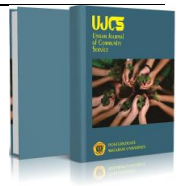
UJCS 6(4) (2025)

Unram Journal of Community Service

https://jurnalpasca.unram.ac.id/index.php/UJCS



Training on the Production and Use of Organic Liquid Fertilizer for the Community in Suka Merindu Village to Support of Environmentally Friendly Agriculture

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Received: November 15, 2025
Revised: December 8, 2025
Accepted: December 18, 2025
Published: December 31, 2025

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DOI: 10.29303/ujcs.v6i4.1405

Abstract: This community service program aimed to enhance community capacity in producing and utilizing organic liquid fertilizer to support environmentally friendly agricultural practices in Suka Merindu Village, West Pemulutan Subdistrict, Ogan Ilir Regency. The activity was conducted using a participatory approach that positioned the community as active participants throughout the process. The program stages included initial socialization with community leaders, identification of local potential and problems through focus group discussions, hands-on training on organic liquid fertilizer production using locally available organic waste, and post-training mentoring and monitoring to ensure sustainability. The results indicate that the training program effectively improved participants' knowledge and technical skills, as evidenced by a substantial increase in post-test scores compared to pre-test results. Participants also reported high levels of satisfaction with the training materials, facilitation, and practical sessions. Furthermore, most participants began applying organic liquid fertilizer in their farming practices, demonstrating the practical relevance and sustainability of the program outcomes. In addition to technical improvements, the activity increased community awareness of the environmental and economic benefits of reducing dependence on chemical fertilizers and utilizing organic waste more productively. Overall, this community service program demonstrates that participatory training on organic liquid fertilizer production can serve as an effective strategy for promoting sustainable agriculture, strengthening farmers' economic resilience, and encouraging environmentally responsible resource management in rural areas.

Keywords: Organic Liquid Fertilizer, Community Empowerment, Environmentally Friendly Agriculture, Participatory Training, Rural Community.

Introduction

Organic waste is waste that can be completely decomposed through biological processes, both aerobic and anaerobic. Organic waste that can be decomposed through biological processes, such as food scraps, vegetables, wood chips, and dry leaves. Organic waste can decompose into small, odorous materials (Latifah et al., 2011). Potential organic waste resources were found in Suka Merindu Village, located in the subdistrict of Pemulutan Barat, Ogan Ilir Regency. This village is a rural area with prominent agricultural characteristics. Based on field observations, the majority of the village population depends on the agricultural sector for their livelihood, particularly small- and medium-scale food crop and horticultural cultivation. Despite its natural resource potential, agricultural practices in this village are still dominated by inorganic inputs, especially chemical fertilizers. This phenomenon has become a structural problem in sustainable agricultural

How to Cite:
Mulyana, E., Saputra, A., & Mardhotillah, R. (2025). Training on the Production and Use of Organic Liquid Fertilizer for the Community in Suka Merindu Village to Support of Environmentally Friendly Agriculture. *Unram Journal of Community Service*, *6*(4), 1070–1075. https://doi.org/10.29303/ujcs.v6i4.1405

development because the excessive and long-term use of chemical fertilizers has been proven to cause soil degradation, groundwater pollution, and a decline in soil microorganism biodiversity (Ashari & Purwaningsih, 2024; Herawati et al., 2019; Pandjaitan et al., 2024; Wulandari et al., 2023).

This problem is also due to the price and distribution of subsidized fertilizer, which is not always consistently accessible to farmers. According to data from the Ministry of Agriculture in 2022, the availability of nationally subsidized fertilizer is under pressure due to budgetary constraints and distribution issues, which directly affect the high production costs faced by small-scale farmers. As a result, the economic resilience of farming households has become vulnerable, and dependence on chemical fertilizers has become increasingly difficult to avoid (Idawati et al., 2018; Sostenes Konyep, 2021). Therefore, innovative alternatives are needed that rural communities can access, create, and use independently, while still prioritizing sustainability and environmental preservation.

One relevant solution is the use of local organic waste to produce organic liquid fertilizer. Organic liquid fertilizer made from household organic waste, agricultural waste, and livestock manure contains sufficient macro and micro nutrients to support plant growth and improve soil structure (Dewi et al., 2024; Pratiwi et al., 2019; Purnamasari et al., 2022; Putra et al., 2023). In addition, the use of liquid organic fertilizer can reduce production costs, improve crop quality, and support environmentally friendly, climate-adaptive agricultural systems (Mauliddah & Rosmaniar, 2021; Rohani et al., 2017; Tono, 2022).

