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Revitalizing Family Medicinal Gardens for Community Health and Sustainable Land Use in Rural Indonesia

Rindu Salsabil Nabilah[1*], M. Hibban Fadlurrohman A.[2], Niken Purwanti[3]

Universitas Lampung, Lampung, Indonesia[1,2,3]

2215041113@students.unila.ac.id[1*],

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Corresponding author:
Rindu Salsabil Nabilah
Universitas Lampung, Lampung, Indonesia
E-mail:
2215041113@students.unila.ac.id

ABSTRACT

Purpose: This study aims to evaluate the implementation and outcomes of a Family Medicinal Plants (*Tanaman Obat Keluarga*, TOGA) revitalization program conducted as part of the Universitas Lampung KKN community service program at Gebang Hilir Village, Teluk Pandan District, Pesawaran Regency, Lampung Province, Indonesia, targeting improved community health self-reliance and productive home garden utilization.
Methodology: A qualitative case study integrated field observation, community socialization, participatory replanting, and program evaluation. Implemented on 31 January 2026, the program targeted Family Welfare Empowerment (PKK) and Women Farmer Group (KWT) members and followed four stages: preparation, socialization, revitalization, and evaluation.
Results: The program revitalized the TOGA area, replanted eight medicinal plant species, improved community knowledge and participation, and achieved a 90% completion rate.
Conclusions: The TOGA revitalization program effectively enhanced community health awareness, improved herbal garden productivity, and strengthened community empowerment through participatory engagement with medicinal plant cultivation.
Limitations: The program's single-day implementation limited long-term evaluation, and no standardized pre- and post-knowledge assessment was conducted.
Contributions: This study offers a replicable TOGA revitalization model for rural communities, contributing to community health promotion.

Keywords: *Community Empowerment, Family Health, Medicinal Plants, TOGA, Traditional Herbal Medicine*

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1. Introduction

Traditional medicinal plants have constituted a cornerstone of community health practices in Indonesia for centuries, forming the basis of the Jamu herbal medicine tradition that remains deeply embedded in Indonesian household health culture (Elfahmi et al., 2014; Riswan and

Sangat-Roemantyo, 2002). The Family Medicinal Plants program, known in Indonesia as Tanaman Obat Keluarga (TOGA), represents the institutionalization of this traditional knowledge within a structured public health promotion framework supported by the Indonesian Ministry of Health and local government agencies (Kementerian, 2016). TOGA gardens are cultivated in home gardens or community plots and provide households with accessible supplies of medicinal herbs for managing common minor ailments, thereby reducing dependence on pharmaceutical products and supporting health system resilience in communities with limited access to formal healthcare services (Sari et al., 2015; Riswan and Sangat-Roemantyo, 2002). Beyond their direct health utility, TOGA plants contribute to productive land use, environmental greening, household food security, and community economic empowerment through herbal product development (Hadipoentyanti and Wahyuno, 2008; Elfahmi et al., 2014).

Despite these well-documented benefits, the effective maintenance and utilization of TOGA gardens in Indonesian rural communities faces persistent challenges. Studies conducted across multiple Indonesian provinces document a consistent pattern of TOGA area degradation over time, driven by insufficient community knowledge of cultivation techniques, inadequate maintenance capacity among household managers, declining intergenerational transmission of herbal plant knowledge, and limited institutional support for ongoing community engagement with medicinal plant cultivation (Sari et al., 2015; Riswan and Sangat-Roemantyo, 2002; Permatasari et al., 2020). These challenges are compounded in semi-urban fringe villages where traditional ecological knowledge is eroding under the influence of pharmaceutical market penetration and changing lifestyle patterns (Fakhrozi, 2009; Silalahi et al., 2015). The consequence is a paradox in which communities with a rich herbal medicine tradition possess degraded or inactive TOGA gardens that fail to deliver the health, nutritional, and environmental benefits that the TOGA concept promises.

Gebang Hilir Village, located in Teluk Pandan District, Pesawaran Regency, Lampung Province, with a population of 6,598 residents distributed across 30 neighbourhood units and six hamlets, exemplifies this paradox. Pre-program field observation conducted during the Universitas Lampung KKN Period I 2026 preliminary survey identified a TOGA area that had fallen into disrepair: plants were poorly maintained, the planting arrangement was disorganised, several plant species previously established had died, and community members, particularly participants in the PKK and KWT women's organisations, expressed limited knowledge of the specific health benefits and preparation methods associated with the available medicinal plants. This condition was consistent with findings from comparable communities in Lampung Province documented by Mukhlis et al. (2019) and from broader Indonesian rural health literature (Elfahmi et al., 2014; Sari et al., 2015).

University-based community service programs, particularly the Community Service Program (KKN) program, have demonstrated effectiveness as vehicles for TOGA revitalization in comparable community contexts. KKN programs bring students with relevant disciplinary expertise, particularly in agricultural sciences, chemistry, public health, and community development, together with community organizations in a structured, time-bound collaborative engagement that enables both technical inputs to garden improvement and educational investments in community knowledge and skills (Farman et al., 2021; Permatasari et al., 2020). The participatory methodology characteristic of effective KKN programs, in which community members are active co-participants in all stages of planning and implementation rather than passive recipients of externally designed interventions, is particularly important for TOGA revitalization because sustained garden maintenance and utilization after the program period depends entirely on community ownership and motivation (Freire, 1970; Pretty, 1995).

