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Article

Regulation of household food needs: Affirmation of socio-cultural resilience in preventing stunting incidents in coastal areas

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Abstract: The problem of stunting is not only related to children's short height, but also has an impact on high morbidity rates, due to long-term nutritional deficiencies. which hinders motor and mental development in children. The objectives of this research are: 1) to understand household food security, 2) to understand the eating habits of pregnant women and toddlers regarding existing belief systems and traditions, and 3) to understand resilience mechanisms in overcoming food emergencies to prevent stunting. The data collection process uses a mixed methods approach by combining qualitative and quantitative research. The research results show that the determining factor for the incidence of stunting in coastal areas of Indonesia is the lack of household food availability due to subsistence economic life which then has an impact on eating behavior in the household, namely the lack of quality and quantity of the types of food consumed. daily. Apart from that, there is still a lack of understanding by pregnant women regarding the importance of providing complementary breast milk food to toddlers, low literacy of food diversity among toddlers, and low public trust in the importance of immunization. Furthermore, the high rate of early marriage in society and the limited awareness of using clean water is caused by a philosophy that still considers rivers as a source of life, so the water is used for consumption. Apart from that, socio-cultural mechanisms as a strategy to resolve the problem of food shortages have not yet been implemented.

Keywords: stunting; subsistence; socio-cultural; mechanisms; prevention; eating behavior

1. Introduction

Indonesia is known to be rich in natural resources, both on land and at sea (Judijanto et al., 2023). The land is vast and fertile, with a variety of vegetables, fruits, and tubers that can grow and develop. The abundant marine products, consisting of various marine biotas, can be utilized and consumed by the community to meet daily living needs. The diversity of natural resources should be able to meet the food needs of the Indonesian population. In reality, many people still cannot meet their family's food needs, so nutritional requirements are not fulfilled (Klemm et al., 2022).

At present, food availability is no longer viewed on a national scale (Nasikh et al., 2021), but must be considered at the micro-level, namely the household. This means the family's ability to meet the food needs of every individual, in terms of quantity, quality, and diversity of food according to local culture. The Food and

Agriculture Organization (FAO) implements household food security based on the household's ability to access food to meet the required nutrition (Mehraban and Ickowitz, 2021).

A household's ability to meet its food needs is closely related to the family's economic condition. The higher the household's economic level, the easier it is to meet its food needs. Conversely, households with a low economic level will have difficulty and limited access to their food needs. The inability of families to meet their basic needs in terms of food is caused by society being trapped in poverty (Fatmah and Nurasiah, 2010).

Unfortunately, in coastal areas rich in fishing resources where most of the population works as fishermen, pockets of poverty often exist (White et al., 2022). Communities living in coastal areas are the most suffering, with levels of welfare far below those of people with other livelihoods. To meet their daily needs, they seek other jobs outside of fishing and even to survive, they must incur debts to capitalists or banks (Karnik and Peterson, 2023). Conditions like these affect the access to meet family food needs, leading to unmet nutritional needs and resulting in malnutrition and stunting (Sitaresmi et al., 2023).

Stunting is when a child is shorter than usual based on age and gender (Sadler et al., 2022). Measuring height is a type of anthropometry that shows a person's nutritional status (Passarelli et al., 2022). The presence of growth retardation indicates long-term (chronic) malnutrition (Gabain et al., 2023). The diagnosis of stunting is made by comparing height-for-age *z* scores obtained from growth charts used worldwide. Indonesia diagnoses stunting using growth charts released in 2005 by the World Health Organization (WHO) (Sevriani, 2022). The *z* score is defined as the difference with the population median standardized through division by the population Standard Deviation (SD); Stunting is defined as height for age below the median age and gender standards. This *z* score is used to determine height according to a certain age (World Health Organization, 2024).

Although some people consider the issue of short children to often be overlooked and regarded as normal as long as their weight is within the normal range, they fail to see that the child's height is below average for their age. In addition, several research findings indicate that stunting is not only related to children's growth but is also closely associated with an increased risk of morbidity and mortality due to nutritional deficiencies in pregnant women and their young children. It was then stated that the determinants of stunting are multisectoral and interconnected, namely related to child health within the family, the provision of nutritious food, birth weight factors, limited access to sanitation and clean water, as well as economic status and the types of food consumed. consumed (Klemm et al., 2022).

Fufa (2022) states that factors influencing stunting and weight loss (wasting) in children under 24 months include a lack of understanding by mothers or the community about the importance of providing complementary feeding (MPASI). The practice of feeding significantly affects the growth and development of infants. Furthermore, according to Basri et al. (2021), the causes of stunting incidents are (i) the lack of food diversity in households and the provision of animal foods to children, (ii) poor distribution of food to priority age groups (children aged 6 to 59 months), making birth spacing a viable solution; (iii) health problems and nutritional availability

in children. Then, Castro-Bedriñana et al. (2021) added factors causing stunting related to child care practices, sanitation access, family welfare, food supervision, awareness of breastfeeding and complementary feeding, and poverty issues. Poverty, according to them, is a determining factor for stunting. The limitation in accessing balanced food needs in households is caused by economic inability within a family.

Research on the determinants of stunting prevalence is essential to examine various interrelated factors that simultaneously affect the prevalence of stunting in a region. Apart from the poverty factor, the cultural diversity in each area that can cause variations in the system of knowledge and beliefs about the types of food that need to be consumed by children or families can also affect the arrangement of food security within households (Fahmida et al., 2022).

The issue of food security is a very important and interesting topic to discuss. It relates to children's nutritional adequacy, especially the issue of stunting prevalence, which deserves attention because it impacts children's lives into adulthood, particularly posing risks to physical and cognitive development if not promptly addressed. The short-term impact of stunting can include a decrease in learning ability (Hermawan et al., 2023). In the long term, it can reduce the quality of life in adulthood due to decreased opportunities for education, employment, and better income (Fonseka et al., 2022). There is even a risk of children becoming obese, thereby increasing the risk of various non-communicable diseases, such as diabetes, hypertension, and cancer (Suryani et al., 2023).

In this context, addressing stunting requires not only formal mechanisms but also through local socio-cultural mechanisms. The formal affirmation is reflected in the establishment of stunting as one of the national development priorities (Hendriyanto and Prakoso, 2023). The direction of strategic policies and the National Medium-Term Development Plan (RPJMN) 2020–2024 mentions improving access and quality of basic health care services, one of which is through the acceleration of community nutrition improvement in the context of accelerating the reduction of stunting (Chandradewi et al., 2023). Stunting is one of the 17 targets of the United Nations Sustainable Development Goals (SDGs) (Umam et al., 2023). Indonesia aims to achieve SDG 2, which is to end hunger, achieve better food and nutrition security, and promote sustainable agriculture, with the goal of accelerating the reduction of stunting to 14% by 2024 (Presidential Decree, 2021).

