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STUNFISH EXPLORATORY STUDY (STUNTING PREVENTION THROUGH FISH DIVERSIFICATION): COASTAL COMMUNITIES' EXPECTATIONS OF THE STUNFISH STRATEGY

Studi Eksplorasi Stunfish (Stunting Prevention Through Fish Diversification): Ekspektasi Masyarakat Pesisir Terhadap Strategi Stunfish

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ABSTRACT

Exploring the STUNFISH strategy is an important integrated effort to optimize stunting prevention. The urgency of this research lies in the importance of exploring the conceptual STUNFISH strategy in improving access to quality food, which is integrated with coastal communities in utilizing local fishery products. This, in turn, can help prevent stunting. This study aims to explore community expectations of the STUNFISH (Stunting Prevention through Fish Diversification) strategy as an approach to stunting prevention based on the diversification of processed fishery products. The research method uses a concurrent mixed method design with a triangulation strategy, in which quantitative and qualitative data are collected simultaneously. The research sample consisted of 96 respondents from the coastal communities of Jeneponto Regency, who were determined using simple random sampling based on the Lemeshow formula. The results showed that the majority of respondents, consisting of pregnant women, nursing mothers, and mothers of toddlers, responded positively ("agree" and "strongly agree") to the ten STUNFISH strategies. The strategies with the highest level of support included diversification of nutritious fishery products, promotion of local foods, marketing campaigns, development of fish processing skills, and MSME entrepreneurship assistance. These results show positive acceptance and high expectations from the community towards the stunting prevention program based on processed fishery products. The integration of increased nutritional intake with local economic development makes STUNFISH a comprehensive and adaptive intervention model in efforts to reduce the prevalence of stunting.

Keywords: Community Expectations, Fisheries Diversification, Stunfish, Stunting

ABSTRAK

Eksplorasi strategi STUNFISH menjadi menjadi upaya penting yang terintegrasi sebagai bentuk optimalisasi dalam upaya pencegahan stunting. Urgensi penelitian ini terletak pada pentingnya mengeksplorasi strategi konseptual STUNFISH dalam meningkatkan akses terhadap makanan berkualitas, yang terintegrasi dengan masyarakat pesisir dalam

memanfaatkan produk perikanan lokal. Sehingga pada gilirannya dapat membantu dalam pencegahan stunting. Penelitian ini bertujuan mengeksplorasi ekspektasi masyarakat terhadap strategi STUNFISH (Stunting Prevention through Fish Diversification) sebagai pendekatan pencegahan stunting berbasis diversifikasi produk olahan perikanan. Metode penelitian menggunakan desain concurrent mixed method dengan strategi triangulation, di mana data kuantitatif dan kualitatif dikumpulkan secara bersamaan. Sampel penelitian berjumlah 96 responden masyarakat pesisir Kabupaten Jeneponto yang ditentukan dengan teknik simple random sampling berdasarkan rumus Lemeshow. Hasil penelitian menunjukkan bahwa mayoritas responden, yang terdiri dari ibu hamil, ibu menyusui, dan ibu balita, memberikan tanggapan positif ("setuju" dan "sangat setuju") terhadap sepuluh strategi STUNFISH. Strategi dengan tingkat dukungan tertinggi meliputi diversifikasi produk perikanan bergizi, promosi pangan lokal, kampanye pemasaran, pengembangan keterampilan pengolahan ikan, serta pendampingan kewirausahaan UMKM. Hasil ini memperlihatkan adanya penerimaan positif sekaligus harapan besar masyarakat terhadap program pencegahan stunting berbasis produk olahan perikanan. Integrasi antara peningkatan asupan gizi dengan pengembangan ekonomi lokal menjadikan STUNFISH sebagai model intervensi komprehensif dan adaptif dalam upaya menurunkan prevalensi stunting.

Kata Kunci: Diversifikasi Perikanan, Ekspektasi Masyarakat, Stunfish, Stunting

INTRODUCTION

Based on data from the *Tim Percepatan Penurunan Angka Stunting Provinsi Sulawesi Selatan* report, the prevalence rate in South Sulawesi was recorded at 27.53%, with certain coastal areas exhibiting stunting rates above 30%, namely Jeneponto Regency (36.3%), Takalar Regency (31.3%), and Maros and Pangkep Regencies (30.1%) (Bintang *et al.*, 2024). These figures are considerably higher than the national average, highlighting the urgency of addressing this issue.

