

Factors Affecting Fishermen's Readiness to Pay for Protection and Indemnity Insurance in Kuala Kedah, Malaysia

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The fisheries industry plays a crucial role in food security and nutrition while also contributing significantly to Malaysia's economy. Despite the high risks of fishing in a dangerous environment, the adoption of Protection and Indemnity (P&I) insurance among fishermen is surprisingly low. This study examines the impact of insurance awareness, government intervention, risk perception, financial consideration and fishermen's attitudes on the readiness to pay (RTP) of P&I insurance. Data were collected from 343 respondents using a convenience sampling technique and multiple regression analysis was conducted using SPSS version 27 to identify the effects of these factors. The findings revealed that government intervention, financial factors, risk perception and fishermen's attitude had a significant positive impact on RTP for P&I insurance, while insurance awareness did not show a notable impact. The results demonstrated that government intervention proved to be the main factor ($\beta = 0.396$) affecting RTP. Through financial support and subsidy programs, government initiatives play a crucial role in promoting P&I insurance, helping fishermen securing better financial stability and encouraging the adoption of insurance policies to mitigate environmental risks. This study provides valuable insight for government bodies and insurance policymakers in signifying suitable financial support and insurance schemes for fishermen to increase P&I insurance uptake to mitigate their risks at sea among fishermen in Malaysia. Future research could explore a broader geographical area, utilise mixed methods and also cross-tabulation analysis to deepen understanding of this issue and support sustainable environmental protection.

1. Introduction

The fisheries industry has gained attention for its vital role in food security and nutrition in the twenty-first century. In 2022, global fish production reached 101.7×10^6 t (FAO, 2024a), of which Malaysia accounted for 2.08×10^6 t (DOF, 2024), representing 0.7 % of the gross domestic product of the national agricultural sector. The fishing industry fosters national development by generating job opportunities, with Asia having the largest fleet, representing 3.5×10^6 vessels, accounting for 71 % of the global total (FAO, 2024b). In Malaysia alone, 116,613 fishermen and 48,605 vessels were registered under the Department of Fisheries Malaysia (DOF) in 2022 (DOF, 2024). Despite the growing demand, fishermen globally face severe environmental hazards (Misaal et al., 2024) while at sea, leading to frequent incidents. Most fatalities and injuries occur in small-scale fishing operations, which represent the main component of labour in global counted fisheries (FAO, 2024c). In Malaysia, the search and rescue operations for the fisheries industry conducted in 2022 documented 270 cases (MMEA, 2022). Studies from China (Jiang and Faure, 2020), Vietnam (Nguyen et al., 2021) and India (Parappurathu et al., 2017) consistently highlight crucial factors affecting fishermen's willingness to pay (WTP) for insurance. Zheng et al. (2018) found that better awareness and education among fishermen raise their insurance payment readiness, but their income and farming experience together decrease this readiness. Nguyen et al. (2021) showed that fishermen receiving risk management training together with income limitations tend to choose

higher premium levels. In contrast, Malaysia lacks comprehensive studies in this area. Previous studies on socioeconomic and environmental issues affecting Malaysian fishermen remains limited, particularly marine insurance (Sanusi et al., 2024) and the factors influencing fishermen's WTP.

This lack of study hinders efforts to understand Malaysian fishermen's reluctance to adopt marine insurance (Preye and Onovughakpo, 2019). Addressing this gap is crucial for creating effective insurance adoption strategies that protect fishermen's livelihoods and reduce risks. The adoption of marine insurance in Malaysia depends on various critical aspects, including awareness levels, governmental policies and financial limitations alongside fishermen's perceptions of risks and their attitudes toward readiness to pay (RTP). This study aims to investigate these variables affecting fishermen's RTP for Environmental Protection and Indemnity (P&I) insurance in Kuala Kedah, Malaysia. A quantitative approach using multiple regression analysis was employed, with the Protection Motivation Theory (PMT) (Rogers, 1975) serving as the theoretical foundation. Hypotheses were developed to assess how these factors shape fishermen's decisions regarding environmental protection and P&I insurance adoption. The study provides practical insights for policymakers at the DOF and other relevant agencies to create targeted interventions. These include strategies to increase insurance adoption, enhance risk mitigation, promote environmentally responsible fishing practices and ensure the long-term sustainability of Malaysia's marine resources by protecting fishermen from unexpected financial losses.

