

IMPLEMENTATION OF SOCIAL PROTECTION TO ACCELERATE STUNTING REDUCTION: AN ADAPTIVE SOCIAL PROTECTION PERSPECTIVE STUDY

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ABSTRACT

This study aims to analyze the implementation of social protection in accelerating stunting reduction in West Bandung Regency from the perspective of adaptive social protection. This study employs a qualitative approach with an explanatory case study method, focusing on West Bandung Regency due to its stunting prevalence rate being higher than the national average. Data were collected through documentation, in-depth interviews, and focus group discussions involving local government officials, experts, and community members. Data analysis follows Miles and Huberman's model, comprising data condensation, display, and conclusion drawing, and data validity was ensured through source and method triangulation. The study concludes that while the regional government has demonstrated a strong commitment and established collaborative governance to reduce stunting, challenges remain in data integration, adaptive response mechanisms, and program effectiveness. From the adaptive social protection perspective, improvements are needed in digital infrastructure, cross-sector coordination, and crisis responsiveness to ensure more targeted, timely, and sustainable interventions. These findings imply that future policies should prioritize the integration of real-time, risk-based data systems and enhance adaptive capacity at both institutional and programmatic levels to better address stunting risks, especially during crises.

Keywords: social protection, stunting, adaptive, social information system.

INTRODUCTION

Stunting, with its significant impact on the quality of human resources, is still a global challenge, including Indonesia. The trend of decreasing stunting rates has been stopped due to COVID-19, due to various factors that directly or indirectly affect access to nutrition, health, and community welfare. Research on stunting has developed from just medical and nutritional studies. [1]; [2] ; [3] Towards a multidimensional approach that considers socio-economic aspects, social protection policies, and the impact of global crises [4]; [5]. Structural factors such as family income levels also play a big role in determining the nutritional status of children. As many as 76% of stunted toddlers come from families with incomes below the Regional Minimum Wage (UMR), emphasizing that socio-economic aspects have a crucial role in determining access to food and health services. Meanwhile, the increasing incidence of extreme weather and disasters over the past six decades [6] Have exacerbated conditions, with impacts that include disruptions to food security and access to essential services. In this context, social protection has a very important role in tackling stunting. However, the pandemic has exposed various weaknesses in the social protection system, including low policy flexibility in responding to crises.



Gambar 1. Prevalensi Stunting di Indonesia Tahun 2022

Sumber: lppm.itk.ac.id

Based on the distribution map of stunting prevalence, it is evident that most provinces in Indonesia still have stunting rates above the threshold set by the World Health Organization (WHO), which is 20%. This indicates that stunting remains a widespread and serious public health issue across the country. The high prevalence reflects ongoing challenges related to nutrition, health services, sanitation, and socio-economic conditions that require comprehensive and integrated interventions. [18].

Stunting is a public health problem that is highly vulnerable to various crises, including climate change, disasters, and economic instability, because it hinders access to nutritious food and health services for stunted vulnerable groups. [7]; [8]; [9]; [10]; [11]. Therefore, social protection must be more adaptive by combining social protection, disaster risk reduction, and climate adaptation goals to ensure long-term prevention. A resilient social protection system requires four key elements: assistance programs, data utilization, financial access, and effective partnerships, so that social interventions can reach the communities most affected. [6]. The social protection approach has been limited to one aspect without considering the integration of the four building blocks. Many developing countries do not yet have social protection mechanisms flexible enough to respond to major shocks such as pandemics and natural disasters, so interventions for vulnerable groups are not optimal. Communities must become more resilient by having three main capacities, namely preparing for risks, overcoming the impacts that occur, and adapting to post-crisis changes. Research related to adaptive social protection in the health sector has been developing. [12]; [13]; [14] But there has been no study that specifically explores how adaptive social protection can be applied holistically in accelerating stunting reduction.

The previous research has been done by [5] "The Relationship between Family Income and Stunting Incidence." This study shows that as many as 76% of stunted toddlers come from families with incomes below the Regional Minimum Wage (UMR). These findings indicate that socio-economic factors, particularly family income levels, have a significant influence on children's nutritional status, as they are closely related to the family's ability to access nutritious food and health services. This research provides a strong basis that a multidimensional approach, including economic-based social protection, is essential in efforts to accelerate stunting reduction.