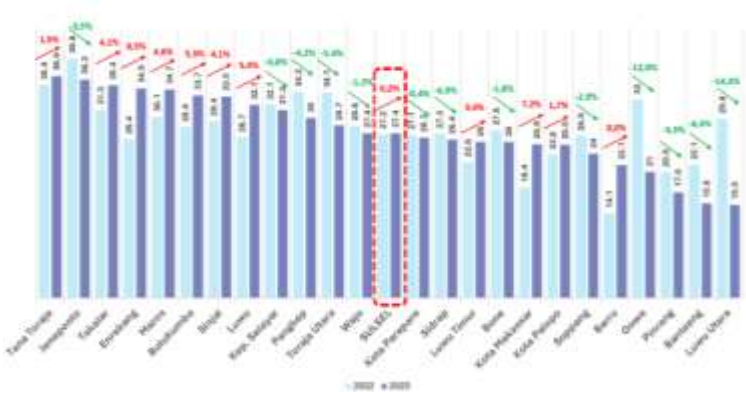


Figure 1. Stunting Prevalence Data in South Sulawesi Province 2022-2023

Coastal areas possess local potential in the form of various types of fish, which can be utilized to meet the demand for animal protein from fish (Nide & Yusran, 2023). Efforts to increase fish consumption offer numerous benefits (Rasdi & Muslimin, 2024), not only enhancing cognitive development but also boosting the fisheries industry (A. Aisyah *et al.*, 2025; Latief *et al.*, 2024). In reality, although coastal regions are rich in fisheries resources and largely dependent on the fisheries sector, the majority of the population lives in poverty (Hasmyati *et al.*, 2025), faces limited employment options, and generally exhibits low levels of education (Saleh *et al.*, 2025). This situation often restricts access to nutritious foods, particularly in the utilization of local food resources (Askar *et al.*, 2024a).

Previous research conducted by Askar *et al.* (2024) titled *STUNFISH (Stunting Prevention through Fish Diversification): Strategi Adaptasi Diversifikasi Olahan Perikanan dalam Upaya Pencegahan Stunting, Perspektif Sosial Ekonomi*explained that to address stunting issues in coastal areas, a strategy named STUNFISH was formulated (Askar *et al.*, 2024b). This strategy presents an innovative approach that leverages diversification of fish-based products as a means to utilize local food resources in coastal regions to prevent stunting.

As an innovative step, this study explores the STUNFISH strategy in achieving a holistic impact. The research plays a crucial role prior to the policy implementation of the STUNFISH strategy for stunting prevention, as it provides in-depth insights into the needs, hopes, and expectations of communities regarding the strategy. One innovative approach that has gained increasing attention is the use of fisheries resources in stunting prevention, as proposed in the STUNFISH strategy (Askar, 2025; Askar *et al.*, 2024b, 2024a). The STUNFISH strategy offers an innovative framework that leverages the diversification of fish-based products as a solution to improve community nutrition and prevent stunting (Askar *et al.*, 2024a). STUNFISH emphasizes the utilization of local fish and fishery products as sources of nutrients to enhance child health and growth, particularly in coastal communities.

The urgency of this research lies in harnessing the potential of local fisheries resources in coastal areas, offering an innovative and sustainable solution to improve community nutritional intake. However, to ensure the successful implementation of the STUNFISH strategy, it is essential to understand community expectations regarding the strategy as proposed in previous studies.

METHODS

The selection of the research location was based on stunting prevalence data at the provincial level across South Sulawesi. Jeneponto Regency is one of the coastal regencies in South Sulawesi with the highest stunting prevalence, recorded at 36.3% (Bintang et al., 2024; Wardyah, 2023).

