

# The Influence of Micro-Financing and Educational Levels on Fishermen's Financial Management with Financial Literacy as a Moderating Variable

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## ABSTRACT

*This study aims to analyze the effect of microfinance and education level on fishermen's financial management, as well as to examine the role of financial literacy as a moderating variable. This study uses a quantitative approach with a survey method involving fishermen as respondents in the Trikora Coastal Area, Bintan Regency. The data analysis technique used is SEM-PLS to test the hypothesis. The results found that microfinance with a significance value of 0.043 and financial literacy with a significance value of 0.000 had a direct, positive, and significant effect on improving fishermen's financial management. Conversely, formal education level with a significance value of 0.848 was not proven to have a significant effect. An important finding from this study is the lack of financial literacy needed to regulate the relationship between financial management and microfinance as well as between education level and financial management. These results imply that in the context of fishermen, financial knowledge does not interact with access to capital or formal education, possibly because of the dominance of urgent operational needs and the higher relevance of practical knowledge (fishing experience).*

**Keywords:** Financial Management; Microfinance; Financial Literacy; Education Level; Fishermen

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## INTRODUCTION

As an archipelagic nation, Indonesia possesses a strategic advantage in the fisheries sector, which serves as a fundamental pillar of national economic security. Although fishermen occupy a central role in managing these marine riches, a paradoxical reality emerges where this community is often trapped in a cycle of financial instability and significant economic vulnerability (Zamzami et al., 2023). This condition is triggered by fluctuating income patterns, an implication of their dependence on climate cycles, seasonal changes, and price uncertainty of commodities at the market level. Therefore, the adoption of measured and disciplined financial governance is viewed as a vital instrument for fishermen to break the chain of vulnerability, while simultaneously providing opportunities for them to develop future projections, optimize fishing operational costs, and strengthen domestic asset accumulation (Loppies, 2023).

The current reality on the ground reveals that the majority of fishing communities are still entangled in very simple, conventional financial management patterns. As a result, the potential income they earn has not yet been transformed into a solid foundation for family economic resilience (Fitriyah & Ansori, 2022). There are two main determinants—external and internal dimensions—that significantly determine the financial management capabilities of fishermen: accessibility to microfinance institutions and the level of formal education attained. Financial inclusion through microfinance access becomes a crucial instrument for small-scale fishermen to build economic resilience, as it facilitates the availability of working capital necessary for productive investments, such as vessel maintenance, gear technology upgrades, and business diversification (Pomeroy et al., 2020). Through this microfinance support, fishermen are encouraged to abandon chronic dependence on informal lending schemes or loan sharks, which are often detrimental. On the other hand, formal education acts as an internal capacity builder that shapes logical frameworks and analytical skills in evaluating risks before making financial decisions; this competence is believed to be the driving force in shifting individual financial behavior toward wiser practices (Azizah & Murdiono, 2023). Consequently, fishermen with higher educational attainment tend

to possess superior proficiency in internalizing strategic planning concepts, disciplined cash flow recording, and efficient allocation of financial resources for long-term welfare.

The interaction between the availability of microfinance support and formal educational background toward the effectiveness of fishermen's financial management is often complex and does not always exhibit a linear relationship. Financial literacy emerges as a crucial determining factor in bridging this relationship, where financial knowledge is defined as an individual's competence to internalize and control their assets effectively (Riyani & Virgi, 2025). A deep mastery of financial principles is an absolute prerequisite for optimizing access to microfinance institutions for business growth (Pomeroy *et al.*, 2020) while also serving as a foundation for individuals to apply the outcomes of their formal education (Azizah & Murdiono, 2023). Without adequate literacy, fishermen who receive capital injections face a high risk of falling into consumptive and non-productive fund allocation behaviors. Conversely, fishermen with extensive financial proficiency are able to convert their knowledge and monetary resources into effective cash flow management strategies for long-term economic stability.

Previous literature has attempted to dissect these variables through various perspectives and regional contexts. For instance, findings by Loppies (2023) confirm that the dimensions of literacy, insight, and financial attitude orientation have a significant positive correlation in shaping financial governance behavior in the fisheries sector in Ambon. In line with this, some studies have conversely found that formal education levels have no direct relevance to investment behavior and money management, particularly in the informal economic sector.

Such discrepancies in results indicate that holding a formal diploma does not automatically guarantee practical proficiency in the field, especially for fishing communities. Similar findings are observed regarding the financial literacy variable; while Loppies (2023) found a significant direct influence, the study by Pomeroy *et al.*, (2020) provided a critical note that financial inclusion through capital access often fails to deliver tangible welfare impacts if not accompanied by strong literacy skills. These differing findings suggest a gap in the literature regarding how these variables interact complexly within the coastal economic ecosystem.

This research is built upon the existence of inconsistent results (research gaps) from various previous studies regarding factors influencing the quality of financial management. Theoretically, educational level should be a primary predictor determining an individual's proficiency in managing their finances. However, empirical facts show contradictory results; a study by Azizah & Murdiono (2023) states that education has a positive effect on financial behavior, while research by Syauqina dan Munandar (2023) found that formal education levels have no direct relevance to investment behavior and money management, particularly in the informal sector.

The fundamental novelty of this study lies in the adoption of a more integrative analytical framework, positioning financial literacy as a moderating variable to transcend previous research findings that only validated the significance of literacy Loppies (2023) and financial inclusion Pomeroy *et al.*, (2020) separately. The primary focus of this research is directed toward dissecting how the interaction between microfinance support and educational background influences the effectiveness of financial governance in fishing communities a model that has not been empirically explored in this specific context. Unlike conventional approaches, this study does not merely treat financial literacy as a one-way predictor. Instead, it tests it as a conditioning factor expected to escalate the positive impact of capital input through microfinance and insights from formal education on the quality of financial management outputs in fishing households.

Driven by this urgency, the study is focused on bridging the literature gap related to the interaction mechanism between financial competence and various determining factors in achieving optimal financial governance among coastal communities. In accordance with the background and originality described, the main objectives of this research are constructed into four fundamental points: evaluating the significance of microfinance support on fishermen's financial management patterns; examining the influence of formal education levels in shaping financial management behavior, proving the role of financial literacy as a moderating variable that strengthens the relationship between micro-capital access and financial practice effectiveness; and identifying the extent to which financial literacy moderates the link between educational background and the quality of financial management in fishing communities.

Various previous literatures have attempted to dissect these variables from diverse perspectives.

