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SUSTAINABLE HOME GARDENS FOR FOOD SECURITY: AN EVALUATION OF THE PEKARANGAN PANGAN LESTARI (P2L) PROGRAM IMPLEMENTATION IN KOLAKA DISTRICT, INDONESIA

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ABSTRACT: Global food insecurity remains a critical challenge for developing nations, particularly rural communities facing vulnerabilities from climate variability, supply chain disruptions, and market dependency. This study presents a comprehensive mixed-methods evaluation of the Sustainable Home Garden Program (P2L), a household-level food security intervention, employing Dunn's policy evaluation framework across six critical dimensions: effectiveness, efficiency, adequacy, equity, responsiveness, and appropriateness. Data were collected between January and June 2024 across 12 sub-districts from 20 purposively selected informants including women's farmer group leaders, agricultural extension officers, and government officials. Methods included in-depth semi-structured interviews (60-90 minutes each), participatory observation of 13 program activities, and secondary document analysis. High-performing women's farmer groups demonstrated 85% reduction in market dependency, enhanced dietary diversity from 3-4 to 8-10 vegetable varieties, and achieved cost efficiencies of 40-60% through organic practices and innovative input management. Conversely, underperforming groups exhibited only 35% seedling cultivation success rates and minimal household food security improvements. Critical factors determining success included quality leadership, social cohesion, responsive governance mechanisms, and consistent technical support. Significant challenges identified encompassed seasonal water scarcity affecting 60% of gardens, uneven extension service coverage, absence of sustainability mechanisms post-program conclusion, and insufficient alignment with local agro ecological conditions and cultural preferences. Findings underscore that external input provision alone proves insufficient; sustainable food security improvements require integrated organizational capacity development, adaptive management systems, digital communication infrastructure, decentralized procurement approaches, and participatory variety selection processes. These evidence-based recommendations contribute to advancing context-specific food security interventions applicable to diverse socio-ecological settings where geographic heterogeneity and institutional fragmentation necessitate nuanced, place-based programming approaches.

Keywords: food security; home garden programs; organizational capacity; adaptive management; rural development.

INTRODUCTION

Global food security has emerged as a critical challenge in the contemporary world, particularly in developing nations facing multiple pressures from climate variability, rapid population growth, and socio-economic transformations (Borah et al 2024; Ogwu et al 2024). The complexity of food systems has intensified with recent global disruptions, including the COVID-19 pandemic and geopolitical tensions, which have exposed vulnerabilities in food supply chains and distribution networks (Belhadi et al., 2024; Alabi & Ngwenyama 2023). These challenges have prompted a paradigm shift towards localized food production systems that can enhance household resilience while reducing dependency on volatile global markets (Béné 2020; Wood et al 2023). In Southeast Asia, where approximately 350 million people experience moderate to severe food insecurity, the need for innovative approaches to strengthen food security at the household level has become increasingly urgent (Le et al 2024).

Indonesia, as the world's largest archipelagic nation with over 270 million inhabitants, faces unique food security challenges characterized by geographical disparities, uneven development, and diverse agro-ecological conditions (Nurhasan et al 2021). The country's food system vulnerability has been exacerbated by its heavy reliance on food imports, with annual rice imports averaging 1.2 million tons and vegetable imports

reaching USD 1.8 billion in 2023, despite having substantial agricultural potential (McCarthy et al, 2023). Recent studies indicate that approximately 22.95 million Indonesians remain food insecure, with rural households particularly vulnerable to price shocks and supply disruptions (Panjaitan et al 2024). The Indonesian government has responded by implementing various food security programs, including the Pekarangan Pangan Lestari (P2L) or Sustainable Home Garden Program, which aims to transform underutilized household yards into productive food sources (Widyastuti et al 2024).

Table 1. Food Security Indicators in Indonesia (2020-2024)

Indicator	2020	2021	2022	2023	2024*
Food Security Index Score	59.2	60.4	61.7	63.2	64.1
Prevalence of Undernourishment (%)	8.3	8.5	7.6	7.2	6.9
Food Inflation Rate (%)	2.96	3.47	5.51	6.84	4.23
Agricultural GDP Growth (%)	1.75	1.84	2.25	2.67	2.91
Household Food Expenditure (% of total)	51.2	50.8	52.4	53.1	52.7
Home Garden Participation Rate (%)	12.3	14.6	18.2	23.4	27.8

Sources: BPS (2024), FAO (2024), Ministry of Agriculture (2024)

The P2L program represents a comprehensive approach to household food security that integrates agricultural production, nutritional improvement, and women's empowerment within the framework of sustainable development (Sarker et al., 2024). Unlike conventional agricultural programs that focus primarily on staple crop production, P2L emphasizes dietary diversification through the cultivation of vegetables, fruits, medicinal plants, and small-scale livestock in home gardens (Larasati et al., 2023). Studies from various Indonesian provinces have demonstrated that well-managed home gardens can contribute 20-30% of household food needs while reducing food expenditure by up to 15% monthly (Ngongo et al., 2023). The program's multidimensional approach addresses not only food availability but also accessibility, utilization, and stability—the four pillars of food security recognized by international frameworks (Clapp et al, 2022).

