



## The Role of Food Security Policy and Educational Management in Reducing Stunting Among Children

Sari Ramayeni Pitri\*, Rahmadani Yusran

Universitas Negeri Padang, Indonesia

Email : [yusranrdy@fis.unp.ac.id](mailto:yusranrdy@fis.unp.ac.id)

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### ABSTRACT

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Public Policy  
Implementation, Food  
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\*Corresponding Author

This study examines the implementation of food security policies in stunting prevention program, through the lens of Grindle's (1980) policy implementation framework. Using a descriptive qualitative approach, data were gathered via in-depth interviews, observations, and document analysis involving government officials, village institutions, and beneficiary communities. The analysis identifies four key barriers: limited community participation, inadequate financial and human resources, inequitable and elite-centered aid distribution, and geographical as well as climatic constraints. These findings reveal a significant gap between policy content and implementation context, where participatory and sustainability principles mandated by national and regional frameworks have not been effectively realized at the local level. Theoretically, the study extends Grindle's model by incorporating ecological and spatial dimensions as critical factors shaping policy outcomes. Practically, it underscores the importance of adaptive policy design that integrates local geographic and socio-cultural contexts, fosters community engagement, enhances inter-sectoral coordination, and promotes participatory budgeting at the village (nagari) level to strengthen food security and reduce stunting sustainably.

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## INTRODUCTION

Food security is a fundamental pillar of national welfare and social stability, influencing economic growth, human development, and the overall quality of life. Ensuring access to sufficient, safe, and nutritious food is not merely a development goal but a constitutional responsibility that guarantees citizens' right to live with dignity. Studies by Olena et al. (2023) and Haakenstad et al. (2022) emphasize that food insecurity directly weakens human productivity, increases health risks, and disrupts intergenerational development. When food systems fail to meet nutritional needs, the effects

extend beyond hunger, leading to malnutrition, stunting, and even social unrest (Abdullahi et al., 2024). Thus, food security policy is not only about food availability but also about maintaining social justice and human rights. In developing nations such as Indonesia, where economic inequality and geographic diversity coexist, achieving food security requires policy frameworks that are adaptive, participatory, and aligned with local realities. This research contributes to that broader discourse on human-centered policy implementation.

Despite Indonesia's comprehensive policy frameworks—such as Law No. 18 of 2012 on Food Security and Presidential Regulation No. 83 of 2017 on Strategic Food and Nutrition Policy—their implementation remains inconsistent across regions (Untung et al., 2025). Persistent stunting rates, uneven food distribution, and weak cross-sectoral coordination highlight a significant gap between policy formulation and execution. Grindle (1980) attributes such failures to a mismatch between policy content and implementation context, where technocratic designs often overlook local social, cultural, and institutional capacities (Cavalcante & Pereira, 2022). This mismatch results in ineffective policy translation at the grassroots level, where local actors and institutions struggle to operationalize national directives. The challenge lies not only in designing coherent policies but in managing their implementation within complex, multi-layered administrative and socio-economic systems. Therefore, understanding how food security policies function at the local level is essential for bridging this gap and ensuring that national commitments translate into tangible welfare outcomes for vulnerable communities.

The case of Agam Regency in West Sumatra exemplifies the complexities of implementing food security policies in decentralized settings. Although the local government has issued West Sumatra Provincial Regulation No. 9 of 2019 and Agam Regent Regulation No. 12 of 2020 to safeguard agricultural land and enhance local food production, stunting rates remain alarmingly high (Yeny et al., 2022). Limited nutritional intake, agricultural land conversion into residential areas, and weak food distribution oversight continue to hinder progress (Y et al., 2024). Scholars such as Setyarini et al. (2024) note that local strategies lack sufficient budget allocation and effective control mechanisms. Moreover, economic and demographic pressures exacerbate land-use changes (Reza, 2024), while geographic and climatic disparities further complicate agricultural productivity (Budiharto, 2020). These interrelated issues demonstrate that food security challenges are not purely technical but managerial and institutional. Effective policy implementation thus depends on how local actors coordinate, allocate resources, and manage community

participation within dynamic socio-ecological systems.

Previous studies on food security in Indonesia predominantly focus on structural, technical, and behavioral dimensions rather than institutional or managerial processes. Luthfiyyah (Muchtar et al., 2025) observed that local food programs often fail due to limited innovation and small-scale implementation. Aulia (Setiawan et al., 2025) emphasized community nutrition practices such as complementary feeding but overlooked systemic issues of food distribution and governance. Firdaus and Maulana (2025) linked weak nutrition education and inequitable program delivery to persistent stunting. Meanwhile, Daniel (Sengchaleun et al., 2023) demonstrated that poor coordination and fragmented governance result in ineffective nutrition referral systems. Collectively, these findings underscore that while technical and consumption-related interventions are well-studied, institutional and management-oriented analyses remain scarce. The neglect of these aspects limits understanding of how inter-agency collaboration, leadership, and local governance determine food policy outcomes.

