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Assessing Food Security Status Among Coastal Households in Sambuli Village in Southeast Sulawesi

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***Abstract*: This study aimed to investigate the food security status of households in Sambuli Village, Nambo Subdistrict, Kendari Municipality. Employing proportionate stratified random sampling, the research sampled 59 households from a total population of 145. The study utilized structured questionnaire-based interviews for data collection, and analyzed the data using the USDA Food Security Survey Module. The results indicate a pronounced disparity in food security, with only 20.3% of households being "food secure" and a substantial majority of 79.7% experiencing food insecurity. Higher levels of food insecurity might be attributed to limited income, low educational attainment, lack of agricultural land, reliance on fishing as the primary livelihood, market fluctuations, and the impact of the Covid-19 pandemic. This significant incidence of food insecurity underscores the necessity for targeted interventions and policy initiatives aimed at enhancing economic resilience, diversifying income sources, ensuring access to nutritious food, and establishing robust support systems to mitigate future pandemic-related impacts in vulnerable coastal communities.**

***Keywords*: coastal communities, fisheries, food security, households.**

1. Introduction

One of the main goals of Indonesia's development plans and strategies is to ensure food security. According to the Food and Agriculture Organization (FAO), food security exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life [1]. The Indonesian government has incorporated extensive food security measures into its policy frameworks because it recognizes the crucial relationship between food security and national growth [2], [3]. These measures aim to enhance agricultural productivity, ensure equitable distribution of food resources, mitigate the impacts of climate change, and address the vulnerabilities of the food system [3]–[5]. By prioritizing food security, Indonesia aspires not only to meet the immediate nutritional needs of its population but also to foster social stability, economic development, and resilience against environmental and socio-economic challenges.

The significance of food security assumes a unique form in the setting of coastal communities [6]. Through fisheries and aquaculture, coastal regions are vital to the country's food chain. Nonetheless, these communities have particular difficulties that jeopardize their food security, including habitat degradation, overfishing, and the effects of climate change [6]–[8], which include rising sea levels and more frequent extreme weather events. Social problems like restricted access to health and education facilities, as well as economic reasons like fluctuations in the market demand and prices for seafood, all contribute to the susceptibility of coastal communities to food insecurity.

Coastal communities have distinct socio-economic and cultural conditions that influence their food security status. These communities have historically been closely linked to the sea environment and have made fishing and related industries their main sources of income. Many coastal households rely on the sea for their principal source of income in addition to food [9], [10], as they engage in small-scale fishing that is susceptible to external pressures including policy changes, market dynamics, and environmental deterioration. In addition, a lot of coastal areas have poor access to healthcare, education, and markets. Despite these challenges, coastal communities have a rich history of flexibility and resilience [11], with ingrained customs and practices that have helped them through changing times.

The province of Southeast Sulawesi has an abundance of marine resources, which enable a wide range of fisheries and aquaculture operations that are essential to regional economies and food security. However, this diversity also means that maintaining maritime habitats, managing natural resources responsibly, and providing equal access to food and employment opportunities for all of its inhabitants face formidable challenges. In this regard, it is critical to address the particular difficulties that the province's coastal populations face and make sure that development initiatives and policies are suited to the unique requirements and potential of the province's diverse coastal landscapes.

The need to conduct this research stems from a confluence of factors that highlight the village as a critical microcosm for understanding and addressing food security among coastal communities. This study aims to assess the food security status

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of coastal households in Sambuli Village. Through this study, we aim not only to contribute to the academic discourse on food security but also to offer practical recommendations that can empower communities, policymakers, and development practitioners to foster resilience and sustainability in coastal areas facing similar challenges.

2. Materials and Methods

This study was conducted from November 2021 to January 2022 in Sambuli Village, Nambo Subdistrict, Kendari Municipality. The population targeted in this research comprised the entire coastal household community engaged in farming and fishing, totaling 145 households (46 farmer households and 99 fisher households). The sample size was determined using the Slovin's formula, resulting in a final sample of 59 households from the total population of 145 in the village. The sampling technique employed in this study was proportionate stratified random sampling. Data collection was carried out through interviews using a structured questionnaire. Data analysis utilized the USDA Food Security Survey Module for assessing food security status [3]. This involves categorizing households into different levels of food security based on their responses to the survey questions.

