



# Empowering Farmer's Group in Increasing Avocado Seeds Through Grafting Technique and Using Organic Fertilizers in Watuaji Jepara Indonesia

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**Abstract.** Watuaji Village is a village that has the main natural product avocado, but a few farmers can reproduce the seeds of avocado. Some societies have wide land, and business cow farms or goat farms. Those livelihood societies are potential assets that can be managed and be objects of community empowerment programs. This study aimed to find the results and describe the effectiveness of the community empowerment program for the farmer's group in Watuaji village, Jepara, Central Java Indonesia. The program focuses on increasing avocado seeds and their quality through grafting techniques and using organic fertilizers. The method of community empowerment uses training with tutorials, accompaniment farmers in using grafting techniques for avocado and making organic fertilizers from cow dung, and evaluating programs. To collect data, this study used questionnaires, interviews, and observation. This study used descriptive analysis to describe the findings of this study. The results 80% of farmers of Watuaji village can practice the grafting technique for avocados, this technique aims to increase avocado seeds. And 75% of farmers can make organic fertilizers from cow dung to increase the quality of avocados in Watuaji. The results of evaluation of this program are 90% of participants evaluate that this program is very important and useful. The grafting technique and the use of organic fertilizers are effective strategies for increasing avocado quantity and quality in Watuaji. It indicated that this community empowerment program for farmers in Watuaji can be implemented properly, and support Watuaji as a center of various avocados and become a tourist village.

**Keywords:** Farmer, Grafting, Avocado, Organic Fertilizers.

## 1 Introduction

### 1.1 Background

Watuaji is one of the villages in the subdistrict Keling Regency Jepara. Jepara is an agricultural region, and the annual fruit and vegetable production in the last three years has been quite large. The five highest production results in 2022 are mangoes reaching 458,696, tangerines reaching 109,033, durian at 84,487, passion fruit at

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75,732, and avocados at 40,899. The product that has the highest selling power of the five types is Avocado [1]. Plantation areas in Jepara with great potential are in the northern part, one of which is Keling District. Based on the Jepara data figures, it is clear that products with high selling prices have the potential to become a source of business and economy for Jepara residents, but the amount of production tends to be minimal, such as avocados. One of the villages in Keling District that has great potential in developing avocados as a business for village farmers is Watuaji Village.

Watuaji Village has several potentials, ranging from large land, abundant water availability, large rivers, and areas that are classified as fertile. This is the main potential capital in developing a village [2]. Apart from that, Watuaji also has the potential of young people who are enthusiastic about advancing the village area. Many residents also started to continue their studies at the university level, and even the officials of Watuaji Village provided financial support or assistance for young people from Watuaji residents in continuing their higher education. This is related to efforts to prepare human resource readiness to support village progress [3]. Especially to reach the village to be a tourist village in Watuaji, though utilize the potential local product avocado in Watuaji.

The main natural product there is avocado with various types, such as avocado Miki ST. The majority of society in Watuaji village are farmers of avocado. The raw material for those avocado seeds came from the parent plant avocado seed. And little the farmers who focus on the multiplication of new plants of avocado. It caused the limitation of the availability of avocado seeds. Besides, some societies have wide land, and business cow farms or goat farms. Based on those conditions, those are potential assets that can be managed and be the object of the community empowerment program. The team community service of UNISNU and UMK runs a community empowerment program for farmer's groups in Watuaji village, Jepara, Central Java Indonesia.

Some scholars have researched avocados and plants with various approaches. Some of them focused on the potential benefits of avocado, such as the benefits of avocado leaf that can be a source of antioxidants [4], can be a diabetes medicine [5], as a beauty ingredient for preventing acne [6], lightening the skin [7]. Some scholars focused on the cultivation of avocados and other plants. Such as Septiadi analyzed the benefit of business on avocado cultivation, it is a potential product because avocado has many advantages and various nutrients for people [8]. Besides, some scholars who tried to make diversification product of avocado become a food, and a drink [9]. Thus, the uniqueness of this paper is to describe the program that focuses on community empowerment of society for increasing avocado seeds and controlling the quality through grafting techniques and using organic fertilizers.

## 2 Method

The method of community empowerment uses training with tutorials, accompaniment farmers in using grafting techniques for avocado and making organic fertilizers from cow dung, and an evaluation program uses an interview method. The participants of

the community empowerment program are informants of this research, several participants are forty people. This study was conducted in Watuaji village in Jepara, Central Java, Indonesia. The respondents were about forty farmers of avocado in Watuaji village. The population of this study is all farmers in Watuaji village, Jepara. And the sample is forty Avocado farmers in Watuaji Jepara. To collect data, this study used questionnaires, interviews, and observation. This study used descriptive analysis, to describe the findings of this study [10].

### 3 Results and Discussion

Participants of the community empowerment program are farmers of avocados in Watuaji village. The number of participants is forty farmers, and almost them are male. Their ages are various, some of them are up to fifty years old, others are forty years old, and also there are a young man about twenty-seven years old. Those various ages showed that the majority of society in Watuaji are farmers. They joined the training of scholars from Universitas Islam Nahdlatul Ulama Jepara and Universitas Muria Kudus. The main theme of the training is the grafting technique and how to make organic utilizers.