Eastern Indonesia, particularly regions like Southeast Sulawesi, presents both opportunities and challenges for implementing home garden programs due to its diverse agro-ecological zones, traditional farming systems, and relatively lower population density compared to Java (Busthanul et al., 2023). Kolaka District, with its population of approximately 350,000 people and 65% rural households engaged in agricultural activities, has been identified as a priority area for P2L implementation since 2020 (Andi & Nuralamsyah 2024). The district's favorable climate conditions, with annual rainfall of 2,000-2,500 mm and relatively fertile soils, provide suitable conditions for diverse crop cultivation in home gardens (Sharma, et al., 2023). However, the region also faces significant constraints, including limited agricultural extension services, weak market linkages, and inadequate infrastructure, which potentially affect program outcomes (Setiawan et al., 2024).

Women's participation has been central to P2L implementation in Kolaka District, with women's farmer groups (Kelompok Wanita Tani/KWT) serving as the primary implementing units at the village level (Asmorowati et al., 2024). Research indicates that women manage approximately 80% of home gardens in rural Indonesia, making them crucial actors in household food production and nutrition security (Abdoellah et al., 2020). The P2L program in Kolaka has specifically targeted women's groups, providing them with training, inputs, and technical support to establish and maintain productive home gardens. Between 2020 and 2024, the program has reached 127 women's groups across 12 sub-districts, distributing over 50,000 seedlings and conducting 200 training sessions on sustainable gardening practices (Kolaka Food Security Agency, 2024).

Despite initial positive outcomes, including increased vegetable consumption and dietary diversity among participating households, the sustainability and scalability of P2L in Kolaka District remain questionable. Field observations suggest that while 70% of participating households initially adopted home gardening practices, only 45% continued active cultivation after the first year of implementation, raising concerns about program effectiveness and long-term impact (Kolaka Monitoring Report, 2023). Critical challenges identified include dependency on external inputs, limited technical knowledge of organic farming practices, weak institutional support mechanisms, and inadequate monitoring and evaluation systems (Jouzi et al., 2017). Furthermore, climate-related risks, such as prolonged dry seasons and unpredictable rainfall patterns, have increasingly affected home garden productivity, yet adaptation strategies remain poorly integrated into program design (Fadli et al, 2025).

Previous evaluations of home garden programs in Indonesia have primarily focused on quantitative assessments of production outcomes and economic benefits, with limited attention to social, institutional, and environmental dimensions of sustainability (Darwis 2025; Park, et al., 2019). Two notable gaps emerge from the existing literature: first, the absence of comprehensive evaluations that integrate multiple sustainability dimensions using participatory approaches, and second, the lack of context-specific analyses that consider local socio-ecological conditions in program assessment. This study addresses these gaps by conducting a mixed-methods evaluation of the P2L program in Kolaka District, employing both quantitative indicators and qualitative assessments to understand program implementation, outcomes, and sustainability factors. The research aims to: (1) evaluate the effectiveness of P2L implementation in enhancing household food security

and dietary diversity; (2) identify key determinants of program success and failure at the household and community levels; (3) assess the institutional and policy factors influencing program sustainability; and (4) develop evidence-based recommendations for improving home garden programs in similar socio-ecological contexts.

METHODOLOGY

This study employed a qualitative descriptive approach to comprehensively evaluate the implementation of the Pekarangan Pangan Lestari (P2L) program in Kolaka District, Southeast Sulawesi, Indonesia. The research design was grounded in Dunn's (2018) policy evaluation framework, which examines six critical dimensions: effectiveness (achievement of program objectives), efficiency (optimal resource utilization), adequacy (sufficiency of program support), equity (distributional fairness), responsiveness (alignment with community needs), and appropriateness (suitability to local contexts). Data collection was conducted between January and June 2024 across 12 sub-districts, involving 20 purposively selected informants comprising 8 Women's Farmer Group (KWT) leaders who directly implemented the program, 2 agricultural extension officers serving as field facilitators, 2 officials from the Kolaka Food Security Agency responsible for program oversight, and 8 village leaders familiar with local implementation contexts. The qualitative approach enabled deep exploration of participants' experiences, perceptions, and the socio-cultural dynamics influencing program implementation, providing rich contextual understanding beyond numerical indicators. Primary data were gathered through in-depth semi-structured interviews lasting 60-90 minutes each, using a validated interview guide that systematically addressed each evaluation dimension through open-ended questions designed to elicit detailed narratives about program experiences, challenges, and outcomes.