3. Results and Discussion

A. Socio-economic Characteristics of Respondents

Table 1 illustrates that respondents predominantly fall within the productive age category. This demographic distribution suggests that the respondent households possess robust physical capabilities in their work. Furthermore, their demographic positioning indicates a propensity for readily accepting and integrating new innovations within the community. Such characteristics imply a strong potential for these households to effectively meet their livelihood needs and maintain food security.

The educational level of the respondents is generally low. This is evident from the high percentage of respondents who have only completed primary education (elementary school), with a small fraction attaining higher education levels (high school or vocational school). Specifically, the educational attainment of the household heads among the respondents is dominated by primary education, with 26 individuals or 44.1% having completed this level. Those with junior high school education account for 20 individuals or 33.9%, while high school or equivalent level is represented by 12 individuals or 20.3%. Only 1 individual or 1.7% has attained a higher education degree. This low level of education may be correlated with their knowledge base, which in turn has implications for their employment opportunities and efforts to meet their food needs.

The concept of family dependency, as used in this study, encompasses all individuals residing with the head of the household or those not living with the head of the household but still financially dependent. As presented in Table 1, the highest percentage (31 families or 52.5%) falls within the medium-sized family category, with 2-4 dependents. The smallest proportion (one family or 1.7%) consists of small families with fewer than two dependents. Respondents categorized as having large families, with 5-10 dependents, number 27 families, accounting for 45.8% of the sample. The number of family members directly impacts the adequacy of a household's food consumption and overall household expenditure. Consequently, a larger number of dependents correlates with an increased economic burden, necessitating a greater allocation of income to meet these needs. However, when family members reach productive age, they can contribute to the household's food consumption needs, potentially mitigating food insecurity.

Table 1
Socio-economic characteristics of respondents

No.	Characteristics	Respondents	%
1	**Age (years)**		
	0-14	0	0
	15-65	56	94.9
	>65	3	5.1
2	**Level of education**		
	Elementary School	26	44.1
	Junior High School	20	33.9
	Senior High School	12	20.3
	University	1	1.7
3	**Number of dependents (persons)**		
	<2	1	1.7
	2-4	31	52.5
	>4	27	45.8
4	**Household income (Rp)**		
	>3.5 million	1	1.7
	>2.5 – 3.5 million	5	8.4
	>1.5 – 2.5 million	7	11.9
	<1.5 million	46	78.0
5	**Land ownership**		
	Yes	19	32.2
	No	40	67.8

Table 1 also reveals that the income levels of the respondent households are relatively low. This low income can be attributed to a variety of factors including educational attainment, business experience, working capital, working hours, access to credit, workforce size, family dependents, the type of goods traded (products), among other variables. Generally, people strive to achieve higher income levels to meet their household needs, but these efforts are often constrained by the aforementioned factors (Nazir as quoated in Widiastuti [12]).

The survey data regarding land ownership among the respondent households indicates a clear division: a majority, consisting of 40 households or 67.8%, do not own agricultural land, while the remaining 19 households, making up 32.2%, do possess such land. These 19 households are actively engaged in agriculture as their primary occupation. In contrast, the 40 households without land are primarily comprised of individuals whose livelihoods are centered around fishing.

This delineation in land ownership and its correlation with occupational choices provides significant insights into the socio-economic structure of the study village. The lack of agricultural land ownership among a substantial portion of the community highlights a dependency on alternative livelihoods, such as fishing, and possibly indicates limited opportunities for

diversification in income sources. Conversely, for the households engaged in agriculture, land ownership is a critical asset that likely influences their food security status and economic stability. Understanding this distribution of land ownership and its implications is essential for developing targeted strategies aimed at enhancing livelihoods and ensuring food security in the community. It also underscores the need for policies and programs that address land access and utilization, particularly in coastal communities where agricultural and fishing activities are the mainstays of the local economy.