For example, findings from (Loppies, 2023) and (Pomeroy et al., 2020) serve as primary references in this study, both in terms of variable substance and sampling methodology. Substantively, these studies confirm the crucial role of financial inclusion in maintaining economic resilience in small-scale fisheries units. Meanwhile, regarding sampling, this study adopts a probability sampling approach using the Slovin Formula, aligned with the methodology used by (Fitriyah & Ansori, 2022) on similar fishing communities. This ensures that the 153 selected respondents possess high representativeness of the fisherman population in the coastal areas of Tanjungpinang and Bintan, thereby providing strong academic validity to the data analysis.

Practically, the results of this study are intended to provide a data-driven foundation for government authorities and regulators to formulate more precise empowerment policies, serve as a consideration for microfinance institutions in designing products relevant to field needs, and function as a credible academic reference for future research development focusing on the economic resilience of fishing communities.

## **LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT**

### **Financial Literacy**

Financial literacy is a manifestation of an individual's depth of understanding and proficiency in orchestrating financial resources to make strategic and effective decisions. Holistically, this dimension encompasses the integration of knowledge, capabilities, confidence, and attitudinal orientation in managing the financial spectrum—including income streams, expenditure allocation, savings accumulation, investment placement, and accompanying risk mitigation. This competence serves as a crucial determinant for individuals to minimize the potential for financial crises resulting from management malpractice (Thaha & Afriyani, 2022). Simultaneously, sound literacy functions as a catalyst in building household economic stability that is more resilient to external shocks (Kumar et al., 2023). Individuals with proficient financial skills tend to exhibit superior financial management behavior, demonstrating the ability to optimize operational costs, maximize sales outcomes, and formulate long-term business sustainability projections (Loppies, 2023).

In the framework of this research, financial literacy is positioned as a significant moderating variable. Financial understanding is believed to be capable of mediating and strengthening the link between educational attainment and the implementation of financial management actions, as well as overall financial behavior, including the dynamics of investment decision-making. Conversely, low financial literacy risks exacerbating economic vulnerability in marginal communities, such as fishermen, and acts as a barrier to internalizing and utilizing formal financial products (Nino et al., 2022). Therefore, escalating financial knowledge is an absolute prerequisite for fishermen to sharpen the accuracy of their financial choices and optimally leverage their available resources.

### **Micro-Financing**

Micro-financing is fundamentally the provision of various financial services—ranging from small-scale capital loans and savings to insurance—specifically designed to embrace low-income individuals or micro-enterprise groups. Its primary focus is to drive economic activity while reducing poverty rates, particularly for those operating in the informal sector or residing in remote rural areas. For instance, the presence of ultra-micro financing programs offers a breath of fresh air for small-scale entrepreneurs who have long been hindered by capital constraints and lack organized financial management systems (Khusnaini & Liyana, 2023). This is where Microfinance Institutions play a vital role; they act as a bridge for MSMEs to overcome funding limitations through more affordable and accessible service options (Salsabila & Kosasih, 2024).

In practice, micro-financing possesses significant potential to support fishermen's operations, whether in providing daily operational capital for seafaring, developing post-harvest processing businesses, or investing in modern fishing gear. Extensive field evidence suggests that easy access to capital can boost income and improve household financial governance within the agriculture and fisheries sectors. More broadly, the availability of formal funding assists fishing families in allocating their resources more effectively. However, these substantial benefits are highly dependent on how the fishermen manage the funds received. In reality, many micro-entrepreneurs in the fisheries sector are still hampered by poor financial management, which ultimately threatens the sustainability of their own

businesses (Khusnaini & Liyana, 2023; Sutarjo et al., 2025). This condition reinforces the fact that the distribution of micro-financing cannot stand alone; it must be accompanied by proficient financial management skills from the fishermen as the beneficiaries.

### **Educational Level**

Educational level fundamentally reflects an individual's journey through formal schooling, spanning from primary school to higher education. However, its role extends far deeper than the mere pursuit of a diploma; education is a primary instrument for honing cognitive sharpness, analytical power, and the ability to grasp abstract concepts closely related to economic insight and financial governance. Through this learning process, individuals gradually develop a more systematic mindset in identifying opportunities and risks. This financial knowledge does not necessarily derive from a single source; one can acquire it through various channels, including formal curricula in schools and universities, as well as more practical informal paths such as workshops, seminars, or specialized training focused on economic empowerment (Gunawan et al., 2023).

The relationship between educational attainment and financial literacy levels has been a focal point in various literature reviews. It is generally recognized that individuals with higher education tend to possess a more mature financial understanding (Gunawan et al., 2023). This occurs because formal educational institutions equip individuals with the capacity to absorb economic insights, sharpen information analysis skills, and make financial decisions rooted in rationality (Gunawan et al., 2023). Recent findings further emphasize that successfully achieving higher education contributes directly to improvements in financial management behavior, which in turn reduces financial anxiety and fosters economic security (Wijaya et al., 2024). For fishing communities, this escalation in education carries a dual impact: it not only simplifies the understanding of complex financial terminology but also strengthens their capacity to process new information. With a better educational background, fishermen become more adaptive in applying modern money management patterns, especially when faced with the increasingly complex and varied options of micro-financing products available today.

### **Financial Management**

Financial management essentially represents a continuous cycle encompassing planning, organizing, and controlling all financial activities at the individual and household levels in order to achieve desired future goals. This practice is not merely limited to recording income and expenditure, but also involves the ability to align cash flow, allocate expenses efficiently, maintain savings discipline, and manage investments and debt obligations wisely. For households with fluctuating income patterns, such as fishing communities, proper financial management serves as the primary foundation for sustaining economic stability. Without strong financial management practices, uncertainty in income caused by natural conditions becomes increasingly difficult to overcome, making prudent financial behavior an essential safeguard for maintaining household welfare amid the unpredictable dynamics of marine livelihoods.

Within fishing communities, financial management is particularly challenging due to the highly volatile nature of income that depends heavily on seasonal cycles and weather conditions (Nino et al., 2022). Furthermore, the dominance of informal financial practices in coastal communities often exacerbates their financial vulnerability. Limited understanding of financial management may trigger systemic problems, including excessive debt burdens beyond repayment capacity and the inability to formulate long-term financial plans (Thaha & Afriyani, 2022). Numerous studies have emphasized that the implementation of effective financial management strategies and sustainable livelihood patterns is crucial for enabling fishermen's households to survive amid high levels of economic vulnerability (Mustika et al., 2023). Although marine resources provide substantial economic potential, such prosperity cannot be sustained without proper management. Financial management therefore acts as an empowerment instrument that enables fishermen to allocate their fishing income wisely, mitigate financial risks, and ultimately improve the living standards of their families (Sulkiah, 2021).

