

Fostering Cultural Synergy to Address Stunting: Community Resilience in Urban-Rural Coastal Belawan Bahari

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Abstract. Stunting persists to be a crucial obstacle in the urban-rural coastal areas of Indonesia, where ecological risks, structural vulnerabilities, and cultural dynamics intersect. The article explores the strategies of the Belawan Bahari community in Medan towards stunting, framing it as both a biomedical concern and a reflection of ecological and social injustices. Interviews, focus groups, observations, and document analysis were used to gather data from 25 participants (parents, health cadres, and local leaders) in a qualitative case study that took place from March to June 2025. In accordance with Bourdieu's habitus and resilience theory, the results indicate that tidal flooding, poor sanitation, and insufficient infrastructure increase the health risks of children, while low maternal education and inadequate services enhance fragility. Traditional medicine and kinship solidarity are cultural practices that families rely on, however they only help with short-term coping. Integrating ecological risk mitigation, healthcare governance, and cultural resources are crucial in designing successful stunting interventions. This is because cultural synergy arises when local traditions connect with institutional programs.

Keywords: stunting, ecological injustice, cultural synergy, resilience, coastal communities.

1 Introduction

A major public health issue in developing countries is stunting, which is caused by a lack of adequate food in children as well as other family-related socioeconomic and environmental factors. The problem goes beyond a lack of nutrition because it is closely related to poverty, environmental vulnerability, and limited access to basic services. The risks become worse in coastal urban-rural areas like Belawan Bahari due to frequent flooding, problematic livelihoods, and fragile conditions for living. In this context, understanding stunting involves going beyond a biological perspective to take responsibility for the larger structural and cultural elements that affect the health of children.

Millions of children under five suffer from stunting worldwide, which affects their long-term economic productivity, intellectual development, and physical growth. According to the World Health Organization (WHO), around 22.3% of children worldwide, or 148 million children, were stunted in 2022, reflecting continuing gaps in nutrition and health [1]. In Indonesia, the prevalence remained high at 21.6% in 2022 in spite of major government initiatives such as the

National Strategy to Accelerate Stunting Prevention (Stranas Stunting) [2]. This evidence shows that the problem is not just nutritional; it also represents broader social injustices and limitations from the environment.

Much of the study on stunting in Indonesia has focused on addressing poverty, maternal health, and nutritional intake [3], [4]. These studies emphasize the biological and socioeconomic causes of stunting and often suggest treatments such as maternal-child health programs or nutritional supplements. Despite their importance, these methods sometimes overlook the ecological component of child health, particularly in areas where environmental degradation, insufficient sanitation, and frequent flooding are problems. Recent studies have begun connecting climate sensitivity to the health of children, showing that environmental shocks have a significant impact on nutritional outcomes [5][6]. These studies, however, usually explore how groups use cultural practices or adjust to reduce such risks.

Research on community resilience in Indonesia has highlighted the importance of indigenous cultural practices, including *gotong royong* (mutual collaboration), for preserving livelihoods and health in unstable circumstances. Researchers have reported similar findings throughout the Pacific Islands, highlighting the essential role of indigenous customs and traditional knowledge in enhancing resistance to ecological injustice [7][8]. However, rather than directly connecting resilience to stunting as a child health consequence, these studies primarily look at resilience in broader contexts of preparedness for disasters or livelihood stability. Additionally, while developing adaptive approaches to address structural health disparities, not enough attention has been paid to the interaction between cultural practices and external institutional assistance, such as community health posts (*Posyandu*) or corporate social responsibility (CSR) activities.

This study focuses on Belawan Bahari's stunting problem as a symbol of environmental injustice and a place where cultures might come together. This study is unique in that it combines two viewpoints: it looks at stunting as a result of structural ecological risk impacted by cultural practices of adaptation and resilience, rather than only as a result of poor nutrition or household poverty. By examining how local communities mobilize their collective cultural values in collaboration with institutional interventions, this study provides a thorough explanation of stunting in urban-rural coastal areas.

The contribution of this study lies in three key areas: first, by framing child health within the broader concept of ecological injustice in Indonesia's coastal urban-rural communities; second, by illustrating how cultural synergy emerges when traditional practices intersect with institutional interventions; and third, by advancing policy recommendations that transcend biomedical solutions and emphasize ecological, structural, and cultural determinants of stunting.

2 Method

This research used a qualitative methodology to examine the impact of ecological injustice and cultural synergy on stunting in Belawan Bahari, Medan, Indonesia. A qualitative approach was considered suitable since it delivers a more profound understanding of life experiences, coping strategies, and cultural practices that a quantitative approach alone cannot fully express. This methodology is extensively recognized in health and social research for investigating complex socio-cultural systems that support community resilience [9][10].

