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# Training on making organic fertilizer (bokashi) as an effort to improve the quality of sustainable plant production in the Taman Seribu Bunga Agrotourism

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**ABSTRACT**

The Taman Seribu Bunga Agrotourism is a tourist destination known as the beautiful flower beds. The right selection of fertilizer is considered important in the sustainability of agrotourism. The continuous use of chemical fertilizers can cause a decrease in soil health and fertility, which has an impact on plant productivity. In addition, Taman Seribu Bunga Agrotourism is surrounded by farmers who have problems in processing their livestock waste. Therefore, this community service activity carried out is to provide training in bokashi composting as an organic fertilizer that can be used by flower farmers in the Taman Seribu Bunga Agrotourism and its surroundings. The method used is a group discussion forum (FGD), interview, observation, and training using learning media such as brochures, and provide tools and supporting materials for bokashi composting. The results of this study is 6 out of 7 farmers expressed sthat they very satisfied with the bokashi composting training held at Taman Seribu Bunga Agrotourism, highlighting its relevance for managing livestock waste and supporting organic fertilizer needs in local flower and horticultural farming. All 7 farmers also showed interest in applying the knowledge by converting their own farm waste into bokashi. Based on the results of the activity, it can be concluded that the activity can overcome problems related to the accumulation of livestock manure that has not been managed properly.
**Keyword:** Bokashi, Farmers, Livestock Manure, Plant, Productivity

**ABSTRAK**

Agrowisata Taman Seribu Bunga merupakan destinasi wisata yang dikenal dengan keindahan hamparan bunga yang indah. Pemilihan pupuk yang tepat dianggap penting dalam keberlangsungan agrowisata tersebut. Penggunaan pupuk kimia secara terus-menerus dapat menyebabkan penurunan kesehatan tanah dan kesuburan yang berdampak pada produktivitas tanaman. Selain itu, Agrowisata Taman Seribu Bunga dikelilingi oleh peternak-peternak yang memiliki permasalahan dalam pengolahan limbah peternakannya. Oleh sebab itu, pengabdian masyarakat yang dilakukan yaitu memberikan pelatihan pembuatan bokashi sebagai pupuk organik yang dapat dimanfaatkan oleh petani bunga di Taman Seribu Bunga dan sekitarnya. Metode yang digunakan yaitu forum group discussion (FGD), wawancara, observasi, dan pelatihan menggunakan media pembelajaran seperti brosur dan bantuan alat dan bahan pendukung pembuatan bokashi. Hasil penelitian ini adalah 6 dari 7 petani menyatakan sangat puas dengan pelatihan pembuatan bokashi yang diadakan di Agrowisata Taman Seribu Bunga, yang menyoroti relevansinya dalam mengelola limbah ternak dan mendukung kebutuhan pupuk organik dalam pertanian bunga dan hortikultura setempat. Ketujuh petani tersebut juga menunjukkan minat untuk menerapkan pengetahuan dengan mengubah limbah pertanian mereka sendiri menjadi bokashi. Berdasarkan hasil kegiatan, dapat disimpulkan kegiatan tersebut dapat mengatasi permasalahan terkait menumpuknya limbah kotoran ternak yang belum dikelola dengan baik.
**Keyword:** Bokashi, Kotoran Ternak, Produktivitas, Petani, Tanaman

## 1. Introduction

Agrotourism sector is one of the important of economic sectors and dynamic in many countries, including Indonesia which has a diversity of tourism. Agrotourism sector through proper and sustainable management can provide significant financial benefits, and preserve the natural beauty, and cultural heritage As an agrarian country, Indonesia has enormous potential in agricultural tourism (agrotourism), particularly in rural areas that combine farming practices with tourism-based activitie [1]. The development of agrotourism in Indonesia shows great promise in supporting the local economy, enhancing community participation, and promoting environmental conservation.

Agrotourism in North Sumatra had rapid development in recent years, driven by abundant natural potential, biodiversity, and efforts by the government and community to develop a sustainable tourism sector. Agrotourism is one of the potentials in the development of the tourism industry around the world [2]. Agrotourism is also considered an efficient promotional method for marketing superior agricultural products [1].

The Taman Seribu Bunga Agrotourism, located in Berastagi District, Karo Regency, North Sumatra Province, is a tourist destination known for the beauty of stunning flower beds. This destination is well known for its beautiful flower gardens and has been officially designated as a tourist village by the Regent of Karo since 2017 [3]. In addition to its recreational value, the park also holds great potential as an educational and conservation hub for flower plant biodiversity.