### **Hypothesis Development**

This study aims to examine how the synergy between microfinance support, educational background, and financial literacy influences the quality of financial management among fishermen. For coastal communities, access to microfinance is not merely a source of funding but also a strategic

capital input that enables business expansion through post-harvest diversification, covers operational fishing expenses without dependence on exploitative informal loans, and supports the modernization of fishing equipment (Fitriyah & Ansori, 2022). Access to formal financing gradually encourages fishermen to shift from a subsistence-oriented mindset focused solely on daily needs toward more structured long-term financial planning (Nino et al., 2022). Moreover, microfinance institutions often implement administrative standards requiring financial recording and disciplined fund management, which indirectly provide practical education regarding effective financial management (Salsabila & Kosasih, 2024). Through stable and legitimate sources of capital, fishermen gain greater control over cash flow, making financial management practices more applicable and impactful for household economic stability.

**H1: Microfinance has a positive and significant effect on fishermen's financial management.**

The relationship between financial literacy and financial management is highly fundamental. Financial literacy functions as a cognitive framework that guides individuals in managing their financial resources. Empirical findings by Loppies (2023) confirmed that financial knowledge significantly affects the effectiveness of financial management, particularly within the fisheries sector, which possesses unique characteristics. Individuals with adequate financial literacy are generally more capable of performing essential management functions, including financial recording, budgeting, risk assessment, and future financial planning (Thaha & Afriyani, 2022). Without such understanding, even substantial income may be exhausted solely for consumptive purposes. For fishermen facing fluctuating income conditions, financial literacy acts as a stabilizing mechanism that enables them to cope with uncertainty through disciplined saving behavior and emergency fund preparation.

**H2: Financial literacy has a positive and significant effect on fishermen's financial management.**

Formal education fundamentally equips individuals with essential competencies, including numeracy, literacy, and analytical thinking skills. Broader educational exposure enables individuals to better absorb financial concepts, even when such knowledge is not explicitly taught within formal curricula. This argument is consistent with the findings of Azizah dan Murdiono (2023) who identified a strong correlation between educational attainment and financial behavior. Individuals with higher levels of education tend to possess longer-term planning perspectives and stronger abilities to process complex financial information. In the context of fishermen's daily lives, the impact of education can be observed in their ability to calculate profit margins accurately, compare loan schemes effectively, and plan long-term investments such as educational funds for their children.

**H3: Educational level has a positive and significant effect on fishermen's financial management.**

The rationale underlying this relationship is that access to capital through microfinance will not generate optimal outcomes without the capability to manage financial resources effectively. In this context, microfinance serves as a triggering factor that facilitates improvements in fishermen's financial literacy. As fishermen interact with formal financial institutions, they are indirectly encouraged to understand loan application procedures, repayment schemes, and the importance of proper financial recording (Salsabila & Kosasih, 2024). In addition, many microfinance institutions require financial mentoring or basic financial training prior to loan disbursement. This learning process gradually enhances fishermen's financial literacy, which subsequently becomes a key driver in improving their financial management behavior. Therefore, microfinance does not merely provide direct financial assistance but also contributes through knowledge transformation that enables fishermen to manage financial resources more wisely.

**H4: Financial literacy positively and significantly mediates the effect of microfinance on fishermen's financial management.**

This hypothesis positions financial literacy as a moderating variable that determines the strength of the relationship between educational background and financial management practices. Although education provides basic cognitive capacity, such knowledge is often general in nature. Financial literacy therefore acts as specific knowledge that activates this cognitive capacity. The primary argument

is that the positive effect of education on financial management becomes significantly stronger when supported by high levels of financial literacy. Conversely, regardless of educational attainment, formal education alone may not substantially influence financial behavior if individuals lack basic financial understanding. Financial literacy serves as a bridge that transforms intellectual potential acquired through education into practical and responsible financial actions. The relevance of this interaction model is supported by the findings of Azizah dan Murdiono (2023), who identified the moderating role of education in financial literacy, as well as (Rizqiandini et al., 2025), who emphasized the role of financial literacy as a reinforcing factor in shaping structured financial behavior.

**H5: Financial literacy positively and significantly moderates the effect of educational level on fishermen's financial management.**

## RESEARCH METHODOLOGY

This study employs a quantitative methodology to empirically examine the relationship between micro-financing and educational attainment, focusing on the quality of fishermen's financial management while considering financial literacy as a moderating factor. Operationally, the research encompasses four primary variables: micro-financing, educational attainment, financial literacy, and financial management practices. The quantitative approach was selected to provide a measurable analysis of financial management phenomena in coastal communities through the systematic processing of objective numerical data.

The data used in this study consist of primary data obtained directly from research participants through the distribution of structured questionnaires. As a measurement instrument, this research utilizes a five-point Likert scale to assess respondent perceptions, ranging from "Strongly Disagree" (1) to "Strongly Agree" (5).

The population for this survey comprises all 247 fishermen residing in Tanjungpinang City. To determine the required sample size, the Slovin formula was applied with a margin of error of 5% (0.05). Based on this calculation, a minimum sample of 153 respondents is required. For sample selection, the simple random sampling method was used to ensure that every member of the population had an equal opportunity to be selected.

The data analysis process was conducted using Structural Equation Modeling (SEM) to evaluate all hypotheses and relationships between variables simultaneously and comprehensively. The analysis was performed systematically, beginning with descriptive analysis to provide a general overview of the data, followed by validity and reliability assessments to verify the accuracy and consistency of the research instrument.

To evaluate the models and hypotheses, the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach was utilized. The selection of the SEM-PLS method is based on its effectiveness as a robust multivariate analysis technique for explaining complex relationships between variables simultaneously. The SEM model used in this study fundamentally consists of two main components:

1. Measurement Model (Outer Model): Functions to explain the extent to which indicators effectively represent their underlying latent variables.
2. Structural Model (Inner Model): Explains the causal relationships between latent variables, including exogenous and endogenous variables.

By integrating these two models, the researcher can conduct a thorough assessment of measurement errors, test construct validity, and empirically prove the research hypotheses through a combination of factor analysis and structural equation modeling.