This methodological framework directed the research conducted from March to June 2025, including comprehensive interviews, focus group discussions (FGDs), participant observation, and document analysis. Twenty-five informants participated, including parents, community health volunteers (Kader Posyandu), and local leaders. Focus group discussions were conducted with women's groups and youth representatives to collect collective perspectives on domestic practices and community-level coping strategies, according to participatory methodologies in health research [11]. For increased authenticity, participants were watched during daily family activities in flooding-prone regions and during community health initiatives, while local documents, including health statistics, government reports, and community records, were examined to augment and enrich the primary data [12].

The data were examined through a thematic approach that combined inductive and deductive methods, capturing field insights while conforming to theoretical frameworks. Inductive processing facilitated the organic emergence of themes from participants' experiences, whereas the deductive method was informed by the conceptual frameworks of ecological injustice and resilience [13]. Bourdieu's concept of habitus was applied to explain how structural restrictions influenced daily behaviors, while resilience theory offered an additional lens to examine the interaction between cultural practices and institutional interventions [14]. To increase credibility and ensure consistency, continuous peer review sessions within the research team were performed, promoting reflexivity and reinforcing the trustworthiness of interpretations.

Ethical approval for this study was obtained from the Research Ethics Committee of the Faculty of Social Sciences at Universitas Negeri Medan. All participants provided informed consent, and confidentiality was maintained throughout the process. During interviews and focus group discussions, careful attention was given to addressing sensitive issues of child health and household economic challenges with respect and confidentiality in reporting.

3 Result and Discussion

Stunting in Belawan Bahari shows the intersection of ecological risk factors, structural weakness, and cultural practices that impact child health effects. The community's experiences illustrate that malnutrition cannot be interpreted only as an issue of nutritional intake or parental irresponsibility; instead, it reflects deep-rooted ecological injustice and continuing systemic inequities that disproportionately impact underprivileged groups. The findings below integrate empirical data with theoretical perspectives to offer a thorough picture of how local households manage the challenges of raising healthy children during continual suffering.

3.1 Ecological Injustice in Everyday Life of Coastal Urban-Rural Communities

Ecological risks are deeply rooted in the daily existence of Belawan Bahari communities. The rural community is frequently subjected to tidal flooding, which covers residences and public areas with polluted water. Families said that children frequently play in floodwater contaminated with sewer waste, increasing the risk of diarrhea, skin infections, and other diseases. The absence of drainage infrastructure complicates the issue, as stagnant water remains long after the rainfall recedes. These ecological stresses illustrate what academics refer to as ecological injustice: environmental loads that significantly impact those communities with

restricted adaptive potential [15]. In contrast with affluent coastal regions capable of investing in flood defenses, people of Belawan Bahari face continuous risk without sufficient institutional protections.

The consequences for child health are significant. National statistics reveal that stunting remains at 21.5% in Indonesia as of 2022, with elevated prevalence in marginalized coastal and rural regions [16][17]. In Belawan Bahari, parents consistently observed that continual disease resulting from insufficient hygiene seriously impacted children's nutritional condition, even in situations of plenty of food. This research emphasizes that stunting should not be assigned just to inadequate nourishment but recognized because of ecological injustice. Comparative studies in the Philippines and Bangladesh indicate that children in areas with flooding show higher levels of growth faltering due to the compounded effects of disease transmitted by water and disrupted food systems, thereby underscoring that Belawan Bahari is not a unique case but rather part of a wider global phenomenon.

The ecological conditions of Belawan Bahari are evidenced by restricted access to potable water, inadequate sanitation, and frequent tidal inundation. Table 1 presents a summary of major environmental challenges.

Table 1. Ecological and Sanitation Challenges in Belawan Bahari

Neighborhood	Water Source	Drainage Condition	Main Issues
7	Borrowed water wells (paid)	Limited	Poor ventilation, cramped housing, basic sanitation
8	Partly purchased water	Moderate	Waste accumulation, densely populated housing
9	Swamp water, tidal flooding	Not functioning	Standing water, poor sanitation, congested housing

3.2 Structural Fragility and Service Gaps in Belawan Bahari

Along with physical obstacles, families encounter systemic obstacles that prevent them from obtaining necessary services. The distribution of healthcare through Posyandu (community health posts) and Puskesmas (primary care facilities) is irregular and constrained in coverage. Mothers indicated that services frequently consist mainly of monthly child weight and the supply of vitamin supplements, without sufficient follow-up for children with chronic diseases. The identified problems indicate significant issues in Indonesia's primary healthcare governance, characterized by resource limitations, dependence on volunteers, and poor oversight, which compromise service quality [18]. Research indicates that community health workers frequently function without proper instruction, financial incentives, or logistical assistance, therefore weakening their ability to implement effective interventions [19].