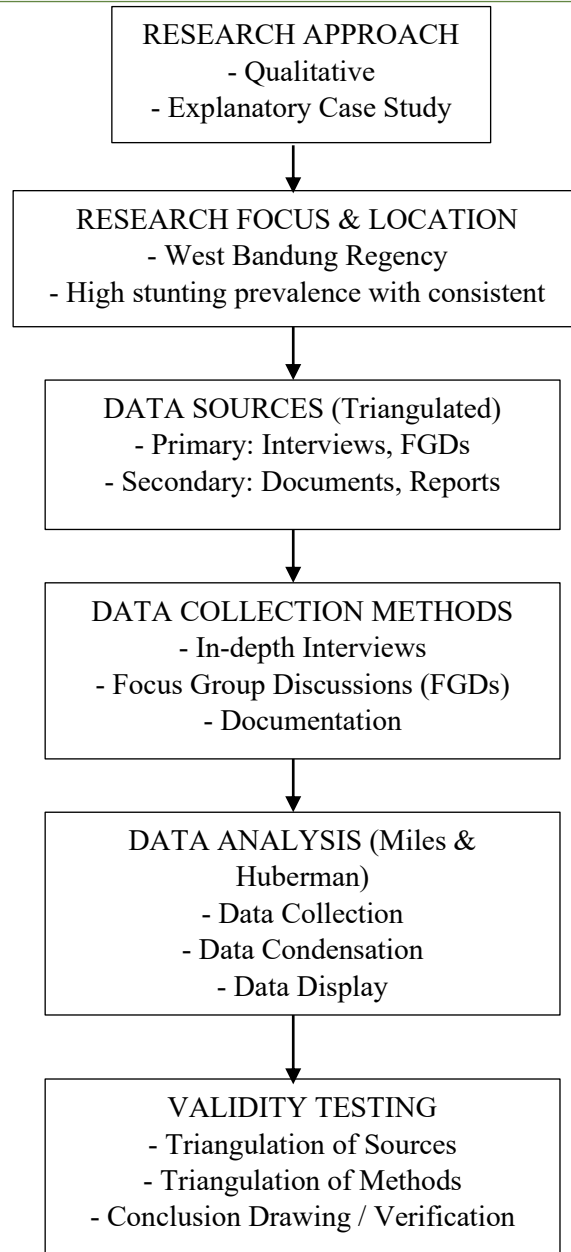
Furthermore, Bowen et al. (2020) [6] "Adaptive Social Protection: Building Resilience to Shocks." This study conveys that adaptive social protection requires four main pillars, namely: social assistance programs, data utilization, financial access, and multi-sector partnerships. With these four elements, social protection becomes more resilient and responsive to shocks such as disasters, pandemics, or climate change. Be an important reference in the framework of the adaptive social protection concept you use. This study underlines how policy interventions can be designed to better prepare to face the risk of stunting due to multidimensional crises.

This research presents a novelty through an adaptive social protection approach in the context of stunting management, which has not been explored specifically in Indonesia. If previously the research tended to focus on the medical, nutritional, or program intervention dimensions in general, this study integrates the four pillars of adaptive social protection—namely assistance programs, data and information systems, responsive funding, and cross-sectoral partnerships—as an analytical framework in measuring the effectiveness of policies to accelerate stunting reduction in vulnerable areas. This study examines the extent to which these elements have been adopted systematically by the Regional Government (West Bandung Regency), as well as identifying gaps in institutional readiness, data integration, funding mechanisms, and early warning systems. This makes a theoretical and practical contribution to building a more resilient and proactive social protection system to face the risk of stunting due to multidimensional crises such as disasters, climate change, and economic instability.

This study aims to analyze the implementation of social protection in accelerating stunting reduction in West Bandung Regency from the perspective of adaptive social protection. In particular, this study aims to examine the role of institutions and cross-sectoral partnerships in supporting policies to accelerate stunting reduction, evaluate the extent to which social data and information systems have been integrated and used adaptively in detecting and responding to stunting risks, examining the effectiveness of funding mechanisms and early warning systems in strengthening the resilience of households vulnerable to economic and social shocks, and analyze how the design of social protection programs has been adapted to respond to emergencies and support the sustainability of nutrition interventions.

METHODOLOGY

This study uses a qualitative approach to explanatory case study methods. This research focuses on West Bandung Regency, where this region has a higher stunting prevalence rate than the national average, so it requires more intensive and coordinated interventions. Although it has a stunting prevalence rate above the national average, West Bandung Regency can consistently reduce the stunting prevalence rate. This research data comes from informants as a primary data source and documents as a secondary data source. The informants in the research come from elements of the Regional Government as program implementers, academics or practitioners as experts, and the community as program recipients. To obtain data relevant to this research, the data collection techniques that will be used are documentation, in-depth interviews, and Focus Group Discussions. Data analysis consists of testing, categorization, tabulation, or recombining evidence to designate the initial proposition of the research [17]. The steps of data analysis that will be carried out are based on Miles and Huberman's theory, namely data collection, data condensation, data display, and conclusion or verification. The validity test of the data was carried out by triangulating sources and methods.



Gambar 2. Framework Research

RESULT

Institutions and Partnerships

1. Government Leadership

The commitment of regional governments in Indonesia to reduce stunting is reflected through the formulation of specific regulations and programs that engage multiple stakeholders in delivering nutrition-specific interventions and monitoring pregnant women and children under five who are at risk. These formal policies support a comprehensive and integrative approach to stunting reduction, encompassing cross-sectoral collaboration, dedicated funding, and structured monitoring and evaluation mechanisms [22]. One strategic move is the designation of stunting reduction as a regional performance indicator, which ensures its inclusion in every stage of local development planning. The mobilization of all regional apparatus to support stunting-priority villages demonstrates a systematic and inclusive governance strategy that promotes equitable intervention delivery. However, previous studies highlight that many local governments have yet to incorporate adaptive social protection systems focused on preemptive measures and the resilience of poor households to socio-economic shocks [23]. As a result, current interventions tend to be reactive rather than anticipatory, and the lack of integration between stunting reduction and broader socio-economic resilience frameworks may leave vulnerable populations exposed to recurring risks during crises.

2. Policy Coherence and Cross-Sector Cooperation

Existing regulations provide a clear legal basis for accelerating stunting reduction in a holistic and integrated manner. The Regional Government has shown seriousness in dealing with stunting by adapting national

regulations, as well as drafting various supporting policies such as circulars and instructions related to changes in community behavior. Programs such as "Pelita Bening," owned by the Regional Government, encourage collaboration between regional apparatus, ensuring that each sub-district receives assistance in accelerating stunting reduction. Policies include improving nutrition, food security, sanitation and environmental health, demonstrating a comprehensive approach to tackling stunting. Regional Regulations encourage corporate social responsibility in nutrition and health programs, while various circulars help build awareness and change in people's behavior. However, there are still weaknesses where the Regional Government has not established a social protection system that directly focuses on preventing and strengthening the resilience of poor households to economic and social shocks. In addition, existing regulations have not fully internalized the concept of household resilience to shocks, so social protection is still more reactive than proactive and adaptive.