## RESULT AND DISCUSSION

### Respondent Characteristics

Based on data collected from 153 respondents, the following demographic profile describes the fishermen who participated in this study.

Table 1. Demographic Profile of Respondents

Category	Characteristics	Frequency	Percentage (%)	Total
Gender	Male	153	100%	153
	Female	0	0%	
Age	20 – 30 Years	25	16,3%	153
	31 – 40 Years	48	31,4%	
	41 – 50 Years	55	35,9%	
	> 50 Years	25	16,4%	
Educational Level	Elementary School / Equivalent	60	39,2%	153
	Elementary School / Equivalent	52	34,0%	
	Senior High School / Equivalent	35	22,9%	
	Diploma / Bachelor's Degree	6	3,9%	
Length of Experience as Fishermen	< 5 Years	18	11,8%	53
	5 – 10 Years	45	29,4%	
	> 10 Years	90	58,8%	

Source: Processed Data by the Author (2025)

Based on the research data, the respondent profile is dominated by fishermen within the productive age range, with the majority falling between 41–50 years (35.9%) and 31–40 years (31.4%). This age maturity indicates that respondents carry significant responsibility for household decision-making, particularly regarding financial management. However, this profile is accompanied by relatively low levels of formal education, where the majority of respondents are graduates of primary school or its equivalent (39.2%) and junior high school or its equivalent (34.0%). This limited educational background underscores the urgency of research into financial literacy, as low formal education often acts as a barrier for fishermen in understanding complex micro-finance instruments without intensive guidance.

In terms of work experience, the majority of respondents (58.8%) have worked as fishermen for more than 10 years, confirming that this profession is their primary and permanent livelihood. While extensive field experience assists fishermen in their fishing activities, without adequate financial literacy, such proficiency often fails to align with systematic financial management. Furthermore, all respondents in this study are male (100%), which is highly relevant to the real-world conditions in Tanjungpinang City, where offshore fishing operations are dominated by men, while the role of women is typically limited to post-harvest sectors or the marketing of catches.

### Descriptive Analysis

The descriptive analysis aims to assess the profile of respondent feedback concerning a set of indicators pertaining to financial management, microfinance, and financial literacy variables. Utilizing frequency distribution techniques, this study aims to delineate the subtleties of respondent perceptions in a more detailed manner. The subsequent section displays the tabulated data, analyzed using Microsoft Excel, to offer a statistical overview of the response distribution for each research variable.

### Microfinance

This section presents the frequency distribution for each response option chosen by participants for each statement within the Microfinance variable. This analysis seeks to delineate the respondents' tendencies in evaluating the capital-related indicators they have received. A detailed analysis of the response distribution, encompassing both frequency and percentage for each item, is methodically summarized in Table 1 below.

Table 2. Respondents' Feedback Concerning Microfinance

No	Statement	Answer Options					Average
		STS	TS	N	S	SS	
		1	2	3	4	5	
PM 1	I perceive that the current business capital loan application process is easily accessible to fishermen.	58	37	15	8	2	1.88
PM 2	I consistently utilize the loan funds exclusively for business operational purposes, rather than for personal consumption.	42	31	18	21	8	2.33
PM 3	The loan amount received is commensurate with my business capital requirements.	45	33	19	15	8	2,23
PM 4	10	40	28	22	20		2,48

Source: Processed Data by the Author (2025)

Data presented in Table 1 reveals that, cumulatively, the respondents' perceptions across the four indicators of the microfinance variable yield an average score of 2.48. A more detailed examination shows that indicator PM 4, which states that "capital loans significantly contribute to enhancing my fishing yields and overall business income," received the highest rating from respondents. This suggests an acknowledgment of the functional benefits of capital in relation to productivity. Conversely, the lowest point is identified in indicator PM 1 regarding the statement "I perceive that the current business capital loan application process is easily accessible to fishermen," which only reached a mean score of 1.88.

The overall mean range across all indicators, spanning only between 1.8 and 2.5, serves as a strong signal that the majority of fishermen provided negative responses tending toward "Strongly Disagree" and "Disagree" options. This reality reflects serious barriers in both accessibility and the effectiveness of fund utilization. These findings indicate that the microfinance ecosystem has not yet optimally met the needs of the fishing community. The primary constraints appear to lie in access procedures that are still perceived as difficult, loan amounts that may not meet actual field requirements, and an impact that remains insignificant in escalating the overall economic status or business income of the fishermen.

### Financial Literacy

This section delineates the response distribution profile for each statement comprising the Financial Literacy variable. Through this frequency breakdown, it is possible to observe the extent of the respondents' financial understanding and proficiency in addressing the provided instruments. Comprehensive details regarding the frequency distribution and respondents' choices for each statement item within this variable are summarized in Table 2 below.

Table 3. Respondents' Feedback Concerning Financial Literacy

No	Statment	Answer Options					Average
		STS	TS	N	S	SS	
		1	2	3	4	5	
LK 1	I believe that having a financial plan is essential for maintaining control over expenditures.	10	14	16	52	28	3.77
LK 2	I consider it highly important to set aside money for savings,	8	12	14	56	30	3.90

	despite having an inconsistent income.						
LK 3	I prefer to spend the income from today's catch immediately rather than saving it for future needs.	25	30	20	28	17	2.88
LK 4	I believe that incurring debt for non-urgent (consumptive) purposes should be avoided.	6	10	15	54	35	3.97

Source: Processed Data by the Author (2025)

Referring to the data presented in Table 2, it is observed that the mean score for the five indicators of the Financial Literacy variable stands at 3.97. A compelling finding emerges from indicator LK 4, where the statement "I believe that incurring debt for non-urgent (consumptive) purposes should be avoided" attained the highest average score. This signifies a strong moral awareness and financial logic among fishermen regarding the risks associated with non-productive debt. Conversely, indicator LK 3, which also addresses the belief in avoiding consumptive debt, recorded the lowest average of 2.88. The contrasting scores on similar substantive issues indicate a gap between "ideal knowledge" and "practical application or conviction" in daily life.

Overall, the financial literacy level of fishermen in the study area falls within the moderate category. This phenomenon suggests that although a foundational knowledge of finance has begun to take root, the aspects of discipline and behavioral consistency in managing financial assets remain significant challenges. Consequently, interventions in the form of more applied education and sustainable microfinance mentoring are required to transform theoretical understanding into healthier and more measurable financial habits.

