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# Analysis of the Relationship between Income and Savings Ratio on the Welfare Level of Fishermen in the Gorontalo Bay Coast

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**ABSTRACT**

The capture fisheries sector plays an important role in the economy of coastal communities, but the welfare of fishermen remains vulnerable due to income fluctuations and limited household financial management. This study aims to analyze the relationship between income and savings ratio and the welfare level of fishermen in the coastal area of Gorontalo Bay. The study used a quantitative approach with a survey method involving 111 fishermen selected using the Slovin formula with a 10% margin of error. Data were collected through structured interviews using questionnaires and analyzed descriptively and using Spearman's rank correlation. The results showed that most fishermen had an income equal to or above the Gorontalo City minimum wage, while the majority had no savings. Most fishermen were classified in the high welfare category based on indicators from the Central Statistics Agency. Income showed a positive and statistically significant relationship with welfare (Spearman's $\rho = 0.486$; $p < 0.001$), whereas the savings ratio showed a weak positive but statistically insignificant relationship with welfare (Spearman's $\rho = 0.149$; $p = 0.120$). These findings indicate that income was significantly associated with fishermen's welfare, whereas the savings ratio was not significantly associated with welfare among the surveyed fishermen.

## INTRODUCTION

The fisheries sector is one of the important pillars of the Indonesian economy because it contributes to the formation of Gross Domestic Product (GDP), employment, and food supply for the community. Data from the Ministry of Maritime Affairs and Fisheries shows that the capture fisheries sub-sector contributes around 6%-7% to Indonesia's GDP, which is relatively small compared to its potential (Selfiana, 2025). Despite its vast fish resources, improvements in the fisheries sector's performance have not been fully matched by improvements in the welfare of fishing households, resulting in a gap between the economic potential of fisheries and the socioeconomic conditions of fishermen (Mulyni et al., 2023).

Fishermen in Indonesia generally belong to a community group with a high level of economic vulnerability. Their dependence on marine resources as their main source of income makes fishermen highly vulnerable to fluctuations in catch and changes in fish prices in the market (Ibrahim & Sapanli, 2024). When bad weather or lean seasons occur, catches decline, directly impacting fishermen's incomes. In addition, market mechanisms that are not fully favorable to fishermen, such as the dominance of middlemen in determining prices, further weaken the bargaining position of fishermen. Burhan and Kamiruddin (2025) explain that the uncertainty of fish prices due to speculative practices makes it difficult for fishermen to plan their finances and develop sustainable fishing businesses. As a result, even though the catch volume is relatively high, the selling price received by fishermen is often not proportional to the operational costs incurred (Burhan & Kamiruddin, 2025).

Fluctuating income affects the ability of fishing households to manage their finances and build economic resilience. Arimawan (2021) show that fishermen's income has a positive and significant effect on the welfare of fishing families because it enables them to better meet their basic needs. This is in line with Rahmat et al. (2025), who state that fishermen's income is related to households' ability to meet basic needs, including education and family consumption as part of welfare indicators. These findings are also supported by Purwanti et al. (2023), who explain that the welfare level of fishing households is related to the amount of income received and the household's ability to manage income to meet basic family needs. Ilarahmi & Sihaloho (2018) emphasize that the welfare of fishing households is not only determined by the amount of income, but also by the ability to manage economic resources in allocating income sustainably. Furthermore, Zulaika et al. (2024) show that income stability and financial management skills, particularly the habit of saving, play an important role in improving the welfare of fishermen. However, the culture of saving among fishermen is still relatively low; Ulva et al. (2020) state that only about 18% of fishing households save regularly. This condition reflects the weak financial management of fisher households and the limitations in the formation of productive assets, as also indicated by Kono et al. (2025) that variations in fishermen's income have not been fully accompanied by an increase in the economic resilience of fisher households.

Similar conditions were also found in the fishing community on the coast of Gorontalo Bay, Gorontalo Province. This area is known as one of the potential waters in eastern Indonesia with economically valuable pelagic fish resources. However, this potential has not been fully reflected in the improved welfare of local fishermen. Korompot et al. (2024) reported that the majority of fishermen in the Tomini Bay area only have an average income of between IDR 1.2 million and IDR 2.5 million per month. The income of fishermen on the coast of Gorontalo Bay is also still relatively low and unstable, influenced by changes in the fishing season (Lukum et al., 2023), the use of traditional fishing gear (Nainggolan et al., 2021), and fluctuations in fish prices (Indara et al., 2017). Nevertheless, previous studies have mainly examined fishermen's income, fishing activities, seasonal changes, and factors affecting household economic conditions. Empirical information regarding whether fishermen's income and their ability to allocate income to savings are associated with household welfare remains limited, particularly in the coastal communities of Gorontalo Bay. Examining these relationships is important because income reflects the economic resources currently available to fishing households, whereas savings may represent their capacity to retain part of those resources for future needs. Therefore, this study aims to analyze the relationship between income and savings ratio and the welfare level of fishermen on the coast of Gorontalo Bay, Gorontalo Province. The findings are expected to provide socioeconomic information that can support the development of more targeted and sustainable fisher empowerment policies.

