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Participatory Livelihood and Care Interventions as Pathways to Health Promotion and Security: A Qualitative Community-Based Implementation Study in Rural Thailand

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Highlights

Public health relevance—How does this work relate to a public health issue?

- In ageing rural Thailand, livelihood insecurity and caregiving burden compound each other, and formal long-term care systems remain too limited to absorb this demographic shift.
- This study examines a community intervention that integrates livelihood support and caregiving training as a single participatory response to these intertwined social determinants of health.

Public health significance—Why is this work of significance to public health?

- Few implementation studies document how livelihood and caregiving components function together, rather than as separate programmes, in resource-constrained rural settings.
- Participants reported perceived improvements in caregiving capacity, social connectedness, and household economic buffering, offering rare qualitative evidence on multidimensional health security.

Public health implications—What are the key implications or messages for practitioners, policy makers and/or researchers in public health?

- Policymakers in comparable low- and middle-income settings could incorporate structural and relational indicators, alongside income-based metrics, when evaluating community health interventions.
- Locally embedded instructors, continuous coaching, and peer support groups appear to be transferable design features for equity-oriented programmes, pending confirmatory research with comparison groups.

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Abstract

Background: Health security among structurally vulnerable populations depends not only on healthcare access but also on livelihood stability, caregiving capacity, and social participation. Evidence on how community-engaged participatory interventions address social determinants of health in low- and middle-income settings remains limited, particularly regarding how such interventions are implemented, documented, and evaluated in practice. Methods: This qualitative implementation study examined a participatory livelihood

and caregiving intervention in a rural Thai setting. Over a nine-month period, 50 core participants from structurally vulnerable households engaged in integrated livelihood and caregiving activities. Data were collected through field observations, participatory reflection meetings, implementation records, LINE-group communication archives, and voluntary household financial logs, and were analysed using inductive thematic analysis. Results: Findings revealed perceived improvements across four interconnected dimensions of well-being: caregiving capacity, social connectedness, livelihood flexibility, and household economic buffering. Participants more consistently described household stabilization achieved through reduced expenditure, resource sharing, and livelihood diversification than rapid income growth. Sustained group participation was associated with strengthened peer support networks and greater self-reported confidence in managing caregiving and household challenges; however, these findings rest on self-reported and predominantly qualitative evidence, with financial documentation available for only a small, non-random subset of participants. Conclusions: These exploratory findings suggest that community-engaged livelihood and caregiving interventions may strengthen multidimensional health security by supporting stabilization processes rather than delivering immediate economic gains. Relational support, adaptive implementation, and community participation emerged as candidate mechanisms linking policy intentions to community health responsiveness. Health policy frameworks in comparable low- and middle-income settings may benefit from incorporating structural and relational social determinants alongside income-based metrics, although confirmatory research with comparison groups is needed before these implementation-level insights can inform generalizable policy guidance.

Keywords: family caregiving; livelihood interventions; health security; social determinants of health; community-engaged participatory research; rural Thailand

1. Introduction

Population ageing is accelerating across high-income and low- and middle-income countries, but the capacity of formal long-term care systems to absorb this demographic shift varies substantially. Thailand is undergoing a rapid demographic transition toward an aging society, with projections indicating that more than 30% of the population will be aged 60 years or older within the next decade [1]. Comparative regional evidence indicates that, relative to Japan and Singapore, Thailand's ageing-in-place infrastructure remains less developed, with community health initiatives serving as a primary—rather than supplementary—mechanism for supporting older residents [2]. Recent policy commentary similarly cautions that Thailand risks "ageing before prosperity," with elderly care remaining fragmented across ministries and heavily reliant on unpaid or undertrained community caregivers despite the existence of a national long-term care policy foundation [3]. This shift intensifies challenges related to long-term care, livelihood insecurity, and social vulnerability, particularly in rural settings where formal support systems remain limited [4,5]. Although caregiving has traditionally been family-based [6], declining fertility, labor migration, and economic precarity have weakened informal support structures, increasing vulnerability among older adults and marginalized groups [7,8].

For structurally vulnerable populations, health security extends beyond financial protection or disease control to encompass household economic buffering, caregiving capacity, access to essential resources, and social connectedness [9,10]. Structural determinants—including poverty, informal employment, and caregiving burdens—shape participation

opportunities and well-being across the life course, reflecting the broader influence of social determinants of health on community resilience.

Community-engaged participatory approaches are increasingly promoted to strengthen resilience and advance health equity [11,12]. A growing international body of literature has begun to document how such approaches are implemented in practice. Qualitative scoping evidence from low- and middle-income countries shows that community-based interventions for chronic disease management depend heavily on the training, cultural familiarity, and local credibility of community-level workers, and that implementation barriers are frequently under-reported relative to outcome data [13]. International expert consultations on community-based mental health and well-being interventions in low- and middle-income countries similarly emphasize that relational and contextual factors—rather than programme content alone—determine sustained engagement, particularly among older populations [14]. Evidence from crisis-affected low- and middle-income settings further indicates that community health participatory interventions for non-communicable disease prevention rely on locally embedded facilitation and iterative adaptation rather than fixed protocols [15]. However, these international studies focus predominantly on health-service delivery or disease-specific outcomes; comparatively little qualitative implementation evidence addresses interventions that integrate livelihood support and caregiving simultaneously, particularly in Southeast Asian rural contexts where livelihood precarity and caregiving burden are structurally intertwined. This gap is the specific focus of the present study: whereas prior work has examined either livelihood interventions or caregiving interventions largely in isolation, evidence on how these two domains function together as a single participatory implementation remains limited. However, translating equity-oriented policy goals into sustained community engagement remains challenging when immediate livelihood pressures compete with structured participation, particularly in resource-constrained rural settings.