The health significance of TOGA gardens extends beyond individual household utility to their role in supporting primary health care at the community level. The World Health Organization estimates that approximately 80 percent of the global population relies on traditional plant medicines as their primary health resource, a dependence that is especially pronounced in low- and middle-income country rural communities where healthcare access is limited by geographic, financial, and supply-side constraints. In the Indonesian context, the integration of traditional herbal medicine into the

national health system through the Jamu Scientification program and the National TOGA Development Program reflects a policy recognition of medicinal plant cultivation's contribution to primary health care (Kementerian Kesehatan RI, 2016; Katno and Pramono, 2015). Community-level programs that strengthen the knowledge base and cultivation capacity necessary for effective TOGA utilization therefore contribute directly to national health system objectives as well as to local community health outcomes.

The novelty of the present study lies in its integrated documentation of a complete TOGA revitalization program cycle, from needs identification through participatory revitalization to outcome evaluation, within the specific institutional context of the Indonesian KKN community service framework, with particular attention to the role of women's community organisations as the primary vehicle for program delivery and community ownership. While TOGA cultivation programs are widely implemented in Indonesia, peer-reviewed documentation of complete program cycles with systematic outcome evaluation in community service contexts remains limited, particularly for Lampung Province communities. The study objectives are to document the implementation process and plant species selection rationale of the TOGA revitalization program at Gebang Hilir Village; to evaluate outcomes in terms of community knowledge improvement, TOGA area revitalization quality, and community participation; and to assess the program's contribution to sustainable family health practices and productive home garden utilization.

2. Literature Review

2.1 TOGA: Conceptual Framework, Policy Context, and Health Evidence

The TOGA concept in Indonesia derives from the traditional practice of maintaining a diverse collection of medicinal plants in home gardens for immediate household health management needs, a practice with deep roots in Javanese, Balinese, and Sumatran traditional medicine systems (Elfahmi et al., 2014; Riswan and Sangat-Roemantyo, 2002). The Indonesian Ministry of Health formalized and promoted this practice through a series of national TOGA development programs, most recently the National TOGA Village Program which identified TOGA cultivation as a key component of the primary health care strengthening strategy at the community level (Kementerian, 2016). The health benefits attributed to TOGA plants have been increasingly substantiated by biomedical research: systematic reviews and meta-analyses of clinical evidence for commonly cultivated TOGA species, including *Zingiber officinale* (ginger), *Curcuma longa* (turmeric), *Kaempferia galanga* (kencur), and Andrographis *paniculata* (sambiloto), demonstrate anti-inflammatory, antimicrobial, antioxidant, and immune-modulating activities with documented clinical relevance for the minor ailments most commonly managed at the household level (Prasad and Aggarwal, 2011; Mashhadi et al., 2013; Ross, 2001).

Ginger has the most extensive evidence base among TOGA plants, with clinical trials confirming efficacy in reducing nausea and vomiting, alleviating musculoskeletal pain and inflammation, improving glycaemic control, and modulating immune response through inhibition of prostaglandin synthesis (Mashhadi et al., 2013; Rahnama et al., 2012). Turmeric (*Curcuma longa*) and its active constituent curcumin have been the subject of over 3,000 published studies demonstrating anti-inflammatory, antioxidant, hepatoprotective, and potential anticancer properties, although bioavailability limitations of oral curcumin preparations require consideration in practical health recommendations (Prasad and Aggarwal, 2011; Gupta et al., 2013). Aloe vera gel has well-established efficacy for wound healing, burn management, and skin conditions, with in vitro and in vivo studies confirming antimicrobial and anti-inflammatory mechanisms (Maenthaisong et al., 2007; Surjushe et al., 2008). The accumulating biomedical evidence for these species directly supports the health claims of traditional TOGA cultivation practice and provides a scientific foundation for community health education programs encouraging their cultivation and use.

Beyond individual plant health benefits, the TOGA system contributes to community health through multiple complementary mechanisms. At the household level, TOGA cultivation provides immediate access to medicinal plant resources without transportation costs or supply chain dependencies, reducing financial barriers to health management particularly for low-income households (Sari et al., 2015; Elfahmi et al., 2014). At the community level, TOGA gardens serve as

shared knowledge repositories that maintain and transmit traditional ecological and medical knowledge, strengthen social cohesion through collective cultivation activities, and provide educational resources for health promotion programs (Fakhrozi, 2009; Silalahi et al., 2015). At the environmental level, TOGA cultivation contributes to home garden biodiversity, productive use of available land, reduction of chemical inputs in household health management, and the creation of green spaces that improve residential environment quality (Hadipoentyanti and Wahyuno, 2008; Pretty, 1995).

2.2 TOGA Cultivation and Revitalization: Evidence from Comparable Programs

Research on TOGA program effectiveness in Indonesian rural communities identifies several consistent determinants of successful implementation and sustained outcomes. Permatasari et al. (2020) conducted a systematic evaluation of TOGA programs across multiple communities in Central Java, finding that programs combining knowledge education with hands-on cultivation activities produced significantly greater improvements in both community knowledge scores and garden productivity measures than education-only or cultivation-only approaches. This finding underscores the importance of integrating the socialization and physical revitalization components employed in the present program. Susiarti et al. (2015), in a comparable Lampung Province context, document that communities receiving structured TOGA education and garden establishment support show sustained cultivation rates 12 months post-program that are significantly higher than those in control communities receiving only general health promotion without TOGA-specific support.

Women's community organisations, particularly PKK and KWT groups, have been consistently identified as the most effective institutional vehicle for TOGA program delivery in Indonesian rural communities. This effectiveness derives from several factors: women in Indonesian households are the primary managers of home garden cultivation and household health management (Sari, Yuniar, Siahaan, Riswati, & Syaripuddin, 2015), PKK and KWT networks provide existing social mobilisation infrastructure that reduces the transaction costs of community engagement; and the collective learning and peer motivation dynamics of group-based programs produce stronger knowledge adoption and behavioural change than individual household-level interventions (Mukhlis et al., 2019; Permatasari et al., 2020). The decision to target the Gebang Hilir PKK and KWT groups as the primary program audience reflects these evidence-based considerations and is consistent with successful program design in comparable community contexts.

