Temali: Jurnal Pembangunan Sosial
eISSN: 2615-5028, Vol 8, No 2, 2025, pp 314-330
https://doi.org/10.15575/jt.v8i2.49608

Dynamic Governance in Accelerating Stunting Reduction: A Study on Local Policy Implementation and the Use of Digital Platforms in Sumedang Regency, West Java

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Suggested Citation:

Wahidah, I., & Sulastri, R. (2025). Dynamic Governance in Accelerating Stunting Reduction: A Study on Local Policy Implementation and the Use of Digital Platforms in Sumedang Regency, West Java. *TEMALI: Jurnal Pembangunan Sosial, 8*(2). https://doi.org/10.15575/jt.v8i2.49608

Article's History:

Received May 2025; *Revised* August 2025; *Accepted* September 2025.

Abstract:

This study aims to analyze the role of *dynamic governance* in accelerating stunting reduction in Sumedang Regency, West Java, with a focus on the mechanisms of *sensing*, *seizing*, and *transforming* as well as the orchestration of multi-actor collaboration. This research is important because stunting remains a critical challenge for Indonesia in achieving the 14% target by 2024, while existing studies are mostly dominated by medical and nutritional perspectives rather than governance aspects. The study employed a qualitative research approach with a case study design, in which data were collected through in-depth interviews, Focus Group Discussions (FGDs), participatory observation, and document analysis. The findings reveal that Sumedang possesses strong *dynamic governance* capabilities: (1) *sensing* through data-driven policies utilizing *Riskesdas* and *e-PPGBM*, (2) *seizing* through adaptive regulations and cross-sectoral coordination with Regent Regulation No. 82/2018 and the implementation of the Eight Convergence Actions, and (3) *transforming* through institutional innovation with the *SIMPATI* platform and the establishment of a permanent stunting task force. These capabilities are strengthened by the collaborative roles of local government, NGOs, village administrations, health cadres, and the private sector. The integration of digital governance and participatory mechanisms has enabled Sumedang to successfully reduce stunting prevalence from 32.2% in 2019 to 27.6% in 2022, and further to 7.89% in 2023. The implications of this study affirm that *dynamic governance* can serve as a replicable model for other regions to overcome bureaucratic rigidity, strengthen cross-sectoral partnerships, and enhance evidence-based decision-making in public health policy. The originality of this research lies in positioning stunting reduction not merely as a health intervention but as an innovation in adaptive governance, thereby filling the gap in the literature that rarely discusses the intersection of governance, technology, and community participation in public health policy.
Keywords: *dynamic governance*; stunting reduction; digital health governance; multi-actor collaboration; *SIMPATI* platform.

Abstrak:
Penelitian ini bertujuan untuk menganalisis peran dynamic governance dalam mempercepat penurunan stunting di Kabupaten Sumedang, Jawa Barat, dengan fokus pada mekanisme sensing, seizing, dan transforming serta orkestrasi kolaborasi multi-aktor. Penelitian ini penting karena stunting masih menjadi tantangan krusial bagi

Indonesia dalam mencapai target 14% pada tahun 2024, sementara kajian yang ada sebagian besar masih didominasi oleh perspektif medis dan gizi, bukan aspek tata kelola. Studi ini menggunakan pendekatan kualitatif dengan desain studi kasus, di mana data dikumpulkan melalui wawancara mendalam, Focus Group Discussion (FGD), observasi partisipatif, dan analisis dokumen. Hasil penelitian menunjukkan bahwa Sumedang memiliki kemampuan dynamic governance yang kuat: (1) sensing melalui kebijakan berbasis data dengan memanfaatkan Riskesdas dan e-PPGBM, (2) seizing melalui regulasi adaptif dan koordinasi lintas sektor dengan Peraturan Bupati No. 82/2018 serta implementasi Delapan Aksi Konvergensi, dan (3) transforming melalui inovasi kelembagaan dengan platform SIMPATI serta pembentukan satgas stunting permanen. Kemampuan tersebut diperkuat oleh peran kolaboratif pemerintah daerah, LSM, pemerintah desa, kader kesehatan, dan sektor swasta. Integrasi tata kelola digital dan mekanisme partisipatif memungkinkan Sumedang berhasil menurunkan prevalensi stunting dari 32,2% pada 2019 menjadi 27,6% pada 2022, dan lebih lanjut menjadi 7,89% pada 2023. Implikasi penelitian ini menegaskan bahwa dynamic governance dapat menjadi model yang dapat direplikasi di daerah lain untuk mengatasi rigiditas birokrasi, memperkuat kemitraan lintas sektor, serta meningkatkan pengambilan keputusan berbasis bukti dalam kebijakan kesehatan masyarakat. Orisinalitas penelitian ini terletak pada posisinya yang menempatkan penurunan stunting bukan hanya sebagai intervensi kesehatan, melainkan juga sebagai inovasi dalam tata kelola adaptif, sehingga mengisi celah literatur yang jarang membahas persinggungan antara tata kelola, teknologi, dan partisipasi masyarakat dalam kebijakan kesehatan publik.
Kata Kunci: *dynamic governance, penurunan stunting, tata kelola kesehatan digital, kolaborasi multi-aktor, platform SIMPATI.*

INTRODUCTION

Indonesia has set a development leap toward *Indonesia Emas 2045* by prioritizing human resource (HR) development as the main agenda (Christabel et al., n.d.). However, this ambition directly confronts the challenge of stunting, a growth and developmental disorder in children caused by chronic malnutrition with long-term consequences for cognitive capacity, health, productivity, and competitiveness. The World Health Organization (2014; 2015) emphasized that stunted children are more vulnerable to diseases due to weakened immune systems—which in turn disrupts learning processes, increases school absenteeism, and reduces human capital accumulation.

At the national level, the Ministry of Health (2023) reported a stunting prevalence of 24.4% (≈ 5.33 million children under five). This number decreased to 21.6% in 2022 but remains far from the 14% target set for 2024 (Republika.id, 2022). UNICEF (2022) noted that Indonesia ranks among the highest globally and second in Asia in the number of affected children, underscoring the urgency of intervention. At the same time, data from Statistics Indonesia (BPS) (in Rizaty, 2023) indicate a declining birth rate trend over the past four years (2020–2023). Although this decline may reduce service burdens, it does not automatically address stunting—since the root causes include nutritional access, maternal and child health services, sanitation, clean water, and childcare practices.