The "Young Care" model was originally developed as a school-based intervention to enhance adolescents' knowledge and engagement in caring for older adults [16]. Prior evaluations demonstrated improvements in caregiving competence; however, less is known about how the model functions when extended to marginalized populations facing livelihood instability and employment precarity. Supported by the Equitable Education Fund (EEF), the intervention was expanded to include out-of-school youth and other vulnerable groups. Participation patterns diverged from initial expectations, as many youth prioritized wage labor [17]—reflecting structural labor-market constraints rather than individual motivational deficits, consistent with realist perspectives on context–mechanism–outcome configurations in complex interventions [12].

Despite growing interest in community-engaged research, evidence remains limited on how participatory interventions address social determinants of health within structurally constrained environments, and, more specifically, on how livelihood support and caregiving components interact when delivered as a single, integrated implementation rather than as parallel programmes. In rural and resource-limited settings, livelihood insecurity, caregiving burdens, and limited institutional support interact to shape participation and health-related outcomes. Understanding these dynamics requires analytical attention not only to intervention components but also to the social and structural conditions through which participation unfolds in practice [9,10].

This study examines how a participatory livelihood and caregiving intervention operated within a rural Thai community characterized by livelihood precarity and demographic ageing, and how it related to perceived health security among marginalized groups. Rather than estimating causal effects, the study provides implementation-relevant insights into

how community-engaged interventions interact with structural determinants to shape adaptive participation pathways and community health outcomes [11,12].

To conceptualize these dynamics, this study adopts a two-tier analytical framework: an a priori structural participation framework (Figure 1), developed before fieldwork to orient data collection, and an empirically derived PACE (Participation, Access, Capacity-building, and Empowerment) Implementation Framework (Figure 2), constructed inductively from coded implementation data once fieldwork was underway. Figure 1 explains why structural conditions shape participation, while Figure 2 describes how the intervention operationally responded to those conditions; full details on the development, scope, and relationship between the two frameworks are provided in Section 2.6.

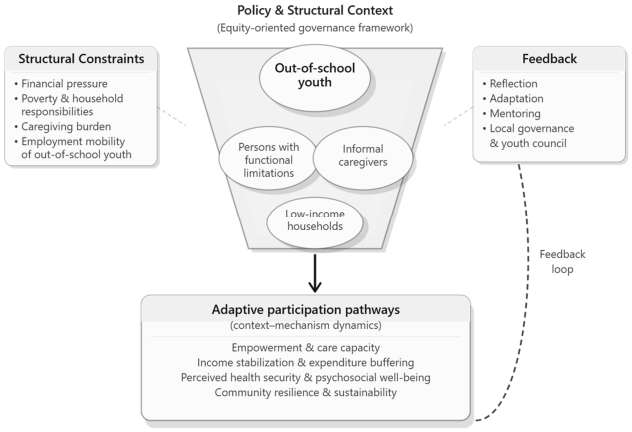


Figure 1. Funnel-based structural participation framework illustrating how equity-oriented policy mandates interact with structural constraints—including poverty, caregiving burden, and employment mobility—to shape adaptive participation pathways and emergent well-being outcomes (empowerment and care capacity, income stabilization and expenditure buffering, perceived health security and psychosocial well-being, and community resilience and sustainability). Feedback processes represent reflection, adaptation, mentoring, and integration with local governance mechanisms supporting program sustainability. This is a conceptual, a priori framework (see Sections 1 and 2.6).

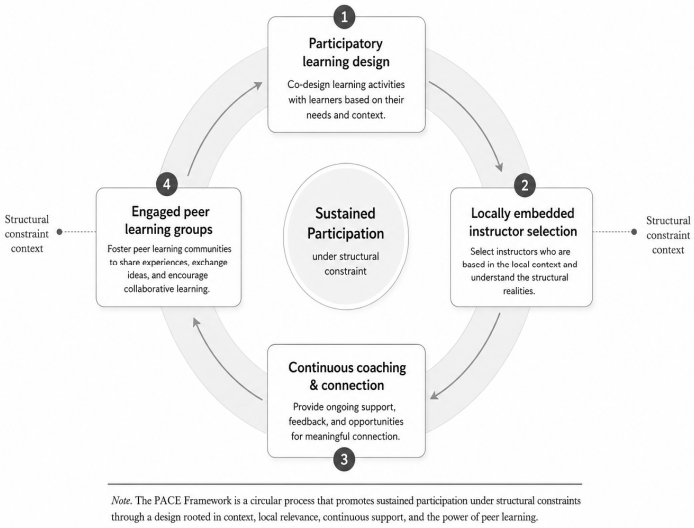


Figure 2. PACE (Participation, Access, Capacity-building, and Empowerment) Implementation Framework depicting four interacting mechanisms supporting sustained participation under structural constraints: (1) Participatory Learning Design, (2) Locally Embedded Instructor Selection, (3) Continuous Coaching and Connection, and (4) Engaged Peer Learning Groups. The circular design reflects the iterative and relational nature of implementation within structurally constrained community contexts. This is an empirically derived, meso-level implementation framework (see Sections 1 and 2.6).

2. Materials and Methods

2.1. Study Design

This qualitative implementation study was embedded within a participatory livelihood and caregiving intervention in rural Thailand. Using longitudinal field observations and structured reflection meetings, the study examined participation pathways, implementation processes, and perceived well-being outcomes under conditions of structural constraint. Rather than estimating causal effects, it aimed to generate implementation-relevant insights into how community-engaged interventions interact with social determinants of health in resource-limited settings.

To clarify the boundaries between programme delivery and research activity, three analytically distinct components should be distinguished. First, intervention delivery comprised the livelihood training sessions, caregiving skill development, and peer group meetings described in Section 2.4; these were programme activities delivered to participants and were not, in themselves, data collection instruments. Second, implementation monitoring comprised the routine documentation generated by facilitators as part of programme administration—attendance, training completion, and group communication records—used to track programme delivery. Third, research data collection comprised the field observations, participatory reflection meetings, and household financial logs described in Section 2.5, which were designed specifically to generate evaluative evidence and were conducted by the research team rather than by programme facilitators. Data collection occurred concurrently with intervention implementation, and the two phases overlapped temporally, but implementation monitoring records and research data collection instruments served distinct purposes and were analysed separately before being triangulated during coding (Section 2.6). This concurrent embedded design is consistent with qualitative implementation research approaches in which data collection is integrated within ongoing programme delivery [11,12].