The researcher targeted the coastal communities of Jeneponto Regency as the study population. This research is relevant to numerous intervention programs designed to address stunting in coastal communities. The exact population size was unknown; therefore, the sampling technique employed was Simple Random Sampling (Thasim & Anggraeny, 2023) using the Lemeshow formula (Nattino et al., 2020; Asfiya et al., 2021) with a 95% confidence level and a 10% margin of error (Caniago & Rustanto, 2022), resulting in a research sample of 96 coastal community members.

Data collection in this study utilized a Likert-scale questionnaire to obtain information from respondents through written questions or statements. A series of questions or statements were developed, asking respondents to indicate their level of agreement or opinion on a graded scale; in this study, a 4-point scale was used ranging from "Strongly Agree" to "Strongly Disagree."

The research employed a survey method using a mixed-methods design with a concurrent mixed-methods approach (Sanggelorang et al., 2022). Through a concurrent triangulation approach, quantitative and qualitative data were collected and analyzed simultaneously to verify findings against each other (Yohannes et al., 2023), allowing the identification of data that could be combined or differentiated (Azhari et al., 2023).

Figure 2 illustrates the Concurrent Triangulation Strategy Model, which represents a data collection strategy within the concurrent mixed-methods approach (Azhari *et al.*, 2023).

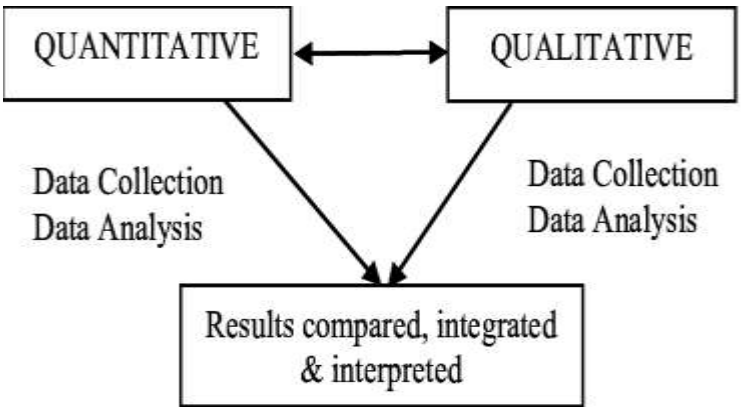


Figure 2. Data Collection Method

RESULTS

Stunting can be prevented through approaches that involve coastal communities and utilize local resources, particularly processed fishery products. Policies focused on education, product diversification, and increased accessibility will significantly reduce stunting rates in coastal areas. Table 1 displays data from the Stunfish strategy (Askar *et al*., 2024b):

