Economic Resilience of Coastal Communities in Kampung Tua, Tanjung Piayu

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Abstract
Coastal communities can be considered as entities that are highly vulnerable in terms of their economy, because they rely linearly on variable fisheries extraction. This study analyzes the economic strength of coastal communities and the adaptation strategies of the fisherman households in responding to climate uncertainty and seasonal anomalies. The approach of this research is descriptive qualitative. The data were collected using field observation techniques in the coastal zone of settlement, interviews, and documentation techniques of the socio-economic profile of the region. Data analysis was done in a circular manner using the interactive model, data reduction, data visualization, and drawing credible conclusions. The results of the research show that economic resilience in this focus area is not a single factor but is a result of adaptive livelihood diversification strategies. The observed phenomenon reflects the shift in the economic roles of women, where their human capital is contributing significantly at the household level in the processing of fisheries products and micro-trade. In addition, the local knowledge, represented by communal social support systems, was also found to be an important economic safety net in times of famine. However, poverty in the structural sense, such as a low level of basic infrastructure and lack of access to formal financial institutions, is also a barrier to economic independence. The integration between adaptive-spatial settlement development policies and the strengthening of community-based economic ecosystems is found to be necessary to build economic resilience to sustainably reduce the hegemony of middlemen in this study.

Keyword: Adaptation; Coastal Settlement; Economic Resilience; Livelihood; Resilience

Introduction

Coastal communities are groups of people who rely heavily on marine resources for their livelihoods as their key source of income. Weather, seasons and fishery resources are important factors that affects household economic condition as most of their revenue comes from fishermen. Coastal communities are more economically vulnerable to the economic impact of this high dependence on marine resources than other communities (Kusnadi, 2009). The features of the coastal community also show the close relationship between economic activities, environmental status, and social life (Satria, 2015). The socioeconomic situation of the traditional fishermen group is still limited in terms of their ability to access financial sources, fishing technology, and capital, resulting in their earnings often not sufficient to enhance the welfare of their families optimally (Solihin & Wahidhani, 2024).

The economic problems of coastal communities are not only economic but also social problems which impact the quality of life of fishing households. The prolonged and strenuous work of fishermen can have detrimental effects on their health, particularly for older individuals, who are susceptible to many diseases (Fitria et al., 2024). Fishing is the main source of livelihood for most of the households in coastal areas, as they have limited employment choices. In this situation, coastal communities are more susceptible to reduction of catch yields or environmental changes that impact fishing activities (Unga et al., 2025).

Climate change not only impacts environmental conditions but also social aspects, including changes in social interaction patterns, changes in family roles, and rise in economic vulnerability of the social units relying on fisheries (Syahrani, 2025). This means that the adaptive capacity of coastal communities must be high for them to handle continuous environmental changes (Pratama et al., 2025).

Adaptive capacity is a key factor in ensuring the well-being of coastal communities. Adaptation means the process whereby communities modify their environmental conditions and the economic pressures they are under. Adaptation can also involve adjustments to work patterns, use of available resources or the creation of livelihood strategies better adapted to the conditions that exist (Hidayati, 2011). Far and Tuhumury (2022) found that coastal communities have adapted in different ways, including moving fishing grounds, accessing social networks, member migration and the creation of alternative social networks, family member mobility and alternative economic activities to ensure the livelihoods of fishing households.

A key approach that coastal communities have taken to increase their economic resilience is livelihood diversification. Diversification involves the ways in which other revenue streams are developed apart from fishing in order for the households not to depend on the fish catch of their main occupation (Ngadi, 2016). It can be put in place by micro scale trading, processing fish, providing some service or any other activity related to the local potential of the community. Fish farming households can reduce economic risks due to fishery output fluctuations and seasonal variation by diversifying their income (Ramdani et al., 2023). Alternative enterprises also offer coastal communities the possibility of contributing towards their sustainable economic development (Suhana et al., 2025).