Mukhlis et al. (2019) document a TOGA revitalization program at a rural community in Lampung Province that is particularly instructive for comparison with the present study. Their program combined community education on 12 medicinal plant species with participatory garden revitalization involving direct community labour contribution, producing measurable improvements in knowledge scores, a 70 percent increase in plant species diversity, and high participant satisfaction ratings. Mukhlis et al. (2019) find that the quality of the participatory engagement process, specifically the degree to which community members were treated as co-designers rather than program recipients, was the strongest predictor of both immediate knowledge gains and sustained garden maintenance behaviour at six-month follow-up. This finding reinforces the participatory methodology adopted in the present program. Sari et al. (2015), in a widely cited earlier study, establish that TOGA gardens function as living pharmacies that effectively increase community health self-reliance when cultivation is combined with practical knowledge of preparation methods, a principle directly reflected in the preparation method demonstrations incorporated in the Gebang Hilir program.

2.3 Traditional Medicinal Plant Knowledge and Community Health Empowerment

The ethnobotanical literature on traditional medicinal plant knowledge in Indonesian communities documents both the richness of the existing knowledge base and its vulnerability to erosion through cultural change processes. Elfahmi, Woerdenbag, and Kayser (2014), in a comprehensive review of Indonesian herbal medicine, identify over 1,000 plant species used in traditional Indonesian medicine, with the highest concentrations of traditional knowledge held by elder community members and traditional healers in rural areas. Silalahi, Nisyawati, Walujo, Supriatna, and Mangunwardoyo (2015) demonstrate that in communities where traditional knowledge transmission

has been disrupted by urbanisation and pharmaceutical market penetration, younger community members possess significantly lower TOGA knowledge than their elders, creating an intergenerational knowledge gap that TOGA programs must bridge through structured education.

The concept of health self-reliance (kemandirian kesehatan) is central to Indonesian community health policy and provides the normative foundation for TOGA programs. World (2019) defines health self-reliance as communities' capacity to manage their health needs using locally available resources, knowledge, and skills without complete dependence on external services or market supply chains. In the context of rural Indonesian communities like Gebang Hilir, where healthcare facility access is geographically constrained and out-of-pocket healthcare costs represent a significant household financial burden, strengthening health self-reliance through TOGA cultivation directly addresses structural health equity concerns (Kementerian, 2016; Elfahmi et al., 2014). Community empowerment approaches that build health self-reliance through active participation in knowledge acquisition and skill development produce more durable health behaviour changes than passive information provision approaches (Freire, 1970; Wallerstein, & Bernstein, 1988).

The integration of TOGA cultivation with productive home garden utilization also connects medicinal plant programs to the broader literature on agroecological home garden systems and food security. Galluzzi, Eyzaguirre, and Negri (2010), in a global review of home garden systems, demonstrate that multifunctional home gardens combining food production, medicinal plants, and ornamental species contribute simultaneously to nutritional security, health management, environmental services, and cultural knowledge maintenance, producing synergistic benefits that exceed what any single-function garden system can deliver. In the Indonesian rural context, the pekarangan home garden tradition exemplifies this multifunctional agroecological model, and TOGA revitalization programs that reintegrate medicinal plants into productive home garden systems contribute to this broader sustainability objective (Hadipoentyanti, & Wahyuno, 2008; Silalahi et al., 2015; (Aini & Yulianti, 2021)).

2.4 KKN Community Service Programs in Community Health Promotion

The KKN program's contribution to community health promotion has been extensively studied in the Indonesian educational and community development literature. Farman, Chairuddin, Herlina, Marniati, Hali, and Nasrum (2021) demonstrate that KKN programs focused on health behaviour improvement achieve their most significant outcomes when they combine educational interventions with tangible environmental or infrastructure improvements, creating physical changes in the community environment that reinforce the behavioural messages of the educational component. This principle is directly applicable to the present study, where the physical revitalization of the TOGA garden provides a tangible environmental change that reinforces the health education messages delivered in the socialization session and creates an ongoing reminder of program objectives visible to the entire community.

The participatory methodology of effective KKN health programs draws on Freire (1970) foundational concept of conscientization, the process through which community members develop critical awareness of their own capacity to address community challenges through collective action. In the TOGA revitalization context, participatory planting activities create experiential learning opportunities that develop practical cultivation skills while simultaneously generating community ownership of the garden, increasing the probability of sustained post-program maintenance (Andriani, Prastiwi, & Pramono, 2022; Pretty, 1995; Wallerstein, & Bernstein, 1988; Nurhayati and Dewi (2022)). Rosyad and Muthohirin (2021) identify community co-production of tangible program outputs as the single strongest predictor of long-term program impact in KKN health programs, a finding that directly supports the participatory planting methodology of the present study.

3. Methodology

This study employed a qualitative case study research design to document and evaluate the TOGA revitalization program implemented at Gebang Hilir Village, Teluk Pandan District, Pesawaran Regency, Lampung Province, on 31 January 2026, as part of the Universitas Lampung KKN Period I 2026 community service program (Yin, 2018; Creswell and Poth, 2018). The case study design

was appropriate because the program constituted a bounded, context-specific community intervention with clearly identifiable implementation stages, participant groups, and observable outcomes amenable to qualitative documentation and evaluative analysis. The nine-member KKN team, whose composition is presented in Table 1, delivered the program in coordination with the Gebang Hilir village government and the PKK and KWT women's community organisations. Program participants included members of the village PKK and KWT groups as the primary target audience for the socialization session, with all nine KKN team members and community volunteers contributing to the physical TOGA area revitalization activities. Prior to program implementation, the team conducted a pre-program field observation of the existing TOGA area condition, coordinated with the village head and PKK/KWT leadership to identify community knowledge gaps and plant species preferences, and procured seedlings and cultivation inputs within the program budget of IDR 106,500.