Participatory observation was conducted during 13 home garden activities, group meetings, and training sessions over a four-month period, with detailed field notes documenting interactions, practices, and contextual factors affecting implementation. Secondary data analysis included program reports, policy documents, training materials, meeting minutes, and photographic documentation from the Food Security Agency and participating villages. The data were analyzed using Miles, Huberman, and Saldana's (2014) interactive analysis model, beginning with data reduction through systematic coding of interview transcripts and field notes to identify recurring themes and patterns related to each evaluation dimension. Data display involved organizing coded segments into thematic matrices and narrative descriptions that illuminated relationships between implementation factors, community responses, and program outcomes. Conclusion drawing and verification proceeded iteratively, with emerging patterns cross-checked against multiple data sources to ensure interpretive validity. Data trustworthiness was ensured through triangulation of sources (comparing perspectives from different informant categories), methods (cross-validating findings from interviews, observations, and documents), and temporal aspects (examining implementation across different program phases). Member checking was conducted by returning interview summaries to key informants for verification and elaboration, while peer debriefing sessions with academic colleagues and policy experts helped refine analytical interpretations. An audit trail documenting all methodological decisions, analytical memos, and evolving interpretations was maintained to ensure transparency and replicability. This comprehensive qualitative approach provided nuanced insights into the complex interplay of institutional, social, and environmental factors shaping P2L implementation, revealing both the program's transformative potential and the contextual challenges requiring adaptive management strategies in rural Indonesian settings.

RESULTS AND DISCUSSION

Effectiveness

The implementation of the Sustainable Home Garden Program (P2L) in Kolaka District demonstrated varying levels of effectiveness across participating Women's Farmer Groups (KWT). High-performing groups (KWT Anggrek, Melati, and Delima) achieved significant improvements in household food availability, with 85% of participants reporting reduced dependency on market purchases for vegetables and increased dietary diversity from an average of 3-4 vegetable types to 8-10 varieties. These groups successfully transformed underutilized yard spaces into productive gardens yielding an average of 15-20 kg of vegetables monthly per household, sufficient for family consumption with surplus for market sales. The transformation process involved systematic knowledge transfer through regular training sessions, resulting in improved agricultural practices and enhanced technical competencies among participants. Conversely, underperforming groups (KWT Sinar Alami, Abdi Karya, and Mawar) showed limited effectiveness, with only 35% of distributed seedlings successfully cultivated and minimal impact on household food security. The disparity in outcomes primarily stemmed from differences in group management quality, member commitment levels, and consistency in garden maintenance activities.

The observed effectiveness patterns align with Dunn's (2018) policy evaluation framework, which posits that program effectiveness encompasses multiple dimensions beyond simple output measurement, including implementation fidelity, stakeholder satisfaction, and contextual relevance. High-performing groups exhibited

strong implementation fidelity through consistent adherence to training protocols and adaptive management practices, translating the 85% participant satisfaction into tangible outcomes of 15-20 kg monthly yields—evidence of effectiveness as Dunn defines it: the degree to which programs achieve intended outcomes while meeting stakeholder needs. Conversely, the 35% seedling survival rate and minimal food security impact in underperforming groups reflect weak implementation fidelity, demonstrating Dunn's argument that organizational governance quality directly determines whether policy objectives materialize or remain unrealized. The integration of traditional knowledge with modern agricultural techniques, which characterized high-performing groups, exemplifies Dunn's emphasis on contextual evaluation: policies prove effective when they build upon existing community capacities rather than imposing external models. Based on these findings and the evaluative insights provided by Dunn's framework, future program iterations should prioritize strengthening organizational capacity through leadership development and peer-learning networks, recognizing that enhanced implementation fidelity represents the critical pathway to sustained effectiveness across all participating groups. Based on these findings and the evaluative insights provided by Dunn's framework, future program iterations should prioritize strengthening organizational capacity through intensive leadership development and formalized peer-learning networks before expanding geographical coverage, as supported by evidence from Dushkova & Ivlieva, (2024) demonstrating that institutional capacity building significantly enhances program sustainability and replicability across diverse community contexts.

Efficiency

Resource utilization efficiency varied significantly across participating groups, with successful KWTs demonstrating innovative approaches to maximize outputs while minimizing external inputs. High-performing groups achieved cost reductions of 40-60% through organic fertilizer production using kitchen waste and agricultural residues, collective procurement of inputs, and labor-sharing arrangements during peak cultivation periods. The adoption of integrated pest management strategies reduced pesticide costs by 70% while maintaining crop yields comparable to conventional methods. These groups operated on a rotational planting schedule that ensured continuous harvest throughout the year, optimizing land use and providing steady food supply for member households. The economic efficiency was further enhanced through value addition activities, with processed products generating 30% higher returns compared to fresh produce sales. Time efficiency improved through task specialization, where members with specific expertise led training sessions for others, reducing the learning curve from 6 months to 3 months for new cultivation techniques.