One of the efforts to improve the quality of the garden and maintain the beauty and health of the flowers in the garden is the selection and use of the right fertilizer. Currently, the Taman Seribu Bunga Agrotourism is facing several challenges in maintaining plant productivity and agricultural land health. Some of the challenges that can be identified such as declining soil fertility, environmental problems, and dependence on chemical fertilizers are the impact of the use of chemical fertilizers. In addition, farmers around the Taman Seribu Bunga Agrotourism also have problems in managing their livestock waste.

To address these challenges, this community service initiative is based on the hypothesis that if local farmers are trained and empowered to convert livestock waste into organic fertilizer (bokashi), then soil fertility will improve, chemical fertilizer use will decrease, and sustainable agriculture around Taman Seribu Bunga Agrotourism will be enhanced. To address these challenges, several strategies will be implemented: (1) educational outreach to raise awareness of the negative impacts of chemical fertilizers and the benefits of organic alternatives; (2) hands-on training in bokashi production using locally available livestock manure; and (3) integration of these practices into the agrotourism model as a sustainable farming example [4-6]. This initiative aligns with national and global eco-agriculture efforts and is expected to benefit both local farmers and the broader agrotourism ecosystem.

## 2. Methods

### *2.1. Study area*

This community service was carried out at the Taman Seribu Bunga Agrotourism, Raya Village, Berastagi District, Karo Regency, North Sumatra Province, with the main target being livestock business actors around the agrotourism area. A total of 7 farmers with various livestock commodities participated in this study.

### *2.2. Method*

*2.2.1. Focus Group Discussion (FGD).* The method used in the community service begins by collecting information through Focus Group Discussion (FGD). This FGD aims to understand the problems faced by farmers related to livestock waste management and its utilization, as well as to explore their knowledge about organic fertilizers and the benefits of bokashi in improving soil fertility and plant productivity.

*2.2.2. Interview.* Interviews were conducted in a semi-structured manner with selected farmers to dig deeper information about perceptions, barriers, and motivations in adopting knowledge from bokashi composting training.

*2.2.3. Observation.* This method is carried out to see firsthand the behavior of farmers after participating in

training. This was done to find out the extent to which the results of bokashi composting training began to be applied in their agricultural activities.

*2.2.4. Training.* In this demo session, the participants were given a thorough understanding of the ingredients needed, the fermentation process, and the steps to make bokashi that can be done simply and efficiently. One of the main ingredients used in bokashi composting is livestock manure, which is produced daily by farms around the agrotourism. Farmers can take advantage of existing local resources, reduce waste, and at the same time produce organic fertilizers to support the sustainability of gardens. Through this training, it is hoped that farmers can acquire enough skills to make bokashi independently, using the materials around them without the need for expensive tools and materials. In addition, farmers are expected to understand the correct fermentation process, thus they can produce good quality bokashi, which can be used to fertilize the soil, and substitute chemical fertilizers that are more environmentally friendly.

*2.2.5. Monitoring.* Program monitoring carried out periodically to evaluate the quality of organic fertilizers made against the quality and productivity of flower plants and soil fertility, and to assist the community in managing livestock waste into organic fertilizer. In addition, an evaluation of service activities is carried out through feedback questioners provided by farmers.

### *2.3. Data Analysis*

The data obtained in this study were analyzed using a descriptive analysis method. In this study, descriptive analysis was used for the level of farmer participation, farmers' perception of training, and intention of technology adoption by farmers, based on the data that had been collected. The data is presented in the form of tables, graphs, and narratives to provide explanation of the phenomena in this study.

## 3. Results and Discussion

Community Service is an activity carried out by individuals, groups, or organizations to make a positive contribution to improving community welfare, thus to create a resilient and independent society. These community service activities often involve the transfer of knowledge, skills, resources to communities in need, especially in social, economic, and educational contexts.

The community service program is carried out at the Taman Seribu Bunga Agrotourism located in Raya Village, Berastagi District, Karo Regency, North Sumatera Province. In this program, bokashi composting training is carried out as an effort to increase the productivity of flower gardens and utilize livestock waste, thus they can implement integrated and sustainable agriculture. The training activities went fluently and the participants were also enthusiastic about the training. This is reflected in the active participation of farmers in the discussion session.

### *3.1. Farmers' perceptions of bokashi's benefit*

Farmers' perception of the training in this program shows a positive impact. This is described as the participation of farmers in a series of community service activities. In this program, farmers as the target of the program participate in determining problems and finding the solutions. The graph of farmers' participation in this series of community service activities is shown in Figure 1.

