COMMUNITY EMPOWERMENT
Vol.10 No.12 (2025) pp. 2268-2280
p-ISSN: 2614-4964 e-ISSN: 2621-4024

Community-based urban farming efficiency: A process engineering approach using mini greenhouses at RPTRA Rasamala, South Jakarta

Megah Stefani, Bunga Cahya Putri, Wardina Humayrah
Sahid University, Jakarta Selatan, Indonesia

stefanigultom@gmail.com
https://doi.org/10.31603/ce.15197

Abstract
Urban food security plays a crucial role in preventing stunting by providing independent nutritional resources. This community service program aims to enhance planting literacy and food production efficiency at RPTRA Rasamala, South Jakarta, through mini-greenhouse optimization. The implementation method employed a participatory approach integrated with process engineering techniques, specifically Value Stream Mapping (VSM) and Just-In-Time (JIT). The results demonstrated significant efficiency improvements, including a reduction in seedling growth time from 14 to 10 days, a 38% increase in the production cycle, and a 30% reduction in water and fertilizer usage. Furthermore, land utilization became more optimal through consistent planting schedules. Participants also showed increased technical understanding of organic planting media and the utilization of harvests for family nutrition. This program proves that integrating industrial management techniques into urban farming effectively increases food productivity while strengthening preventive measures against stunting in densely populated areas.

Keywords: Food security; Planting literacy; Mini greenhouse; Urban farming

Contributions to SDGs

Article History
Received: 04/10/25
Revised: 25/11/25
Accepted: 09/12/25

Efisiensi pertanian perkotaan berbasis komunitas: Pendekatan rekayasa proses menggunakan rumah kaca mini di RPTRA Rasamala, Jakarta Selatan

Abstrak
Ketahanan pangan perkotaan berperan krusial dalam pencegahan stunting melalui penyediaan nutrisi mandiri. Program pengabdian ini bertujuan meningkatkan literasi menanam dan efisiensi produksi pangan di RPTRA Rasamala, Jakarta Selatan, melalui optimalisasi mini greenhouse. Metode yang digunakan adalah pendekatan partisipatif yang diintegrasikan dengan rekayasa proses Value Stream Mapping (VSM) dan Just-In-Time (JIT). Hasil kegiatan menunjukkan peningkatan efisiensi yang signifikan, antara lain percepatan masa semai dari 14 hari menjadi 10 hari, peningkatan siklus produksi sebesar 38%, serta penghematan air dan pupuk hingga 30%. Selain itu, penggunaan lahan menjadi lebih optimal dengan penjadwalan tanam yang konsisten. Peserta juga mengalami peningkatan pemahaman teknis mengenai media tanam organik dan pemanfaatan hasil panen untuk gizi keluarga. Program ini membuktikan bahwa integrasi teknik manajemen industri dalam urban farming efektif meningkatkan produktivitas pangan sekaligus memperkuat upaya preventif stunting di wilayah padat penduduk.

Kata Kunci: *Ketahanan pangan; Literasi tanam; Mini greenhouse; Urban farming*

1. Introduction

Stunting prevention in urban areas cannot rely solely on the availability of nutritious food but requires community-based learning that builds understanding and practical skills across the entire food system from food production to utilisation. Food literacy has been widely recognised as a behavioural and social construct that enables individuals and households to make informed food choices, improve dietary quality, and support sustainable nutrition (Manna et al., 2024; O'Brien et al., 2024). Research consistently demonstrates that higher food literacy correlates with better purchasing habits, reduced consumption of unhealthy snacks, and improved nutritional outcomes among families in low-income urban settings (Manna et al., 2024; O'Brien et al., 2024). Furthermore, food literacy is increasingly viewed as a competency that extends beyond knowledge, encompassing motivation, skills, and confidence to apply that knowledge within real-life food environments (Groufh-Jacobsen & Medin, 2023).

In densely populated cities, particularly in Southeast Asian megacities such as Jakarta, limited land availability presents a major barrier to local food production (Food and Agriculture Organization, 2021; Pradhan et al., 2024). This structural constraint has created strong dependency on commercially processed and ready-to-eat foods, which are typically high in calories but low in essential micronutrients (Food and Agriculture Organization, 2021). Consequently, urban households face the dual challenge of high food expenditure and poor dietary diversity, both of which contribute to persistent undernutrition and rising obesity rates (Pradhan et al., 2024). Abdillah et al. (2023) further emphasises that urban farming contributes not only to food access but also to urban resilience by strengthening social cohesion, ecological awareness, and community adaptive capacity.