Fifty core participants were followed up with over a nine-month implementation period. Multiple qualitative data sources were used, including three rounds of field follow-up visits, two participatory reflection meetings, household financial logs (maintained voluntarily by 11 of the 50 participants, or 22%), implementation records, group communication archives (LINE groups), and documentation of a public dissemination event. Descriptive quantitative indicators—including participation continuity, income-generating cases, and engagement in household accounting—were used to contextualize qualitative findings rather than to test statistical associations; as detailed in Section 4.4, the study did not systematically track individual-level attrition or fluctuation in participation intensity across the nine-month period, and participation-continuity statements in this manuscript should be read as general field-observation impressions rather than as quantified retention data. All research procedures received approval from the institutional ethics committee, and written informed consent was obtained from every participant; full details are provided in the Institutional Review Board Statement and Informed Consent Statement at the end of this manuscript.

2.2. Study Setting

The study was conducted in a rural subdistrict in northeastern Thailand comprising 14 villages with approximately 2340 residents. Among 711 older adults, 97 (13.6%) were classified as functionally dependent—exceeding provincial averages—with a caregiver-to-dependent ratio of approximately 1:10, below recommended community long-term care standards.

The area also faced significant livelihood insecurity: 96 residents were identified as unemployed or underemployed, with average household incomes below national rural

averages. Most households relied on seasonal agriculture, informal wage labor, and small-scale production (frog farming, bamboo handicrafts, and poultry raising). Youth migration, shrinking household size, and economic precarity contributed to caregiving gaps and limited community participation. This layered vulnerability provided a relevant setting for examining equity-oriented participatory interventions under structural constraint.

2.3. Participant Selection

Participant identification followed a community-based accountability mechanism aligned with the Equitable Education Fund (EEF) equity mandate [17]. Inclusion criteria were: adults aged ≥18 years; residence in the subdistrict; identification as experiencing livelihood insecurity, caregiving burden, functional limitation, or broader social vulnerability; and willingness to engage in intervention activities and reflection meetings. Individuals under 18 years, those unable to provide informed consent, or those with severe cognitive impairment were excluded.

Candidate lists were reviewed through participatory village consultations and endorsed by the Subdistrict Administrative Organization (SAO), ensuring transparency and alignment with local governance structures.

2.4. Intervention Description

The intervention comprised participatory livelihood and caregiving activities designed to enhance caregiving capacity, social participation, and household well-being. Participants selected activities based on their interests, household contexts, and caregiving responsibilities. Four groups were established: (1) community caregivers, (2) frog and fish farming, (3) gamecock raising, and (4) bamboo handicrafts. Participants could engage in multiple groups, reflecting a flexible, context-sensitive design.

Training was delivered through field-based activities and site visits, accommodating participants with caregiving responsibilities. Sessions included skill development, peer learning, hands-on practice, and ongoing follow-up via group meetings and LINE communication platforms. Cross-cutting modules covered health promotion, basic caregiving, household financial management, and online marketing.

Training was delivered by a combination of locally embedded practitioners and institutional experts. Livelihood instructors for frog and fish farming, gamecock raising, and bamboo handicrafts were experienced community members with established small-scale enterprises, functioning as voluntary community-based practitioners with no formal NGO affiliation. Their selection was based on local credibility, practical expertise, and established relationships within the community. Health-related modules—including symptom management, basic health assessment, patient mobility, and herbal compress use—were delivered by licensed healthcare professionals from local health-promoting hospitals and district-level hospitals. Training on rational medicine use was provided by faculty members from a university-based pharmacy programme, while emergency response and basic life-support training were conducted by medical professionals from a university-affiliated medical faculty. Additional capacity-building sessions on household financial management and digital media for small-scale online businesses were delivered by instructors from a university-based economics programme. The formal community caregiver (CG) training programme followed the national caregiver curriculum and was jointly implemented by professional staff from local health-promoting hospitals and district-level hospitals. Each participant received a small grant of approximately 2500 Thai Baht (≈69 USD) to reduce initial resource barriers. Community caregivers additionally received formal recognition, modest monthly compensation, and access to essential equipment through collaboration with local health services and administrative organizations.

The intervention logic, integrating livelihood activities and caregiving training across multiple pathways to household stability and well-being, is illustrated in Figure 3 below, which is referenced here and described further in Section 2.6.