Therefore, the government has launched an acceleration of stunting management through two major intervention frameworks, namely specific nutrition interventions and sensitive nutrition interventions (Domili et al., 2023). Specific nutrition intervention activities directly address stunting, such as food intake, maternal nutrition, infectious diseases, and environmental health. These interventions are short-term, where the results can be observed within a relatively short period. Unlike specific nutrition interventions, sensitive nutrition interventions are carried out through various developments outside of health, targeting families and communities through macro-level programs implemented across ministries or institutions (Presidential Decree, 2021).

This study seeks to answer several questions: 1) what is the food security condition among poor households suffering from stunting? 2) what are the eating behaviors of poor households suffering from stunting? 3) how are food emergency

mechanisms managed to prevent stunting incidents? This study's findings are significant because a policy's sustainability will be created when the established mechanism connects theoretical frameworks, institutional capital, social capital, and governance (Blake et al., 2023). Traditional mechanisms in stunting alleviation are very strategic to develop because this aspect directly touches on the issue of the perspective and cultural practices of the local community. Therefore, with their local strategies, traditional leaders can encourage local wisdom to work together with the government so that poverty and stunting alleviation programs can work quickly.

2. Literature review

The literature review in this paper aims to limit research by understanding and finding the theoretical foundations related to research issues. The concept of food availability is related to the family's ability to prepare and access food. Then the concept of coastal consumer behavior is linked to the consumption behavior of pregnant mothers, nursing mothers, and young children. The concept is related in terms of subsistence with very minimal income, so that the family does not meet the food and nutritional needs of the family, so the child suffers stunting, as well as the mechanisms carried out in the face of food shortages.

2.1. Food and nutrition

Food is a basic individual need that must be met at all times, so its availability must be guaranteed. Household food security is the ability of a household to meet the food sufficiency of its members over time so that they can live healthily and be able to carry out daily activities (Sumastuti et al., 2010). Later, at the 1996 Committee on World Food Security session, this definition was expanded to include the requirement that it "must be acceptable within the given culture" (Ariesa and Khairani, 2019). In Law No. 18 of 2012 regarding food, it states that food security is the condition of food fulfillment for the country down to individuals, reflected in the availability of sufficient food, both in quantity and quality, safe, diverse, nutritious, evenly distributed, and affordable, and not in conflict with religion, beliefs, and culture of the community, to be able to live healthy, active, and productive lives sustainably (Nurleli et al., 2022).

Food security is a situation where all households have both physical and economic access to food for all their family members, and each household does not have a significant risk of losing both types of access (Sumastuti et al., 2010). To achieve a high-quality Indonesian population is closely related to food and nutrition factors. This can be reflected in the level of achievement of the food provided and consumed against the quantity and quality of food and nutrition available, as well as its diversity (Hairil Akbar et al., 2021). Indonesia, as a country with a large population, faces very complex challenges in meeting the food needs of its people. The impact of food shortages is felt directly because it can trigger hunger, poverty, and malnutrition in the younger generation (Saragih et al., 2020).

Food can be classified into nine groups, which include: 1) cereals consisting of rice, corn, wheat, and others; 2) tubers consisting of potatoes, cassava, sweet potatoes, sago, taro, and others; 3) animal products consisting of fish, meat, eggs, milk, and

animal fat; 4) fats and oils consisting of coconut oil, corn oil, palm oil, and margarine; 5) oil seeds consisting of coconuts, candlenuts, walnuts, cashews, and cocoa; 6) legumes consisting of soybeans, peanuts, green beans, and others; 7) sugars consisting of granulated sugar, palm sugar, and others; 8) vegetables and fruits consisting of all types of vegetables and fruits that can and are commonly consumed by humans; 9) others consisting of coffee, tea, spices, and alcoholic beverages (Habib et al., 2021).

To achieve sustainable food security, the Food Security Council has conducted an analysis, where the factors supporting success in implementing food security include three pillars of food security indicators: (i) Food Availability; (ii) Access to Food; and (iii) Utilization of Food (Fauzi et al., 2019). Food availability is related to the physical fulfillment of food from domestic production, food reserves, and food imports in a certain area. A condition where food is not fulfilled is a food-vulnerable condition (Fauzi et al., 2019). Access to food is related to the ability of households to obtain enough food, and conversely, a condition where individuals cannot buy or obtain food is called a purchasing power-vulnerable condition (Lestari et al., 2022). Meanwhile, food utilization is related to the use of food by households, and the individual's ability to absorb and metabolize nutrients (Saputro & Fidayani, 2020).

2.2. Coastal community food consumption behavior

The consumption of staple foods constitutes the largest proportion of meals in Indonesia because it is considered very important among other types of food. From a socio-cultural perspective, food is not only a source of nutrition but also involves beliefs, prestige, status, solidarity, and tranquility in human life (Arida et al., 2015). The food consumption behavior of communities is based on eating habits (food habit) that grow and develop within the family environment through the process of socialization (Fisberg et al., 2023). These eating habits can be influenced by the ecological environment of a region, such as the characteristics of food plants, livestock, or fish available and cultivable in that area (Khan Mirzaei et al., 2020).

Coastal communities are a group of residents living in coastal areas, sustaining their livelihoods from the resources in coastal regions (Kazimierczuk et al., 2023). Residents living in coastal cities or settlements have socio-economic characteristics closely related to economic sources from the sea. Similarly, the types of livelihoods utilizing natural resources or environmental services in coastal areas include fishermen, fish farmers, and owners or workers in the maritime industry (Amone-Mabuto et al., 2023). Coastal communities, predominantly engaged in fishing, generally live below the poverty line, have no alternative livelihood options, low education levels, and lack awareness and understanding of natural resource and environmental sustainability (Cahaya, 2015).

Cultural patterns influence an individual's food choices, the types of food produced, methods of processing, distribution, preparation, and presentation (Troncoso et al., 2023). In general, the food consumption patterns of communities in Indonesia are characterized by various types of food that are common and can be locally produced. For example, in coastal areas, fishermen communities choose fish as their daily food because it can be self-produced (Oleszczak et al., 2023). The work patterns of fishing communities, especially traditional fishermen, still rely heavily on

income from the sale of caught fish, and are still vulnerable to income uncertainties, causing fishing households to create a lifestyle different from other community groups (Lindley, 2023).