Despite the urgency of this issue, many community nutrition programs still focus on one-way information dissemination and short-term campaigns, which often fail to transform knowledge into sustainable practice (Manna et al., 2024). However, emerging evidence suggests that community-based education models, particularly those integrated with urban farming that can effectively improve food literacy, strengthen local food security, and foster active social participation (Abdillah et al., 2023; Marzban et al., 2024). Community gardens and collective urban farming initiatives not only provide access to fresh produce but also serve as participatory learning environments where citizens can learn, cultivate, and share knowledge through lived experiences (Egli et al., 2016). Yap & Anderson (2025) confirms that community garden settings enhance experiential, social, and reflective learning processes, allowing participants to internalise knowledge through real-world cultivation practices.

Building on this need for community-based learning environments, RPTRA Rasamala serves as a strategic partner with its role as a community hub in Menteng Dalam. RPTRA Rasamala is a community-integrated public space located in Menteng Dalam, Tebet, serving as a local hub for child-friendly activities, women's empowerment programmes, and community-based learning. Despite its strategic role, the RPTRA had long experienced limitations in managing its garden area, including irregular planting routines, inefficient seedling growth, frequent crop loss, and underutilisation of available space. These issues were compounded by the limited technical skills of staff and PKK cadres in applying structured planting schedules, resource-efficient practices, and integrated food production methods. Such conditions highlight the need for a

capacity-building programme that strengthens planting literacy, improves workflow efficiency, and enables the RPTRA to optimise its garden as a sustainable community learning facility.

To enhance the efficiency and sustainability of such initiatives, several scholars have proposed the adoption of simple process-engineering tools such as Value Stream Mapping (VSM) and Just-In-Time (JIT) in small-scale agriculture (Melin & Barth, 2020; Steur et al., 2016). These methods, originally developed for industrial management, have proven effective in identifying waste, optimising workflow, and improving resource efficiency, even in non-industrial, community-based contexts (Batwara et al., 2023; Melin & Barth, 2020; Steur et al., 2016). Applying these principles to urban farming can reduce inefficiencies such as uncoordinated watering, irregular planting schedules, and loss of seedlings, while also serving as a structured learning process for participants (Pradhan et al., 2024)

The integration of food literacy, planting literacy, and process efficiency thus represents an innovative approach to community empowerment. Yet, few programs have explicitly linked these three domains in urban Indonesia, particularly among women-led groups such as PKK cadres, who play central roles in household nutrition education (Artika & Surahman, 2025). Preliminary observation at RPTRA Rasamala, located in Menteng Dalam Subdistrict, Tebet, South Jakarta, revealed that while PKK cadres and RPTRA staff possessed basic nutrition knowledge, their gardening practices were inefficient, inconsistent, and disconnected from everyday food consumption habits. Seedling growth typically required two weeks or more, with high mortality rates, demonstrating a gap between knowledge of nutritious food and the ability to produce it efficiently. Building on the concept of experiential learning, Gray et al. (2022) argue that practical, hands-on engagement combined with guided reflection can significantly enhance participants' competence and retention in agricultural and food system education, supporting the transition from theoretical awareness to practical mastery.

To address this challenge, a mini greenhouse was established as a practical and sustainable community learning space. The greenhouse functions as both a production site and an educational laboratory where participants can directly link conceptual knowledge with hands-on experience. Following its construction, the Enhancing Process Efficiency and Planting Literacy Through Community-Based Urban Farming program implemented participatory training and mentoring sessions designed to convert latent knowledge into practical competence. Using simplified VSM and JIT approaches, community learned to streamline planting workflows, reduce waste, and synchronise cultivation cycles with community nutrition activities (Batwara et al., 2023; Melin & Barth, 2020; Steur et al., 2016).

This approach aligns with the principles of implementation science in public health, which emphasise that sustainable behaviour change emerges not only from knowledge transfer but from environments that make healthy practices easier, faster, and socially reinforced (Brownson et al., 2021). Within this framework, RPTRA Rasamala functions as a micro-laboratory of community empowerment where community can develop agricultural skills, reflect on practical challenges, and integrate food production with family nutrition decisions. Accordingly, this paper documents how mini-greenhouse-based urban farming, combined with process efficiency learning, can enhance planting literacy, improve resource efficiency, and strengthen community resilience in dense urban environments.

