

# Revitalizing Mapalus as a Social Ecosystem Model in Improving Family Food Security to Prevent Stunting

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## Abstract

The stunting phenomenon remains a crucial issue in human resource development in Indonesia. In Minahasa, one form of local wisdom that has great potential is Mapalus, which reflects solidarity, social cohesion, and a network of mutual assistance in daily life, including in food management. The urgency of this research lies in the need to revitalize local social values as an alternative strategy in improving family food security, which plays an important role in preventing child stunting. Mapalus is believed to be able to become a social ecosystem medium that supports food distribution, resource exchange, and the formation of collectivity in meeting family nutritional needs. The purpose of this study is to explore the dynamics and transformation of the Mapalus system in a contemporary context and to develop a community empowerment model based on local wisdom to support family food security and stunting prevention. This research uses a qualitative approach with a case study method. From the results of this study, it was found that community participation in Mapalus is still high among the older generation and families who are mostly farmers, but the younger generation tends to be less involved due to changes in lifestyles and migration to cities. Utilizing community yards and gardens provides diverse food sources, ensuring adequate nutrition for pregnant and breastfeeding women and toddlers. The expected outcome is a conceptual model for revitalizing Mapalus as a local social ecosystem to strengthen food security and prevent stunting.

**Keywords:** *Revitalization, Mapalus, Social Ecosystem, Food Security, Stunting.*

## 1. Introduction

Stunting remains a critical issue in public health development in Indonesia, including in North Sulawesi Province. Data from the 2022 Indonesian Nutrition Status Survey (SSGI) show that the stunting prevalence in Southeast Sulawesi Regency reached 22.1%, exceeding the WHO tolerance threshold of 20%. This figure not only reflects children's health problems but also indicates deeper structural issues related to food security, access to health services, and the socio-cultural dynamics of the community. Fundamentally, stunting is a condition of impaired growth due to chronic malnutrition occurring during the first 1,000 days of life. However, a biomedical approach focusing solely on consumption status and health services is insufficient to explain why stunting persists in areas with abundant food resources such as Southeast Sulawesi. A substantial body of literature shows that social determinants—including cultural norms, family relationship

patterns, local economic structures, and community social networks—affect the patterns of food production, distribution, and consumption at the household level (Demment et al., 2003; Victora et al., 2021). Therefore, a social approach is essential to understand how social factors and local values work either to support or hinder household food security.

Household food security is a fundamental element in preventing stunting. According to the Food and Agriculture Organization (FAO), food security not only encompasses food availability but also access, stability, and utilization within the context of health and nutrition. However, in local communities such as Southeast Minahasa, the concept of food security carries a broader meaning because it is also connected to social structures, traditions of mutual cooperation, and kinship relations that influence families' ability to obtain and manage food resources. Various studies in Indonesia show that food security cannot be separated from informal social networks formed through kinship, customary practices, and community-based economic activities (Suhardi et al., 2020). Food resources are often acquired not only through market mechanisms but through social exchanges, family-to-family loans, mutual assistance among farmers, and collective community work. Therefore, food security should be understood as part of a social ecosystem that is more complex than merely the adequacy of individual consumption.

In the socio-cultural context of Minahasa, one value system that has historically supported the food security ecosystem is Mapalus. Mapalus is a form of local wisdom rooted in Minahasa culture, characterized by collective cooperation based on solidarity and equitable task distribution within a group. Its core value is mutual, non-reciprocal assistance, in which group members work together on the land or activities of other members in rotation. This tradition not only increases work efficiency in agriculture but also strengthens social cohesion, trust, and solidarity—important components of social capital (Makaliwe, 2019). Mapalus also functions as an informal social safety net when families face crises such as food shortages, crop failure, or other urgent needs. Through Mapalus, families do not have to face crises individually but receive support from a long-standing social network passed down across generations.

From a development sociology perspective, Mapalus represents a tangible form of social capital that can strengthen food security. Coleman (1990) explains that social capital includes relational structures that facilitate collective action and resource exchange. In the context of Mapalus, rules, trust, and reciprocal norms within the community enable members to share workload, income, and food yields. Theoretically, this reduces household vulnerability to food shortages, one of the primary risk factors for stunting. When families have strong social networks, they can access support in the form of food, labor, or nutritional information, thereby reducing the risk of chronic malnutrition among children. However, over the past two decades, Mapalus has deteriorated due to structural changes and modernization. Literature indicates that cooperative and traditional solidarity systems in many Indigenous Indonesian communities have weakened due to shifts in economic orientation from communal to individualistic systems, changing youth preferences, migration, and the expansion of market-driven economies (Li, 2021).