However, the community's knowledge and technical skills in the production and use of organic liquid fertilizer in Suka Merindu Village are still very limited. This condition is caused by the suboptimal transfer of information and appropriate technology that is relevant to the local context to the village community. This inequality in access to agricultural innovation has led most farmers to still rely on conventional practices that are often unsustainable. Therefore, training in the production of organic liquid fertilizer is intended not only as a form of technology transfer but also as a transformative, participatory empowerment tool.

According to Iryana (2018), effective empowerment is one that places communities as active subjects in the process of social, economic, and environmental change. This means that communities are not only beneficiaries, but also participate in shaping the decision-making process and implementation of innovations. In the context of environmentally friendly agriculture, this includes providing access to adaptive technologies, increasing knowledge capacity based on local wisdom, and strengthening critical awareness of the long-term impacts of using synthetic chemical inputs.

Given the current conditions in Suka Merindu Village and empirical findings from previous studies, training on the production and use of organic liquid fertilizer is highly strategic and urgent. This activity is not only aimed at reducing the community's dependence on chemical fertilizers, but also as a first step towards strengthening a sustainable agricultural system based on local potential. In addition to providing environmental benefits, this activity is expected to strengthen farmers' economic resilience, improve the quality of agricultural production, and expand the knowledge network among residents for the wise and sustainable management of biological resources.

Method

The location of this activity is Suka Merindu Village, West Pemulutan Subdistrict, Ogan Ilir Regency. The community service activity will be carried out from June to August 2025. The target audience for this community service activity is the residents of Suka Merindu Village, West Pemulutan Subdistrict, Ogan Ilir Regency, particularly farmers who are actively involved in small- and medium-scale agricultural activities, with a target of 25-30 people. Priority is given to individuals or groups who own agricultural land and have relied on chemical fertilizers as the primary input for crop cultivation. In addition, this activity involves community leaders and village officials to strengthen the village's institutional capacity to support environment-based development programs.

The implementation method for this community service activity uses a participatory approach that positions the community as the primary subject throughout the process, from planning to evaluation. The implementation stages are designed systematically and adaptively through several phases, namely: (1) Initial socialization to community leaders, village officials, and farmer groups as a form of program introduction and exploration of local readiness and support; (2) Identification of local potential and problems through focus group discussions (FGD) and environmental observation to tailor training to the local context; (3) Training on organic liquid fertilizer production, which includes a brief theory, hands-on practice, and field demonstrations on how to apply it to plants; and (4) Post-training assistance and monitoring to ensure the sustainability of practices and provide technical consultation for participants. All activities will be carried out with consideration for the principles of inclusiveness and sustainability, and will utilize

available local resources to increase the relevance and efficiency of the program. The implementation team will also develop training support materials, such as printed modules, PowerPoint presentations, and video tutorials, to make the material easier to understand and easier for participants to replicate independently.

The success indicator for this community service activity is that ≥85% of training participants understand and continuously apply organic liquid fertilizer in the agricultural sector of Suka Merindu Village. The evaluation method for this training activity is a pre-test and post-test related to the material on the production and processing of organic liquid fertilizer for the target audience.

Result and Discussion

Initial Socialization to Community Leaders

The initial training activity on the production and use of organic liquid fertilizer for the community in Suka Merindu Village was a socialization program for the village head and his staff. The first visit was to provide information on the use of organic liquid fertilizer. This activity was important to gather all village residents to actively participate and coordinate well during the training. The community service activities in Suka Merindu Village collaborated with the MBKM program, which involved 10 students as part of their direct community-based learning activities under the "Merdeka Belajar Kampus Merdeka Membangun Desa" initiative. Additionally, it aimed to foster students' attitudes and feelings of love, social concern, and responsibility toward community development while cultivating professionalism within the community.

Preparations before implementing community service are important, namely obtaining permission for community service activities from the Village Head and coordinating with the village authorities to determine the activities. The activities presents through figure 1.

Figure 1. The initial socialization stage

The initial socialization stage is an important foundation for implementing community service activities because it determines the level of acceptance and participation within the target community. In this activity, socialization was carried out with community leaders, village officials, and representatives of the farmer group in Suka Merindu Village. This activity served as a medium for introducing the objectives, scope, and benefits of the training program on the production and use of organic liquid fertilizer.

Through socialization, the community service team obtained an initial picture of the social conditions, farming practices, and community perceptions regarding the use of chemical fertilizers and organic fertilizer alternatives. Initial discussions showed that the community was interested in environmentally friendly agricultural innovations but still had doubts about the effectiveness of liquid organic fertilizer due to limited experience and technical information. Therefore, this stage played a strategic role in building trust between the implementation team and partners and in motivating the community to actively participate in the entire series of activities.

