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Empowering Community Resilience: Utilization of Yard Land as a Sustainable Food Source to Overcome Stunting in Gonggang Village, Poncol District, Magetan Regency

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ABSTRACT The COVID-19 pandemic has intensified food insecurity and the prevalence of stunting in rural areas, particularly in Gonggang Village, Poncol District, Magetan Regency. Limited access to nutritious food and underutilization of yard land have contributed to nutritional deficiencies among children, increasing the urgency for sustainable, community-based interventions. This community service program aimed to empower local residents to optimize the use of yard land as a sustainable food source to enhance food security and prevent stunting. The program employed a participatory approach over seven months, combining training, mentoring, and field practicums. Activities included workshops on nutrition and clean and healthy living behavior (PHBS), practical sessions on cultivating vegetables and medicinal plants (TOGA), and the revitalization of *Posyandu* through the capacity building of health cadres. Cross-sectoral collaboration between local government, academic institutions, and community organizations was emphasized to ensure program sustainability. The results showed that 50% of participating households successfully utilized their yard land for food production, thereby improving household food availability. Moreover, 100% of *Posyandu* cadres demonstrated enhanced competencies in early detection of child growth and development, and community participation in *Posyandu* activities increased to over 90%. Participants also reported better understanding and implementation of PHBS practices. In conclusion, the utilization of yard land as an alternative food source effectively strengthened food security and contributed to stunting prevention in Gonggang Village. The success of this initiative underscores the importance of integrated community empowerment and multisectoral collaboration in achieving sustainable improvements in public health and local food systems.

INDEX TERMS Food Security, Stunting, Community Empowerment, Yard Land, *Posyandu*

I. INTRODUCTION

Stunting remains one of the most critical public health issues in Indonesia, reflecting chronic undernutrition and inadequate access to essential nutrients during the first 1,000 days of life. The problem has been exacerbated by the socioeconomic impacts of the COVID-19 pandemic, particularly in rural areas such as Gonggang Village, Poncol District, Magetan Regency. According to the Magetan District Health Office, the prevalence of stunting has reached approximately 20%, indicating an urgent need for sustainable interventions targeting household food security and child nutrition [1], [2]. The pandemic disrupted food supply chains, reduced household income, and limited access to diverse and nutritious foods, aggravating existing health disparities [3], [4]. Many rural families still fail to utilize their yard land optimally for food production, leaving vast potential resources unused [5], [6]. Consequently, there is a pressing need to develop community-based strategies that enhance local food self-sufficiency while simultaneously addressing stunting prevention.

Recent studies emphasize the importance of urban and rural farming as an adaptive response to food insecurity and nutrition challenges [7]–[9]. The Sustainable Food Yard Program (*Pekarangan Pangan Lestari*) and similar initiatives have shown that community-based agriculture can significantly improve household nutrition, empower women, and promote sustainable food systems [10], [11]. Additionally, participatory approaches integrating health education, clean and healthy living behaviors (PHBS), and *Posyandu* revitalization have been proven effective in improving community resilience and maternal–child health [12]–[14]. However, most existing programs focus primarily on urban settings or on productivity outcomes, with limited integration between agricultural, health, and empowerment dimensions in rural contexts [15], [16].

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The existing gap lies in the lack of a holistic model that combines food security, stunting prevention, and community empowerment through participatory engagement. Previous initiatives often overlook the potential of *Posyandu* cadres and women's groups as local change agents in promoting nutritional literacy and sustainable agriculture [17]–[19]. Therefore, this study proposes an integrated empowerment model focusing on the utilization of yard land as a sustainable food source, complemented by the strengthening of community capacity through education, training, and health service participation.

The aim of this program is to empower the community of Gonggang Village to utilize yard land effectively to increase food security and prevent stunting. Specifically, this activity seeks to (1) improve the knowledge and skills of residents in sustainable yard-based food cultivation, (2) strengthen the competencies of *Posyandu* cadres in early detection of child growth and development, and (3) enhance public awareness and participation in health and nutrition programs. The key contributions of this article are as follows:

1. It presents a **community empowerment framework** that integrates agriculture, health promotion, and stunting prevention strategies in a rural context.
2. It provides **empirical evidence** on the effectiveness of yard land utilization in improving food security and *Posyandu* participation.
3. It proposes **a collaborative model** involving academia, local government, and community organizations to ensure sustainability of public health interventions.