2.3. Poverty and stunting

The lifestyle of traditional fishermen, relying solely on catches and dependent on climate, results in uncertain and subsistence-level outcomes, thus keeping them within the poverty cycle (Ahmed et al., 2021). There are three types of poverty among fishing communities, according to their causes: First, structural poverty, which is due to the existing social structure conditions, where they cannot utilize available income sources, also due to policy arrangements that favor the capital-owning class (large fishermen). Forces outside the household of small fishermen marginalize them and keep them in the chains of poverty, due to uneven access to resources, because of the social structure. Second, cultural poverty is related to the attitude of individuals or groups who do not try hard enough to improve their standard of living even though there are opportunities. This poverty is caused by lifestyle, habits, and culture that make them feel sufficient even though their conditions are inadequate (Ilyasa et al., 2020; Yuliansyah, 2022). This poverty is inseparable from the values embraced by the households in question in their way of life. Third, natural poverty occurs due to environmental conditions that do not support them in undertaking productive economic activities because of the nature of the resources involved (Larbi Ayisi et al., 2023).

Various determinants contribute to the incidence of stunting, one of which is poverty (Sihite and Chaidir, 2022). Stunting is a growth and development disorder in children due to long-term nutritional deficiencies, starting from pregnancy up to 24 months (De Sanctis et al., 2021; Ilmani and Fikawati, 2023; Prendergast and Humphrey, 2014). The causes of stunting can be classified into direct and indirect causes. Direct causes include the provision of colostrum and exclusive breastfeeding, children's consumption patterns, and infectious diseases that affect children's nutritional status and can lead to stunting. Indirect causes are access to and availability of food materials as well as sanitation and environmental health (Nadila and Herdiani, 2024). This indicates that the determinants of stunting prevalence are very multisectoral, with many contributing factors, thus requiring a holistic view to easily find solutions to the problem (Tafese et al., 2020).

3. Materials and methods

3.1. Research area

The research was conducted in Aluh-Aluh Besar Village, Aluh-Aluh District, Banjar Regency, South Kalimantan Province. The area of Aluh-Aluh Besar Village is 6.50 km^2. This village is a coastal area with a mangrove ecosystem that is rich in flora and fauna, which is dominated by Rambai padi (Sonneratia caseolaris) and Nipah (Nypa fruticans) (Hardiansyah and Noorhidayati, 2020). There are 21 types of herbal plants containing chemicals that can be used as traditional medicine, and various herbal plants can be used as vegetables (Hidayah et al., 2022). Besides, the potential

fauna as an abundant food source includes tiny shrimp, squid, crab, snakehead fish, seluang fish, and sepat fish. These are all possible food sources for local communities that can support food security.

3.2. Approach and data source

The research method combines qualitative and quantitative (mixed methods) to obtain more comprehensive, valid, reliable, and objective data (Creswell, 2014). The research respondents were low-income families with one child suffering from stunting and as many as 27 people were selected by the census. Other respondents were vital informants who were chosen deliberately, as many as six people because they knew about the condition of stunted children in Aluh-Aluh Besar Village, namely health workers who handle community nutrition (2 people), population and family planning officers (1 person), traditional leaders (1 person), village head (1 person) and religious officers (KUA) (1 person). Primary and secondary data are needed for the study. Primary data is quantitative data obtained through participatory observation and structured interviews with respondents using closed questionnaires. Meanwhile, qualitative data was obtained from discussions using open and flexible interview guides.

The data collected include age, education, type of work, income level, number of family members, ownership of production assets, and kind of work. All of these affect food availability in the family, affecting consumption patterns and levels of balanced food intake in the family members concerned (Sanjaya and Rahmawati, 2022). In addition, data was also collected on the prevalence of stunting and the tendency of infants and toddlers to suffer from stunting, nutritional management programs that have been implemented, family planning programs, the tendency of poor fishing families to marry early, customary mechanisms that can be developed to support formal government affirmation related to efforts to overcome stunting, After all the data is obtained, the analysis and interpretation process are carried out through source triangulation and connecting one aspect with another aspect related to the problem and mechanism for overcoming stunting.

3.3. Analysis

The research findings were then analyzed using the behavioral theory of Lawrence Green (**Figure 1**).

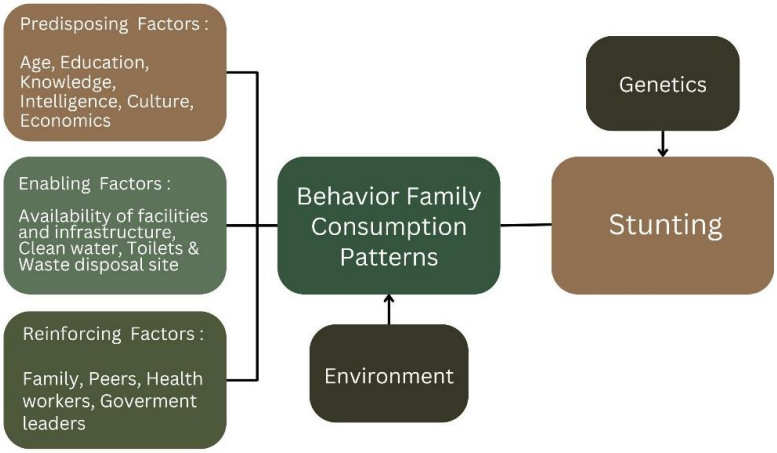

Figure 1. Modified from Lawrence Green theoretical framework (Green et al., 1980).

The research findings were then analyzed using the behavioral theory of Lawrence Green. In relation to health behavior, according to Green et al. (1980), there are several determinants that can shape an individual or family's behavior, namely:

1) First are the Predisposing Factors, which are determinants that can encourage the formation of behavior in someone's life, including knowledge, education, culture or traditional values, and self-efficacy. If related to this study, then healthy living behavior for communities in coastal areas is formed based on knowledge, education, culture and traditions, as well as self-confidence possessed.
2) Second are the Enabling Factors, which are all facilities and infrastructure, as well as access that supports the possibility of forming a behavior. If related to the focus of this study, it is associated with access and facilities owned, such as facilities and infrastructure, both personally owned and publicly available, such as health facilities, markets, roads, public toilets, and clean water facilities.
3) Third are the Reinforcing Factors, which are references or benchmarks, such as neighbors, family, friends, leaders, employers, and teachers, thus shaping an individual's or household's behavior.

This study focuses on predisposing factors, namely behaviors formed by several determinants, such as education, age, perception, self-confidence, culture, tradition, income or economy, and resource availability, attitude, and intelligence. These elements form the work behavior of the community, eating behavior, and behavior in overcoming food emergencies to prevent stunting incidents.

3.4. Ethical clearance

This research has been declared to pass the ethical review and received an ethical clearance Decree no. 483/KE.01/SK/07/2023. The Decree was issued by the Ethical Commission in the Social Humanities field of the National Research and Innovation Agency on 12 July 2023.