### Financial Management

This section presents an overview of the frequency distribution of respondent choices for each statement within the Financial Management variable. Through this presentation, the actual behavioral patterns of fishermen in organizing their daily financial resources can be mapped. Detailed frequencies and percentages for all indicators within this variable have been systematically compiled and can be examined in Table 3 below.

Table 4. Respondents' Feedback Concerning Financial Management

No	Statement	Answer Options					Average
		STS	TS	N	S	SS	
		1	2	3	4	5	
PK 1	I develop a spending plan (budget) prior to utilizing the income earned from fishing	38	42	25	10	5	2,10
PK 2	I segregate funds for fishing operational costs (fuel, ice, etc.) from money designated for household expenditures.	35	40	27	12	6	2,20
PK 3	I consistently set aside a portion of my income for savings (at home, in a bank, or through community rotating savings) every time I receive earnings.	30	33	28	18	11	2,47

Source: Processed Data by the Author (2025)

Based on the data summarized in Table 3, the mean response score for the five indicators of the Financial Management variable is 2.47. Upon examining each indicator, PK 3, which states, "I

consistently set aside a portion of my income for savings (at home, in a bank, or through community rotating savings) every time I receive earnings," recorded the highest average. This suggests that despite existing limitations, the fishermen have begun to develop an inherent awareness of the importance of reserving funds as a form of future anticipation. However, a contradiction arises in indicator PK 1, the statement "I develop a spending plan (budget) prior to utilizing the income earned from fishing" which represents the lowest point with a score of 2.10. The low score in this planning aspect indicates that the utilization of fishing income remains largely spontaneous and is not yet grounded in rigorous budgetary calculations.

Comprehensively, these findings reinforce the conclusion that the quality of financial management among fishermen in the study area remains in the low category. Current management patterns tend to be reactive, focusing primarily on meeting immediate needs without a clear planning structure. This condition necessitates more intensive financial education and mentoring efforts to guide fishermen toward more systematic financial management. The primary focus of such education should be directed at cash flow management skills, consistency in saving, and, most crucially, the discipline to segregate domestic household funds from business sustainability capital.

### Test Result

The implementation of SmartPLS for data processing in this study was conducted through two crucial stages: the evaluation of the measurement model (outer model) and the assessment of the structural model (inner model). In the initial phase, the primary focus was directed toward the measurement model to ensure that the instruments utilized were both valid and reliable in representing the latent variables under investigation. Referring to the framework by Hair et al., (2022), one of the fundamental advantages of Partial Least Squares (PLS)-based statistical analysis is its non-parametric nature, which does not require specific data distribution assumptions during the parameter estimation process. Consequently, significance testing does not rely on conventional parametric techniques but instead rests upon the evaluation of the outer model, which emphasizes construct validity and indicator reliability consistency.

Subsequently, the second stage involves the assessment of the structural model, or inner model. This stage constitutes the core of the statistical testing, aimed at confirming and validating research hypotheses through the analysis of causality between latent variables. In this study, the structural model is specifically designed to dissect how direct and indirect interactions occur among the latent variable indicators. The conceptual framework illustrating the complexity of these inter-variable relationships can be visually observed in Figure 1, which serves as a roadmap for understanding the dynamics of influence exerted by microfinance, education, and literacy on the financial management of fishermen.

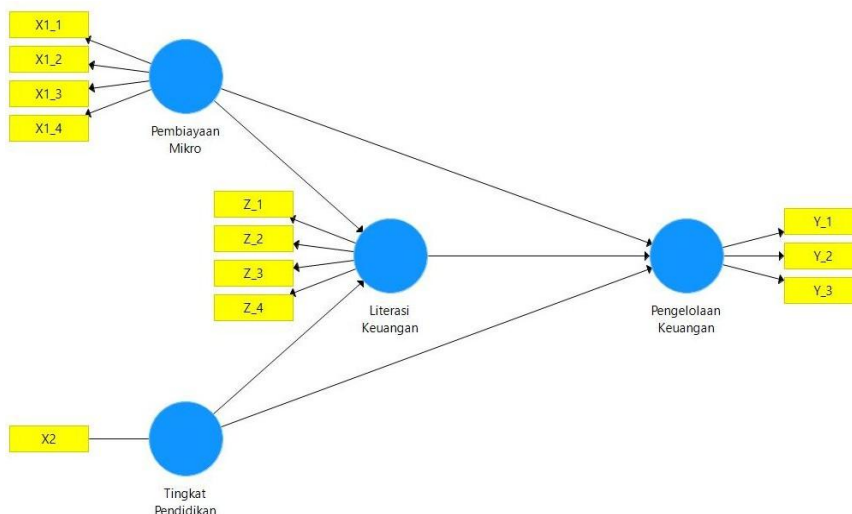


Figure 1. Research Model  
Source: Processed Data by the Author (2025)

### Measurement Model Results

Validity testing is a crucial stage in measuring the quality and precision of research instruments. Its objective is to ensure that each statement in the questionnaire accurately represents the theoretical concepts being measured Hair et al., (2022). In Partial Least Squares (PLS)-based analysis, validity evaluation is conducted through two primary procedures which are *convergent validity* and *discriminant validity*.

*Convergent validity* is employed to demonstrate the extent to which indicators within the same construct exhibit a high degree of correlation. The parameters utilized in this test are outer loading values and the Average Variance Extracted (AVE). A construct is deemed to meet the criteria for convergent validity if it possesses an AVE value exceeding 0.5. This figure serves as evidence that the latent variable is capable of explaining more than 50% of the variance among its constituent indicators.

In the initial phase of the measurement model evaluation, the analysis results indicated that several indicators had *outer loading* values below the 0.7 threshold. This indicates that these indicators did not contribute sufficiently to representing their respective latent variables, thus failing to meet strict convergent validity criteria. As a refinement measure, the researcher decided to exclude the two indicators with the lowest loading values from the model.

Following the screening and re-testing of the revised SEM-PLS model, all remaining indicators now record outer loading values above 0.7. These results confirm that the current measurement model possesses highly adequate validity quality, consequently, all indicators are declared capable of measuring the research variables consistently and accurately prior to proceeding to the structural testing phase.

