Designing effective stunting prevention strategies for coastal households in Bengkulu Province

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Abstract. Background: The 2023 Indonesian Health Survey reported a stunting prevalence of 21.5% nationwide, with Bengkulu Province at 20.2%. Although lower, this rate still indicates a significant public health concern, as a stunting prevalence exceeding 20% is alarming. Coastal households in Bengkulu Province are particularly vulnerable, requiring targeted strategies to address stunting through collaborative public action involving multiple factors, sectors, and stakeholders. Objectives: Efforts are focused on coastal areas to support at-risk populations, address economic disparities, and achieve sustainable reductions in stunting. Methods: This study used a descriptive design with a policy analysis approach, employing SWOT analysis to evaluate strategic factors. Both internal (strengths and weaknesses) and external (opportunities and threats) factors were analyzed to develop stunting prevention strategies. The research subjects consisted of data on stunting prevention in coastal households in Bengkulu Province during 2022–2023. Results: SWOT analysis positioned the strategy in Quadrant I, with a strength-weakness difference of 0.75 (x-axis) and an opportunity-threat difference of 0.203 (y-axis). This quadrant supports an aggressive or SO strategy, leveraging strengths to capitalize on opportunities. Conclusion: Collaborative partnerships, incorporating various factors, sectors, and actors, are crucial for designing and implementing effective stunting prevention strategies in the coastal households of Bengkulu Province.

1 Introduction

The 2020-2024 national health development policies and strategies are integral to the 2005-2025 RPJPK. According to the 2023 Indonesian Health Survey (IHS), the prevalence of stunting in Bengkulu Province stands at 20.2%. This statistic highlights stunting as a

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significant public health concern, as a prevalence above 20% is classified as high by public health standards. Coastal households in Bengkulu Province are particularly vulnerable and require targeted interventions in stunting prevention efforts [1]. Investments aimed at reducing stunting in Indonesia have the potential to yield up to 48 times their economic value [2]. According to the Indonesian Nutrition Status Survey 2022, the stunting prevalence in Bengkulu decreased by 2.3% compared to 2021. The *E-PPGBM (Elektronik Pencatatan dan Pelaporan Gizi Berbasis Masyarakat)* information system reports a slight reduction in stunting prevalence in Bengkulu Province, from 4.9% in 2022 to 4.8% in 2023 (Bengkulu Provincial Health Office). Although this figure appears low in comparison to the 2023 IHS data, the *E-PPGBM* data is partial and represents only a segment of the population. Therefore, the challenge of stunting prevention remains a priority, particularly in the effort to meet the national target of 12.55%. Children who experience stunting face a higher risk of significant challenges in life, including impaired physical growth and cognitive development. These challenges can lead to lower educational attainment, reduced earnings in adulthood, and an increased risk of perpetuating intergenerational poverty. Furthermore, stunting can heighten susceptibility to future infections and chronic diseases, such as hypertension and obesity, due to metabolic changes resulting from chronic malnutrition during early childhood [3].

In Bengkulu Province, stunting is influenced not only by nutritional deficiencies but also by multidimensional risk factors. Socio-economic conditions, including low family income, limited access to health facilities, and a lack of awareness about balanced nutrition, are significant contributors. Geographical conditions, such as the location of households in coastal areas, often impede access to clean water and adequate sanitation, thereby increasing the risk of recurrent infections that contribute to stunting. According to the Bengkulu Provincial Health Office (2023), stunting rates in coastal areas are higher than those in inland regions, underscoring the need for targeted interventions for this population. By examining the interplay of these risk factors, this study seeks to develop a stunting prevention strategy that extends beyond nutrition, incorporating environmental improvements and the empowerment of coastal communities. Previous research by Jiren (2020) aligns with this study, emphasizing policy approaches to achieve food security among farmers in southwest Ethiopia, focusing on smallholder development. The findings highlight clear differences in framing issues, interventions, resource ownership, and the perceived role of biodiversity [6].

The success of the National Strategy for the Acceleration of Stunting Reduction aims to decrease the prevalence of stunting among children under five by ensuring adequate nutritional intake, enhancing parenting practices, improving access to and the quality of health services, and increasing access to clean water and sanitation. In 2021, stunting reduction efforts in Bengkulu Province focused on the coastal regencies of North Bengkulu, Kaur, South Bengkulu and Seluma. These coastal areas were selected due to their high stunting prevalence, often attributed to limited access to health services, low awareness of balanced nutrition, and poorer economic conditions compared to other regions. While upland areas in Bengkulu Province also experience stunting, coastal regions face distinct challenges, including limited access to nutritious food, clean water, and proper sanitation facilities, making them more vulnerable to stunting. Research by Lusiana and Maryanto (2014) revealed that the prevalence of malnutrition among toddlers in fishing families was 80% higher compared to farming families [4]. Previous research by Capanzana et al. (2018) on coastal households in the Philippines found that the prevalence of wasting among children aged 0-60 months was 7.9% [5]. The aim of this study is to analyze strategies for designing stunting prevention programs targeting coastal households in Bengkulu Province.