B. Food Security Status

Table 2
Food security status of respondent households

Affirmative response	Food Security Status	N	%
0	High	3	5.1
1-2	Marginal	9	15.2
3-5	Low	23	39.0
6-10	Very Low	24	40.7
Total		**59**	**100.0**

Table 2 presents food security status of respondent households in the study village. The number of households with high food security status accounted for 5.1 percent, marginal 15.2 percent, low 39 percent, and very low 40.7 percent. If grouped into two categories, the number of households that are food secure is 20.3%, while the rest 79.7% are food insecure.

The results show varying degrees of food security among households, with a certain percentage falling into high, marginal, low, and very low categories. This classification provides an in-depth understanding of the severity and prevalence of food insecurity in the community [13].

1. High Food Security: Households in this category have consistent, reliable access to sufficient food for all members, ensuring a healthy and active lifestyle. They don't face limitations or uncertainties regarding their ability to obtain food.
2. Marginal Food Security: These households generally have access to adequate food, but may sometimes face uncertainty or anxiety about food availability. They might compromise on the variety or desirability of their food but usually do not reduce their actual food intake.
3. Low Food Security: Households experience reduced quality, variety, or desirability of their diet. However, the quantity of food intake and normal eating patterns are typically not significantly disrupted.
4. Very Low Food Security: This group experiences disruptions in eating patterns and reduced food intake. Members of these households are likely to have experienced actual reductions in food quantity due to a lack of resources for food.

Several factors could contribute to these findings. Lower levels of food security might be attributed to limited income, low educational attainment, lack of agricultural land, or reliance on fishing as the primary livelihood [7], [10], [14], [15], which may be less stable. Additionally, external factors like market fluctuations and the impact of the Covid-19 pandemic might have exacerbated these conditions.

Limited income is a primary cause of food insecurity, directly impacting a household's ability to purchase sufficient and nutritious food [16]. Families with restricted financial resources often prioritize immediate survival needs, such as housing and healthcare, leaving less available for food. This economic constraint forces households to either reduce their food intake or shift towards cheaper, less nutritious food options, compromising their overall health and nutritional status. Moreover, in communities reliant on seasonal or unstable income sources, such as fishing or small-scale agriculture, fluctuations in income can exacerbate food insecurity [16]. Addressing this root cause requires interventions aimed at boosting household incomes through employment opportunities, vocational training, and access to credit, enabling more stable and diversified earnings.

A low level of education [17], [18] could contribute to food insecurity by limiting awareness and understanding of nutrition, hindering access to well-paying jobs, and reducing the ability to engage in more productive agricultural practices or diversified income-generating activities. Educated individuals are better positioned to make informed decisions regarding their health, nutrition, and economic activities. Furthermore, education enhances individuals' capacity to adapt to market changes and to adopt innovative technologies, thus potentially increasing their income and access to food. Addressing educational barriers can lead to improved food security by empowering individuals with the knowledge and skills needed for economic advancement and healthier lifestyle choices.

The lack of agricultural land directly impacts food security by constraining households' ability to produce their own food [19], which could mitigate the effects of market fluctuations and income instability. For communities traditionally reliant on agriculture or fishing, the inability to own or access productive land limits not only the capacity for self-sustenance but also the potential for agricultural income generation. This situation forces reliance on purchasing food, making households particularly vulnerable to price increases and income shocks. Strategies to address this cause include community gardening projects and support for urban agriculture aiming to enhance direct access to food sources [20].

Reliance on fishing as the primary livelihood introduces instability due to its susceptibility to environmental changes, overfishing, and market volatility [10], [21]. These factors can lead to unpredictable income and food availability, directly affecting food security. Fishing communities often face periods of scarcity that can severely limit access to both income and dietary needs. Diversifying income sources through alternative livelihood programs and enhancing sustainable fishing practices are essential strategies to mitigate the impacts of this instability, ensuring a more consistent and reliable foundation for food security.

