

Co-Producing the Problem: How Government, Community, and Private-Sector Actors Build a Shared Evidence Base for Stunting Prevention on a Remote Island in Indonesia

Adnan^{1*}, Muhammad Yusran Amir², Sukri Palutturi², Darmawansyah², Suriah³ and Setiawan Kasim⁴

¹Magister Program in Public Health, Faculty of Public Health, Hasanuddin University, Makassar 90245, Indonesia

²Department of Health Administration and Policy, Faculty of Public Health, Hasanuddin University, Makassar 90245, Indonesia

³Department of Health Promotion and Behavioral Sciences, Faculty of Public Health, Hasanuddin University, Makassar 90245, Indonesia

⁴Department of Public Health, Faculty of Health, Patria Artha University, Gowa, Indonesia

*Corresponding author: adnanbunyu@yahoo.com

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ABSTRACT

Background: Stunting remains a major public health challenge in Indonesia, especially in geographically isolated areas where fragmented governance limits the effectiveness of nutrition programs. Little is known about how collaborating actors define the problem together before they act.

Objective: To explore how government, community, and private-sector actors co-produced a shared understanding of stunting within a Triple Helix-informed collaboration on Bunyu Island, North Kalimantan, Indonesia.

Methods: We conducted a qualitative phenomenological study from February to March 2026 in the working area of Bunyu District Health Center. Twenty-one purposively selected informants from the District Health Office, the health center, subdistrict and village governments, Posyandu cadres, private companies, and community representatives took part. Data came from in-depth interviews, focus group discussions, non-participant observation, and document review. Data were analyzed using Braun and Clarke's thematic analysis in NVivo 15. Reporting followed COREQ.

Results: Four themes described the problem-definition stage: (1) multi-method situational analysis combining 5W analysis, fishbone analysis, and review of low-performing program indicators; (2) multifactorial risk-factor framing aligned with national nutrition priorities; (3) household and field verification that tested routine data against community reports; and (4) shared understanding built through policy alignment and collective learning, with limited community knowledge as a persistent barrier. Companies directed CSR resources toward jointly identified needs.

Conclusions: Problem definition works as a distinct governance stage in which shared evidence, and not formal agreement alone, creates the basis for joint action. Institutionalizing joint situational analysis, household-level verification, and community education could strengthen multisectoral stunting governance in remote settings.

Keywords: stunting prevention; collaborative governance; Triple Helix; problem definition; community health workers; multisectoral collaboration; qualitative research

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INTRODUCTION

Stunting remains one of the most pressing public health challenges worldwide because it harms child survival, cognitive development, educational attainment, and future economic productivity [1,2]. Global prevalence continues to exceed the targets set under the Sustainable Development Goals, particularly in low- and middle-income countries [3]. Accelerating stunting reduction therefore requires interventions that integrate health, education, food systems, sanitation, and social protection,

supported by political commitment and effective governance [4–6].

Indonesia treats stunting reduction as a national priority through a National Strategy that stresses convergence among government institutions and stakeholders at all administrative levels [7]. Stunting in Indonesia has multiple interacting determinants, spanning maternal characteristics, feeding practices, household conditions, sanitation, and health service use [8]. Island and border districts add structural barriers, including limited healthcare accessibility, inadequate nutrition services,

*Author for Correspondence: adnanbunyu@yahoo.com

fragmented institutional coordination, and shortages of skilled human resources. Outcomes in such settings therefore depend on governance and cross-sector collaboration as much as on health sector interventions.

Collaborative governance has emerged as a strategy for integrating diverse actors through shared decision-making, trust building, resource mobilization, and accountability [9,10]. Cross-sector collaborations are shaped by their initial conditions, processes, structures, and the agreements that bind partners [11]. In Indonesia, studies of collaboration in stunting reduction have documented mandated arrangements that remain government-owned and involve non-state actors only to a limited degree [12], as well as Penta-Helix approaches that extend collaboration to academia, business, community, and media [13]. A systematic review has likewise highlighted the importance of collaboration guidelines in stunting management [14].

