Asian Journal of Community Services (AJCS)
Vol. 5, No. 6 2026: 417-426

Applying SEBACEM Technology and Small-Plot Spatial Planning to Strengthen the Sustainable Food Program of Dasa Wisma RW 08 Cemorokandang, Malang City

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A R T I C L E I N F O

Keywrds: SEBACEM, Organic Waste, Urban Farming, Land Spatial Planning, Community Empowerment

Received : 16, March
Revised : 18, May
Accepted: 20, July

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A B S T R A C T

Urban food gardens have become a practical strategy for improving household food resilience in densely populated neighbourhoods. They allow residents to use small yards, narrow side spaces, and shared community land for vegetables, herbs, and family medicinal plants. Urban agriculture also supports environmental resilience when communities connect food production with local waste reduction and soil improvement. This community service program strengthened the Sustainable Food Program of Dasa Wisma RW 08 Cemorokandang, Malang City, through SEBACEM organic fertilizer technology and small-plot spatial planning. The participatory program involved needs assessment, training, hands-on composting, demonstration plot arrangement, fertilizer application, mentoring, and evaluation. The activities improved participants' skills in using household and leaf waste, producing organic fertilizer, arranging narrow urban land, and supporting sustainable household food gardens.

DOI prefik: https://doi.org/10.55927/ajcs.v5i7.41
ISSN-E: 2962-1496
https://journalajcs.my.id/index.php/ajcs

INTRODUCTION

Urban food gardens have become a practical strategy for improving household food resilience in densely populated neighbourhoods. They allow residents to use small yards, narrow side spaces, and shared community land for vegetables, herbs, and family medicinal plants. Urban agriculture also supports environmental resilience when communities connect food production with local waste reduction and soil improvement. Langemeyer et al. (2021) argue that urban agriculture contributes to wider urban resilience when it strengthens social, ecological, and food-related functions.

The Dasa Wisma groups in RW 08 Cemorokandang, Kedung Kandang District, Malang City, already have a Sustainable Food Program under Pokja 3. The members come from different household and occupational backgrounds, such as teachers, entrepreneurs, and homemakers. This diversity can support collective learning because each member brings practical experience and different forms of local knowledge. However, the draft assessment showed that the groups still relied mainly on self-learning and informal experience in managing soil fertility, plant care, and waste-based fertilizer production.

Household waste, fallen leaves, bamboo litter, pine leaves, and other local organic residues are available around the neighbourhood. These materials often become unmanaged waste when residents do not understand their value for composting and soil amendment. Urban organic waste can become a useful input for vegetable cultivation when communities process it into organic fertilizer and apply it with proper methods. Haryanta et al. (2023) showed that urban organic waste can be converted into liquid organic fertilizer and used to support vegetable crops in urban farming systems.

The main problem faced by the partner community was not the absence of local resources, but limited knowledge and limited technical skills in using those resources. The groups also needed a clearer arrangement of land allocation because the available spaces were narrow and had to serve different functions. Without spatial planning, the demonstration plot could not support efficient planting, seedling preparation, fertilizer application, and maintenance. This condition created a need for a community service program that combined organic fertilizer technology with small-plot spatial planning.

SEBACEM technology offered a suitable solution because it uses bamboo leaves, pine leaves, pine flowers, household organic waste, and bioactivator support to produce organic fertilizer. Previous community service work in Cemorokandang showed that SEBACEM can convert leaf waste into fertilizer with economic and environmental value. The activity also reduced fertilizer dependence and improved community skills in urban farming. Kirnoprasetyo et al. (2025) reported that SEBACEM supports urban farming by improving soil fertility, reducing production costs, and encouraging continuous mentoring.

This program aimed to strengthen the Sustainable Food Program of Dasa Wisma RW 08 Cemorokandang through SEBACEM training, direct composting practice, demonstration plot arrangement, and continuous mentoring. The contribution of this service lies in the integration of waste utilization and land spatial planning in a neighbourhood-based food program. The program did not only introduce fertilizer production, but also guided participants to apply SEBACEM efficiently on vegetable and medicinal plant plots. Table 1 summarizes the preliminary problems, existing conditions, program responses, and expected outcomes.