2. Literature review

2.1 Underpinning theory

In PMT, insurance awareness is a key factor; however, it is the combination of awareness and the ability to apply that knowledge effectively that significantly boosts fishermen's confidence in purchasing insurance (Niedziółka, 2023). Studies indicate that greater awareness of P&I's role is an essential factor for enhancing self-efficacy, which leads to better intentions towards insurance adoption among fishermen (Xiao et al., 2014). Insurance adoption is also positively influenced by government financial support and subsidies, which reduce fishermen's financial burden and strengthen their motivation and capacity to engage with insurance products (Puntsagdorj et al., 2021). Financial factors, particularly income and savings, shape perceived response costs associated with protective actions (Sabri and Dass, 2017). A stable financial situation makes insurance premiums appear less burdensome, increasing the likelihood of adoption. Risk perception, including perceived vulnerability and severity, drives fishermen to adopt protective measures like P&I insurance to mitigate environmental and occupational hazards (Faryabi et al., 2023). Positive attitudes toward safety, when combined with strong self-efficacy, enhance motivation to engage in protective behaviours (Maddux and Rogers, 1983). The financial stability of fishermen allows them to view insurance premiums as less burdensome, which encourages them to adopt protective measures.

2.2 Hypothesis development

Beyond insurance awareness, knowledge and confidence, a key factor in driving adoption in sectors like fisheries is the positive motivation that converts awareness into WTP. This is illustrated by the increased insurance uptake among farmers and shrimp growers informed about available subsidies (Nguyen et al., 2021). There are gaps in adoption among fishermen due to misconceptions that insurance is an unnecessary expense (Bakshi et al., 2023). Efforts to boost awareness must include trust-building and the provision of actionable information, which have proven effective in increasing WTP (Brahmantyo et al., 2021). To enhance insurance adoption in vulnerable sectors, the awareness-WTP relationship should be examined in light of socio-economic and cultural factors that shape the connection between awareness and payment willingness. Government intervention, mainly through subsidies, tax exemptions or allowances (Zhang et al., 2023), has a significant impact on the fishermen's RTP for insurance. Their study highlights the effectiveness of government subsidies in raising WTP across various sectors of the fishing industry. For example, while subsidies have proven effective in boosting insurance adoption among farmers (Li et al., 2024) and fisheries (Zheng et al., 2020), many small-scale fishermen still lack adequate coverage due to limited financial resources (Tikadar et al., 2022). Several studies suggest that over-reliance on government support may suppress voluntary insurance demand, complicating the relationship between financial preparedness and dependence on public assistance (Zhang and Qian, 2018).

Financial factors such as income, debt levels and household wealth are closely associated with financial well-being and ultimately, influence insurance purchasing decisions (Aisyah and Umami, 2022). More specifically, WTP for insurance typically increases with income (Nosratnejad et al., 2016). Interestingly, Zheng et al. (2018) reported a negative relationship between income and RTP among fishermen, suggesting that higher income levels may promote risk diversification and reduce the perceived need for insurance. Affordability is another major barrier, with premium costs deterring participation in insurance schemes (Maltby et al., 2023), further revealing the intricate relationships between financial capacity and insurance adoption. A portion of the

fishermen's RTP insurance is dominated by their assessments of perceived risks. Nguyen et al. (2021) found that shrimp farmers who engage in risk management practices are more likely to commit to insurance premium payments. Xu et al. (2024) similarly showed that perceived vulnerability increases insurance adoption among fishing producers. Fishermen often face difficulties with financial literacy and premium affordability, hindering widespread insurance uptake despite facing evident occupational hazards. Their risk perception is reflected in safety-related behaviors, such as engaging in group fishing and monitoring weather forecasts. Evidence from Agbekpomu et al. (2014) showed that Indonesian fishermen who monitor weather forecasts are more inclined to purchase insurance, whereas the use of personal protective equipment may reduce their perceived need for coverage. Based on the reviewed literature, this study proposes the conceptual framework shown in Figure 1 and formulates the following hypotheses:

H1: There is a significant positive impact of insurance awareness and fishermen's RTP for P&I insurance.

H2: There is a significant positive impact of government intervention and fishermen's RTP on P&I insurance.