Further, the existing literature tends to treat food policy implementation as a linear process, assuming that well-designed programs will naturally yield positive outcomes. However, Simorangkir et al. (2024) revealed weak social networks connecting vulnerable groups to institutional resources, such as local governments and producer associations. Yet, their analysis fails to explain how managerial capacity and inter-organizational coordination shape policy performance. This gap is critical because, as public policy theory suggests, implementation is inherently political, negotiated, and context-dependent. It requires active management of human, financial, and institutional resources. Therefore, a deeper exploration of the “policy–management nexus” is needed—examining how actors’ interactions, leadership styles, and decision-making structures influence the translation of policy intentions into practical outcomes. Addressing this gap will enhance theoretical understanding of local governance and contribute to developing adaptive frameworks for food security management in developing contexts.

This study offers a novel contribution by integrating Grindle’s (1980) policy implementation framework with ecological, social, and managerial dimensions in the analysis of regional food security. Unlike previous studies that focus primarily on technical or economic determinants, this research situates policy implementation within a multi-dimensional context that includes geography, climate, institutional capacity, and governance dynamics. The Agam Regency case provides a unique lens to explore how local actors negotiate and reinterpret technocratic policies through informal networks and adaptive management. Theoretically, this integration enriches Grindle’s model

by highlighting how spatial and ecological factors shape policy effectiveness. Practically, it presents a context-sensitive approach to food security governance—emphasizing that sustainable stunting prevention requires participatory management, community empowerment, and inter-sectoral collaboration. By framing implementation as a managerial and social process, this research extends policy analysis beyond compliance to understanding local adaptability and institutional resilience.

Based on these issues, this study seeks to answer the central research question: How is the implementation of food security policies for stunting prevention in Agam Regency shaped by the interaction between policy content, implementing actors, and socio-institutional contexts? This question is essential because it conceptualizes implementation as a complex managerial arena involving multiple actors with diverse interests and capacities. The tentative argument proposes that the effectiveness of food security policy implementation is largely determined by the managerial and social capabilities of local institutions to foster cross-sectoral coordination and participatory governance. When relationships among actors are strengthened through effective communication, collaboration, and adaptive leadership, policies become more responsive to local needs. Conversely, weak coordination, inadequate resources, and poor oversight can undermine even well-designed programs. Thus, the study advances the theoretical understanding of the policy–management nexus while offering practical insights for improving local governance and institutional performance.

Theoretically, this research contributes to the broader literature on public policy and development management by extending Grindle’s framework to incorporate spatial and ecological contexts. It underscores that implementation success depends not only on policy design but also on the managerial competencies of institutions to adapt, coordinate, and mobilize community participation. Practically, the study provides evidence-based recommendations for strengthening local food security governance through participatory budgeting, inter-sectoral coordination, and community empowerment at the village (nagari) level. By highlighting the interdependence between policy frameworks and managerial execution, this research offers a more holistic understanding of how food security can serve as a foundation for sustainable human development. Ultimately, it positions effective policy implementation as a key determinant of Indonesia’s capacity to reduce stunting, promote social equity, and achieve long-term food sovereignty in the face of ecological and socio-economic challenges.

## RESEARCH METHOD

This study employed a qualitative, descriptive design. This approach was chosen because it allowed researchers to deeply understand the phenomenon of food security policy implementation in stunting prevention in Agam Regency, not only measuring outcomes but also exploring the meanings, processes, and social contexts surrounding them. The qualitative descriptive design was used because it aligned with the research objective of systematically and factually describing the relationship between policy content and implementation context, as explained by Grindle (1980). Thus, this study sought to comprehensively interpret how policy substance, institutional capacity, and socio-economic dynamics influence the effectiveness of food security policy implementation at the local level.

This research was conducted in Agam Regency, West Sumatra Province. The location was selected purposively, considering that Agam Regency is one of the national priority areas for stunting management and strengthening food security. This region has a fairly comprehensive policy framework, including Agam Regent Regulation No. 12 of 2020 on the Protection of Sustainable Food Crop Land. However, it still faces challenges in policy implementation on the ground, including limited institutional capacity, land conversion, and a lack of coordination across sectors. This situation makes Agam Regency a relevant location to examine the gap between the formulation and implementation of food security policies in the context of stunting prevention.