Table 1. Preliminary Problems and Service Program Responses

No.	Preliminary Problem	Existing Condition	Service Program	Expected Outcome
1	Limited knowledge of organic waste utilization	Household residues and leaf litter were available but were not processed systematically.	Training on waste sorting, material preparation, and SEBACEM composting.	Improved ability to convert local organic waste into fertilizer inputs.
2	Limited skill in SEBACEM production	Members lacked practical experience in processing, mixing, and fermenting materials.	Hands-on practice using fermentors, local residues, and EM4 bioactivator.	Improved technical skill in producing mature organic fertilizer.
3	Inefficient use of narrow land	Available plots were not arranged according to planting, seedling, and maintenance needs.	Small-plot spatial planning and demonstration plot arrangement.	More efficient land allocation for vegetables and family medicinal plants.
4	Limited evaluation habit	Plant growth and fertilizer application were observed informally.	Monitoring, reflection, and discussion with Pokja 3 and Dasa Wisma members.	Better understanding of follow-up needs and program improvement.

Source: Result of preliminary observation, 2026

Table 1 shows that the program linked each partner problem with a practical activity. This structure helped the team move from observation to training, direct practice, land arrangement, and evaluation in a logical sequence.

IMPLEMENTATION AND METHODS

This community service program used a participatory mentoring approach. The approach placed Pokja 3 and Dasa Wisma members as active participants in identifying problems, preparing materials, practicing SEBACEM production, arranging the demonstration plot, and evaluating the activity. Participatory Action Research principles are relevant for this type of program because they encourage communities to take part in problem identification, action, reflection, and improvement. Khafsoh and Riani (2024) explain that PAR in community service strengthens participant involvement throughout program implementation.

The program took place in RW 08 Cemorokandang, Kedung Kandang District, Malang City, Indonesia. The participants consisted of Pokja 3 members and representatives of several Dasa Wisma groups who were involved in the Sustainable Food Program. The activity was implemented in 2025 through a series of socialization, training, direct practice, mentoring, application, and evaluation activities. The program site was selected because the community had an ongoing food-garden initiative and had access to household organic waste and leaf litter that could be processed into fertilizer.

The implementation began with problem measurement through survey, field observation, and informal interviews with Dasa Wisma leaders and members. The team documented the condition of organic waste, the available demonstration plot, participant needs, and constraints in plant maintenance. This stage helped the team understand that the program had to combine technical fertilizer training with spatial planning for narrow land. The assessment results then became the basis for preparing training materials, tools, and mentoring activities.

The second stage involved training on SEBACEM production. The core equipment included a closed fermentor or drum, cutting tools, mixing containers, and simple application tools. The main materials included household organic waste, dry leaves, bamboo litter, pine leaves, pine flowers, and EM4 bioactivator. EM4-based composting has been used in household organic waste training because it helps participants understand microbial decomposition and practical compost preparation. Wulandari et al. (2024) reported that EM4 application in household composting can increase the practical skills of PKK members.

The third stage involved hands-on practice and mentoring. Participants collected organic materials, chopped the residues to reduce particle size, mixed the materials with bioactivator, and placed them in closed fermentors. The team guided participants to observe maturity indicators, including colour, texture, odour, and material consistency. This step was important because poor fermentation can reduce fertilizer quality and participant confidence.

The fourth stage focused on demonstration plot arrangement and fertilizer application. Participants arranged narrow land according to the function of each space, including seedling preparation, growing beds, vertical planting areas, and maintenance access. SEBACEM was applied as a base fertilizer and as a planting-media mixture for vegetables and family medicinal plants. Previous experimental work showed that humus from bamboo and pine materials can support mustard growth when the media composition is suitable. Rahayu et al. (2026) reported positive growth responses in bitter mustard using compost media based on bamboo and pine residues.

The final stage consisted of monitoring and evaluation. The team observed plant growth, plant health, ease of fertilizer production, participant responses, and the use of narrow land after the activity. Participants also gave feedback through discussion about challenges during material preparation, fermentation, application, and maintenance. Figure 1 presents the overall implementation framework used in the community service program.