The economic resilience of coastal communities depends on economic factors but is also shaped by social relationships that emerge within the community. Social capital in terms of trust, mutual aid and collaboration is an important resource for communities to confront a range of economic challenges (Azis et al., 2022). When communities are under pressure, they may rely on strong social networks to provide them with access to support, information, and assistance (Sayuti et al., 2024). Fishing communities are able to lower their vulnerability by relying on family savings, finding extra jobs, and using other assets they have to support their household's livelihood (Kaseng et al., 2024). In addition to strengthening fishermen's resilience, skill building, hiring of young fishermen, and strengthening of coastal communities' institutional capacity is needed to face a variety of economic, social and environmental challenges in a sustainable manner (Alexsander & Harmiati, 2024).

The coastal residential area of Kampung Tua Tanjung Piayu is one of the areas in Batam City that are still largely relying on the fisheries sector as a source of income for the community. Fishing household is facing challenges due to changes in environmental conditions, unpredictable weather, income fluctuation etc. There are a number of adaptation measures also adopted by the community to live off income, but the capacity of households to develop economic resilience is still a question that needs to be explored. The purpose of this study is to analyze the economic resiliency of the coastal community and the adaptation strategies used by fishers' households in responding to environmental changes and economic pressures in Kampung Tua Tanjung Piayu.

Research Method

This study uses a qualitative descriptive approach in a phenomenological framework to examine the phenomenon of economic resilience in coastal communities in-depth. The selection of this approach was based on the ability to find out the socio-economic condition of the respondents and their experience in dealing with environmental changes and economic pressures in the study area (Iba & Wardhana, 2023). The phenomenological approach in an attempt to understand the experiences of coastal communities responding to seasonal uncertainty, weather changes and income fluctuations of fishing families. This is an appropriate method for studying coastal communities' economic adaptation strategies following their first-hand experiences in the process (Saputra et., 2019).

The research was carried out in the village of Kampung Tua Tanjung Piayu which is located in Batam City, Riau Islands Province. The area was deemed to be the research site because most of the community within the area still depend on the fisheries sector for their livelihood, rendering them vulnerable to environmental changes and economic variables. The unit of analysis for this study are fishing households and micro-business

ownersin the Coastel area.