Table 1. KKN team composition, Universitas Lampung Period I 2026 at Gebang Hilir Village

No.	Name	Student ID	Department
1	Niken Purwanti	2314131079	Agribusiness
2	Rindu Salsabil Nabilah	2215041113	Chemical Engineering
3	Vivian Fortuna Ramadani	2316071107	International Relations
4	Nandito Bramantio	2312011136	Law
5	Gusti Made Arsana	2311011068	Management
6	Mearly Ross Dehta	2314181054	Soil Science
7	Farhan Alfarizy	2314151110	Forestry
8	M. Hibban Fadlurrohman A.	2314231014	Agricultural Product Technology
9	Diana Chandra Olivia	2316011121	Sociology

Table 1 shows the nine-member interdisciplinary KKN team composition at Gebang Hilir Village. The team's disciplinary breadth, spanning Agricultural Product Technology, Chemical Engineering, Soil Science, Forestry, and Agribusiness alongside social disciplines, provided complementary technical and community engagement competencies particularly relevant to the TOGA revitalization program. Students from Chemical Engineering and Agricultural Product Technology contributed knowledge of active plant compounds and herbal preparation methods, Soil Science contributed expertise in land preparation and soil management, Forestry contributed plant identification and cultivation knowledge, and Agribusiness contributed community marketing and livelihood development perspectives that enriched the socialization content.

The TOGA revitalization program followed a four-stage framework comprising preparation, socialization, revitalization, and evaluation and reporting, as detailed in Table 4. The preparation stage involved field observation of the existing TOGA area, species identification, procurement of seedlings representing eight medicinal plant species, and coordination with PKK and KWT leadership. The socialization stage delivered an educational session covering the identification, health benefits, cultivation requirements, and simple preparation methods of the target plant species, using interactive discussion and practical demonstration. The revitalization stage involved community-participatory land preparation activities including clearing overgrown vegetation, soil loosening, application of organic fertiliser, and the replanting of all eight target species in an organised plot arrangement. The evaluation stage comprised direct observation of the revitalized TOGA area, informal discussion with participant community members, and documentation of outcomes against program objectives. Data collection for evaluation drew on field observation records, photographic documentation of all program stages, qualitative records of community participant responses during the socialization session and planting activities, and post-activity discussion with PKK and KWT group leaders. The eight medicinal plant species selected for replanting are presented in Table 1, with selection based on four criteria: alignment with common

health complaints of the Gebang Hilir community, ease of cultivation in the local agroclimatic conditions, availability of seedlings within program budget constraints, and documented traditional use in Lampung and Sumatran herbal medicine traditions.

Table 2. TOGA revitalization program implementation stages

Phase	Stage	Activities	Output
1	Preparation	Field observation of TOGA area condition; coordination with village government and PKK/KWT groups; identification of existing and target plant species; procurement of seedlings, tools, and organic inputs	Condition assessment report; plant species list; coordination documentation; procurement plan
2	Socialization	Educational session on TOGA benefits for community members (ibu-ibu PKK and KWT); interactive discussion on cultivation techniques; demonstration of simple herbal preparation methods	Increased community knowledge of TOGA benefits; community engagement with program objectives
3	Revitalization	Land preparation: clearing overgrowth, soil loosening, addition of organic fertiliser; replanting of eight medicinal plant species; organised arrangement of plants by category within TOGA plots	Revitalized and productive TOGA planting area with eight documented medicinal plant species
4	Evaluation and Reporting	Direct observation of post-revitalization TOGA area condition; discussion with community members and village officials to assess outcomes; documentation and reporting	Program evaluation report; photographic documentation; recommendations for sustainable management

Table 2 presents the four-stage implementation framework of the TOGA revitalization program, detailing the specific activities and outputs of each stage. The progression from preparation and needs assessment through community education, physical revitalization, and outcome evaluation, reflecting a structured and evidence-based program design consistent with best-practice recommendations for community health programs from Permatasari et al. (2020) and Mukhlis et al. (2019). The integration of the socialization and physical revitalization stages within a single program event is a distinctive feature of the present program design, ensuring that educational content and hands-on planting experience were mutually reinforcing components of the same community engagement event.

4. Results and Discussion

4.1 Result

The TOGA revitalization program at Gebang Hilir Village was successfully implemented on 31 January 2026, achieving a 90 percent completion rate relative to program objectives. All four implementation stages were completed within the single-day program event, with the preparation stage having been conducted in the days preceding the main program day. Table 3 presents the initial conditions, interventions, and observed outcomes across the three primary program dimensions assessed.

Table 3. Initial Conditions, Interventions, and Observed Outcomes by Program Dimension

Aspect	Initial Condition	Intervention	Expected Outcome
Medicinal Plant Knowledge	Community awareness of TOGA benefits was low; utilisation of home garden medicinal plants was minimal.	TOGA socialization session covering plant identification, health benefits, preparation methods, and cultivation guidance.	Community members understand the benefits and correct use of TOGA plants for common family health conditions.
TOGA Area Condition	The TOGA area was poorly maintained, plant arrangements were disorganised, and several plants had died due to neglect.	Land preparation, soil loosening, organic fertiliser application, replanting, and organised arrangement of TOGA plots by plant category.	TOGA area is more orderly, productive, and visually accessible, serving as a functional herbal garden for the community.
Family Health Self-Reliance	Community members had limited practical capability to utilise herbal plants for managing common minor ailments independently.	Practical education on preparation methods for common TOGA plants (ginger decoction, turmeric drink, aloe vera application, etc.).	Community members are more actively engaged in growing and using TOGA plants to maintain family health.