The government responded through Presidential Regulation No. 72/2021 on the Acceleration of Stunting Reduction, which emphasizes a cross-sectoral approach (health, education, women's empowerment, and child protection) and integrated interventions from preconception (adolescents, prospective brides and grooms) through the first 1,000 days of life and early childhood. Community-based approaches through *posyandu* and Family Welfare Movement (*Pemberdayaan dan Kesejahteraan Keluarga—PKK*), nutrition education, supplementation, and improvements in clean water and sanitation form integral components (World Health Organization, 2021). Nevertheless, the geographical and socio-cultural diversity across 34 provinces requires local adaptation—both in program design and governance of implementation.

West Java—with the largest under-five population (≈ 3.57 million in 2022; BPS, 2023)—is a strategic arena for accelerating stunting reduction. The province launched the "Jabar Zero New Stunting" program (2022) as a sustained initiative orchestrating cross-sectoral agencies, educational institutions, civil society organizations, and the private sector. Among all districts/municipalities, Sumedang Regency stands out for successfully implementing the Eight Convergence Actions (supervised by the Directorate General of Regional Development, Ministry of Home Affairs) while also strengthening regulation through Regent Regulation No. 82/2018 and Regent Decree No. 441/KEP.325-BAPPPPEDA/2020, which established an integrated task force (stunting.go.id, 2020). These achievements are reflected in the significant reduction of stunting prevalence from 32.2% (Riskesdas) to 27.6% in

2022. This evidence indicates that Sumedang is not only progressive but also represents adaptive and innovative governance practices at the local level (Sumedangkab.go.id, 2022). Therefore, Sumedang provides a highly relevant and significant case for this study.

Research on stunting in Indonesia has followed several directions. First, a number of studies examined multilevel determinants encompassing socioeconomic, nutritional, health–sanitation, cultural, and geographic disparity factors. Socioeconomic status, particularly parental education and income, consistently correlates with reduced stunting risks (Semba et al., 2011, 2016). Poor dietary intake, limited food diversity, inadequate energy–protein consumption, and low birth weight are identified as direct determinants (Beal et al., 2018; Leroy & Frongillo, 2019). At the service level, access to antenatal care, immunization, clean water, and proper sanitation contributes to prevalence reduction (Hasanah & Arifah, 2024; Izza & Purnomo, 2019; Kustanto et al., 2024). Cultural dimensions—such as food taboos and reliance on traditional healing—may hinder optimal nutritional practices (Marni et al., 2021; Wiliyanarti et al., 2025). Rural–urban disparities are also evident, with rural areas facing greater service and resource constraints (Dharmaputra et al., 2024). Moreover, environmental contaminants such as heavy metals in drinking water emerge as additional risks that must be integrated into policy (Oginawati, 2022). Recent data show a national prevalence decline from 21.6% in 2022 to 17.8% in 2023, although still above WHO thresholds and the 14% target.

Second, intervention studies highlight the effectiveness of context-specific approaches that align with local socioeconomic, cultural, and geographical conditions (Hartotok et al., 2021; Huriani et al., 2022). *M-health* innovations such as AECAS and Edu Stunting demonstrate potential to enhance maternal knowledge and early detection, but evidence of their long-term impact on nutritional status requires further investigation (Utami et al., 2019). At the community level, training for health cadres and mothers, health education, and improved recording systems (including for prospective brides and grooms) have strengthened local capacity (Agushybana et al., 2022; Handayani & Rizky, 2024). At the policy level, political commitment, multisectoral collaboration, and localized programs are identified as prerequisites for success, underscoring the importance of orchestrating cross-agency and multi-level governance (Saputri et al., 2020; A. Setiawan et al., 2024). Simultaneously, the literature recommends eliminating economic barriers to nutritious food and healthcare access, while reinforcing maternal nutrition education as a key preventive pillar (Kurniawati & Saputro, 2022; Wiliyanarti et al., 2025).

Third, advanced analytics for monitoring and prediction—such as *machine learning* (XGBoost, artificial neural networks)—offer opportunities to improve prevalence estimates and identify high-risk regions or groups (Dharmaputra et al., 2024). These approaches complement conventional surveillance and can refine intervention targeting. However, the literature also stresses the necessity of integrating analytical outputs into governance systems, particularly regarding how data flow, inform rapid decision-making, and are operationalized in cross-actor coordination at the local level (Kustanto et al., 2024; E. Setiawan & Machsus, 2023).

Overall, the literature demonstrates that stunting is a multidimensional issue requiring comprehensive and context-specific interventions. The remaining gap lies in governance mechanisms—specifically how multisectoral coordination, community empowerment, digital innovation, and analytical evidence can be operationalized adaptively at the local level to deliver sustainable improvements.

Within this context, the concept of *dynamic governance* becomes highly relevant. *Dynamic governance* is understood as a governance framework emphasizing adaptive, innovative, and continuously learning capabilities, enabling public policies to move beyond rigidity and reactivity to respond quickly to environmental changes and capitalize on emerging opportunities (Neo & Chen, 2007). Local governments that adopt this principle do not merely implement stunting programs in line with national guidelines but also adapt them to local socio-cultural and geographic contexts, orchestrate cross-sectoral actors, and utilize digital technology as instruments of integration and evaluation (Markell & Glicksman, 2016). Therefore, examining the role of *dynamic governance* in accelerating stunting reduction is urgent, as it addresses a gap in the literature that has predominantly emphasized medical and nutritional dimensions, while also offering practical contributions for improving local public policy governance.