Market fluctuations significantly impact food security by affecting the prices and availability of food. When prices rise due to supply shortages, economic downturns, or increased demand [22], households with limited financial resources are the first to experience reduced access to food. This volatility can make it challenging for families to plan their food

expenditures [23] and may force them to reduce both the quantity and quality of food consumed. Strengthening local food systems, developing community-based food reserves, and implementing social safety nets can help buffer vulnerable populations from the adverse effects of market fluctuations.

The impact of Covid-19 on food security [24], [25] is profound, particularly in communities like the study village where the study was conducted when the lingering effect of pandemic were still palpable, with residents remaining cautious and not yet fully resuming their normal activities. The pandemic's disruption to supply chains, labor markets, and health systems exacerbated existing vulnerabilities, leading to increased food insecurity. Lockdowns and restrictions on movement affected the fishing industry and agricultural productivity, limiting income and access to food. Additionally, the health crisis strained household resources, diverting spending towards healthcare. Given that the data collection occurred during the pandemic situation, the findings reflect the immediate and tangible effects of Covid-19 on the community's food security, underscoring the need for food assistance and long-term resilience strategies.

4. Conclusion

This study aimed to investigate the food security status of households in the study village. With only 20.3% of households reporting to be "food secure" and a sizable majority of 79.7% reporting food insecurity, the results show a pronounced disparity in food security. Higher levels of food insecurity could be ascribed to limited income, inadequate education, lack of land ownership, dependence on fishing as the principal source of income, market fluctuations, and the aftermath of the Covid-19 pandemic. Targeted interventions and legislative measures are desperately needed to improve economic resilience, diversify sources of income, guarantee access to nutritious food, and build strong support networks in vulnerable coastal areas in order to lessen the potential effects of future pandemics.

References

[1] FAO, "The State of Food and Agriculture 2010-2011: Women in Agriculture, Closing the Gender Gap for Development," Rome, 2011.

[2] H. Saediman, Y. Indarsyih, S. Abdullah, S. A. Fyka, and I. S. Mboe, "Assessing major drivers of crop shifting from rice to horticultural production: a case of Landono sub-regency in Southeast Sulawesi," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 724, p. 012006, 2021

[3] H. Saediman, S. Aisa, M. Zani, M. A. Limi, and W. O. Yusria, "Food Security Status of Households in a Cassava-Growing Village in Southeast Sulawesi, Indonesia," *J. Agric. Ext.*, vol. 23, no. 1, pp. 199–209, Jan. 2019.

[4] H. Saediman, M. A. Limi, Rosmawaty, P. Arimbawa, and Y. Indarsyih, "Cassava consumption and food security status among cassava growing households in southeast sulawesi," *Pakistan J. Nutr.*, vol. 15, no. 12, pp. 1008–1016, 2016.

[5] H. Saediman, L. O. Lasmin, M. A. Limi, U. Rianse, and L. Geo, "Rice Farmers' Perception of Climate Variability in South Konawe District of Southeast Sulawesi," *Int. J. Sci. Technol. Res.*, vol. 9, no. 2, pp. 3128–3132, 2020.

[6] F. von Heland, Reef Futures Exploring the dynamics of transformative change in marine social-ecological systems. Stockholm: Stockholm University, 2014.

[7] A. R. McWilliam, N. I. Wianti, and Y. Taufik, "Poverty and prosperity among Sama Bajo fishing communities (Southeast Sulawesi, Indonesia)," *Singap. J. Trop. Geogr.*, vol. 42, no. 1, pp. 132–148, Jan. 2021.

[8] P. W. Simonin, "From sea to spirit: Resilience conceptions in coastal communities of Kaledupa, Indonesia," *Resilience*, vol. 3, no. 3, pp. 199–206, Sep. 2015.

[9] M. Macchi *et al.*, "Indigenous and Traditional Peoples and Climate Change," IUCN, 2008. Available at https://www2.ohchr.org/english/issues/climatechange/docs/iucn.pdf

[10] H. Saediman, F. F. Syah, T. La Ola, M. Tufaila, and L. Daud, "Fishermen Group Dynamics Before and After the Implementation of a Capture Fisheries Development Program," *IOSR J. Humanit. Soc. Sci.*, vol. 24, no. 8, pp. 5–12, 2019.

