Assessment of food security status of Bajo fishing households in Kabawo Subdistrict, Southeast Sulawesi

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Abstract. Coastal communities can be particularly vulnerable to food insecurity due to a combination of factors related to their geographical location, socio-economic conditions, and environmental challenges. This research aimed to evaluate the level of food security in Bajo fishermen's households. The study was undertaken in Kawite-wite Village, Kabawo Subdistrict, Muna Regency in Southeast Sulawesi. There were 161 Bajo fishing households living in the village, of which 64 households were selected as respondents. The food security status was assessed using the US Department of Agriculture's household food security survey module. Study results indicated that 6.25% of households were in marginal food security status, 18.75% were in very low food security status, 65.54% were in low food security status, and 9.38% were in high food security status. If only grouped into two categories, 84.38% of households were food insecure, while the remaining 15.63%were food secure. The findings showed that most Bajo households were food insecure. Households employed two strategies to overcome food shortages, namely those pertaining to food and those pertaining to income and expenditure. The government and all stakeholders need to improve the food security status of Bajo fishing households.

1 Introduction

Food security, which encompasses the availability, accessibility, utilization, and stability of food [1, 2], is a critical component of human well-being. Law Number 18 of 2012 concerning Food Security explains that the government and the community are responsible for ensuring food security. The government is responsible for making regulations, fostering, controlling, and supervising the supply of enough food that is safe, nutritious, varied, evenly distributed, and within the means of the general public. While consumers have the right to obtain safe and nutritious food, the community needs to take part in food production, supply, trade, and distribution.

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Coastal communities can be particularly vulnerable to food insecurity due to a combination of factors related to their geographical location, socio-economic conditions, and environmental challenges. Coastal communities often rely heavily on fishing and other marine resources as their primary source of livelihood and food. Their dependence on these resources exposes them to risks such as overfishing, depletion of fish stocks, and environmental degradation, which can directly impact their food security [3].

One of the many ethnic groups living on the coast of Southeast Sulawesi is the Bajo people. The Bajo, or Bajau, known as the "Sea Gypsies," are indigenous maritime people primarily residing in coastal areas of Indonesia. Historically, the Bajo communities have relied on fishing and marine resources as their primary source of livelihood and sustenance. However, the rapid changes in marine ecosystems, overfishing, and the encroachment of modern fishing practices have significantly impacted their traditional fishing practices, thereby threatening their food security [3]. Furthermore, the Bajo face socio-economic challenges, including limited access to education, healthcare, and economic opportunities, which further exacerbate their vulnerability to food insecurity [4, 5].

To date, limited research has been conducted on the food security status of the Bajo communities in Indonesia. This article seeks to address this knowledge gap by conducting an analysis of the food security status of Bajo fishing households and assessing their strategies in coping with food shortages or food insecurity. The findings from this analysis will provide insights and evidence to inform policy interventions and community-based initiatives that can enhance food security and promote sustainable development among the Bajau communities.

2 Methodology

The research was undertaken in July 2022 in Kawite-Wite Village, Kabawo Subdistrict, Muna District. The study location was selected purposively, as it is a coastal village that is dominantly inhabited by the Bajo community. The majority of households (77%) rely on fishing as their primary source of living. The total number of Bajo fishing households in the village is 161 families. From this population, 64 households were randomly selected as respondents.

The food security status of fishing households was measured through the use of the US Department of Agriculture’s household food security survey module. This module contains ten questions that are intended for households without considering whether or not there are children in the household. In this regard, the questions asked were directed at measuring the food security condition during the previous 30 days [6]. The questions were formulated accordingly, taking into account the varying levels of respondents’ comprehension in rural areas.

Questions are asked starting with low food insecurity and moving on to serious food insecurity. So households that give negative answers to the initial questions are most likely not to experience food insecurity and can be categorized as households with high food security status. It is not necessary to ask such respondents the following questions. From the existing questionnaire, responses of “yes,” “often,” “sometimes,” “almost every day,” and “some days but not every day” were categorized as affirmative answers. In the context of 30 days in a month, the response "5 days or more" was regarded as affirmative. The number of affirmative responses to the ten questions is the household food security score, which falls into the following categorization [6], [7]:

- Score 0 : High food security status
- Score 1-2 : Marginal food security status
- Score 3-5 : Low food security status
- Score 6-10 : Very low food security status

The first two categories taken together are classified as having a food secure status, whereas the latter two are classified as having a food insecure position.

3 Results and Discussion

3.1 Description of study area

Located within the Kabawo sub-district of Muna District, Kawite-Wite Village spans approximately 24.52 square kilometers and is situated 19 kilometers from the sub-district capital and 58 kilometers from the district capital. The village is notably characterized by its lowland topography, which primarily steers the local economy towards maritime activities. Similar to other Indonesian villages, Kawite-Wite experiences a tropical climate with average temperatures fluctuating between 25 °C and 27 °C, consistent with the broader climatic patterns of the Kabawo sub-district. This climate is punctuated by two significant seasonal phases: the rainy season and the dry season, each profoundly influencing the village's economic dynamics, particularly within the fishing community.