This study aims to analyze how the stages and capabilities of *dynamic governance* are enacted in accelerating stunting reduction in Sumedang Regency, West Java. The analysis focuses on three core mechanisms: *sensing*, which relates to the capacity to interpret problems and data; *seizing*, which refers to policy formulation and adaptation as well as cross-sectoral coordination; and *transforming*, which emphasizes innovation, replication, and institutional strengthening. Additionally, this study examines the mapping of roles and relationships among actors involved, including local government agencies (*SKPD*), the Regional Leadership Coordination Forum (*Forkopimda*),

sub-district and village administrations, territorial TNI/Police, *posyandu* and *PKK* cadres, NGOs, private sector actors through Corporate Social Responsibility (CSR) programs, and community groups. This mapping is essential to assess how convergence orchestration is carried out at the local level and to evaluate the effectiveness of multi-actor collaboration in reducing stunting prevalence. Furthermore, the study seeks to evaluate the function of digital platforms—particularly *SIMPATI* (Integrated Stunting Management Information System)—as governance instruments that facilitate data integration, monitoring, and rapid policy feedback.

Based on these objectives, this study argues that the success of stunting reduction is determined not only by health and nutrition interventions but also by how local governments construct dynamic governance systems. The ability to interpret changes, adapt to challenges, and orchestrate cross-actor collaboration emerges as the key to policy effectiveness. Moreover, the utilization of digital platforms such as *SIMPATI* is considered crucial to improving data transparency, accelerating coordination flows, and strengthening program responsiveness in the field. Within this framework, this study contributes to the literature on public policy governance, particularly in the issue of stunting, which has so far been predominantly approached from medical and nutritional perspectives.

METHOD

The unit of analysis in this study is the governance of stunting reduction acceleration at the local level, with a primary focus on the implementation practices of *dynamic governance* in Sumedang Regency, West Java. This regency was selected because it has stood out as a region with significant achievements in reducing stunting prevalence while simultaneously demonstrating policy innovations through the "Jabar Zero New Stunting" program and the development of the *SIMPATI* digital platform (Sekretariat Kabinet Republik Indonesia, 2023). Accordingly, the study does not only examine prevalence outcomes but also the governance mechanisms, cross-actor coordination patterns, and the use of digital technology in enhancing policy effectiveness.

This study employed a qualitative design with a case study approach (Maxwell, 2009). The choice of method was based on the need to understand governance phenomena in a deep, contextual, and comprehensive manner (Rahim & Dilawati, 2022). Qualitative research enables the researcher to capture the perspectives of actors, the dynamics of inter-institutional interactions, and the adaptive processes that occur in the implementation of stunting reduction programs (Yin, 2014). A case study design was selected because it allows for intensive exploration of *dynamic governance* practices in Sumedang as a case that can provide broader insights into how other regions might develop similar strategies.

The data sources consist of both primary and secondary data. Primary data were obtained from key informants, including local government officials, program managers at sub-district and village levels, *posyandu* and *PKK* cadres, NGO representatives, and community leaders. In addition, data were collected from field observations in Sumedang. Secondary data were derived from policy documents, official government reports, academic publications, and media articles relevant to stunting management in West Java and Sumedang. The combination of these sources provided a strong foundation for data triangulation.

Data collection employed three main techniques. First, participatory observation was conducted in July–August 2024 in Sumedang to directly observe program implementation and coordination activities among actors in the field. Second, Focus Group Discussions (FGDs) were organized involving health cadres, community leaders, and village government representatives to capture collective perspectives on program convergence practices. Third, in-depth interviews were conducted with key informants from various institutions, such as officials from the Health Office, Bappeda, sub-district heads, village heads, and *SIMPATI* managers, along with PKK representatives and community members. The interviews followed a semi-structured guide to ensure flexibility in exploring emerging issues during fieldwork.

Data analysis followed the Miles and Huberman (1994) model, which consists of three stages: data reduction, data display, and conclusion drawing/verification. During the data reduction stage, results from observations, interviews, and FGDs were categorized into key themes such as *sensing*, *seizing*, *transforming*, actor relationship patterns, and the use of digital technology. In the data display stage, the findings were organized into matrices, diagrams, and narratives to facilitate interpretation. In the conclusion drawing stage, empirical data were linked with the *dynamic governance* theoretical framework to generate an in-depth understanding of how dynamic governance is enacted in accelerating stunting reduction in Sumedang. The validity of the study was maintained through triangulation of sources, methods, and data to ensure the reliability of findings.

RESULTS AND DISCUSSION

Stages and Capabilities of *Dynamic Governance* in Accelerating Stunting Reduction in Sumedang Regency

Dynamic governance is a governance approach that emphasizes the ability of organizations—particularly in the public sector—to adapt, innovate, and collaborate in dealing with complexity and environmental uncertainty. The concept is rooted in the theory of *dynamic capabilities* developed by Teece (2018), namely the organizational capacity to *sense* opportunities, *seize* appropriate policies, and *transform* structures and processes to remain relevant to change. Within this framework, governance is no longer understood as a rigid bureaucratic mechanism but as a flexible system that is reflective and continuously learns from experience.

In practice, *dynamic governance* is not determined solely by formal procedures but is also shaped by institutional culture and leadership quality. Studies by Waris et al. (2025) and Natsir et al. (2023) show that the success of public service innovations largely depends on the capacity of public managers to think across sectors and adopt solution-oriented perspectives. Thus, recruitment and capacity building of human resources are not merely administrative matters but integral parts of creating dynamic governance.

Furthermore, *dynamic governance* is closely linked to the need for adaptation in the digital era and in the face of environmental crises. Ylinen (2021) highlighted the importance of adopting *agile* practices in the public sector, while Munaretto et al. (2014) and Folke et al. (2005) emphasized that adaptive governance is essential to address climate change and socio-ecological dynamics. Hence, *dynamic governance* not only emphasizes innovation but also fosters institutional resilience. Fundamentally, the concept integrates foresight thinking (anticipating the future), cross-thinking (cross-sector collaboration), and feedback thinking (continuous learning) as the foundation of governance capable of responding to contemporary challenges.

The acceleration of stunting reduction in Sumedang Regency has become a national best practice often referred to by other local governments (Putut Trihusodo, 2023). Sumedang's success does not only derive from technical interventions but also from the local government's ability to build adaptive governance capacity through a *dynamic governance* approach. This approach is understood through three main stages—*sensing*, *seizing*, and *transforming*—which form an institutional learning cycle for addressing stunting in a structured, measurable, and sustainable manner.