In response to these identified needs and the recommended solution to strengthen community-based food and planting literacy, this program sets out clear objectives that align closely with its methodological approach and expected outcomes. The objective of this program is to strengthen the planting literacy and improve the planting workflow efficiency of RPTRA Rasamala staff and PKK cadres through participatory urban farming training using a mini greenhouse, supported by the practical application of simplified Value Stream Mapping (VSM) and Just-In-Time (JIT) methods to accelerate seedling growth, reduce resource waste, and optimise garden utilisation.

2. Method

2.1. Setting and participants

This community engagement programme was implemented at RPTRA Rasamala, located in Menteng Dalam Subdistrict, Tebet District, South Jakarta. The RPTRA was selected because it functions as a community hub at the sub-district level and has an existing community garden plot that had previously been underutilised. Similar to the Community Nutrition Garden (POKIMAS) model in Bekasi, which demonstrated success in improving local food literacy and household vegetable consumption (Humayrah et al., 2021), this site was chosen to adapt and scale up participatory nutrition garden approaches in an urban Jakarta context.

In terms of implementation timeline, the programme began with coordination and socialisation activities in late June 2025, continued with greenhouse construction and seedling preparation throughout August 2025, followed by a site visit and workflow planning on 18 September 2025, and concluded with the community gardening training conducted on 7 October 2025. The programme involved 12 participants, divided into two functional groups: six PKK cadres trained under a Training of Trainers (ToT) approach, and six RPTRA staff members, who served as greenhouse managers and co-implementers. This dual structure was designed to ensure both community-level outreach and institutional sustainability, echoing recommendations from World Health Organization (2014) and Presiden Republik Indonesia (2021) that emphasise women's empowerment and institutional collaboration in nutrition-sensitive interventions. The collaboration aimed to create a dual institutional memory, allowing RPTRA staff to maintain structured routines while cadres extended learning to households.

2.2. Programme design and approach

The programme was designed as a participatory learning model to strengthen planting literacy and improve planting workflow efficiency rather than as an experimental study. Its core approach was grounded in collaborative construction and use of a mini greenhouse as a shared learning facility, reflecting the participatory principles highlighted by Yap & Anderson (2025), who emphasised that hands-on collaboration fosters environmental belonging in urban farming initiatives, and supported by evidence that greenhouse co-creation enhances sustainability in community empowerment programmes (Sufiyanto et al., 2024).

First, collaborative planning and greenhouse construction. The first stage included joint planning, greenhouse construction, installation of raised beds, irrigation setup, and organic soil preparation. This participatory infrastructure development aligns with findings from Marzban et al (Marzban et al., 2024), who noted its importance for

sustaining urban farming in resource-constrained areas. Similar outcomes have been demonstrated in participatory greenhouse revitalisation initiatives in Malang (Sufiyanto et al., 2024) showing that community-driven construction increases engagement and practical skill development.

Second, urban farming practice with integrated VSM and JIT concepts. After the greenhouse was established, participants conducted hands-on urban farming activities, including seedling preparation, transplanting, watering, and monitoring. Facilitators introduced simplified VSM and JIT as practical tools to improve workflow efficiency, supported by evidence that such adaptations reduce waste and enhance productivity in small-scale agriculture (Adiana et al., 2025; Melin & Barth, 2020; Steur et al., 2016) These methods functioned as learning tools to translate abstract efficiency concepts into practice, consistent with collective learning principles (Groufh-Jacobsen & Medin, 2023).

Third, reflective dialogue, problem-solving, and process improvement. Structured reflective dialogue formed the final stage of implementation. Participants reviewed planting bottlenecks, assessed workflow challenges, and collaboratively formulated improvements. This reflective, experience-based learning model aligns with experiential learning frameworks (O'Brien et al., 2024) and evidence showing that hands-on contextualisation significantly enhances retention and competence in agricultural learning (Gray et al., 2022). Similar reflective mentoring approaches in rural agricultural programmes have proven effective in improving participants' skills and autonomy(Budirahardjo & Wibowo, 2024).

2.3. Implementation procedures

The programme followed three structured stages. First, collaborative planning and greenhouse construction (Figure 1) including raised-bed installation, irrigation setup, and organic soil preparation strengthened participants' sense of ownership, aligning with studies showing that participatory infrastructure supports sustainability in urban farming (Marzban et al., 2024; Sufiyanto et al., 2024). Second, participants carried out co-created urban farming practices, while facilitators introduced VSM and JIT to address workflow challenges such as scheduling and batch balancing. Third, reflective dialogue and case-based discussions helped participants assess bottlenecks and propose improvements, supporting the practical internalisation of efficiency principles (Budirahardjo & Wibowo, 2024; Gray et al., 2022).