Data collection was conducted using three main techniques, including in-depth interviews. Interviews were conducted with informants directly involved in food security policy implementation, including officials from the food security and health offices, village government representatives, nutrition cadres, and beneficiary communities. The aim was to explore their understanding, experiences, and perceptions of policy implementation and the challenges it entails. In addition, researchers conducted direct field observations to assess the policy implementation process, inter-agency coordination, and community participation in food security and stunting prevention programs. Researchers also documented regional policies, reports on related agency activities, stunting data, food security program reports, and implementing regulations at the village level.

Informants were selected using purposive sampling, based on their relevance and direct involvement in policy implementation, to obtain in-depth, contextual data. Data analysis was conducted interactively, referring to the Miles, Huberman, and Saldaña (2014) model, which includes four stages: first, data condensation. Researchers selected, focused, and simplified data relevant to the research objectives.

Data from interviews, observations, and documentation were classified into themes including policy content, actor roles, socio-economic context, and implementation outcomes. Second, data reduction. The condensed data were selected and organized into categories to identify patterns, relationships, and differences between informants. Third, data display. The results of the reduction were presented in descriptive narratives, tables, and matrices to facilitate researchers' understanding of the relationship between policy content and its implementation context. Fourth, verification and conclusion drawing/verification. Researchers interpret the data by linking it to Grindle's (1980) policy implementation theoretical framework, then conduct a verification process to ensure the conclusions are valid and consistent with the field data.

## **RESULTS AND DISCUSSION**

### **Result**

With the rise in stunting cases in Agam Regency, the local government, through the Food Security and Fisheries Agency, the Health Agency, and the Agriculture Agency, has implemented various efforts through community development through outreach and outreach, food land management through cross-sectoral coordination, and the provision of agricultural facilities and infrastructure, as stipulated in Agam Regent Regulation Number 12 of 2020 concerning the Protection of Sustainable Food Agricultural Land. However, research indicates that implementing food security policies to prevent stunting still faces significant challenges at the implementation level. Based on field findings, four main variables influence policy effectiveness: low community participation, limited budget and resources, inaccurate targeting of aid, and geographical constraints and extreme weather. These four variables illustrate the gap between the content of the designed policy and the context of implementation encountered in the field.

### **Low Public Participation in the Implementation of Socialization**

Low community participation in the implementation of food security program outreach is defined as minimal active involvement of residents in outreach activities, training, and public discussions organized by the local government. Participation here includes attendance, involvement in discussions, and contributions to outreach activities for nutritious food and stunting prevention programs. Research shows that people in Agam Regency still tend to be passive recipients of information rather than active participants in the outreach process. This situation indicates that the policy-mandated participatory development process has not been fully implemented. In the context of Grindle's (1980) theory, this phenomenon illustrates an imbalance

between the content of the policy, which emphasizes participatory principles, and the context of implementation, which does not support real participation at the local level.

An interview with Fitriani, Head of the Food Security and Nutrition Division of the Agam Regency Food Security and Fisheries Office, revealed that community participation in outreach activities remains low. Fitriani stated: "...but in practice, our community does not want to achieve a prosperous life. For example, when outreach activities, which offer numerous benefits, are implemented, the community does not participate as we would expect." (Interview, September 15, 2025). The researcher's interpretation of this quote indicates a perception gap between the government and the community. From the government's perspective, low participation is seen as a lack of public awareness of the importance of nutrition and nutritious food. However, from an implementation management perspective, low participation indicates a lack of participatory communication strategies from the local government. The outreach process remains informational (top-down) and fails to address the community's psychosocial needs and real needs on the ground.

Another informant, Rahmad Hidayat, a village official in the Food Security Sector, added: "The outreach is sometimes only held once a year, and the participants are mostly village officials. Ordinary residents rarely participate, perhaps because the schedules do not match or because they do not feel the activity is important." (Interview, September 17, 2025). This quote reinforces that low participation is not only due to low public awareness but also to a lack of managerial planning in determining the timing, methods, and targets of outreach activities. This indicates problems with coordination and activity planning between the agency and the village government. Researchers argue that without adaptive management tailored to local needs, socialization activities are merely administrative formalities that do not significantly change community behavior.

**Table 1. Low Community Participation in Socialization Implementation**

<b>Informant Position</b>	<b>Interview Excerpt</b>	<b>Analysis Indicator</b>
Head of Food Insecurity and Nutrition Division	"...the community doesn't participate as we expected."	Low community involvement in socialization activities; top-down perception from the government.
Village Apparatus for Food Security Division	"Socialization is only held once a year, with only village officials participating, residents rarely participate..."	Lack of activity planning based on local needs; weak inter-agency coordination and implementation management.