The rainy season typically spans from April to June, followed by the dry season from July to October. However, the transitional periods between these seasons, extending occasionally from November to March, significantly dictate the viability of fishing activities which are integral to the village's livelihood. These seasonal cycles are further delineated by prevailing wind patterns, categorized into the East monsoon and the West monsoon, which dictate the feasibility of fishing activities.

Fishing, the predominant economic activity, is optimally conducted for about six months each year, from October to March. During this period, fishermen exploit favorable weather conditions to enhance their catch. However, the period from April to September presents considerable challenges due to strong winds and high waves, making the sea conditions hard for fishing. As a result, this adverse weather limits fishing activities, forcing many fishermen into a period of enforced inactivity. This seasonal dichotomy not only exemplifies the environmental adversities faced by the Kawite-Wite community but also underlines the significant impact of these temporal patterns on their economic stability and social well-being.

3.2 Socioeconomic characteristics of respondents

The socio-economic profile of respondents reveals critical insights into the demographics and educational background of Bajo fishing households. The age distribution of respondents predominantly falls within the 45-54 year range (56.3%), followed by 37.5% being younger than 45 years, and a minor proportion (6.3%) being 54 years and above, with the mean age positioned at 45 years. This demographic spread indicates that the majority of respondents were within their active working ages, suggesting a potential for sustained livelihood activities. Educational attainment among the respondents exhibited a notable skew towards lower educational levels; 56.3% had completed education up to elementary school, 15.6% had reached junior high school, and an equivalent percentage (15.6%) had not received any formal education. Only a modest 12.5% had progressed to senior high school. This level of education was even more pronounced among the housewives within the community, where a staggering 81.3% had never attended school or only received elementary education. Regarding household composition, 37.5% of the respondents had a family size of 4 or fewer members, whereas the majority (62.5%) lived in larger families with more than four members. These socio-economic characteristics underscore the challenges and complexities inherent in addressing food security among Bajo fishing households, highlighting the interplay between age, educational attainment, and household size in shaping their livelihood strategies and, by extension, their food security status.

3.3 Status of food insecurity

Food security, as defined by the World Food Summit of 1996, is when "all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life" [1]. To empirically assess this intricate concept, numerous measurement tools have been developed, with the USDA Household Food Insecurity Access Scale (HFIAS) being one of the most prominent.

USDA HFIAS is one of the numerous measurement tools that are used to assess the concept of food security. It offers an understanding of the degrees of food security through a number of questions pertaining to eating patterns, food intake disruptions, and concerns about food sufficiency. Households were classified into four categories of food security status: high, marginal, low, and very low, depending on the quantity of food insecure conditions they describe [6], [8]. Table 1, presented below, showed distribution of the Bajo fishing households across these categories, providing insights into their prevailing food security statuses.

Table 1. Food security status of Bajo fishing households in the survey village.

No	Affirmative responses	Food Security Status	N	%
1	0	High	6	9,38
2	1-2	Marginal	4	6,25
3	3-5	Low	42	65,63
4	6-10	Very low	12	18,75
Total			64	100,00

Source: Field survey results, 2022

In Table 1, it is evident that a significant majority (65.6%) of the Bajo fishing households experienced 3-5 instances of food insecurity, categorizing them under low food security. On the other hand, 18.7% of the households fell into the very low food security bracket, having reported 6-10 food-insecure conditions. Households that exhibited high food security and marginal food security constituted a mere 9.4% and 6.3%, respectively. An overarching observation from these results was that a staggering 84.4% of the households were classified as "Food Insecure," while only 15.6% managed to attain a "Food Secure" status. This predominant trend underscored the acute challenges faced by a majority of these households in consistently accessing adequate food. Focus Group Discussions (FGDs) further corroborated these findings, with a significant number of households expressing apprehensions about consistent food availability and access. Many of these households also reported disruptions in their regular eating patterns and noticeable reductions in food consumption.

The findings were in line with other studies that as part of coastal communities, Bajo communities are vulnerable to food insecurity [4, 9, 10]. The prevalent food insecurity among Bajo fishing households can be attributed to a confluence of factors that are both intrinsic to their lifestyle and emblematic of the broader challenges faced by coastal communities. They include environmental degradation [11, 12], climate change [13], economic marginalization [10], traditional practices [12, 14], and limited engagement with terrestrial agriculture [15].

3.4 Coping strategy

In grappling with the challenges of food insecurity, households, particularly those in coastal and marine-dependent communities like the Bajo, develop various coping strategies. These strategies are essentially adaptive mechanisms to mitigate the immediate and potential threats of hunger and economic hardship. Broadly, these coping strategies can be categorized into two main areas: food-related strategies and income or expenditure-related strategies. Each encompasses distinct approaches and techniques, reflecting the socio-economic and cultural dimensions of the households.

3.4.1 Food related strategy

The Bajo fishing households, when faced with food insecurity, employ various adaptive mechanisms to ensure their sustenance. As can be seen in Table 2, households employed several food related strategies. A significant majority, 75% of the households, opted to reduce the portion of food consumed. The same number of households also decided to reduce the meal frequency. Buying foods in installments or on credit was a strategy employed by 62.5% of households. About 31.3% of households chose to cook whatever was available at home.