Table 5. Convergent Validity dan Realibility

Composite / Indikator	Outer Loading	Cronbach's Alpha	Composite Realibility	AVE
PM		0.776	0.842	0.580
X1.1	0.855			
X1.2	0.915			
X1.3	0.549			
X1.4	0.670			
TP		1.000	1.000	1.000
PK		0.585	0.781	0.544
Y1	0.767			
Y2	0.720			
Y3	0.725			
LK		0.701	0.762	0.550
Z1	0.782			
Z2	0.713			
Z3	0.639			
Z4	0.522			

Source: Processed Data by the Author (2025)

Based on the analysis of outer loading, composite reliability, Cronbach's alpha, and Average Variance Extracted (AVE) values presented in Table 5, it can be concluded that the research model fully satisfies the criteria for both convergent validity and reliability. Convergent validity was optimally achieved as all indicators yielded outer loading values above the required threshold and AVE values exceeding 0.5. This empirically proves that the latent constructs are capable of explaining the majority of the variance in their respective indicators. Correspondingly, construct reliability was confirmed through Cronbach's alpha and composite reliability values, both of which consistently remained above 0.7, signifying excellent internal consistency and the dependability of the instrument in measuring each variable stably and accurately.

The measurement model evaluation phase proceeded to discriminant validity testing using two primary approaches: the Fornell-Larcker Criterion and Cross-Loadings. Results from the Fornell-Larcker Criterion demonstrate that the square root of the AVE for each construct is higher than the correlation values between that construct and others within the model. This finding is further

corroborated by the Cross-Loadings analysis, which shows that each indicator exhibits a significantly more dominant correlation with its original construct compared to other constructs. This provides robust evidence that each latent variable in this research model possesses unique characteristics, with no indication of inter-construct overlap.

With all criteria successfully met, it can be affirmed that the research model has thoroughly passed the discriminant validity tests, meaning each construct is unique, distinct, and capable of measuring specific, different concepts. The successful completion of the measurement model phase ensures that the instrument possesses high precision and is free from significant measurement errors. This condition establishes a solid foundation for proceeding to the next analytical stage: the structural model evaluation to verify inter-variable relationships and empirically test the formulated hypotheses.

### Structural Model Assessment

Table 6. R-Squared Value

	R-Square	R-Square Adjusted
PK	0.193	0.082
LK	0.704	0.702

Sumber Table : Hasil Olah Data Penulis (2025)

Table 7. Path Coefficient (T-Values, P-Value)

	Original Sample	Sample Mean	Standard Deviation (STDEV)	T-Statistics	P-Values
PM -> PK	0.173	0.151	0.085	2.034	0.043
TP -> PK	0.033	0.021	0.174	0.192	0.848
LK -> PK	0.537	0.553	0.088	6.103	0.000

Source of Table: Processed Data by the Author (2025)

The results of the structural model testing summarized in Table 7 reveal the dynamics of the relationships among variables through the parameters of original sample, t-statistics, and p-values. In determining the significance of the relationships, this study applied a threshold of t-statistics greater than 1.65 and p-values below 0.05. Overall, the empirical findings indicate that microfinance and financial literacy play crucial roles in determining the quality of fishermen's financial management. The integration of these evaluation criteria provides a strong statistical foundation for validating the hypotheses proposed in this study.

Based on the path estimation illustrating the direct interactions among latent variables, two major significant findings were identified. First, microfinance was found to have a positive and significant effect on financial management, as indicated by a p-value of 0.043. Second, financial literacy also demonstrated a highly significant positive effect on financial management, confirmed by a p-value of 0.000. These findings indicate that the better the fishermen's financial understanding and access to capital, the more structured and effective their financial management practices become.

On the other hand, the results revealed that educational level did not have a significant effect on financial management, meaning that this relationship was not empirically supported within the context of this study. This phenomenon suggests that formal educational attainment alone does not necessarily guarantee financial management capability without the support of specific financial literacy and adequate access to funding. Therefore, the availability of accessible formal financing and the strengthening of financial education emerge as far more effective instruments in promoting the welfare and economic stability of fishermen in the research area.

Table 8. *Indirect Impact*

	Original Sample	Sample Mean	Standard Deviation (STDEV)	T-Statistic	P-Values
PM -> LK -> PK	-0.073	-0.068	0.098	0.746	0.456
TP -> LK -> PK	-0.019	-0.014	0.053	0.353	0.724

Source of Table: Processed Data by the Author (2025)

This study employed path analysis to examine the complexity of both direct and indirect relationships among variables. The primary objective of this analysis was to evaluate the mediating role of variables in linking independent variables to the dependent variable. Within the SmartPLS statistical framework, an indirect effect is considered significant when it satisfies the criteria of a t-statistic greater than 1.65 and a p-value below 0.05. Conversely, if the resulting values fall below these thresholds, it can be concluded that the mediating variable does not perform a significant mediating function within the proposed model.

Based on the testing results summarized in Table 8, financial literacy was found to be incapable of acting as a significant mediating variable in the relationship between microfinance and educational level toward financial management. The data analysis demonstrated that both mediation paths produced t-statistic values below 1.65 and p-values greater than 0.05. These findings indicate that stimuli in the form of access to funding and educational background do not automatically transform fishermen's financial management behavior through the existing level of financial literacy.

This phenomenon suggests that although fishermen may have access to microfinance services and varying educational backgrounds, such factors alone are insufficient to strengthen financial management practices indirectly through financial literacy. In other words, the current level of financial literacy among fishermen has not yet reached a stage where it can effectively bridge the influence of funding access and education on financial behavior. Therefore, more intensive financial education programs and continuous assistance are necessary to ensure that financial literacy can function optimally as a strategic mechanism in improving fishermen's financial management capabilities.

## DISCUSSION

### **Nelayan The Effect of Microfinance on Fishermen's Financial Management**

The empirical findings of this study demonstrate that microfinance exerts a positive and significant effect on the quality of fishermen's financial management. This relationship is quantitatively supported by a significance value of 0.043 ( $p < 0.05$ ), thereby providing strong evidence for the acceptance of the first hypothesis (H1). These findings confirm that the availability of microfinance instruments in Tanjungpinang is not merely a form of financial assistance, but also a determining factor that encourages fishermen to organize and manage their financial resources in a more effective and structured manner. Theoretically, these results provide strong support for the Liquidity Constraints Theory, which assumes that reducing barriers to capital access among low-income communities will stimulate improvements in consumption patterns and managerial behavior.