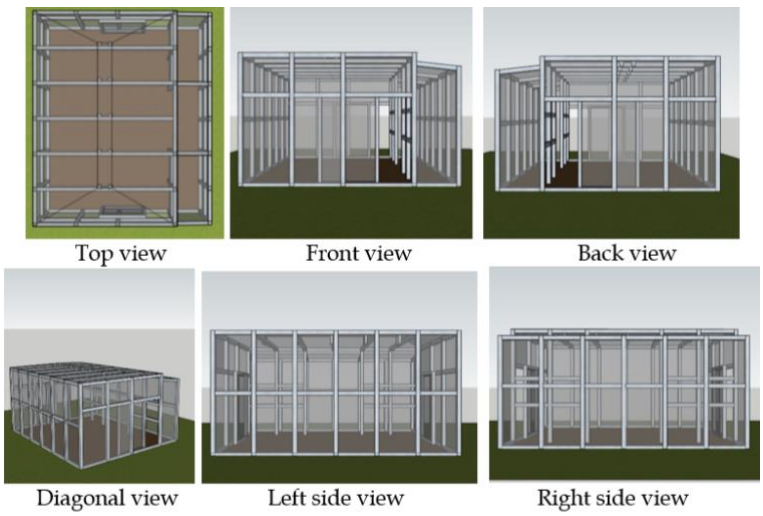

Figure 1. Mini-green house design

2.4. Community capacity strengthening mechanisms

Throughout all stages, four intentional mechanisms were embedded to ensure sustainability, they are a) concrete learning, linking every concept directly with greenhouse tasks to avoid abstract instruction; b) shared ownership, giving participants a role in setting work rhythms to build intrinsic motivation; c) collective accountability, achieved through shared monitoring to ensure transparency and mutual responsibility; and d) institutional transferability, supported by co-creating a greenhouse SOP for post-programme continuity. These mechanisms shaped the greenhouse into a continuous social learning environment that integrated process-efficiency principles with eco-nutrition practices, consistent with lean community agriculture concepts (Pradhan et al., 2024)

3. Results and Discussion

3.1. Strengthening planting literacy through participatory learning

The implementation of the programme significantly improved participants' understanding of foundational urban farming concepts and process-efficiency practices in a micro-scale food production context (Figure 2). *Moringa* was retained as a principal crop due to its high nutrient content and proven role in stunting prevention (Food and Agriculture Organization, 2021; Presiden Republik Indonesia, 2021). Alongside moringa, vegetables such as water spinach (*Ipomoea aquatica*), pak choi, mustard greens, and celery were grown, as well as fruit trees and medicinal plants that combined nutritional and economic value. The learning process was designed using a participatory and reflective approach, where participants were actively involved in planning, implementation, and evaluation.

Figure 2. Documentation of the urban farming training activity

This design aligns with contemporary experiential and social learning frameworks, which emphasise that knowledge is most effectively constructed through direct practice, collaboration, and reflection within community contexts (Charatsari et al., 2022; Sousa, 2021; Utami et al., 2022). Gray et al. (2022) further confirmed that hands-on agricultural learning combined with structured reflection significantly enhances adult learners' ability to translate abstract agricultural concepts into context-specific practices. Such approaches support the co-creation of knowledge, foster collective responsibility, and enable participants to connect abstract concepts, such as efficiency and sustainability with lived experiences and everyday decision-making processes. Observation and reflection logs indicated that after the sessions, participants could clearly articulate the growth requirements of various crops, prepare organic growing media, and apply

correct watering and maintenance techniques, demonstrating the practical embodiment of experiential learning principles.

3.2. Enhancing process efficiency through the application of VSM and JIT

Central to the programme's design was the integration of process-engineering tools, namely Value Stream Mapping (VSM) and Just-In-Time (JIT) scheduling as pedagogic instruments to enhance planting workflow efficiency. VSM was employed to map the "current state" of operations, uncovering non-value activities such as idle waiting during watering, task duplication, and unsynchronised transplanting schedules. These findings echo the work of Batwara et al. (2023), who demonstrated that lean agriculture methodologies can significantly reduce waste in community garden settings. Through future-state mapping and participatory simulation, these non-value tasks were reduced, leading to a ~38% improvement in process efficiency and ~30% reduction in water/fertiliser use compared to baseline conditions (Figure 3).