Agricultural modernization and the rise of consumerist culture in many North Sulawesi villages have also changed how communities perceive collective work. Activities previously carried out collectively through Mapalus are now often replaced by wage-based systems and hired labor. This shift transforms social relationships from solidarity-based to transactional. The degradation of Mapalus directly affects household food security structures. When collective work is replaced by market mechanisms, families with limited economic resources find it increasingly difficult to access labor or support to meet their food needs. Meanwhile, more economically capable families tend to become more individualistic and disengaged from broader communal activities. This change increases inequality in access to resources, including food. A study by Palar et al. (2020) in Minahasa found that families still involved in Mapalus-based communities have more stable food security than those lacking strong social networks.

Furthermore, cultural shifts and weak regeneration mean that younger generations are less familiar with the social function of Mapalus. Many young people prefer working in formal sectors

or pursuing urban employment rather than engaging in agriculture or traditional community activities. Consequently, collective work is no longer part of daily life. This condition weakens society's capacity to build community-based food crisis coping mechanisms. On the other hand, formal government programs, although important, cannot replace the long-term role of informal social networks such as Mapalus. Many stunting intervention programs are top-down and focus on education and nutritional assistance but fail to address socio-cultural roots influencing consumption behavior and household survival strategies. Policy studies reveal that interventions not considering local contexts often fail because they do not align with community values, practices, and social structures (Chandler & Reid, 2020)

Understanding Mapalus as social capital and as a food security strategy suggests that efforts to reduce stunting in Southeast Minahasa should focus on strengthening local cultural practices that support food availability and access. Mapalus revitalization can be carried out through community empowerment approaches involving traditional leaders, youth, women, and village governments collaboratively. Reinforcing values of mutual cooperation can encourage collective local food production, expand inter-household exchange networks, and improve access to healthy food among vulnerable families. Additionally, integrating Mapalus values into government programs such as family health posts, village food resilience initiatives, and nutrition interventions can create synergy between formal policies and local social practices. Culturally grounded social capital has been shown to enhance the effectiveness of development programs when applied contextually and inclusively.

In conclusion, stunting in Southeast Minahasa cannot be understood solely as a nutritional issue but as a structural problem linked to the weakening of traditional social networks. Strengthening household food security requires not only technical interventions but also rebuilding the community's socio-cultural ecosystem through the revitalization of local wisdom such as Mapalus. A culturally grounded approach allows development interventions to operate more effectively, sustainably, and in ways accepted by the community. Revitalizing Mapalus values means restoring social solidarity as the foundation of food security, which indirectly contributes to reducing stunting rates in Southeast Minahasa.

## **2. Literature Review**

### **Food Security and Its Relevance to Stunting**

Food security is a multidimensional concept that not only includes food availability but also covers aspects of accessibility, utilization, quality, and long-term stability. According to the Food and Agriculture Organization (FAO), a household is considered food secure when all its members have physical, social, and economic access to sufficient, safe, nutritious, and diverse food that can be obtained sustainably. In the Indonesian context, food security is influenced by the household's socioeconomic conditions, access to production resources, parents' education levels, and food price dynamics. When any of these elements is disrupted such as uneven food distribution, declining purchasing power, or weakened local food production households can fall into food insecurity. This condition directly affects consumption patterns and children's nutritional quality.

The relationship between food security and stunting is particularly strong during the critical 1,000 Days of Life (HPK), which spans from conception to the age of two. During this phase, adequate maternal and child nutrition becomes a primary determinant of healthy physical growth and cognitive development. Various studies in Indonesia show that households experiencing food insecurity have a higher risk of giving birth to stunted children. Food insecurity reduces intake of protein, iron, zinc, calcium, and other micronutrients that are crucial for growth. Moreover, food-insecure households tend to rely on cheaper foods that are high in carbohydrates but low in nutrients. In the context of Southeast Minahasa, although the region has relatively strong agricultural and fisheries potential, challenges remain in food distribution and families' ability to

access quality nutrition. Thus, food security must be understood as a structural factor intertwined with social, economic, and cultural conditions that determine stunting risk.