The findings are consistent with the study conducted by Nadjib dan Thoha (2023) which emphasized that microfinance systems built upon trust and adapted to local socio-economic contexts have an essential role in strengthening the economic independence of coastal communities. The nature of fishermen's occupations, which are highly risky and heavily dependent on natural conditions, requires flexible financial schemes. In the context of the Riau Islands, the ability of financial institutions to understand the economic rhythms of small-scale fishermen, particularly during periods of fluctuating catches, has proven to be a key factor in strengthening respondents' capacity to allocate income more productively. Through such support, fishermen are encouraged to maintain liquidity reserves both for urgent operational fishing activities and future savings, thereby enabling locality-based approaches to gradually reduce chronic structural poverty.

Furthermore, the findings reinforce the consistency of previous studies by Leonardo & Amboningtyas (2021) which highlighted the crucial role of microfinance access in improving household cash flow management among fishermen. Easier financing access combined with competitive interest schemes and flexible repayment mechanisms provides fishermen with alternatives to escape dependency on middlemen and burdensome informal lending systems. This transition from informal to formal

financing not only contributes to the optimization of fishing outcomes through equipment modernization but also simultaneously strengthens household economic stability. Such stability serves as a protective mechanism against economic uncertainty caused by extreme weather conditions, including the North Wind Season phenomenon, which frequently results in prolonged income reductions.

Comprehensively, these findings position microfinance as a strategic empowerment instrument capable of promoting genuine financial inclusion within the fisheries sector. Its presence offers a practical solution to the challenges faced by small-scale fishermen in overcoming rigid bureaucratic barriers imposed by formal financial institutions. Through targeted financing support rooted in local wisdom, fishermen not only gain access to capital but also experience a learning process related to responsible debt management. Ultimately, this contributes to the development of financially independent coastal communities, where effective financial management becomes a key pathway toward more equitable and sustainable economic welfare in the Riau Islands region.

### **The Effect of Financial Literacy on Fishermen's Financial Management**

Based on the results of the second hypothesis test (H2), this study found a highly significant relationship between financial literacy and fishermen's financial management behavior, with a significance value of 0.000 ( $p < 0.05$ ). This finding indicates that financial literacy serves as a central foundation for economic activities among coastal communities in Tanjungpinang. Substantively, financial literacy extends beyond numerical understanding and encompasses the ability of fishermen to internalize financial knowledge as a guide for managing assets amid uncertainty in fishing outcomes. The findings confirm that the higher the fishermen's understanding of financial concepts such as interest rates, savings, and financial risks, the more organized and disciplined their cash flow management becomes.

Theoretically, these findings are consistent with the Theory of Planned Behavior (TPB), where knowledge shapes attitudes that subsequently influence responsible financial behavior. This result is strongly supported by the study of Abdullah & Samsidar (2025), which emphasized that financial literacy strengthens fishermen's bargaining power in economic decision-making. Fishermen with higher levels of financial literacy are no longer solely dependent on instinctive or traditional "earn today, spend today" behavior, but instead begin considering income diversification and asset protection strategies. Financial knowledge therefore functions as a safeguard against exploitative lending schemes imposed by third parties.

Moreover, the findings strengthen the argument proposed by Larasati et al., (2024) which stated that fishermen's economic resilience is highly dependent on financial discipline. In practice, financial literacy acts as a filtering mechanism against consumptive lifestyles that often become a major economic challenge within coastal communities. Fishermen possessing strong financial literacy are generally more capable of planning short-term investments, such as setting aside funds for repairing fishing nets or boat engines, rather than allocating surplus income during harvest seasons toward non-productive expenditures.

The results of this study further emphasize that breaking the cycle of poverty in coastal areas of the Riau Islands cannot rely solely on financial assistance. Financial literacy is an essential prerequisite to ensure that financial support and physical resources are managed effectively and sustainably. A noticeable paradigm shift is evident, where fishermen gradually move from a survival-oriented mindset toward a business development orientation. Therefore, strengthening capacity through practical and context-based financial education becomes a critical factor in promoting the long-term financial independence of fishing communities.

### **The Effect of Educational Level on Fishermen's Financial Management**

The findings of this study revealed that the third hypothesis (H3) was not supported. One of the most interesting and paradoxical findings in this research is the absence of a significant relationship between formal educational level and the quality of fishermen's financial management, as evidenced by a significance value of 0.848 ( $p > 0.05$ ). This statistical evidence demonstrates that educational attainment, whether at the elementary, junior high, or senior high school level, is not an accurate predictor of fishermen's financial management capability in Tanjungpinang. The realities observed in the field suggest the existence of a "gap" in which formal educational qualifications do not automatically translate into managerial competence, particularly in managing highly fluctuating and uncertain fishing

income.

This phenomenon is consistent with the findings of Syauqina & Munandar, (2023) which emphasized that educational background often has no direct relevance to financial management behavior and investment decisions. In the modern era, external factors such as easy access to information through social media, exposure to non-formal educational content, and interactions within economic communities may exert stronger influences on financial mindsets than formal school curricula. Formal education tends to be theoretical and general in nature, whereas fishermen's financial management is primarily a practical skill developed through field experience and adaptation to local economic culture. Based on this analysis, it can be concluded that financial management practices within coastal communities are more strongly shaped by learning-by-doing processes and social environmental influences than by formal educational attainment. This finding aligns with Human Capital Theory, which in the context of coastal fishermen emphasizes specific practical skills rather than formal academic credentials. The weak relationship between formal education and financial behavior indicates an urgent need for more targeted educational programs, such as practical community-based microfinance management training. These findings provide important implications for policymakers, suggesting that efforts to improve fishermen's economic welfare should not rely solely on general education pathways but must also focus on strengthening practical skills relevant to the fishermen's working ecosystem.

### **The Effect of Microfinance on Fishermen's Financial Management with Financial Literacy as a Mediating Variable**

The path analysis results revealed that financial literacy does not mediate the relationship between microfinance and fishermen's financial management, as indicated by a significance value of 0.456 ( $p > 0.05$ ). This phenomenon can be explained through the perspective of Short-Term Consumption Utility Theory, where fishermen as informal economic actors with fluctuating incomes tend to exhibit high present-bias preferences. Within uncertain coastal economic environments, immediate needs become a greater priority than long-term financial planning.

These findings are consistent with the study by Hidajat (2015) which argued that within communities characterized by poverty and high uncertainty, financial literacy often loses its effectiveness as a behavioural filter due to the pressure of fulfilling basic needs. Consequently, microfinance funds are more frequently utilized as emergency liquidity support rather than being allocated toward productive business expansion requiring long-term planning.