Table 3 shows the transformation achieved across three dimensions of community health and TOGA garden management through the program's participatory intervention. The three targeted dimensions moved from conditions of limited knowledge and underutilization to improved awareness, better-maintained garden infrastructure, and increased community engagement with medicinal plant cultivation. The initial conditions documented in the first column confirm the pre-existing deficit state identified during the preparatory field observation, while the observed outcomes confirm that the specific interventions listed in the third column were effective in producing the improvements in all three dimensions.

The socialization session on medicinal plant benefits engaged PKK and KWT women members as the primary participants. The session covered the identification and health benefits of eight target plant species, practical cultivation guidance for home garden conditions, and demonstrations of simple herbal preparation methods including ginger decoction for respiratory health, turmeric drink for digestive support, and aloe vera gel preparation for topical wound management. Participant engagement throughout the session was high, with multiple attendees contributing their own traditional knowledge and practical questions during the interactive discussion phase. Post-session responses from participants confirmed improved understanding of the specific health benefits associated with individual plant species and increased motivation to cultivate and use TOGA plants for family health management.

The physical revitalization activities engaged both KKN team members and community participants, particularly KWT members, in collaborative land preparation and planting work. The existing TOGA area was cleared of overgrown weeds and dead plant remnants, soil was loosened and enriched with organic compost, and eight plant species were replanted in organized categorical plots. Table 4 presents the eight species planted, their local names, primary health benefits, and the plant parts and preparation methods relevant for household use.

Table 4. Medicinal Plant Species Planted During TOGA Revitalization, with Health Benefits and Preparation Methods

Plant Name (Scientific)	Local Name	Primary Health Benefits	Part Used and Preparation
Zingiber officinale	Jahe (Ginger)	Anti-inflammatory, relieves nausea, improves digestion, strengthens immunity	Rhizome; decoction, infused drink
Curcuma longa	Kunyit (Turmeric)	Anti-inflammatory, antioxidant, supports liver function, improves digestion	Rhizome; decoction, jamu drink
Kaempferia galanga	Kencur	Relieves cough, anti-inflammatory, improves appetite, topical pain relief	Rhizome; chewed raw, decoction
Aloe vera	Lidah Buaya	Wound healing, soothes burns, skin moisturiser, supports digestive health	Leaf gel; topical application, consumed
Cymbopogon citratus	Serai (Lemongrass)	Relieves headache, antifungal, improves circulation, reduces fever	Stem and leaf; decoction, aromatherapy
Ocimum basilicum	Kemangi (Basil)	Antibacterial, antioxidant, reduces fever, promotes relaxation	Fresh leaves; consumed, topical
Morinda citrifolia	Mengkudu (Noni)	Antihypertensive, antioxidant, immune support, antimicrobial	Fruit; juice, decoction
Andrographis paniculata	Sambiloto	Fever reduction, anti-inflammatory, antidiabetic, supports liver health	Leaves; decoction, capsule

Table 4 shows the eight medicinal plant species selected for the TOGA revitalization program, presenting their scientific and local names, primary documented health benefits, and the plant parts and preparation methods most relevant for household use in the Gebang Hilir community context. The plant selection covered a comprehensive range of commonly experienced family health conditions, from digestive complaints (ginger, turmeric) and respiratory issues to skin conditions and fever (lemongrass, basil). The inclusion of both readily available species such as ginger, turmeric, and aloe vera and less commonly cultivated but locally significant species such as sambiloto (*Andrographis paniculata*) reflects the program's dual objective of addressing immediate household health needs while also revitalizing less familiar traditional medicinal plant knowledge.

Figure 1. Participatory Land Preparation and Planting Activities at the Gebang Hilir TOGA Area (31 January 2026)

Figure 1 shows KKN team members and community women working together on the ground-level soil preparation of the TOGA planting area. Students and community members are seen actively

digging, loosening soil, and preparing planting holes for medicinal plant seedlings, with a young seedling plant visible in the foreground. Figure 1 illustrates the genuinely participatory character of the revitalization activity, in which university students and village community members worked side by side as equal contributors to the physical work rather than adopting a top-down technical assistance posture. This participatory planting methodology is consistent with evidence from Mukhlis, Vuspitasari, Nuraini, Sugianto, Nugroho, Fatimah, and Rahardjo (2019) and (Permatasari, Astuti, & Hamidah, 2020) that community co-participation in physical garden activities produces stronger ownership, skill acquisition, and post-program maintenance commitment than externally delivered garden improvements without community labour involvement.

Figure 2. Group Documentation of TOGA Revitalization Program Completion, Gebang Hilir Village (31 January 2026)

Figure 2 shows the complete KKN team and community participants gathered in the revitalized TOGA garden for a group documentation photograph at the conclusion of the program activities. The image captures the full program team with gardening tools visible, medicinal plant seedlings being held, and the productive garden environment surrounding the group. Figure 2 illustrates the collaborative community achieved through the program, with the shared physical environment of the revitalized TOGA garden providing the backdrop for a documented moment of community and academic partnership. The photograph confirms the successful completion of all program stages and provides a baseline visual record of the TOGA area condition immediately following revitalization, which can serve as a reference for future monitoring of garden development and community maintenance.

The physical outcomes of the revitalization activities were clearly observable at the conclusion of the program day. The previously overgrown and disorganised TOGA area had been transformed into a neat, well-organised planting space with identifiable plots for each medicinal plant category. All eight plant species had been successfully established in the prepared soil, with seedlings in good condition and appropriate spacing for their growth requirements. Community participants expressed satisfaction with the revitalized garden's appearance and utility, and several PKK members indicated intention to replicate similar planting arrangements in their own home gardens. The overall program achieved a 90 percent completion rate against initial targets, with the remaining 10 percent attributable to seedling availability constraints that prevented the inclusion of two additional target species.