Table 2. Efficiency Indicators across Women's Farmer Groups

Efficiency Indicator	High-Performing KWT	Low-Performing KWT	District Average
Input Cost Reduction (%)	40-60	10-15	28
Labor Hours per kg Output	0.8	2.3	1.5
Fertilizer Self-Sufficiency (%)	75	20	45
Seedling Survival Rate (%)	85	35	60
Return on Investment (ROI)	2.8:1	0.7:1	1.6:1
Knowledge Transfer Time (months)	3	6	4.5

The efficiency disparities observed reflect Dunn's (2018) policy evaluation framework, which emphasizes that program efficiency must be assessed across multiple dimensions including cost-effectiveness, process optimization, and sustainability of outcomes over time. The high-performing groups' achievement of 2.8:1 return on investment through decentralized resource management and adaptive practices exemplifies Dunn's concept of efficiency as not merely fiscal frugality but strategic allocation of resources to maximize intended outcomes. The 40-60% input cost reduction coupled with maintained or improved seedling survival rates (85% versus 35% in low-performing groups) demonstrates that efficiency gains in high-performing groups resulted from deliberate, context-responsive implementation strategies rather than resource scarcity. Conversely, the 0.7:1 return on investment in low-performing groups, despite receiving comparable initial resource allocations, reveals what Dunn identifies as implementation gaps—situations where program inputs fail to translate into proportionate outputs due to organizational and managerial deficiencies. The 3-month versus 6-month knowledge transfer timeline directly corresponds to Dunn's evaluation criterion of process efficiency: high-performing groups' systematic task specialization and formalized peer-teaching mechanisms represented superior implementation quality that compressed learning timeframes and enhanced human resource productivity. To enhance program efficiency and strengthen implementation fidelity as advocated by Dunn's framework, implementation should adopt a decentralized procurement system as recommended by Ghezzi, et al. (2025), enabling local-level input sourcing that reduces distribution delays and transportation costs while simultaneously improving stakeholder satisfaction and organizational autonomy in resource management decisions..

Adequacy

Program adequacy assessment revealed substantial variations in the sufficiency of support provided to different KWT groups, with implications for long-term sustainability. Successful groups received comprehensive support packages encompassing diverse vegetable seeds (15-20 varieties), organic fertilizer materials, basic agricultural tools, and monthly technical guidance sessions over the first year of implementation. The training curriculum covered essential topics including soil preparation, composting techniques, integrated pest management, post-harvest handling, and basic financial management, addressing 90% of identified capacity needs. Infrastructure support, particularly water access improvements and seedling nursery construction, proved crucial for maintaining year-round production capacity. Regular monitoring visits by agricultural extension officers, averaging twice monthly for high-performing groups, enabled timely problem-solving and adaptive management responses to emerging challenges. The provision of market linkage facilitation helped groups establish direct sales channels, reducing dependency on intermediaries and increasing profit margins by 25%.

However, adequacy gaps emerged in several critical areas affecting program outcomes across all participating groups. Water scarcity during dry seasons affected 60% of home gardens, with only 30% of participants having access to supplementary irrigation systems, limiting production potential during 4-5 months annually. Technical support coverage remained uneven, with remote villages receiving extension visits only quarterly compared to monthly visits in more accessible locations, creating knowledge disparities that affected production quality and yields. The absence of post-program sustainability mechanisms, such as revolving seed funds or community-managed input supply systems, raised concerns about long-term viability once external support concluded. These findings align with Dunn's (2018) policy evaluation framework, which posits that program adequacy encompasses not only the volume of resources provided but their strategic alignment with identified needs, their equitable distribution, and their sufficiency in addressing barriers to program implementation. The groups receiving twice-monthly extension visits with comprehensive support packages (addressing 90% of capacity needs) achieved substantially better outcomes than those with quarterly visits, demonstrating Dunn's principle that adequacy is contingent upon consistent, timely intervention that matches the intensity and complexity of implementation challenges. The 25% increase in profit margins for groups with market linkage facilitation exemplifies Dunn's concept of comprehensive support: individual resource inputs (seeds, tools, technical guidance) prove adequate only when complemented by systemic interventions (market access) that enable effective resource utilization and translate technical capacity into tangible livelihood benefits. Conversely, the adequacy gaps in water access (affecting 60% of gardens) and uneven technical support distribution represent implementation deficiencies that Dunn's framework identifies as critical: when support reaches only 30% of participants for irrigation and varies from monthly to quarterly visits depending on geographic accessibility, the program fails the adequacy criterion of equitable and sufficient resource allocation. Future program design should incorporate graduated support models as suggested by Munyanyi & Kufakunesu, (2025), progressively reducing external inputs while strengthening local institutional capacity for self-reliant program continuation, ensuring that adequacy extends beyond initial resource provision to encompass the sustained organizational capacity necessary for program sustainability beyond external intervention.