The gap between knowledge and action is further supported by Ajzen (1991). Theory of Planned Behavior (TPB). Although financial literacy may foster positive attitudes, the Perceived Behavioral Control among fishermen remains relatively weak. This finding is in line with (Rizqiandini et al., 2025) which demonstrated that heavy dependence on external factors such as weather anomalies and uncertain fishing yields creates a perception that systematic financial planning is ineffective. As a result, the financial knowledge possessed by fishermen becomes ineffective when confronted with field realities requiring immediate responses, thereby preventing financial literacy from functioning as a bridge for behavioral transformation.

Both theoretically and practically, financial literacy becomes a relatively weak variable because fishermen's financial management behavior in Tanjungpinang tends to be reactive rather than proactive. The perception of limited control over natural and market conditions causes microfinance funds to be immediately absorbed for urgent needs before being processed through ideal financial management considerations. These findings provide a strong signal, consistent with the argument of Hidajat (2015), that financial literacy programs for coastal communities will not be effective if implemented in isolation without supporting policies capable of mitigating external risks and ensuring income stability.

### **The Effect of Educational Level on Fishermen's Financial Management with Financial Literacy as a Moderating Variable**

The fifth finding of this study revealed a contradictory reality in which financial literacy was unable to moderate the relationship between formal educational level and fishermen's financial management capacity ( $p = 0.724$ ). Statistically, this indicates that regardless of whether fishermen graduated from elementary, junior high, or senior high school, educational attainment does not substantially influence the quality of their financial management, even when accompanied by relatively good financial literacy.

This finding highlights a disconnect between formal educational content and the harsh realities faced within the fisheries sector. Formal educational qualifications ultimately function merely as administrative symbols that do not guarantee the ability to manage highly volatile financial flows in marine-based livelihoods.

The findings indicate that formal education systems remain overly general and insufficiently focused on life skills relevant to coastal communities. Financial literacy, which was initially expected to bridge intellectual capital acquired through formal education into practical financial behavior, failed to overcome structural barriers encountered in the field. Fishermen in Tanjungpinang continue to rely more heavily on empirical experience, inherited traditions, and conventional survival strategies, particularly during the North Wind Season. Consequently, formal education loses its functional relevance because it is perceived as insufficiently applicable to the economic risks encountered in marine activities.

These findings are consistent with Hidajat (2015) perspective, which argued that within complex and highly pressured socio-economic environments, the moderating effect of financial literacy tends to weaken because individuals prioritize immediate survival strategies. Similarly, the recent study conducted by Siti Komariah et al., (2025) yang juga menemukan bahwa literasi keuangan tidak selalu bisa memperkuat hubungan antara also found that financial literacy does not always strengthen the relationship between education and financial behavior, particularly among informal community groups. Collectively, these results serve as an important reflection on current educational models. For fishermen, financial capability is not primarily developed through formal schooling, but rather through practical, contextual, and experience-based training closely aligned with their everyday realities. Financial literacy cannot effectively moderate educational influences if the educational foundation itself fails to address the actual ecosystem and occupational realities of fishermen's livelihoods.

## CONCLUSION

### Conclusion

Based on the results of data analysis using PLS-SEM involving 153 fishermen respondents, this study draws several major conclusions as follows:

1. Microfinance  
Microfinance was found to have a positive and significant effect on fishermen's financial management, with a significance value of 0.043. This finding indicates that well-targeted access to capital serves as an important stimulus for fishermen in organizing and managing their financial resources in a more structured and planned manner.
2. Financial Literacy  
Financial literacy emerged as the most significant determinant influencing financial management, with a significance value of 0.000. Financial knowledge was proven to function as a guiding framework that directs fishermen toward healthier and more responsible financial behavior.
3. Educational Level  
Paradoxically, educational level did not demonstrate a significant effect on financial management (p-value = 0.848). Formal educational attainment does not automatically transform into managerial competence in managing highly fluctuating fishing income and household cash flow.
4. Moderating and Mediating Variables  
Financial literacy was found to be incapable of mediating the relationship between microfinance and financial management (p-value = 0.456), as well as moderating the relationship between educational level and financial management (p-value = 0.724). This condition is primarily influenced by fishermen's reactive financial behavior, where financial resources are predominantly allocated to fulfill urgent short-term consumption needs rather than proactive investment activities.

### Research Contributions

This study provides important contributions both theoretically and practically:

1. Theoretical Contribution  
This research enriches the literature on Behavioral Finance within coastal communities, particularly regarding the disconnect between formal education and practical financial management behavior among fishermen. The findings provide empirical evidence that financial capability in coastal

societies is shaped more strongly by practical experience, financial literacy, and socio-economic adaptation than by formal educational attainment alone.

## 2. Practical Contribution for Government

The findings of this study may serve as a consideration for the Governments of Tanjungpinang City and Bintan Regency in formulating financial assistance policies for fishermen communities. Policy interventions should not merely focus on providing physical capital or financial aid, but should also incorporate practical and contextual financial literacy assistance programs that align with the economic rhythms and livelihood patterns of fishermen.

## Research Limitations

The researcher acknowledges several limitations within this study that should be considered:

### 1. Research Design

This study employed a cross-sectional research design, which only captures conditions at a single point in time and does not allow observation of long-term behavioral changes longitudinally.

### 2. Geographical Scope

The scope of this research was limited to Tanjungpinang and surrounding areas. Therefore, the findings may produce different outcomes if applied to fishermen communities in other regions with distinct cultural characteristics and market ecosystems.

### 3. Data Subjectivity

The data were collected through self-reported questionnaires, which may potentially generate social desirability bias, where respondents tend to provide answers perceived as socially acceptable or favorable.

## Recommendations for Future Research

Based on the findings and limitations above, several recommendations for future studies are proposed:

1. Future research is encouraged to integrate variables such as fishing experience or tacit knowledge as primary predictors, considering that practical field experience appears to be more influential than formal educational background.

2. Future researchers are also recommended to employ qualitative or ethnographic approaches in order to explore subjective dimensions more deeply, including local wisdom, trust, and socio-cultural values influencing fishermen's financial decision-making behavior.

3. Microfinance Institutions (MFIs) are advised to reorient their role from merely acting as capital providers to becoming active mentoring partners that supervise and guide the productive utilization of loan funds among fishermen communities.

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