II. METHODS

A. STUDY DESIGN

This community service study adopted a **participatory action research (PAR)** design, which integrates community involvement in every stage of program implementation. The participatory approach was chosen to ensure that local residents actively contributed to identifying problems, planning solutions, and evaluating program outcomes. This design aligns with community empowerment frameworks emphasizing collective participation and knowledge sharing as key to behavioral and social change [31], [32]. The activity was conducted prospectively from **May to October 2024** in **Gonggang Village**, Poncol District, Magetan Regency, East Java, Indonesia.

B. STUDY POPULATION AND SAMPLING

The study population included **households with toddlers**, *Posyandu* (integrated health post) cadres, youth organizations, and village officials. The total number of participants was **100 individuals**, comprising 50 household representatives, 20 *Posyandu* cadres, and 30 members from youth and women's groups. Participants were selected using a **purposive sampling technique**, based on criteria such as:

1. Residents owning a minimum of 10 m² of yard land,
2. Active involvement in *Posyandu* or village community activities, and
3. Willingness to participate throughout the program period.

This non-randomized approach is consistent with community empowerment studies where purposive inclusion ensures engagement of key stakeholders who can sustain program continuity [33].

C. MATERIALS AND EQUIPMENT

The materials used included **vegetable seeds**, **herbal (TOGA) plant seedlings**, **organic fertilizers**, and **simple gardening tools** such as hoes, watering cans, and planting pots. For the health education component, materials included **educational leaflets**, **nutrition charts**, and **training modules** developed in collaboration with the Department of Midwifery and the Department of Environmental Health at Poltekkes Kemenkes Surabaya. The modules contained topics on balanced nutrition, stunting prevention, clean and healthy living behavior (PHBS), and sustainable food management practices. Additionally, anthropometric tools including **infant scales, measuring boards, and KIA (Maternal and Child Health) books** were provided for cadre training on early detection of child growth and development.

D. PROSEDURES.

The community service program was implemented through **five sequential stages**, each emphasizing capacity building and community participation.

1. Preparation and Coordination

This stage involved needs assessment, stakeholder coordination, and resource mapping. Surveys and focus group discussions were conducted to identify existing issues related to food security, stunting prevalence, and yard land utilization. Agreements were established with the village government, *Posyandu* cadres, and community leaders to ensure alignment with local priorities [34].

2. Training and Education

A series of training sessions and workshops were delivered to participants on the topics of **yard-based food cultivation**, **balanced nutrition**, and **PHBS**. Sessions combined lectures, demonstrations, and interactive discussions. Each participant received a set of vegetable and TOGA seedlings for practical implementation. In addition, *Posyandu* cadres underwent specialized training in **early detection of stunting** using anthropometric measurements and KIA record-keeping. This stage aimed to strengthen the cadres' technical competencies and their role as community health promoters [35].

3. Field Practicum and Implementation

Participants applied the skills learned during the workshops by cultivating their yard land using organic farming techniques. This activity emphasized environmentally sustainable practices such as composting, water-efficient irrigation, and integrated pest management. The implementation phase lasted for approximately **four months**, during which participants were mentored weekly by the academic team and health cadres.

4. Monitoring and Evaluation

The community service team conducted regular **monitoring visits** to assess plant growth, household food

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yield, and participants' adherence to good agricultural and hygiene practices. Parallel monitoring was carried out at *Posyandu* sites to evaluate improvements in child growth monitoring and community attendance rates. Data were collected through **observation sheets, progress checklists, and pre–post knowledge questionnaires** [36].

5. Dissemination and Feedback

At the end of the program, evaluation meetings were conducted to review outcomes, discuss challenges, and collect community feedback. The findings were disseminated through village meetings, video documentation, and journal publications to promote knowledge transfer and replication in similar rural settings [37].

FIGURE 1. **The results of community service activities in Gonggang Village**

E. DATA COLLECTION AND ANALYSIS

Data were obtained from both **quantitative and qualitative sources**. Quantitative data included:

- Percentage of households successfully cultivating yard land,
- *Posyandu* participation rates, and
- Improvement in cadre competency scores (pre–post training).

Qualitative data included participants' perceptions, satisfaction, and narratives of behavior change. Descriptive statistics were used to summarize quantitative outcomes, while thematic analysis was applied to qualitative responses. This mixed-method evaluation allowed for a comprehensive understanding of both behavioral and technical impacts [38].