3. Governance Structure

The Regional Government has formed the Stunting Reduction Acceleration Team (TPPS) at various levels by involving various elements such as the central and regional governments, academics, professional organizations, NGOs, community organizations, and others. TPPS covers the health, education, agriculture, economy, and social sectors, with clear duties and responsibilities, minimizing overlapping authority, and increasing the effectiveness of program monitoring and evaluation. Existing regulations are a clear legal basis for the implementation of strategies to accelerate stunting reduction in a holistic and integrated manner. The Regional Government has adapted national regulations by reviewing existing regulations in the regions to ensure policy alignment with the national strategy to accelerate stunting reduction. However, disaster actors have not been formally included in the TPPS structure, resulting in disaster impact preparedness that is less integrated with social protection strategies and responses to stunting.

4. Institutional Capacity

The Regional Government has carried out capacity building for 165 village governments, ensuring that all village governments receive guidance in accelerating stunting reduction. Action 5 in the Stunting Convergence ensures that actors at the village level have a clear and coordinated role in reducing stunting rates. Cadre development has been carried out by the relevant agencies, reaching all villages and sub-districts, and adjusting interventions to local conditions. The government uses the EMO-DEMO approach and education modules to ensure that cadres are able to provide counseling in accordance with recommendations for pregnant women and children, so that nutrition-based interventions can run more optimally. However, many cadres leave the system without formal attachment, so it is necessary to carry out continuous retraining to replace cadres who are no longer active. Cadres and assistants have diverse capacities, so education and assistance for the community are not optimal, especially in terms of changing the behavior of aid recipients related to stunting.

Data and Information Systems

1. Household Risk and Vulnerability Assessment

West Bandung Regency already has data on families at risk of stunting, audits of stunting clowns, and stunting prevalence data at various levels, including health centers, sub-districts, and villages. Efforts to update data are carried out periodically through the Family Information System (SIGA) as well as regular reporting to Bappelitbangda and related OPDs to ensure the accuracy and effectiveness of interventions. The government has implemented direct data collection through field surveys, as well as validation and verification processes to ensure that the data used represents the actual conditions. Disaster management actors utilize population data, health data, and environmental data in emergency conditions to ensure appropriate interventions, including in the aspects of nutrition and health services. Updated data through digital-based applications allows for faster decision-making and responsiveness to changing situations, including in crisis conditions. However, time and resource constraints led to a quick approach that lacked depth in data analysis, resulting in the program being more generalized. A considerable gap from different measurement sources indicates differences in sample coverage, measurement quality, and frequency of data collection, potentially affecting the accuracy of the analysis results. There are still limitations in data collection and input officers, and there are no agreed-upon standard criteria, so the mapping process of target groups has not been maximized. Inappropriate measurement tools, complex application systems, and limited budget allocations cause data validation to be suboptimal, potentially hindering the effectiveness of social protection interventions.

2. Social Listings

Action 6 ensures that Bappelitbangda is the person in charge of coordination, while the regional apparatus is responsible for the availability and utilization of data, which is then discussed in the regular TPPS meeting. Data in the regional apparatus is systematically matched, including synchronization of social and health data, as well as the implementation of a single NIK to reduce duplication of aid recipients. The field survey process, validation of social assistance recipients, and data blending with the DTKS system ensure that the data collected truly represents real conditions in the field. Local Governments are committed to updating data through the Family Information System (SIGA) and periodic reporting, enabling data-driven decision-making. The use of technology in data management ensures real-time monitoring, increases transparency, and accelerates responses to changing conditions. The change from DTKS to DTSN (Single Social and Economic Data) managed by BPS is a strategic step in improving data alignment for social assistance targeting. However, the validation system still faces obstacles, including a lack of transparency in automated criteria, as well as limitations in feedback mechanisms

for social companions. Errors in data collection cause eligible families to be not recorded (exclusion error), while those who are not entitled are actually included as recipients (inclusion error). West Bandung Regency still faces obstacles in harmonizing data between sources, so the available information is not fully accurate and integrated. Different programs apply non-uniform definitions, formats, and indicators, causing difficulties in combining data efficiently. Data related to the integration of social assistance recipients, access to nutritious food, and the condition of households at risk of stunting are still not systematically available, hampering the effectiveness of adaptive social protection policies.

1. Early Warning System

The Regional Government has implemented monitoring of the nutritional status of children and pregnant women through monthly weighing of toddlers, which allows for early detection of stunting risks and faster intervention. The data collected is analyzed using an application provided by the Ministry of Health, so that the identification of the nutritional conditions of children and pregnant women can be carried out more accurately and in a timely manner. Robust data infrastructure and early warning systems contribute to ensuring a rapid response in the distribution of aid and nutrition interventions, especially for vulnerable groups. The Health Office routinely updates child and maternal health status data, which is used in the early detection of stunting vulnerability in disaster areas, allowing for more effective allocation of assistance. Disaster management actors have established disaster-resilient villages and disaster-resilient families, enabling communities to understand disaster threats, including those related to nutrition and health. However, the collected health data has not been integrated with the data of disaster management actors, so there is still no system that can detect disaster-prone areas that are at risk of disruption of access to clean water, food, and health services. Disaster management actors collaborate with the Health Office and the Social Service in handling stunting in disaster-affected areas, but coordination is only carried out on a case-by-case basis, without a regular communication forum. Disaster management actors do not yet have an integrated program with relevant agencies to prepare the community to face nutritional risks when a disaster occurs, so intervention is still limited to response after the event. Monitoring of food prices in disaster-affected areas or extreme poverty has not been used as part of the early warning system, so the potential for scarcity of nutritious food is still difficult to detect proactively.