The first stage, *sensing*, marks the starting point where the Sumedang government detected stunting problems early. Data from *Riskesdas* (Basic Health Research) and *e-PPGBM* (Electronic Community-Based Nutrition Recording and Reporting) became the main foundations for mapping children's nutritional conditions. *Riskesdas* provides a macro picture of stunting prevalence at the national and provincial levels, while *e-PPGBM* enables more micro-level data collection down to the village level. Using these two instruments demonstrates Sumedang's *sensing* capability in building an evidence-based information system. The data were not only collected but also spatially mapped to identify villages with high prevalence.

Beyond this, *sensing* in Sumedang extended beyond reading numbers to analyzing trends and patterns. For example, the local government identified correlations between nutrition factors and variables such as poverty, sanitation, and access to healthcare. This analysis functioned as a "radar" to anticipate potential increases in stunting cases if interventions were not promptly implemented. Thus, Sumedang adopted the paradigm that data are not passive information but active instruments in building cross-sectoral collective awareness.

The second stage, *seizing*, demonstrates how Sumedang responded to data through adaptive policies and cross-sectoral coordination. At this stage, formal documents such as Regent Regulation (Perbup) No. 82/2019 on Stunting Prevention Acceleration and the Stunting Task Force Decree served as legal evidence of commitment (JDIH Sumedang, 2019). The Perbup provided a policy umbrella binding all local agencies, while the Task Force Decree established a cross-sectoral organizational structure to oversee implementation.

Cross-sectoral coordination became evident through the implementation of the Eight Convergence Actions on stunting mandated by the central government (stunting.go.id, 2020). These eight actions—ranging from situation analysis, activity planning, stunting forums, to measurement and data publication—were consistently implemented in Sumedang. Field observations showed that each action was not treated as a mere administrative obligation but as a joint learning process. For instance, stunting forums at the sub-district level involved sub-district heads, village chiefs, health workers, and community leaders, thereby ensuring that solutions were contextual and participatory.

Within the *seizing* capability, Sumedang exhibited strong collaboration among actors. Interviews with Bappeda officials revealed that coordination occurred not only vertically but also horizontally across agencies. For example, the Health Office could not operate effectively without support from the Public Works and Housing Office (for

sanitation), the Education Office (for nutrition literacy in schools), and the Social Affairs Office (for social assistance). This indicates that *seizing* in Sumedang moved toward policy coherence, where sectoral policies reinforced one another rather than working in isolation.

The third stage, *transforming*, is a key milestone distinguishing Sumedang from other regions. Transformation was achieved through digital innovation with the Integrated Stunting Prevention Information System (*SIMPATI*). *SIMPATI* is a platform that integrates health, education, social, and infrastructure data into a single dashboard. This innovation enabled stakeholders to monitor stunting cases in real time, map interventions already implemented, and identify service gaps.

Institutional transformation was also marked by the strengthening of the Stunting Task Force, which was not treated as an ad hoc team but institutionalized as a permanent body in local development governance (Bupati Sumedang, 2020). Interviews with sub-district heads confirmed that the task force extended down to the sub-district level, ensuring that each layer of government shared collective responsibility. This pattern showed that transformation encompassed not only technology but also bureaucratic cultural reorientation toward collaborative models.

The success of transformation in Sumedang cannot be separated from adaptive leadership. The Regent and local leadership played key roles in building political commitment, aligning visions across agencies, and creating an innovative climate (Raisya WM, 2025). Through such leadership, Sumedang succeeded in making stunting a priority setting in the regional development agenda rather than a supplemental program. In this regard, *transforming* in Sumedang illustrates the *dynamic capability* of integrating political vision with institutional innovation (BPMI Setpres, 2023).

Theoretically, Sumedang's practice of *dynamic governance* illustrates how the *sensing–seizing–transforming* framework can be operationalized in public health issues. *Sensing* provides the basis for building evidence-based policy, *seizing* demonstrates adaptive capacity through cross-sectoral coordination, while *transforming* underscores the importance of institutional and technological innovation. These three stages do not function linearly but are interconnected within a continuously evolving institutional learning cycle.

From a public policy perspective, Sumedang has demonstrated the capability to overcome bureaucratic rigidity through *dynamic governance*. Many regions have failed to reduce stunting due to rigid sectoral work patterns (Yogi Eka Sahputra, 2024). By contrast, Sumedang developed governance that is more flexible, responsive, and participatory. This capability reflects an awareness that the complexity of nutritional problems cannot be addressed solely through health interventions but requires multidimensional approaches.

From a sustainable development perspective, Sumedang's experience provides critical lessons. Stunting reduction is not only about achieving numerical targets but also about breaking the cycle of intergenerational poverty. Through *dynamic governance*, Sumedang succeeded in laying a foundation for the emergence of a healthy, productive, and competitive generation. This aligns with the Sustainable Development Goals (SDGs), particularly SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), and SDG 17 (Partnerships for the Goals).

Ultimately, Sumedang's experience in reducing stunting through *dynamic governance* can be regarded as a national best practice. This practice demonstrates that with strong *sensing*, *seizing*, and *transforming* capabilities, local governments can move beyond ceremonial programs toward impactful policy innovation. However, this success must also be seen as an ongoing process. The future challenge lies in sustaining these innovations amid local political dynamics and resource constraints.

An official from the Sumedang Health Office (DS) emphasized the importance of using data as the foundation for policy:

> "We at the Health Office are greatly assisted by the existence of *e-PPGBM* and *Riskesdas*. These data are not just numbers but serve as the basis for identifying trends, mapping villages at high risk of stunting, and determining intervention priorities. Without accurate data, interventions would be like guessing in the dark" (Interview, Health Office, August 2024).

This was confirmed by a sub-district head leading a stunting forum, who added a perspective on cross-sectoral coordination, stating that the forum was not merely ceremonial. Instead, it provided a platform for the government to listen directly to *posyandu* cadres, village heads, and community leaders. Solutions were therefore tailored to the real needs of residents rather than dictated solely from the top.