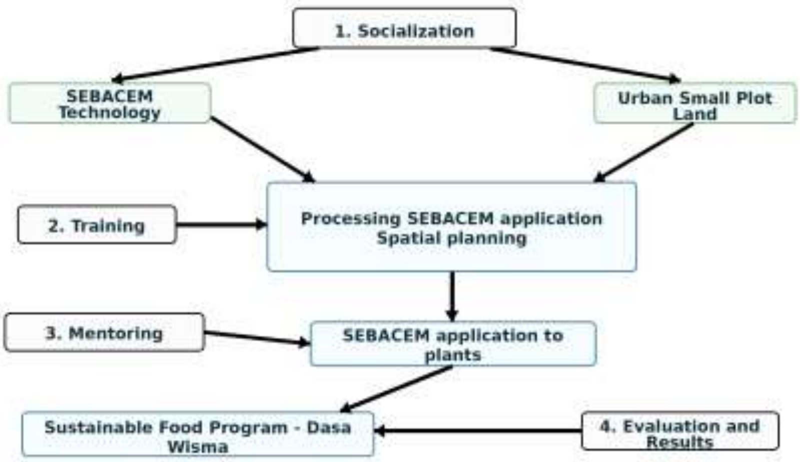

Figure 1. Community Service Implementation Framework

Figure 1 illustrates the integration of socialization, SEBACEM technology, small-plot spatial planning, training, mentoring, application, and evaluation. The framework ensured that the program did not stop at knowledge transfer, but continued into direct practice and demonstration plot improvement.

RESULTS AND DISCUSSION

Preliminary Assessment and Participant Readiness

The survey and interviews showed that the Dasa Wisma groups had strong motivation to maintain the Sustainable Food Program. Members already understood the value of planting vegetables and family medicinal plants for household needs. However, they had limited knowledge about transforming household organic waste and leaf litter into usable fertilizer. They also needed clearer guidance on how to arrange narrow land so that planting, seedling, and maintenance activities could run efficiently.

This finding confirmed that community readiness existed, but technical assistance remained necessary. Participants responded positively because the program addressed problems they encountered in their daily environment. The initial observation also showed that local organic residues were available throughout the neighbourhood. Czekała et al. (2023) emphasize that modern waste management must treat waste as a resource when communities can process it through appropriate technology.

SEBACEM Training and Composting Practice

The SEBACEM training improved participant understanding of the relationship between organic waste, fermentation, soil fertility, and plant growth. Participants learned how to prepare materials, reduce material size, mix organic residues with bioactivator, and manage closed fermentation. This training helped participants see household residues and environmental waste as productive inputs rather than waste that needed disposal. The practical method was important because many participants had previously learned plant care only through trial and error.

During the practice session, participants prepared the fermentor, mixed household organic waste and leaf materials, and learned how to identify mature fertilizer. The process emphasized simple indicators that were easy for participants to apply at home or in group activities. This practical design made the training suitable for neighbourhood groups with limited tools and limited capital. It also strengthened the idea that appropriate technology must fit local resources, local labour capacity, and local maintenance habits.

The use of SEBACEM was consistent with earlier work on the same technology. Kirnoprasetyo et al. (2025) describe SEBACEM as a practical fertilizer package based on local bamboo and pine residues. The current program expanded that application by linking SEBACEM production with the needs of Dasa Wisma and Pokja 3 in a Sustainable Food Program. This local continuity made the program more acceptable to participants because the technology had already been tested in a similar urban farming context.

Small-Plot Spatial Planning and Demonstration Plot Application

The land arrangement activity helped participants improve the use of limited urban space. The team guided participants to separate areas for seedling preparation, growing plants, applying media mixtures, and accessing plants during maintenance. This arrangement reduced confusion in using the demonstration plot and made the planting area easier to manage. Participants also learned that narrow land can support food-garden activities when planting layout, media preparation, and fertilizer application are planned together.

SEBACEM was applied as a base fertilizer and as a mixture in planting media. Participants observed how the fertilizer could be used for vegetable seedlings and family medicinal plants. The activity also gave participants practical experience in moving from compost production to fertilizer application. Schröder et al. (2021) showed that urban organic waste compost can support urban farming when the composting process and growing media are managed properly.