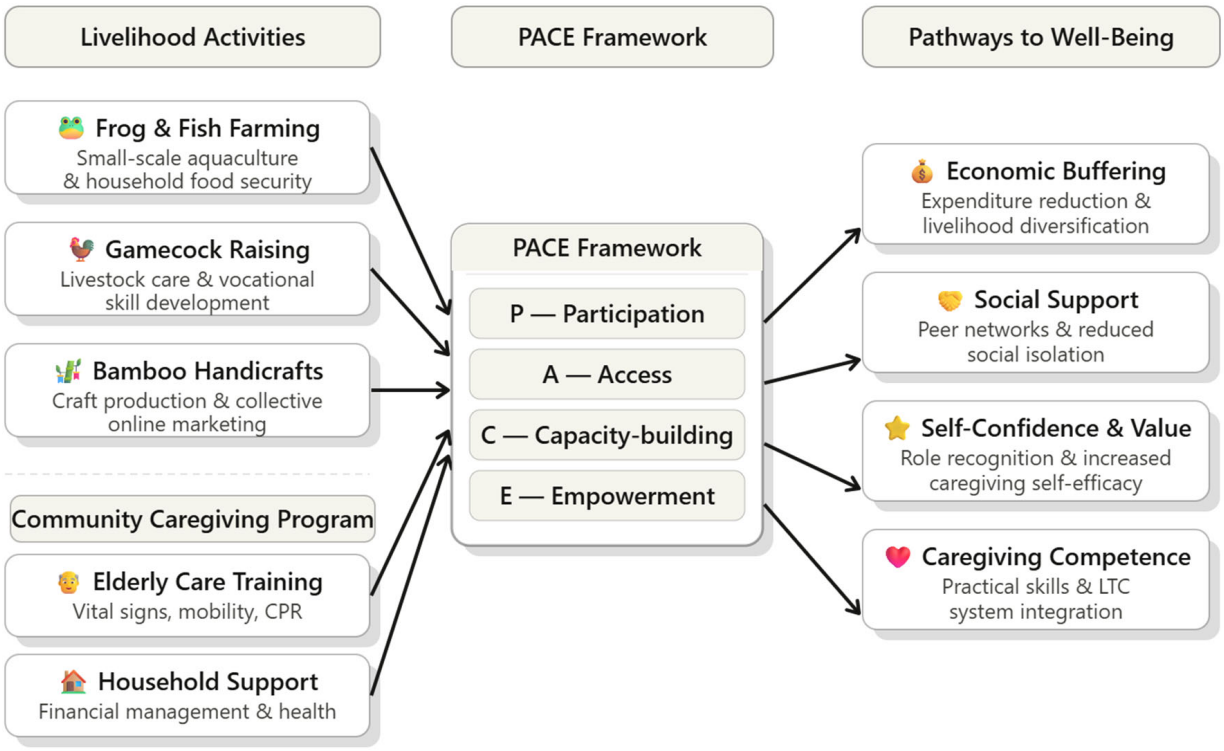


Figure 3. Intervention logic model illustrating pathways from livelihood activities (frog and fish farming, gamecock raising, and bamboo handicrafts) and the Community Caregiving Program (elderly care training and household support) to multidimensional well-being outcomes (economic buffering, social support and connections, self-confidence and value, and caregiving competence) within the PACE (Participation, Access, Capacity-building, and Empowerment) framework.

2.5. Data Collection

Data collection occurred concurrently with implementation through a structured multi-stage process. A baseline participatory assessment explored readiness, livelihood interests, and expectations. Midline visits documented implementation progress, resource mobilization, and emerging constraints. Endline visits focused on observed outcomes, participant experiences, and sustainability factors. Each of the three field follow-up visits lasted approximately one full day per village cluster and combined direct observation with informal conversations with participants and instructors; observations were recorded as structured field notes rather than audio-recorded, given the informal, mobile nature of field-based training sites.

The two participatory reflection meetings were held at the subdistrict community hall at the implementation midpoint and near programme completion. Each meeting lasted approximately two to three hours, involved between 28 and 35 core participants representing all four activity groups, and was facilitated by a member of the research team using a semi-structured guide covering expectations, perceived changes, and emerging challenges. Meetings were audio-recorded with participant consent and later transcribed verbatim in Thai; transcripts, together with facilitator field notes, formed the primary reflection-meeting data source used in coding. Participants compared initial expectations with realized outcomes and identified adaptive pathways.

Group communication through LINE—a widely used messaging platform in Thailand—was used by each of the four activity groups throughout the implementation

period to coordinate activities, share practical advice, and post updates on production and sales. For analysis, a research team member reviewed the full chat history of each of the four group archives and manually extracted messages relevant to participation, mutual assistance, problem-solving, and perceived outcomes, while excluding logistical messages (e.g., meeting-time confirmations) that carried no analytic content. Extracted messages were transcribed into a coding spreadsheet with sender identifiers replaced by participant codes prior to analysis, and no verbatim LINE messages containing identifying information were retained beyond the coding stage; this anonymization step was completed before thematic coding began.

The public dissemination event, held near the end of the implementation period, was documented through structured observation notes and photographs of exhibited products and participant testimonials, providing contextual—rather than primary analytic—evidence of community-level reach.

Perceived well-being was operationalized across four domains: (1) household economic buffering, (2) caregiving capacity, (3) social connectedness, and (4) confidence in managing health-related needs. Household financial logs maintained by 11 participants across three groups (gamecock raising, n = 4; bamboo handicrafts, n = 6; community caregiving, n = 1) were used descriptively, and only as contextual, illustrative evidence, to accompany qualitative accounts of perceived economic stabilization; given that these logs were completed voluntarily by 22% of participants, and that only a single log was available from the caregiving group, they do not support quantitative or generalizable conclusions about household expenditure and are not treated as such anywhere in this manuscript. Qualitative data sources are summarized in Table 1.

Table 1. Qualitative data sources used in the analysis.

Data Source	Description	Number
Core participants	Individuals participating in livelihood or caregiving activities	50
Reflection meetings	Structured participatory reflection sessions (audio-recorded, transcribed verbatim; approximately 28–35 participants each)	2
Field follow-up visits	Observational visits documenting implementation processes	3
Household financial logs	Voluntary expenditure monitoring records (22% of participants)	11
Implementation records	Documentation of training activities and facilitation processes	Throughout 9-month period
LINE group archives	Digital communication records capturing peer interaction and ongoing support; extracted and anonymized prior to coding	4 groups
Dissemination event	Documentation of public community dissemination and learning exchange (structured observation notes, photographs)	1

2.6. Data Analysis

Qualitative data were analyzed using inductive thematic analysis. Field notes, reflection-meeting transcripts, extracted and anonymized LINE-group excerpts, implemen-

tation records, and participant quotations were reviewed to identify recurring experiences and implementation dynamics. Coding was conducted by two researchers, both of whom held prior training and practical experience in qualitative public-health research. Each coder independently open-coded the full dataset; the two coders then met in a series of consensus meetings to compare codes line by line, discuss discrepancies, and agree on a unified coding scheme. Disagreements were resolved through discussion and, where necessary, re-examination of the original data source; no disagreements required arbitration by a third party. Related codes were grouped into higher-order thematic categories representing key dimensions of the intervention experience, and these categories were revisited iteratively against the raw data to check that they remained grounded in participants' own accounts rather than in the researchers' prior expectations.