4. Results and discussion

4.1. Results

4.1.1. Characteristics and food availability in households

By the established criteria, the informants and units of analysis in this research are households that have children who are indicated to suffer from stunting in the Indonesian Coastal region. The number of informants observed was around 27 households. The aspects observed in each household are age, education, type of work, total income, number of family members, ownership system, and facilities used. These aspects influence the availability of food in the family which in turn will influence consumption patterns and the level of balanced food intake among the family members concerned.

Based on the results of surveys and interviews with several informants, in general, the heads of households are still relatively young or still of productive age, so the opportunity to innovate to improve the family's standard of living is still very possible, but the reality on the ground is not like that. They still tend to have a livelihood system that relies on what is available in the natural environment. This is because the general level of education does not complete elementary school. Education has long been viewed as a path out of poverty, both in America and around the world (Gewirtz, 2017). The average length of schooling has a directly proportional (positive) effect on the number of poor people (Surbakti et al., 2023).

In **Figure 2** it can be seen that the age range of 31–45 years for the highest head of household (48, 15%). Then the age range of 15–30 years (48, 15%) is in second place, and the last is the age range of 45–60 (3, 70%). These households are generally still new because they get married at the age of 19. According to interviews, boys are often invited by their parents or family to go fishing and when they return from fishing, they earn money. This causes them not to want to continue their education at a higher level of education because they are already able to earn income without having to go through a higher level of education. So, it can also be seen in **Figure 2** that the highest number of heads of families who have not completed elementary school is 37%, followed by 30% who have completed high school, then 22% who have completed junior high school, and 11% who have completed elementary school.

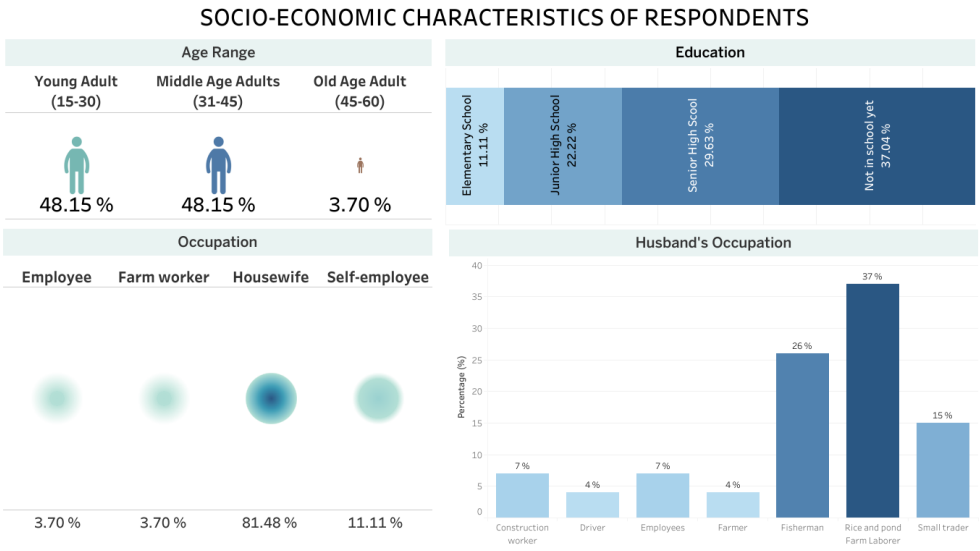

Figure 2. Socio-economic characteristics of respondents.

The ages listed in the diagram show that the highest age group is 32–37 or 44%,

indicating heads of households who are still relatively young. Then, the age group of 20–30 years (30%) ranks second in the household age composition, and they are also considered young, followed by the age group of 40–47 (26%). These households are generally still new households, as they typically marry at the age of 19. According to interview results, boys are often taken by their parents or family to go fishing, and upon returning from fishing, they earn money. This causes them not to want to pursue higher education, as they are able to earn an income without having to go through higher education levels.

The results of the study showed that the level of education of the head of the family as the backbone of the family was dominated by a low level of education of 48%, then 22% had secondary education and 30% had higher education, namely senior high school (**Figure 2**). The low level of education is one of the causes of the lack of skills and opportunities to get jobs that can improve the standard of living of his family (Retnowulandari, 2018).

The analysis results show that most informants' husbands work as farm laborers, both rice farm laborers and pond farm laborers, namely around (37%), fishermen are in second place (26%), small traders (15%), construction workers (7%), employees 7%, tidal rice farmers (4%) and drivers (4%). Based on the results of interviews with respondents, these types of jobs are the main occupations, but it does not rule out the possibility of them looking for additional work if the main job is not able to meet the economic needs of the family. This can be seen in the average household income, with the recapitulation results showing that the total income of each household ranges from IDR 600,000 per month to IDR 7,122,499 per month. Hence, if the average household income is around IDR 2,909,425 per month. If the income of each household is divided among all family members, which on average amounts to 4 people, the result is IDR 727,356 per capita per month or IDR 24,245 per capita per day.

Low income is a primary issue in fulfilling household food needs, leading to an inability to provide balanced nutritious food. This situation becomes more critical when the family size exceeds four members, affecting the distribution of food among family members. Interviews and data collection revealed that the number of family members in each household ranges from a minimum of four to a maximum of eight. The relationship between household income and food distribution results in an inadequacy in meeting the food needs of family members, increasing the risk of stunting. Households typically can only fulfill their food requirements for one week or six days. In contrast, households in densely populated areas of Nepal can meet their food needs for three months and acknowledge that they are in a state of food insecurity and at high risk of experiencing stunting in children (Dirghayu et al., 2021).

The variety of food available in households tends to be limited or very restricted due to reliance on food sourced from the surrounding natural environment. Consequently, most food must be obtained from outside the area. Besides economic factors affecting subsistence, the lack of food variety is also attributable to the relatively remote location of Aluh-Aluh Besar Village from the city center, with difficult access via mostly dirt and rocky roads.

The types of food accessible and consumed by households in the village include rice, which is largely sourced from outside the area, including Java. Households with limited incomes often cannot afford rice, particularly those reliant on unstable

employment, such as farm laborers, fishermen, and small traders among the residents of Aluh-Aluh Besar Village. Two types of rice are available: local rice, known as Siam rice, and rice from outside the area, referred to as Java rice. Despite preferring local rice, which is more expensive at around IDR 21,000 per kilogram compared to IDR 15,000 per kilogram for rice from outside, they generally opt for the more affordable external rice to meet daily needs.

