International Journal of Economics, Management and Accounting

E-ISSN: 3046-9376
P-ISSN: 3048-0396

Research Article

The Influence of Socio-Economic Factors on the Income of Traditional Fishermen in Kabila Bone District, Bone Bolango Regency

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Abstract: The income of traditional fishermen in Kabila Bone District remains relatively low. This is caused by various fluctuating socio-economic factors, such as limited fishing equipment, the use of boat engines, and the high cost of fuel. In addition, fishermen's experience, unpredictable weather conditions, and age also affect their productivity. This study aims to determine the influence of socio-economic factors on fishermen's income. The research used a quantitative method with a sample of 74 respondents out of a population of 288 fishermen, determined using the Slovin formula. Data collection techniques included questionnaires, observation, and documentation. The results showed that socio-economic factors influence fishermen's income by 25.2%, while the remaining 74.8% is influenced by other factors such as education and access to training on more efficient fishing techniques. In conclusion, there is a positive and significant influence between socio-economic factors and fishermen's income. This means that the better the socio-economic conditions of the fishermen, the higher their income will be.

Keywords: Gorontalo Province, Income, Fishermen, Kabila Bone District, Socio-Economic Factors.

Received: April 13, 2025
Revised: April 27, 2025
Accepted: May 12, 2025
Online Available: May 14, 2025
Curr. Ver.: May 14, 2025

1. Introduction

Indonesia is a maritime country with two-thirds of its territory consisting of oceans. The marine sector can become a cornerstone or main stream of development, bringing benefits for improving the nation's welfare both now and in the future. Therefore, the marine and fisheries sectors should receive greater attention from the government. The fisheries sub-sector is largely composed of small-scale or traditional fisheries, with only a small portion being industrial fisheries. Traditional fisheries remain dominant, characterized by the use of inherited methods passed down through generations, limited integration of modern information, and the use of simple equipment. The marine and fisheries sector plays an important role in national economic development, particularly in providing protein-rich food, generating foreign exchange, and creating job opportunities.

Fishermen are individuals actively engaged in the capture of fish and other aquatic animals (Widodo, 2019). The welfare of fishermen is largely determined by their catch. The amount of catch is reflected in the income they receive, most of which is used to meet household consumption needs. Thus, the level of family consumption fulfillment is highly dependent on the income earned. Fishermen engage in this work with the goal of earning income to sustain their livelihoods. However, the implementation of fishing activities requires equipment and is influenced by several factors that support success. The quantity of fish

caught depends on the type of boat, equipment used, and other factors such as tides and seasons.

Traditional fishermen are individuals actively engaged in fishing using traditional fishing gear. Their boats are typically 5 meters long, 1 meter wide, and 0.5 meters high, with a maximum passenger capacity of two people, and powered by a 5.5 HP outboard engine. The fishing gear used includes nets and fishing rods (Anwar, 2017).

Based on the observations conducted by the researcher, it was found that fishermen's income remains low due to several fluctuating socio-economic factors. These include the use of engines to power boats, fishing tools such as trawl nets (jaring or jala), light and fishing hooks for catching fish, spears used to catch fish and squid, and fuel for the engines. Although the fishermen have sufficient experience, their income is also influenced by unpredictable seasons and weather, as well as their age. The purpose of this study is to determine the influence of these factors on the income of fishermen in Kabila Bone District.

2. Literature Review

2.1. Definition of Income and Traditional Fishermen

Income is any addition received or earned by an individual or entity that reflects economic capability, whether derived from domestic or international sources. This income may take various forms, including wages, business profits, investment returns, and other sources (Rahman, 2020).

Fishermen's income refers to the total earnings received by the entire household of a fisherman after engaging in fishing activities over a certain period. The income received is used to meet all household needs, such as purchasing basic necessities (e.g., rice, coconut oil, and spices), paying electricity bills, buying fishing equipment and facilities, financing fishing trips, and even covering children's educational expenses (Sari, 2022).

Fishermen are individuals whose livelihood depends on harvesting marine products. In Indonesia, fishermen generally reside in coastal or seaside areas. A fishermen community is a group of people who work in marine-based livelihoods and live in coastal villages (Harumy & Amrul, 2018).

Traditional fishermen are those who use small outboard motorboats or non-motorized boats in their fishing activities and employ simple fishing equipment (Nainggolan et al., 2020). This category of fishermen operates within small-scale fisheries.