The spatial planning component became important because fertilizer availability alone does not guarantee productive small plots. Narrow urban land needs clear allocation, simple maintenance access, and plant grouping that matches household needs. The demonstration plot became a learning space where participants could observe the combined effect of land arrangement and organic fertilizer use. This result supports the program assumption that waste-based fertilizer training should be accompanied by plot management assistance.

Figure 2. Fragments of Program Implementation in RW 08 Cemorokandang

Figure 2 documents five activity fragments: (a) group photo at the RW hall, (b) initial demonstration plot condition, (c) land preparation and SEBACEM application as base fertilizer, (d) seedling preparation, and (e) SEBACEM application as a planting-media mixture. The documentation shows that the program combined classroom explanation, field practice, and demonstration plot improvement.

Monitoring, Evaluation, and Participant Feedback

Monitoring showed that participants understood the steps of SEBACEM preparation more clearly after direct practice. They could explain the function of organic residues, the need for chopping, the role of bioactivator, and the importance of observing fermentation maturity. They also gave feedback on the practical challenges of collecting enough materials, maintaining the fermentor, and arranging group work schedules. These findings show that technical guidance must continue after the first training session.

The evaluation also showed that participants valued the economic and environmental benefits of the program. Organic fertilizer production can reduce dependence on purchased fertilizer, while local waste processing can help keep the neighbourhood cleaner. This benefit is relevant for urban communities that have limited land but continuous household organic waste. Sarangi et al. (2024) explain that food and organic waste valorisation can support food security when waste is treated as a bioresource rather than a disposal problem.

The reflection session indicated that the program increased participant confidence to continue the Sustainable Food Program. Members saw that organic fertilizer production and narrow-land planning could work together. The activity also opened the possibility of developing small-scale organic fertilizer production as an additional group activity. However, further mentoring remains necessary to standardize material composition, fermentation duration, fertilizer maturity indicators, and application dosage.

Table 2. Summary of Program Outcomes in Dasa Wisma RW 08 Cemorokandang

Program Component	Initial Condition	Capacity-Building Activity	Outcome Achieved
Needs assessment	Problems were known informally but had not been mapped into clear program steps.	Survey, observation, and discussion with Pokja 3 and Dasa Wisma members.	Problems and service responses were identified more systematically.
SEBACEM training	Participants had limited knowledge of organic waste processing and fermentation.	Training on material collection, chopping, mixing, bioactivator use, and closed fermentation.	Participants understood the basic process of transforming waste into organic fertilizer.
Hands-on practice	Members lacked direct experience in producing and identifying mature fertilizer.	Mentored practice using household organic waste, leaf litter, and EM4 bioactivator.	Participants gained practical composting skills and learned maturity indicators.
Land spatial planning	The demonstration plot used narrow land that had not been arranged efficiently.	Arrangement of seedling areas, growing spaces, planting media, and access routes.	The land became easier to use for vegetables and family medicinal plants.
Application and evaluation	Fertilizer use and plant growth were not monitored systematically.	SEBACEM application to plants, observation, feedback collection, and reflection.	Participants saw the link between waste utilization, fertilizer use, and sustainable food gardens.

Source: Result of program implementation, 2026

Table 2 confirms that the program produced outcomes at the knowledge, skill, land-use, and evaluation levels. The strongest contribution came from the combination of direct practice and mentoring because participants could immediately apply the material to their own demonstration plot.

Program Implications

The program has practical implications for community-based urban farming. First, the Dasa Wisma groups can reduce unmanaged organic waste by converting it into fertilizer inputs. Second, the groups can improve the productivity of narrow spaces through simple spatial planning. Third, the Sustainable Food Program can become a learning platform for environmental care, household food production, and group cooperation.

The program also has institutional implications for university-community partnerships. The involvement of Universitas Wisnuwardhana Malang provided technical guidance, while the RW 08 community provided local knowledge, land, participation, and feedback. This collaboration strengthened trust and allowed the service activity to respond to real community needs. Continuous mentoring will help the partner community maintain the skills gained during the program.