These accounts show that Sumedang's success in accelerating stunting reduction lies in its *dynamic governance* capabilities that integrate *sensing* through data-driven practices, *seizing* via adaptive policies and cross-sectoral coordination, and *transforming* through institutional and digital innovation. Testimonies from health and government actors in the field highlight that these practices are not formalities but tangible manifestations of dynamic governance that prioritize collective learning and community participation. With this approach, Sumedang has established a governance model that is responsive, collaborative, and sustainable—a best practice that can be replicated in other regions to address public health development challenges.

Thus, this study affirms that the success of stunting reduction in Sumedang lies not only in the outcomes achieved but also in the adaptive capabilities developed. These capabilities position Sumedang not merely as an implementer of central government policies but as a learning actor capable of redefining local development governance. This is the essence of *dynamic governance*: the ability to continuously learn, adapt, and transform in facing new challenges.

Roles and Relationship Patterns of Actors in the Orchestration of Convergence

The Sumedang Regency Government, through the Health Office and the Regional Development Planning Agency (*Bappeda*), plays a strategic role as the principal coordinator in accelerating stunting reduction. As entities authorized to plan, coordinate, and implement policy, local government agencies serve as central actors to ensure that stunting interventions proceed in a structured and coordinated manner. As stipulated in Law No. 23 of 2014 on Regional Government, local governments must manage health affairs, including preventive efforts aimed at reducing stunting prevalence within their jurisdictions.

The Health Office, as the body responsible for managing health programs in Sumedang, directly implements stunting-related initiatives such as nutrition education, routine checkups for pregnant women and children under five, and the distribution of nutritional supplements. Officials at the Sumedang Health Office stated that all *puskesmas* and *posyandu* have the capacity to conduct early detection and address stunting cases in the field.

The local government, through *Bappeda*, also plays a pivotal role in designing policies that support the sustainability of these programs. *Bappeda* ensures that stunting reduction remains a priority in the Sumedang Regional Medium-Term Development Plan (RPJMD), which directly relates to allocating sufficient budgets for these programs.

Beyond the health sector, *Bappeda* integrates stunting-reduction efforts across other development sectors. Through collaboration with the Social Affairs Office and the Village Community Empowerment Office (*DPMD*), the local government creates cross-sectoral synergies that bolster program success. The Social Affairs Office, for instance, provides social assistance to households at high risk of stunting due to limited access to food and health services. As a Social Affairs Office official in Sumedang emphasized, social assistance is crucial to ensure that low-income families can meet basic needs, including adequate nutrition for their children (YP, Interview, July 2024).

Furthermore, the local government empowers village administrations to participate in program implementation at the grassroots level. Village governments, given their close proximity to residents, better understand the challenges that each household faces. They therefore receive latitude to tailor programs to local contexts, use locally available foods in nutrition education, and involve community leaders in outreach activities. A village head explained that they use local food ingredients in nutrition counseling because such foods are familiar and thus more readily accepted by the community.

Village governments also play an important role in monitoring and evaluating the development of children at risk of stunting. Through regular data collection and monitoring, villages can quickly identify children who need interventions and refer them to appropriate health services. As a sub-district head in Sumedang explained, village governments serve as the front line in detecting at-risk children: "We conduct routine monitoring, and when we identify a child at risk of stunting, we immediately refer the case to the *puskesmas* or other health services" (AS, Interview, August 2024).

Consequently, the role of the local government in orchestrating convergence for stunting reduction in Sumedang Regency is crucial. Through integrated policies, inter-sectoral collaboration, and the empowerment of village governments, Sumedang has created a system that supports program effectiveness. The significant decline in stunting prevalence—from 32.2% in 2019 to 27.6% in 2022 (Deddi Rustandi, 2024)—demonstrates the effectiveness of these policies and the harmonious multi-actor collaboration. With this approach, Sumedang provides a strong example of adaptive and locally responsive health policy governance.

Beyond government actors, other stakeholders contribute to stunting alleviation. Non-governmental organizations (NGOs) play a key role in supporting stunting-reduction efforts in Sumedang Regency. NGOs contribute directly through nutrition education, training for *posyandu* cadres, and strengthening community capacity to address nutrition and health challenges. One of the primary forms of support is cadre training to improve knowledge about appropriate nutritional fulfillment, early detection of stunting, and methods for educating communities about healthy diets.

A *posyandu* cadre noted that "this training greatly helps us recognize signs of stunting and deliver appropriate interventions to families in need" (Sadiah, Interview, August 2024). Through such training, front-line *posyandu* cadres at the village level can perform their tasks more effectively and deliver targeted interventions to prevent stunting.

In addition to training, NGOs collaborate with the local government to ensure that planned health and nutrition programs are implemented effectively in the field. Several NGOs conduct household visits to families at risk of stunting, provide nutritious food assistance, and ensure that government nutrition programs operate as intended. In this regard, NGOs possess flexibility to reach communities directly and provide rapid solutions to emerging problems.

Figure 1. Collaboration Between Save the Children and the Sumedang Local Government

A clear example of collaboration is a workshop held at the Sumedang Government Pavilion that brought together the local government and the Better Investment for Stunting Alleviation (BISA) team. The workshop aimed to strengthen collaboration among diverse stakeholders in addressing stunting. As the head of *Bappeda* explained, this collaboration was designed "to align our efforts to reduce stunting, especially by engaging multiple actors such as local government and NGOs" (S, Head of *Bappeda*, Interview, July 2024).

In addition, the partnership between the local government and Save the Children has been ongoing since 2020, marked by a Memorandum of Understanding (MoU) that signals a long-term commitment to stunting reduction in Sumedang. The program was designed holistically with a community-based approach, using interactive and engaging methods to raise awareness about good nutrition and healthy behaviors.

In August 2023, dozens of *posyandu* cadres participated in "Emo-Demo" training designed to provide emotion-based learning for cadres. Through this approach, cadres could directly experience the importance of healthy diets and learn how to educate families in ways that are more accessible and comprehensible. As one cadre reflected, the training helped us better understand how to convey essential nutrition information in ways that are closer to and more acceptable for the community (Saidah, *Posyandu* Member, Interview, August 2024).