### **Social Capital as the Foundation of Collective Work and Community Resilience**

Social capital is an essential concept for understanding community development dynamics, especially in rural areas. According to Coleman and Putnam, social capital consists of three main elements: social networks, trust among individuals or groups, and shared norms that guide collective action. Social capital enables community members to collaborate effectively because of mutual trust, reciprocal obligations, and social control mechanisms that maintain group balance. In local development contexts, social capital often becomes a non-material resource more valuable than physical assets. When social capital is strong, communities can create buffering mechanisms that protect their members from economic, social, and nutritional crises. Conversely, when social capital weakens, communities become more vulnerable to shocks and uncertainty.

In Indonesia, social capital is manifested through the tradition of gotong royong, a collective work practice voluntarily carried out for the common good. Gotong royong is a cultural heritage that predates modern governmental structures. This practice not only facilitates faster completion of tasks but also creates emotional bonds among community members, nurtures mutual care, and builds solidarity mechanisms that function as an informal social security system. Research shows that gotong royong strengthens social resilience, increases informational access, and supports resource distribution during crisis situations, including the fulfillment of household food needs. In rural areas, strong social networks enable families facing hardship to receive food assistance, labor, or moral support from the community. Therefore, social capital plays a significant role in addressing vulnerabilities that can trigger nutritional problems, including stunting.

### **Mapalus as a System of Collective Work and Social Protection in Minahasa Communities**

Mapalus is a form of local wisdom among the Minahasa people and has long served as a foundation of community social and economic life. As a system of collective work, Mapalus involves community groups who work collaboratively and in rotation in activities such as farming, house construction, social gatherings, and traditional rituals. This system is built upon values of solidarity, togetherness, and reciprocity, where every group member is obligated to assist others when they need labor or resources. In Mapalus, relationships among members are not transactional but based on mutual trust and moral responsibility. Therefore, Mapalus is not merely a collective work mechanism but a social ecosystem that regulates labor distribution, harvest sharing, and community-based social protection.

In terms of food security, Mapalus has long functioned as a crisis buffer, especially for families facing difficulties in food production. Through collective labor, farmers can overcome labor shortages, speed up planting and harvesting processes, and reduce risks of crop failure. In some traditional Mapalus practices, harvests are shared or set aside for group needs or for members experiencing hardship. This solidarity-based redistribution pattern serves as an informal social safety net that enables families to maintain food access even during economic hardship. Thus, Mapalus functions as a contextual form of social capital that directly contributes to stabilizing household food security.

However, a major challenge emerges as Mapalus faces what can be described as "cultural entropy," where the practice weakens despite its values still being recognized. Modernization, economic restructuring, increasing individualism, and declining interest among younger generations in traditional practices have caused Mapalus to lose its prominence in daily Minahasa life. As collective work becomes increasingly replaced by market-based mechanisms such as the use of paid labor, poor families' access to social support becomes more limited. This widens vulnerability gaps and can ultimately increase stunting risks among food-insecure households. Therefore, revitalizing Mapalus as a local sociocultural strategy is crucial to strengthening community solidarity networks and improving food security as part of stunting prevention efforts.

### 3. Research Methods

This study employs a qualitative approach with a case study design to comprehensively explore how the Mapalus social system contributes to strengthening household food security and preventing stunting in Southeast Minahasa. The qualitative approach was chosen because it enables the researcher to deeply understand the social and cultural realities embedded within the community and to trace the meanings, values, and practices that shape collective behavior in food management and child health. In this context, the study does not solely focus on quantitative data such as nutritional prevalence or food distribution, but rather emphasizes understanding the processes, interactions, and community experiences that form the dynamics of food security. The case study design is used because it provides space for the researcher to examine social phenomena holistically within the context of everyday life, allowing interpretations that are more in-depth and aligned with local realities.

The research site is located in Rasi Satu Village, Ratahan District, Southeast Minahasa Regency. This location was selected because it represents one of the areas that still maintains the practice of Mapalus in its social life whether in agriculture, social activities, or family-based mutual assistance mechanisms. In addition, the area faces challenges in reducing stunting rates and child nutrition problems, making it a relevant context for examining the relationship between local cultural values, food security, and children's nutritional status. The presence of an active social system combined with real nutritional issues makes Rasi Satu Village an ideal location for deeply exploring how Mapalus functions as a form of social capital that has the potential to support stunting prevention efforts.