Education represents another structural risk. A significant number of mothers in Belawan Bahari lacked sufficient formal education, which restricts their understanding of nutrition, cleanliness, and childcare practices. The lack of continual health promotion increases the disparity, as families depend mostly on informal knowledge or stories from others instead of structured educational initiatives. According to empirical research conducted throughout Indonesia, maternal education is one of the most significant indicators of child nutritional outcomes [20].

The infrastructural shortcomings in Belawan Bahari, comprising damaged roads, insufficient drainage, and inconsistent access to potable water, increase those inequalities. Families face difficulties in accessing health care, and government outreach workers encounter challenges in routinely reaching houses in flood-prone areas. Structural fragility consequently sustains cycles of vulnerability that transcend individual acts. The socio-economic profile of the informants indicates that the majority of women occupy precarious positions, characterized by low income, while shouldering a dual burden as both economic providers and primary caregivers. A summary of these attributes is provided in Table 2.

Table 2. Socio-Economic Profile and Women’s Double Burden

Variable	Key Findings
Number of Informants	8
Average Age	26–37 years
Main Occupation	Daily laborers (4), scavenger (1), food vendor (1), fisher’s wife (1), welder (1)
Ethnicity	Javanese (6), Batak (1), Karo (1)
Average Income	IDR 500,000 – 1,500,000 per month

3.3 Cultural Practices in Navigating Barriers

Dealing with ecological and structural challenges, families depend on cultural beliefs and practices for resilience. Mothers sometimes resort to traditional medicines, such as jamu (herbal medicine), for addressing childhood diseases. Although these techniques contain significant cultural traditions and offer accessible care in communities with limited medical resources, they can also have negative impacts. Certain treatment options may mitigate minor diseases and provide a sense of agency; nonetheless, they are insufficient alternatives for medical intervention in serious circumstances. Parents follow food taboos, including avoiding the introduction of specific protein-rich meals to young children, according to local beliefs. These cultural behaviors illustrate how knowledge systems influence child feeding, sometimes ensuring safety while at other times reinforcing potential risks [20].

Cultural solidarity structures, such as gotong royong (mutual cooperation), offer essential informal security mechanisms. Families often depend on family and close friends for food borrowing, childcare sharing, or assistance during floods. These activities reflect what sociologists refer to as cultural resilience: the usage of local values and networks to endure external pressures [21]. Such processes have been observed in other coastal communities in Southeast Asia, where community solidarity supports livelihoods against environmental stress [22]. Nevertheless, the need for informal networks highlights the insufficient quality of institutional responses, as families cannot serve as a permanent replacement for systemic reforms.

Community-based health services are comparatively accessible; yet, families continue to rely significantly on external support and employ pragmatic coping mechanisms in their daily lives. The results are encapsulated in Table 3.

Table 3. Access to Posyandu, External Assistance, and Coping Strategies

Variable	Key Findings
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Attendance at Posyandu	Most attend regularly (7 out of 8 informants)
Assistance Received	Milk, mung bean porridge, vitamins (Posyandu); food aid (political parties/CSR); incidental support (students, PKK)
Stunting Awareness	Information obtained from Puskesmas, village office, PKK, and students
Coping Strategies	Cooking with limited resources, fulfilling children's requests, allowing frequent snacking, relying on relatives
Child Consumption Patterns	Mainly rice, fish, eggs; limited meat and fruit; snacking more frequent than nutritious food intake

3.4 Cultural Synergy as a Pathway to Resilience

The development of cultural harmony between official institutions and local traditions is perhaps the most remarkable discovery. Despite the deficiencies of Posyandu, families engage with health volunteers by integrating local customs with medical efforts. Health professionals integrate cultural narratives to encourage moms to practice exclusive breastfeeding and to expand the nutrition of their kids. Another strategy used by local leaders to increase participation in health campaigns is the mobilization of kinship networks. These traditions demonstrate the possibility of cultural synergy, wherein indigenous values converge with institutional objectives to bolster resilience.