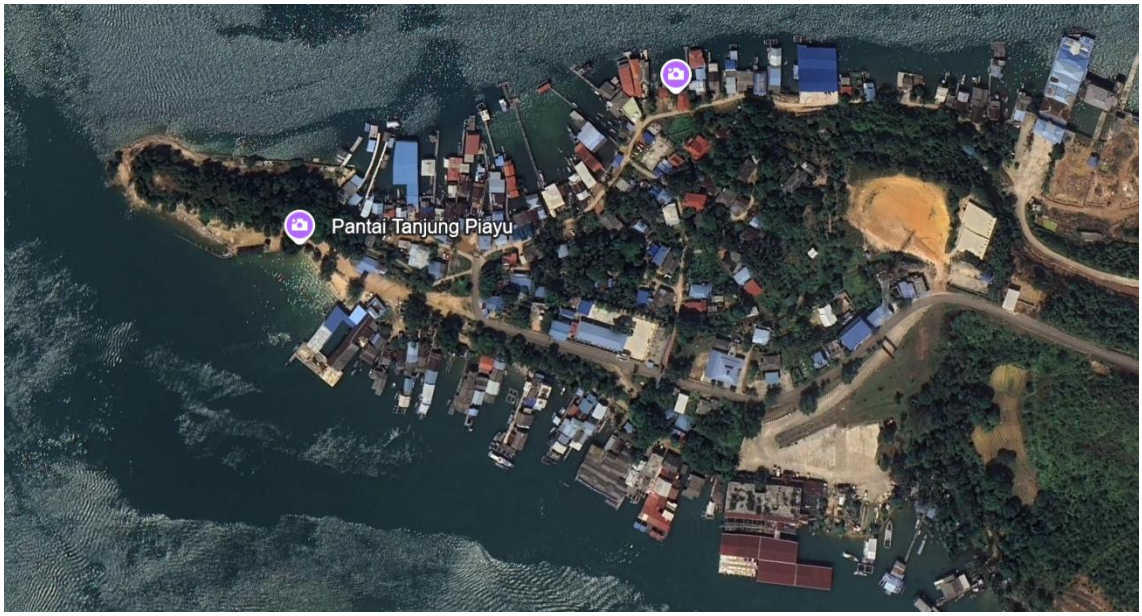


Figure 1. Research location in Kampung Tua Tanjung Piayu, Batam
Source: Google maps, 2026

Tanjung Piayu Old Village is a UNESCO World Heritage Site. Purposive sampling was used to select the research informants, based on their participation in the economic activities of the coastal community and their knowledge of the socioeconomic conditions in the area.

For this study, Primary and Secondary data sources have been used. Primary data was collected directly from the field by using observation and dept interview method with the informants of the study. Secondary data were gathered from books, scientific journals, reserach report and other relevant economic resilience related documents of coastal communities. The data collection techniques used were observation, interview, and document study for socio economic condition of the region. Observations of physical conditions at the settlement were carried out to gain insight into physical conditions in the settlement and the economic activities of the coastal community, while interviews were conducted to gain information on the adaption strategies and the economic resilience of fishing households (Pratama et al., 2021).

The method used in data analysis was Miles and Huberman interactive analysis model, including data reduction, data presentation and drawing conclusions. Data collected from observations, interviews and documentation were analysed in a multi-staged process in order to detect patterns and relationships between phenomena investigated. To ensure the level of reliability in the research findings, data validity was carried out from the source triangulation by comparing the information that was acquired from the different informants and data sources.

Results and Discussions

The results of observation and interviews in Tanjung Piayu Old Village show that the livelihood structure of the community is still dominated by fishing. The fishery is

known to be the major source of family income among approximately 80% of the household heads. Through generations, this is an occupation that has become a cultural and economic heritage. Marine products are critical in the daily rounds of the community, and they are also a source of livelihood, so the resolve of the people towards the fisheries sector is evident. Thus, the fisheries industry can be regarded as the backbone of the coastal economy in the area.

Based on the interview, fishermen's income is very much dependent on the weather and their ability to sail regularly, fishermen can earn around Rp 3.500.000 – 4.000.000 per month. The larger the catch the more money the fishermen can make. This makes economic stability more likely within the family since they are able to cover their needs. The size of the catch, and the income of the fishermen depend largely on the weather.

It's a different story when the fishing weather is not conducive. The informants state that fishermen's income can range from Rp 1.500.000 to Rp 2.000.000 per month. The drop is due to fishermen not being able to venture out to sea as often as they would like, owing to high waves and strong winds. The catch is also significantly smaller than under normal weather conditions. Such significant income swings suggest a strong reliance on nature for coastal communities' livelihoods.

But if the weather is not conducive to fishing, then the situation will change. The income of fishermen can be reduced to approximately Rp. per informant. 1.500.000 to Rp. 2.000.000 per month. This reduction is attributed to the reduction of ability of fishermen to go out to sea as expected because of high waves and strong winds. This catch is also much less during the normal weather. This substantial shift in earnings reflects a huge natural dependency on the livelihoods of the coastal communities.

The fishermen complain the most about the west monsoon. At this time, the fishing process is more dangerous due to high waves, many fishermen decide to minimize their activities at sea during this season. Some informants stated that they could even go for two to four months without fishing if the weather really is bad. The moratorium on fishing directly affects household income since the primary source of income is not able to function properly. This puts the fishing family in a dilemma of adjusting expenditure to survive every day.