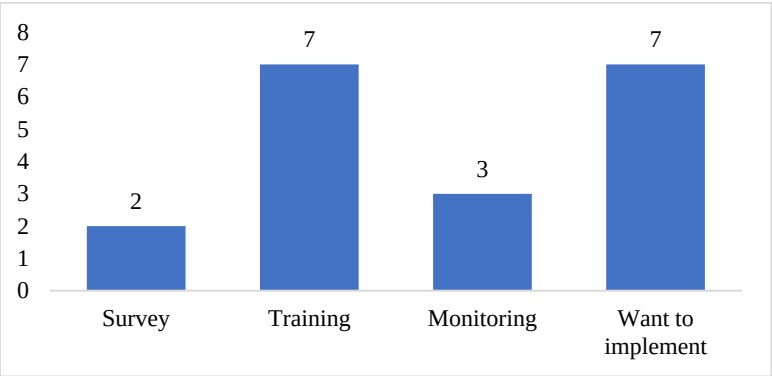


Figure 1. Graph of farmer participation in community service programs.

There are 7 farmers who participated in the training, where all farmers are willing to apply the results of the training on their farms. The training shapes farmers' perceptions, thus they are willing to apply processing livestock manure into bokashi in their farms. The transfer of knowledge during the training opens up farmers' insights related to the benefits of bokashi. According to [7], training is a method of knowledge transfer that can improve people's knowledge and skills. The bokashi-making demonstration activity is shown in Figure 2. In addition to the demonstration, a discussion and interview session was conducted between the farmers and the community service team, as shown in Figure 3.

Figure 2. Demonstration of bokashi composting.

The process of bokashi composting involves microorganisms that can improve soil structure, increase organic matter content, and reduce soil erosion, which ultimately supports environmentally friendly agricultural sustainability. In this activity, farmers received information about the function of fermentation in livestock manure so that it can be used as organic fertilizer which can improve soil health. The presence of microorganisms in organic fertilizer can help the process of decomposing organic material in the soil, thereby improving and increasing the biological properties of the soil and increasing soil fertility [8]. Organic substances will be absorbed by plants through the roots, therefore introducing organic materials without EM4 inoculation will result in the decomposition of organic materials which can cause the production of heat which is dangerous for plants because it can inhibit plant development [9].

Figure 3. Farmer discussion and interview.

From an environmental perspective, through participation in this community service activities, farmers are starting to understand that bokashi can help reduce livestock waste which is often simply thrown away or applied directly to plants, which has the potential to cause water and air pollution. By using livestock manure to make bokashi, they can reduce environmental pollution. Apart from that, from an economic aspect, many farmers see this product (bokashi) as a way to reduce the cost of purchasing chemical fertilizers, where the prices of which continue to increase. By using livestock waste and other materials, they can produce their own bokashi, which not only saves costs, but can also increase the efficiency of the livestock business. This training also opens up new opportunities to develop businesses, such as selling bokashi fertilizer to farmers or local communities, which can be a source of revenue stream.

### *3.2. Improvement of farmer hard skills*

Hard skills are defined as abilities possessed by a person including knowledge, technology, and technical skills related to a certain field [10]. Based on farmer participation, 100% (7 out of 7) farmers who tried making bokashi also wanted to apply the technology in their own farms. This indicates that farmers have mastered the technical skills in bokashi composting. The improvement of hard skills obtained by farmers in Raya Village through training of bokashi composting directly, so that farmers can participate in the process of bokashi composting. In addition, farmers can also practice the method of bokashi composting independently in their farms (Figure 4).

Figure 4. Good-quality bokashi was produced using 10 kg of cow dung and 0.5 kg of rice bran, resulting in a final product with good texture, dark brown color, and no pungent odor.

Before this activity was carried out, farmers in Raya Village generally used livestock manure as fertilizer but without processing, so that many caused unpleasant odors and invited flies. This certainly interferes with the comfort of tourists who visit the Taman Seribu Bunga Agrotourism. In addition, the selling price of unprocessed livestock manure is cheap. Through this community service activities, in addition to being able to reduce pollution caused by livestock manure, it can also be an added value for livestock manure as livestock waste. The application of science and technology such as the method of processing livestock manure into bokashi can strengthen a person's skills, one of which is hard skills [11]. The improvement of farmers' hard skills can be measured from the farmer's knowledge of good quality of bokashi. The quality of bokashi in this training is shown in Figure 5.