The first training was about the grafting technique on avocado plants with the tutorial method. The grafting technique is used because it has been proven to be effective [11]. The participants were taught about some steps in the grafting technique, and they also were accompanied to practice. The main point of the grafting technique is to prepare the lower plant seeds and prepare the upper part of the plant (entry) which will be connected to the rootstock stem. The first step, prepare the rootstock plants, namely avocado plant seeds are come from seed nurseries at 3-4 months old. Make sure that a rod with the same diameter is both the rootstock plant and the upper part of the plant. It caused the balance and effectiveness to make the cambium of the scion and rootstock meet each other [12]. The second step, prepare the scions obtained from parent avocado trees with superior, productive, healthy varieties and free from pest or disease attacks. Choose the main part of the mother tree in the form of a branch that doesn't grow at the end. Cut the selected scions, then throw away all the leaves.

In the fourth step, cut the rootstock tree into a medium section and split the rootstock about 2-2.5 cm with a cutter. In the fifth step, prepare the scion about 10-15 cm, and make an incision on the scion on the right and left sides to form a taper-like wedge. Then insert the scion on the rootstock, making sure that the cambium of the scion and rootstock meet each other and fastening it using plastic ice or grafting tape. If the grafting technique is successful, within 2 weeks new shoots will usually grow from the axils of the scion leaves. This technique was effective in reproducing the plants, as the findings of scholars who have practiced it in durian plants [13], and others [11].

After all participants practiced the grafting technique, they joined the second training. The second training is making organic fertilizers from cow dung, several steps of making organic fertilizer from cows are collecting and sorting cow dung from foreign objects such as stones, pieces of wood, and others. Then the step of composting of

cow dung. Firstly, prepare cow dung and other compost materials, then flush it with a starter over the cow dung and stir until well blended. Secondly, add enough water to the mixture, then stir and cover with a cover. Then the composting process is carried out on the third day, if it feels hot, then the composting process is taking place. The composting process lasts for 3 weeks. It related the findings of research that showed the longer composting process of organic fertilizer can impact the results will be more optimal [14]. After all, participants practiced the process of making a utilizer, they continued the composting process by themselves.

After 3 weeks the compost is ready, characterized by the compost material not being hot and not smelly. Those training and practicing the organic utilizer to empower the farmers can utilize cow dung and others. It is related to the effective impact of organic utilizers on the quality of plants and also its fruit [15]. Besides, it also has an economic benefit by making the utilizer a product that has the potential to be for sale to other societies.

The team of community service did the monitoring and evaluating process periodically. In the first evaluation to measure the success of the program, the team distributed questionnaires to participants to respond to the implementation empowerment program. The results of the responses of the participants as shown in Figure 1.

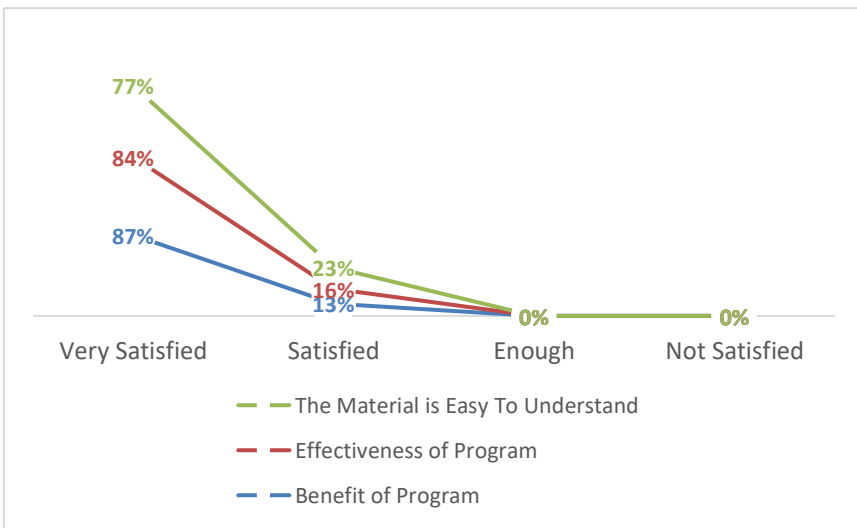


Fig. 1. The Picture of Results Evaluation Graphic

Figure 1 above shows that 87% of participants were very satisfied, and 13% were satisfied with the benefit of the program. The results of participants' responses about the effectiveness of the program showed that 84% of participants were very satisfied, and 16% satisfied. 77% of participants were very satisfied that the material was easy to understand, then 23% responded satisfied. It indicated that this community empowerment program was received by all participants and they were satisfied with the program.

Then the team also evaluated the results of avocado seeds and the organic fertilizer made by all participants. The results of the training and accompanying process showed that 80% of participants could practice the grafting technique for avocados. It showed from the results of avocado seeds which were growing well. This technique aims to increase avocado seeds. And 75% of participants can make organic fertilizers from cow dung to increase the quality of avocado in Watuaji. The results of avocado seeds and the organic fertilizer as shown in Figure 2.



**Fig. 2.** The results of avocado seeds and the organic fertilizer that were made by participants of a community empowerment program in Watuaji village

The results of evaluation of this program are 90% of participants evaluate that this program is very important and useful. The grafting technique and the use of organic fertilizers are effective strategies for increasing avocado quantity and quality in Watuaji village. It indicated that this community empowerment program for farmers in Watuaji can be implemented properly, and support Watuaji as a center of various avocados and become a tourist village.

## 4 Conclusion

The results 80% of farmers of Watuaji village can practice the grafting technique for avocados, this technique aims to increase avocado seeds. And 75% of farmers can make organic fertilizers from cow dung to increase the quality of avocados in Watuaji. The results of evaluation of this program are 90% of participants evaluate that this program is very important and useful. The grafting technique and the use of organic fertilizers are effective strategies for increasing avocado quantity and quality in Watuaji. It indicated that this community empowerment program for farmers in Watuaji can be implemented properly, and support Watuaji as a center of various avocados and become a tourist village.

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