The main limitation of the program was the absence of a detailed quantitative measurement of participant knowledge before and after training. The evaluation relied on observation, participant feedback, and field documentation. Future activities should add pre-test and post-test instruments, simple plant-growth measurements, and a standard record of fertilizer production. These instruments will make the program outcomes easier to compare and report in future community service publications.

CONCLUSIONS AND RECOMMENDATIONS

The SEBACEM technology and small-plot spatial planning program strengthened the Sustainable Food Program of Dasa Wisma RW 08 Cemorokandang. The activity helped participants understand how household organic waste, bamboo leaves, pine leaves, pine flowers, and other local residues can be processed into organic fertilizer. The hands-on practice improved participant skills in material preparation, fermentation, maturity observation, and fertilizer application. The spatial planning activity also helped participants use narrow urban land more efficiently for vegetables and family medicinal plants.

The program shows that community-based food gardens need both fertilizer innovation and land-use assistance. SEBACEM can support cleaner neighbourhood waste management and reduce dependence on purchased fertilizer when participants continue the practice consistently. The program also increased awareness that local organic waste has economic and environmental value. This result supports the role of Dasa Wisma and Pokja 3 as local drivers of sustainable household food production.

Future programs should provide longer mentoring to standardize SEBACEM formulation, fermentation duration, application dosage, and plant-growth monitoring. The next activity should also add simple quantitative evaluation tools, such as participant knowledge tests, fertilizer quality indicators, and plant performance records. These improvements will strengthen the evidence base and help the community scale the program to other Dasa Wisma groups in Cemorokandang

ACKNOWLEDGMENT

The authors would like to thank LPPM Universitas Wisnuwardhana Malang for the internal community service grant that supported this program. Appreciation is also extended to the RW 08 Cemorokandang administrators, Pokja 3, and all Dasa Wisma members who provided facilities, time, participation, and local knowledge during the implementation of the SEBACEM training and demonstration plot activities.

REFERENCES

Czekała, W., Drozdowski, J., & Łabiak, P. (2023). Modern technologies for waste management: A review. Applied Sciences, 13(15), 8847. https://doi.org/10.3390/app13158847.

Haryanta, D., Sa'adah, T. T., Thohiron, M., & Rejeki, F. S. (2023). Utilization of urban waste as liquid organic fertilizer for vegetable crops in urban farming system. Plant Science Today, 10(2), 120–128. https://doi.org/10.14719/pst.2028.

Khafsoh, N. A., & Riani, N. (2024). Implementation of Participatory Action Research (PAR) in community service program. Jurnal Pengabdian Masyarakat, 5(1), 237–253. https://doi.org/10.32815/jpm.v5i1.2034.

Kirnoprasetyo, I., S, M. A. B., Qomarrudin, & Hariyanto, A. (2025). Sebacem sebagai solusi kebutuhan pupuk pada program pertanian kota di Desa Cemorokandang Kecamatan Kedung Kandang Kota Malang. BERNAS: Jurnal Pengabdian Kepada Masyarakat, 6(4), 3461–3466. https://doi.org/10.31949/jb.v6i4.15577.

Langemeyer, J., Madrid-Lopez, C., Mendoza Beltran, A., & Villalba Mendez, G. (2021). Urban agriculture - A necessary pathway towards urban resilience and global sustainability? Landscape and Urban Planning, 210, 104055. https://doi.org/10.1016/j.landurbplan.2021.104055.

Rahayu, Y. S., Kirnoprasetyo, I., Hariyanto, A., & Sulistyo, M. A. B. (2026). Aplikasi media humus daun bambu, daun cemara dan bunga cemara dalam bahan kompos pada tanaman sawi pahit (Brassica juncea L). Agrika: Jurnal Ilmu-Ilmu Pertanian, 20(1), 126–140. https://doi.org/10.31328/ja.v20i1.7586.

Schröder, C., Häfner, F., Larsen, O. C., & Krause, A. (2021). Urban organic waste for urban farming: Growing lettuce using vermicompost and thermophilic compost. Agronomy, 11(6), 1175. https://doi.org/10.3390/agronomy11061175.