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Empowerment of Young Muhammadiyah Women through Liquid Organic Fertilizer (POC) Entrepreneurship at PCNA Bumiayu, Central Java

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Artikel info

Abstract. *This community service activity aims to improve the entrepreneurial skills of young Muhammadiyah women, particularly in the production of Liquid Organic Fertilizer (POC), accounting-based financial management, and product packaging and marketing. This program is carried out through training that combines theory and direct practice, where participants are given an understanding of how to conduct POC efficiently, transparent financial management in accordance with accounting standards, and appropriate packaging techniques and marketing strategies to increase product competitiveness. The results of this activity show a significant increase in participant skills, especially in the production of quality POC, more efficient financial management, and more effective product marketing capabilities. The application of science and technology in this activity not only provides technical insight but also strengthens cadres' capacity to address entrepreneurial challenges in the agricultural and environmental sectors.*

Abstrak. *Kegiatan pengabdian masyarakat ini bertujuan untuk peningkatkan kemampuan perempuan muda Muhammadiyah dalam kewirausahaan, khususnya dalam pembuatan Pupuk Organik Cair (POC), pengelolaan keuangan berbasis akuntansi, serta pengemasan dan pemasaran produk. Program ini dilakukan melalui pelatihan yang menggabungkan teori dan praktik langsung, di mana peserta diberikan pemahaman mengenai cara pembuatan POC yang efisien,*

pengelolaan keuangan yang transparan sesuai standar akuntansi, serta teknik pengemasan dan strategi pemasaran yang tepat untuk meningkatkan daya saing produk. Hasil dari kegiatan ini menunjukkan peningkatan signifikan pada keterampilan peserta, terutama dalam pembuatan POC berkualitas, pengelolaan keuangan yang lebih efisien, dan kemampuan pemasaran produk yang lebih efektif. Penerapan IPTEK dalam kegiatan ini tidak hanya memberikan wawasan teknis, tetapi juga memperkuat kapasitas kader untuk menghadapi tantangan kewirausahaan di sektor pertanian dan lingkungan hidup.

Keywords:
Bumiayu; Entrepreneurship; Nasyiatul Aisyiyah; Fertilizer; Liquid Organic Fertilizer (POC)..

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INTRODUCTION

Bumiayu District, located in the southern part of Brebes Regency, covers an area of 82.09 km² and consists of 15 villages. Kalinusu Village is the largest village, with an area of 32.69 km², whereas Pamijen Village is the smallest, covering 0.89 km². The area has an average rainfall of 158 mm with approximately nine rainy days per month. Bumiayu is known for its fertile agricultural land, which supports the cultivation of rice, secondary crops, vegetables, and fruits. Plantation and livestock activities also constitute important sources of livelihood. In 2023, the population was recorded at 115,976 people, including 17,487 women of productive age (20-39 years). Most residents work as traders, farmers, laborers, entrepreneurs, or civil servants, while some productive-age residents migrate or continue their education. Educational attainment varies from junior and senior high school to higher education (BPS Kabupaten Brebes, 2024).

Bumiayu is also home to Nasyiatul Aisyiyah, an autonomous organization under Muhammadiyah that focuses on empowering young women and promoting community development. The organization conducts various activities, including religious mentoring, social and humanitarian programs, education, cadre development, economic strengthening, environmental management, and hygiene promotion. Through these activities, Nasyiatul Aisyiyah seeks to shape young women in Bumiayu District, Brebes Regency, into active, productive, and socially impactful individuals. The organization's main objective is to develop and empower young women so that they become independent, principled, and actively engaged in both family and community life. In addition, Nasyiatul Aisyiyah plays a strategic role in improving women's educational quality, economic welfare, and social participation in the Bumiayu area.

The results of the survey and discussions with the administrators of the Branch Leadership of Nasyiatul Aisyiyah in Bumiayu District and the proposing team of the science and technology-based community service program indicated a strong expectation that cadres would be involved in creative economic development activities based on agriculture. Such activities are expected to improve cadre welfare and contribute to the local economy. The administrators also expressed the need for skills training that could equip cadres to become more independent and empowered within society. The priority areas for skills development included agriculture, fisheries, livestock, and the processing of products derived from related commodities. These areas are relevant to the family backgrounds and environmental conditions of the cadres in Bumiayu District, which support the development of competencies in those fields.