The income of traditional fishermen is a crucial factor in operational sustainability, as it directly influences the expected profit and ensures the livelihood of fishing communities. According to Bawamenewi (2022), indicators of income improvement include:

a. Earnings
b. Employment
c. Family burdens borne

In society, socio-economic conditions vary according to individuals' roles and statuses, even though all humans are inherently equal before God. Hoeriah (2021) highlights several factors influencing socio-economic status:

a) Wealth — the wealthier a person, the higher their social status in society.
b) Power — the more authority one holds, the higher their socio-economic status.
c) Honor — respected individuals are often positioned higher than others in their community.
d) Knowledge — in knowledge-valuing societies, education is a measure of status.

2.2 Socio-Economic Factors Affecting Traditional Fishermen's Income

Fishermen work to earn income used to meet their daily living needs. According to Indara et al. (n.d.), several socio-economic factors influence the income of traditional fishermen:

2.2.1. Equipment Used by Traditional Fishermen

1) Engine

A study by Daniel et al. (2017) The engine plays a significant role in the fishing activities of traditional fishermen. Engine size refers to the capacity or power (in horsepower or HP) used by fishermen in Kabila Bone District, Bone Bolango Regency. Most traditional fishermen in this region use 5 HP engines to power their boats.

2) Fishing Gear
   The fishing gear commonly used daily by traditional fishermen in Kabila Bone District is known as "pukat" or fishing nets, typically measuring 4 meters in length and 20 meters in diameter (Perikananku.id, 2018).
3) Fuel
   Fuel (gasoline) is a refined petroleum product essential for operating boat engines. The availability and amount of fuel significantly affect the mobility and productivity of fishermen. Inadequate fuel supply in fishing communities can limit fishing activities and reduce income. The more liters of fuel available and used, the more likely fishermen can catch more fish and thus increase their income (Perikananku.id, 2018).
4) Experience
   Experience is a crucial factor in fishing success. A fisherman is considered experienced (locally called "pawing") if he has worked in the field for at least 15 to 30 years. Experience often correlates with better fishing techniques and knowledge of marine conditions, contributing to more effective catches (Daniel et al., 017)
5) Season
   Seasonal changes significantly impact the livelihood of fishermen. The western and eastern monsoons influence sea conditions, affecting fishermen's ability to go to sea and the amount of catch available during different times of the year (Safruddin et al., 2022).
6) Age
   The study by Daniel et al. (2017) discusses age also plays a role in determining whether someone is officially considered a fisherman. Individuals aged 15 years and older who actively engage in fishing are recognized as fishermen. Those below this age, although they may accompany their elders to sea, are generally not classified as fishermen.

3. Proposed Method

In this study, the researcher chose a location in Kabila Bone District, Bone Bolango Regency. The research time starts from March 2024 to May 2025. This study uses a quantitative method. The quantitative approach is used to research a specific population or sample, collect data using research instruments, and analyze data quantitatively or statistically with the goal of a predetermined hypothesis. With the aim of finding out the socio-economic factors that affect the income of traditional fishermen in Kabila Bone District, Bone Bolango Regency. Through this method, it can be seen that the problems that will be studied in each variable, both free and bound variables. In this study, the researcher took the population of the fishermen community in Kabila Bone District, Bone Bolango Regency with a total of 288 people. Because the population is more than 100, which is 288 people, this study uses the Slovin formula and from the calculation 74 samples are obtained. The researcher used data collection techniques, namely: questionnaire, observation and documentation.

4. Results and Discussion

4.1. Validity Test

The technique used for the validity test was the Product-Moment correlation with the assistance of SPSS for Windows version 20.0. The trial was conducted on 30 respondents. The validity test utilized the *Statistical Product and Service Solution (SPSS)* version 20.0 software. The validity of the statements was determined by the *Corrected Item–Total Correlation* value; if the calculated *r-value* is greater than the *r-table* value and is positive, then the item is considered valid. Conversely, if the *r-calculated* value is less than the *r-table*, the item is considered invalid. For this study, with $n = 30$, the *r-table* value is 0.361. The complete SPSS output can be found in the appendix. A summary of the validity test results is presented in Table 4.4 below:

Table 1. Instrument Validity Test Results

No	Hasil Uji Validitas		r-tabel	Keterangan
	X	Y		
1	**0.425**	**0.526**	**0,361**	**Valid**
2	**0.426**	**0.371**		**Valid**
3	**0.369**	**0.422**		**Valid**
4	**0.378**	**0.375**		**Valid**
5	**0.391**	**0.491**		**Valid**
6	**0.449**	**0.449**		**Valid**
7	**0.379**	**0.446**		**Valid**
8	**0.428**	**0.431**		**Valid**
9	**0.593**	**0.389**		**Valid**
10	**0.494**	**0.460**		**Valid**
11	**0.556**	**0.366**		**Valid**
12	**0.429**	**0.391**		**Valid**
13	**0.534**	**0.496**		**Valid**
14	**0.614**	**0.419**		**Valid**
15	**0.461**	**0.466**		**Valid**
16	**0.400**	**0.481**		**Valid**

Source: Primary Data Processed, 2025.

The Pearson Correlation test results indicate that all questionnaire items under the variables tested produced correlation values greater than 0.361. Thus, the researcher concludes that the questionnaire used in this study is valid.

4.2. Reliability Test

The reliability test is an index indicating whether a measurement tool is trustworthy or consistent. A measuring instrument is considered reliable if it produces relatively consistent results when used repeatedly to assess the same phenomenon. The reliability coefficient was obtained using the Cronbach's Alpha formula with SPSS version 20.0. If the Cronbach's Alpha value is greater than 0.6, the instrument is considered reliable; otherwise, it is deemed unreliable. The detailed results are presented in the appendix, while a summary is shown in Table 2. below:

Table 2. Instrument Reliability Test Results

Variable	Cronbach Alpha	r-table	Criteria
Socio-Economic Factors	0.736	0.6	Reliable
Income	0.702		Reliable

Source: Primary Data Processed, 2025.

The Cronbach's Alpha results show that all questionnaire items under the tested variables achieved a score greater than 0.6. Therefore, the researcher concludes that the instruments used in this study are reliable.

4.3. Normality Test

A prerequisite before conducting regression analysis is the normality of data distribution, particularly for the dependent variable. The first assumption to be tested is the normality of data. If the data distribution is not normal, regression analysis cannot proceed because it violates the normality assumption. In this study, income is considered an endogenous variable; thus, the residuals must follow a normal distribution. The normality test was conducted using SPSS version 20.0 software.

Table 3. Normality Test of Dependent Variable

One-Sample Kolmogorov-Smirnov Test	
Kolmogrov Smirnov-Z	**0.910**
Asymp. Sig. (2-tailed)	**0.379**
a. Test distribution is Normal.	
b. Calculated from data.	

Source: Primary Data Processed, 2025.

Based on table , the Kolmogorov-Smirnov test result shows an *Asymp. Sig. (2-tailed)* value of 0.379, which is greater than 0.05. This indicates that the residuals of the income regression equation are normally distributed. As the normality assumption has been fulfilled, the regression analysis can proceed. Furthermore, the normality of residuals is illustrated in the Normal P-P Plot, as shown in Figure 1. below :

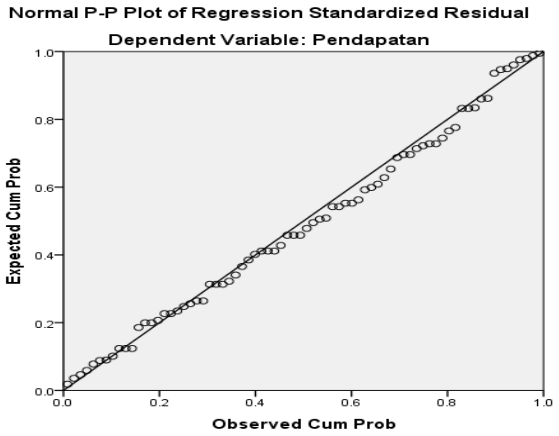

Figure 1. Normality Test Result using P-P Plot

It can be observed that the residuals in the regression model are scattered around and follow the direction of the diagonal line. This confirms that the regression model meets the assumption of normality. Since the residuals are normally distributed, the regression analysis for this study can continue as the assumption has been satisfied.