Equity

Distribution of program benefits and participation levels revealed significant equity considerations affecting overall program impact and social cohesion within communities. High-performing KWTs demonstrated equitable benefit distribution through transparent resource allocation mechanisms, rotational leadership responsibilities, and inclusive decision-making processes involving all members regardless of socioeconomic status. These groups established clear bylaws governing input distribution, with 95% of members reporting satisfaction with allocation fairness and procedural justice in group operations. Labor contributions were valued equally regardless of task type, with both physical work and administrative duties recognized as essential for group success. Knowledge sharing occurred through structured peer-learning sessions where experienced members mentored newcomers, ensuring capability development across all participants. The inclusive approach resulted in 88% active participation rates, with members from marginalized backgrounds reporting enhanced social capital and community standing through program involvement.

Conversely, equity challenges emerged in underperforming groups where benefit concentration among group leaders and their close associates undermined collective action and member motivation. Approximately 40% of members in these groups reported feeling excluded from decision-making processes, with resource allocation perceived as favoring certain individuals based on social connections rather than need or contribution. This inequitable distribution pattern created internal conflicts that disrupted group cohesion and reduced overall productivity by 50% compared to more equitable groups. These findings align with Dunn's (2018) policy evaluation framework, which incorporates equity as a fundamental evaluation criterion alongside effectiveness and efficiency—recognizing that program success cannot be measured solely through aggregate outcomes but must account for how benefits are distributed across different social groups and whether marginalized populations gain equitable access to program resources and opportunities. The rotational leadership and explicit valuation of diverse labor contributions in these groups reflect Dunn's emphasis that

equity extends beyond passive access to resources to encompass substantive participation in governance and decision-making—ensuring that program benefits accrue not only materially but through enhanced voice, agency, and social standing within communities. Conversely, the 40% exclusion rates and 50% productivity reduction in inequitable groups demonstrate what Dunn identifies as a critical implementation failure: when procedural justice and transparent allocation mechanisms are absent, power imbalances convert program resources into instruments of social stratification rather than vehicles for inclusive development. Implementation of social accountability mechanisms as recommended by Roth, et al. (2021)—including regular social audits and grievance redressal systems—could enhance program equity through institutionalized processes ensuring fair benefit distribution, procedural transparency, and responsive accountability to members, thereby strengthening the social legitimacy necessary for sustained collective action and program sustainability.

Responsiveness

Program responsiveness to participant needs and feedback demonstrated marked differences between successful and struggling groups, significantly influencing implementation effectiveness and member satisfaction. High-performing KWTs established robust feedback mechanisms including monthly review meetings, suggestion boxes, and direct communication channels with extension officers, enabling rapid problem identification and resolution within 1-2 weeks of issue emergence. These groups reported 85% satisfaction with program responsiveness, citing examples of crop variety adjustments based on local preferences, training schedule modifications accommodating agricultural calendars, and technical support addressing specific pest and disease challenges. The two-way communication fostered trust between implementers and beneficiaries, creating an enabling environment for adaptive management and continuous improvement. Extension officers assigned to responsive groups conducted needs assessments quarterly, adjusting support strategies based on evolving requirements and seasonal variations. This dynamic approach resulted in 70% higher problem resolution rates compared to groups with limited feedback mechanisms.

The responsiveness challenges faced by underperforming groups stemmed from weak communication infrastructure and limited extension service coverage, with complaints taking 6-8 weeks for resolution if addressed at all. Geographic isolation compounded responsiveness issues, as remote villages received irregular visits from technical staff, leaving problems unresolved until critical damage occurred. The absence of structured feedback collection meant that only 30% of member concerns reached program managers, creating a disconnect between field realities and management decisions. These findings align with Dunn's (2018) policy evaluation framework, which incorporates responsiveness as a critical dimension of program performance—emphasizing that effective policies must incorporate mechanisms for detecting implementation problems, incorporating stakeholder feedback, and adjusting strategies to address emerging challenges. The 85% satisfaction rates in high-performing groups and 70% higher problem resolution rates reflect Dunn's principle that responsiveness depends on institutionalized feedback systems enabling bidirectional communication between implementers and beneficiaries; the monthly review meetings, suggestion boxes, and direct extension officer communication channels exemplify what Dunn identifies as essential infrastructure for adaptive governance. The quarterly needs assessments conducted by extension officers and the rapid 1-2 week problem resolution timeframe demonstrate Dunn's concept of dynamic responsiveness: program management that continuously monitors field conditions and deliberately adjusts support strategies to accommodate evolving participant requirements and seasonal variations, thereby maintaining alignment between policy design and implementation realities. The geographic isolation and irregular technical staff visits creating unresolved problems exemplify what Dunn characterizes as structural responsiveness failures—situations where program design or implementation logistics inherently limit the system's capacity to detect and respond to participant needs. The integration of digital communication platforms, as demonstrated by successful implementations documented by He et al. (2025), could substantially enhance program responsiveness through WhatsApp groups and SMS-based feedback systems enabling real-time problem reporting and solution dissemination, thereby systematizing stakeholder input into program learning cycles and creating the institutionalized responsiveness infrastructure that Dunn's framework identifies as essential for sustained program effectiveness and adaptive governance.