The west monsoon is the season that complained most by the fishermen. At this period, fishing activities are more hazardous at sea because of high waves and many fishermen tend to shorten their activities at sea. Some informants reported they even refrain from fishing for up to 2-4 months during the most disadvantageous weather conditions. The cessation of fishing has an immediate effect on the incomes of households, which is no longer able to carry out its usual operations. This situation makes fishing families to restructure their expenditures in order to cater for their daily demands. The time for the most frequent complaints from fishermen is the west monsoon. In this season, fishing becomes risky due to high waves and fishermen have to limit their fishing at sea. Some informants reported that they even ceased fishing for 2-4 months during extremely unfavourable weather. The decrease in fishing activity means that the main source of income is not working as intended; this reduces the household's income. In this

context, fishing families have to adjust their budgets to accommodate their expenses for the day.

Individuals are making a variety of efforts to adjust to this. Some families are adopting austerity measures and focussing on the necessities. Some are using their savings to pay bills when their income is reduced. The measures are implemented to maintain the financial stability of the family until the situation improves. One method of coping with a decline in income is for individuals to change their spending habits.

Differences in career options amongst the older and younger generation were also found during the interviews. The majority of household heads still earn a living from fishing, which has been their main livelihood for long. Meanwhile. Labourers are chosen as chosen by the young entering the market as against following the profession of their parents. One of the main reasons why people choose these types of jobs is the fact that they have a more stable income. The existence of industrial area in Batam city also provides great opportunities for employment to coastal area youth.

Parental childcare engaged in can influence the economic status of the family. Labour income is additional income for the household when fish catch falls. Alternative livelihoods provide some form of earnings for households other than fishing, and this enables them to secure their food needs not solely from sea resources. This helps to minimize the vulnerability of households' livelihoods relative to relying entirely on fishing as their livelihood activity. More sources of income also help give families a sense of security in the event of unpredictable weather and seasonal changes.

Parents and children do not have the same preferences in career choice, which affects the family's economic position. Labour income also contributes to the income of the laborers when fish catches are low. A diversified revenue base provides the family with livelihood alternative besides fishing to address their daily living. This lowers the economic risk of households, as opposed to relying solely on the sea. Additionally, diverse sources of income help give a sense of security to families when faced with unpredictable weather, seasonal variations and the like.

The research has revealed that the economic resilience of Kampung Tua Tanjung Piayu is developed based on primary income from their fisheries activities, secondary income from their alternative working activities and social support from the community. The results are consistent with Far and Tuhumury (2022) study on adaptation strategies of coastal fishing households in Kei Besar Island, where the researchers discovered that fishing households adapted their livelihoods through a series of adaptation strategies, including increasing the diversity of jobs and making use of social networks to deal with the uncertainties brought by climate change. In addition Ngadi's (2016) study in Wakatobi also indicated that livelihood diversification is an important strategy for decreasing dependency on the fluctuating income in coastal areas throughout Indonesia.

Conclusion

The fishing industry is still a major contributor to household income in Kampung Tua Tanjung Piayu, and is a critical livelihood area, for the economic resilience of the community. The level of dependence on fishing activities makes the economic situation

of the community vulnerable to changes in weather and season, especially the west monsoon period which can limit fishing activities and reduce the income of fishermen. In response to these factors, the community has adopted a number of survival strategies including controlling household budgets, accessing savings, and obtaining extra income from family members outside of the fishing industry. The younger generation's choice to become labores also helps in sustaining family's economic stability despite the reduction in fish catch. Also, there is significant social and kinship bonding in the community which provides a means of support for fishing families facing economic difficulties. The economic resilience of coastal communities is not only based on fish catch yields, but also on the adaptive capacity of households to changing economic and environmental conditions.

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Competing Interest

The authors declare that there are no conflicts of interest regarding the conduct of this research or the publication of this article.

Generative AI Statement

In preparing this manuscript, the author used generative artificial intelligence (AI) technology to help improve grammar, sentence structure, and readability. All results have been reviewed, edited, and verified by the author. The author is solely responsible for the content, accuracy, data interpretation, and conclusions presented in this article. AI technology was used solely as a writing aid and was not used in data collection, data analysis, or the drawing of research conclusions.

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