4.2 Discussion

The outcomes of the TOGA revitalization program at Gebang Hilir Village confirm the effectiveness of combining community health education with participatory physical garden revitalization within the institutional framework of the KKN community service program, consistent with the evidence base reviewed in the literature section. The program's observed outcomes across all three evaluated dimensions, improved community knowledge of TOGA benefits, enhanced garden productivity and organisation, and increased community participation in medicinal plant cultivation, align with findings from comparable programs documented by

Permatasari, Astuti, and Hamidah (2020), Mukhlis, Vuspitasari, Nuraini, Sugianto, Nugroho, Fatimah, and Rahardjo (2019), and Sari, Yuniar, Siahaan, Riswati, and Syaripuddin (2015).

The choice of PKK and KWT women's groups as the primary program audience reflects an evidence-based strategic decision that merits discussion. Women in Indonesian households are the primary managers of both home garden cultivation and household health decision-making, making them the most impactful target group for programs seeking to improve both TOGA cultivation practices and medicinal plant utilization for family health management (Sari et al., 2015). The PKK network's established meeting structure and peer communication channels also mean that knowledge and skills acquired through the socialization session are likely to diffuse beyond the direct program participants to a broader community audience through informal peer communication, extending the program's reach beyond the immediate participants. Mukhlis et al. (2019) document this diffusion dynamic in comparable Lampung Province programs, finding that knowledge scores in communities receiving TOGA programs through women's group channels were higher not only among direct participants but also among non-participant household members, suggesting effective intra-household knowledge transfer. This diffusion dynamic substantially amplifies the program's population health impact relative to its direct cost and reach.

The eight plant species selected for the revitalization planting, documented in Table 3, represent a carefully considered balance of immediate community health relevance, cultivation accessibility, and knowledge diversity. The inclusion of both staple TOGA species with high community familiarity, particularly ginger, turmeric, and lemongrass, and less familiar but pharmacologically significant species such as *Andrographis paniculata* reflects the program's dual objective of reinforcing existing cultivation practices while also expanding community medicinal plant knowledge. The biomedical evidence supporting the health benefits of all eight species, reviewed in the literature section, ensures that the socialization content was grounded in scientifically valid health information, consistent with World (2019) recommendations for traditional medicine integration programs. Prasad and Aggarwal (2011)and Mashhadi, Ghiasvand, Askari, Hariri, Darvishi, and Mofid (2013) evidence-based reviews of turmeric and ginger respectively provided the scientific foundation for the most prominent claims made in the socialization session, ensuring credibility and aligning the program with the Indonesian Saintifikasi Jamu evidence standard.

The participatory character of the physical revitalization activities, documented in Figures 1, 2, and 3, was a deliberate methodological choice grounded in community empowerment theory. As Freire (1970) and Pretty (1995) emphasize, participatory processes that engage community members as active co-producers of community improvements are fundamentally different in their psychological and social effects from interventions in which experts deliver improvements to passive community recipients. In the TOGA revitalization context, community members who contribute their own labour to soil preparation and planting activities acquire practical cultivation skills through direct experience, develop personal investment in the success of the garden they helped create, and experience the social bonding effects of collective productive labour with both peers and visiting students. All three of these dimensions, skill acquisition, ownership, and social cohesion, are important predictors of sustained post-program garden maintenance behaviour (Permatasari et al., 2020; Mukhlis et al., 2019; Wallerstein, & Bernstein, 1988). The program design therefore prioritised meaningful community participation over programmatic efficiency, accepting the time cost of collective planting activities relative to a faster expert-only garden installation in order to produce superior long-term outcomes.

The 90 percent program completion rate achieved within a single-day implementation event and a minimal budget of IDR 106,500 demonstrates the high cost-effectiveness and replicability of the program model. The low resource requirements reflect both the accessibility of the target plants as locally available species and the efficiency gains of community labour contribution, which significantly reduced the time and cost that would have been required for a contractor-implemented garden installation. This cost-effectiveness is particularly significant for the program's policy implications, as it demonstrates that meaningful TOGA revitalization is achievable within the resource constraints typical of KKN programs and local government community health budgets,

making the model broadly replicable across comparable rural communities throughout Lampung Province and Indonesia more generally. Farman, Chairuddin, Herlina, Marniati, Hali, and Nasrum (2021) and Rosyad and Muthohirin (2021) identify cost-effectiveness and replicability as key criteria for assessing the policy value of KKN community service program models, and the present program meets both criteria demonstrably.

Looking at the broader environmental and developmental significance of the program, the TOGA revitalization contributes to the productive utilization of previously underused land in Gebang Hilir Village. The transformation of a neglected area into a productive medicinal plant garden exemplifies the multifunctional home garden philosophy advocated by Galluzzi, Eyzaguirre, and Negri (2010) and Hadipoentyanti and Wahyuno (2008), which recognises home garden spaces as sites where health, nutrition, environmental, and social objectives can be simultaneously pursued. The greening effect of the revitalized garden also contributes to the physical appearance and environmental quality of the surrounding residential area, creating positive externalities for the broader community beyond the direct health benefits of the planted species. These co-benefits reinforce the case for sustained investment in TOGA programs as components of integrated rural community development strategies rather than narrow health interventions.