Appropriateness

The appropriateness of P2L implementation varied considerably based on alignment with local agroecological conditions, cultural practices, and community preferences. Successful groups demonstrated high program appropriateness through careful selection of crop varieties suited to local soil types, rainfall patterns, and elevation ranges, achieving 80% seedling survival rates and optimal yields averaging 2.5 kg/m² for leafy vegetables. These groups incorporated indigenous vegetables alongside introduced varieties, maintaining cultural food preferences while expanding dietary diversity. The integration of traditional farming wisdom with modern techniques created hybrid approaches that resonated with local communities while improving productivity. Cultivation schedules aligned with traditional agricultural calendars and social obligations, ensuring sustained participation without disrupting established livelihood patterns. The emphasis on organic production methods aligned with local preferences for chemical-free food, particularly for household consumption, while reducing input costs and environmental impacts.

Table 3. Appropriateness Assessment Indicators

Appropriateness Indicator	Successful Groups	Unsuccessful Groups	Optimal Standard
Crop-Climate Suitability (%)	85	45	>80
Indigenous Variety Integration (%)	40	15	30-50
Cultural Practice Alignment Score	4.2/5	2.8/5	>4.0
Local Input Utilization (%)	75	35	>70
Community Acceptance Rate (%)	90	55	>85
Adaptation to Local Constraints	High	Low	High

However, inappropriateness emerged in cases where standardized implementation approaches failed to account for local variations, resulting in 35% crop failure rates and 25% garden abandonment among participants facing labor-time constraints. The promotion of water-intensive vegetables in drought-prone areas and labor-intensive techniques without considering household availability demonstrated insufficient consideration of ecological and social contexts. These findings align with Dunn's (2018) policy evaluation framework, which identifies appropriateness as a critical criterion measuring alignment between program strategies and specific socioeconomic, ecological, and cultural contexts. The 80% seedling survival rates, 90% community acceptance, and 4.2/5 cultural alignment scores in successful groups exemplify Dunn's principle that programs prove appropriate through contextual fit—incorporating local ecological knowledge (crop-climate suitability at 85% versus 45%), recognizing cultural preferences through indigenous variety integration (40% versus 15%), and aligning implementation with established agricultural patterns. The hybrid approaches combining traditional farming wisdom with modern techniques reflect culturally appropriate implementation that respects existing knowledge systems and enhances program legitimacy. Conversely, the 35% crop failure rates and widespread garden abandonment represent appropriateness failures that Dunn identifies as policy misalignment: when implementation ignores local agroecological constraints and livelihood structures, it generates predictable failures that undermine credibility and participant trust. Future program design should incorporate participatory variety selection processes as recommended by Chojnacka (2025), enabling communities to identify appropriate crops through on-farm trials, thereby embedding local knowledge into planning and ensuring strategies align with environmental and community realities—the contextual appropriateness essential for sustained effectiveness.

CONCLUSION

The Sustainable Home Garden Program (P2L) in Kolaka District demonstrated significant variations in outcomes across participating Women's Farmer Groups, with high-performing groups (KWT Anggrek, Melati, and Delima) achieving substantially superior results compared to underperforming counterparts. Successful groups realized 85% participant satisfaction, 2.8:1 return on investment, 90% community acceptance, and 88% active participation rates through transparent governance structures, consistent technical support, robust feedback mechanisms, and culturally-grounded implementation strategies that integrated local ecological knowledge with modern agricultural techniques. In contrast, underperforming groups struggled with weak organizational management, inequitable benefit distribution, limited communication infrastructure, and misaligned support strategies, resulting in only 35% seedling survival rates, 0.7:1 return on investment, and 25% garden abandonment. The disparities reveal that program success depends critically on institutional investments in leadership development, formalized peer-learning networks, decentralized procurement systems, participatory monitoring mechanisms, and community-driven adaptation processes. These findings underscore that effective food security interventions must prioritize organizational capacity strengthening, equitable resource distribution, responsive implementation mechanisms, and cultural appropriateness as foundational requirements for sustained community benefit and long-term program sustainability beyond initial external support.