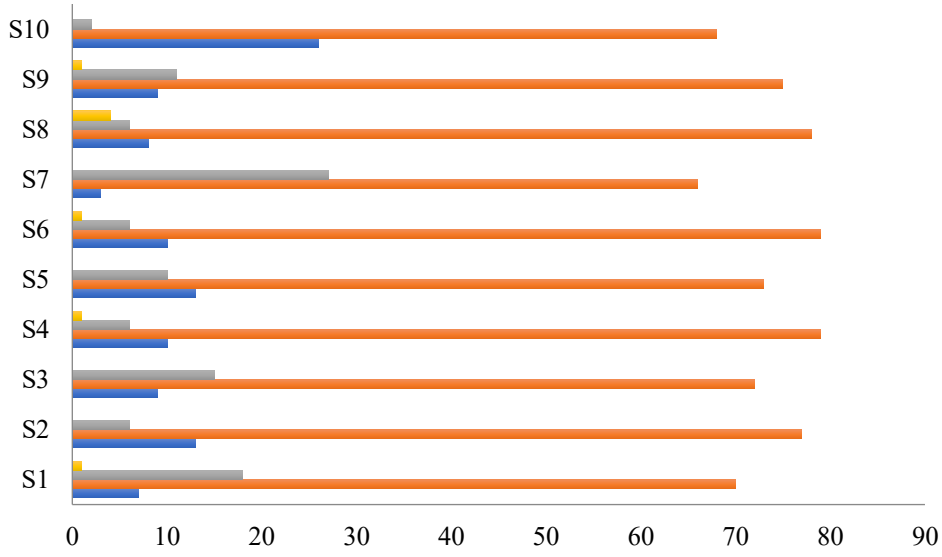
Table 1. Stunfish Strategy

Strategy 1	Optimize the utilization of resources through education and training by developing nutrition education programs that leverage local knowledge in fish processing to raise awareness of the importance of consuming fishery products in stunting prevention.
Strategy 2	Diversify fishery products to promote innovative, appealing, and nutritious offerings through coastal fish processing groups with synergistic partnership programs.
Strategy 3	Establish collaboration with various stakeholders, including government, private sector, educational implementers, and community organizations, to support stunting prevention programs and the development of the fishery industry.
Strategy 4	Promote locally processed food products as healthy and nutritious choices through the transformation of MSME and household industry products.
Strategy 5	Expand networks by engaging local communities, particularly fish processing industry groups, to maximize the distribution of healthy and high-quality diversified fishery products.
Strategy 6	Conduct marketing campaigns to promote and introduce diversified fishery products as a nutritious food alternative for stunting prevention in coastal areas.
Strategy 7	Increase public access to information on nutrition and health through local media and extension programs.
Strategy 8	Develop human resource skills through regular training sessions to enhance product competitiveness (technology transfer) in utilizing local food or fishery resources.
Strategy 9	Transform fishery-based products produced by local fish processing groups or MSMEs through entrepreneurship mentoring to create value-added and nutritious diversified fishery products.
Strategy 10	Establish social programs that provide direct assistance to families at risk of stunting to ensure they have access to nutritious food.

Data source: Research by Askar *et al.* (2024) (Askar *et al*., 2024)

Based on this strategy, prioritizing community expectations and hopes for the STUNFISH strategy not only provides insight into the proposed strategy's effectiveness but also identifies the challenges and opportunities faced by communities in adopting this approach. Therefore, it is important to understand community expectations and views regarding the strategies proposed in previous research.

The following assessment of coastal community perceptions regarding expectations and hopes for the stunfish strategy is presented in Figure 3.



	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Strongly Disagree	1	0	0	1	0	1	0	4	1	0
Disagree	18	6	15	6	10	6	27	6	11	2
Agree	70	77	72	79	73	79	66	78	75	68
Strongly Agree	7	13	9	10	13	10	3	8	9	26

Figure 3. Pregnant Women's Perceptions Regarding Expectations and Hopes for the Stunfish Strategy

Based on the graph, it can be seen that in the ten STUNFISH strategies (S1–S10), it shows that the majority of respondents from the three groups of mothers (Pregnant Mothers, Breastfeeding Mothers, Toddler Mothers) gave the response “agree” to the ten STUNFISH strategies, with small variations in the categories of “strongly agree” and “disagree”. This shows that in general there is positive acceptance and high expectations from the mother group towards the stunting prevention program based on fishery product diversification in coastal areas.

DISCUSSION

Based on the graph in Figure 3, it can be observed that for the ten STUNFISH strategies (S1–S10), the majority of respondents across the three groups of mothers (Pregnant Mothers, Lactating Mothers, Mothers of Toddlers) provided “agree” responses for all ten STUNFISH strategies, with minor variations in the “strongly agree” and “disagree” categories. This indicates a positive reception and high expectations from the mothers’ groups regarding the stunting prevention program based on the diversification of fishery products in coastal areas.

For Strategy 1 (nutrition education and training based on local wisdom), the majority of respondents agreed (70 respondents), with an expectation and hope percentage of 72.92%,

indicating that this strategy is highly relevant. Data in Figure 3 show that most respondents, whether pregnant mothers, lactating mothers, or mothers of toddlers, answered "agree" or "strongly agree" regarding the importance of nutrition education integrating local wisdom. This demonstrates that the mothers' group is highly aware of the necessity for nutrition knowledge relevant to daily life. Pregnant mothers emphasize the importance of education during the first 1,000 days of life (Putri et al., 2023). Their expectations align with research showing that nutrition education can increase the consumption of animal protein during pregnancy and the first 1,000 days (Rasdi & Muslimin, 2024; Saha et al., 2024). Meanwhile, lactating mothers require practical guidance on balanced dietary patterns to support lactation (Widiastuti & Putri, 2023). Mothers of toddlers desire education focused on fish-based complementary foods (MP-ASI) to facilitate acceptance of animal protein by children (Kusakabe & Sereyvath, 2014). Fish nutrition supports child growth, and mothers also creatively incorporate fish into MP-ASI. Introducing various fish preparations attracts toddlers and enhances their appetite. Compared to monotonous foods commonly served at home, providing diversified meals prevents boredom.

