

## Farmers' Assistance Through The Learning Process in Utilizing The Potential of Local Waste Towards Organic Coffee Plantations Turekisa Village

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### ABSTRACT

The people of Turekisa Village have their main profession as coffee farmers. Lectures in Turekisa Village are one way of providing learning experiences to farmer groups as partners in Community Service (PKM) activities in identifying potential and dealing with local problems in developing the village's local potential towards an organic coffee plantation in Turekisa Village. PKM activities aim to increase the knowledge, understanding, and skills of coffee farmers in utilizing waste for managing organic coffee plantations using a thematic and andragogical participatory learning approach as a method of implementing activities. The results of the activity show that farmer groups as activity partners can increase managerial capacity farmer groups and have awareness, insight, and skills in managing coffee plantations organically by producing organic fertilizer from skin waste coffee and utilizing organic fertilizer products on coffee plantations in a sustainable manner.

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## INTRODUCTION

Coffee is a prestigious plantation commodity (Sari et al., 2016). Ngada Regency is the main coffee-producing area in East Nusa Tenggara Province with an area of 6,040 ha. Of this area, 5,234 ha is Arabica coffee planting area and the remaining 806 ha is Robusta coffee (Soemarno et al., 2009). Turekisa Village is one of the coffee-producing centers in Ngada Regency with a population of 1816 (BPS Ngada Regency, 2023). Most of the population depends on agricultural and plantation products for their living.

It is hoped that the potential of coffee can improve farmers' welfare and increase and equalize farmers' income. Zuraida (2011) states that the decline in the amount of coffee production is a unidirectional relationship between the amount of coffee production and farmer income, low production amounts result in low farmer income. Farmers are risk-takers in utilizing the limited land they have, so farmers must be able to allocate it optimally (Fitriani et al., 2020). Even though coffee is a potential and superior commodity, the poverty percentage in Turekisa Village still reaches 11.93% (BPS Ngada Regency, 2023). The high level of poverty is driven by a relatively low level of human development index (HDI), so empowerment and development efforts are needed to improve the standard of living of the community (Adhiguna et al., 2022). The location of partners and coffee plantations as well as coffee skin waste that is not utilized by farmer groups can be seen in Figure 1.



**FIGURE 1.** Partner locations, coffee plantations, and unused coffee waste

Coffee as one of the plantation commodities cultivated by farmer groups has decreased production due to several factors, including farmers' lack of attention to coffee plants, where the coffee plants are not properly cared for, so they cannot produce optimally, this condition causes the coffee plants to grow wildly (Sarvina et al., 2020). Apart from that, farmers are highly dependent on using fertilizers and pesticides without paying attention to the environmental impact and quality of the coffee produced, as well as a decline in coffee production. This is in line with research by Simanjuntak et al., (2013) where the continuous use of inorganic fertilizers without being balanced with the use of organic fertilizers has degraded land which has had an impact on decreasing production.

Organic management of coffee plants has not been carried out by farmers who are members of farmer groups where the management does not use organic fertilizer as a whole. This is in line with research by Winarni et al., (2013) where organic coffee is an environmentally friendly agricultural product but the management of organic coffee plants has not been carried out intensively and this can be seen from the

management which does not use organic fertilizer as a whole. When compared to using chemical (inorganic) fertilizer, using organic fertilizer will save garden maintenance costs by up to 30% (Arief, 2011). Farmers' dependence on using inorganic fertilizers and pesticides can have an impact on coffee quality and consumer safety, through chemical residues and fluctuations in fertilizer prices causing high farmer expenditures (Adhiguna et al., 2022)

More Farmers Group Masi has the potential for agricultural waste from red-picked coffee skins as raw material for making organic fertilizer which can be applied to coffee plants which can increase plant productivity and have economic value for society. Research by Agustino et al., (2018) states that if the fresh coffee harvest is 1000 kg, then around 500-600 kg of coffee skins are wasted. Coffee waste has not been utilized properly by farmer groups due to limited human resources regarding processing technology. Compost Fertilizer is an alternative product resulting from coffee waste processing and has the potential to be utilized in the fields of agriculture, animal husbandry, and fisheries (Saraswati et al., 2020), so that community service activities (PKM) carried out can improve the management of farmer groups so that they become more productive, have good group business management skills by utilizing existing local potential.