2 Materials and methods

Data collection for this study spanned two months, including the preparation phase. The research informants comprised both primary and supporting participants, selected purposively to represent diverse perspectives relevant to the research objectives. The Focus Group Discussion (FGD) was held online with 90 participants, including representatives from the local government, Puskesmas, villages, community organizations, and community leaders. The second meeting took place at the respective Puskesmas, inviting key stakeholders such as the district health office, puskesmas staff, village officials, cadres, and community leaders. The informants were selected from key stakeholders involved in relevant policies, including the Bengkulu Province Food Consumption and Safety Division (related to the food security program), the Head of Health Office policy (responsible for the stunting prevention program), and village officials and leaders (focused on the role of the village head and posyandu in the community).

Information was collected through in-depth interviews and Focus Group Discussions (FGDs), utilizing a pre-validated semi-structured interview guide. All data were recorded using a digital audio device, and the interview and FGD transcripts were transcribed verbatim. For qualitative analysis, SPSS software was employed to assist in coding, categorization, and the creation of a thematic matrix. The research design was qualitative, with the analysis process involving data reduction (selecting, focusing, simplifying and transforming data from field notes). After fieldwork, the notes were expanded into detailed transcripts or expanded field notes. The data were then analyzed using content analysis to interpret the meanings behind the words and actions of the research participants, and to develop overarching concepts and theories that explain the findings in the field.

In addition to the qualitative analysis, a SWOT analysis was performed to design stunting prevention strategies. This process involved determining the weight values of the Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) matrices using the pairwise comparison method. The determination of weight values was carried out by distributing questionnaires to respondents, including members of coastal households selected through stratified random sampling. The questionnaire was designed to identify strengths, weaknesses, opportunities and threats associated with stunting prevention efforts. The results of both qualitative and quantitative analyses were combined to identify the most relevant internal and external strategies for coastal households in Bengkulu Province. The analysis process was carried out transparently to ensure the validity and reproducibility of the research results.

3 Results and discussion

The results of this study provide information from various informants, as outlined in Table I. One key point expressed by the informants regarding policies related to food security programs is:

"The government has implemented policies related to food security and stunting prevention in Bengkulu province. The program in Bengkulu City includes a stunting audit, which involves health workers such as nutritionists, pediatricians, and health center staff. Toddlers undergoing stunting audits benefit from cross-sector collaboration aimed at improving their health and nutritional status" (Informant 1)

"Inter-agency collaboration is crucial for effective stunting prevention programs. Local governments partner with various stakeholders, including the private sector and community

organizations, to enhance food security and ensure the distribution of nutritious food to families in need" (Informant 2)

"In Bengkulu, the government's policy to combat stunting emphasizes community empowerment, particularly targeting pregnant women and children under five. Existing programs focus on educating the public about the importance of balanced nutrition and promoting regular health checks to prevent stunting" (Informant 3)

The information gathered from informants regarding policies implemented by the government in addressing stunting highlights the following aspects related to the food security program.

Table 1. List of key informants

Informant	Type of Information Collected
Food Security Agency (BKP) of Bengkulu Province and BKP of Bengkulu City as well as Central Bengkulu, North Bengkulu, South Bengkulu, Muko-muko, Seluma and Kaur Regencies	Policies related to food security programs
Heads of the Provincial Health Office and Health Offices of Bengkulu City and Central Bengkulu, North Bengkulu, South Bengkulu, Muko-muko, Seluma and Kaur Regencies.	Policies related to stunting prevention programs
Village officials and leaders	The institutional role of the village head and puskesmas in village stunting prevention