1. Crisis Paca Needs Assessment

Local governments have implemented regular monitoring and updating of maternal and child nutrition status data, even outside of disaster conditions, allowing for early detection and faster intervention. Analysis of the impact of the crisis on access to food, sanitation, and health services has been carried out by relying on data reports from the Health Office, ensuring a more targeted and targeted response. Disaster management actors are responsible for monitoring post-crisis conditions, including the distribution of social assistance and mapping of affected populations, ensuring the continuity of social protection. The Health Office has an update system that allows data changes to be followed up immediately, so that decisions can be made based on the latest information. Disaster management actors, the Health Office, and the Social Service have worked together in dealing with the impact of the crisis, including the distribution of aid and monitoring the health status of families at risk of stunting. However, the validation of social assistance recipients is still carried out by requesting manual data matching to the Social Service, causing potential inaccuracies in the distribution of assistance. Disaster management actors and related agencies are still evaluating needs incidentally, rather than as a structured mechanism that can systematically adjust social protection to changing conditions. The lack of a social data update system can cause eligible families to be excluded (exclusion error) or recipients who are not eligible to be included in the list (inclusion error).

1. Data Sharing Protocol Platform

Regional Governments have easy access to data for all regional apparatus, including those who are not members of TPPS, with a simple login system and regular coordination forum support. Data from various regional devices is systematically matched to avoid overlapping program objectives, including synchronization with DTKS and P3KE systems. Data can only be accessed through written requests and news releases, as well as access restriction mechanisms to ensure data is used responsibly and cannot be edited directly. An app-based system has been provided by the government to ensure that data remains up-to-date and accurate, as well as to assist in monitoring nutritional status and social protection. Regional data provider apparatus is open and willing to assist in understanding and utilizing data, including training for cadres and officers who need access to information. However, the Regional Government does not yet have a public platform to provide data, making it difficult for the general public to access information about social protection programs. There is no clear access mechanism from the relevant ministries, causing limitations in the use of national data, such as Regsosek, which has not been fully approved. Nationwide concurrent access schedules cause servers to go down frequently, leaving officers to work outside of operating hours to avoid access disruptions. Application training is still a challenge, especially for cadres who are not familiar with technology, hampering the speed and efficiency of data utilization in the field. Many families are unaware of the existence of social protection programs or are confused about how to register, so more active education and data clarification, and correction mechanisms are needed.

Funding

1. Estimated Response Costs

Disaster management actors have evaluated the impact of the crisis, using data from the Health Office, Health Centers, and Posyandu, ensuring that health and nutrition interventions are carried out based on accurate

information. West Bandung Regency already has a mechanism for monitoring and evaluating post-crisis conditions, especially in the aspects of health, sanitation, and access to clean water, helping in the preparation of post-disaster recovery strategies. The sharing of the costs of health and nutrition interventions (Health Office), social assistance (Ministry of Social Affairs), and the restoration of infrastructure and basic services (related OPDs) is clear, ensuring that each sector has specific responsibilities. Disaster management actors, the Health Office, and the Social Service have worked together in handling post-disaster recovery, including in the aspect of providing cash assistance and economic recovery support for vulnerable groups. However, the calculation of social assistance is still carried out based on the number of previous years, without considering the risks and impacts of disasters more dynamically, causing a potential shortage of funds allocation when there is a sudden increase in needs. Limited access to social data causes difficulties in compiling the calculation of adaptive social protection costs, making the aid distribution process less evidence-based. An evaluation of basic service infrastructure has been carried out, but there is no mechanism that considers the impact of the crisis on vulnerable groups, specifically in the preparation of social assistance budget allocations.

2. Risk Financing

Disaster management actors have allocated dedicated funds for crisis and disaster management, ensuring that affected communities receive prompt and targeted assistance. West Bandung Regency has achieved Universal Health Coverage (UHC), allowing people to access health services for free with only an ID card, as well as financing class 3 BPJS contributions for those who are not covered by health insurance. Funding comes from various sources, including the APBD, State Budget, Village Fund, Special Allocation Fund (DAK), CSR, and funding for assistance tasks from the central government. West Bandung Regency has implemented a budget allocation based on risk, including a basic financing layer from the APBD for health programs, contingency funds for high-risk groups, and responsive funds for major shocks. West Bandung Regency has collaborated with international companies and organizations to support the funding of various nutrition intervention programs and family economic empowerment. The central government has allocated funding of 5 billion to support West Bandung Regency's efforts in achieving zero stunting, ensuring the sustainability of intervention and program monitoring. However, financing of human resources for apparatus, community, logistics, and vehicles is still insufficient, leading to limitations in the broader crisis response. There is no policy that allows the use of emergency funds for post-disaster prevention or recovery, so social protection interventions are still more reactive than preventive. The calculation of social assistance is carried out based on the previous year's data, without considering the risk of changing conditions due to crises or economic shocks. Social data is not publicly accessible, causing difficulties in compiling evidence-based cost estimates and considering socio-economic aspects more holistically.