Analytic attention focused on facilitation practices, locally embedded instructors, peer interaction, and ongoing coaching mechanisms. Through this iterative comparison process, four interacting domains emerged and were conceptualized inductively as the PACE Implementation Framework (Participation, Access, Capacity-building, and Empowerment). We note transparently that, because data collection and analysis proceeded concurrently with implementation, the PACE framework was not finalized until after an initial round of coding had been completed partway through the intervention period; it is therefore best described as inductively derived from early and mid-implementation data and subsequently confirmed against later data, rather than as either a purely a priori model or a fully post hoc interpretation applied only once fieldwork had ended. This is distinct from the structural participation framework in Figure 1, which was conceptual and a priori (see Section 1).

The relationship between the two frameworks introduced in Section 1 can now be specified in full. Figure 1 operates at a macro, conceptual level: it is a theoretical lens, informed by the social determinants of health and sustainable livelihoods studies, illustrating how policy mandates interact with structural constraints—caregiving burden and livelihood precarity—to shape adaptive participation pathways and emergent outcomes, including social inclusion, caregiving capacity, income stabilization, and perceived health security. It was developed prior to fieldwork to orient data collection and was not itself tested empirically. Figure 2, by contrast, operates at a meso, programmatic level: it was not specified in advance but was constructed from the coded implementation data described above, and describes the four interacting operational mechanisms—participatory learning design, locally embedded instructor selection, continuous coaching, and engaged peer learning groups—through which the structural dynamics in Figure 1 were enacted on the ground. Figure 1 explains why structural conditions shape participation, while Figure 2 describes how the intervention operationally responded to those conditions; the two frameworks are therefore complementary rather than competing, operating at different analytical levels and developed at different stages of the research (conceptual/a priori for Figure 1, empirical/inductive for Figure 2).

The analytical pathway proceeded from the data sources described above (participant observations, reflection-meeting transcripts, household financial logs, implementation records, and field follow-up visits), through data organization and the coding process detailed above, to the thematic categories and emergent pathways of perceived well-being reported in Section 3—namely improved caregiving competence, strengthened social connections, increased livelihood flexibility, and greater household resilience. An illustrative excerpt of this coding progression, from raw quotation to initial code, category, and theme, is provided in Table A1 (Appendix A).

Methodological rigor followed Lincoln and Guba's trustworthiness criteria [18]: credibility through source triangulation and prolonged engagement across the nine-month field period; dependability through independent coding, consensus meetings, and a maintained

decision log; confirmability through an audit trail linking themes back to original data excerpts; and transferability through detailed contextual description of the study setting. Appendix B summarizes, criterion by criterion, the specific procedures used to address each element of trustworthiness in this study.

3. Results

3.1. Participant Characteristics and Program Reach

The intervention directly engaged 50 core participants from structurally vulnerable households, including individuals experiencing livelihood instability, informal caregivers, older adults, and family members responsible for household care. Although the program initially prioritized out-of-school youth, participation expanded to include a broader range of community members whose socioeconomic circumstances aligned with the intervention's objectives—reflecting the adaptive participation pathways described in the structural participation framework (Figure 1).

Four activity groups were established during the implementation period: community caregiving, frog and fish farming, gamecock raising, and bamboo handicrafts. Based on field-team observation, most of the 50 core participants maintained engagement in at least one group across the nine-month period; however, as noted in Section 2.1 and discussed further as a limitation in Section 4.4, the study did not systematically record individual-level attrition or quantify fluctuations in participation intensity, so this impression of general continuity cannot be substantiated with retention figures and should not be read as evidence of uniformly sustained engagement across all participants. Beyond core participants, approximately 600 additional community members were reached through learning exchanges, dissemination activities, and public engagement events, illustrating the initiative's broader community reach. Participant characteristics and group composition are summarized in Table 2.

Table 2. Structure of the livelihood and caregiving training activities.

Activity Group	Participants	Training Approach	Key Competencies
Community caregivers	14	70-h caregiver training based on national curriculum	Vital sign monitoring, wound care, patient transfer, CPR, herbal compress
Frog and fish farming	9	Practical training by experienced farmers	Aquaculture techniques, pond management, small-scale sales, household food security
Gamecock raising	15	Local vocational training	Livestock care, feeding management, disease prevention, basic veterinary skills
Bamboo handicrafts	12	Hands-on training facilitated by a community-based expert and local handicraft group leader	Bamboo weaving techniques, product design, collective production, online marketing

Note: All participants received foundational training in basic healthcare and community support skills. Caregiver participants completed an additional standardized 70-h training program.

3.2. Livelihood and Economic Stabilization

Livelihood activities were commonly described by participants as contributing to household economic stabilization and resource diversification rather than immediate income expansion—consistent with the study's conceptualization of health security as encompassing household economic buffering alongside caregiving and social dimensions. This section reports participants' perceptions of economic change; the household financial logs described in Section 2.5, being voluntary and available for only 11 of 50 participants, are used here solely as illustrative, contextual detail alongside these qualitative accounts, not as independent quantitative confirmation of expenditure reduction.

Participants described several practical benefits, including reduced household food expenditure through small-scale production, shared access to materials within activity groups, opportunities for supplementary income, and greater flexibility in managing household financial pressures. For example, frog farming provided occasional income through small-scale sales while simultaneously reducing dependence on purchased food:

> *"Raising frogs may not make us rich, but we no longer need to buy fish from the market. Sometimes we sell some, but mostly it helps reduce daily expenses"* (Participant 9)

Bamboo handicraft participants similarly described how collective production created opportunities for small but steady income:

> *"When we work together, production is faster, and we can share materials. Sometimes we receive orders from outside the village, which helps bring some additional income"* (Participant 17)

Field observations documented cooperative practices reinforcing these stabilization processes. Participants frequently exchanged labor, shared materials, and supported one another during labor-intensive activities such as pond construction and livestock care:

> *"When someone needs help digging a pond or repairing something, the group comes together. Alone, it would be very difficult"* (Participant 13)

Digital communication platforms, particularly LINE groups, further facilitated coordination, practical advice exchange, and promotion of locally produced goods—functioning as an informal infrastructure supporting livelihood resilience.