Figure 3. Seedling maintenance process

Moreover, the application of VSM/JIT served as a cognitive scaffold for participants that enabling even those without prior technical backgrounds to grasp efficiency concepts through hands-on activity rather than abstract lectures. Steur et al. (2016) provided empirical support for this approach in agrarian contexts, while Irsyad & Hartini (2024) found that VSM training enhanced workforce learning and team problem-solving in lean-oriented agri-food chains. These findings suggest that efficiency tools can double as instructional tools in community settings, not just production aids.

3.3. Optimizing land use and developing mini greenhouse infrastructure

A key achievement of the programme was the creation of a mini greenhouse that functioned both as a learning hub and practical production site. The infrastructure included raised beds, tiered racks and vertical growing modules, enabling more efficient space utilisation. The effective planting area expanded to ~81,000 cm² compared to ~70,650 cm² using conventional pot planting, representing an increase in land-use efficiency of approximately 14.6%. Pradhan et al. (2024) also highlighted that urban farming innovations, such as vertical modules and hydroponic or aquaponic systems can significantly enhance space productivity, especially in densely populated urban settlements (Figure 4).

Surrounding areas were utilized for supplementary planting using hanging pots, while a small pond was converted into a simple aquaponic system, allowing nutrient recycling between plants and water. These innovations align with the concept of integrated urban agriculture, where vertical and horizontal integration and closed-loop systems optimise urban food production (Senthamizh & Anbarasan, 2025; Tomatis et al., 2023). Beyond productivity improvement, this land-use optimisation strengthened participants' ecological awareness of sustainable design in urban farming.

Figure 4. Garden conditions: pre (left) and post (right) construction mini greenhouse

Corroborating findings of Altieri et al. (2017) who argued that agroecological designs in urban settings build resilience and environmental literacy. Notably, the greenhouse environment accelerated seedling growth: average time to germination shortened from two weeks to ~1.5 weeks, a ~35% reduction in cycle time which demonstrates that infrastructural design plus process learning can deliver measurable improvements in micro-scale food production. Such spatial efficiency not only increased productivity but also strengthened participants' ecological awareness regarding sustainable design in urban farming.

3.4. Improving knowledge and food literacy

Learning evaluations revealed substantial improvements in participant knowledge and confidence. Pre-test results indicated a planting-literacy baseline of 69%, while post-training results rose to 98% evidence that nearly all participants achieved significant gains in comprehension of home-based urban farming, planting techniques, irrigation strategies, organic fertilisation, and natural pest control. These outcomes echo systematic reviews by Manna et al. (2024) and O'Brien et al. (2024) that found multi-modal food literacy interventions enhanced both knowledge and behaviour change in diverse populations. Pradhan et al. (2024) similarly argued that linking practical production with reflective learning enhances both environmental understanding and behavioural outcomes, making urban farming a strong literacy-building mechanism.

Participants also demonstrated the ability to connect production with consumption: all reported taking harvested moringa and water spinach home for family meals, a practical manifestation of the transition from planting literacy to food literacy, defined as the interplay of knowledge, skill and motivation for healthy food choices (Manna et al., 2024). In addition, circular-learning practices emerged: about 70% of fertiliser used in the greenhouse was derived from locally composted waste via the community waste bank that reducing external fertiliser dependence by around 40%. This aligns with Food and Agriculture Organization (2021) report, which emphasises urban agroecology and

resource-efficient food production as cornerstones of sustainable food systems (Figure 5).