The Triple Helix framework, which emphasizes interaction among government, academia, and industry, was originally developed to explain innovation systems [15,16]. Applying it to community nutrition offers a way to examine how knowledge, public authority, and private resources can be combined, including through corporate social responsibility (CSR) programs. In collaborative governance theory, the early part of the collaborative process is described as one of face-to-face dialogue, trust building, and the development of shared understanding [9], and later collaborative dynamics depend on principled engagement, shared motivation, and the capacity for joint action [10]. Yet this early problem-definition stage is rarely examined empirically. Few studies describe how actors from different institutions gather evidence, agree on causes, and set priorities before interventions begin, particularly in geographically isolated settings.

Bunyu District in Bulungan Regency, North Kalimantan Province, is an island with limited public service infrastructure. It has a primary health center, local government agencies, and private companies that run CSR programs, which creates opportunities for collaborative action. This study asks: *how do government, community, and private-sector actors define the stunting problem together, and what mechanisms turn individual perspectives into a shared evidence base?* We aimed to describe the collaborative processes of situational analysis, risk-factor identification, field verification, and shared understanding in stunting prevention in the working area of Bunyu District Health Center.

MATERIALS AND METHODS

Study design

We used a qualitative phenomenological design to capture stakeholders' lived experience and perceptions of collaborative governance among government, community, and private-sector actors in stunting prevention. The study was conducted in a constructivist paradigm and examined collaboration through the lenses of institutional interaction, leadership, communication, resource sharing,

and stakeholder engagement. It is reported according to the Consolidated Criteria for Reporting Qualitative Research (COREQ) [17]. The researchers served as the primary research instrument by conducting interviews, facilitating focus group discussions (FGDs), observing in the field, and triangulating evidence from several sources. Reflexivity was maintained through field notes, analytical memos, and regular peer discussion.

Study setting

The study took place in the working area of Bunyu District Health Center, Bulungan Regency, North Kalimantan, Indonesia. Bunyu was selected purposively because of its high stunting rate and its status as a geographically isolated island with limited transportation and health services. These conditions call for strong partnerships among government, community-based organizations, academic institutions, and private partners acting through CSR initiatives. Fieldwork took place from February to March 2026 and comprised stakeholder consultation, interviews, field observation, transcription, initial analysis, and validation of findings.

Participants and sampling

We recruited participants purposively to include stakeholders with direct experience of stunting prevention and of cross-sector collaboration. Sampling followed the principle of information richness and continued until thematic saturation was reached [18]. Twenty-one informants took part (Table 1). They represented government institutions (Bulungan District Health Office, Bunyu District Health Center, Bunyu Subdistrict Office, and village governments), community stakeholders (Posyandu cadres, nutrition officers, physicians, community leaders, and community representatives involved in maternal and child health initiatives), and the private sector (PT Pertamina EP Bunyu and PT Lamindo Intermultikon, through CSR programs). Their experience in stunting interventions ranged from 3 to more than 20 years. Participants had been involved in planning, implementation, supervision, financing, or facilitation of stunting reduction interventions. Public health and clinical nutrition experts were also consulted to improve the context analysis. All participants provided informed consent.

Data collection

We used four data sources to allow methodological triangulation. In-depth semi-structured interviews were the primary source. Questions covered institutional roles, intersectoral coordination, leadership, communication, resource allocation, policy implementation, barriers, facilitators, and the perceived impact of the collaboration. FGDs were held to validate emerging findings and to explore shared experiences among government, community, and private-sector stakeholders. We reviewed documentary evidence, including health reports, policy documents, CSR reports, meeting minutes, and program records. We also conducted non-participant observation of Posyandu activities, coordination meetings, and nutrition

programs. All interviews and FGDs were audio-recorded and transcribed verbatim.