3. Disbursement Mechanism

The Regional Government has implemented a beneficiary validation system based on actual health conditions, so that nutritional interventions such as the provision of PMT can be carried out in a timely manner without being constrained by an integrated data system. Puskesmas can directly submit and validate recipients, including hospitalization for undernourished toddlers, ensuring immediate intervention without protracted administrative procedures. Assistance is provided in the form of PMT that has been processed as needed, avoiding the risk of misuse of cash funds by beneficiaries. The Regional Government has used a technology-based application system to monitor the nutritional status of toddlers and pregnant women in real-time, increasing the effectiveness of the program. However, E-wallets, QR codes, and digital transfers have not yet been implemented, causing the distribution of cash assistance to still be done manually, which has the potential to slow down the disbursement process and transparency monitoring. Because the DTSN data will only be completed in February 2025, data matching has not been carried out, causing the potential for duplication of aid recipients that could hinder the effectiveness of distribution. The use of AI-based algorithms and big data to assess needs based on economic conditions, health, and stunting risk has not yet been implemented. The Regional Government does not have a public platform to display beneficiary data and distribution progress in real-time, so monitoring by the community is still limited.

4. Long-Term Financing

Local governments have implemented long-term fund allocations, ensuring that nutrition interventions and social protection remain sustainable in each planning cycle. Local governments have set a special ceiling for accelerating stunting reduction in budget planning documents, making stunting a prioritized key performance indicator (KPI). Programs that are national or regional priorities are advocated to continue to obtain financing despite facing fiscal limitations, ensuring that important interventions continue to run. The Regional Government has utilized the State Budget, Regional Budget, Village Fund, DAK, CSR, and partnerships with international organizations such as BISA and Save the Children to support programs to accelerate stunting reduction. Local governments have implemented a basic financing layer from the APBD for health programs, contingency funds for high-risk families, as well as a response fund for major shocks, ensuring a more efficient allocation of funds according to the level of need. The Regional Government has developed a monitoring system for budget absorption and performance achievements, including routine reporting by Bappelitbangda to maintain funding transparency. However, funding still has to compete with the needs of other sectors, such as education and infrastructure, so that some programs do not get as much allocation as expected by the regional apparatus. CSR and funding from the private sector are not always available every year, leading to uncertainty in the sustainability of funding for

certain programs. Regional governments still face obstacles in integrating social and economic data, so financing estimates have not fully considered aspects of social vulnerability. There is no dashboard or public platform that allows the public to access information about budget distribution and the effectiveness of using funds in reducing stunting.

Program

1. Social Protection Coverage

Local governments have combined nutrition, health services, education, clean water, and sanitation interventions, ensuring broader and targeted social protection coverage. Programs that have been running such as PMT for pregnant women and toddlers, immunization, administration of blood supplement tablets (TTD), and worm testing, are adapted to support the acceleration of stunting reduction. The Regional Government has developed Pelita Bening, Getol, Gobang, and Salting, as well as community-based intervention approaches and direct assistance for groups at risk of stunting. Social assistance and health programs such as PMT are not only provided to poor families, but also based on real-time health status, allowing program goals to be more dynamic and effective. PMT is provided based on local foodstuffs, involving the community in the provision and processing, as well as educating them about the importance of consuming nutritious food. The government ensures that interventions are adjusted to the level of need, such as toddlers with underweight receive PMT for 28 days, while undernourished toddlers receive PMT for 56 days. In the event of a disaster, assistance is adjusted to the impact that occurs, including the fulfillment of nutritious food, health services, and trauma healing, based on data updated monthly by the Health Office. However, many programs come from various sectors and regional apparatus, so there is a risk of duplication of interventions if there is no more systematic coordination mechanism. There is no public dashboard that allows the public to access information on the coverage of beneficiaries and the progress of social protection interventions in real-time. Some programs do not have a specific mechanism to prioritize stunting prevention, so the allocation of assistance has not been fully directed. Post-disaster aid distribution is not yet fully optimal, still relying on a manual assessment process that takes longer.

2. Program Design Parameters

The Regional Government has implemented a situation analysis as the basis for the formulation of interventions, ensuring that service targets are in accordance with the distribution of stunting prevalence and the coverage of existing health services. Target groups were based on risk and vulnerability, including pregnant women, breastfeeding mothers, children aged 0-23 months, children aged 24-59 months, women of childbearing age, and adolescent girls, ensuring interventions were more targeted. The Regional Government has implemented quarterly monitoring and evaluation every semester, including monitoring of performance targets and intervention coverage by Bappelitbangda and related regional apparatus. If the stunting reduction target is not achieved, obstacles are identified and strategies are improved, including an annual review in the Stunting Convergence Action to optimize the effectiveness of the program. This program oversees direct intervention in stunting locus sub-districts, strengthening the coordination of regional apparatus so that assistance is more targeted. Monitoring is given every 7 days for toddlers receiving PMT, ensuring that the intervention is effective, as well as an examination by a doctor if there is no improvement in the condition. However, food security and access to health services have not been included in the eligibility parameters, so the risk-based approach is still not optimal. The Regional Government does not have a systematic evaluation mechanism for the level of community satisfaction, so the response to needs and feedback from beneficiaries is still limited.