Instead of viewing culture as a hindrance to health promotion, we should view it as a valuable resource. Recent research confirms this sentiment, arguing for interventions that are situationally appropriate and based on local reality [23]. Although international funders and governmental organizations frequently advocate for technical or scientific interventions for preventing stunting, the Belawan Bahari case illustrates that community-driven modifications can improve program implementation and sustainability. Comparative studies from Vietnam and Cambodia highlight that culturally adapted health interventions improve participation and yield better durable long-term outcomes [24][25]. As a result, the Belawan Bahari case adds to ongoing discussions around the world by demonstrating how cultural and institutional factors interact to build resilience.

3.5 Implications for Understanding Stunting

Stunting is changed from a nutritional or medical problem to something more complex when ecological, structural, and cultural viewpoints are considered together. It emphasizes that stunting is a complex injustice that derives from a lack of equitable awareness of cultural norms, limited systemic services, and unbalanced responses to environmental risks. By emphasizing ecological injustice, the study criticizes traditional medical perspectives and improves a deep knowledge of child health in at-risk coastal environments. The findings indicate that reducing stunting requires initiatives that also build infrastructure, increase service quality, and interact with cultural traditions instead of abandoning them.

4 Conclusion

The results of this study demonstrate that stunting in Belawan Bahari is caused by a wide range of ecological, structural, and cultural factors, rather than just a lack of proper diet or medication. Environmental injustice has a direct impact on the development outcomes of children when they

are exposed to long-term health risks due to factors such as inadequate infrastructure, poor sanitation, and persistent tidal flooding.

Insufficient public services, a low quality of maternal education, and the absence of healthcare resources all contribute to families' poor financial situations and make it even more difficult for them to receive the comprehensive support they need. Local households employ cultural behaviors—such as kinship-based collaboration, dependence on traditional medicines, and communal solidarity—as adaptation tactics. Although unprepared individually, these activities signify crucial types of resilience that, when integrated with institutional programs, create pathways for cultural synergy.

The results indicate that tackling stunting in coastal urban-rural areas requires policies that extend basic technological improvements. Effective methods should integrate ecological risk mitigation, inclusive service provision, and the incorporation of local cultural assets.

Policy implication: To achieve significant impact, policymakers must implement integrated strategies that concurrently enhance infrastructure, ensure equitable access to health services, and incorporate cultural practices, such as women's networks and community solidarity into program design. Characterizing stunting as a public health and social justice concern facilitates the development of more sustainable and contextually relevant treatments for at-risk coastal communities.

This study examines stunting in the context of ecological transition and social innovation, so it aligns with the conference themes of Environmental and Green Transitions and Social Innovation and Community Resilience in the Digital Age. It emphasizes that local cultural practices, when integrated with institutional frameworks, can promote resilience and equity in response to environmental and structural issues.

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References

- [1] WHO, UNICEF, and W. Bank, "Levels and trends in child malnutrition: UNICEF/WHO/World Bank Group joint child malnutrition estimates: key findings of the 2023 edition," 2023. [Online]. Available: <https://www.who.int/publications/i/item/9789240073791>
- [2] SSGI, "Indonesian Nutritional Status Survey (SSGI) 2022," 2022. [Online]. Available: <https://www.litbang.kemkes.go.id/buku-saku-hasil-studi-status-gizi-indonesia-ssgi-tahun-2021/>
- [3] T. Beal, A. Tumilowicz, A. Sutrisna, D. Izwardy, and L. M. Neufeld, "A review of child stunting determinants in Indonesia," *Matern. Child Nutr.*, vol. 14, no. 4, pp. 1–10, 2018, doi: 10.1111/mcn.12617.
- [4] A. L. Rusyda and Y. F. Baliwati, "Transforming maternal and child health systems and nutritional intervention: Impacts on stunting prevalence in Indonesia," *Penelit. Gizi dan Makanan*, vol. 47, no. 1, pp. 43–52, 2025, [Online]. Available: <https://doi.org/10.36457/pgm.v47i1.779>
- [5] M. Lieber, P. Chin-Hong, K. Kelly, M. Dandu, and S. D. Weiser, "A systematic review and meta-analysis assessing the impact of droughts, flooding, and climate variability on malnutrition," *Glob. Public Health*, vol. 17, no. 1, pp. 68–82, 2022, doi: 10.1080/17441692.2020.1860247.
- [6] D. K. Kinyoki et al., "Mapping child growth failure across low- and middle-income countries," *Nature*, vol. 577, no. 7789, pp. 231–234, 2020, doi: 10.1038/s41586-019-1878-8.
- [7] P. D. Nunn et al., "Traditional knowledge for climate resilience in the Pacific Islands," *Wiley Interdiscip. Rev. Clim. Chang.*, vol. 15, no. 4, pp. 1–25, 2024, doi: 10.1002/wcc.882.
- [8] H. Suryani, P., & Daryanto, "The role of local wisdom in fostering community cohesion in Medan," *J. Soc. Cult. Anthropol.*, vol. 19, pp. 195–210, 2022, doi: <https://doi.org/10.1080/17543148.2022.1868572>.
- [9] J. W. Creswell., *Qualitative inquiry and research design : choosing among five approaches - 3rd edition*. 2017.
- [10] U. Flick, *An introduction to qualitative research*, 4th ed. Thousand Oaks, CA: Sage Publications Ltd, 2009.
- [11] C. Fogg et al., "The role of Participatory Action Research in developing new models of healthcare: Perspectives from participants and recommendations for ethical review and governance oversight," *Ethics, Med. Public Heal.*, vol. 24, p. 100833, 2022, doi: 10.1016/j.jemep.2022 .
- [12] N. K. Denzin, *The Research Art : A Theoretical Introduction to Sociological Methods*, 1st Editio. New York: Routledge, 2017. doi: <https://doi.org/10.4324/9781315134543>.
- [13] L. S. Nowell, J. M. Norris, D. E. White, and N. J. Moules, "Thematic Analysis: Striving to Meet the Trustworthiness Criteria," *Int. J. Qual. Methods*, vol. 16, no. 1, pp. 1–13, 2017, doi: 10.1177/1609406917733847.
- [14] P. Bourdieu, *Outline of A Theory of Paractice*. Switzerland: Cambridge University Press, 2013. doi: <https://doi.org/10.1017/CBO9780511812507>.
- [15] L. A. Royer, "Environmental and human health justice: A call to greater action," *Integr. Environ. Assess. Manag.*, vol. 18, no. 2, pp. 303–304, Mar. 2022, doi: <https://doi.org/10.1002/ieam.4582>.