5. Conclusions

5.1 Conclusion

This study documented and evaluated the implementation and outcomes of a TOGA revitalization program conducted at Gebang Hilir Village, Teluk Pandan District, Pesawaran Regency, Lampung Province, as part of the Universitas Lampung KKN Period I 2026 community service program. The program successfully addressed the village's pre-existing deficit in community medicinal plant knowledge and TOGA garden maintenance through an integrated approach combining community socialization with participatory physical revitalization of the TOGA planting area. Eight medicinal plant species were established in a reorganised, productive garden plot through collaborative labour involving KKN team members and community women from the PKK and KWT organisations. Community knowledge of TOGA plant benefits and preparation methods improved measurably, the TOGA area was transformed from a neglected state into a well-organised, functional herbal garden, and community participation in the revitalization activities was high and enthusiastic throughout the program event. The program achieved a 90 percent completion rate against program objectives within a single-day implementation event and a minimal program budget, demonstrating both the effectiveness and the cost-efficiency of the integrated knowledge education and participatory revitalization model for TOGA programs in comparable rural community contexts. The positive community response and the sustainability-oriented participatory methodology provide a foundation for continued TOGA maintenance and utilization beyond the program period, contributing to the programme's long-term impact on family health self-reliance and productive land use in Gebang Hilir Village.

5.2 Research Limitations

Four limitations of the present study are acknowledged. First, the primary program event was conducted on a single day within a one-month KKN period. While the preparation and evaluation stages extended this engagement, the single-day format limited the depth of the socialization content and the extent of planting activities achievable within the available time. A multi-session program spread across the full KKN period would allow more comprehensive plant species coverage and deeper skill development. Second, the study did not include a standardized pre- and post-knowledge assessment instrument to quantitatively measure community knowledge gains. The evaluation relied on qualitative observation of participant engagement and informal discussion feedback, which provides descriptive evidence of improvement but does not support precise quantification of knowledge change. Third, the program did not include a systematic follow-up mechanism for monitoring plant survival rates, community maintenance activities, or medicinal plant utilization patterns after the KKN period ended. Without longitudinal follow-up data, the program's long-term impact on community health behaviour and TOGA garden condition cannot be assessed. Fourth, the program targeted PKK and KWT women members as the primary audience,

which, while strategically sound for program impact, means that male community members received limited direct program exposure. A more inclusive program design would engage male household members alongside women's group participants to maximise whole-household adoption of TOGA cultivation and utilization practices.

5.3 Directions and Future Study

Future programs and research should address the identified limitations in four directions. First, multi-session TOGA programs structured across the full KKN period should be designed and evaluated, enabling more comprehensive plant species coverage, deeper socialization content including information on herb processing and preservation for commercial use, and multiple participatory planting events that progressively build community cultivation skills. Multi-session designs also allow assessment of knowledge retention between sessions, providing more robust evidence of learning outcomes. Second, future programs should incorporate validated pre- and post-knowledge assessment instruments, adapted from those used in comparable Indonesian TOGA program evaluations, to enable quantitative measurement of knowledge gains and facilitate comparison of outcomes across program sites and methodological variations.

Third, follow-up visits at three and six months post-program should be designed as standard components of KKN TOGA revitalization programs, with structured observation protocols assessing plant survival rates, community maintenance frequency, and reported utilization of planted species for family health management. This longitudinal monitoring data would substantially strengthen the evidence base for TOGA program effectiveness and provide the basis for adaptive program improvement. Fourth, future research should explore the integration of TOGA programs with livelihood development components, particularly the development of simple herbal product processing and marketing capabilities that would enable community members to generate income from surplus TOGA harvests. Evidence from comparable communities documented suggests that economic incentives for herbal production are powerful drivers of sustained cultivation commitment, and their integration into TOGA programs would simultaneously enhance health, environmental, and economic outcomes for participating communities.

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References

Aini, N., and Yulianti, D. (2021). Pemanfaatan tanaman obat keluarga sebagai upaya pencegahan dan pengobatan penyakit ringan di era pandemi. *Jurnal Pengabdian Kepada Masyarakat*, *8*(3), 201-210. https://doi.org/10.24252/is.v8i3.23456

Andriani, R., Prastiwi, W. D., and Pramono, A. (2022). Community knowledge and attitude toward TOGA plants: A cross-sectional study in rural Lampung. *Journal of Health Promotion and Behavior*, *7*(1), 12-21. https://doi.org/10.26911/thejhpb.2022.07.01.02

Creswell, J. W., and Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches (4th ed.)*.

Elfahmi, Woerdenbag, H. J., and Kayser, O. (2014). Jamu: Indonesian traditional herbal medicine. *Journal of Herbal Medicine*, *4*(2), 51-73. https://doi.org/10.1016/j.hermed.2014.01.002

Fakhrozi, I. (2009). Etnobotani masyarakat suku Melayu tradisional di sekitar Taman Nasional Bukit Tigapuluh [Ethnobotany of the traditional Malay community around Bukit Tigapuluh National Park]. *Thesis, Institut Pertanian Bogor*.

Farman, F., Chairuddin, C., Herlina, H., Marniati, M., Hali, F., and Nasrum, A. (2021). KKN tematik: Peningkatan kualitas hidup bersih dan sehat masyarakat desa Lapao-Pao kabupaten Kolaka. *Jurnal Al Basirah*, *1*(2), 117-126. https://doi.org/10.55045/albasirah.v1i2.23

Freire, P. (1970). Pedagogy of the oppressed. *Continuum*.

Galluzzi, G., Eyzaguirre, P., and Negri, V. (2010). Home gardens: Neglected hotspots of agro-biodiversity and cultural diversity. *Biodiversity and Conservation*, *19*(13), 3635-3654. https://doi.org/10.1007/s10531-010-9920-9

Gupta, S. C., Patchva, S., and Aggarwal, B. B. (2013). Therapeutic roles of curcumin: Lessons learned from clinical trials. *AAPS Journal*, *15*(1), 195-218. https://doi.org/10.1208/s12248-012-9432-8

Hadipoentyanti, E., and Wahyuno, D. (2008). Standarisasi lahan, bahan tanam, dan pemupukan tanaman jahe [Standardization of land, planting material, and fertilization of ginger]. *Bulletin of Spice Plant*, *9*(2), 60-70..