## MATERIAL AND METHODS

***Study site.*** This study was conducted from September to October 2026 in the coastal area of Gorontalo Bay, Gorontalo Province, Indonesia. Gorontalo Bay is part of Tomini Bay and is administratively located in the city of Gorontalo and Bone Bolango Regency. This area is intensively used for small-scale fishing activities and is dominated by traditional fishermen.

The research location was selected using purposive sampling, taking into account the concentration of fishing activities, the representativeness of the socioeconomic characteristics of the fishermen, and the ease of access for field data collection. The research location covers six coastal villages around Gorontalo Bay. A map of the research location is presented in Figure 1 below.

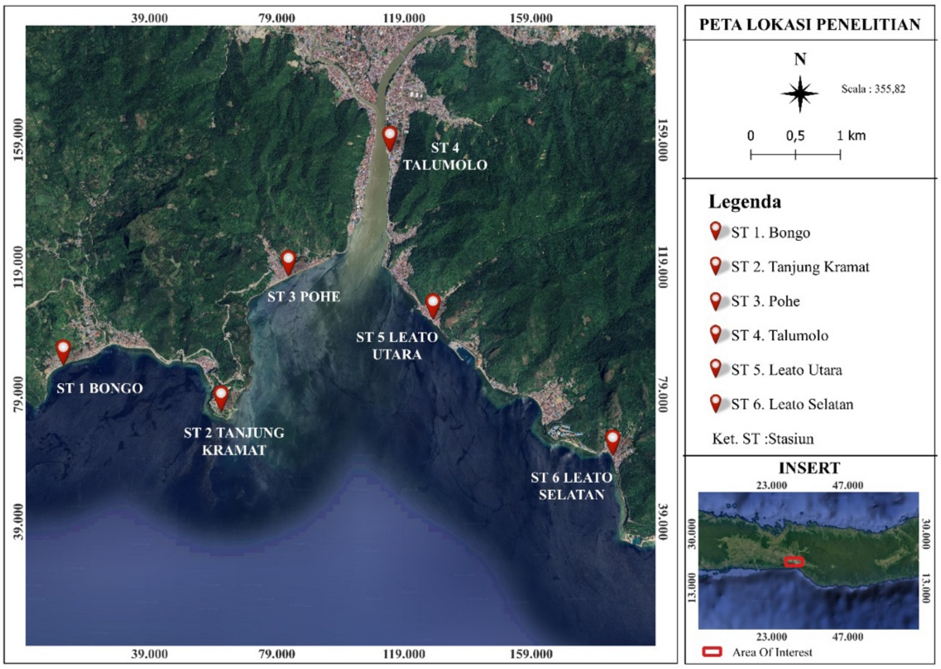


**Figure 1**. Research location in the coastal area of Gorontalo Bay, Indonesia. Red dots (●) indicate the locations where data on fishermen were collected in coastal villages around Gorontalo Bay.

Figure 1 shows the research location covering six coastal villages around Gorontalo Bay, namely Bongo Village, Tanjung Kramat Village, Pohe Village, Talumolo Village, North Leato Village, and South Leato Village. These six villages are areas with relatively active fishing activities and are the locations for collecting data on fishermen.

***Tools and Materials.*** The tools used in this study included structured questionnaires as the main data collection instrument, writing instruments, and supporting devices such as mobile phones for documentation and field notes. The materials used were primary data obtained from direct interviews with fisher respondents and secondary data obtained from relevant agencies, such as the Central Statistics Agency and the Marine and Fisheries Service.

***Data collection techniques.*** This study used a quantitative approach with a survey method to obtain numerical data on fishermen's income, savings ratio, and welfare level. Primary data were collected directly from 111 fishermen through structured interviews using a questionnaire, while secondary data were obtained from relevant agencies and supporting literature. The sample size was determined using the Slovin formula (Majdina et al., 2024) with a 10% margin of error. Based on a total population of 1.643 fishermen in the study area, a minimum sample of 111 respondents was obtained. The sample was then allocated proportionally among the six study villages according to the number of fishermen in each village.