Data analysis

Transcripts were analyzed using Braun and Clarke's six-phase thematic analysis [19]: familiarization with the data, initial coding, theme development, theme refinement, theme definition, and interpretation. Interview transcripts, field notes, observation notes, and documents were triangulated to inform a rich contextual understanding. NVivo version 15 (Lumivero, Denver, CO, USA) was used to manage and code the data, compare codes across participant groups, and run matrix coding queries and word-frequency queries. We used a hybrid deductive-inductive approach. Deductive codes were derived from the Triple Helix and collaborative governance frameworks, and inductive coding allowed context-specific themes to emerge. Iterative coding, constant comparison, analytical memos, and consensus discussions among the researchers supported analytical rigor. This paper reports the themes related to the problem-definition stage of the collaboration; themes concerning later stages of the collaborative process are reported separately. Quotations were translated from Indonesian into English for reporting.

Trustworthiness

Trustworthiness was addressed using the criteria of credibility, transferability, dependability, and confirmability [20,21]. Credibility was supported by extended field engagement, triangulation of methods and sources, member checking [22], and peer debriefing. Participants represented different stakeholder groups within the Triple Helix framework. Transferability was supported by detailed description of the context and participants. A detailed audit trail of data collection and analysis supported dependability, and reflexive journaling and systematic recording of analytical decisions supported confirmability.

Ethical considerations

The study followed the principles of the Declaration of Helsinki [23] and national regulations governing research with human participants. Ethical approval was obtained from the Health Research Ethics Committee of the Faculty of Public Health, Hasanuddin University, before data collection began. Participants gave informed consent and were assured of confidentiality; quotations are identified by role and participant code only.

RESULTS

Participant characteristics

Twenty-one key informants participated, representing the three institutional domains of the Triple Helix framework (Table 1). Their experience in stunting interventions ranged from 3 to more than 20 years. The mix of decision-makers, program implementers, and community-level actors allowed triangulation of perspectives on policy implementation, institutional coordination, community participation, and resource mobilization. Analysis produced four themes that describe how actors defined the stunting problem together (Table 2; Figure 1). Word-

frequency queries of the transcripts showed that the terms for stunting, program, health center, collaboration, government, and community were among the most frequent, which is consistent with the central coordinating role of the health center and the multisectoral framing of participants' accounts.

Theme 1: Multi-method situational analysis

The first theme concerned the collaborative process of defining the local stunting situation. Participants consistently explained that identifying the magnitude and characteristics of stunting was the foundation for intervention planning. Instead of relying only on routine surveillance reports, stakeholders combined epidemiological data, village reports, household observation, and community consultation to build a comprehensive understanding of the problem.

NVivo matrix coding showed that situational analysis consisted of five components: 5W analysis, fishbone analysis, identification of low-performing nutrition programs, community reporting mechanisms, and field verification (the last two are elaborated under Theme 3). Identification of low-performing program indicators generated the highest number of coding references, which indicates that stakeholders regarded routine program monitoring as essential for collaborative decision-making.

Village government officers described structured analytic tools. One explained, "By using the 5W method" (Village Government Officer, P6), which meant systematically asking what, why, where, when, and who for each reported stunting case before intervening. Another said, "By using the fishbone method" (Village Government Officer, P5). Participants explained that the fishbone framework facilitated multidisciplinary discussion by allowing health workers, village officials, and CSR representatives to visualize complex causal pathways instead of focusing only on nutritional deficiency.

Program performance data also triggered joint analysis. A senior official of the District Health Office said: "Based on the data, our achievement is still below 80%, so we are trying to identify the root cause through growth monitoring, especially at Posyandu" (District Health Office, P1). Collaborative planning was therefore driven by systematic evaluation of program performance indicators as well as by epidemiological evidence.