F. ETHICAL CONSIDERATIONS

Ethical approval was obtained from the **Poltekkes Kemenkes Surabaya Institutional Review Board** (Approval No. 098/KEPK-Poltekkes/V/2024). All participants provided **informed consent** before participation. Data confidentiality and anonymity were ensured throughout the study. The program followed ethical principles of community engagement and social responsibility as outlined by national health research guidelines [39].

G. SUSTAINABILITY AND REPLICATION FRAMEWORK

To ensure program sustainability, the project established **community working groups** composed of local residents and *Posyandu* cadres. These groups continue to monitor yard cultivation and conduct monthly review meetings. The framework is replicable for other rural settings with minor contextual adaptation, provided that community participation and institutional collaboration are maintained [40].

III. RESULT

Overall, this community service activity succeeded in achieving the set goals, namely increasing knowledge, skills, and community participation in efforts to prevent stunting and increase food security in Gonggang Village.
Place of activity: Gonggang Village, Poncol District, Magetan Regency, Time, May 2024 to October 2024. Partners, Posyandu Cadres, Youth Organizations, Dasa Wisma Group, Village Apparatus, RW Chairman and RT Chairman **FIGURE 1**.

A. INCREASED PUBLIC KNOWLEDGE:

The training activities carried out o May 20, 2024 have succeeded in increasing public knowledge about the use of yard land for agriculture, stunting prevention, and clean and healthy living behaviors (PHBS). Participants consisting of the chairman of the neighborhood unit and Posyandu cadres received comprehensive theoretical and practical material. Material on how to detect early child growth and development based on the KIA book was also presented, which assisted Posyandu cadres in conducting health checks for toddlers.

B. YARD FARMING PRACTICES

Giving Toga Plants, Each participant received 5 types of toga plants to be planted in their yard. This activity not only increases food security but also provides opportunities for the community to compete in a group toga plant planting competition, Implementation of Practices. The community has successfully applied the farming techniques taught, and many have reported positive results from growing vegetables and food crops in their yards.

C. REVITALIZATION OF POSYANDU

Increased Participation, This activity succeeded in increasing community participation in Posyandu activities, with the achievement of D/S (healthy village) of more than 90%. Trained Posyandu cadres are able to check the growth and development of toddlers properly and

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correctly, Cadre Assistance. Posyandu cadres receive intensive assistance during activities, so that they can carry out their duties independently and effectively.

D. PUBLIC HEALTH IMPROVEMENT

Early Detection of Stunting, with training and mentoring, Posyandu cadres can carry out early detection of stunting problems among toddlers. This is expected to reduce the stunting rate in Gonggang Village, Clean and Healthy Living Behavior. The community showed an increase in the implementation of clean and healthy living behaviors, including how to wash hands correctly and maintain environmental cleanliness.

E. ECONOMIC EMPOWERMENT

Food Security, By using the yard to grow vegetables and food crops, the community can increase family food security. The target of 50% of the target partners successfully used their yards for food crops, Increased Independence. This activity also encourages community independence in meeting their food needs, which previously depended on external sources.

F. EVALUATION AND FEEDBACK

Monitoring Results. The community service team monitors and evaluates the results of the activity. Feedback from the community shows that they feel more confident in managing their yard land and understand the importance of health. Follow-up Plan. The results of this evaluation will be used to plan follow-up activities, including further training and strengthening the capacity of Posyandu cadres as shown in **FIGURE 2**.

IV. DISCUSSION

Discussion of the results of community service activities (Pengabmas) in Gonggang Village can be carried out by considering several important aspects, namely impacts, challenges, and recommendations for the sustainability of the program.

A. IMPROVEMENT OF KNOWLEDGE AND SKILLS

The findings of this community empowerment program demonstrated significant improvement in community knowledge, practical skills, and participation in health-related activities, particularly Posyandu operations. The training and field practice activities increased public understanding of the importance of utilizing yard land for food production and maintaining clean and healthy living behaviors (PHBS). The post-program evaluation indicated that more than 50% of the households successfully cultivated their yard land with vegetable and herbal plants, while 100% of Posyandu cadres demonstrated enhanced competence in early detection of child growth and development.

These outcomes are consistent with previous studies that emphasized the effectiveness of participatory training in improving community awareness and self-reliance in health and nutrition programs. For instance, Setianingsih et al. [41] reported that educational interventions on PHBS significantly improved maternal behavior in child care and hygiene practices. Similarly, Rinawan et al. [42] found that capacity-building initiatives among Posyandu cadres strengthened local health surveillance and child monitoring systems. These parallels confirm that structured community education, when combined with practical implementation, can foster sustainable behavioral changes and collective action toward improved family health and food security.

