

Utilization of Local Resources as Technology and Innovation for Making Organic Fertilizer and Bio-Pesticides: Case Study of the Dahlia Women Farming Group

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ABSTRACT

Utilization of local resources as organic fertilizers and environmentally friendly biological pesticides is a strategy to maintain agricultural sustainability. The purpose of this community service is to form an environmentally friendly agricultural ecosystem in the Dahlia Women Farmers group. Previously, the Dahlia Women Farmers group had not been running. This community empowerment method uses the PRA approach. The level of understanding of knowledge and practice of making organic fertilizers and biological pesticides is carried out using the PRA method. Data was taken by filling out a questionnaire before and after the extension was given. The results showed an increase in knowledge of almost two times from 43% to 82%. The average increase in participant knowledge was 38%.

INTRODUCTION

The increasing awareness of the importance of sustainable agriculture has encouraged farmer groups/women farmers to adopt this system. The use of sustainability farming methods, one of easy and cheap to build organic vegetable farming. One of the most important things to do in organic farming is to replace the use of inorganic fertilizers and pesticides with organic fertilizer and pesticide. The abundance of local resources around the farming area of the farmer group is the key to increasing utilization. Steps that can be taken are to utilize it to be made into organic fertilizers and plant-based pesticides as an alternative to inorganic fertilizers and pesticides. This system not only supports environmental sustainability but also provides economic benefits to the community by reducing dependence on high-cost chemical products.

The Dahlia Women Farmers Group (WFG) as a community active in the agricultural sector has a strategic role in encouraging local innovation to support sustainable agricultural practices (Firmansyah et al., 2024). Community-based empowerment in the production of organic fertilizers and biological pesticides by WFG Dahlia aims to increase the capacity of group members in managing local resources independently, creatively, and sustainably. The use of organic waste and natural materials as raw materials not only helps reduce waste, but can also substitute the use of inorganic fertilizers. (Sari et al., 2019). In addition, the community-based empowerment process is able to strengthen social solidarity, improve skills, and create added value that can improve the economic welfare of its members.

However, the implementation of this program faces a number of challenges, such as limited knowledge, technical skills, and access to supporting technology. Therefore, a systematic approach is needed that includes training, mentoring, and providing access to information so that WFG Dahlia members can optimally develop their local potential through the manufacture of organic fertilizers and biological pesticides (Lesmana et al., 2022). This empowerment is not only aimed at increasing agricultural output, but also creating a more independent society, caring about the environment, and able to face the challenges of sustainable development in the agricultural sector.

IMPLEMENTATION AND METHODS

Location and Time of Implementation

The implementation of community service was carried out in Calingcing Village, Sukahening District, Tasikmalaya Regency. The implementation of this activity involved a team of lecturers and WFG Dahlia as residents of Calingcing Village. Community service was carried out for 8 months with an intensity of mentoring every 3 weeks.

Identification of problems

The main problems in WFG Dahlia are related to the lack of knowledge and skills in building environmentally friendly agriculture. Based on this, the limitations are summarized in the low knowledge in environmentally friendly farming, environmentally friendly farming management, the non-utilization of household waste into organic fertilizers and environmentally friendly products such as ecoenzymes, and the lack of knowledge in making environmentally friendly plant and biological pesticides. The lack of knowledge about environmentally friendly farming causes plant cultivation to be carried out without measuring the soil nutrient status and soil pH, resulting in the use of fertilizers without knowing the specific needs of the location so that their use is not appropriate in dosage. In addition, agricultural practices in this village are still carried out conventionally using inorganic fertilizers and pesticides which are practical to use but have a negative impact on the environment. In fact, if you look closer, this village has great potential in implementing environmentally friendly agriculture by utilizing abundant local resources. These abundant local resources include harvest residues, household waste (rice washing water, stale rice, vegetables, and fruit peels), and clove plants. The people of Calingcing Village admitted that they needed skills and knowledge related to proper land management and the use of local resources to be made into organic fertilizers, ecoenzyme products, and botanical pesticides. This problem certainly must immediately get attention from Universities to apply science.