Theme 2: Multifactorial risk-factor framing

Stakeholders consistently described stunting as a multifactorial problem resulting from interacting nutritional, behavioural, environmental, and health service determinants and not as a consequence of inadequate food intake alone. Government agencies, primary healthcare professionals, Posyandu cadres, village authorities, and private-sector partners all took part in identifying risk factors before intervention strategies were designed. Nutritional deficiencies were closely linked to limited maternal knowledge, suboptimal infant and young child feeding, incomplete immunization, poor utilization of maternal health services, and limited compliance with

micronutrient supplementation. Rather than addressing each determinant independently, stakeholders considered them interconnected components that required synchronized action across institutions.

National priority interventions were the main reference for identifying nutritional risk factors. A District Health Office official explained: “Another factor that is the cause of the need for increased immunization and the provision of iron supplements and Vitamin A, which is indeed one of the interventions that we must monitor nationally in an effort to reduce stunting rates” (District Health Office, P1, interview, 19 February 2026). Local framing of risk therefore remained strongly aligned with national stunting reduction priorities.

Participants also highlighted household environmental conditions and daily behaviours as contributors to chronic malnutrition. Community health workers assessed sanitation, hygiene practices, household food preparation, childcare behaviour, and environmental cleanliness. Private-sector organizations recognized that identifying risk factors was a prerequisite for allocating CSR resources effectively. Instead of generalized nutrition programs, CSR activities were increasingly directed toward priorities identified jointly with government institutions and healthcare providers.

Theme 3: Household and field verification

Field data collection and verification emerged as a fundamental component of problem definition because stakeholders held that collaborative decisions should rest on accurate, current, and context-specific information. Matrix coding identified two categories, field visits and home visits, with home visits coded slightly more often. This pattern suggests that stakeholders prioritized direct household verification of children's nutritional status and of determinants not captured by routine reporting.

Participants explained that verification was not limited to confirming anthropometric measurements. It also involved observing household environments, parenting practices, sanitation conditions, food availability, and family health behaviours, and it involved health professionals, Posyandu cadres, village governments, and community representatives. A Posyandu cadre described it as follows: “Together with the Community Health Center team, we went directly from house to house to observe the residents' living habits and the environment that influences them” (Posyandu cadre, POY4, interview, 19 February 2026). Another cadre noted that “Posyandu cadres assisted by the Bunyu Health Center team went directly to the field” (POY4). Home visits therefore worked as comprehensive assessments and not as administrative checks, and they also created opportunities for health education and individual counselling of caregivers.

Community members were also a source of information. As one cadre explained: “Usually, there are also reports from residents whose children are thin, and we immediately go down to see before we report it to the Community Health Center team” (Posyandu cadre,

POY3). Cases first identified through Posyandu records or community reports were re-evaluated by direct observation before intervention priorities were set. Participants said that this cross-validation reduced discrepancies between routine surveillance data and actual community conditions, minimized classification errors, and increased the confidence of collaborating institutions in program targeting. Home-based activities also strengthened trust between community members and health providers, which improved community acceptance of nutrition interventions.

Theme 4: Shared understanding of stunting prevention

The fourth theme described how stakeholders developed shared understanding of the objectives, priorities, and strategies of stunting prevention. Matrix coding indicated three interrelated dimensions: alignment with national stunting policies, improving community knowledge and awareness, and shared understanding of intervention strategies. References to alignment with national policy and to limited community knowledge were the most frequent. Government representatives emphasized that all collaborating institutions referred to the National Strategy for Accelerating Stunting Reduction when designing local interventions, as in the District Health Office statement quoted under Theme 2. Shared interpretation of national direction reduced fragmentation and served as a common operational framework across institutional boundaries.

Participants acknowledged, however, that institutional consensus alone was not enough because community understanding remained limited. A representative of the Bunyu Subdistrict Office stated: “What I know in general is that this is the result of one of the understandings or education received by our society” (Subdistrict Office, P2, interview, 19 February 2026). Stakeholders therefore treated health education as an integral part of collaborative governance, and community education was incorporated into coordination meetings, village forums, Posyandu services, and CSR-supported outreach.