H3: There is a significant positive impact of financial factors and fishermen's RTP for P&I insurance.

H4: There is a significant positive impact of risk perception and fishermen's RTP for P&I insurance.

H5: There is a significant positive impact of fishermen's attitude and fishermen's RTP on P&I insurance.

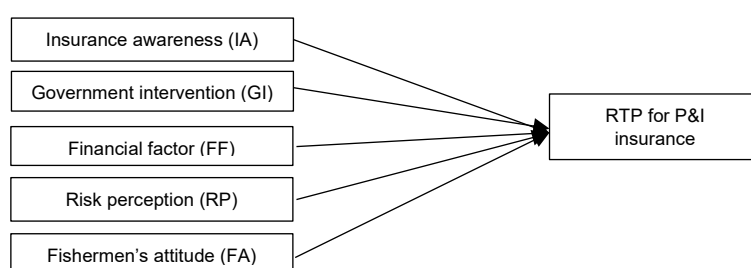


Figure 1: Research framework for the study

3. Methodology

This study employed a cross-sectional quantitative research design to examine the variables influencing fishermen's RTP for P&I insurance in Kuala Kedah. Data were collected using a convenience sampling method from 343 fishermen across selected locations, providing a practical and cost-effective approach for obtaining initial insights into RTP determinants (Golzar et al., 2022). A structured questionnaire covering 27 items was adapted from previous studies such as insurance awareness (Han and Jiang, 2019), government intervention (Jiang and Faure, 2020), financial factors (Maltby et al., 2023), risk perception (Agbekpomu et al., 2014) and fishermen's attitudes (Xu et al., 2024). Respondents rated their agreement on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Data analysis was performed using Statistical Package for Social Sciences (SPSS) version 27, including descriptive statistics of demographics and the multiple linear regression method for determining the independent variable's impact on RTP. To ensure the reliability of the instrument, a pilot test was conducted with 40 respondents. The results yielded Cronbach's alpha values above 0.70, confirming the internal consistency of all constructs and their suitability for further analysis.

4. Results

The study comprised 343 respondents, predominantly male (98 %) and Malay (99.4 %), with most participants being married (75.2 %). The majority (33.8 %) possessed 11-20 y of fishing experience and had completed primary education (52.8 %). A significant proportion (79.6 %) reported an annual income below RM 15,000. The majority (92.7 %) had never previously purchased P&I insurance. Fibre vessels were the most common (91.5 %), with ages ranging from 6 to 20 y. Table 1 shows the means (2.60–3.68) and standard deviations (0.78–1.02) for all variables. Internal consistency was high, with Cronbach's alpha values ranging from 0.801 to 0.875, confirming the reliability of the instrument. Normality of data was verified by skewness and kurtosis values within the acceptable range of ± 2 (Hair et al., 2010). Pearson correlation analysis in Table 2 revealed that insurance awareness ($r = 0.689$), government intervention ($r = 0.625$), and financial factors ($r = 0.556$) exhibited strong positive correlations with RTP ($p < 0.001$), while risk perception ($r = 0.458$) demonstrated a moderate correlation. In contrast, fishermen's attitude showed only a weak positive correlation with RTP ($r = 0.280$, $p < 0.001$) (Cohen, 1988). Following confirmation of linearity, multiple linear regression analysis revealed that the five independent variables collectively explained 57.6 % of the variance in RTP ($R^2 = 0.576$). Government intervention emerged as the strongest positive predictor ($\beta = 0.396$, $p < 0.001$), followed by risk perception ($\beta = 0.211$, $p < 0.001$),

financial factors ($\beta = 0.181$, $p < 0.001$) and fishermen's attitudes ($\beta = 0.139$, $p = 0.004$). In contrast, insurance awareness did not significantly predict RTP ($\beta = 0.042$, $p = 0.282$).

No multicollinearity issues were detected, as variance inflation factor values remained below 5 (Sang and Bekhet, 2015). These findings support hypotheses H2, H3, H4 and H5, but not H1.