Method and Implementation

The method applied in this community empowerment is Participatory Rural Appraisal (PRA). The basic principle of this approach is to fully involve the community in every stage of the activity with a focus on participation based on the principle of learning from the community, the active role of the community as the main subject, the exchange of knowledge and experience between community members, and the role of outsiders as facilitators. All segments of society are involved in a free, informal atmosphere that respects diversity. The program implementation process follows stages such as recognizing partner needs, planning needs, organizing activities, monitoring, and evaluation. Determination of problem priorities is carried out by considering partner needs and through discussions with members of the farmer group. The activities created have been discussed in advance according to the problems and needs of the partners to then jointly obtain approval from the partners.

RESULTS AND DISCUSSION

The empowerment of organic farming is carried out by making organic fertilizers and biological pesticides. Partners are asked to collect local materials such as rice water, household waste, harvest waste, and papaya leaves, cloves and soursop. These easily found materials will later become added value and usefulness to become the foundation for pioneering environmentally friendly farming. The making of this organic fertilizer is added with decomposer bacteria and sugar molasses as an aid to decompose organic materials, and as food for bacteria. While the making of biological pesticides is assisted by bacteria *Trichodherma* sp.

The results of this counseling were measured by filling out the questionnaire during the pretest and posttest. According to (Zainuddin and Wardhana, 2023) The questionnaire filling method is a personal data collection method. The questionnaire is also considered more effective and efficient to be applied to target partners because the variables to be measured are known in advance (Nafisatur, 2024). Measurement of the level of understanding of knowledge and practice of making organic fertilizers and bio-pesticides showed an almost two-fold increase in knowledge (Figure 1). From 43% to 82%. The average increase in participant knowledge was 38%. From the results of the t-test, it was found that there was an increase in knowledge before and after. Which results were significantly different ($p < 0.05$). This increase in knowledge was also accompanied by an increase in partner skills from those who had not produced solid, liquid organic fertilizers, and botanical pesticides to being able to produce at least 15 liters of liquid organic fertilizer, 40 kg of solid organic fertilizer, and 15 liters of botanical pesticides from papaya and soursop leaves (Figure 2). These results indicate that there was an increase in knowledge of 38%.

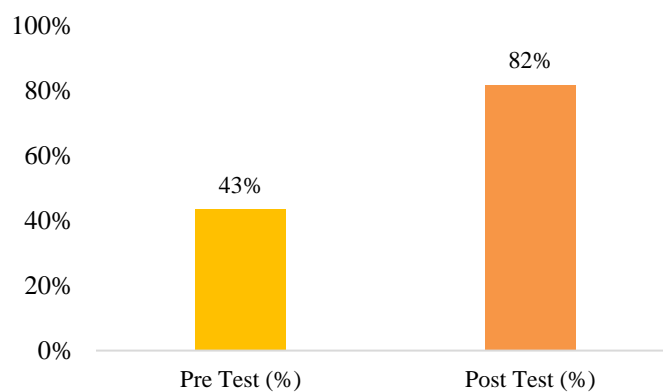


Figure 1. Respondents Results in Answering the Pre and Post Tests on Making Organic Fertilizers and Biological Pesticides



Figure 2. Documentation of Organic Fertilizer and Plant and Biological Pesticide Manufacturing Activities

After conducting counseling in the form of knowledge and practice, the next stage is to evaluate the program by filling out a questionnaire. Questions in the questionnaire consist of the level of ease of the material provided, the level of usefulness of the material, the level of novelty of the material, and the desire to apply the technology and innovation provided. The evaluation results showed that 52.6% of WFG Dahlia respondents felt that the material provided was sufficient to understand. The rest of the other respondents answered that it was very easy to understand 47.4%. The easy manufacture of organic fertilizers and pesticides can be one of the reasons that this technology is easy to understand how to make it. The materials used are also easy to obtain because they come from local materials around WFG Dahlia which are difficult to utilize.

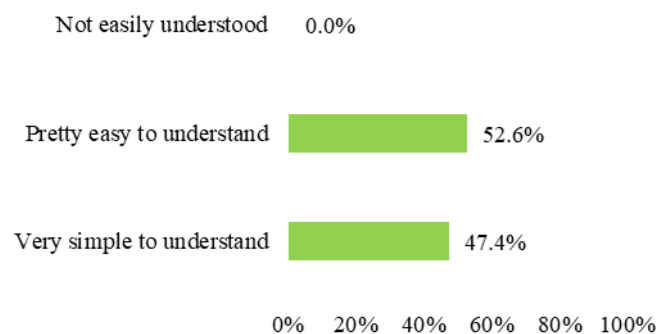


Figure 3. Percentage of Material Facilities Provided by the Community Empowerment Team

The results of the next evaluation are the desire to adopt technology and innovation, the manufacture of organic fertilizers, and plant-based pesticides. The application of the manufacture of organic fertilizers, molasses, ecoenzyme products, and plant-based pesticides shows that 89.5% of WFG Dahlia members are very enthusiastic about implementing the technology and innovation provided by the PBM Bima FP UNSIL team. As many as 10.5% of members answered enthusiastically. This indicates the usefulness and application of technology and innovation provided by the team. Where, the ease of technology used increases the enthusiasm of WFG members to implement it. In addition, tools that are easy to use and can be taken from used goods make WFG Dahlia members, namely mothers, very enthusiastic.