The Table above shows that the two informants described the phenomenon of low participation from different perspectives. However, they reached the same conclusion: low community involvement stems from weak communication between managers and policymakers. The first informant viewed it from the perspective of public awareness, while the second highlighted technical limitations in the planning and implementation of outreach programs. This pattern suggests that the primary obstacle lies not solely in community behavior but instead in the lack of a participatory approach in program implementation management.

More deeply, this finding suggests that the local government still relies on a one-way communication pattern in implementing food and nutrition policies. There is no feedback mechanism for the community, resulting in the outreach program failing to foster a sense of ownership. When communities are not involved in planning and decision-making, they tend not to feel responsible for the program's success. Therefore, public communication management and institutional coordination are crucial factors in determining the success of food policy implementation in Agam Regency.

Field observations support the interview findings. Researchers observed that the outreach activities held at the village office were conducted in a one-way fashion. Office officials delivered materials through presentations without any opportunity for open discussion. Some participants appeared passive, and some even left the room before the event concluded. Furthermore, documentation of the activities showed that the majority of participants were village officials and Family Welfare Movement (PKK) cadres, while the general public, particularly vulnerable families, rarely participated. Based on these observations, researchers concluded that the outreach activities were not designed with participatory principles and did not accommodate the needs of the target community. Ineffective managerial processes in organizing schedules, methods, and participants contributed to this low participation.

Based on interviews and observations, it can be concluded that low community participation in the food security program outreach in Agam Regency was due to two main factors: a weak participatory communication strategy by the local government and a lack of managerial coordination among agencies and the village government. Although national and regional regulations mandate participatory principles in food policy, their implementation in the field remains formalistic. This situation demonstrates a policy gap between the draft policy, which emphasizes active community participation, and the reality of implementation, which remains administratively oriented.

From all the data collected, a pattern emerges of disharmony between the policy substance and the implementation context. The policy content demands community empowerment through a participatory approach, while the implementation context demonstrates a hierarchical communication pattern and minimal two-way interaction. Another emerging pattern is weak integration between managerial and social aspects: outreach activities are planned technically without considering local communities' sociocultural conditions. Consequently, community participation is low because they do not see direct benefits from the activities undertaken. Within Grindle's (1980) theoretical framework, this pattern suggests that policy success is determined not only by its content but also by the ability of implementation management to adapt the policy to the local social context.

### **Budget and Resource Limitations in Implementing the Food Security Program**

Budget and resource limitations in this study are defined as the limited financial capacity, infrastructure, and number and competence of implementing staff within local governments to implement food security policies. This situation encompasses the gap between program needs and available resources, including fiscal allocations, equipment, and human resources (HR) for field extension workers. In the context of Grindle's (1980) theory, this problem reflects a weak policy content element, particularly in the dimensions of resources and capacity of implementing agencies. This means that a good policy on paper will be ineffective if it is not supported by adequate resources to achieve policy objectives at the implementation level.

Based on an interview with Fitriani, Head of the Food Security and Nutrition Division of the Agam Regency Food Security and Fisheries Office, the following information was obtained: "Furthermore, limited budget and supporting facilities also pose challenges in assisting communities, compounded by the minimal number of extension workers in this field." (Interview, September 15, 2025). From this statement, the researcher interpreted that the main obstacle was not only limited funding, but also an imbalance between program burden and implementing capacity. Limited extension workers prevented program development and monitoring activities from running optimally. Furthermore, food aid distribution was uneven because the budget was insufficient to reach all targets. This situation indicates that managerial weaknesses in budget planning and human resource recruitment directly impacted the low effectiveness of policies in the field.

Another informant, Ediarta Isra Bastin, Head of the Food Availability and Stabilization Division, stated: "Our budget is minimal, tiny, and the

number of competent staff in their respective fields can be counted on one hand. However, if competent employees and sufficient funds were available, all programs could be implemented." (Interview, September 15, 2025). The researcher's interpretation of this quote indicates that implementing parties are aware that policy success is crucially determined by budget support and the quality of implementing human resources. The shortage of competent staff hampers implementation, particularly during the program's socialization, outreach, and evaluation stages. From a managerial perspective, this indicates that the planning, organizing, and monitoring functions have not been implemented effectively due to limited structural resources. In other words, the ideal policy content cannot be implemented optimally because the implementation context lacks adequate supporting capacity.