3.3. Strengthening Caregiving Capacity

Participants in the caregiver group reported increased confidence in providing basic care for older adults and individuals with chronic health conditions. Training enabled participants to develop practical skills applicable within households and community settings, including monitoring vital signs, assisting with patient mobility, and recognizing early warning signs of health complications.

Some participants became formally registered within the local Long-Term Care (LTC) system, enabling them to provide community-based caregiving services and receive modest monthly stipends. Formal recognition strengthened participants' sense of responsibility and legitimacy in caregiving roles:

> *"The training gave me confidence in caring for others. I learned how to measure vital signs and observe symptoms. Now I feel more capable of helping older people in my community"* (Participant 3)

This outcome reflects the Access and Capacity-building dimensions of the PACE Implementation Framework, wherein locally embedded training and institutional collaboration were associated with participants' self-reported ability to translate newly acquired competencies into community caregiving practice.

3.4. Social Connectedness and Mutual Support

Group-based participation strengthened social relationships and peer support networks among participants facing similar livelihood and caregiving challenges. Group interactions facilitated peer learning, exchange of practical advice, collective problem-solving, and emotional encouragement.

Participants reported that joining activity groups reduced feelings of social isolation and strengthened their sense of belonging:

> *"Before joining the group, I mostly stayed at home and did not interact with many people. Now we meet regularly, talk about our work, and help each other solve problems"* (Participant 6)

> *"Before joining the group, we worked separately. Now we help each other, share ideas, and encourage each other"* (Participant 21)

These relational dynamics reflect the Participation and Empowerment dimensions of the PACE framework, wherein sustained group engagement was associated, in participants' accounts, with forms of social capital that appeared to extend beyond the immediate activities to support broader household and caregiving resilience.

3.5. Participatory Reflection and Adaptive Implementation

Two rounds of structured participatory reflection meetings provided opportunities for participants to compare initial expectations with observed outcomes and collectively identify adaptive strategies. Reflection discussions revealed recurring themes including improved self-confidence, stronger peer relationships, recognition of emerging livelihood opportunities, and increased awareness of community caregiving needs.

These meetings functioned not only as data collection events but as implementation mechanisms—enabling adaptive modification of activities in response to participants' evolving circumstances. This adaptive quality aligned with the continuous coaching and engaged peer learning dimensions of the PACE framework, and appeared, based on facilitator observation, to support sustained engagement despite structural constraints including caregiving responsibilities and livelihood pressures.

One participant summarized the cumulative experience of participation:

> *"This project may not have clearly increased my monthly income, but it reduced our expenses. We have food, some money for daily needs, and a group that encourages each other"* (Participant 11)

3.6. Multidimensional Perceived Well-Being

Across activity groups, participants reported improvements across four interconnected dimensions of perceived well-being: caregiving capacity, social connectedness, livelihood flexibility, and confidence in managing household and health-related challenges. These dimensions correspond to the well-being domains operationalized in the study design and reflect the multidimensional conceptualization of health security that guided the analysis.

Rather than reporting rapid income growth, participants more consistently described gradual household stabilization achieved through reduced expenditures, resource sharing, and livelihood diversification. Because these findings derive from self-reported, predominantly qualitative accounts without a comparison group, they are best interpreted as suggesting a plausible pattern rather than establishing that participatory community-engaged interventions strengthen health security through stabilization and relational support mechanisms; this pattern nonetheless carries implementation-relevant significance for how equity-oriented health policies are designed and evaluated in resource-constrained settings.

4. Discussion

4.1. Principal Findings

This qualitative implementation study suggests that equity-oriented community-engaged participatory interventions may be associated with strengthened perceived health security among structurally vulnerable populations, even in the absence of rapid income growth. Rather than generating immediate economic expansion, the intervention was associated, in participants' accounts and in field observation, with household stabilization through improved social inclusion, strengthened caregiving capacity, and livelihood buffering strategies. To be explicit about the strength of this evidence, caregiving-capacity gains and social-connectedness gains rest on convergent self-report across reflection meetings, field observation, and LINE-archive content, and are the most consistently supported findings in this dataset; economic-stabilization claims rest more heavily on self-report, with only fragmentary and non-representative financial-log data as supplementary illustration; and the overall association between the intervention and these outcomes is an implementation-level, non-causal observation, since the study used neither a comparison group nor pre/post quantitative measurement. These stabilization dynamics are broadly consistent with sustainable livelihood theory, which emphasizes diversification and risk reduction as components of resilience in resource-constrained environments [19,20].

Within the structural participation framework (Figure 1), participation appeared to function less as a direct economic accelerator and more as a mediating mechanism associated with relational and capability-based assets. Participants described increased confidence, peer trust, and role recognition—particularly among registered community caregivers. These relational and psychosocial dimensions align with social determinants of health perspectives, which emphasize that well-being in disadvantaged settings is shaped not only by material resources but also by social cohesion, legitimacy, and functional capability [9,21,22].

Limited sustained engagement among out-of-school youth should not be interpreted as programmatic failure but rather, tentatively, as a reflection of structural labor-market pressures and livelihood precarity, an interpretation consistent with—though not directly tested by—realist-informed implementation perspectives in which participation patterns are shaped by contextual factors including caregiving burdens, economic necessity, and opportunity structures [11,12]. These findings are consistent with the broader understanding that intervention outcomes emerge through interactions between contextual conditions and intervention mechanisms rather than through uniform exposure to program components [23].