## SOLUTIONS AND TARGETS OUTSIDE

1. There is no science and technology input related to coffee skin waste processing in the partner group. The solution offered to overcome the problem is increasing farmers' human resources through learning activities and providing material regarding the characteristics of organic waste, techniques for making and formulating compost as well as applying organic fertilizer to coffee plantations which is carried out periodically during service activities to partner groups. The output of the activities carried out is improving the quality of production through the stages of teaching, training, and assistance in utilizing coffee waste into organic fertilizer (compost fertilizer) which is able to provide added economic value for partner groups.
2. Partners have not yet carried out the stages of cultivating coffee organically. The solution offered to overcome the problem is to provide education to improve and restore the condition of the land to organic coffee land through learning activities and providing material regarding organic coffee cultivation. Apart from that, assistance activities are also carried out in the application of organic fertilizer from coffee waste produced by coffee plants so that it can increase productivity with quality organic coffee which has a high selling value.
3. The partner group does not yet have good management skills and is not producing actively in the economic sector. The solution offered to overcome this problem is providing training and assistance to increase managerial capacity to partner groups regarding leadership, decision-making, financial management to partner groups. The output of training and mentoring activities is the formation of groups of trained farmers who have good group business management skills and mentoring partners who can become a center for innovation in organic fertilizer processing.

## METHOD

Community service activities are carried out using mentoring methods for members of partner farmer groups. Implementation of activities is carried out fully in the field with a thematic and participatory andragogical learning approach (Sumardi, 2008). The stages of implementing activities are as follows:

1. Initial survey and problem identification

An initial survey was conducted in Turekisa village with the village head, representatives of farmer

groups, and youth leaders using interview and discussion techniques to identify the problems faced by farmers in managing coffee plantations.

2. Needs analysis

The aim is to find out and analyze the needs required during the activity. The needs analysis is carried out by considering aspects of physical resources including facilities and infrastructure components, and human resources of the coffee plantation management business.

3. Determining the intended target

The aim of setting targets is so that the PKM activities carried out are right on target and able to answer the problems that occur. The target is the More Masi Farmers Group located in Turekisa Village.

4. Program Preparation

The preparation of the program was carried out through internal team discussions, heads of farmer groups, representatives of farmer group members, and village heads, which were carried out collectively to produce a series of programs that would be implemented with the aim of implementing eco-farming through mentoring activities in the village.

5. Formulation and measurement

Success indicators The formulation and measurement of success indicators was carried out through direct team interviews with partners regarding conditions before and after the program was completed.

6. Targeted mentoring strategy

The target development strategy is carried out using non-formal lecture methods directly using thematic and andragogical participatory methods, by providing material and direct practice in the field.

7. Monitoring And Evaluation

Monitoring is carried out periodically, namely every two weeks (14 days) by the team by evaluating the implementation of each program that has been prepared to compare indicators of success before and after implementing the program.

## RESULTS AND DISCUSSION

The More Masi Farmer Group is one of the Farmer groups in Turekisa Village. Administratively, the More Masi Farmers Group was formed in 2021 and has 15 farmer group members consisting of farming communities in the village. Coffee is one of the plantation commodities cultivated by farmer groups. The formation of the farmer group was based on an initiative of the farming community in Turekisa Village which aims to be a forum for learning and communication, a vehicle for cooperation and a production unit to increase agricultural productivity and support the economy of farmer households.