4.4. Regression Analysis

After confirming that the data meets the normality requirements, the next step is to conduct regression analysis to test the relationship between socioeconomic factors and income. The analysis was conducted using simple linear regression. The statistical method applied is simple regression, using the following regression model:

$$\hat{Y} = a + bx$$ (Sugiyono, 2018)

Explanation:
Ŷ: Income
X: Socioeconomic Factors

The regression analysis conducted using SPSS produced the following findings:

Table 4. Regression Analysis Results

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	30.122	7.555	–	3.987	.000
Faktor Sosial Ekonomi	0.548	0.111	0.502	4.929	.000

(Source: Primary Data Processed with SPSS, 2025)

The regression results show the model equation Y = 30.122 + 0.548, indicating that each increase in the socioeconomic factor variable is predicted to increase income by 0.548. The positive regression coefficient value indicates a positive influence of socioeconomic factors on income. Based on the analysis results, the t-count value for the socioeconomic factor variable is 4.929. To determine whether to accept or reject the null hypothesis (Ho), the t-table value was calculated with a statistical significance level of 5%. The obtained t-table value is 1.666. The comparison shows that the t-count is greater than the t-table value, leading to the rejection of Ho, which implies a significant influence of socioeconomic factors on income.

Based on this study, it is proven that socioeconomic factors have a positive and significant effect on income. Therefore, the next step is to determine the extent of this impact. The coefficient of determination value is analyzed to measure the proportion of variation in

the dependent variable that can be explained by the independent variable. This value ranges from 0% to 100%, with higher values indicating a greater proportion of explanation. The goodness-of-fit between variables in the regression model is presented below :

Table 6. Coefficient of Determination Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	**0.502**	**0.252**	**0.242**	**3.807**

(Source: Primary Data Processed with SPSS, 2025)

The regression analysis shows a coefficient of determination of 0.252, indicating that 25.2% of the variation in income is explained by socioeconomic factors. This shows a positive relationship between socioeconomic factors and income, where improvements in socioeconomic factors correspond to increased income. The remaining 74.8% (residual value) is influenced by other factors not investigated in this study.

4.5. Discussion

The findings of this study reveal that socioeconomic factors account for 25.2% of the variation in the income of traditional fishermen in Kabila Bone District, Bone Bolango Regency, while the remaining 74.8% of the variation is explained by other factors. These results suggest that while socioeconomic factors, such as income, education, and family structure, do influence the economic outcomes of fishermen, a significant portion of income variation is driven by external factors not directly measured in this study. As noted in the previous section, factors such as education, skills training, and access to fishing technologies contribute significantly to productivity, as does the availability of strong social networks. This aligns with findings from international literature, which provide insight into the broader implications of socioeconomic factors on income generation in fishing communities worldwide.

4.5.1. Socioeconomic Factors and Income Generation

International studies have consistently highlighted the importance of socioeconomic factors, such as education and access to resources, in determining the economic outcomes of individuals, particularly in rural or marginalized communities. A study by Smith et al. (2017) on small-scale fisheries in Africa found that education and skills training are positively correlated with higher incomes and better fishing practices. Similarly, a study conducted in the Philippines by Hernandez and Garcia (2019) demonstrated that fishermen with access to formal education and training were more likely to use modern fishing technologies, leading to increased catches and, consequently, higher income levels. These findings are consistent with the results of this study, which indicate that factors such as education and skills training are essential for enhancing the productivity of fishermen in Kabila Bone District.

However, this study also highlights the significant role of other factors that influence income generation. While socioeconomic factors contribute to the economic wellbeing of fishermen, access to modern fishing technologies, such as advanced boats, fish preservation methods, and information technologies, plays an equally important role in determining income levels. As discussed earlier, low levels of education and limited access to fishing technology remain major challenges for the fishermen in the study area. This finding is consistent with the work of Davis et al. (2020), who argue that the absence of modern fish preservation methods and technology in rural areas often leads to post-harvest losses, reducing overall income potential.

4.5.2. Social Networks and Market Access

Another crucial factor identified in both this study and international research is the role of social networks in facilitating access to markets and financial support. In their study of coastal communities in Indonesia, Wulandari and Santosa (2018) found that strong social networks among fishermen allowed them to access better market prices, credit facilities, and financial assistance, all of which directly influenced their income levels. The ability to tap into these

networks often determines the economic viability of traditional fishing activities, as fishermen can share resources, acquire market information, and coordinate fishing efforts.