Bumiayu District, whose economic activities are largely based on agriculture and livestock, produces a considerable amount of waste each year. Only a small portion of agricultural waste is used as animal feed, while the remaining waste may pollute the environment if not properly managed, potentially affecting public health and ecosystems. One strategy to minimize these impacts is to process local agricultural waste into economically valuable products. Locally available waste can be utilized to produce liquid organic fertilizer (POC), which supports plant growth and productivity (Marasabessy & Tanasale, 2021). This type of waste decomposes easily and is rich in nutrients required by plants (Widyabudiningsih et al., 2021). POC contains macronutrients such as nitrogen (N), phosphorus (P), potassium (K), and organic carbon, which are required by plants in relatively large quantities (Umar et al., 2021). In addition, liquid organic fertilizer contains beneficial microbes, including photosynthetic bacteria, lactic acid bacteria, yeasts (Saccharomyces sp.), Actinomycetes, and fermentative bacteria (Aspergillus sp.), which not only improve soil fertility but also help prevent plant diseases.

Studies have shown that liquid organic fertilizer produced from fermented organic waste for 21 days contains very high levels of organic carbon, phosphorus, and nitrogen, moderate potassium content, and a neutral pH of 6.9 (Hadi, 2019). In addition to household food waste, POC may be produced from other organic materials such as bamboo leaves, lamtoro leaves, coconut fiber, and banana stems, which are easily obtained and rich in nutrients. The application of this fertilizer has been shown to increase the growth and yield of pakcoy (Mendrofa et al., 2025), lettuce (Yusuf & Muhamad, 2017), and cacao seedlings (Rosmawati, 2016).

According to the Indonesian Agency for Agricultural Research and Development, liquid organic fertilizer has high economic value because it can be produced from livestock or plant waste at a relatively low cost. In addition to improving crop productivity, POC helps maintain soil fertility sustainably, reduces dependence on chemical fertilizers, and can be marketed at competitive prices, thereby opening business opportunities for local producers. Accordingly, POC entrepreneurship represents an alternative model for empowering young Muhammadiyah women while creating an additional source of income. For this reason, the implementation of science and technology-based activities is necessary to improve the skills of Nasyiatul Aisyiyah cadres in POC production, financial management, product packaging, and marketing.

Data and Methodology

Time and Location

The liquid organic fertilizer (POC) entrepreneurship training was conducted from February to May 2026. The activity was centered at SMA Muhammadiyah Bumiayu, Bumiayu District, Brebes Regency, Central Java.

Implementation of Activities

This community service program employed a lecture and extension approach combined with direct practice and mentoring for the partner organization. Through this approach, participants were expected not only to understand the material conceptually but also to apply the activity directly. The steps required to implement the proposed solution for addressing the community service program's problems are presented in Figure 1.

The target participants of this program were cadres of Nasyiatul Aisyiyah in Bumiayu District, Brebes Regency, Central Java. This target group was selected based on the partner's request for improved understanding and practical skills related to liquid organic fertilizer entrepreneurship. In this community service program, participants and partners were involved fully so that they could obtain optimal benefits from the implemented activities.To measure changes in participants' knowledge, attitudes, or skills before and after the activity, pre-tests and post-tests were administered.

The pre-test was used to evaluate participants' initial understanding of the material to be delivered, whereas the post-test was used to assess the extent to which their understanding or skills improved after participating in the community service activity. These tests enabled the implementing team to measure the effectiveness of the activity and observe its impact objectively.