3. Program Feature Design

The Regional Government has optimized existing programs in the regional apparatus, such as health services, social assistance, and education, to support the acceleration of stunting reduction without having to create new programs. Although there is no special budget, the Pelita Bening program continues to run thanks to the strong support of government leaders, showing the seriousness of the local government in overcoming stunting. Nutrition monitoring dashboards and routine health surveys help in detecting the condition of pregnant women and toddlers at risk of stunting, allowing for faster and more targeted interventions. In emergency response conditions, all disaster victims immediately receive assistance without having to go through further assessments, including nutritious food assistance, baby kits, and housing facilities that prioritize pregnant women and toddlers. The Regional Government guarantees balanced, nutritious food intake three times a day for affected victims, helping to meet nutritional needs during the crisis. Health programs such as PMT delivery have been tailored to real-time health conditions, ensuring that assistance is delivered to those who really need it. The Regional Government has implemented Universal Health Coverage (UHC), ensuring free access to health for people who do not have health insurance to avoid financial barriers in obtaining health services. The local PMT program involves the community in food processing and distribution, as well as providing education on healthy eating and how to process nutritious food. However, although there has been real-time data-driven nutrition monitoring, there is no automatic notification system for at-risk families, so interventions cannot always be carried out in a timely manner. Nutritious food e-vouchers or health consultation applications have not been implemented, so the distribution of aid in emergency situations still has logistical obstacles. When families are separated by disasters, access to aid is disrupted, so there is a need for a more structured reunification system to ensure that protection for vulnerable groups continues.

DISCUSSION

Local governments have shown a strong commitment to accelerating stunting reduction, with comprehensive policies and cross-sector coordination. Collective leadership is needed to ensure synergy between various stakeholders and avoid overlapping authority in adaptive social protection policies. Although policy coherence is good, there are still challenges in internalizing adaptive social protection, clarifying the role of villages, and sustaining interventions for poor and vulnerable households [19]. Harmonization of regulations between levels of government is needed to simplify administrative procedures and ensure a quick response in emergencies. Local governments have a clear governance structure, but disaster actors have not been optimally integrated into the TPPS, so the response to crises is still limited [15]. Standardized integration between institutions is needed to create synergies of social and disaster protection to reduce the impact on poor and vulnerable households. Institutional capacity building has been carried out, but the challenge of rapid cadre turnover hinders the continuity of the program.

Local governments have complete, accurate, and up-to-date sectoral data, but they have not been optimally integrated, which leads to duplication of aid recipients between the government, NGOs, CSRs, and associations [28]. Adaptive social protection requires a centralized data system that includes data storage, management, and distribution mechanisms for more targeted interventions and faster response to crises. Social lists play an important role in adaptive social protection by expanding the coverage of high-risk areas and updating information more frequently [29]. Local governments have not been optimal in combining regional and household data to identify exposure to natural hazards and climate change risks. In the Philippines, the Bureau of Disaster Management uses social registers to estimate disaster impacts based on household locations [6], while the Dominican Republic developed a vulnerability index to measure household risk exposure to hurricanes and floods. The use of digital technology can increase the effectiveness of social protection and cash assistance distribution, expand the reach of programs, and accelerate the economic recovery of affected households. For this reason, data automation is needed to ensure real-time validation of beneficiary lists, improve integration with disaster data, and support monitoring of changes in the status of aid recipients with artificial intelligence. The Aadhaar program in India has used biometric technology to authenticate beneficiaries in various social programs. Local governments have implemented an early warning system in monitoring maternal and child nutrition and health, but it has not been optimally integrated with the disaster and food security sectors. Adaptive preparedness is needed so that social protection systems can be more flexible in responding to crises, data-based, and oriented towards preventing negative impacts for vulnerable groups [30]. In the Philippines, conditional cash assistance programs are used as a means of disaster preparedness education, strengthening response to crises.

Local governments in Indonesia have begun to establish various risk financing instruments, such as standby funds, social insurance schemes, and diversified funding sources. However, significant challenges remain in optimizing the use of these funds for pre-disaster preparedness and post-crisis recovery. Limitations include the lack of integration between social and economic data systems, inadequate contingency fund coverage, and procedural constraints in emergency fund disbursement. Effective reserve financing should be linked to climate information and early warning systems, as demonstrated in several global best practices [20]. Adaptive financing mechanisms are essential to ensure that social protection systems remain flexible and responsive to evolving socio-economic risks. These include responsive funding schemes that enable rapid disbursement without excessive bureaucracy and recovery funds aimed at supporting post-crisis economic resilience especially for MSMEs and vulnerable populations [21]. Leveraging digital technologies can enhance the transparency and accuracy of fund allocation, ensuring that assistance reaches the intended beneficiaries. Additionally, adaptive microinsurance can strengthen the financial resilience of poor households by offering protection against economic shocks, and when integrated with other social protection mechanisms such as cash transfers and emergency response funds, it can build a more robust and inclusive support ecosystem. Nonetheless, local governments continue to face barriers in the timely and targeted deployment of resources during crises due to logistical, coordination, and communication infrastructure constraints.

The digitization of social assistance represents a critical advancement in improving the efficiency, accuracy, and accountability of fund distribution. The use of digital tools such as e-wallets, real-time monitoring systems, and integration with social registries and early warning systems has proven to significantly reduce leakages and delays in disbursement [16]. For instance, a previous study on digital cash transfers during the COVID-19 pandemic demonstrated that digital channels not only expedited delivery but also enhanced targeting accuracy, especially when integrated with national social registries [24].

Furthermore, blockchain technology has emerged as a promising tool for increasing transparency and traceability in the management of social assistance, minimizing the risk of fraud and corruption [25]. In the Indonesian context, while local governments have adopted long-term financing strategies such as multi-year budgeting and diversification of funding many still lack integrated digital platforms for budget planning and monitoring, which hinders adaptive responses during crises [26].

To strengthen financial resilience, it is essential to diversify funding sources beyond government allocations. The role of private sector contributions through CSR initiatives, international grants from organizations such as UNICEF and the World Bank, and community-based crowdfunding platforms has been emphasized in research by [26], which found that multi-actor financing models can enhance the sustainability and responsiveness of social

protection systems. The concept of collective financing engaging governments, private sectors, civil society, and international actors has also been supported by [27], who argue that social protection is most effective when designed as a shared responsibility within a broader social contract. Therefore, building a robust ecosystem for adaptive social protection requires not only technological innovation but also institutional coordination and multi-stakeholder collaboration.