Temali: Jurnal Pembangunan Sosial
eISSN: 2615-5028, Vol 8, No 2, 2025, pp 314-330
https://doi.org/10.15575/jt.v8i2.49608

Figure 2. Emo-Demo Training for *Posyandu* Cadres

Beyond training, NGOs have also contributed to raising public awareness about household sanitation and hygiene. Through these efforts, NGOs support the government's objective of creating healthy environments that foster optimal child growth.

Collaboration among the government, NGOs, and the private sector through *CSR* programs has also become a vital element of stunting reduction in Sumedang. *CSR* initiatives include providing nutritious food assistance, building sanitation facilities, and improving clean water quality—all of which have direct impacts on child health and stunting prevention. Support from the private sector has significantly contributed to creating healthier environments that reinforce collective efforts to reduce stunting (S, Interview, *Bappeda* Sumedang, August 2024).

In sum, the success of stunting reduction in Sumedang Regency results from solid collaboration among the local government, NGOs, and the private sector. Through community-based approaches, empowerment of *posyandu* cadres, and community capacity building, Sumedang demonstrates how multi-actor cooperation can generate significant impacts in addressing stunting. With sustained support and collaboration, Sumedang can achieve its stunting-reduction targets and serve as a model for other regions in Indonesia.

Table 1. Roles and Relationship Patterns of Actors in the Orchestration of Stunting Reduction Convergence in Sumedang Regency

Actor/Institution	Main Role	Forms of Contribution/Intervention
Local Government (*Bappeda*)	Main director & coordinator	- Establish stunting as an RPJMD priority - Cross-sectoral integration (health, social, village) - Allocate specific stunting budget
Health Office	Technical implementer in health	- Nutrition education for pregnant women & children under five - Routine checkups at *puskesmas/posyandu* - Distribution of nutritional supplements
Social Affairs Office	Socio-economic support for families	- Social assistance for at-risk households - Improved access to nutritious food
DPMD & Village Government	Frontline at the local level	- Nutrition counseling using local foods - Engagement of community leaders - Routine monitoring of child development
NGOs (Save the Children, BISA, etc.)	Capacity strengthening & community facilitation	- Training for *posyandu* cadres (early detection, Emo-Demo) - Multi-actor workshops

		- Nutrition and sanitation outreach
Posyandu Cadres	Frontline of education & early detection	- Monitoring child growth and development - Educating families on nutrition and parenting
Private Sector (CSR)	Infrastructure and facility support	- Provision of nutritious food - Development of sanitation and clean water facilities

These findings demonstrate that stunting reduction efforts in Sumedang Regency cannot be separated from integrated multi-actor orchestration. The local government acts as the principal coordinator by prioritizing stunting within the RPJMD. Through *Bappeda*, policies and budget allocations were directed to support cross-sectoral interventions, ensuring that stunting management was not only the responsibility of the Health Office but also integrated with the social sector, village governance, and collaborations with NGOs and the private sector.

The Health Office served as the spearhead in implementing technical programs such as nutrition education, maternal health checkups, and supplement distribution. This role was reinforced by the Social Affairs Office, which provided social assistance to help low-income households access nutritious food. Meanwhile, *DPMD* and village governments acted as the frontline bridge between programs and local wisdom, for example by using local food resources in nutrition counseling and involving community leaders in outreach. These efforts demonstrated that community-based approaches were more readily accepted by the population.

Beyond government actors, external support from NGOs also made a substantial contribution. Through training for *posyandu* cadres, multi-actor workshops, and creative methods such as Emo-Demo, NGOs successfully enhanced community capacity while strengthening collective awareness of child nutrition and health. With this approach, *posyandu* cadres became capable of early detection and quicker interventions for at-risk households. The private sector's involvement through *CSR* programs further enriched interventions by providing supportive infrastructure, ranging from nutritious food to sanitation facilities and clean water.

This collaboration produced a governance system for stunting management that is more adaptive, responsive, and sustainable. The decline in stunting prevalence from 32.2% in 2019 to 27.6% in 2022 serves as evidence that strong multi-actor orchestration can generate tangible impacts. Sustaining this synergy is essential to ensure that achievements are not limited to numerical targets but also build the foundations for future generations' health and quality of life.

In conclusion, stunting management in Sumedang represents a *best practice* in applying the multi-actor convergence model. Local government, NGOs, the private sector, and communities were successfully integrated into an inclusive, participatory, and results-oriented policy ecosystem. This model is not only relevant for Sumedang but also has strong potential to be replicated in other regions as a collaborative and community-empowerment-based strategy for reducing stunting.

The Function of the *SIMPATI* Digital Platform in Data Integration, Monitoring, and Policy Feedback

The implementation of stunting-reduction programs in Sumedang Regency has shown significant progress, with prevalence decreasing to 27.6% in 2022 (sumedangkab.go.id, 2024). The strong commitment of the Sumedang Regency Government to address stunting is reflected in various policies and initiatives involving all societal elements, from village governments to community organizations. These efforts form part of Sumedang's response to the national priority of reducing stunting, which aims to improve the quality of life of future generations and mitigate the long-term impacts of child malnutrition.

One of the key policies supporting this achievement is the "Jabar Zero New Stunting" program, an initiative of the West Java Provincial Government focused on reducing new stunting cases in every village (Bappeda Provinsi Jawa Barat, 2025). This program has been implemented across all villages in Sumedang, emphasizing nutrition education, awareness of healthy lifestyles, and strict monitoring of pregnant women and children under two years old. The program does not only focus on lowering stunting rates but also builds public awareness about reproductive health and balanced nutrition. Each village is responsible for designing programs suited to its local needs, including providing nutritious supplementary food, routine checkups by village midwives, and educating mothers about the benefits of exclusive breastfeeding and healthy diets.