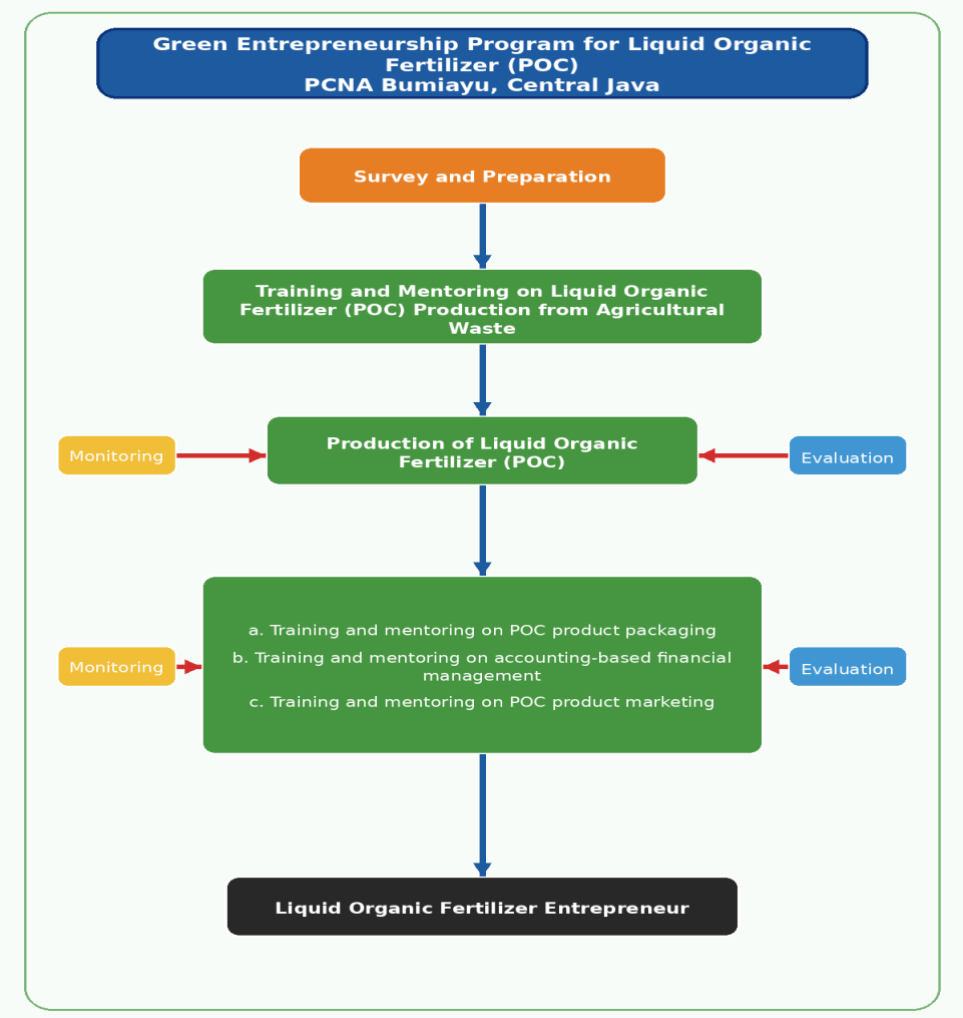

Figure 1. Overview of the science and technology activities implemented.

Results and Discussion

The training activity, implemented under the theme "Development of Green Entrepreneurs through Liquid Organic Fertilizer (POC) Entrepreneurship for Young Muhammadiyah Women at PCNA Bumiayu, Central Java," produced positive results in improving participants' understanding of various aspects of POC-based entrepreneurship. The primary objective of the training was to provide participants with knowledge and skills related to POC production, product packaging, marketing strategies, and financial management required to operate a POC business. The evaluation results showed a substantial improvement in participants' understanding of all activity objectives.

Based on the analysis of pre-test and post-test responses, the liquid organic fertilizer entrepreneurship training improved participants' understanding across several key entrepreneurship indicators, with different percentages of improvement: (1) activity objectives (76.90%), (2) POC production (56.45%), (3) the benefits of POC for plants (58.06%), (4) simple accounting for POC agribusiness (64.52%), and (5) product packaging and marketing techniques (70.97%).

These data indicate that the training did not merely transfer information but effectively developed participants' contextual and applied knowledge of all components of POC entrepreneurship after the activity (Figure 2).