**Table 2. Budget and Resource Limitations**

<b>Informant Position</b>	<b>Interview Excerpt</b>	<b>Analysis Indicator</b>
Head of Food Insecurity and Nutrition Division	"...limited budget and supporting facilities are also challenges in implementing assistance to the community..."	Budget limitations and a lack of extension workers have resulted in low program outcomes; weak planning and operational support.
Head of Food Availability and Stabilization Division	"The budget is minimal, competent staff can be counted on one hand. If the staff are competent and the budget is sufficient, all programs can be implemented."	mbalance between the number of human resources and the workload; weak managerial capacity in resource allocation and implementation coordination.

The Table above shows that both informants offered consistent views on the lack of resource support for the implementation of food security policy. Fitriani emphasized the limited budget and the shortage of field extension staff, while Ediarta highlighted employee competency and the limited allocation of operational funds. This pattern suggests that the primary problem lies not in the nominal budget alone, but in inefficient and uncoordinated resource management. This means that institutional capacity is unable to manage resources adaptively to the complexity of field needs. A deeper interpretation indicates that local governments still employ an administrative and centralized management model. Budget prioritization is primarily top-down, while field technical needs are often overlooked. As a result, programs are implemented in a fragmented manner, with inadequate human resources and facilities. This has

implications for the low commitment and capacity of implementing agencies, as Grindle (1980) explains: policies with ideal designs will fail without the commitment and capacity of implementers to adapt them to the local context.

Based on observations at the Agam Regency Food Security and Fisheries Office, researchers found that operational activities, such as extension and coaching, are carried out only at specific times due to limited travel costs and field equipment. In the food sector, only two staff members are handling more than five key programs, including family food security, food diversification, and addressing nutritional insecurity. Some activities even rely on provincial funding. Based on these observations, researchers interpret that a streamlined bureaucratic structure without adequate fiscal support makes program implementation unsustainable. This confirms that resource constraints are not only a financial issue but also a management issue.

Based on interview and observation data, budget and human resource limitations are the main obstacles to implementing food security policies in Agam Regency. Although regulations such as Law No. 18 of 2012 and Regent Regulation No. 12 of 2020 emphasize local governments' responsibility to provide facilities and budgets, in practice, these policies have not been fully operationalized. This is due to limited budget allocations, limited technical staff, and weak managerial capacity to set program priorities and coordinate across sectors. Thus, there is a significant gap between the ideal policy content and the limited implementation context.

From the overall data, a consistent pattern emerges that resource limitations are the primary obstacle to the success of food security policies. This pattern is characterized by (1) minimal fiscal support for program operations, (2) a shortage of competent technical personnel, and (3) weak cross-sectoral planning and management. This pattern demonstrates that policy effectiveness depends not only on policy content but also on local governments' ability to manage available resources efficiently and collaboratively. Therefore, from Grindle's (1980) theoretical perspective, policy implementation in Agam Regency demonstrates a weak relationship between the capacity of implementing institutions and resource structures, thereby hampering the achievement of policy objectives for food security and stunting prevention.

### **Uneven and Inappropriately Targeted Aid Programs**

In this study, uneven and poorly targeted aid programs are defined as a mismatch between the beneficiary groups who are supposed to be eligible and the reality of aid distribution on the ground. Some recipients do not meet the criteria for need, while those in need receive no assistance. The types of aid in question include the provision of seeds, subsidized fertilizer, agricultural

infrastructure, and nutritious food programs to strengthen community food security. In the context of Grindle's (1980) implementation theory, this problem relates to the dimensions of benefit types and resource distribution. This means the policy content emphasizes equitable and just distribution, but the implementation context reveals biased interests and weak oversight mechanisms at the local level.

Based on an interview with Helma, a resident of Nagari Kamang Tengah Anam Suku, the following statement was obtained: "...aid is not well targeted, such as the provision of seeds, hamlets, and cadres have been collecting data on those in need, but when the aid was distributed, those of us who were registered did not receive it. It turned out that aid was only given to those closest to the village government." (Interview, August 28, 2025). The researcher's interpretation of this statement indicates that the aid distribution process is subject to social and structural bias. Although a data-collection mechanism has been implemented, the final decision on aid distribution is not transparent and is often influenced by social proximity to village officials. This illustrates the dominance of local power (local patronage), shifting policy objectives from community empowerment to the interests of certain groups. From a policy management perspective, this situation demonstrates a weak internal control system and public transparency in the implementation of the food aid program.