4.1.2. Eating habits of household members with stunting

a) Eating habits of household members and pregnant women

According to the Food Frequency Questionnaire (FFQ) results, rice is consumed daily as the staple food by all household members. Generally, the frequency of eating is twice a day, during the afternoon and at night, with no difference between pregnant women and other family members. The limited availability of food and habits passed down from generation to generation are the reasons for the persistence of this eating pattern. The FFQ results indicate that the daily per capita calorie consumption is 1407 kcal, while the ideal is 2150 kcal. This shows that the general energy consumption pattern is still lacking, making the occurrence of stunting in children unsurprising. Although energy sources are available in the area, accessing them is difficult because they have to be purchased, and income is insufficient to buy various food sources. The FFQ also reveals that fish and shrimp are the most frequently consumed animal products because they are easy to obtain, while eggs are rarely eaten due to the need to buy them with limited household income. Fish and shrimp are the most accessible animal food sources for every household living near rivers and estuaries.

Meanwhile, the vegetable-based side dish frequently consumed is temped, which is eaten almost daily by all family members, including pregnant women and toddlers over two years old. Tempeh is the main choice due to its easy availability and affordability. Recapitulation results show that market visits are made weekly on market day, with purchases limited to tempeh and vegetables. This indicates that the fish consumed daily is generally either caught by the family itself or received from relatives and neighbors. This contributes to the high per capita protein consumption within the household, as recorded in the FFQ, where the average protein consumption is quite high at 65.13 g per day per capita, while the ideal is 57 g per day per capita. The survey results indicate tempeh/tofu consumption of 3–4 times per week.

Regarding the availability of vegetables in Aluh-Aluh Besar, the frequency of vegetable consumption by households is recorded as very low. The types of vegetables usually consumed include water spinach, cassava leaves, ferns, carrots, squash, cucumbers, eggplants, and cabbage, with the consumption of vegetables and fruits about 1–3 times per week. The fruits often consumed by household members are bananas, mangoes, and papayas.

The results of observations of daily household consumption patterns can be seen in **Table 1** below:

Table 1. Household members' eating habits.

No.	Types of food	Frequency
1	Rice	Twice a day
2	Fish	Twice a day

Table 1. (*Continued*).

No.	Types of food	Frequency
3	Tempe/tofu	4–6 times a week
4	Vegetables	1–3 times a week

Based on the results of observations, it was revealed that several types of food are not recommended for consumption by pregnant women because they are considered to be harmful to the fetus. These foods include dipaiz fish, which is fish that is processed into fish pepes, either made from sea fish or river fish. In addition, pregnant and breastfeeding women are also prohibited from consuming sticky rice. This prohibition is strictly adhered to by pregnant women because it is believed that it can cause serious harm if violated. The types of food that are considered taboo for pregnant women can be seen in **Table 2**.

Table 2. Taboo foods for pregnant women.

No.	Types of food	Reasons
1	Durian fruit (Durio zibethinus)	May cause miscarriage
2	Sticky rice	Difficulty in giving birth
3	Spicy steamed fish (ikan dipaiz)	The fetus may feel the spiciness
4	Spiny fish	Can cause bleeding

Table 2 describes the types of food that are considered taboo or prohibited for pregnant women. The prohibition is based on the beliefs and cultural values of the coastal communities of Aluh-Aluh Besar village. However, on the contrary, certain foods are considered important, even recommended for consumption by breastfeeding mothers. Important foods for breastfeeding mothers include tofu, tempeh, eggs and Katuk leaves (Sauropus androgynus). Katuk leaf vegetables are considered special food for breastfeeding mothers because they are believed to facilitate breast milk production. Consuming Katuk leaf functions to stimulate breast milk production during breastfeeding (Suryawan and Rahfiludin, 2021).

b) Eating behavior of toddlers' sufferer from stunting

Eating behavior plays an important role in determining the nutritional status of a person or child in a community (Fatmah and Nurasiah, 2010). The results of the study showed that the eating behavior of stunted toddlers (aged 1–12 months) in Aluh-Aluh Besar Village can be seen in **Figure 3** below.

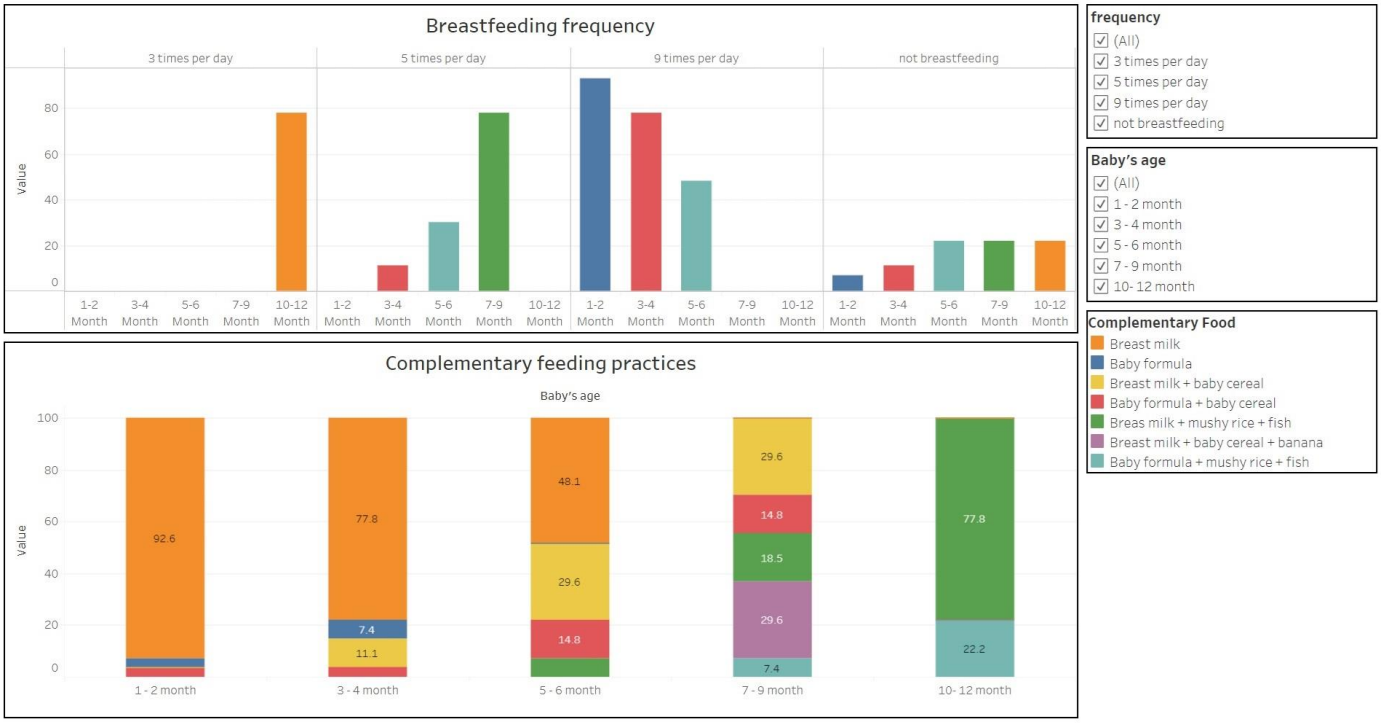

Figure 3. Breastfeeding frequency per day and complementary feeding practices.