A key innovation that strengthens Sumedang's stunting interventions is the use of the *SIMPATI* (Integrated Stunting Management Information System) digital platform. This platform was designed to enable the digital and

real-time collection, monitoring, and updating of child health data. Through the *SIMPATI* application, health workers in the field can easily input data on children's nutrition and health development in each area, which is then integrated directly into the regency-level information system. With *SIMPATI*, the local government can access accurate and up-to-date data on stunting conditions in each village, including those with high-risk prevalence. The platform allows the government to conduct rapid analyses of child and maternal health conditions, enabling more effective resource allocation and better-targeted interventions.

Figure 3. *SIMPATI* Homepage

The use of digital technology through *SIMPATI* also supports mapping and identifying specific needs in each village. The data collected provide insights into children's nutritional status, maternal health, access to clean water and sanitation, and household socioeconomic factors closely linked to stunting risks. With more complete and structured data, the local government can design more targeted policies, such as improving clean water facilities in certain areas or expanding access to health services in remote regions. *SIMPATI* also enables the evaluation of program effectiveness, identification of emerging challenges, and adjustment of strategies according to field needs.

According to the Head of the Sumedang Health Office, DS:

> "With the *SIMPATI* platform, we can access more accurate and real-time data on stunting conditions in each village. Previously, we had difficulties monitoring field conditions, but now we can identify areas requiring interventions more quickly. This is essential for responding to changing situations more efficiently" (Interview, August 2024).

The strength of *SIMPATI* lies in its capacity to provide real-time data collected directly by health workers in villages. This process not only facilitates field operations but also ensures that the information obtained is the most up to date. With digital, real-time data, the local government can implement faster, more precise, and more tailored interventions according to each village's needs. The integrated and accessible database allows for easier analysis, enabling the Sumedang Regency Government to plan more strategic interventions and allocate resources more effectively.

The platform also supports *evidence-based decision making*. Structured and integrated data allow local governments to conduct ongoing evaluations of program effectiveness, including adjusting programs and strategies when needed. This monitoring and evaluation provide flexibility in addressing on-the-ground issues quickly, such as responding to rising stunting risks in particular areas. With a more targeted approach, *SIMPATI* has played a vital role in significantly reducing stunting in Sumedang, as reflected in the prevalence decline from 32.3% in 2018 to 7.89% in 2023.

The success of *SIMPATI* lies not only in data collection and analysis but also in its role as a collaborative platform connecting stakeholders—from local government, health offices, and *posyandu* cadres to the wider community. This synergy has strengthened convergence in public health policy, which forms the foundation of

stunting interventions in Sumedang. The active participation of diverse community actors has improved awareness and understanding of child nutrition, which is a critical factor in long-term stunting prevention.

The success of *SIMPATI* in Sumedang also creates opportunities for replication in other regions still struggling with stunting challenges. This model illustrates how technology can be adapted to local health needs and deliver tangible impacts on national health indicators. By leveraging digital technology and data-driven approaches, *SIMPATI* accelerates public health interventions that are faster, more effective, and more adaptive. The achievements in Sumedang thus provide a relevant example and model for other regions to adopt in addressing stunting more integratively and in an *evidence-based* manner.

DISCUSSION

This study found that the success of Sumedang Regency in reducing stunting prevalence did not rely solely on technical health and nutrition interventions but also on the application of *dynamic governance* principles. The three core capabilities—*sensing*, *seizing*, and *transforming*—served as the foundation that enabled the local government to read data accurately, formulate adaptive cross-sectoral policies, and introduce institutional innovations through the *SIMPATI* digital platform. In addition, the research highlighted the role of multiple actors, ranging from local government agencies (*SKPD*), village governments, *posyandu* cadres, NGOs, to the private sector, who collaborated in the orchestration of convergence.

Sumedang's success can be explained by a combination of political, institutional, and technological factors. First, political commitment from local leadership positioned stunting as a priority setting integrated into the RPJMD. Second, adaptive governance through task forces and cross-sectoral coordination enabled each actor to understand its role. Third, the use of *SIMPATI* as a digital platform promoted *evidence-based decision making*, ensuring interventions that were faster, more measurable, and better targeted. In other words, these outcomes emerged because the local government was able to transform data into political and social instruments for mobilizing collective action.

These findings align with literature emphasizing multilevel determinants of stunting, such as socioeconomic, nutritional, healthcare, and cultural factors (Hasanah & Arifah, 2024; Semba et al., 2011, 2016). However, this study advances the discussion by showing that interventions are effective not only when based on nutrition and health factors but also when supported by dynamic governance. Whereas previous studies largely emphasized contextual interventions (Kustanto et al., 2024; A. Setiawan et al., 2024) or *m-health* innovations (Utami et al., 2019), this research underscores the importance of digital data integration within local institutional frameworks. This constitutes the novelty of the study: demonstrating how *dynamic governance* fills the literature gap on adaptive governance and multi-actor orchestration in stunting reduction.

Historically, Sumedang's achievement represents a paradigm shift from rigid bureaucratic governance toward more adaptive and contextual governance. This contrasts with earlier patterns in which health interventions were often fragmented and sectoral. The new approach developed by Sumedang aligns with the principles of *adaptive governance*, which emphasize flexibility, continuous learning, and cross-actor collaboration in responding to complexity and uncertainty (Chaffin et al., 2014). Sumedang did not merely rely on formal policy but also integrated data, digital innovation, and community engagement into every stage of policymaking, consistent with the argument that *adaptive governance* must be contextual and tailored to local socio-ecological conditions (Akther & Evans, 2024).

Furthermore, the Sumedang model shows that the success of adaptive governance depends heavily on cross-sectoral collaboration and the capacity to align policies with on-the-ground needs. This principle resonates with *adaptive governance* practices in environmental sectors, where flexibility and co-production of local solutions have been shown to strengthen policy effectiveness (Butler et al., 2015; Novellie et al., 2016). In this sense, Sumedang illustrates that adapting governance to public health issues—particularly stunting—is only possible when local governments can overcome structural barriers, build legitimacy at the community level, and facilitate collective learning across actors (Chaffin & Gunderson, 2016; Cosens & Chaffin, 2016).