Another informant, Budi, a farmer from Sungai Pua District, shared a similar experience: "...during my farming career, there has been no assistance from the local or village government regarding seeds or technology. Furthermore, farmers have not received educational assistance in the form of knowledge on more effective and efficient food production." (Interview, August 28, 2025). From this statement, the researcher interprets that a lack of agricultural assistance and education also accompanies the unequal distribution of aid. This means the aid program has failed not only in terms of equity but also in strengthening the capacity of recipient communities. This situation indicates that the administrative policy approach has not transformed into one oriented toward capacity building. As a result, smallholder farmers remain marginalized in the regional food production system, thereby depriving food security policies of the impetus to improve community welfare.

**Table 3. Unequal and Inappropriately Targeted Assistance Programs**

<b>Informant Position</b>	<b>Interview Excerpt</b>	<b>Analysis Indicator</b>
Resident of Nagari Kamang Tengah	"...those of us who are registered don't receive assistance. It turns out that assistance is only	There is a bias in the distribution of assistance; transparency and social

Anam Suku	given to those closest to the village government."	accountability are weak.
Sungai Pua Farmer	"...during my farming career, there has been no assistance from the government, including seeds and efficient agricultural education."	Inequitable distribution of assistance and weak technical assistance; policies have not reached vulnerable communities.

The Table above shows that both informants experienced inequities in access to food and agricultural aid. Helma described issues related to distributional equity, while Budi highlighted the uneven distribution of aid and the lack of capacity building for recipient communities. This pattern indicates that food security policies in Agam Regency do not fully reflect the principles of equity and empowerment as mandated by Law No. 18 of 2012.

A more in-depth interpretation suggests that this problem extends beyond the technical aspects of distribution, but also reflects ineffective public policy management at the local level. Aid distribution was carried out without a community-based oversight mechanism, and there was no ongoing beneficiary evaluation system. Within Grindle's (1980) framework, this situation illustrates the weak link between policy design and practice, in which the implementation process remains dominated by local actors' interests rather than the needs of vulnerable communities.

Field observations indicate that aid distribution in several villages in Agam Regency is conducted without public forums involving recipient communities. Recipient data is only announced internally by village officials, while the general public is unaware of the verification mechanism. During a seed distribution activity, researchers noted that some recipients were individuals who were not previously listed as beneficiaries. Furthermore, there was no independent reporting or monitoring system to ensure aid reached those in need. These findings suggest that policy implementation remains administrative and elitist, with distribution mechanisms failing to adhere to the principles of transparency and public participation.

Based on interviews and observations, it can be confirmed that the food security assistance program in Agam Regency has not been implemented evenly and effectively. Although national and regional regulations emphasize the importance of fair and equitable distribution, their implementation remains biased toward local interests and lacks public oversight. Aid programs intended to improve welfare can actually deepen social inequality. Thus, there is a gap between the policy content, which demands equity, and the implementation context, characterized by weak institutional capacity and local patronage practices.

From the overall data, a general pattern emerges: the aid distribution process in Agam Regency is influenced not only by administrative limitations but also by local power dynamics. This pattern reflects the weakness of accountability and transparency in the management of public policy implementation. Three main patterns emerged: (1) aid distribution was not based on data on the community's real needs, (2) the distribution process did not involve social oversight, and (3) personal relationships with village officials often influenced decisions regarding aid recipients. In the context of Grindle's (1980) theory, this demonstrates a policy gap resulting from a disharmony between policy designs that emphasize distributive justice and the local socio-political context, which remains rife with patronage.

### **Geographical Constraints and Extreme Weather**

This sub-finding examines the influence of geographic constraints and extreme weather on the effectiveness of food security policy implementation in Agam Regency. Operationally, the observed indicators include: (1) the frequency and duration of extreme weather events (e.g., long dry seasons), (2) changes in agricultural land productivity (decreased crop yields or land drying out), (3) the availability and function of irrigation infrastructure (irrigation, reservoirs, and dams), and (4) bureaucratic readiness/capacity and cross-sectoral coordination in responding to ecological risks. This sub-finding emphasizes that when these variables are negative (high extreme weather, weak infrastructure, poor coordination), the effectiveness of food security program implementation decreases.

Informant: Fitriani, Head of the Food Security and Nutrition Division of the Food Security and Fisheries Office of Agam Regency. Excerpt: "...the biggest obstacle to implementing food security policies is weather. In several villages in Agam Regency, there are long dry seasons that result in drought in our community's land, for example, in Kamang Tengah Anam Suku Village." (Interview, August 28, 2025).