Research by Askar et al. (2024a) indicates that health education programs are a necessary initial step for stunting prevention in coastal areas, targeting mothers and families at risk of stunting. Additionally, workshops on optimal processing and utilization of fishery products as alternative nutritious foods are required (Junaidi et al., 2024). According to Muchtar et al. (2025), nutrition education through posyandu with contextual materials improves child feeding practices. Nugraheni (2024) further confirms the effectiveness of nutrition education in reducing stunting-risk behaviors.

Strategy 2 (diversification of nutritious fishery products) recorded 77 respondents agreeing. The majority agreed that diversification of fish products, such as nuggets, floss, meatballs, and fish chips, is a crucial strategy for stunting prevention. Fish serves as a protein source essential for the body due to its content of essential amino acids (Muchtar & Hastian, 2023). The role of fish in enhancing dietary quality is highly significant. This marine commodity functions as a primary source of essential fatty acids, particularly omega-3 and omega-6, critical for maintaining human health. Additionally, fish contain valuable long-chain polyunsaturated fatty acids that contribute to overall nutritional quality (Funge-Smith & Bennett, 2019). Considering the high prevalence of stunting, prevention efforts should focus on increasing consumption of highly nutritious foods, especially protein-rich and energy-dense sources. For instance, utilizing fish-derived protein concentrates as alternative quality nutrition sources is recommended (Muslimin et al., 2024). Policies supporting the availability of food based on marine resources play a strategic role in improving community consumption patterns. These efforts contribute significantly to nutritional intake and ultimately have a positive impact on reducing child mortality (Byrd et al., 2021). However, limited knowledge and experience in preparing various fish dishes may result in children becoming bored of fish. From a nutrition science perspective, food diversification plays a vital role in meeting daily nutrient requirements. Introducing diverse food types from an early age broadens children's experiences with different textures, flavors, and aromas, supporting optimal growth and development (Nirmala & Octavia, 2022). Lack of knowledge regarding healthy and nutritious food preparation often leads parents to provide meals without considering their nutritional content. However, with guidance, MSMEs and household industries are encouraged to develop new products (Latief et al., 2024) that are high in nutrition. Awareness of marine resource potential can foster children's interest in consuming seafood as a primary protein source, which is a crucial strategy for optimizing nutrient utilization from aquatic resources.

Strategy 3 recorded 72 respondents agreeing (75.00%), reflecting expectations and hopes of coastal communities for support from government, private sector, and society in stunting prevention through fishery product utilization as illustrated in Figure 3. Respondents

anticipated cross-sectoral collaboration, including government, health workers, MSMEs, and community organizations. Pregnant mothers highlighted the importance of local government support in providing educational facilities and posyandu services. Lactating mothers expected involvement of MSMEs and private sector to expand fish product access. Mothers of toddlers emphasized collaboration between schools, posyandu, and MSMEs to ensure consistent availability of healthy food. The multisectoral approach concept (Ansell & Gash, 2008) emphasizes that the success of public health programs is determined by partnerships among actors (government, private sector, community) (Ansell & Gash, 2008). This expectation is relevant as stunting prevention requires synergy between health, fisheries, education, and MSME sectors (Jumino & Sartika, 2025). Research by Sukmawati et al.(2025) affirms that involvement of health cadres, local government, and MSMEs strengthens early detection of stunting and community-based interventions.

Promotion of local food products received strong support from the three mother groups in Strategy 4, shown in Figure 1. Strategy 4 demonstrated high support (79 mothers agreed), indicating the desire for local fish products to be positioned as healthy and nutritious foods. Pregnant mothers expect promotion to emphasize fish nutritional value for fetal development, while lactating mothers and mothers of toddlers stress the ease of access to healthy and appealing processed products. This shows that promotion is not merely advertising but must deliver a clear health message.