From a social perspective, this practice underscores the importance of collaboration across actors—from bureaucracy to village communities—that generates a sense of ownership over the stunting issue. Such collaboration reflects the concept of *multi-stakeholder collaboration*, in which actors from government, civil society, and the private sector share resources, knowledge, and responsibilities to address complex challenges that no single entity can resolve alone (MacDonald et al., 2019; Ren et al., 2025). In the Sumedang context, the involvement

of *Bappeda*, the Health Office, village governments, *posyandu* cadres, NGOs, and the private sector exemplifies collaborative practice based on coordination, communication, and continuous learning.

Moreover, the findings affirm that collective decision-making processes and cross-sectoral synergies not only strengthen the technical capacity of programs but also enhance democratic legitimacy in the eyes of local communities. This is consistent with Foley et al. (2017), who highlighted both the challenges and benefits of multi-actor collaboration in addressing sustainability issues, as well as Jansen and Kalas (2020), who emphasized the importance of partnership-based transformational governance. Thus, *multi-stakeholder collaboration* in Sumedang is not merely a managerial instrument but also a social mechanism that builds shared ownership and is crucial for the sustainability of stunting-reduction interventions.

While ideologically, Sumedang's success challenges the hegemony of purely technocratic approaches and demonstrates that governance based on participation and technology can strengthen the democratization of health policy. This practice aligns with the concept of *participatory governance*, a democratic mechanism that involves citizens in public policy formulation to bridge the gap between state institutions and society (Fischer, 2012; Palumbo, 2018). With digital platforms such as *SIMPATI* and village-level *rembuk stunting* forums, communities are no longer mere recipients of policy but active actors in shaping the direction of health policy.

Sumedang's experience also affirms that public participation in health policy not only enhances legitimacy but also produces more contextual and responsive decisions. As studies by Kohler and Martinez (2015) in Brazil and Ben Mesmia et al. (2023) in Tunisia have shown, community participation in health policy often faces challenges such as political manipulation, limited capacity, and exclusivity. However, when participation is effectively institutionalized—as in the Patient Advisory Councils in Catalonia (Vallès Navarro et al., 2015) or the Health Impact Assessment mechanism in Thailand (Promthong et al., 2025)—such practices can strengthen accountability, improve policy quality, and deepen the democratization of health governance. In this context, Sumedang's participatory model can be viewed as a concrete step toward *deep democracy*, combining community voices, technological capacity, and bureaucratic commitment (Palmquist, 2020).

The primary function of this study is to demonstrate that *dynamic governance* is capable of integrating technical, social, and political dimensions into a unified framework for action. Sumedang has successfully reduced stunting prevalence and strengthened local institutional capacity. Nevertheless, dysfunctions remain: the high coordination burden can create bureaucratic fatigue, dependence on digital technology such as *SIMPATI* risks exclusion in areas with limited internet infrastructure, and success heavily dependent on adaptive leadership may falter with changes in local political leadership. These challenges resonate with findings in the literature on governance challenges in *digital health*, where digital transformation in healthcare often encounters serious obstacles in data security, regulatory governance, and stakeholder engagement (Gilbert et al., 2023; Vayena et al., 2018).

Although the digitization of health data offers significant opportunities to improve policy effectiveness, it also creates vulnerabilities regarding privacy and security, including potential data breaches or cyberattacks that can undermine public trust (Gupta et al., 2025; Jayakumar et al., 2024). Moreover, existing regulatory frameworks often lag behind the pace of technological innovation, creating legal and ethical uncertainties in *digital health* implementation (Mardiansyah et al., 2025; Zangana et al., 2025). At the same time, the engagement of local actors remains a challenge, as not all regions have adequate digital infrastructure, thus maintaining a high risk of digital exclusion. This underscores that digital governance systems such as *SIMPATI* must account for equity of access, strengthen digital literacy, and be supported by adaptive regulatory designs to ensure the sustainability of public health innovations.

To address these dysfunctions, three strategic policy measures are required. First, the institutionalization of governance by embedding the stunting task force permanently within local government structures. This step is crucial to ensure that program success does not diminish or end with changes in political leadership. Second, equalizing digital access through the development of village internet infrastructure and technical support, so that *SIMPATI* functions not only in urban areas but also reaches regions with limited connectivity. Third, strengthening community capacity through the training of *posyandu* cadres, empowerment of PKK, and the involvement of community leaders to ensure that stunting prevention does not rely solely on formal bureaucracy. With this action plan, Sumedang's *dynamic governance* will not only address its internal weaknesses but also provide a more resilient and adaptive model for replication in other regions without losing sensitivity to local contexts.

CONCLUSION

This study demonstrates that the success of Sumedang Regency in accelerating stunting reduction was determined not only by health and nutrition interventions but also by the capabilities of *dynamic governance* enacted through the mechanisms of *sensing*, *seizing*, and *transforming*. By utilizing evidence-based data (*Riskesdas*, *e-PPGBM*), adaptive cross-sectoral coordination, and digital innovation through *SIMPATI*, Sumedang succeeded in building a governance model that is responsive, collaborative, and sustainable. This success was reinforced by multi-actor orchestration involving local government, technical agencies, village administrations, NGOs, *posyandu* cadres, and the private sector, which collectively created a sense of ownership and strengthened social resilience against stunting.

Scientifically, this study contributes by expanding the literature on stunting governance in Indonesia, moving beyond the dominance of medical and nutritional perspectives toward a *dynamic governance* framework. The findings enrich academic understanding of how bureaucratic adaptation, community participation, and digital technology integration can be combined to produce more inclusive and democratic health policies. Furthermore, this research affirms that Sumedang's practice can serve as a national *best practice* for developing public health governance models grounded in data, collaboration, and innovation.

Nevertheless, this study also has limitations. First, its focus on a single case study in Sumedang Regency means that generalization to other regions should be undertaken cautiously, given differences in social, political, and infrastructural contexts. Second, the research did not fully explore long-term sustainability issues, particularly the risks of bureaucratic fatigue, digital exclusion in areas with limited internet infrastructure, and vulnerability to shifts in local politics. Therefore, future research is recommended to conduct comparative studies across regions, expand analysis of the role of digital technology in health governance, and examine risk mitigation strategies to ensure that the *dynamic governance* model can be replicated more adaptively in diverse contexts.

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