Participants in this study were selected using purposive sampling to ensure that the information obtained would be relevant to the research objectives. Participants consist of several strategic groups: (1) household heads both mothers and fathers who are directly involved in providing and managing household food as well as child care; (2) community leaders who understand the history, values, and practices of Mapalus in the social life of the residents; (3) local health workers such as posyandu cadres, village midwives, or community health center personnel who possess information regarding child nutrition conditions, nutritional intervention programs, and field challenges; and (4) families with children who have nutritional problems or are at risk of stunting. This participant composition is expected to provide a comprehensive overview of how the Mapalus system operates, how food is managed, and how families deal with nutritional challenges.

The research process was carried out in three main stages. The first stage is data collection. In this stage, several techniques were used simultaneously to obtain rich and in-depth descriptions. First, in-depth interviews were conducted with household heads, community leaders, and health workers to understand their experiences, views, and practices related to Mapalus, food security, and stunting prevention. The interviews were conducted flexibly using semi-structured interview guides, allowing the researcher to explore broader information according to conversational dynamics. Second, participatory observation was conducted by the researcher either participating in or directly observing community activities, particularly those related to the implementation of Mapalus in agricultural work, collective labor, or other social activities. This observation is important for understanding social practices that cannot always be articulated in interviews. Third, focus group discussions (FGDs) were conducted to explore collective community perceptions, understand inter-actor dynamics, and map shared values that influence food management and child health. Additionally, documentation and literature review were carried out to enrich the understanding of the history of Mapalus, local nutrition data, and policies related to food security and stunting.

The second stage is data analysis. The data collected through interviews, observations, FGDs, and documentation were analyzed using thematic analysis. The analysis process began by transcribing all interview and discussion recordings verbatim. After transcription, the researcher

conducted initial coding to identify important data segments relevant to the research focus. These codes were then grouped into broader categories to identify patterns, relationships, and main thematic findings such as values of solidarity, mechanisms of Mapalus work, household food fulfillment strategies, nutritional challenges, and interactions between social capital and children's nutritional status. The analysis was carried out iteratively, allowing the researcher to continuously compare new data with previous findings. To ensure data credibility, dependability, and confirmability, this study implemented triangulation techniques, including source triangulation (comparing information from different participants), method triangulation (comparing interviews, observations, and FGDs), and secondary data triangulation. Triangulation was conducted to minimize bias and ensure that interpretations were grounded in strong evidence.

The third stage is the preparation of the research report. At this stage, the researcher prepared a progress report after completing the data collection phase, which served to present preliminary findings and developments in the research process. Upon completing the entire data analysis, the researcher prepared a final report containing comprehensive findings regarding the role of Mapalus in food security and stunting prevention in Southeast Minahasa. The final report will be written according to scientific writing standards and prepared for publication in a nationally accredited SINTA-4 journal. Such publication is expected to provide both academic and practical contributions to the development of stunting-prevention strategies based on local wisdom.

#### **4. Result and Discussion**

##### **Mapalus Practice in Rasi Satu Village**

The research findings indicate that the practice of Mapalus in Rasi Satu Village remains a highly important social mechanism for the community, particularly in supporting agricultural activities and household food management. Although modernization has influenced many aspects of rural life, Mapalus continues to function as a collective work system embedded in the daily lives of the people. In practice, Mapalus is carried out through rotational labor among families in rice fields and gardens, where group members help one another to cultivate land, plant crops, remove weeds, harvest, and transport yields. This rotational system allows for an even distribution of labor, enabling families with limited workforce to manage their land optimally without having to spend additional costs on hired labor. This condition is especially helpful for lower-income families, who form a significant portion of the population in Rasi Satu Village.

Beyond work in rice fields and gardens, Mapalus also involves a mechanism of borrowing harvest yields as a form of solidarity when a family experiences crop failure due to extreme weather, pest attacks, or other technical factors. This borrowing system is often informal and does not always require repayment of the same quantity, but instead follows a collective moral agreement. Such practices strengthen the internal solidarity network of the village and ensure that no family falls into severe food insecurity during difficult times. Participatory observations also show that Mapalus is not merely an economic activity but is also rich in social values such as inter-family communication, social bond reinforcement, small customary rituals, and collective learning about agricultural techniques. In several activities, Mapalus even becomes an intergenerational learning space where elders teach the value of mutual cooperation to children and adolescents. However, despite the high participation in Mapalus among the older generation and farming families, youth involvement appears to be declining. This is due to lifestyle changes, increasing urban migration, and the younger generation's orientation toward more individualistic work. Nevertheless, Mapalus remains an important part of community life in Rasi Satu Village and continues to function as a key pillar of local food security.