Local governments have built a broad coverage of social protection, covering nutrition, health, education, clean water, and sanitation, and are supported by cross-sectoral integration and flexibility in dealing with crises. However, it is still necessary to optimize the integration of beneficiary data, evaluate the effectiveness of social assistance, and strengthen adaptive response mechanisms. For this reason, integrated services are needed to connect social protection with health services, align disaster data with social lists, and utilize digitalization to accelerate access to services [13]. The scalability of the program must be improved so that interventions can evolve as needed, increase the flexibility of the number of beneficiaries, and be associated with adaptive financing mechanisms, so that social protection remains functional despite increased needs. In addition, program adaptability is necessary in order to adapt to changing social and economic conditions, ensuring interventions remain relevant in a variety of situations. West Bandung Regency has an emergency response mechanism, but it still needs to improve multisectoral integration and the use of technology in aid distribution so that the program is more targeted and sustainable. Rapid response is essential to provide assistance immediately after a crisis, integrate early warning systems, and use digital technology for the distribution of aid without delay. Evaluations must also be dynamic, enabling real-time data-driven monitoring, minimizing distribution errors, and ensuring programs are always adapted to current social and economic conditions.

CONCLUSION

The Regional Government has shown a strong commitment to accelerating stunting reduction with comprehensive and collaborative policies across sectors. From an adaptive social protection perspective, there are advantages in organized institutional structures and broad multi-sectoral partnerships, but there are still challenges in data integration, crisis response, and program effectiveness. In the institutional aspect, the governance structure has been running well, with cross-sector coordination that allows for policy synchronization from the national to regional levels. However, the internalization of adaptive social protection in policies has not been optimal, disaster actors have not been fully integrated into the TPPS. In partnerships, the Local Government has built strong cooperation with a wide range of stakeholders, including governments, academia, the private sector, NGOs, and the international community. While this approach is quite strategic, there are still challenges in cross-sector coordination, prevention of duplication of programs, and the effectiveness of resource distribution to ensure targeted and sustainable assistance.

Local governments already have complete and accurate sectoral data, but still face challenges in integration, validation, and utilization of technology to ensure optimal adaptive social protection. From an adaptive social protection perspective, data management systems need to be strengthened so that interventions are more targeted, efficient, and sustainable. In terms of data and information systems, there are challenges in synchronizing data across sectors, especially between health, disasters, and food security. The early warning system has not been fully integrated, so the response to stunting risks is still not fast and structured. In addition, post-crisis assessments are not optimal, as there are still obstacles in social data validation and impact monitoring mechanisms.

Regional Governments already have a fairly stable financing strategy to accelerate stunting reduction, with multi-year budgeting, diversification of funding sources, as well as risk financing instruments such as standby funds and social insurance schemes. However, from the perspective of adaptive social protection, there are still challenges in the flexibility of the use of emergency funds, the integration of social and economic data, and the optimization of the digitalization of aid disbursement. Funding has not been fully responsive to pre-disaster and post-disaster recovery, so the allocation of assistance has not been optimal in dealing with the risk of stunting due to the crisis. The mechanism for disbursing funds has been running well, but there is still a need for digitization, transparency of distribution, and matching of national data to be faster and more accurate.

Local governments already have a broad scope of social protection, covering nutrition, health, education, clean water, and sanitation, with support for cross-sectoral integration, risk-based approaches, and flexibility in dealing with crises. From the perspective of adaptive social protection, existing programs already have good design parameters, including the determination of risk-based target groups, periodic monitoring, and evaluation of achievements. However, there are still challenges in validating beneficiary data, integrating NIK-based data, and utilizing technology for program monitoring. In addition, the adaptive response to the crisis has not been optimal, especially in strengthening multisectoral integration and digitalizing aid distribution.