Researchers' observations noted the geographical pattern of Agam Regency, which is dominated by hills and elevation variations between villages (nagari), with much land dependent on seasonal water sources and uneven irrigation infrastructure (reservoirs/ponds are small or located far from productive land). In the field, there is also minimal technical coordination between agencies (Food Security, Agriculture, and Public Works) regarding water resource management, resulting in fragmented technical improvements and mitigation measures. Interpretation: The combination of fragile topography, limited water infrastructure, and weak inter-agency coordination creates a structural bottleneck that makes food security programs vulnerable to

extreme weather events. Without technical intervention and strengthened coordination, stunting-prevention efforts through food policies will struggle to meet their targets.

Interview and observation data consistently indicate that geographic constraints (topography, elevation variations) and extreme weather (prolonged droughts) are key determinants hampering the effectiveness of food security policies in Agam Regency. Although national and regional regulations incorporate principles of sustainability and climate adaptation, their implementation remains normative and has not yet been operationalized at the village level. Therefore, to increase program effectiveness and reduce the risk of stunting, it is necessary to integrate adaptive measures (technical, institutional, and coordinative) that are appropriate to the local geographic context.

**Table 4. Geographical and Extreme Weather Constraints**

<b>Informant Position</b>	<b>Interview Excerpt</b>	<b>Indicator</b>
Head of Food and Nutrition Insecurity (Fitriani)	"The biggest constraint... the long dry season causes the land to dry out (Nagari Kamang Tengah Anam Suku)."	Frequency/duration of dry seasons; decreased soil moisture; risk of crop failure
Village Head (Fitra)	"The implementation of the Cheap Staple Rice Field extension program was hampered by the long drought; the land became dry."	Obstacles to program implementation; gap between planning and field conditions

The Table shows that both informants highlighted prolonged drought as the primary trigger for the operational failure of food security programs. Technical indicators (soil moisture, land productivity) decline during the dry season, making interventions that rely solely on extension services or agricultural inputs (e.g., the Sawah Pokok Murah program) ineffective without the support of water infrastructure and drought-resistant agricultural technology. In other words, climate factors function as moderating variables that determine whether policy content (programs) can produce planned outcomes.

The Table also shows institutional indicators: implementation barriers and weak intersectoral coordination. When programs are formulated without spatial adjustments and technical coordination mechanisms (e.g., cross-nagari irrigation management plans), there is a mismatch between policy design and field capacity. This requires a strategic shift from a sectoral to a cross-sectoral, context-based approach—e.g., integrating water resources management, drought-tolerant crop diversification, and rapid-response mechanisms across

agencies.

## Discussion

Research results on the implementation of food security policies to prevent stunting in Agam Regency indicate that the effectiveness of program implementation is significantly influenced by four main factors: low community participation, limited budget and resources, inaccurate targeting of aid programs, and geographic constraints and extreme weather. These four factors demonstrate a gap between the well-designed policy content and the implementation context, which is characterized by social, economic, and ecological complexities. These results align with Grindle's (1980) view that successful policy implementation depends heavily on the interaction between the policy substance and the implementation context (Nurhadi et al., 2024). In the case of Agam Regency, the food security policy substance emphasizes the principles of participation, distributive justice, and sustainability. However, the local context demonstrates weak resource support, coordination, and adaptation to environmental conditions.

The first finding regarding low public participation supports Arnstein's (1969) theory of public policy participation, as outlined in his Ladder of Citizen Participation. He stated that public participation in public policy often stops at tokenism—merely symbolic involvement without real influence on decision-making (Di Santo et al., 2023). This was evident in Agam Regency, where outreach activities were conducted in a top-down manner, leaving no space for two-way communication. This contrasts with Wibowo's (2022) findings, which stated that the successful implementation of the national nutrition program was significantly influenced by active public involvement from the planning through evaluation stages (A. P. Putra et al., 2024). This means that low public participation is not simply a result of a lack of public awareness, but also of weak public communication management by local governments. The theoretical implications of this finding suggest the need to strengthen the participatory dimension in public policy implementation theory. In practice, local governments must shift their outreach from an informative to a collaborative approach that involves the community from the planning stage.

The second factor, namely budget and resource limitations, emphasizes the importance of the resources and capacity dimensions of implementing agencies, as explained by Grindle (Evita et al., 2025). This study found that minimal fiscal allocation and the number of extension workers directly impacted the low effectiveness of policies. These results align with Jurisman's research, which states that weak bureaucratic capacity and fiscal constraints are common obstacles to the implementation of food security policies at the

regional level (Jurisman Kadji, 2022). However, this study adds a new dimension: these limitations are not only quantitative (amount of funds or staff), but also qualitative, namely the lack of managerial competence in designing program priorities and cross-sectoral coordination. Theoretically, these results broaden understanding of the importance of institutional capacity as a key factor in policy implementation. At the same time, in practice, they indicate the need to reformulate resource management strategies to address local needs and to increase the technical capacity of policy implementers.