Figure 3 shows a variation in the length of breastfeeding for a stunting family in the village of Aluh-Aluh Besar. Surveys and field interviews indicate that most nursing mothers give exclusive breast milk to their six-month-old baby, then continue until the age of 10 or 12 months with accompanying food. If a baby is not breastfed, the mother is unable to produce milk. The types of breast milk companions given are instant bread and ripe bananas. In addition to instant flour, some nursing mothers give their babies smooth rice without vegetables or fish, while the region is rich in fish, both fish from the river and fish that come from the sea. It's because of the lack of literacy among nursing mothers about the importance of nutritious food for the baby.

The diagram indicates that infants aged 1–3 months are generally breast milk, except one family not breastfeeding due to the mother's lack of milk. By the age of 4–6 months, infants are given complementary foods like rice-flavored porridge to keep them full. Then, at 7–10 months, infants are introduced to additional complementary foods, namely ripe bananas. At 11–12 months, most infants are no longer breastfed but are given soft rice and fish. Out of 27 informants, only one mother continued breastfeeding at this age. The data collection did not find instances of infants being given porridge and soft rice mixed with vegetables. They were only given breast milk, porridge, and fish. Almost all mothers wean their children by the age of 12 months or 1 year.

Based on **Figure 3**, it is known that 2 (7.4%) babies since the age of 1 month did not get breast milk because their mother's breast milk was not fluent, so breast milk was replaced with formula milk. The mother's breast milk, which was not fluent, was caused by the mother experiencing problems in her household, and another thing was the mother's age being too young (15 years). Both new mothers experienced emotional disturbances that affected their breast milk. The higher the level of emotional

disturbance, the less prolactin hormone stimulation is given to produce breast milk, so there is a relationship between stress and smooth breast milk (Amalia, 2016). As the baby's age increases, it can be seen that when the baby is 5–6 months old, only 48.1% (13 babies) are still given exclusive breast milk, and no additional food is given. The World Health Organization (WHO) states that breast milk is breast milk given to babies from birth for 6 (six) months without adding and replacing it with other foods or drinks. Exclusive breastfeeding is not only about fulfilling physical and nutritional needs but also plays a role in forming the foundation of health and intelligence for babies so that it can help optimize their development. While as many as 29.6% (8 babies) were given breast milk five times (for 24 h), and even 22.2% (6 babies) were not given breast milk. These babies have been given complementary foods. Furthermore, at the age of 10–12 months, breastfeeding was only given three times (for 24 h) to 77.8% of babies (21), while the remaining 22.2% (6 babies) were no longer drinking breast milk but were replaced with formula milk.

4.1.3. Resilience mechanisms, addressing food emergencies to prevent stunting incidents

a) Informal/Traditional Mechanisms

Traditional mechanisms are food supply mechanisms to minimize the incidence of stunting by applying social values in coastal communities such as mutual cooperation, mutual assistance and loans with trusted capital, reducing the frequency of eating and job diversification.

- Reducing eating frequency and food quality

Recapitulation results and field interviews reveal that most families struggle to meet their food needs. One strategy employed by these families is to reduce the frequency of meals each day and also decrease the quality of the food consumed. Interviews indicated that to reduce financial expenses, families opt to purchase the cheapest rice available, in line with their financial situation.

In addition to consuming cheaper rice, they also attempt to reduce the frequency of rice consumption daily, for example, eating snacks and drinking tea at 10:00 AM. Then, they only eat rice at 3:00 PM, avoiding rice consumption at night. Interviews revealed that they typically eat twice a day, consuming the cheapest rice so that all family members can eat rice daily. Similarly, with side dishes, they choose inexpensive and easily obtained fish. Often, larger and higher-quality fish catches are sold to generate income, while smaller fish are kept for family consumption.

- Strengthening social bonds through interactions and social relationships

Social relationships with neighbors' manifest in forms of mutual assistance and sharing. One common form of sharing among neighbors is when a fisherman has a bountiful catch, part of it is given to the neighbors. Helping each other clean the catch is also frequently observed; upon completion, the helper receives a portion of the fish from the neighbor they assisted.

The presence of neighbors plays a vital role in daily activities; even in poverty, they manage to survive due to the emotional bonds between them. These emotional ties are formed through shared circumstances, long and intensive neighborly relations, kinship bonds, and living in the same place (village). All these are accumulated in the form of mutual assistance and serve as a glue among community members.

- Building mutual trust

Based on data collected through questionnaires, out of 27 informants from impoverished households, the majority are unable to meet their families' daily needs. To cope, they resort to borrowing money in amounts ranging from Rp 30,000 to Rp 1,000,000. The sources for these loans vary, including parents, siblings, neighbors, and friends as shown in **Figure 4**.

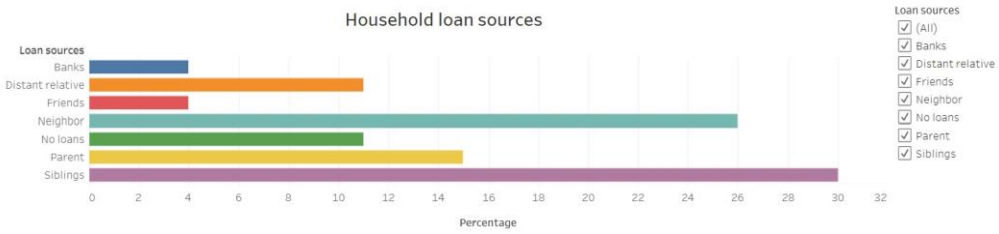

Figure 4. Household loan sources.

The diagram illustrates that most households borrow from neighbors (26%). This shows that there is a strong sense of trust between neighbors, even though there is no blood relationship, but because of the strong emotional closeness, it creates a sense of trust between them. Next, some households borrowed from siblings (29%), which included brothers and sisters. After that, some borrow from parents (15%), and lastly, borrow from friends (4%).