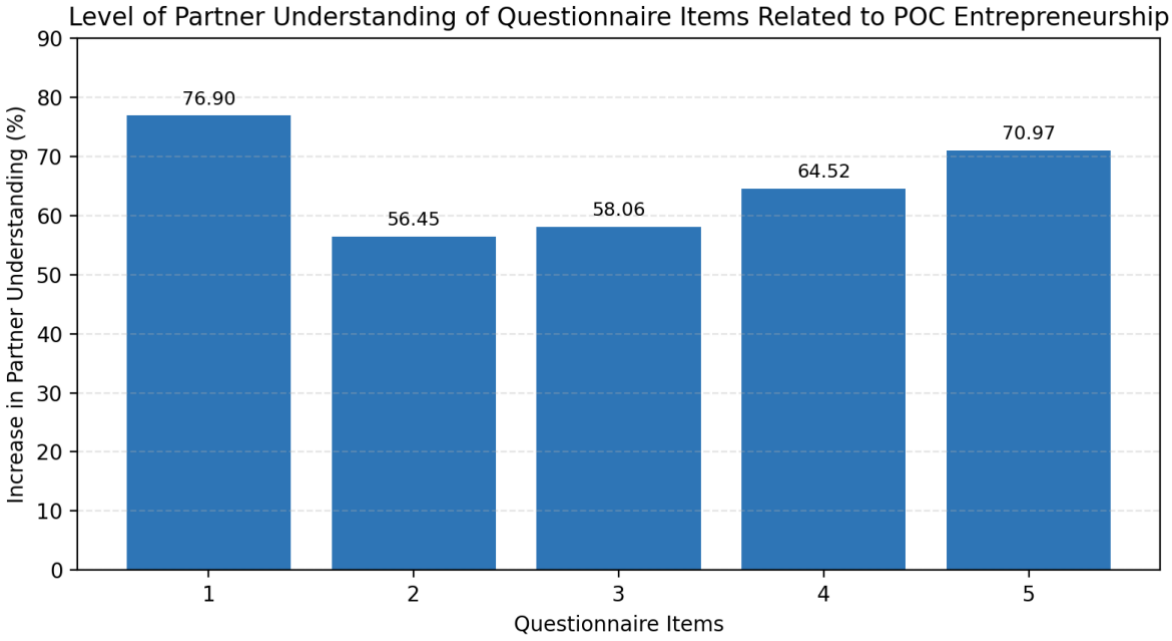

Figure 2. Level of partner understanding of questionnaire items related to liquid organic fertilizer (POC) entrepreneurship among young Muhammadiyah women at PCNA Bumiayu, Brebes, Central Java.

Overall, the improvement in understanding of the activity objectives (76.90%) indicates that participants not only understood the technical training material but also grasped the strategic concept of the community service activity itself. This high percentage demonstrates that the participants were able to internalize the purpose and direction of the program, namely the development of green entrepreneurs who integrate economic, social, and environmental dimensions within a single business model. This finding is consistent with evaluations of similar training activities that reported significant improvements in participants' understanding of organic fertilizer-based entrepreneurship objectives after intensive training programs (Shofiyani et al., 2025).

Figure 3. Delivery of agribusiness training material on liquid organic fertilizer (POC) from agricultural waste by the instructors (Source: Team documentation, 2026).

Figure 4. Practical production of liquid organic fertilizer (POC) from agricultural waste by PCNA Bumiayu cadres (Source: Team documentation, 2026).

The indicators for understanding POC production techniques (56.45%) and the benefits of POC for plants (58.06%) show that participants were able to internalize the technical aspects of production and product application in a practical way. Although these two indicators were lower than the indicator related to the general objectives of the activity, the results still reflect a meaningful increase in participants' knowledge compared with their pre-training level. A comprehensive understanding of technical aspects is essential in practice-based training because it integrates theoretical knowledge of raw materials, fermentation microbiology, and production processes with the ability to produce POC that is feasible for use. Agribusiness training literature suggests that learning processes involving direct practice tend to generate valid knowledge gains, although improvements in some technical aspects may vary depending on the complexity of the material delivered (Oktaria et al., 2021).

In addition, participants did not only learn production techniques but also essential managerial aspects for business sustainability. This is indicated by the increase in participants' understanding of simple accounting in POC agribusiness by 64.52%. This finding is important because modern entrepreneurship training should not focus solely on technical production; it should also develop the ability to manage and interpret simple financial reports, prepare budgets, and understand cost and revenue structures. Literature on agribusiness entrepreneurship training emphasizes that financial management skills provide long-term benefits for the sustainability of microenterprises, particularly when participants are empowered to enter commercial markets (Amalia et al., 2025).

Figure 5. Harvesting and packaging process of liquid organic fertilizer (POC) from agricultural waste by PCNA Bumiayu cadres (Source: Team documentation, 2026).

The final aspect, namely participants' understanding of packaging techniques, marketing, and market share, increased by 70.97%. This indicator shows that participants were able to evaluate and understand how POC products can be positioned in the market, including branding strategies, pricing, market segmentation, and effective promotional methods. The high score for this indicator suggests that the training successfully applied the principle of market orientation in entrepreneurship, enabling participants to identify market needs and connect those needs with the advantages of the product produced. Other training evaluations also confirm that marketing capability is one of the aspects that improves most significantly when the material is delivered contextually and directly linked to local business opportunities (Agustien & Hapsari, 2018).

Substantively, the evaluation results indicate that the training achieved its main objective of improving participants' competencies holistically in POC entrepreneurship. The increased understanding across all questionnaire indicators demonstrates the effectiveness of a comprehensive learning approach that combines theory, direct practice, and reflective assessment. This type of evaluation model aligns with the capacity-building approach recommended in the literature on community empowerment and microenterprise development based on agriculture (Harsanti and Desthariani, 2025), particularly in relation to liquid organic fertilizer (POC) developed by PCNA Bumiayu.

Conclusion

The liquid organic fertilizer (POC)-based entrepreneurship training conducted for young Muhammadiyah women produced very positive results in improving participants' understanding of various entrepreneurial aspects. Participants experienced increased competencies in POC production, packaging techniques, marketing, and financial management. The training provided practical skills needed to operate an environmentally friendly and profitable POC business while also increasing awareness of the importance of organic waste management and basic accounting. Through this training, young Muhammadiyah women in Bumiayu are better prepared to initiate business activities that support environmental sustainability and contribute positively to the local economy.

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