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DAFTAR PUSTAKA

- [1] E. Elisaria, J. Mrema, T. Bogale, G. Segafredo, and C. Festo, "Effectiveness of integrated nutrition interventions on childhood stunting: a quasi-experimental evaluation design," *BMC Nutr.*, vol. 7, no. 1, p. 17, 2021.
- [2] D. J. Raiten and A. A. Bremer, "Exploring the nutritional ecology of stunting: new approaches to an old problem," *Nutrients*, vol. 12, no. 2, p. 371, 2020.
- [3] A. T. Mulyani, M. A. Khairinisa, A. Khatib, and A. Y. Chaerunisaa, "Understanding Stunting: Impact, Causes, and Strategy to Accelerate Stunting Reduction—A Narrative Review," *Nutrients*, vol. 17, no. 9, p. 1493, 2025.
- [4] S. A. T. Cahyono and S. W. Iryani, "Gerak Langkah Program Keluarga Harapan: Kontribusi Program Keluarga Harapan Terhadap Kesejahteraan Keluarga Penerima Manfaat," *J. Penelit. Kesejaht. Sos.*, vol. 17, no. 4, pp. 1–10, 2018.
- [5] L. Agustini and D. Rahmawati, "Hubungan pendapatan keluarga dengan kejadian stunting," *Indones. J. Midwifery*, vol. 4, no. 1, p. 30, 2021.
- [6] T. Bowen et al., *Adaptive social protection: building resilience to shocks*. World Bank Publications, 2020.
- [7] H. Alderman and D. D. Headey, "How important is parental education for child nutrition?," *World Dev.*, vol. 94, pp. 448–464, 2017.
- [8] P. Singh, S. Dey, S. Chowdhury, and K. Bali, "Early life exposure to outdoor air pollution: effect on child health in India," 2019.
- [9] K. Baye and K. Hirvonen, *Accelerating progress in improving diets and nutrition in Ethiopia*, vol. 144. Intl Food Policy Res Inst, 2020.
- [10] L. Smith and L. Haddad, "Reducing Child Undernutrition: Past Drivers and Priorities for the Post-MDG Era," *IDS Work. Pap.*, vol. 2014, no. 441, pp. 1–47, 2014.
- [11] J. Keasley, J. Blickwedel, and S. Quenby, "Adverse effects of exposure to armed conflict on pregnancy: a systematic review," *BMJ Glob. Heal.*, vol. 2, no. 4, p. e000377, 2017.
- [12] M. Ćwiklicki, F. Schiavone, J. Klich, and K. Pilch, "Antecedents of use of e-health services in Central Eastern Europe: a qualitative comparative analysis," *BMC Health Serv. Res.*, vol. 20, pp. 1–15, 2020.
- [13] C. Béné, A. Cornelius, and F. Howland, "Bridging humanitarian responses and long-term development through transformative changes—some initial reflections from the World Bank's adaptive social protection program in the Sahel," *Sustainability*, vol. 10, no. 6, p. 1697, 2018.
- [14] J. L. D. P. Lu, "Impact of climate change on human health," *Acta Med. Philipp.*, vol. 50, no. 2, 2016.
- [15] L. C. Smith and L. Haddad, "Reducing child undernutrition: past drivers and priorities for the post-MDG era," *World Dev.*, vol. 68, pp. 180–204, 2015.
- [16] L. Blomqvist, "Blockchain and entrepreneurial value creation in the textile industry." 2018
- [17] J. Xue, P. Liu, J. Yin, W. Wang, J. Zhang, W. Wang, T. Le, D. Ni, and H. Jiang, "Dynamic changes in volatile compounds of shaken black tea during its manufacture by GC × GC-TOFMS and multivariate data analysis," *Foods*, vol. 11, no. 9, p. 1228, 2022. <https://doi.org/10.3390/foods11091228>
- [18] F. N. Hayati, D. Nurlaily, and P. Hasanah, *Studi Prevalensi Stunting di Indonesia: Perspektif Gizi dan Kesehatan Balita. Fokus Riset: Smart City*, 2024.
- [19] K. H. O'Brien, "Social determinants of health: The how, who, and where screenings are occurring; a systematic review," *Social Work in Health Care*, vol. 58, no. 8, pp. 719–745, 2019. <https://doi.org/10.1080/00981389.2019.1645795>
- [20] O. C. Enworo, "Application of Guba and Lincoln's parallel criteria to assess trustworthiness of qualitative research on indigenous social protection systems," *Qualitative Research Journal*, vol. 23, no. 4, 2023
- [21] The World Bank, *Reference guide for climate-smart public investment*, Washington, DC: World Bank, 2022. <https://www.worldbank.org>
- [22] A. W. Subandoro, S. Holschneider, and J. Ruel-Bergeron, *Operationalizing multisectoral nutrition programs to accelerate progress: A nutrition governance perspective*, Washington, DC: The World Bank, Dec. 2021.
- [23] H. K. Kundo, M. Brueckner, R. Spencer, and J. Davis, "Mainstreaming climate adaptation into social protection: The issues yet to be addressed," *Journal of International Development*, vol. 33, no. 8, pp. 1306–1324, Jun. 2021. <https://doi.org/10.1002/jid.3567>
- [24] N. Y. Hussain, F. I. Babalola, E. Kokogho, and P. E. Odio, "Blockchain technology adoption models for emerging financial markets: Enhancing transparency, reducing fraud, and improving efficiency," *International Journal of Multidisciplinary Research and Growth Evaluation*, <https://www.allmultidisciplinaryjournal.com>
- [25] J. R. Siahaan, G. Pagalung, E. B. Demmallino, A. Saleng, A. A. Sulaiman, and N. Nagu, "Reframing sustainability in post-mining landscapes: A foundational framework for institutional and behavioral integration in Indonesia," *Sustainability*, vol. 17, no. 12, p. 5278, 2025. <https://doi.org/10.3390/su17125278>
- [26] D. Aassouli and H. Ahmed, "Supporting SMEs financial resilience during crises: A framework to evaluate the effectiveness of financial literacy programs targeting SMEs," *Malaysian Journal of Economic Studies*, vol. 60, no. 1, pp. 105–121, 2023. <https://search.informit.org/doi/10.3316/informit.172828087637247>
- [27] J. Milner and A. Klassen, *Civil society and the politics of the global refugee regime*, LERRN Paper No. 15, Local Engagement Refugee Research Network, Sept. 2021.

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- [28] J. M. Kerner, Complexity, coordination, and the politics of global health emergencies: Institutions, actors, and responses, 2025. https://digitalrepository.unm.edu/pols_etds/125
- [29] T. Lone, M. Shakeel, and J. Bischler, “Towards shock-responsive social protection: Lessons from the COVID-19 response in Pakistan,” in Shock-responsive social protection responses during COVID-19, Oxford: Oxford Policy Management, 2020.
- [30] R. Lambin, W. C. Muangi, and M. Nyssölä, Social protection in humanitarian contexts: Exploring stakeholder views from Tanzania, WIDER Working Paper. Helsinki: United Nations University World Institute for Development Economics Research (UNU-WIDER), 2025. <https://hdl.handle.net/10419/315100>