According to Salma et al. (2021) in the book Potret Masyarakat Pesisir: Konsep Inovasi Gizi & Kesehatan, promotion emphasizing health benefits is more effective in changing consumption behavior than mere commercial promotion. This expectation also highlights the need for MSME transformation so that products meet nutritional and food safety standards (Askar, 2025; Latief et al., 2024). For STUNFISH strategies, promotion should be packaged as nutrition-informative, such as simple labels on products, campaigns at posyandu, social media, and schools. Promotional messages should emphasize health benefits rather than just taste to more convincingly influence consumers.

Strategy 5 (expansion of nutritious fish product distribution networks) showed 73 respondents agreeing (76.04%). Distribution strategy received relatively lower support compared to other strategies, with some respondents disagreeing (Figure 1). Mothers of toddlers expressed concern because nutritious products are often unavailable nearby. Lactating mothers highlighted price and affordability, while pregnant mothers stressed product availability when needed. This indicates doubts about the effectiveness of fish product distribution in coastal areas, influenced by infrastructure limitations and market access. Food distribution in coastal regions often faces challenges related to infrastructure, cold chain, and market limitations (Subramaniam et al., 2023). Coastal community expectations indicate the need for a more equitable and affordable distribution system supported by abundant local fishery resources in Jeneponto Regency.

Strategy S6 (marketing campaign for diversified fishery products) received high agreement (79 respondents agreed, 82.29%) with additional support from 10 respondents strongly agreeing. This demonstrates that pregnant mothers have strong expectations for promotion that can raise family awareness about the importance of fish consumption in stunting prevention. Social media and posyandu-based campaigns improve community nutrition literacy. The importance of adaptive, data-driven digital communication strategies for promoting healthy and sustainable food consumption is emphasized (S. Aisyah et al., 2024; Wibowo & Kartikawati, 2025). Luo et al. (2024) affirm that social campaigns raise awareness, though integration with face-to-face approaches is needed for long-term impact.

Strategy 7 (nutrition information access) displayed different dynamics. Figure 3 shows S7 as divided, with 66 respondents agreeing and 27 disagreeing. This signals gaps in information or low nutrition literacy. Coastal community expectations include more

comprehensible, affordable, and consistent counseling. Askar et al. (2024a) indicate that groups with limited education struggle to access adequate health information. Data from this study suggest enhancing stunting education, particularly for pregnant and lactating mothers, who may require different approaches to reach all groups for effective stunting prevention in coastal areas. Lack of community knowledge about stunting leads many parents to be unaware of necessary steps from early pregnancy to birth (Askar, 2025; Askar et al., 2024a; Thasim & Anggraeny, 2023). Health education is a vital means to increase mothers' understanding of stunting prevention (Nurjanah & Sukoco, 2023).

Strategy 8 (Skills Development through Fish Product Processing Training) showed that the majority of respondents (pregnant, lactating, and toddler mothers) answered "agree" with some "strongly agree" for S8 (Figure 3). The largest composition was in the "agree" category (~78 respondents), indicating that mothers perceive training and skill development as highly relevant and necessary to support the STUNFISH program. Pregnant and lactating mothers consider this important for maintaining family nutrition quality, while mothers of toddlers view it as ensuring ready-to-eat products are diverse with highly nutritious fish-based preparations. Training or extension programs aimed at enhancing skills in preparing modern fish-based meals while maintaining nutritional value require active participation from coastal communities, particularly mothers (Askar et al., 2024b; Prameswari et al., 2019; Rosalina et al., 2023).

These findings align with research by Askar et al. (2022), Oka et al. (2017), and Rahman & Mustafa (2023), emphasizing that individual skill improvement correlates with household productivity and welfare. In stunting prevention, fish processing training helps families access nutritious products hygienically, appealingly, and aligned with children's preferences. Studies by Lailiyah et al. (2023) and Yorita et al. (2023) confirm that fish processing into ready-to-eat products enhances the competitiveness of coastal MSMEs and broadens distribution of nutritious foods, making them more accessible to households at risk of stunting.