Identification of Local Potential and Problems Through Focus Group Discussions (FGD)

The identification of potential problems was conducted through focus group discussions (FGDs) and observations of the village environment. The results of the identification showed that Suka Merindu Village has an abundant supply of organic waste from household, agricultural, and livestock activities, but it has not been optimally utilized. Waste is generally discarded or burned, which can cause environmental pollution.

On the other hand, farmers are still heavily dependent on chemical fertilizers, which are subject to price fluctuations and are often difficult to obtain. This situation has resulted in high production costs and declining soil quality. The findings from this stage formed the basis for adjusting the training material, particularly in selecting raw materials for organic liquid fertilizer that are readily available locally. Thus, the program is not top-down, but contextual and relevant to the real needs of the community.

Training Stage for Organic Liquid Fertilizer Production

The training stage is the core of this community service activity. Training is delivered through a combination of brief instruction and hands-on practice (learning by doing). Theoretical material covers the concepts of environmentally friendly agriculture, the benefits of organic liquid fertilizer, and its comparison with chemical fertilizers. Next, participants actively engage in the practice of making organic liquid fertilizer from local materials such as vegetable waste, fruit scraps, and livestock manure.

The hands-on approach has proven effective in improving participants' understanding and skills. The community not only understands the technical stages of producing organic liquid fertilizer but also gains

practical experience that builds their confidence to produce fertilizer independently. In addition, demonstrations on how to apply liquid fertilizer to plants provide a concrete picture of how the training outcomes can be used in everyday agricultural practices.

Post-Training Mentoring and Monitoring Stage

Post-training mentoring is conducted to ensure the continuity of the knowledge and skills imparted. At this stage, the team acts as a facilitator and technical consultant for the community, especially when participants begin to independently produce and apply organic liquid fertilizer. Monitoring is conducted through field visits and ongoing communication with participants. The results indicate that most participants have begun reducing their use of chemical fertilizers and are combining them with organic liquid fertilizers. This mentoring stage is crucial for addressing initial technical challenges, such as fermentation errors or incorrect application dosages, to prevent the community from reverting to less environmentally friendly conventional agricultural practices.

Activity evaluation is conducted both formatively and summatively.

Formative evaluation takes place throughout the training process through participant observation and interactive discussions. Summative evaluation, meanwhile, involves pre- and post-tests to measure participants' knowledge gains, as well as a satisfaction questionnaire to assess community perceptions of the activity's implementation. The evaluation results are expected to demonstrate a significant increase in community knowledge and skills related to organic liquid fertilizer, as targeted in the activity's outcomes. Furthermore, the evaluation provides the community service team with feedback to refine the training module and mentoring strategies for similar activities in the future. The evaluations presents through figure 2.

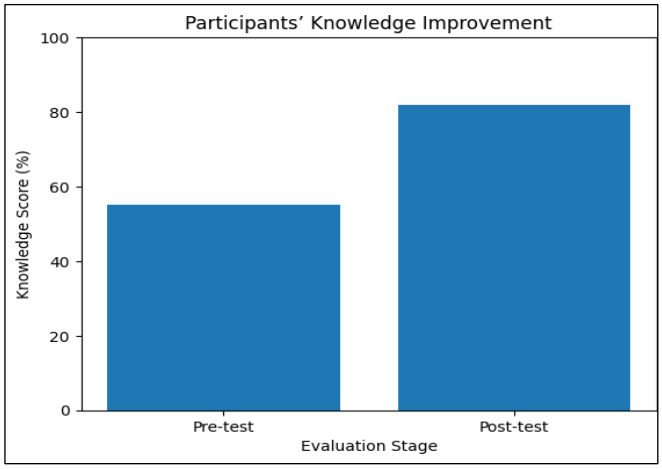

Figure 2. Participants' Knowledge Improvement

Figure 2 shows the comparison between pre-test and post-test scores of participants' knowledge regarding organic liquid fertilizer production. The post-test results indicate a substantial improvement, reflecting the effectiveness of the training program in enhancing participants' understanding. There was a 27 percentages point increase in the score, indicating that the training activities had a significant impact on participants' understanding. This increase has exceeded the success indicators set in the proposal, namely a minimum increase of ≥30%, so it can be concluded that the hands-on training method is effective in increasing community knowledge of organic liquid fertilizer and environmentally friendly agriculture. The Participants' Satisfaction Level presents through figure 3.