Private-sector organizations also recognized the urgency of collaborative action. A CSR manager stated: “We understand the importance of handling stunting” (PT Lamindo Intermultikon, PS1, interview, 19 February 2026). Stunting was increasingly regarded as a shared development responsibility and not solely a governmental obligation, which encouraged broader institutional participation. Overall, shared understanding was achieved through continuous communication, policy alignment, and collective learning and not through formal agreements alone.

Synthesis of the problem-definition stage

Taken together, the four themes show that collaboration on Bunyu Island began with the development of a shared evidence base and not with immediate program execution. Situational analysis, risk-factor framing, verification, and shared understanding were complementary processes. Data validation, policy alignment, and continuous interaction among government institutions, health

providers, community organizations, and private-sector actors established the institutional foundation for later stages of deliberation, decision-making, and implementation. The effectiveness of the collaboration therefore depended not only on available resources but also on stakeholders' ability to build a common understanding of the stunting problem before deciding on coordinated strategies.

DISCUSSION

Principal findings

This study shows that, in a remote island district, problem definition was an active, multi-actor process of evidence building. Government officials, health center staff, cadres, and private partners combined epidemiological data, household observation, community reports, and program monitoring into a common analytical frame, and they did so through concrete tools (5W and fishbone analysis), routine program indicators, and home visits. The findings give empirical content to the shared-understanding element that Ansell and Gash place within the collaborative process [9], and they suggest that shared evidence is one route by which that understanding is built.

Verification as a collaborative and learning mechanism

Household verification strengthened the quality of collaborative decision-making. Direct observation revealed sanitation, parenting, environmental, and health-seeking factors that routine surveillance often misses, and it reduced classification errors before priorities were set. Repeated interaction among health workers, cadres, and village officials in the field also functioned as an institutional learning mechanism that reduced information asymmetry and strengthened mutual accountability. This corresponds to the capacity for joint action in the collaborative governance regime framework, in which shared procedures and resources enable partners to act together [10]. Because verification involved cadres, it also drew on community health workers' recognized role in linking communities and health services [24,25].

Community cadres as boundary spanners

Posyandu cadres connected formal institutions with households by reporting community concerns, visiting homes with health center staff, and providing counselling. This matches the description of boundary spanners as actors who build relationships and translate between organizations in collaborative settings [26]. In contrast to a study from West Java that described stunting collaboration as government-owned, with limited participation by non-state actors [12], informants on Bunyu described community and private-sector actors as taking part in analyzing the problem. This difference may reflect the small island context, the presence of CSR-active companies, or both, and it should be tested in other settings.

Shared understanding without formal agreement

Shared understanding emerged from policy alignment, continuous communication, and collective learning and not from formal agreements alone. This is consistent with

collaborative governance literature that treats shared motivation and principled engagement as drivers of collaborative dynamics [10], and it adds a nuance to the cross-sector collaboration literature, which gives weight to formal and informal agreements [11]. National policy functioned as a common reference that let institutions interpret the problem in compatible ways, which is in line with evidence that policy commitment shapes nutrition action [5,6]. At the same time, limited community knowledge remained a persistent gap, which suggests that consensus among institutions does not guarantee behavioural change at household level.

The private sector in problem definition

Private companies used jointly identified needs to direct CSR resources, and they described stunting as a shared development responsibility. This indicates that, in this setting, CSR was linked to local evidence and not only to philanthropy. Public-private health partnerships generally require clear governance, transparency, and defined responsibilities [27], and the Bunyu experience suggests that a shared evidence base can provide a basis for such clarity.

Theoretical and practical implications

The study makes three contributions. First, it identifies problem definition as an empirically distinct stage within Triple Helix-informed collaborative governance, a stage that the innovation-focused Triple Helix literature seldom examines [15,16]. Second, it shows how structured analytic tools, program-performance indicators, and household visits together form the shared evidence on which actors from different sectors can agree. Third, it shows how CSR resources can be directed by this evidence. For practice in remote settings, the findings suggest institutionalizing joint situational analysis among the health office, health center, village governments, and CSR actors; formalizing household verification as part of routine surveillance, with support and training for cadres; and pairing institutional alignment with community education so that shared understanding reaches households.