For Strategy 9, data in Figure 3 indicate that the majority of respondents across all mother groups agreed with entrepreneurship mentoring for fish-processing MSMEs. This strategy shows that coastal communities place high expectations on comprehensive entrepreneurship support for MSMEs producing fishery products. Consistent support across the three groups indicates awareness that fish processing enterprises can provide nutritious foods accessible to at-risk households. Research by Wibowo & Kartikawati (2025), Latief et al. (2024), Wardana et al. (2024), and Wulandari et al. (2023) demonstrate that MSME mentoring in fisheries improves product quality, expands market access, and strengthens small businesses amid competition. Abdullah et al. (2022) also confirm that integrating fish processing technology transfer with business mentoring enables coastal MSMEs to produce competitive processed products. Respondents perceive mentoring as a long-term investment for business sustainability and family nutrition improvement.

Expectations and hopes from coastal communities indicate that STUNFISH programs need to emphasize comprehensive MSME mentoring, including business management, capital access, product legality, and digital marketing technology utilization. For pregnant and lactating mothers, strong MSMEs ensure availability of diverse, nutritious fish products. For mothers of toddlers, fish-based products produced through MSME mentoring offer healthy alternatives aligned with children's preferences. Therefore, MSME mentoring strategies address nutritional needs for stunting prevention while fostering economic self-reliance among coastal households. Successful implementation can produce dual benefits: increased consumption of nutritious fish-based foods and strengthened sustainable local economies.

Expectations and hopes of coastal communities, particularly mothers, for Strategy 10 (nutritious social assistance) in Figure 3 indicate that the majority of respondents across

pregnant, lactating, and toddler mother groups agreed with the social assistance strategy offered by STUNFISH. The "agree" response dominated nearly all respondents (70.83%, 68 respondents), followed by a smaller number who "strongly agreed" (26 respondents, 27.08%). This strategy demonstrates that coastal communities perceive social assistance programs providing nutritious foods as one of the most realistic and immediately beneficial strategies. Food aid programs not only bridge nutrition access gaps for impoverished families but also serve as policy instruments to protect children during the critical first 1,000 days of life. This aligns with initiatives under the national stunting reduction program, such as the Free Nutritious Meals Program led by President Prabowo, aimed at providing access to nutritious foods, particularly for children vulnerable to stunting.

According to Sunarya (2023), nutritious food assistance significantly impacts reducing stunting prevalence in Indonesia, particularly among pregnant women and toddlers. This reinforces that respondents' support for Strategy 10 reflects not only short-term needs but also awareness that assistance should be accompanied by improved nutrition literacy. Hence, fish-based healthy food assistance programs are not merely temporary solutions but also mechanisms to strengthen the health quality of future generations. This strategy offers sustainable hope for communities at risk of stunting when integrated with the empowerment of local fishery MSMEs, ensuring processed fish products become part of the aid package. Such integration extends benefits beyond family nutrition fulfillment, simultaneously boosting the coastal fishery processing economy.

CONCLUSION

Based on the research results shown through the respondent perception graph, it can be concluded that the majority of pregnant women, breastfeeding mothers, and mothers of toddlers gave a "agree" response to the ten STUNFISH strategies (S1–S10). The strategy of diversifying nutritious fishery products (S2), promoting local processed food products (S4), (S6) Marketing campaigns for diversified fishery products, fish processing skills training (S8), and entrepreneurship assistance for MSMEs. Diversified fishery products (S9) obtained the highest level of agreement with more than 70 respondents stating they agreed. This indicates a positive acceptance and coastal communities have high hopes that this approach can be a real solution in efforts to prevent stunting in coastal communities through the utilization of fishery-based food potential and diversification of fishery products. Thus, it can be concluded that the STUNFISH strategy is not only relevant as a nutritional intervention, but also has the potential to be an instrument for strengthening the coastal household economy. The integration between fulfilling children's nutrition with community empowerment shows that STUNFISH is a comprehensive, adaptive intervention model, and in line with the real needs of coastal communities in reducing the prevalence of stunting.

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