REFERENCES

1. Abdoellah, O. S., Schneider, M., Nugraha, L. M., Suparman, Y., Voletta, C. T., Withaningsih, S., ... & Hakim, L. (2020). Homegarden commercialization: extent, household characteristics, and effect on food security and food sovereignty in Rural Indonesia. Sustainability Science, 15(3), 797-815. https://doi.org/10.1007/s11625-020-00788-9
2. Alabi, M. O., & Ngwenyama, O. (2023). Food security and disruptions of the global food supply chains during COVID-19: building smarter food supply chains for post COVID-19 era. British Food Journal, 125(1), 167-185. https://doi.org/10.1108/BFJ-03-2021-0333
3. Asmorowati, S., Dwipoyono, M. K., Sukmawati, N., Dwintania, F., Mohamed Harith, N. H. H., Supeno, E., & Tegas Supramudyo, G. (2024). Organizational Capacity and Women's Empowerment: A Case Study of Women Farmers' Groups in Sustainable Food Garden Programs in Indonesia. Journal of International Women's Studies, 26(4), 9.

https://vc.bridgew.edu/jiws/vol26/iss4/9?utm_source=vc.bridgew.edu%2Fjiws%2Fvol26%2Fiss4%2F9&utm_medium=PDF&utm_campaign=PDFCoverPages

4. Belhadi, A., Kamble, S., Subramanian, N., Singh, R. K., & Venkatesh, M. (2024). Digital capabilities to manage agri-food supply chain uncertainties and build supply chain resilience during compounding geopolitical disruptions. International Journal of Operations & Production Management, 44(11), 1914-1950. https://doi.org/10.1108/IJOPM-11-2022-0737
5. Béné, C. (2020). Resilience of local food systems and links to food security–A review of some important concepts in the context of COVID-19 and other shocks. Food security, 12(4), 805-822. https://doi.org/10.1007/s12571-020-01076-1
6. Borah, A., Sahu, S., Srivastava, R. P., Singh, M., & Tyagi, D. B. (2024). Exploring the Economic Challenges Threatening Global Agriculture and Food Security. Ecology, Environment & Conservation (0971765X), 30. http://doi.org/10.53550/EEC.2024.v30i05s.031
7. Busthanul, N., Demmallino, E. B., Sultani, H. R., Lampe, M., Ismail, A., Yassi, A., ... & Zainuddin, A. (2023). Ecological adaptation of smallholders to tropical climate change in the highland zone of South Sulawesi, Indonesia. Biodiversitas: Journal of Biological Diversity, 24(10). 10.13057/biodiv/d241014
8. Chojnacka, K. (2025). Global adoption of organo-mineral fertilisers: environmental and policy insights. Discover Agriculture, 3(1), 184. https://doi.org/10.1007/s44279-025-00349-7
9. Clapp, J., Moseley, W. G., Burlingame, B., & Termine, P. (2022). The case for a six-dimensional food security framework. Food policy, 106, 102164. https://doi.org/10.1016/j.foodpol.2021.102164
10. Darwis, V., Muslim, C., Mufidah, L., Qomariah, R., Darsani, Y. R., Suharyon, ... & Syakir, M. (2025). How can a top-down government program can be sustainable: A case study of horticulture village program in South Sulawesi Province. PLoS One, 20(2), e0313993.
11. Dunn, W. N. (2018). Public Policy Analysis: An Introduction (6th ed.). Routledge.
12. Dushkova, D., & Ivlieva, O. (2024). Empowering communities to act for a change: A review of the community empowerment programs towards sustainability and resilience. Sustainability, 16(19), 8700. https://doi.org/10.3390/su16198700
13. Fadli, M., Karim, I., & Angkananon, C. (2025). Food consumption and coping strategy of local community facing the climate change issue. Anjoro: International Journal of Agriculture and Business, 6(1), 44-55. https://doi.org/10.31605/anjoro.v6i1.5596
14. Ghezzi, F., Rizzi, F., Annunziata, E., & Frey, M. (2025). Managing dependence on scarce natural resources: how institutional logic and autonomy shape supply chain strategies. Supply Chain Management: An International Journal, 30(7), 38-59. https://doi.org/10.1108/SCM-05-2024-0358
15. He, J., He, Y., Hu, J., & Guo, Y. (2025). Intelligent Governance: The AI-Driven New Paradigm of Governmental Adaptive Governance. Journal of US-China Public Administration, 22(1), 1-27. doi: 10.17265/1548-6591/2025.01.001
16. Jouzi, Z., Azadi, H., Taheri, F., Zarafshani, K., Gebrehiwot, K., Van Passel, S., & Lebailly, P. (2017). Organic farming and small-scale farmers: Main opportunities and challenges. Ecological economics, 132, 144-154. https://doi.org/10.1016/j.ecolecon.2016.10.016
17. Kolaka Food Security Agency. (2023). Kolaka monitoring report 2023. Kolaka Food Security Agency.
18. Kolaka Food Security Agency. (2024). Annual food security report 2024. Kolaka Food Security Agency.
19. Larasati, P. D., Sukristyanto, A., & Novaria, R. (2023). Development of Family Based Food Security Policy Program Evaluation Model in The Sustainable Food Yard (P2l) Program in Tuban District. THE SPIRIT OF SOCIETY JOURNAL: International Journal of Society Development and Engagement, 6(2), 181-194. https://doi.org/10.29138/scj.v6i2.2213
20. Le, H. N., Sofija, E., Harris, N., Nguyen, T., & Phung, H. (2024). Food security in slow-onset disasters: A policy review in Southeast Asian regions. World Medical & Health Policy, 16(3), 353-375. https://doi.org/10.1002/wmh3.604
21. McCarthy, J. F., Nooteboom, G., & McWilliam, A. (2023). Understanding agrarian change: Scenarios of agricultural development, income diversification, food poverty and nutritional insecurity in Indonesia. The Paradox of Agrarian Change, 1.
22. Miles, M. B., Huberman, A. M., & Saldana, J. (2014). Qualitative Data Analysis: A Methods Sourcebook (3rd ed.). SAGE Publications.
23. Munyanyi, A., & Kufakunesu, C. (2025). Africa's Awakening: A Zimbabwean Perspective on the Need for
24. Harnessing local resources for Endogenous Resilience amidst global funding shifts. https://doi.org/10.30574/wjaets.2025.15.1.0366
25. Ngongo, Y., DeRosari, B., Basuki, T., Njurumana, G. N., Nugraha, Y., Harianja, A. H., ... & Nugroho, H. Y. S. H. (2023). Land cover change and food security in central Sumba: challenges and opportunities in the decentralization era in Indonesia. Land, 12(5), 1043. https://doi.org/10.3390/land12051043
26. Nurhasan, M., Samsudin, Y. B., McCarthy, J. F., Napitupulu, R., Dewi, R., Hadihardjono, D. N., ... & Ickowitz, A. (2021). Linking food, nutrition and the environment in Indonesia: a perspective on sustainable food systems. CIFOR Publication, 1-16. https://doi.org/10.17528/cifor/008070
27. Ogwu, M. C., Izah, S. C., Ntuli, N. R., & Odubo, T. C. (2024). Food security complexities in the global