The involvement of students from midwifery and environmental health programs also contributed to the program's success by facilitating knowledge transfer and mentorship. This intersectoral collaboration supports findings from Wijaya [43], who showed that university–community partnerships enhance the sustainability of rural nutrition programs through continuous technical assistance and innovation. Moreover, community participation in Posyandu activities increased by more than 90%, indicating revitalized interest in preventive health programs. Similar patterns were reported by Budiana [44], where revitalization and cadre empowerment programs increased community attendance in maternal and child health services.

Despite these encouraging results, sustaining long-term behavioral change remains a challenge. The success of empowerment programs depends on consistent follow-up and ongoing motivation among participants. As noted by Forsetlund et al. [45], knowledge gained from one-time interventions tends to decline without continuous reinforcement. Therefore, integrating periodic refresher training and routine community monitoring is crucial to ensure sustainability.

FIGURE 2. **The results of community participation efforts in stunting prevention**

B. ECONOMIC EMPOWERMENT, FOOD SECURITY, AND EVIRONMENTAL SUSTAINABILITY

Beyond health improvements, the program demonstrated positive impacts on the local economy through enhanced household food production and reduced dependence on

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external food sources. Participants who optimized their yard land reported lower food expenditure and increased self-sufficiency, indicating progress toward household-level food security. This aligns with the Sustainable Development Goals (SDG-2: Zero Hunger), which emphasize the importance of local food systems and community resilience in addressing malnutrition [46].

Comparable outcomes have been reported in other empowerment programs. Renita [47] found that the Sustainable Food Yard (Pekarangan Pangan Lestari) initiative significantly improved household food diversity and reduced stunting prevalence in Sleman Regency. Similarly, Sudomo [48] demonstrated that integrating agroforestry systems into community farming increased food production and environmental sustainability in East Java. The current study's results reinforce these findings, confirming that utilizing available land for sustainable food cultivation is an effective strategy to enhance nutritional outcomes while promoting ecological balance.

Economic empowerment is also reflected in the increased independence and innovation of participants. Households not only cultivated vegetables for personal consumption but also initiated small-scale sales of surplus produce, indicating entrepreneurial potential. Such grassroots economic activities contribute to poverty reduction and local economic resilience, as suggested by Cahyono [49], who found that empowerment-based village programs create alternative livelihoods and strengthen rural economies. Additionally, empowerment initiatives stimulate social cohesion and collective problem-solving, critical components of resilient communities [50].

However, certain limitations were identified. Some participants faced challenges in maintaining consistent crop yields due to varying soil fertility, lack of irrigation, and limited access to agricultural tools. These constraints mirror observations by Nedzingahe [46], who reported that infrastructural limitations hindered smallholder productivity in rural food systems. To address these issues, future programs should integrate agricultural technology support, such as drip irrigation, organic composting, and cooperative seed banks, to ensure continuous productivity.

Environmental sustainability also emerged as a vital implication of this program. The use of organic fertilizers and traditional cultivation methods reduced chemical dependency and promoted soil health. These practices contribute to local adaptation to climate change while reinforcing sustainable agriculture principles. As highlighted by Hlongwane [47], environmentally conscious farming not only improves food security but also supports biodiversity and ecological stability in rural ecosystems. Thus, community-based programs integrating health and agricultural education can simultaneously achieve nutrition, economic, and environmental objectives.

C. CHALLENGES, LIMITATIONS, AND FUTURE IMPLICATIONS

Although this program achieved its primary objectives, several limitations should be acknowledged. First, the study used a non-randomized, purposive sampling design, which may introduce selection bias and limit generalizability. Participants were mainly those already motivated to engage in community activities, potentially overestimating program impact. Future studies could employ quasi-experimental or randomized community trials to strengthen causal inference and assess broader applicability.

Second, the evaluation period was limited to six months, which may not fully capture long-term behavioral and health outcomes. Stunting prevention and food security improvements typically require sustained intervention and multi-year observation. Longitudinal studies are therefore recommended to assess the durability of changes in household food production and child nutritional status [48].

Third, infrastructure and financial constraints affected the scalability of the program. Although community enthusiasm was high, limited access to agricultural tools and funding restricted expansion. These issues are common in rural empowerment projects, as noted by Raj [49], who highlighted that community-based programs often struggle to maintain momentum without consistent institutional or governmental support. Strengthening partnerships with local authorities, NGOs, and private sectors is thus critical for continuity.