Table 2. Food-related strategy to cope with food shortages or food insecurity condition

No	Food related strategy	N	%
1	Reduce portion sizes	48	75.0
2	Purchase food on credit	40	62.5
3	Reduce meal frequency	48	75.0
4	Cook available resources	20	31.3

Source: Field survey results, 2022

Based on the several strategies that households have employed, it can be said that Bajo fishing households exhibit a significant level of adaptability in their food consumption habits when faced with food insecurity. The strategies also indicated a severity of the situation, as three-quarters of these households have resorted to reducing both food portions and meal frequency. In addition, the reliance on buying food in installments or credit by over half the households points towards underlying economic challenges. Finally, that nearly one-third of households cook with whatever is available suggests a willingness to be flexible in diet choices. It could indicate seasonal food availability variations or financial constraints limiting their purchasing power.

3.4.2 Income or Expenditure Related Strategy

A more multifaceted approach, this strategy delves into the economic activities and financial behaviors of households to combat food insecurity. As can be seen in Table 3, households employed eight strategies. These eight strategies can be broadly classified into three main categories: fisheries-based economic strategies, non-fisheries based economic strategies, and social strategies. Each of these categories represents distinct pathways through which the households navigate the challenges of food insecurity and economic instability.

Fisheries based strategies predominantly involve optimizing fishing practices given the marine centric lifestyle of Bajo people. They include extending fishing duration and fuel mixing. Extending fishing duration means extending or lengthening fishing periods, either by increasing the number of hours or days with the objective to secure adequate catches. The adaptation of mixing solar with kerosene, as reported by 53.1% of households, indicates a pragmatic approach to cost-saving and fuel optimization. This method allows households to economize their fuel usage and potentially extend their fishing expeditions.

While fisheries-based strategies delve deep into the Bajo's traditional knowledge and primary source of livelihood, the non-fisheries-based approaches provide a glimpse into their adaptability, embracing alternate avenues of income. A notable shift can be observed in the livelihood strategies of Bajo fishing households, with 25.01% now venturing into construction work. This diversification signifies an adaptive response to the challenges and uncertainties tied to a predominantly fisheries-dependent income. By branching out into the construction sector, these households are not only seeking alternate income streams but also capitalizing on the rising demand for construction labor, especially in rapidly developing coastal regions.

However, it is worth noting that income or expenditure related strategies in the survey village were mostly done by men. This is different with that found in other coastal communities where housewives are also active to do side jobs to get supplementary income, such as fish smoking [16] and selling cookies [17].

Table 3. Income or expenditure related strategy to cope with food shortages or food insecurity

No	Income and Expenditure-Related Strategy	N	%
1	Extend fishing duration	54	84.4
2	Fuel mixing	34	53.1
3	Involve in construction work	28	43.8
4	Sell jewelry	24	37.5
5	Tap into savings	8	12.5
6	Borrow from relatives or neighbors	28	43.8
7	Borrow from institution	8	12.5
8	Reduce non-essential expenditures	44	68.8

Source: Field survey results, 2022

Social strategies unveil the community's resilience, reliance on social capital, and sacrifices made in the name of survival. Rooted in the strong communal bonds often found in close-knit communities like the Bajo, this approach involves leaning on social networks for support. Households might sell their jewelries, use their savings, borrow resources from neighbors or relatives, borrow money from formal money lending institution, and reducing non-essential expenditures. This strategy underscores the significance of community solidarity in confronting shared challenges and prioritization of essentials over personal comforts.

In assessing the food security status of Bajo fishing households, this study did not explicitly account for seasonal variations that may significantly impact livelihoods and, consequently, food security status. It is important to acknowledge that the livelihood strategies and food availability in coastal communities such as those of the Bajo are inherently seasonal, with certain periods being more conducive to fishing and others posing substantial challenges. Notably, our data collection was conducted in July 2022, a period characterized by rough or big waves, which likely impacted fishing yields and, by extension, the food security status of these households. This timing may have skewed the representation of food security levels, potentially underestimating the periods of higher food security and overemphasizing the adversities faced. Such seasonal dynamics are crucial for understanding the full scope of food security challenges in coastal settings, and future research should aim to capture these variations to provide a more comprehensive understanding of food security across different seasons.

4 Conclusion

A total of 6.25% of households were in a marginal food security status, 18.75% were in a very low food security status, 65.63% were in a low food security status, and 9.38% were in a high food security status. When grouped into two categories, 84.38% of households fall into the 'food insecure' level, while the remaining 15.63% are considered 'food secure.' Strategies to overcome food scarcity or insecurity include those pertaining to food and those pertaining to household income and expenditure. The dominant food-related strategies are reducing food portions and decreasing the frequency of meals per day. Strategies pertaining to household income and food expenditure include increasing income (from fishing and non-fishing sources), using savings, selling jewelry, borrowing money, and cutting back on less essential expenses.

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