- Job diversification

In general, poor families with stunts have jobs in agriculture, such as being a peasant worker and a drilling worker (41%). Working as a farm worker is a seasonal job; they will work when the harvest season arrives, so that when they don't harvest, they have no income, while the family's economic needs have to be met. To cover the family's economic needs, they have to diversify their jobs, including fishing with relatives. In addition, there are workers on ships that carry goods to coal ships, which are in the midst of the sea. The second most work is done by traditional fishermen (26%), with very simple catch equipment, so the catch operations are very limited and they are very dependent on the conditions of nature. Consequently, these communities often lack the financial resources to procure food items such as chicken and beef, resulting in a reliance on their catch as a source of sustenance (Aisyah et al., 2019). When the rainy season comes, they will not be able to sail because the storm and the wind are in danger of their safety, so the fishermen have no income. To cover the family's income shortage, they diversify their jobs by working as construction workers and becoming laborers on cargo ships.

b) Formal Mechanisms

The formal mechanism is a stunting prevention mechanism through government assistance schemes. According to data collected through questionnaires, out of 27 informants/respondents, 15 households received assistance from the government in the form of cash, Direct Cash Assistance (BLT), groceries, and rice. Those who received such aid found it somewhat helpful in supporting daily needs, even though the assistance was received once every three months. However, this aid has not been able to address the daily household needs issue completely, and its distribution has not yet reached all impoverished households in Aluh-Aluh Besar. To date, daily

necessities remain a problem for these poor households, unable to escape their economic difficulties. Of the 15 households that received assistance, 10 stated that the government's aid was helpful, while 4 said it was not helpful, and 1 found it to be moderately helpful.

4.2. Discussion

4.2.1. Food insecurity in households

The research results indicate that households suffering from stunting experience food insecurity due to the lack of innovation among family members to increase their income. Despite the fact that the heads of households are generally of productive age, the low level of education among them leads to a lack of job innovation within each household. Households typically rely on the limited availability of natural resources (livelihood system). The food sources available in the surrounding environment are generally imported from other areas, so meeting the family's food needs is done by purchasing. The limited access due to low household income results in food insecurity, making it impossible to meet the nutritional needs of family members and leading to stunting. In line with the findings of Ecker (2018), who stated that in rural Ghana, the diversity of agricultural products and household income significantly affect the availability and variety of food within the household. Over the last seven years, from 2005 to 2013, households that cultivated tubers and bananas, as well as raised poultry, could increase food diversity within the household, eliminating the need to spend money on purchasing family food needs and the necessity to bring in food sources from outside the area, since each house was able to meet its family's food security. These research results show that to prevent the occurrence of food insecurity in households suffering from stunting, it is necessary to transform agriculture by cultivating food crops and poultry farming by each household to achieve food security at both the household and national levels.

Looking at the types of jobs that families are engaged in, as shown in **Figure 2**, it can be seen that they have not been able to meet their living needs because their income fluctuates, both from their work as fishermen and farm laborers. The recapitulated average income per household ranges from IDR 600,000 to IDR 7,122,499 per month, with an average income of around IDR 2,909,425.00 per month. When this income is divided by the number of family members, which on average amounts to four people, each family member earns IDR 727,356 per month, or IDR 24,245 per day. This shows that their income is far below the poverty line. According to the standard set by the World Bank for the lower middle-income class, which is US $3.65 per capita per day or IDR 1,666,152 per capita per month, this is one of the indicators of poverty (World Bank, 2023). The number of family members affects food availability; the more members to be covered, the higher the risk of experiencing food insecurity as very limited family income leads to nutritional inadequacies. Family heads, who play an important role in decision-making and household food security, have not been able to function optimally due to their low level of education, as shown in **Figure 2**. This confirms that food security is better achieved when there is increased intelligence in household management.

According to the theory of health behavior proposed by Lawrence Green, the

economic condition or type of work of a person or community acts as one of the factors that determine their health behavior. In this context, especially for stunted households in the study sites, very low economic levels limit their access to food. This situation not only causes food insecurity but also shapes life behaviors that ultimately affect quality of life. The results show that the quality of healthy life in these households is very low, which contributes to malnutrition, increased morbidity, and ultimately culminates in stunting.

4.2.2. Eating behavior in households with stunting

a) Eating behavior of household members and pregnant women

Eating behavior in a household is strongly influenced by the natural resources and economic conditions of the family. The results showed that food selection by family members was more oriented towards satiety than meeting the body's nutritional needs. This condition applies to all family members, including pregnant women and other adults. Therefore, there is no difference in meal frequency between adults and pregnant women, who generally eat twice a day. However, there are differences in the types of food consumed by pregnant women and breastfeeding mothers compared to other adults. The community has certain views on abstinence or food taboos related to the safety of pregnant women and the unborn baby. It is believed that pregnancy is a very vulnerable period, requiring safe food intake for fetal development (Maugliani and Baldi, 2023). Outside of pregnancy and breastfeeding, there are no specific dietary restrictions in the family, including for children under five. Each culture has its own beliefs and values about foods that can and cannot be consumed, creating various customs that are followed by the community (Prisylvia et al., 2022). For example, the people of Aluh-Aluh Besar Village have certain restrictions on food consumption for pregnant women and breastfeeding mothers.

Eating behavior is influenced by various factors, one of which is the housewife knowledge about the food consumed by her family members. Limited economic factors also play an important role in regulating the family's ability to meet the food needs of its members (Syahroni et al., 2021). Turner et al. (2018) suggest that there are differences in diet between low- and high-income communities, which are caused by differences in perceptions of nutritious food and ideal body weight, due to differences in knowledge. Research by Maugliani and Baldi (2023) found that the internet provides an opportunity for families, especially pregnant women with high income, to gain knowledge about diverse, healthy and safe food choices. Salem et al. (2022) explained that cultural values have a major influence, even considered more dominant in determining the practice of food consumption habits in households. Meanwhile, research by Seda et al. (2020) shows that the food consumption patterns of urban upper-class communities are more influenced by economic factors and modern healthy lifestyles than cultural factors. Colozza et al. (2023) stated that the migration of people from villages to cities affects their eating habits, including in terms of adopting local culinary traditions such as fish and vegetable consumption. These eating habits play an important role in determining the nutritional status of individuals or children in a community (Fatmah and Nurasiah, 2010).

b) Eating behavior of toddlers

Analyzing the phenomenon of breastfeeding for under-fives, most mothers rely

on exclusive breastfeeding until the baby is 1–11 months old, as depicted in **Figure 3**. However, factors such as the availability of breast milk from the mother and the baby's appetite affect this feeding (Kadir, 2016). Nutrient intake in under-fives, who are vulnerable to food shortages, shows no variation in complementary feeding during the first 1–12 months. After 1 year of age, toddlers begin to eat adult foods, a habit that is a risk factor for stunting in coastal areas. Lack of variety in the diets of under-fives contributes to this problem. Leong et al. (2021) found that inadequate nutrient intake in the first 6 months of life can lead to health problems in children. Schmidt et al. (2002) mentioned that weight loss in infants often occurs in the first two months, not only after birth but also influenced by conditions during pregnancy.