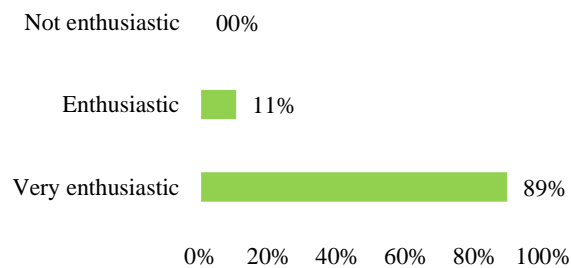


Figure 4. Percentage of Desire to Adopt the Manufacture of Organic Fertilizers and Plant-Based Pesticides

Field practice of technology application in community service activities is important. This is related to the level of partner's desire to apply technology and innovation provided by the BIMA community empowerment team, Faculty of Agriculture, UNSIL. The level of usefulness and novelty of knowledge and practice was also measured through the provision of a questionnaire. The level of usefulness of the material provided showed a percentage of 100% (Figure 5). The high level of usefulness of the material and innovation technology provided was in accordance with the needs of the partners at the beginning when discussing with the community service team. In addition, the results of the novelty of the material received showed that 89.5% (Figure 6) of respondents stated that this was something new. Meanwhile, 10.5% (Figure 6) of respondents answered that the material provided had been received before. The high percentage of the level of novelty of the material provided is thought to be because WFG Dahlia members previously studied farming autodidactically so that the material and innovation technology provided had never been received by WFG Dahlia.

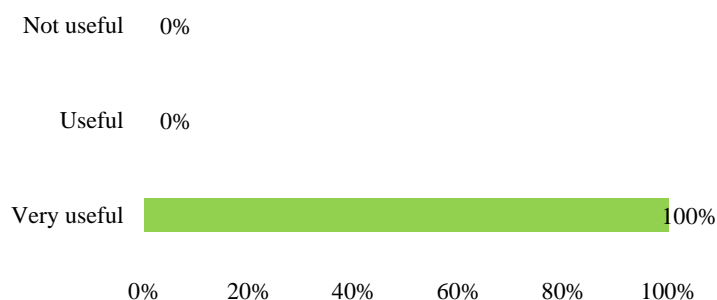


Figure 5. The Benefits of the Materials used to make Organic Fertilizers and Pesticides

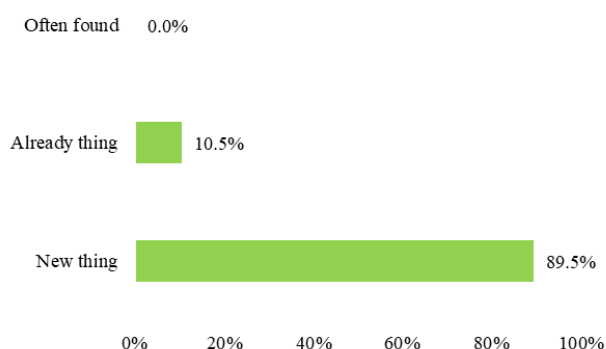


Figure 6. Percentage of the Newness of the Materials Used to Make Organic Fertilizers and Pesticides Provided

The direct training and extension method for farmers is in great demand because it has a direct impact on them. In addition, the high frequency of extension activities can accelerate the adoption process of the introduced technology and innovation (Fitria et al., 2023).

CONCLUSIONS AND RECOMMENDATIONS

The PRA method is considered effective for community-based empowerment, increasing knowledge and skills of WFG Dahlia members as partners. The results of the evaluation of this activity also showed that the novelty of the material and the usefulness of the material provided by the community empowerment team were responded positively by partners. However, the sustainability of this activity must be maintained in order to form an environmentally friendly agricultural ecosystem at WFG Dahlia.

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