Income in this study refers to income earned by fishermen from fishing activities at sea. Income was measured in Indonesian Rupiah (IDR) per month and subsequently classified according to the Gorontalo City minimum wage. The savings ratio represents the proportion of income set aside as savings and was calculated as the amount saved divided by income and multiplied by 100%. Welfare was assessed using socioeconomic indicators referring to the Central Statistics Agency (BPS), including income, consumption or expenditure, education, health, housing conditions and facilities, and access to basic services.

***Data analysis.*** Data analysis was conducted descriptively to describe the characteristics of respondents and the conditions of income, savings ratio, and welfare level of fishermen. Furthermore, correlation analysis was used to identify the relationship between income and savings ratio with the welfare level of fishermen. The entire data analysis process was conducted using statistical software.

## RESULTS AND DISCUSSION

***Fishermen's Income.*** Fishermen's income is the amount of money earned by fishermen from fishing activities at sea. The amount of income affects the level of family welfare, assuming that a large income will be able to meet family needs, thereby improving welfare (Wibowo et al., 2019). The distribution of fishermen's income on the coast of Gorontalo Bay is classified based on the Regional Minimum Wage (UMR) of Gorontalo City, as shown in Figure 2 below.

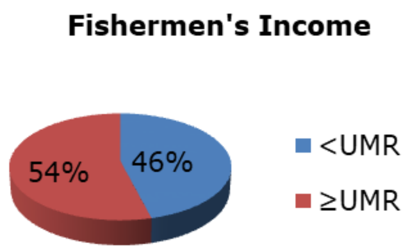


**Figure 2.** Income Distribution of Fishermen on the Coast of Gorontalo Bay

The analysis shows that most fishermen have reached an income level in the ≥UMR category. As shown in Figure 2, 54 percent of fishermen are in the income category above the Gorontalo City minimum wage of Rp 3,221,731, while 46 percent of fishermen are still in the income category below the minimum wage.

These findings show that more than half of the fishermen in the study location have earned an income that meets the minimum standard for a decent life. However, the proportion of fishermen with incomes below the minimum wage is still relatively large, indicating economic inequality among fishing households. These income disparities reflect the characteristics of the fishing industry, which is heavily influenced by the fishing season, the availability of fish resources, and differences in the fishing equipment and technology used, as also found in the study (Lukum et al., 2023).

***Fishermen Savings Ratio.*** The savings ratio is the ratio between income received and the portion set aside as savings. In the context of fishermen, savings are income that is not consumed, and the amount of savings depends on the amount of income. (Heluka, 2021). The distribution of fishermen based on the savings ratio to monthly net income is presented in Figure 3 below.

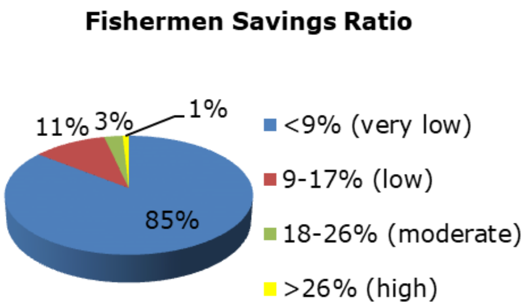


**Figure 3.** Distribution of Fishermen's Savings Ratio on the Coast of Gorontalo Bay

Based on Figure 3, 85 percent of fishermen have no savings, while 11 percent have a savings ratio of 1–10 percent (low category), 3 percent have a ratio of 10–20 percent (medium category), and only 1 percent of fishermen have a savings ratio of more than 20 percent (high category). This condition shows that even though some fishermen have achieved a relatively adequate level of income, their ability to set aside income as savings is still relatively low.

The low savings ratio indicates that most of the fishermen's income is used to meet daily household consumption needs. Daud (2018) states that fishermen's household savings are generally the remainder of income after meeting various urgent expenses and are not saved regularly due to unexpected needs, such as home repairs or fishing equipment. Prasetya (2024) also adds that limited literacy and financial planning among fishing households has implications for their low ability to save, so that the economic resilience of families remains vulnerable even when their income increases during certain periods. This finding is also supported by Rahmawati (2017), who found that the savings rate of fishermen tends to remain low even when income increases, because most of the income is allocated to meeting household consumption needs, so that savings are not a top priority in fishermen's financial management.