Despite these challenges, the program provides valuable lessons for future interventions. One key implication is the demonstrated effectiveness of cross-sectoral collaboration. Involving universities, local government, and community organizations created a dynamic ecosystem of learning and resource sharing. Similar collaborative frameworks have been reported by Dubey [41] and Nassar [42], who emphasized that multi-stakeholder cooperation accelerates knowledge dissemination and program sustainability in empowerment initiatives.

Another important implication concerns gender inclusion. Women, particularly mothers and Posyandu cadres, played a central role in implementing the program. Their active participation not only improved child health outcomes but also strengthened their agency within the community. This finding supports the work of Mechlowitz [43], who showed that women's empowerment correlates strongly with improved child nutrition and household welfare. Future empowerment models should therefore incorporate gender-sensitive strategies to maximize social and health impacts.

Finally, the success of the program highlights the potential for replicability in other rural areas with similar socioeconomic contexts. The program's modular structure consisting of training, field practice, and monitoring can be adapted for diverse communities across Indonesia. To enhance scalability, digital tools such as mobile-based agricultural monitoring and e-learning modules for Posyandu cadres could be integrated. As noted by Rinawan [44], digital innovations can improve data accuracy and accessibility in community health programs.

In conclusion, the discussion of results confirms that yard land utilization combined with participatory education is a practical and sustainable strategy for improving food security, reducing stunting, and enhancing

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community resilience. Despite certain logistical and methodological limitations, the program successfully demonstrated that empowering local communities through integrated agricultural and health approaches can create lasting improvements in nutrition and well-being. Future research should focus on longitudinal assessment, economic modeling of household productivity, and development of digital empowerment tools to further strengthen community-based health promotion initiatives in Indonesia and beyond.

V. CONCLUSION

This study aimed to empower the community of Gonggang Village, Poncol District, Magetan Regency, in utilizing yard land as a sustainable food source to improve food security and reduce the prevalence of stunting. The program, implemented over seven months using a participatory action research approach, demonstrated measurable success in enhancing community capacity, knowledge, and resilience. Approximately 50% of participating households successfully converted their yards into productive food plots, contributing to improved household-level food availability. Meanwhile, 100% of Posyandu cadres exhibited increased competence in early detection of child growth and development after receiving targeted training. Additionally, community participation in Posyandu activities reached over 90%, indicating revitalized engagement in local health services. The findings confirm that the integration of agricultural education, health promotion, and community empowerment effectively strengthens local food systems and supports sustainable stunting prevention. Furthermore, the collaboration between academia, village governments, and local organizations proved essential in ensuring program sustainability. Despite these achievements, several limitations were noted, including the short evaluation period and resource constraints that may affect program scalability. Therefore, future work should focus on longitudinal assessments to evaluate long-term behavioral and nutritional impacts, integration of digital-based agricultural monitoring tools, and expansion of partnerships with governmental and non-governmental organizations to ensure broader community reach. Overall, this program provides an evidence-based framework for replicating sustainable community empowerment models aimed at enhancing nutrition, food security, and public health resilience in rural Indonesia and similar global contexts.

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DATA AVAILABILITY

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request. All qualitative and quantitative data were collected in compliance with ethical standards and are stored securely at Poltekkes Kemenkes Surabay.

AUTHOR CONTRIBUTION

All authors contributed significantly to the conception, design, and execution of this study. **Hery Sumasto** and **Astuti Setiyani** were responsible for conceptualizing the research framework, designing the empowerment model, and coordinating community engagement activities. **Fitri Rohkmalia** and **Nurwening Tyas Wisnu** carried out data collection, field implementation, and documentation of program outcomes. **Suhermin** and **Astuti Setiyani** contributed to data analysis, interpretation of findings, and validation of results. **Hery Sumasto** and **Fitri Rohkmalia** prepared the initial manuscript draft, while **Nurwening Tyas Wisnu** and **Suhermin** critically reviewed and edited the final version to ensure academic rigor and coherence. All authors read and approved the final manuscript and agreed to be accountable for all aspects of the work.

DECLARATIONS

ETHICAL APPROVAL

This study received ethical clearance from the **Ethical Review Board of Poltekkes Kemenkes Surabaya** under approval number **098/KEPK-Poltekkes/V/2024**. All procedures performed in this study were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments.

CONSENT FOR PUBLICATION PARTICIPANTS.

Consent for publication was given by all participants

COMPETING INTERESTS

The authors declare no competing interests.

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