Taken together, the findings of this study suggest that in structurally constrained rural contexts, multidimensional health security may develop incrementally through stabilization, diversification, and relational integration—rather than through immediate income expansion. This is offered as an exploratory challenge to policy assumptions that prioritize income generation as the primary pathway to improved well-being in vulnerable populations, and it points to the potential value of incorporating structural and relational dimensions into community health frameworks [9,10]; confirming this pattern would require designs capable of testing it directly.

4.2. Livelihood Activities as Adaptive Security Mechanisms

Livelihood activities in this study appeared, from participants' accounts, to function less as discrete vocational programmes and more as adaptive buffering mechanisms within the structural participation processes illustrated in Figure 1. Perceived economic effects were characterized primarily by expenditure reduction, improved predictability of household resources, and diversification of livelihood strategies rather than by immediate

income growth. From a sustainable livelihood perspective, such stabilization, if confirmed by future work with stronger economic measurement, would provide meaningful economic security for vulnerable households [19,20].

Beyond economic dimensions, livelihood groups appeared to operate as relational infrastructures that facilitated social interaction, trust-building, and collective accountability. Regular participation was associated, in participants' self-reports, with reduced social isolation and strengthened peer support networks—consistent with well-established determinants of well-being and resilience described elsewhere [22,24]. These relational dynamics suggest that livelihood interventions can potentially function alongside, rather than only as a precursor to, social protection mechanisms in contexts of structural vulnerability.

Caregiving activities further appeared to strengthen connections with community health systems. Through training and formal recognition within the local Long-Term Care (LTC) system, some participants became integrated into existing community health support structures—broadly consistent with international evidence on the role of community-based caregiving networks in responding to care demands associated with population ageing [25], and with qualitative evidence from other low- and middle-income settings indicating that the credibility and embeddedness of community-level facilitators, rather than programme content alone, shapes whether such integration is sustained [13,14].

When livelihood initiatives are embedded within participatory and socially supportive processes, they may function as adaptive security mechanisms associated with multidimensional health security even in the absence of substantial short-term income expansion. In this context, stabilization is best understood provisionally as an active form of adaptive capacity enabling households to manage uncertainty, rather than as a definitively established outcome of the intervention.

Although this study was conducted in a single rural Thai setting, these findings may offer transferable, hypothesis-generating insights for comparable low- and middle-income contexts where livelihood precarity, population ageing, and limited formal care systems similarly constrain community health outcomes [2,3]; direct comparison would require replication in other settings.

4.3. Implementation Lessons and the Role of PACE

Several implementation-level insights emerged from this study. First, equity-oriented interventions operating under structural constraints may require evaluation frameworks that capture adaptive functionality rather than solely economic outputs. Sustained participation, caregiving competence, and relational integration emerged, in this study, as candidate indicators of implementation viability—reflecting system responsiveness and social adaptation rather than linear productivity measures [23,25].

Second, empowerment appeared, in participants' accounts, to unfold as a staged process. Improvements in confidence, peer trust, and caregiving self-efficacy were reported as preceding observable livelihood stabilization, suggesting that relational and cognitive transformations may function as enabling mechanisms within complex community systems [11,26].

Third, adaptive flexibility proved important in participants' descriptions of their own engagement. Role fluidity, family-level participation, and context-sensitive scheduling appeared to allow participants to remain engaged despite diverse livelihood pressures—broadly consistent with implementation science perspectives emphasizing context–mechanism alignment in community-based interventions [11,12].

Within this implementation environment, the PACE framework (Figure 2, described in Section 2.6) is best understood as descriptive rather than as a validated causal or prescriptive model. With that caveat, participatory learning design, locally embedded instructor

credibility, continuous coaching, and peer-group reinforcement functioned, in this study, as relational stabilizers associated with sustained engagement. By pairing Figures 1 and 2, the study offers a process-oriented, hypothesis-generating account of how community-engaged interventions may translate equity-oriented policy goals into adaptive participation pathways under real-world structural constraints.

4.4. Limitations

Several limitations should be acknowledged, and the conclusions of this study should be read in light of them. First, the qualitative design and single-site setting limit generalizability; findings reflect implementation dynamics within a specific rural Thai context and should be interpreted as transferable, hypothesis-generating insights rather than as generalizable or causal conclusions. Second, reliance on self-reported outcomes introduces potential social desirability bias, and household financial logs were maintained voluntarily by only 11 of 50 participants (22%), with only a single log from the community caregiving group; these logs are consequently a minor, illustrative data source rather than a robust evidentiary basis for claims of reduced expenditure or resource diversification, and such claims in this manuscript rest primarily on qualitative self-report rather than on the financial logs. Third, the study did not systematically measure participant attrition or fluctuations in participation intensity over the nine-month period; consequently, the manuscript's statements about "sustained" or "continued" participation reflect general field-team impressions rather than quantified retention data, and this absence of attrition data should be treated as a specific limitation of the evidence base for claims about sustained engagement. Fourth, the nine-month implementation period may not be sufficient to capture longer-term livelihood or health security outcomes. Fifth, the absence of a comparison group precludes causal attribution of observed changes to the intervention; throughout this manuscript we have accordingly used associative rather than causal language (e.g., "was associated with," "appeared to," "participants described") to describe intervention–outcome relationships, and any residual causal-sounding phrasing should be read in this associative sense. Sixth, although the PACE framework was derived inductively, its finalization partway through the implementation period means it cannot be considered a fully independent, a priori analytic lens; this is disclosed transparently in Section 2.6. Future research employing mixed-methods or longitudinal designs, ideally with comparison sites and systematic attrition tracking, across multiple locations would strengthen the evidence base for community-engaged participatory interventions addressing social determinants of health in structurally vulnerable populations.

4.5. Policy and Practice Implications

These exploratory findings point toward a possible reorientation of health policy frameworks in resource-constrained settings, where health security may not be adequately captured by income-based indicators alone; we frame the following as candidate, context-specific implications rather than established recommendations.