The service activities carried out are in the form of knowledge transfer through the provision of material using non-formal lecture methods based on the theme of organic coffee plantation management and organic waste processing involving human resources who have expertise in their respective fields such as agricultural technology experts, plantation crop cultivation experts and plantation management experts. Comes from a lecturer in the agrotechnology study program and animal husbandry study program at the Flores Bajawa Agricultural College. Community service activities are carried out through interactive discussions which open up perspective space and can provide more insight to farmer groups. Training and mentoring activities as well as field practice are carried out for partner farmer groups by utilizing and optimizing the potential found in partner villages.

The provision of material is carried out using a non-formal lecture method through a learning process to farmer groups consisting of training in the form of providing material and mentoring, discussions, and direct practice in the field in the form of making compost and applying it to farmers' land. Learning for farmers consists of discussions providing material regarding the characteristics of organic waste, manufacturing techniques, and composting formulations as shown in Figure 2.



**FIGURE 2.** Learning activities and providing material regarding the characteristics of organic waste, manufacturing techniques, and composting formulations by farmer group participants and students

PKM activities carried out by farmer groups are also provided with training and assistance to increase managerial capacity so that farmer group members gain new insight into farming business management, which includes aspects of planning, organizing, and controlling. The expected results of this training are that farmer groups have an understanding and skills in separating personal finances from business, and business actors can monitor business developments through systematic bookkeeping. Training to increase managerial capacity can be seen in Figure 3. This is in line with research by Salmah et al., (2020) which states that financial planning and management is a control tool that can remind them to do the best for the business they are running.



**FIGURE 3.** Farmer Group Management Training and Mentoring (Leadership, Decision Making, Financial Management)

The practice of composting can provide education to farmers about managing coffee waste which has not been utilized properly by the community. Apart from that, farmer groups gain knowledge about composting techniques and their benefits in increasing coffee productivity. The ingredients for making compost consist of coffee skin waste, pig manure, a mixture of microorganisms in the form of EM4, brown sugar, and water mixed in a balanced manner. This is in line with research by Manuputty et al., (2012) where composting is carried out by regulating and controlling a balanced mixture of organic materials, providing sufficient water, regulating aeration, and providing effective inoculants/composting activators. The practice of making compost from coffee waste by farmer groups and students is shown in Figure 4.



**FIGURE 4.** The practice of composting coffee skin waste by farmer groups and students

Service activities also involve students as technical assistants for the Agrotechnology and Animal Husbandry study program where students have experience studying outside campus and can implement the knowledge learned on campus in the social and social fields. Implementation of this PKM activity can be used as one of the competencies in the area of expertise of the students involved so that it becomes a qualification for excellence in obtaining a decent job. This service activity involves students as a form of implementation of the Independent Campus Learning (MBKM) program. Apart from community service and training activities using non-formal lecture methods through a learning process for farmer groups and composting techniques, farmer groups also learn about compost packaging techniques in 5 kg units.



**FIGURE 5.** Compost packaging and farmer groups participating in the activity

Compost processing can foster an entrepreneurial spirit and generate material profits if marketed well. Farmer groups can gain financial results so that farmer groups are more productive and have sustainability in the business they run. Apart from being financially profitable, the compost produced by farmer groups is applied back to the farmers' coffee fields which can increase the farmers' coffee productivity. The compost products produced and the stages of applying the compost to farmers' land are shown in Figure 6.



**FIGURE 6.** Compost products and applications to coffee fields

Measuring indicators of program success is carried out by the service team together with members of farmer groups and village officials directly at the PKM activity location. After the learning process with farmers, the service team monitors and evaluates conditions before and after the program is implemented.

## CONCLUSIONS AND RECOMMENDATIONS

Through training and assistance provided to farmer groups as partners in Community Service Activities (PKM), they can increase the managerial capacity of farmer groups and have awareness, insight, and skills in managing coffee plantations organically by producing organic fertilizer from coffee skin waste and utilizing the results. Organic fertilizer products on coffee plantations in a sustainable manner. Suggestions for further PKM activities include delivering material and practices regarding the use of agricultural waste to produce organic pesticides.

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