***Fishermen's Welfare Level.*** The welfare level of fishermen is a description of the ability of fishing households to meet their basic needs in a decent manner based on socioeconomic indicators, including income, consumption or expenditure, education, health, housing conditions and facilities, and access to other basic services, as measured by the criteria of the Central Statistics Agency (BPS). This measurement shows the extent to which fishermen can meet their families' basic needs on a sustainable basis and reflects their overall quality of life (Mudzakir & Suherman, 2019). The distribution of the welfare level of fishermen on the coast of Gorontalo Bay is presented in Figure 4 below.

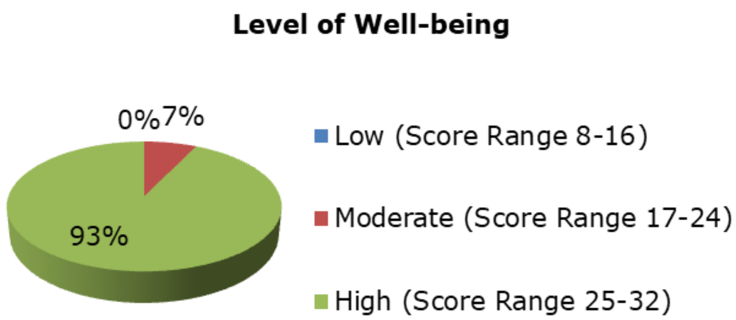


**Figure 4.** Distribution of Fishermen's Welfare Levels Based on BPS Indicators on the Coast of Gorontalo Bay

The analysis shows that most fishermen are in the relatively high welfare category. As shown in Figure 4, 93 percent of fishermen are in the high welfare category with a score of 25–32, while 7 percent of fishermen are in the moderate welfare category with a score of 17–24. This condition shows that, in general, fishermen on the coast of Gorontalo Bay have been able to meet their basic household needs, such as consumption, education, and health. However, there are still a small number of fishermen who are at a moderate level of welfare, indicating variations in the socioeconomic conditions between fishing households. This finding is in line with Ulva et al. (2020), who stated that the welfare level of fishermen is not only determined by the amount of income, but also by income stability and the household's ability to manage its economic resources.

**Table 1.** Spearman's Rank Correlation Test Results between Income, Savings Ratio, and Fishermen's Welfare

| Variable | | Level of Well-being |
|---|---|---|
| Income | Correlation Coefficient | 0.486 |
| | Sig.(2-Tailed) | 0.000 |
| | N | 111 |
| Savings Ratio | Correlation Coefficient | 0.149 |
| | Sig.(2-Tailed) | 0.120 |
| | N | 111 |

Based on Table 1, the correlation coefficient between income and welfare level is 0.486 with a significance level of 0.000, indicating a positive and statistically significant relationship. This finding indicates that an increase in income plays a role in improving the ability of fishing households to meet their basic needs and maintain their family's economic condition. The results of this study are in line with the findings of Fadilah et al. (2023), who stated that the income of fishing households is related to the welfare level of fishing families. In addition, Muhammad et al. (2023) mentioned that an increase in fishermen's income contributes to family welfare through the fulfillment of basic household needs. Ulva et al. (2020) also reported that fishermen with higher income levels tend to have better welfare levels. These findings are reinforced by Yahya and Pudjihardjo (2024), who emphasize that fishermen's household income is closely related to their ability to meet their basic needs, making income an important indicator in assessing the welfare level of fishermen.

Conversely, the savings ratio did not show a statistically significant relationship with fishermen's welfare (Spearman's $\rho = 0.149$; $p = 0.120$). This indicates that the present data do not provide sufficient evidence of an association between the proportion of income saved and the welfare level of the surveyed fishermen. One possible explanation is the limited variation in savings behavior, as 85% of respondents reported having no savings. Furthermore, savings may represent a household's capacity to prepare for future financial needs or economic shocks, whereas the welfare indicators used in this study primarily reflect current socioeconomic conditions. Therefore, the insignificant relationship should not be interpreted as direct evidence of poor financial management, as financial management behavior was not specifically measured in this study.

## CONCLUSION

This study shows that the welfare level of fishermen on the coast of Gorontalo Bay was generally high based on the indicators used. Income showed a moderate positive and statistically significant relationship with fishermen's welfare (Spearman's $\rho = 0.486$; $p < 0.001$), indicating that fishermen with higher income tended to have higher welfare scores. In contrast, the savings ratio showed a weak positive but statistically insignificant relationship with welfare (Spearman's $\rho = 0.149$; $p = 0.120$). The coexistence of relatively high welfare scores and low levels of savings suggests that the ability to meet current household needs may not necessarily reflect the capacity to accumulate financial reserves. These findings highlight the importance of considering both current socioeconomic welfare and household financial resilience in programs aimed at improving the livelihoods of fishing communities.

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