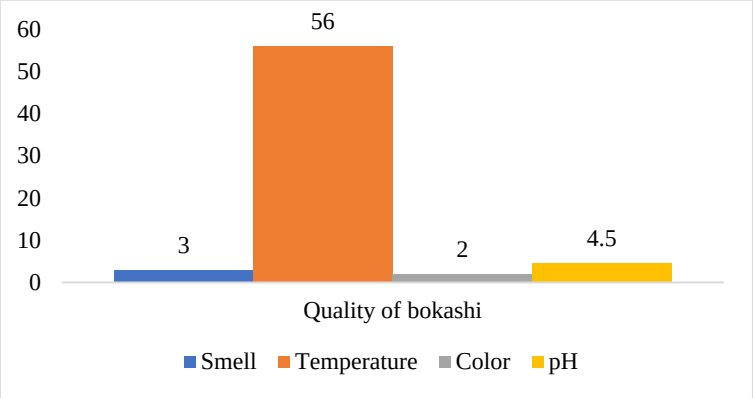


Figure 5. Graph showing the quality indicators of bokashi fertilizer based on odor, temperature, and color (odor is rated on a scale from 1 to 3, where 1 indicates a foul and pungent odor, 2 indicates a fermented odor with slight foulness, and 3 represents a proper fermentation odor; temperature is measured in degrees Celsius (°C); color is rated on a scale of 1 to 2, where 1 represents deviant (e.g., too light, yellowish, or greenish), and 2 indicates the ideal blackish-brown color characteristic of well-fermented bokashi).

### 3.3. Improvement of farmer soft skills

Soft skills refer to non-technical abilities, including interpersonal and behavioral traits, that are typically developed through personal experience and interaction [10]. The improvement of soft skills obtained by farmers as participants in this community service activities includes teamwork, effective communication, leadership, empathy and problem solving. In addition to gaining knowledge and understanding related to the benefits and urgency of using organic fertilizers in the agricultural sector, farmers also held discussions related to the management of livestock manure waste processing. Based on the results of the discussion, farmers planned to make bokashi together on one of the farms to facilitate the production process. This is an increase in skills because previously livestock manure was not processed together. Through the presentation of the training material, farmers also experienced an increase in information and knowledge that can be useful for their business management, including waste management. This can be the basis for finding solutions to problems, especially related to livestock waste management and decision-making.

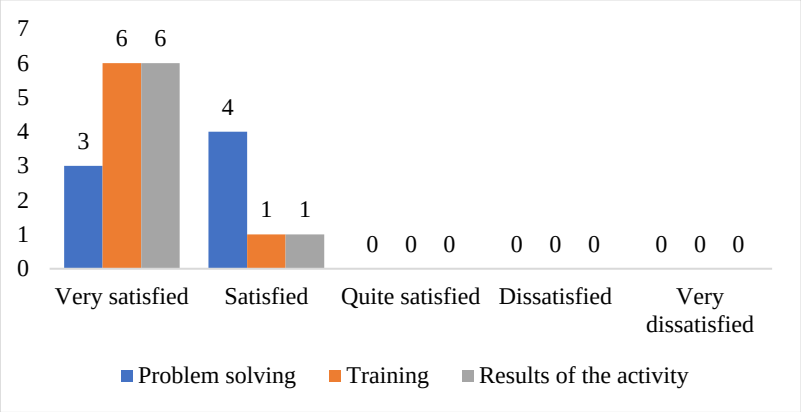


Figure 6. Graph of farmers' satisfaction level with community service programs.

Based on the results of the feedback filled in by the farmers, it is known that all participants are satisfied with this activity (Figure 6). 7 farmers were satisfied and very satisfied with the training of bokashi composting held at the Taman Seribu Bunga Agrotourism. Farmers feel that the solutions provided related to livestock waste management are right on target, considering that around the Taman Seribu Bunga Agrotourism there are many flower and horticultural farmers who also need organic fertilizers. According to [12], organic fertilizer from livestock manure is considered to be able to increase plant productivity, so that not only livestock farmers get a positive impact from this community service activity, but flower and horticultural farmers also get a positive impact. In addition, this training also received a good response from farmers, where 6 out of 7 farmers expressed their satisfaction with the training on bokashi composting and the results of the activities. They also want to manage their farm waste into bokashi.

## 4. Conclusions

The conclusion of the community service activity that have been carried out is that the community in Raya Village, especially the farmers around the Taman Seribu Bunga Agrotourism are very enthusiastic in the application of technology transfer (bokashi production). This can be seen from the active participation of farmers in a series of community service program. Farmers who are targeted in this program feel that the training can solve their problem related to the accumulation of livestock manure that has not been managed properly and is able to increase plant productivity and reduce environmental pollution.

## 5. Acknowledgements

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