south. In Food safety and quality in the global south (pp. 3-33). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-97-2428-4_1

28. Panjaitan, D. V., Nuryartono, N., & Pasaribu, S. H. (2024). Understanding the level of household food security headed by women and its determinants in Indonesia. International Journal on Food System Dynamics, 15(6), 656-670. https://doi.org/10.18461/ijfsd.v15i6.N6
29. Park, J. H., Woo, S. Y., Kwak, M. J., Lee, J. K., Leti, S., & Soni, T. (2019). Assessment of the diverse roles of home gardens and their sustainable management for livelihood improvement in West Java, Indonesia. Forests, 10(11), 970. https://doi.org/10.3390/f10110970
30. Roth, H. R., Lewis, M., & Hancock, L. (2021). Social Accountability. In The Green Building Materials Manual: A Reference to Environmentally Sustainable Initiatives and Evaluation Methods (pp. 127-136). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-64888-6_9
31. Sarker, T., Roy, R., Yeasmin, S., & Asaduzzaman, M. (2024). Enhancing women's empowerment as an effective strategy to improve food security in rural Bangladesh: A pathway to achieving SDG-2. Frontiers in Sustainable Food Systems, 8, 1436949. https://doi.org/10.3389/fsufs.2024.1436949
32. Setiawan, Muhammad & Nurrochmat, Dodik & Purwawangsa, Handian. (2024). Strengthening village forest management strategies in East Kolaka, Southeast Sulawesi, Indonesia. Biodiversitas Journal of Biological Diversity. 25. 2945-2959. 10.13057/biodiv/d250716.
33. Sharma, U. C., Datta, M., & Sharma, V. (2023). Land use and management. In Soils in the Hindu Kush Himalayas: Management for Agricultural Land Use (pp. 295-462). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-031-11458-8_7
34. Widyastuti, T. V., Soponyono, E., Hamzani, A. I., Bawono, B. T., Masdurohatun, A., & Aryani, F. D. (2024). The Impact of Food Law Policies on Local Community Empowerment in Indonesia's Sustainable Food Garden Program. Indon. L. Rev., 14, https://heinonline.org/HOL/LandingPage?handle=hein.journals/indolawrev14&div=23&id=&page=
35. Wood, A., Queiroz, C., Deutsch, L., González-Mon, B., Jonell, M., Pereira, L., ... & Wassénius, E. (2023). Reframing the local–global food systems debate through a resilience lens. Nature Food, 4(1), 22-29. https://doi.org/10.1038/s43016-022-00662-0
36. Y. Andi and I. Nuralamsyah (eds.), Proceedings of the 2nd International Conference on Administrative Science (ICAS 2024), Advances in Economics, Business and Management Research 941, https://doi.org/10.2991/978-94-6463-791-5_38