Strengths and limitations

Strengths include triangulation across interviews, FGDs, observation, and documents; the inclusion of government, community, and private-sector perspectives; and the use of established procedures for credibility, including member checking and peer debriefing. Several limitations apply. The study covered one island and one health center catchment, so transferability depends on similarity of context. Academic institutions were consulted as experts but were not a separate informant group, so the academic helix is under-represented and the findings are best read as Triple Helix-informed collaborative governance. The findings reflect participants' perceptions and not measured stunting outcomes, so no conclusion about effectiveness can be drawn. Quotations were translated from Indonesian, which may affect nuance. Future studies should include academic actors as informants, compare several districts,

and link collaboration processes to anthropometric outcomes using mixed-methods or longitudinal designs.

CONCLUSION

On Bunyu Island, problem definition in stunting prevention was a collaborative process in which multi-method situational analysis, multifactorial risk-factor framing, household and field verification, and policy-aligned shared understanding created a common evidence base across government, community, and private-sector actors. Shared evidence, and not formal agreement alone, supported institutional trust and prepared the ground for joint action. Strengthening joint analysis, household-level verification, and community education should be priorities for multisectoral stunting governance in geographically isolated settings. Future research should examine whether these processes translate into improved nutritional outcomes.

DECLARATIONS

Ethics approval and consent to participate

The study followed the Declaration of Helsinki and national regulations governing research involving human participants. Ethical approval was granted by the Health Research Ethics Committee of the Faculty of Public Health, Hasanuddin University, before data collection began. All participants provided informed consent.

Consent for publication

Not applicable. All participants provided informed consent for the use of anonymized interview data for scientific publication.

Availability of data and materials

The datasets generated and analyzed during the current study are not publicly available because they contain information that could compromise participant confidentiality. De-identified data are available from the corresponding author on reasonable request, subject to institutional ethical approval.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

Adnan conceptualized the study, developed the research design, conducted the fieldwork, collected and analyzed the qualitative data using NVivo 15, interpreted the findings, and drafted the original manuscript. Muhammad Yusran Amir contributed to the study methodology, supervised the research process, validated the analytical framework, critically reviewed the interpretation of the findings, and substantially revised the manuscript for important intellectual content. Sukri Palutturi contributed to the conceptual framework, provided expertise in collaborative governance and public health policy, participated in data interpretation, critically reviewed the manuscript, and supervised the overall research process.

Darmawansyah contributed to the study design, methodological validation, interpretation of the findings, manuscript revision, and supervision of the research. Suriah contributed to data interpretation, validation of the qualitative findings, manuscript editing, and critical review of the final version. Setiawan Kasim contribution to be confirmed by the authors. All authors read and approved the final manuscript and agreed to be accountable for all aspects of the work, ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Declaration of generative AI use

Adjust to the target journal's policy. During the preparation of this manuscript, the authors used Claude (Anthropic) to assist with restructuring and language editing. The authors reviewed and edited all content and take full responsibility for the content of the publication.

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Table 1. Characteristics of informants (N = 21)

Stakeholder domain	Institutions and roles	Participant codes cited in the text	Number of informants
Government	Bulungan District Health Office; Bunyu District Health Center; Bunyu Subdistrict Office; village governments	P1 (District Health Office); P2 (Subdistrict Office); P5, P6 (village government officers)	11
Community	Posyandu cadres; nutrition officers; physicians; community leaders and community representatives involved in maternal and child health initiatives	POY3, POY4 (Posyandu cadres)	9
Private sector	PT Pertamina EP Bunyu; PT Lamindo Intermultikon (corporate social responsibility programs)	PS1 (CSR manager, PT Lamindo Intermultikon)	1
Total	Experience in stunting interventions: 3 to more than 20 years		21

Participant codes are those used in the quotations. Public health and clinical nutrition experts were also consulted to improve the context analysis.