- [16] United nation children, "Laporan Indonesia Tahunan 2020," pp. 1–23, 2020, [Online]. Available: www.unicef.or.id
- [17] United Nations Children's Fund (UNICEF) Indonesia, "The State of Children in Indonesia," 2020. [Online]. Available: <https://www.unicef.org/indonesia/sites/unicef.org.indonesia/files/2020-06/The-State-of-Children-in-Indonesia-2020.pdf>
- [18] M. Hasanbasri, A. W. Maula, B. S. Wiratama, A. Espressivo, and T. Marthias, "Analyzing Primary Healthcare Governance in Indonesia: Perspectives of Community Health Workers," *Cureus*, vol. 16, no. 3, 2024, doi: 10.7759/cureus.56099.
- [19] S. Wenang et al., "Availability and Accessibility of Primary Care for the Remote, Rural, and Poor Population of Indonesia," *Front. Public Heal.*, vol. 9, no. September, pp. 1–11, 2021, doi: 10.3389/fpubh.2021.721886.
- [20] A. D. Laksono, R. D. Wulandari, N. Amaliah, and R. W. Wisnuwardani, "Stunting among children under two years in Indonesia: Does maternal education matter?," *PLoS One*, vol. 17, no. 7 July, pp. 1–11, 2022, doi: 10.1371/journal.pone.0271509.
- [21] M. Ungar, "Systemic resilience: principles and processes for a science of change in contexts of adversity," *Ecol. Soc.*, vol. 23, no. 4, 2018, doi: 10.5751/ES-10385-230434.
- [22] S. Sagala et al., "Improving Resilience in Indonesia through Coastal Community-led Climate Change Adaptation and Disaster Risk Reduction." [Online]. Available: <https://rdiglobal.org/publications/view/12473/improving-resilience-in-indonesia-through-coastal-community-led-climate-change-adaptation-and-disaster-risk-reduction?>
- [23] J. Page-Reeves, "Community-Based Participatory Research for Health," *Health Promot. Pract.*, vol. 20, no. 1, pp. 15–17, Aug. 2025, [Online]. Available: <https://www.jstor.org/stable/27008407>
- [24] T. T. Nguyen et al., "Bridging the evidence-to-action gap: enhancing alignment of national nutrition strategies in Cambodia, Laos, and Vietnam with global and regional recommendations," *Front. Nutr.*, vol. 10, no. January, pp. 1–11, 2023, doi: 10.3389/fnut.2023.1277804.
- [25] J. M. Labonté et al., "Restricting diet for perceived health benefit: A mixed-methods exploration of peripartum food taboos in rural Cambodia," *Matern. Child Nutr.*, vol. 19, no. 3, 2023, doi: 10.1111/mcn.13517.