Housewife play an important role in determining family eating habits as they are generally responsible for food purchasing and preparation (Kurz and Johnson-Welch, 2001; Wang et al., 2014). Fahmida et al. (2022) emphasized the importance of nutrient-rich foods for children under five, including foods rich in iron, calcium, and folic acid such as chicken liver, green beans, anchovies, and moringa leaves to support children's heart health and nutrition. Lack of knowledge about a balanced diet and food diversification, coupled with limited family income, results in the nutritional intake of children under five and pregnant women not meeting the necessary standards, exacerbating the prevalence of stunting in the region.

Stunting prevention should focus on nutrition during the first 1000 days of life, starting with exclusive breastfeeding until the baby is 2 years old, followed by complementary foods that meet the child's nutritional needs. International policies since 2010 have targeted nutrition improvement in the first 1000 days of life age group (Hijrawati et al., 2021) because stunting is a serious growth disorder and has a multigenerational impact, affecting 22% of children under 5 years of age globally (Khan Mirzaei et al., 2020). Shaun et al. (2023) underline the importance of complementary feeding from 1–23 months of age as a critical period that determines the quality of later life, often referred to as the golden period.

Eating habits in a family are influenced by various factors, including economic conditions and the housewife knowledge of the various types of food consumed by her family members. Economic limitations can limit a family's ability to meet the food needs of family members (Eicher-Miller et al., 2023; Schuler et al., 2020; Screti et al., 2024). This is similar to the conditions faced by poor households in Aluh-Aluh Besar, which ultimately shape eating habits that have an impact on the level of nutritional adequacy of family members. Turner et al. (2018) found that there are differences in dietary patterns between high- and low-income communities, including perceptions of nutritious food and ideal body weight.

Creating good and nutritious eating habits is very important, especially for children under five years old who are at a critical age, with attention to eating habits as a top priority. Low food frequency in children under five can lead to stunting (Basri et al., 2021). The importance of managing food diversity, even from simple foods rich in iron, calcium, and folic acid, should not be overlooked (Hasanah et al., 2013).

Green et al. (1980) state that knowledge is one of the determinants of individual or household behavior. Family eating behaviors can contribute directly to stunting in children. According to Green et al. (1980), knowledge has a strong influence on the formation of a person's behavior or the household. The lack of family knowledge

about healthy and nutritious foods leads to eating behavior that does not pay attention to whether the food consumed already meets the nutritional requirements of the body but only covers the hunger to survive. Also, with the Declaration of Care of Babies from in the womb until the age of two years or more, known as "The first 1000 days". The practice of care for pregnant mothers and patterns of childcare in the village of Aluh-Aluh Besar is the knowledge acquired based on the experience applied by the parents, regardless of the extension from the local health service. To reduce the incidence of stunting and other diseases in children, it is necessary to improve the nutrition of fertile women, especially during pregnancy, and exclusive breastfeeding for the first six months of birth, providing adequate, healthy, and safe breastfeeding. And not forgetting to introduce safe and adequate local food, while still breastfeeding for up to two years.

4.2.3. Building socio-cultural mechanisms in addressing hunger to prevent stunting

This study reveals two main mechanisms developed by stunting households in coastal areas to cope with hunger and prevent stunting: traditional and formal mechanisms. Traditional mechanisms are rooted in cultural values and local traditions, including gotong royong, honesty, trust and empathy among community members. These values are maintained by each household as an effort to address food insecurity and prevent stunting. The tradition of borrowing and lending between households, based on trust without material collateral, is a common practice as all households feel deprived and need each other's help. For example, if a fisherman gets a bountiful catch of fish, he will usually share some of it with his neighbors. The process of helping each other in cleaning the fish is also part of this mechanism, where individuals who help will get a portion of the catch. This practice of helping each other is not limited to the fulfillment of daily needs, but also extends to the celebration of life cycle ceremonies. In times of economic deprivation, the existence of neighbors who help each other makes them able to survive.

Strong emotional bonds between residents, created by common fate, intense and long-standing neighborly interactions, and kin ties within the same community, accumulate in the form of mutual aid and generosity. This shows how important socio-cultural mechanisms are in overcoming food and nutrition problems, including stunting prevention in coastal areas. Informal mechanisms have proven to be an important social capital for household food security, especially in the coastal areas of South Kalimantan, with characteristics similar to the experience of low-income groups in the Somali region of America. Therefore, job diversification for low-income groups should not be considered as the main solution, but rather as a temporary strategy. The need for formal policy affirmation to improve economic welfare and food security more permanently is emphasized by Karnik and Peterson (2023), with the hope that traditional mechanisms supported by these policies can improve the welfare of low-income groups in a sustainable manner.

On the other hand, formal mechanisms include assistance from the government or private institutions through the local government, either in the form of cash, rice, or nine basic necessities (sembako) given in stages to several households. This mechanism aims to reduce food insecurity and prevent stunting in the coastal areas of

South Kalimantan. Research by Nguyen et al. (2021) in Bac Lieu, Ben Tre, Ca Mau, Soc Tran, and Tra Vinh Provinces, Vietnam, shows a similar practice, where the government provides insurance to protect rural farmers from financial losses. This insurance scheme has several premium tiers: 100% of the premium is covered for poor farmer households and individuals, 90% for near-poor farmers, and 60% for regular farmers. This approach has been very helpful for poor families in coping with various daily life issues. Both informal and formal mechanisms play an important role in strengthening food security and reducing the risk of stunting, demonstrating the importance of synergies between community efforts and government policy support in tackling social and economic problems among low-income communities.

5. Conclusion

Poor communities in coastal areas often rely on limited natural resources as a source of meeting their food needs, without looking for innovation or trying new things to improve their standard of living. Livelihood systems that depend on river and marine catches rarely generate adequate income. This causes limited access to food in the household, because the community's staple food in the form of rice can only be accessed through purchase. So, the limited amount of income is not enough to cover rice needs. When rice as a basic need is difficult to fulfill, how can families buy additional food such as protein and other nutritious foods for family members? This condition ultimately triggers a high incidence of stunting. Although adult food can be regulated by reducing food portions. However, this option carries risks for health sustainability if applied to pregnant women, breastfeeding mothers and children in the first 1000 days. At the household scale, innovation and income diversification are needed to increase family income as the main variable in preventing stunting.

Household food security in the face of food emergencies to prevent stunting is carried out by combining traditional social mechanisms with formal policies developed by the government. Social ties such as mutual cooperation between neighbors, relatives or friends in need can be promoted as a social network for stunting prevention which is supported by the government. Apart from that, the trust system formed between communities can be reflected in the lending and borrowing traditions that have been practiced, and can be used as a "media for strengthening community participation in maintaining food security", as implemented by the Central Java government through the jogo tonggo program. Aligning traditional mechanisms with formal policies in efforts to eradicate stunting in poor households is a strategic scenario that can be developed in Indonesian society which is rich in traditions, social ties and beliefs in food as well as community practices and family health.

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