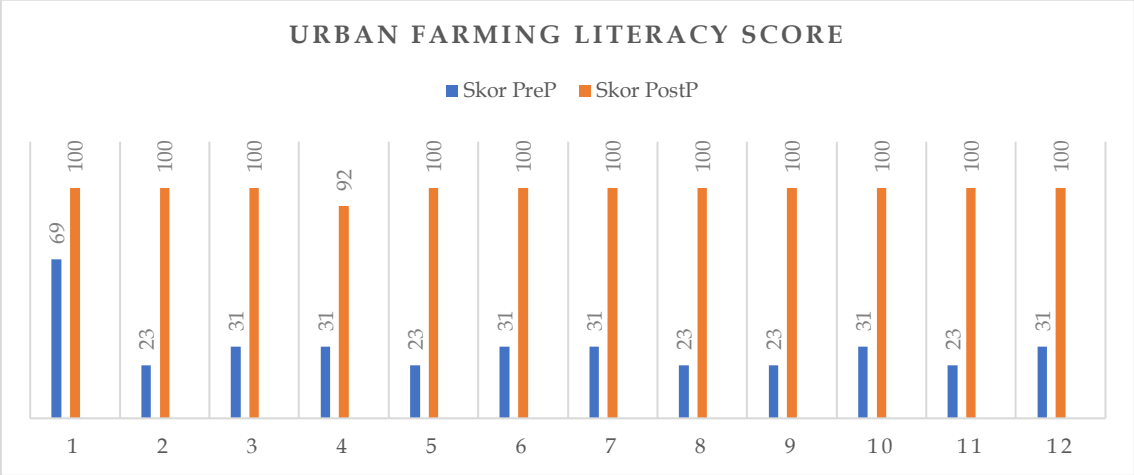

Figure 5. Literacy scores before and after the training

3.5. Institutional strengthening and community sustainability

The programme also strengthened RPTRA's institutional capacity as a community learning and production centre (Figure 6). Critical documents including the greenhouse Standard Operating Procedures (SOPs), reflection logs and planting schedules were archived and integrated into the RPTRA's operational framework. Both PKK cadres and RPTRA staff incorporated daily greenhouse monitoring into their routines, promoting post-programme continuity. This approach aligns with the Training of Trainers (ToT) model, which fosters knowledge replication in women's networks, a strategy recommended by World Health Organization (2014) and supported by Abdillah et al. (2023) in Indonesia's urban farming context.

Figure 6. Institutional strengthening

The Training of Trainers (ToT) approach allowed participants to replicate the knowledge within their local networks, expanding the program's impact. As emphasized by World Health Organization (2014) and the Ministry of Health RI (Permen KKP No. 47/PERMEN-KP/2020 Tahun 2020, 2020), empowering women as community health and nutrition facilitators is among the most effective strategies to improve household food security and promote healthy urban lifestyles. This experience demonstrated that mini-greenhouse-based urban farming is not merely a small-scale agricultural practice but also a social learning mechanism that fosters collective community capacity and institutional resilience.

3.6. Implications for urban food security and community empowerment

By merging participatory learning with process efficiency principles, the initiative created a "social laboratory" for community members to explore, experiment and co-create sustainable farming systems (Figure 7). The observed improvements in time efficiency, land utilisation and resource savings reflect the lean community-based agriculture paradigm advanced by Hume et al. (2022) and Batwara et al. (2023). Conceptually, the programme operationalises Indonesian regulations Permenkes No. 2/2020 on Food and Nutrition Security and Permenkes No. 21/2020 on Stunting Prevention, delivering a community-level mechanism that links nutrition education, local production and environmental stewardship.

Figure 7. Implications for urban food security

These evaluation results are consistent with findings from Pradhan et al. (2024), who demonstrated that community-based urban farming initiatives that incorporate reflective learning and structured process guidance significantly improve local food system resilience through increased production efficiency, resource-conscious practices, and strengthened institutional participation. Similarly, Manna et al. (2024) emphasised that literacy-oriented interventions in food systems foster behavioural change when participants engage in experiential learning environments that connect production to consumption and everyday decision-making, mirroring how Rasamala participants applied planting literacy to household food use. Furthermore, Gray et al. (2022) found that adult agricultural learning becomes more sustainable when knowledge transfer occurs through collective practice, peer mentoring, and responsibility sharing, validating the observed post-program maintenance and self-directed problem-solving by RPTRA cadres and staff.

Ultimately, this initiative establishes a replicable model of community-based urban farming education, integrating learning, process efficiency, and ecological sustainability. Through the active participation of women and local institutions, the program fostered collective learning practices that directly contribute to inclusive and sustainable urban food security.

4. Conclusion

The programme successfully strengthened planting literacy and improved planting workflow efficiency among RPTRA Rasamala staff and PKK cadres, directly fulfilling its primary objective. Through participatory training supported by simplified VSM and JIT, participants achieved faster seedling growth, reduced resource waste, and optimised the

use of the mini greenhouse as a learning and production space. These outcomes indicate that integrating process-efficiency tools with community-based urban farming can reinforce sustainable practices, enhance institutional readiness, and provide a scalable model for broader urban agriculture initiatives.

Acknowledgements

The authors express their sincere appreciation to the management and staff of RPTRA Rasamala, as well as the PKK cadres of Menteng Dalam Subdistrict, Tebet District, for their active participation, enthusiasm, and collaboration throughout the implementation of the community engagement program. The authors also thank the Institute of Research and Community Service, Sahid University, for their continuous support and facilitation in technical aspects of the project.