First, within Thailand's existing policy architecture, the Subdistrict Health Promoting Fund [27] and the national Long-Term Care programme administered jointly by the National Health Security Office and local health-promoting hospitals [5,28] already provide administrative channels through which multidimensional indicators—social participation, caregiving capacity, and economic buffering, alongside conventional income-based metrics—could plausibly be piloted at subdistrict level, consistent with broader social-determinants-of-health framing [9,10].

Second, policy design in Thailand and comparable ASEAN settings should explicitly account for structural constraints such as labor-market pressures and caregiving burdens

that shape participation patterns; regional reviews of long-term care policy implementation under COVID-19 have similarly noted that flexible, subdistrict-level governance mechanisms offer more viable pathways for sustained engagement among vulnerable groups than centrally administered, uniform programmes [28], a conclusion broadly consistent with our field observations of the value of locally embedded instructors and hybrid participation models [23].

Third, strengthening health systems in such contexts requires cross-sectoral governance. In the Thai context specifically, this could involve institutionalized collaboration between Subdistrict Administrative Organizations, the Ministry of Social Development and Human Security, the Equitable Education Fund and comparable education-sector actors, and primary healthcare systems (health-promoting hospitals and district hospitals), building on the collaborative structure already used in this intervention, to support integrated service delivery and long-term programme embedding [11,29].

Finally, participatory reflection processes emerged as a candidate mechanism for adaptive learning and local ownership. Our field experience suggests that external actors are likely to be more effective when functioning as enabling partners rather than directive implementers, reinforcing principles of systems thinking and decentralized governance in public health [11]; whether this translates into measurably better outcomes at scale remains an open question for future comparative research.

5. Conclusions

This qualitative, single-site implementation study offers exploratory evidence that equity-oriented community-engaged participatory interventions may be associated with strengthened multidimensional health security among structurally vulnerable populations, even in the absence of measurable short-term income growth. Rather than generating rapid economic expansion, the intervention was associated, in participants' self-reports and field observation, with household stabilization through reduced expenditure, improved food access, modest financial flexibility, and diversified livelihood opportunities.

Participants consistently described the perceived value of the intervention as extending beyond income, encompassing strengthened caregiving capacity, enhanced relational support, increased livelihood flexibility, and greater perceived household stability. These self-reported experiences suggest—though, given the study's design, do not establish—that health security in structurally constrained contexts may be shaped as much by social embeddedness and adaptive capacity as by economic gain.

The structural participation framework and the PACE implementation framework together provide implementation-relevant, hypothesis-generating insights into how equity-oriented policy goals may translate into adaptive community-level pathways under structural constraints. In resource-constrained rural settings, stabilization, diversification, and social integration may represent context-sensitive candidate indicators of equity advancement alongside, rather than in place of, immediate income growth. Given the single-site qualitative design, self-reported outcomes, minimal and non-representative financial documentation, and absence of a comparison group, these findings should be understood as suggestive, exploratory, and implementation-relevant—a foundation for future comparative and mixed-methods research on community-engaged approaches to social determinants of health in low- and middle-income settings—rather than as evidence of intervention effectiveness in themselves.

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Institutional Review Board Statement: This study was conducted in accordance with the Declaration of Helsinki, and approved by The Mahasarakham University Ethics Committee for Research Involving Human Subjects, Thailand (protocol code 639-579/2024; approved on 16 October 2024).

Informed Consent Statement: Informed consent was obtained from all subjects involved in this study.

Data Availability Statement: The data supporting the findings of this study are not publicly available due to ethical restrictions and participant confidentiality. De-identified data may be made available from the corresponding author upon reasonable request and with permission from The Mahasarakham University Ethics Committee for Research Involving Human Subjects.

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Abbreviations

EEF	Equitable Education Fund
IJERPH	International Journal of Environmental Research and Public Health
LTC	Long-Term Care
PACE	Participation, Access, Capacity-building, and Empowerment
SAO	Subdistrict Administrative Organization
SDH	Social Determinants of Health

Appendix A

Table A1. Example of the qualitative coding process illustrating the progression from participant quotations to initial codes, thematic categories, and emergent pathways of perceived well-being. This table illustrates, in place of a separate summary figure, the analytical pathway described in Section 2.6.

Example Quotation	Initial Code	Category	Theme/Pathway
"Raising frogs may not make us rich, but we no longer need to buy fish from the market."	reduced food expenditure	livelihood buffering	economic stabilization
"When someone needs help digging a pond, the group comes together."	mutual assistance	collective cooperation	social connectedness
"The training gave me confidence in caring for older people."	caregiving confidence	caregiving skills development	caregiving capacity
"Before joining the group, I mostly stayed at home and did not interact with many people."	reduced isolation	peer interaction	social inclusion
"Now we meet regularly and help each other solve problems."	shared problem-solving	peer support networks	relational support

Note: Quotations are drawn from field observations and participatory reflection meetings. Initial codes were derived inductively by two independent researchers. Thematic categories correspond to emergent themes described in Section 2.6 and the Results section. Participant identifiers omitted to protect confidentiality.

Appendix B

Table A2. Procedures used to address Lincoln and Guba's trustworthiness criteria in this study.

Criterion	Procedures Used in This Study
Credibility	Source triangulation across field observations, reflection-meeting transcripts, LINE-group archives, implementation records, and household financial logs; prolonged engagement across the nine-month field period; peer debriefing during coding consensus meetings.
Dependability	Independent open coding by two researchers; iterative consensus meetings to resolve discrepancies; maintained decision log documenting coding-scheme revisions.
Confirmability	Audit trail linking each thematic category back to original data excerpts (illustrated in Table A1); reflexivity statement documenting researcher positionality and its potential influence on interpretation.
Transferability	Detailed description of study setting, participant characteristics, and intervention design (Sections 2.2–2.4) to allow readers to assess applicability to other contexts.

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