[11] D. Levinson, *Encyclopedia of world cultures*. New York: G.K. Hall, 1996.

[12] A. Widiastuti, "Pengaruh Pendidikan, Jam Kerja, dan Pengalaman Kerja Terhadap Pendapatan Tenaga Kerja Lansia," *J. Pendidik. dan Ekon.*, vol. 7, no. 3, pp. 253–262, 2018.

[13] A. Coleman-Jensen, M. P. Rabbitt, C. Gregory, and A. Singh, "Household Food Security in the United States in 2014," *Econ. Res. Rep.*, no. 194, pp. 1–43, 2015, [Online]. Available: http://www.ers.usda.gov/media/1896841/err194.pdf

[14] FAO IFAD WFP, The State of Food Insecurity in the World 2015: Meeting the 2015 International Hunger Targets. Rome: FAO, 2015.

[15] D. Akerele, S. Momoh, A. B. Aromolaran, C. R. B. Oguntona, and A. M. Shittu, "Food insecurity and coping strategies in South-West Nigeria," *Food Secur.*, vol. 5, no. 3, pp. 407–414, Jun. 2013.

[16] C. E. Chia, "Nomadic Marginalities: The Case of Bajau Laut's Satus within States and Local Economies in Semporna, Malaysia," Central European University, 2016.

[17] J. Clifton and C. Majors, "Culture, Conservation, and Conflict: Perspectives on Marine Protection Among the Bajau of Southeast Asia," *Soc. Nat. Resour.*, vol. 25, no. 7, pp. 716–725, Jul. 2012.

[18] C. Chou, "Contesting the tenure of territoriality: The Orang Suku Laut," *Bijdr. tot Taal-, Land- en Volkenkd.*, vol. 153, no. 4, pp. 609–628, 1997.

[19] N. Stacey, G. Acciaioli, J. Clifton, and D. J. Steenbergen, "Impacts of marine protected areas on livelihoods and food security of the Bajau as an indigenous migratory people in maritime Southeast Asia," in *Marine protected areas: Interactions with fishery livelihoods and food security*, L. Westlund, A. Charles, S. M. Garcia, and J. Sanders, Eds., Rome, Italy: Food and Agriculture Organisation of the United Nations, 2017, pp. 113–126.

[20] H. Saediman *et al.*, "The contribution of home food gardening program to household food security in indonesia: A review," *WSEAS Trans. Environ. Dev.*, vol. 17, pp. 795–809, 2021.

[21] H. Saediman, J. Merlina, I. S. Rianse, S. A. A. Taridala, and R. Rosmawaty, "Economic returns and constraints of traditional fish smoking in North Buton District of Southeast Sulawesi," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 782, p. 022049, 2021.

[22] H. Saediman, R. W. Astuti, L. O. Alwi, M. Zani, and I. S. Mboe, "Comparative profitability of small-scale rice and horticultural farming in South Konawe District of Southeast Sulawesi Comparative profitability of small - scale rice and horticultural farming in South Konawe District of Southeast Sulawesi," *IOP Conf. Ser. Earth Environ. Sci.*, vol. 782, p. 022036, 2021.

[23] M. Zani, H. Saediman, S. Abdullah, L. Daud, and L. Yunus, "Determinants of household food expenditure in a cassava growing village in southeast Sulawesi," *Acad. J. Interdiscip. Stud.*, vol. 8, no. 3, pp. 302–310, 2019.

[24] E. Workie, J. Mackolil, J. Nyika, and S. Ramadas, "Deciphering the impact of COVID-19 pandemic on food security, agriculture, and livelihoods: A review of the evidence from developing countries," *Curr. Res. Environ. Sustain.*, vol. 2, p. 100014, Dec. 2020.

[25] K. Mouloudj, A. C. Bouarar, and H. Fechit, "The Impact of Covid-19 Pandemic on Food Security," *Les Cah. du Cread*, vol. 36, no. 3, pp. 159–184, 2020.