In contrast, the limited social capital in the Kabila Bone District may hinder fishermen from fully capitalizing on these opportunities. As found in this study, while social networks are important, the existing social structures in the fishing communities may not be strong enough to facilitate the same level of economic cooperation observed in other regions. This discrepancy can be attributed to factors such as geographic isolation, lack of community development programs, and limited institutional support.

Internationally, the concept of social capital has been explored in various studies. For instance, in a study by Mohammed et al. (2021) on fishing communities in West Africa, it was revealed that strong social ties led to increased trust among fishermen, which improved collaboration, resource-sharing, and access to markets. The results of this study echo these findings, emphasizing that fostering strong social ties could improve income-generating opportunities for fishermen.

4.5.3. The Impact of External Factors: A Broader Perspective

The results of this study also suggest that the remaining 74.8% of income variation is influenced by other unexamined factors, including environmental conditions, government policies, and global market trends. These external factors are often outside the control of individual fishermen, but they significantly impact their income levels.

One such factor is the availability and sustainability of fishing resources, which varies by region and is influenced by both environmental and policy factors. According to a study by Garber et al. (2018), sustainable fishing practices and the protection of marine ecosystems are critical to ensuring long-term income stability for small-scale fishermen. In regions where fish stocks are declining due to overfishing or environmental degradation, fishermen often face lower catches and reduced income potential. This challenge is compounded by weak government policies in some areas, which fail to enforce fishing regulations or provide adequate support for resource management.

In Kabila Bone District, environmental factors such as overfishing, climate change, and the degradation of coral reefs and fish habitats may contribute to the income instability observed in the study. These external challenges are not easily addressed by fishermen themselves, highlighting the need for more comprehensive policies and support from local and national governments.

Moreover, global market fluctuations, such as changes in the price of fish or competition from larger commercial fishing operations, also impact the income of traditional fishermen. International research by Thompson et al. (2021) on global fish market trends indicates that small-scale fishermen often struggle to compete with larger, industrial fisheries that can afford better technology and infrastructure. These global market dynamics may be contributing factors to the income disparities observed in this study.

4.5.4. Education and Skills Development: Policy Implications

A key takeaway from this study is the need for increased investment in education and skills training for fishermen. While this study found that only 25.2% of income variation was attributable to socioeconomic factors, education and training emerged as significant variables that could improve productivity and, consequently, income. This is in line with the work of Mako et al. (2016), who demonstrated that providing fishermen with access to education and training programs can lead to improved fishing techniques, better financial management, and greater market awareness. The study suggests that, with targeted interventions in education and skills development, the income of traditional fishermen could be significantly improved.

Moreover, international studies underscore the importance of integrating technological advancements into fishing practices. As seen in studies by Tanaka and Okamoto (2020), introducing fishermen to new technologies, such as mobile applications for weather forecasting and digital tools for market price tracking, can greatly enhance their economic outcomes. Encouragingly, some organizations and governments are already providing such interventions in other parts of the world, and similar programs could be beneficial in the context of Kabila Bone District.

5. Conclusion and Recommendations

Based on the research findings and empirical theoretical discussion, it can be concluded that there is a positive and significant relationship between socioeconomic factors and the income of traditional fishermen in Kabila Bone District, Bone Bolango Regency. The positive sign indicates that the better the socioeconomic factor values, the higher the income of traditional fishermen in the area. Any changes in socioeconomic factors will result in a corresponding change in income. The coefficient of determination also shows that the variation in income among traditional fishermen in the district can be explained by socioeconomic factors. Based on the above conclusions, the researcher offers the following recommendations:

1) For the Government
   - The government is advised to provide skills training programs or education improvement initiatives for traditional fishermen. Success can be measured by the level of participation in training and the resulting skill improvements, which can directly affect income over time.
   - The government should also facilitate traditional fishermen's access to business capital or more efficient fishing technologies. Success can be gauged by the increase in the number of fishermen gaining such access and the direct changes in income after implementation.
2) For the Fishing Community
   Fishermen are encouraged to participate in training programs organized by the government to improve their skills or education, as this can directly impact their income over time.
3) For Future Researchers
   Researchers are encouraged to conduct further studies that include additional factors affecting traditional fishermen's income, such as capital and education. Employing different research methods, such as qualitative approaches, may provide a deeper understanding of the factors influencing the income of traditional fishermen in Kabila Bone District, Bone Bolango Regency.

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