Table 1: Description statistics of variables and correlation matrix

Var.	I	M	SD	α	Var.	Correlation matrix					
						RTP	IA	GI	FF	RP	FA
RTP	5	3.035	0.966	0.875	RTP	1					
IA	5	3.678	0.782	0.801	IA	0.689**	1				
GI	4	3.128	1.024	0.829	GI	0.625**	0.626**	1			
FF	4	2.603	0.898	0.819	FF	0.556**	0.596*	0.612**	1		
RP	5	3.636	0.894	0.836	RP	0.458**	0.370**	0.382**	0.257**	1	
FA	4	3.418	0.955	0.809	FA	0.280**	0.256**	0.282**	0.120*	0.337**	1

Note: Var.-Variables; I-Items; M-Mean; SD-Stadard deviation; α -Cronbach's Alpha; -RTP- P&I insurance; IA-; Insurance awareness GI- Government intervention; FF- Financial factor; RP- Risk perception; FA- Fishermen's attitude; **. Correlation is significant at the 0.01 level (2-tailed).

Table 2: Measurement model

F	Unstd. Coeff. β	SE	Std. Coeff. β	t	P	VIF	Results
(Constant)	-0.139	0.201	-	-0.692	0.489	-	
IA	0.051	0.048	0.042	1.078	0.282	1.183	Not supported (H1)
GI	0.374	0.047	0.396	8.007	<0.001	1.948	Supported(H2)
FF	0.195	0.043	0.181	4.500	<0.001	1.288	Supported (H3)
RP	0.228	0.055	0.211	4.157	<0.001	2.050	Supported (H4)
FA	0.140	0.049	0.139	2.884	0.004	1.841	Supported (H5)

Notes: F-Factors; Unstd. Coeff. β - Unstandardized coefficients β ; SE-Standard error; Std. Coeff. β - Standardized coefficient β ; t- t-value; P- p-value; VIF- Variance inflation factor; Dependent variable = RTP; $R = 0.759$, $R^2 = 57.6\%$, adjusted $R^2 = 57\%$, $F = 91.689$, significant = 0.05

5. Discussion

The study investigated the impact of various factors such as insurance awareness, government intervention, financial stability, risk perception and fishermen's attitudes on their RTP for P&I insurance. The findings revealed a positive correlation between insurance awareness and RTP, but no statistically significant evidence supported this relationship (H1). This result contrasts with prior studies in China and Vietnam, where higher awareness levels translated into greater insurance uptake (Xu et al., 2024). Malaysia's comparatively limited approach has resulted in lower adoption rates, highlighting the need for more targeted policy interventions. The inconsistency arises because fishermen perceive existing government insurance programs adequately safeguard them which reduces their motivation for additional P&I coverage (Wang et al., 2012). The findings confirmed that government intervention through financial support and subsidies enhances RTP (H2), consistent with the findings of Tikadar et al. (2022). This suggests that future insurance policies should be tailored to meet the diverse needs of various fishing communities to optimize enrolment success. The study also supports the hypothesis that financial resources improve insurance affordability (H3), as higher income and stronger financial stability are directly linked to increased likelihood of insurance uptake (Maltby et al., 2023). To support this, fishermen would benefit from educational programs in financial literacy and resilience, which could help them secure P&I insurance coverage. The results also established that risk perception significantly affects RTP (H4), as fishermen who recognize higher operational risks are more inclined to adopt insurance as a preventive measure (Xu et al., 2024). Finally, fishermen's attitudes showed a significant positive relationship with RTP (H5). Community outreach and educational campaigns that promote positive attitudes towards insurance can effectively encourage greater uptake of protection (Suharno et al., 2022).

6. Conclusions

This paper investigates fishermen's RTP for P&I insurance and the factors affecting it in Kuala Kedah, focusing on insurance awareness, government intervention, financial factors, risk perceptions and fishermen's attitudes. The demographic analysis revealed a predominantly male (98 %) and Malay (99 %) population, with a large

proportion reporting low annual income and minimal P&I insurance adoption. The key findings indicate that government intervention, risk perception, financial capability and fishermen's attitudes were the most influential positive factors affecting RTP, while insurance awareness showed no significant impact. To enhance fishermen's welfare and improve the affordability of insurance, targeted policy interventions are essential. An effective approach is to encourage the establishment of community-based insurance groups, which can make coverage more accessible and cost-effective, while simultaneously promoting environmentally sustainable fishing practices. This study offers valuable insights into the structural challenges faced by the fisheries sector and encourages stakeholders to implement more impactful strategies to boost insurance adoption, which in turn promotes risk mitigation and environmental sustainability among fishermen.

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