##### **The Contribution of Mapalus to Household Food Security**

Mapalus significantly contributes to household food security through various mechanisms that operate simultaneously within the social structure of Rasi Satu Village. First, in terms of productivity, Mapalus increases the efficiency of agricultural land management. Collective work

enables land to be processed more quickly and systematically, reducing the workload of families and minimizing the risk of delays in planting and harvesting seasons. This efficiency is crucial considering the average land area of around 1,069.33 hectares distributed among 432 families, meaning each household must maximize its limited land with the available labor. With the support of Mapalus, families can ensure the availability of food sourced from their fields and gardens, which serve as the primary supply of daily consumption.

Second, Mapalus functions as a social buffer against crop failure. The system of borrowing harvests between families helps maintain food security for those affected by agricultural disasters or economic crises. This practice demonstrates that collective work does not only serve as a productive mechanism but also as an effective informal social protection network at the local level. When one family is in difficulty, others contribute by providing assistance without demanding immediate compensation.

Third, Mapalus supports household food diversification. Through the management of home gardens and farmland, the community can produce various food sources such as vegetables, fruits, tubers, legumes, and local crops rich in micronutrients. Such diversification is crucial for ensuring adequate nutrient intake for pregnant women, breastfeeding mothers, and toddlers. Nutrition literature shows that local food diversification is one of the most effective strategies to maintain household nutritional security, especially in rural areas vulnerable to food price fluctuations.

Fourth, Mapalus offers strong educational and social effects. Through collective activities, community members exchange information about farming techniques, harvest storage, pest prevention, and healthy consumption patterns. This knowledge transfer occurs not only from the older to the younger generation but also among families with different experiences. Thus, Mapalus strengthens food security not only materially but also by building sustainable social capacity and collective knowledge in managing household food.

### **Implications of Mapalus for Stunting Prevention**

The contribution of Mapalus to stunting prevention is evident in how the system helps maintain access to nutritious food and supports appropriate dietary practices for pregnant women, breastfeeding mothers, and toddlers. Posyandu data in Rasi Satu Village show that most children receive supplementary food, vitamins, and basic health services as recommended. However, the effectiveness of these formal health interventions is heavily influenced by household food security, which in this village is largely supported by the Mapalus system. With yields from their own fields, families can provide nutritious meals at least three times a day, which is a key factor in the First 1,000 Days of Life the most critical period for stunting prevention.

Additionally, the social solidarity within Mapalus creates an environment that promotes good nutrition practices. Community members remind each other about the importance of giving nutritious food to toddlers, maintaining pregnant women's diets, and attending posyandu activities. Such community involvement strengthens the impact of government programs, as health messages come not only from medical workers but also from internal social networks within the village. This aligns with studies showing that social capital and collective work practices can enhance the effectiveness of nutrition programs, accelerate behavior change, and increase adherence to public health interventions. Thus, Mapalus holds a strategic role as a community-based social intervention that reinforces stunting prevention efforts.

### **Challenges and Barriers to Mapalus Practice**

Although Mapalus continues to function in the daily life of Rasi Satu Village, its practice faces several structural, cultural, and economic challenges. One major challenge is the high rate of labor migration, particularly among young people who move to cities for work. This reduces the number of active members in Mapalus activities, making it difficult for some families to find labor

during planting or harvesting seasons. Migration also disrupts cultural regeneration, as younger generations are no longer directly involved in this traditional practice.

The second challenge is the increasingly modern lifestyle, which shifts community orientation especially among the youth toward individualism and more rational economic calculations. Mapalus, which is based on principles of solidarity and mutual reciprocity, is becoming viewed as impractical by some residents who work in non-agricultural sectors or have inflexible working hours.

Third, the values of Mapalus are increasingly difficult to pass down due to limited informal education about the importance of collective work for community sustainability. New families are often unfamiliar with Mapalus practices and prefer to rely on hired labor, leading to a decline in the social and moral meanings of the practice.