Author Contribution

Activity implementation: MS, BCP, WH; Article preparation: MS, WH; Analysis of service impact: BCP, WH; Presentation of service results: MS; Article revision: WH.

Conflict of Interest

The authors state that there is no conflict of interest in the publication of this article.

Funding

This community engagement program and publication were funded by the Directorate of Research and Community Service (Direktorat Penelitian dan Pengabdian kepada Masyarakat), Ministry of Education, Culture, Research, and Technology (Kemendiktisaintek) of the Republic of Indonesia, under the 2025 Community Service Grant (Hibah Pengabdian kepada Masyarakat 2025). The funding body had no involvement in the study design, implementation, analysis, or the decision to publish the findings.

References

Abdillah, A., Widianingsih, I., Buchari, R. A., & Nurasa, H. (2023). Implications of urban farming on urban resilience in Indonesia : Systematic literature review and research identification Implications of urban farming on urban resilience in Indonesia : Systematic literature review and research identification. *Cogent Food & Agriculture*, *9*(1). https://doi.org/10.1080/23311932.2023.2216484

Adiana, B. E., Akmal, M., Laili, N., Ramadhan, A. W., Fisabilillah, N., Fatikasari, A., Najwa, A. F., Malinda, I. P., Rahmatillah, P. K., Alkautsar, Z. I., Prasetiyo, A., & Tidar, U. (2025). Dissemination of agricultural technology as an innovation for modern agricultural transformation in Lebak Village, Grabag. *Community Empowerment*, *10*(9), 1826–1835. https://doi.org/10.31603/ce.14579

Altieri, M. A., Nicholls, C. I., & Montalba, R. (2017). Technological Approaches to Sustainable Agriculture at a Crossroads : An Agroecological Perspective. *Sustainability*, *9*(3), 1–13. https://doi.org/10.3390/su9030349

Artika, T. W., & Surahman, E. (2025). Pelatihan Urban Farming Hidroponik di Kecamatan Tembok. *UNITY: Journal of Community Service*, *2*(1), 6–10. https://doi.org/10.70716/unity.v2i1.213

Batwara, A., Sharma, V., Makkar, M., & Giallanza, A. (2023). Heliyon Towards smart sustainable development through value stream mapping – a systematic literature review. *Heliyon*, *9*(5), e15852. https://doi.org/10.1016/j.heliyon.2023.e15852

Brownson, R. C., Kumanyika, S. K., Kreuter, M. W., & Haire-joshu, D. (2021). Implementation science should give higher priority to health equity. *Implement Science*, *16*(1), 28. https://doi.org/10.1186/s13012-021-01097-0

Budirahardjo, S., & Wibowo, S. (2024). Optimizing yard space for independent food security in Kebonbatur Village. *Community Empowerment*, *9*(6), 935–941. https://doi.org/10.31603/ce.11552

Charatsari, C., Lioutas, E. D., Papadaki-klavdianou, A., Koutsouris, A., & Michailidis, A. (2022). Experiential, Social, Connectivist or Transformative Learning ? Farm Advisors and the Construction of Agroecological Knowledge. *Sustainability*, *14*(4). https://doi.org/10.3390/su14042426

Egli, V., Oliver, M., & Tautolo, E. (2016). The development of a model of community garden bene fi ts to wellbeing. *Preventive Medicine Reports*, *3*, 348–352. https://doi.org/10.1016/j.pmedr.2016.04.005

Food and Agriculture Organization. (2021). *FOOD AND AGRICULTURE MAKING AGRIFOOD SYSTEMS MORE RESILIENT TO SHOCKS*.

Gray, T., Tracey, D., Truong, S., Ward, K., Gray, T., Tracey, D., Truong, S., Community, K. W., Gray, T., Tracey, D., & Truong, S. (2022). Community gardens as local learning environments in social housing contexts : participant perceptions of enhanced wellbeing and community connection. *Local Environment*, *27*(5), 570–585. https://doi.org/10.1080/13549839.2022.2048255

Groufh-Jacobsen, S., & Medin, A. C. (2023). Food literacy competencies in youth – a mini-review. *Public Health and Nutrition*, *11*, 1–7. https://doi.org/10.3389/fpubh.2023.1185410

Humayrah, W., Febrina, L., & Stefani, M. (2021). The community nutrition garden (POKIMAS) In the Kingdom Community of BGBJ, Bekasi, West Java. *ICCD*, *3*(1), 493–497. https://doi.org/10.33068/iccd.Vol3.Iss1.408