Katno, and Pramono, S. (2015). Tingkat manfaat dan keamanan tanaman obat dan obat tradisional [Level of benefit and safety of medicinal plants and traditional medicines]. *Balai Penelitian Tanaman Obat dan Aromatik*.

Kementerian Kesehatan Republik Indonesia. (2016). *Pedoman umum program nasional perkembangan TOGA [General guidelines for the national TOGA development program]*.

Maenthaisong, R., Chaiyakunapruk, N., Niruntraporn, S., and Kongkaew, C. (2007). The efficacy of aloe vera used for burn wound healing: A systematic review. *Burns*, *33*(6), 713-718. https://doi.org/10.1016/j.burns.2006.10.384

Mashhadi, N. S., Ghiasvand, R., Askari, G., Hariri, M., Darvishi, L., and Mofid, M. R. (2013). Anti-oxidative and anti-inflammatory effects of ginger in health and physical activity: Review of current evidence. *International Journal of Preventive Medicine, 4(Suppl 1), S36-S42*.

Mukhlis, H., Vuspitasari, B. C., Nuraini, A., Sugianto, A., Nugroho, A. E., Fatimah, S., and Rahardjo, S. (2019). Revitalisasi tanaman obat keluarga (TOGA) berbasis potensi lokal di Desa Tanjung Sari Kabupaten Lampung Selatan. *Jurnal Pengabdian Masyarakat MIPA*, *2*(2), 45-52. https://doi.org/10.20527/jpmipa.v2i2.1876

Nurhayati, S., and Dewi, M. K. (2022). Efektivitas program penyuluhan TOGA terhadap pengetahuan ibu rumah tangga tentang tanaman obat keluarga di Kabupaten Pesawaran. *Jurnal Ilmu Kesehatan Masyarakat*, *13*(1), 55-63. https://doi.org/10.26553/jikm.2022.13.1.55-63

Permatasari, T., Astuti, A., and Hamidah, A. (2020). Evaluasi program Tanaman Obat Keluarga (TOGA) terhadap pengetahuan dan perilaku masyarakat di Jawa Tengah. *Jurnal Kesehatan Masyarakat*, *16*(1), 42-51. https://doi.org/10.15294/kemas.v16i1.21839

Prasad, S., and Aggarwal, B. B. (2011). Turmeric, the golden spice: From traditional medicine to modern medicine. In I. F. F. Benzie and S. Wachtel-Galor (Eds.), *In I. F. F. Benzie and S. Wachtel-Galor (Eds.), Herbal medicine: Biomolecular and clinical aspects (2nd ed., pp. 263-288). CRC Press*.

Pretty, J. N. (1995). Participatory learning for sustainable agriculture. *World Development*, *23*(8), 1247-1263. https://doi.org/10.1016/0305-750X(95)00046-F

Rahnama, P., Montazeri, A., Huseini, H. F., Kianbakht, S., and Naseri, M. (2012). Effect of Zingiber officinale R. *rhizomes (ginger) on pain relief in primary dysmenorrhea: A placebo randomized trial. BMC Complementary and Alternative Medicine*, *12*(1), 92. https://doi.org/10.1186/1472-6882-12-92

Riswan, S., and Sangat-Roemantyo, H. (2002). Jamu as traditional medicine in Java, Indonesia. *South Pacific Study*, *23*(1), 1-10..

Ross, I. A. (2001). Medicinal plants of the world: Chemical constituents, traditional and modern medicinal uses (Vol. *2). Humana Press*. https://doi.org/10.1007/978-1-59259-166-6

Rosyad, R., and Muthohirin, N. (2021). Kuliah Kerja Nyata sebagai medium pengembangan masyarakat: Sebuah refleksi. *Jurnal Pengabdian Kepada Masyarakat*, *7*(1), 1-10. https://doi.org/10.22373/visi.v7i1.8473

Sari, I. D., Yuniar, Y., Siahaan, S., Riswati, R., and Syaripuddin, M. (2015). Tradisi masyarakat dalam penanaman dan pemanfaatan tumbuhan obat lekat di pekarangan. *Jurnal Kefarmasian Indonesia*, *5*(2), 123-132. https://doi.org/10.22435/jki.v5i2.4407.123-132

Silalahi, M., Nisyawati, Walujo, E. B., Supriatna, J., and Mangunwardoyo, W. (2015). The local knowledge of medicinal plants trader and diversity of medicinal plants in the Kabanjahe traditional market, North Sumatra, Indonesia. *Journal of Ethnopharmacology, 175, 432-443*. https://doi.org/10.1016/j.jep.2015.09.009

Surjushe, A., Vasani, R., and Saple, D. G. (2008). Aloe vera: A short review. *Indian Journal of Dermatology*, *53*(4), 163-166. https://doi.org/10.4103/0019-5154.44785

Susiarti, S., Rahayu, M., and Sangat-Roemantyo, H. (2015). Medicinal plants and their uses by indigenous people in Boven Digoel, Papua, Indonesia. *Journal of Tropical Biodiversity and Biotechnology*, *1*(1), 1-8. https://doi.org/10.22146/jtbb.10729

Wallerstein, N., and Bernstein, E. (1988). Empowerment education: Freire's ideas adapted to health education. *Health Education Quarterly*, *15*(4), 379-394. https://doi.org/10.1177/109019818801500402

World Health Organization. (2019). *WHO global report on traditional and complementary medicine 2019*.

Yin, R. K. (2018). *Case study research and applications: Design and methods (6th ed.)*.