Fourth, economic pressures also pose significant constraints. Some families must divide their time between farming activities and additional jobs outside the village. As a result, they cannot fully participate in Mapalus, causing scheduling mismatches and reducing the effectiveness of collective work.

Fifth, Mapalus institutions are still informal and lack standardized organizational structures. This means that coordination among members often depends on the initiative of a few key figures. When these individuals are inactive, Mapalus activities may stall. Moreover, the absence of formal rules sometimes causes perceptions of unfairness in the distribution of tasks or benefits, which can affect group harmony.

### **Interpretation of Findings in Theoretical and Literature Perspectives**

The interpretation of the research findings indicates that Mapalus functions as an effective social ecosystem that strengthens household food security, and its role aligns with the concept of social capital as proposed by Putnam and Coleman. From the perspective of social capital, strong social networks, norms of mutual assistance, and a high level of trust serve as the foundation for successful collective action within communities. Mapalus embodies all these elements of social capital: inter-family work networks, reciprocal norms, and strong bonds of solidarity that enable the creation of a stable and resilient food production system.

The declining participation of younger generations in Mapalus reflects symptoms of cultural entropy, in which the values of Mapalus remain conceptually alive but its practices weaken due to modernization, migration, and lifestyle changes. This aligns with cultural entropy theory, which explains that traditional practices tend to diminish as societies shift toward market-oriented economies and more individualistic values.

From the perspective of food and nutrition security, Mapalus supports the literature emphasizing the importance of local food diversification as a strategy to prevent malnutrition. Through the management of gardens and household yards, communities can provide diverse sources of nutrient-rich foods, thereby helping meet the nutritional needs of toddlers, pregnant women, and breastfeeding mothers. Additionally, Mapalus offers an essential food buffer during crop failures, thus reducing the risk of households experiencing food shortages that may lead to stunting.

Overall, the findings of this study reaffirm that Mapalus is not merely a traditional work mechanism but also a community-based social intervention that can serve as a vital pillar in strengthening food security and preventing stunting in rural communities.

## **5. Conclusion**

Based on the overall findings of the study, it can be concluded that Mapalus still holds strong relevance as a social ecosystem that supports household food security in Rasi Satu Village. The Mapalus practice rooted in the values of solidarity, mutual cooperation, and collective labor has proven not only to facilitate land cultivation and food distribution, but also to provide a social protection mechanism for vulnerable families, especially in situations of crop failure or limited



economic access. In the context of stunting prevention, Mapalus functions as an informal support system that ensures sustained access to nutritious local food and promotes better consumption patterns among pregnant women, breastfeeding mothers, and toddlers, thereby reinforcing formal health interventions carried out by posyandu and village medical workers. However, this study also highlights that the sustainability of Mapalus faces significant challenges due to modernization, youth migration, shifts in value orientation, and weakening cultural regeneration. These conditions underscore the importance of revitalizing Mapalus so that it remains relevant and adaptable to ongoing social changes.

In line with this, the study recommends stronger integration among village authorities, health institutions, and the Mapalus social structure in designing food security and stunting prevention programs. The involvement of the younger generation is an essential aspect that requires attention, both through education on mutual cooperation values and through technological innovations that can facilitate Mapalus coordination activities, such as work rotation applications or digital data systems. Furthermore, strengthening the institutional aspects of Mapalus is necessary to maintain organizational mechanisms, benefit distribution, and the continuity of cultural values, while ensuring alignment with the needs of modern communities. Thus, Mapalus can function not only as a cultural heritage but also as a strategic social instrument in achieving household food security and preventing stunting in rural areas.

## 6. Suggestion

Future research is encouraged to explore the revitalization of Mapalus through interdisciplinary approaches that integrate social, cultural, economic, and technological perspectives, particularly in relation to household food security and stunting prevention. Studies involving comparative analyses between villages that masih aktif menjalankan Mapalus and those that have experienced cultural decline may provide deeper insights into factors that sustain or weaken collective action. Researchers are also advised to examine how digital innovation, youth participation, and formal–informal institutional collaboration can strengthen the adaptability of Mapalus in modern contexts. Additionally, longitudinal studies that monitor changes in food security and child nutritional status over time will help capture the long-term impact of Mapalus-based interventions. Such research may contribute to more evidence-based policymaking and reinforce the role of local wisdom in supporting community health and resilience.

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