Table 2. Themes of the problem-definition stage and their contribution to collaboration

Theme	Key components	Main actors	Contribution to collaborative governance
1. Multi-method situational analysis	5W analysis; fishbone analysis; identification of low-performing programs (most frequently coded); community reporting; field verification	Village government; District Health Office; Health Center; Posyandu cadres	Joint problem analysis; priority setting; evidence-based planning
2. Multifactorial risk-factor framing	Nutritional, behavioural, and environmental determinants; national priority interventions; evidence-based CSR	District Health Office; Health Center; Posyandu cadres; village government; companies	Alignment with national policy; efficient allocation of collaborative resources
3. Household and field verification	Field visits; home visits (coded slightly more often); community reporting; cross-validation of routine data	Health Center; Posyandu cadres; village government; community members	Validated surveillance data; accurate targeting; trust between households and providers
4. Shared understanding of stunting prevention	Alignment with national policy; community education; shared intervention strategies; private-sector commitment; collective learning	All stakeholder groups	Reduced fragmentation; institutional trust; broader participation

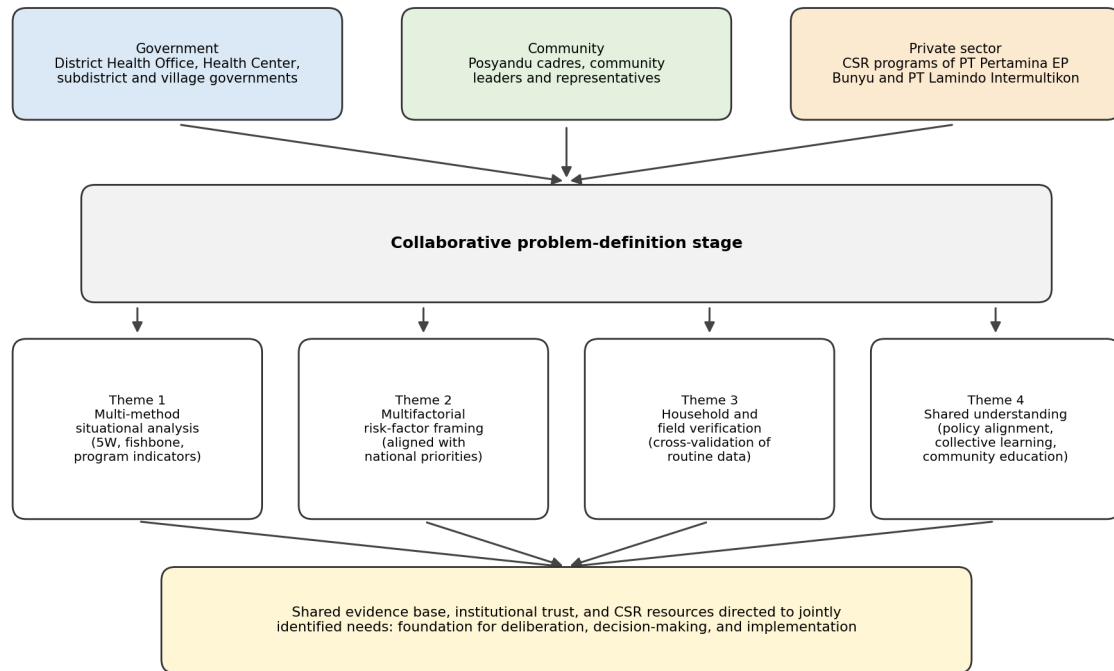


Figure 1. Thematic map of the collaborative problem-definition stage in stunting prevention on Bunyu Island. Government, community, and private-sector actors contribute to four themes that together build a shared evidence base for later deliberation, decision-making, and implementation.