Third, findings regarding uneven and poorly targeted aid programs indicate a mismatch between policy designs oriented toward distributive justice and implementation practices influenced by local socio-political interests. These findings are consistent with Nugroho's (2021) research, which found that local patronage practices often distort public policy objectives in rural Indonesia (C. Y. Putra et al., 2025). In the context of Grindle's (1980) theory, this situation demonstrates weak accountability and transparency mechanisms in implementation (Zulhakim et al., 2024). However, this study broadens the perspective by showing that inaccurate targeting is also due to the absence of a community-based evaluation and monitoring system. The theoretical implication is the need to strengthen the governance-based monitoring dimension in policy implementation models, while the practical implication is to encourage local governments to involve civil society organizations and village officials in the verification and evaluation process of aid recipients.

The fourth factor —geographical constraints and extreme weather —underscores the importance of the physical environment as a determinant of policy implementation. The results of this study align with Torres-Lima's view on the importance of adaptive governance in food security policies, particularly in areas vulnerable to climate change (Torres-Lima et al., 2022). In Agam Regency, hilly topography, limited irrigation infrastructure, and weak cross-sectoral coordination make it difficult for food policies to adapt to ecological risks. This suggests that a one-size-fits-all policy design is ineffective in regions with high geographic diversity. The theoretical implications of these findings reinforce the argument that environmental variables must be explicitly included in the analysis of public policy implementation. In contrast, the practical implications encourage the formulation of local climate adaptation strategies, such as drought-resistant crop diversification, improved water infrastructure, and technical coordination among agencies.

Overall, the results of this study demonstrate that implementing food security policies in Agam Regency faces multidimensional obstacles encompassing social (community participation), structural (resources and coordination), political (biased aid distribution), and ecological (geographical

constraints and extreme weather) factors. These four factors interact, creating a gap between the content of policy and its implementation context, as described in Grindle's (1980) model. Theoretically, this study enriches the literature by demonstrating the need for an integrative approach that combines policy implementation theory with adaptive and participatory perspectives. Practically, the findings provide recommendations for local governments to strengthen public communication management, improve resource efficiency, expand community-based monitoring mechanisms, and develop policies sensitive to local geographic and climatic conditions to ensure the sustainable effectiveness of food security policies in stunting prevention.

## CONCLUSION

The results of this study indicate that the implementation of food security policies to prevent stunting in Agam Regency has not been optimal, despite having a strong legal basis, including Law Number 18 of 2012 concerning Food Security, Presidential Regulation Number 83 of 2017 concerning Strategic Food and Nutrition Policy, and Agam Regent Regulation Number 12 of 2020 concerning Sustainable Agricultural Land Protection. An analysis using Grindle's (1980) theoretical framework found that policy implementation success depends not only on the policy's content but also on the implementation context, including social, institutional, and environmental conditions. The main factors hindering policy implementation include low community participation in outreach activities, limited budget and human resources, uneven and inaccurate targeting of aid programs, and geographical constraints and extreme weather conditions.

A key lesson from these findings is that the success of food security policies depends heavily on adaptability and collaboration among the government, the community, and local ecological conditions. Thus, sound policies on paper need to be accompanied by implementation strategies that are sensitive to the social and environmental context so that they are not only oriented towards food productivity but also contribute to sustainable stunting prevention.

Theoretically, this research makes an important contribution to the development of public policy implementation theory in Indonesia by expanding the application of Grindle's (1980) model. This research demonstrates that sound policy content does not guarantee successful implementation if the implementation context is not supportive. The main contribution of this research lies in two aspects: First, this research confirms the relevance of Grindle's model in explaining the policy gap between technocratic national policies and the complex realities of implementation at the local level.

Second, this research expands the scope of Grindle's theory by incorporating ecological and spatial dimensions as important factors in policy implementation, particularly in a topographically diverse region such as Agam Regency. Thus, this research enriches the scientific discourse on public policy implementation by adding perspectives on food security based on geographical context and ecological adaptation, which have not been widely explored in policy studies in Indonesia.

The main limitation of this study is its limited coverage, which was conducted only in Agam Regency, limiting the ability to generalize the results to all regions in Indonesia. Furthermore, this study focused more on the implementation process than on the policy's long-term impact on changes in community behavior and child nutritional security. For future research, it is recommended to conduct comparative studies across regions with different geographic characteristics to understand the varying contexts of food security policy implementation.

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