Hume, C., Grieger, J. A., Kalamkarian, A., Onise, K. D., & Smithers, L. G. (2022). Community gardens and their effects on diet, health, psychosocial and community outcomes : a systematic review. *BMC Public Health*, *22*(1), 1247. https://doi.org/10.1186/s12889-022-13591-1

Irsyad, M. N., & Hartini, S. (2024). VALUE STREAM MAPPING SEBAGAI ALAT ANALISIS DALAM LEAN MANUFACTURING : ANALISIS BIBLIOMETRIK. *J@ti Undip: Jurnal Teknik Industri*, *19*(1), 35–45. https://doi.org/10.14710/jati.19.1.35-45

Permen KKP No. 47/PERMEN-KP/2020 Tahun 2020, 1 (2020).

Manna, A., Vidgen, H., & Gallegos, D. (2024). Examining the effectiveness of food literacy interventions in improving food literacy behavior and healthy eating among adults belonging to different socioeconomic groups - a systematic

scoping review. *Systematic Reviews*, *13*(1), 221. https://doi.org/10.1186/s13643-024-02632-y

Marzban, A., Dowlati, M., & Nodoushan, F. S. (2024). Urban Agriculture and Food Security: A Narrative Review. *Journal of Nutrition and Food Security*, *9*(1), 152–159. https://doi.org/10.18502/jnfs.v9i1.14850

Melin, M., & Barth, H. (2020). Value stream mapping for sustainable change at a Swedish dairy farm. *International Journal of Environment and Waste Management*, *25*(1), 130–140. https://doi.org/10.1504/IJEWM.2020.104367

O'Brien, K., Macdonald-Wicks, L., & Heaney, S. E. (2024). A Scoping Review of Food Literacy Interventions. *Nutrients*, *16*(18), 3171. https://doi.org/10.3390/nu16183171

Pradhan, P., Subedi, D. R., Dahal, K., Basyal, S., Hu, Y., Gurung, P., Pokharel, S., Kafle, S., Khatri, B., Joshi, A., & Gurung, M. (2024). Urban agriculture matters for sustainable development. *Cell Reports Sustainability*, *1*(9), 100217. https://doi.org/10.1016/j.crsus.2024.100217

Presiden Republik Indonesia. (2021). *Perpres Nomor 72 tahun 2021 Tentang Percepatan Penurunan Stunting* (Issue 1). Sekretariat Negara.

Senthamizh, R., & Anbarasan, P. (2025). Urban agriculture in a changing world : a thematic review of global trends, innovations, governance, and pathways to sustainability. *Frontiers in Sustainable Food Systems*, *9*. https://doi.org/10.3389/fsufs.2025.1624426

Sousa, L. O. De. (2021). Learning Experiences of a Participatory Approach to Educating for Sustainable Development in a South African Higher Education Institution Yielding Social Learning Indicators. *Sustainability*, *13*(6), 3210. https://doi.org/10.3390/su13063210

Steur, H. De, Wesana, J., Dora, M. K., Pearce, D., & Gellynck, X. (2016). Applying Value Stream Mapping to reduce food losses and wastes in supply chains : A systematic review. *Waste Management*, *58*, 359–368. https://doi.org/10.1016/j.wasman.2016.08.025

Sufiyanto, Yuniarti, S., & Tutuko, P. (2024). Revitalization of thematic villages through red ginger cultivation in Mulyorejo Village, Malang City. *Community Empowerment*, *9*(5), 821–833. https://doi.org/10.31603/ce.11301

Tomatis, F., Egerer, M., & Correa-guimaraes, A. (2023). Urban Gardening in a Changing Climate : A Review of Effects, Responses and Adaptation Capacities for Cities. *Agriculture*, *13*(2), 502. https://doi.org/10.3390/agriculture13020502

Utami, L. A., Lechner, A. M., Permanasari, E., Purwandaru, P., & Ardianto, D. T. (2022). Participatory Learning and Co-Design for Sustainable Rural Living , Supporting the Revival of Indigenous Values and Community Resiliency in Sabrang Village , Indonesia. *Land*, *11*(9). https://doi.org/10.3390/land11091597

World Health Organization. (2014). *Comprehensive implementation plan on maternal, infant and young child nutrition*.

Yap, C., & Anderson, C. R. (2025). Learning the city through urban agriculture. *Environment and Planning D: Society and Space*, *43*(5), 854–874. https://doi.org/10.1177/02637758241304667