Stunting prevention strategies in coastal areas must take into account the unique local culture and dietary habits, which may differ from those in non-coastal areas. An effective approach would be to integrate locally preferred healthy foods, aligning with regional dietary customs. The diversity of local foods in the coastal areas of Bengkulu presents a valuable opportunity for stunting prevention and management. For example, Bengkulu's coastal regions have access to a wide variety of fish and fishery products, which can play a key role in the prevention and treatment of stunting. Fish is rich in protein, omega-3 fatty acids, and other essential nutrients necessary for children's growth and development. Regular consumption of fish can significantly help prevent stunting. Additionally, bananas are rich in potassium, fiber, and various vitamins, making them a great source of energy. They also aid in digestion and contribute to overall health. The availability of local bananas in this area can be utilized as complementary food for children. Green vegetables such as kale, spinach, and cassava leaves are rich in iron, calcium, and vitamin A. Deficiencies in iron and vitamin A are known to contribute to stunting, making these vegetables important in stunting prevention. Regular consumption of green vegetables can help prevent nutritional deficiencies in children. Pulses such as green beans and soybeans, along with grains like corn, serve as an essential source of plant-based protein for growing children. Nuts are also rich in iron and fiber. Additionally, fruits such as durian, rambutan, and local mangoes are packed with vitamin C and other vital nutrients that support the immune system in children. Cassava and sweet potatoes are rich in complex carbohydrates, fiber, and vitamin A. Carbohydrates serve as the primary source of energy, while vitamin A plays a crucial role in the growth and development of children's eyes. Dairy products, such as local cow's milk, cheese, or yoghurt, are excellent sources of calcium and protein. Calcium is essential for the development of children's bones and teeth. Soy is an excellent source of plant-based protein, and soy products such as tempeh and tofu also provide iron and calcium. To address stunting, it is crucial to promote a balanced and diverse diet while ensuring access to nutrient-rich local foods. Educating the community about the importance of healthy diets and utilizing local food

diversity can significantly contribute to stunting prevention and management in Bengkulu's coastal areas. The SWOT analysis in this study places the strategy within the aggressive quadrant, leveraging strengths such as trained human resources and robust government support [7]. Stunting prevention efforts encompass counseling, enhanced access to health facilities, and nutrition education. Opportunities provided by central government programs can be leveraged to expand health services [8]. However, challenges such as climate change and social conflict must be addressed through food diversification initiatives and inclusive mitigation strategies [9].

Table 2. Results of IFE and EFE matrix planning and prevention of stunting of coastal families in Bengkulu Province

No	Factors identified	Weight	Average rating	Score
Strength				
1	Trained human resources	0.09	3.50	0.32
	Community potential	0.08	3.40	0.27
	Local food diversity	0.10	3.70	0.26
	Local government support	0.10	3.60	0.29
	Natural resources	0.09	3.30	0.30
	Active non-governmental organisations	0.09	3.20	0.29
	Sub total			1.72
Weakness				
2	Limited access to health care	0.09	2.80	0.25
	Low nutrition and sanitation education	0.09	2.60	0.23
	Lack of knowledge of a balanced diet	0.08	2.50	0.23
	Lack of understanding about the importance of stunting prevention	0.11	2.50	0.28
		0.24	5.30	0.99
	Total		50	2.71
	Difference (Strength - Weakness)			0.73
Opportunity				
3	Central government programmes that support stunting prevention	0.10	3.80	0.38
	Grant funding or support from international organisations	0.06	2.30	0.14
	Grant funding or support from international organisations	0.06	2.30	0.14
	Improved access to health care	0.12	3.80	0.46
	Increased public awareness on nutrition and health	0.10	3.40	0.34
	Sub total			1.31
Threat				
4	Climate change threats affecting food availability	0.07	2.70	0.19
	Natural disasters	0.09	2.80	0.25
	Social conflict	0.12	3.70	0.44
	Changes in government policies that do not support stunting prevention	0.09	2.50	0.23
	Sub total			1.11
	Total	1	50	2.51
	Difference (Opportunity - Threat)			0.20

The results diagram based on the IFE matrix and EFE matrix is as follows:

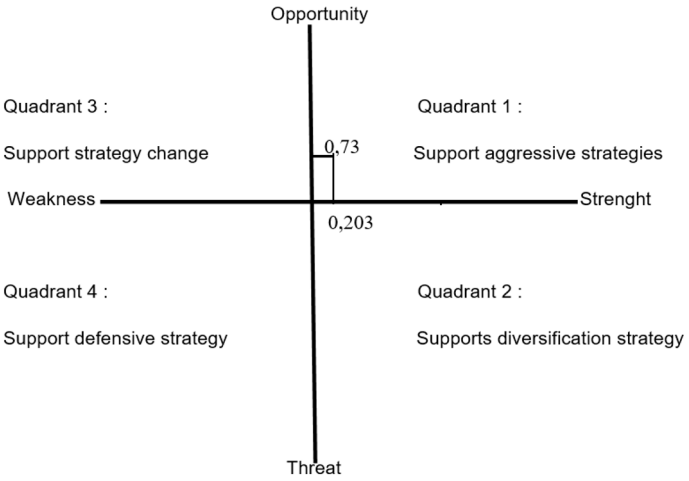

Fig. 1. SWOT Diagram Results

The table below outlines various strategies for planning and preventing stunting in the coastal areas of Bengkulu Province. These strategies aim to address the root causes of stunting through a comprehensive and community-centered approach. The results of the SWOT diagram indicate that the planning and prevention of stunting among coastal families fall into the SO quadrant, suggesting a favorable situation for coastal households in Bengkulu. This positioning highlights the presence of both strengths and opportunities that can be leveraged effectively. The recommended strategy is to implement aggressive growth policies, which include integration strategies such as backward, forward, and horizontal integration. A strategic marketing analysis indicates a strength-weakness difference of 0.75 on the x-axis and an opportunity-threat difference of 0.203 on the y-axis. This places the strategy in quadrant I, supporting an aggressive or SO (Strengths-Opportunities) approach. Based on the SWOT analysis table above, the SO strategy, positioned in quadrant I (aggressive), is the recommended approach. The strategies derived from the SWOT diagram will be integrated to formulate suitable alternative strategies through the use of a SWOT matrix.

Table 3. Solutions strategy for planning and prevention of stunting in coastal Bengkulu Province

No	Aspect analysis	Strategy
1	Utilize existing strengths and opportunities to overcome weaknesses and face threats.	a. Establish health facilities closer to coastal communities and areas with limited access Community education and awareness b. Improved nutrition education c. Improved Sanitation and Environmental Hygiene. d. Improved Monitoring of Toddler Growth e. Food and Nutrition Program Support f. Collaboration with International Organizations and NGOs g. Program evaluation and monitoring
2	Strategic efforts to overcome internal factors that are weaknesses	a. Improved access to health services b. Improved nutrition and sanitation education c. Promotion of a balanced diet

No	Aspect analysis	Strategy
		d. Understanding the importance of stunting prevention e. Increased cooperation between stakeholders f. Community empowerment g. Monitoring and evaluation
3	Strategic efforts to capitalize on opportunities from external factors	a. Strengthening central government programs that support stunting prevention b. Optimizing grants or support from international institutions c. Improving access to health services d. Increased public awareness on nutrition and health e. Collaboration with Non-Governmental Organizations (NGOs) and Non-Governmental Organizations (NGOs) f. Strengthening the monitoring and evaluation system g. Stunting prevention requires a comprehensive and integrated approach, involving various parties, including the government, communities, NGOs, and international organizations.
4	External factors that pose a threat	a. Adaptation Policy b. Natural Disaster Early Warning System c. Natural disaster early warning system development d. Improvement of Disaster Preparedness e. Policy Advocacy f. Health System Strengthening g. Education and Counseling h. Strengthening Partnerships

Strategic recommendations can be developed as follows:
a. Integrated Program: Implement an integrated approach combining nutrition education, improved health access, and active community participation, with sensitivity to the local cultural context of coastal areas.
b. Partnership and Coordination: Strengthen collaboration among government agencies, NGOs, and local communities to optimize the use of available resources effectively.
c. Improved Health Infrastructure: Increase investment in health infrastructure in coastal areas to ensure accessible and quality healthcare facilities.
d. Education and Outreach: Launch nutrition and health education programs utilizing local media and trained extension workers to enhance community awareness.
e. Monitoring and Evaluation: Establish regular monitoring and evaluation mechanisms to assess program effectiveness and implement necessary improvements.
f. Risk Mitigation: Formulate strategies to address climate change and natural disasters that could impact food availability and stunting prevention efforts.

In interpreting the results, it is crucial to acknowledge that the proposed strategies must be tailored to address practical challenges in the field, including resource limitations and the sustainability of programs. Furthermore, the findings of this study should be validated through additional surveys with broader coverage to ensure representativeness and

generalizability. Collaboration with the private sector and civil society must be further expanded to enhance interventions, particularly in improving access to health services and delivering nutrition education in coastal areas. By evaluating strengths, weaknesses, opportunities, and threats, this study lays the groundwork for developing more effective and sustainable strategies to reduce stunting prevalence in these regions.

4 Conclusion

This design can be implemented through cooperation and coordination between the government, relevant institutions, and community participation. It also requires the development of nutrition education and counseling. Following this, specific nutrition intervention programs should be intensified, supported by synergy from stakeholders and across sectors.

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