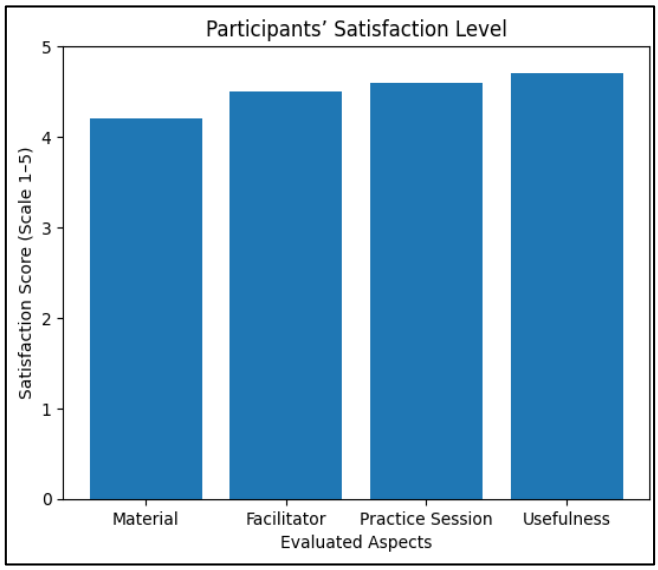

Figure 3. Participants' Satisfaction Level

Figure 3 illustrates participants' satisfaction across four evaluated aspects: training material, facilitator performance, practice session, and usefulness of the program. All aspects received high satisfaction scores, indicating positive participant perceptions of the activity implementation. The high level of participant satisfaction indicates that the material presented is relevant to community needs and easy to understand. The practical aspect received high scores, confirming that the learning-by-doing approach is well-suited to community empowerment activities. This strengthens the argument that community service activities are not only informative but also applicable and contextual. The Sustainability of Organic Liquid Fertilizer Application presents by figure 4.

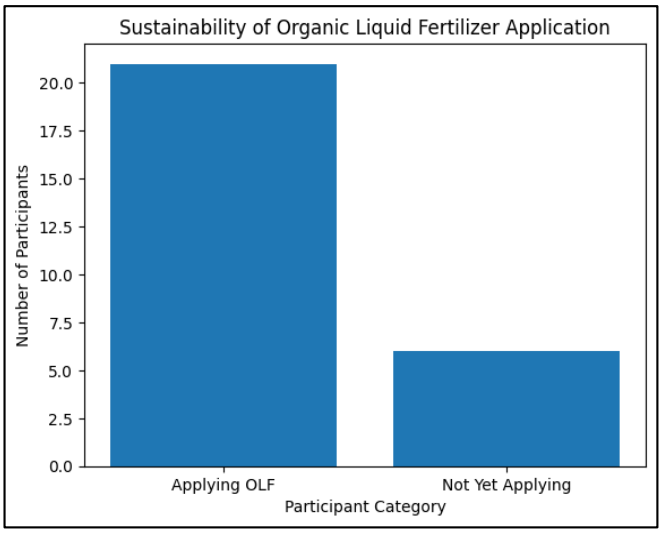

Figure 4. Sustainability of Organic Liquid Fertilizer Application

Figure 4 presents the sustainability of the training outcomes, showing the number of participants who have applied organic liquid fertilizer in their farming practices compared to those who have not yet implemented it. The majority of participants have adopted the practice of making and utilizing organic liquid fertilizer, indicating that the community service activity has a sustainable impact. Those who have not yet implemented it are generally still in the trial stage or constrained by time and materials. This finding underscores the importance of continued mentoring to strengthen the innovation's overall adoption.

Conclusion

This community service activity confirms that training on the production and use of organic liquid fertilizer is an effective approach to empowering rural communities and supporting environmentally friendly agricultural practices in Suka Merindu Village. The participatory training model, combining brief theoretical explanations, hands-on practice, and post-training mentoring, successfully enhanced participants' knowledge and technical skills. Evaluation results showed a clear increase in participants' understanding, supported by improved post-test scores and high levels of satisfaction with the training materials, facilitation, and practical sessions. Most participants began applying organic liquid fertilizer in their farming activities, indicating that the training outcomes were practically adopted and sustainable. In addition to improving technical capacity, the program increased community awareness of the environmental and economic benefits of reducing dependence on chemical fertilizers and utilizing locally available organic waste. Overall, this training demonstrates strong potential as a scalable model for promoting sustainable agriculture, improving farmers' economic resilience, and encouraging environmentally responsible resource management. Continued mentoring and institutional support are recommended to strengthen long-term adoption and replication in similar rural contexts.

Acknowledgments

The authors would like to express their sincere gratitude to the village government and community of Suka Merindu Village for their active participation and cooperation throughout the implementation of this community service program. The authors also gratefully acknowledge the support provided by the affiliated institution. This community service activity was fully funded through an independent (self-funded), which enabled the implementation of the training and mentoring activities. Finally, the authors thank all participants and parties who contributed, directly or indirectly, to the successful completion of this program.

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