

Technology Transfer and Good Manufacturing Practices for Robusta Coffee as a Leading Product of Educational Tourism in Wonodadi Village, Buayan District

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ABSTRACT

Forest Farmer Group (KTH) Tani Jaya is located at RT03 RW02 Blok Blanakan, Wonodadi Village, Buayan District, Kebumen Regency, Central Java, Indonesia. This farmer group manages a coffee plantation with Robusta coffee under a pine forest of seven hectares. Currently, KTH Tani Jaya's coffee production is 1000 kg per year and is sold exclusively to the local market in Kebumen Regency. The coffee products of KTH Tani Jaya had not met the quality and food safety standards since the coffee production used to be inconsistent. For example, the roasting results were found too burnt. The community service program aims to showcase the implementation of good manufacturing practices (GMP). The GMP technology transfer program should be carried out at KTH Tani Jaya to reduce the inconsistency in the quality of the coffee produced to compete in the market. The method used in this community service was training and guidance through pre-and post-tests. The pre-test results showed the farmers' knowledge and basic knowledge about good manufacturing practices were still limited, with a low average score in raw material control and documentation. After intensive training and guidance, the post-test results demonstrated that the participants had a significantly improved understanding of GMP, especially concerning the control and documentation of raw materials.



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1. Introduction

Forest Farmer Group (KTH) Tani Jaya is located in RT 03 RW02 Blok Blanakan, Wonodadi Village, Buayan District, Kebumen Regency, Central Java, Indonesia. This KTH manages a coffee plantation with Robusta coffee under a 7 Ha pine forest stand. KTH Tani Jaya coffee production is 1000 kg per year and is sold only at the local market in Kebumen Regency.

This potential makes Robusta coffee an important raw material that can be relied upon to improve the local economy [1]. With the development of the times and increasing public interest in hygienic and quality products, implementing Good Manufacturing Practices (GMP) in the production process of Robusta coffee has become very relevant and urgent [2].

Good Manufacturing Practices (GMP) is a system that ensures that products are consistently manufactured and controlled according to established quality standards [3]. As part of Robusta coffee production in Wonodadi Village, the implementation of GMP is intended to ensure that every stage of production, from the selection of coffee beans to processing and packaging, is carried out in a manner that meets health and food safety standards. This means that the Robusta coffee produced has a quality that is competitive in the national and international markets.

Technology transfer in implementing GMP is an attempt to improve the quality of Robusta coffee products and a strategic step to strengthen local communities. Through knowledge and technology transfer, coffee farmers in Wonodadi village will learn more efficient and modern production techniques. This capacity building is essential to ensure that the production process of Robusta coffee runs smoothly and consistently produces high-quality products.

Besides the production aspect, developing Robusta coffee as a high-quality product also opens opportunities for Wonodadi Village to develop the potential for educational tourism. This educational tourism can be a new attraction for the village, where tourists not only enjoy the natural beauty and rural atmosphere but also get to know the production process of Robusta coffee directly. In this way, Wonodadi Village can become known as a tourist destination that offers unique and educational experiences.

The development of educational tourism around Robusta Coffee is also expected to have a positive impact on the local economy. When tourists come to learn about and witness the coffee production process, the income of the village community can increase through various supporting activities such as providing private accommodation, cafes, and local coffee products. This improves the community's well-being and strengthens the identity of Wonodadi Village as an agricultural tourism village.

However, collaboration between the government, science, and communities is required to achieve this potential. The government should provide support through training, facilities and access to the latest technologies. At the same time, scientists can provide technical advice and research to ensure that the implementation of GMP and the development of educational tourism can proceed smoothly. The communities must strongly commit to learning and innovating to develop their Robusta coffee products.

Through technology transfer and proper implementation of GMP, Wonodadi Village Robusta coffee can become a premium product known for its quality and production process, including education and community empowerment. Wonodadi Village can become a successful example of village development based on local products and educational tourism, benefiting all its citizens.

2. Method

This community service methodology aims to measure the effectiveness of technology transfer to implement good manufacturing practices in Robusta coffee production in Wonodadi Village through a pre and post-test-based training and mentoring approach [4]. This methodology consists of several phases in which the community, especially coffee farmers, are actively involved to ensure that knowledge and technology transfer can occur effectively and sustainably.

1. Identification of participants and initial conditions (pre-test)

The first phase is to identify the participants involved in this non-profit program, namely coffee farmers in Wonodadi Village. After identifying the participants, a pre-test was conducted to measure their initial knowledge and skills regarding the Robusta coffee production process and GMP implementation. This pre-test included questionnaires and interviews on the participants' understanding of the GMP concept, the stages of the production process they are currently performing and the challenges they face.

2. Preparation of training material

Based on the pre-test results, the training module is prepared to meet the specific requirements of the participants. This module contains materials on GMP, standard-compliant Robusta coffee production techniques and case studies from other regions that have successfully implemented GMP. It also contains practical guidelines that will be used during the training.

3. Training and technical support

The next phase is intensive training of the participants. This training takes place in phases and includes direct demonstrations on-site. During the training, participants learn how to implement GMP in every phase of Robusta coffee production, from the selection of coffee beans to processing and packaging. In addition, technical support is provided on-site to ensure that participants can apply what they have learned in their daily production process.

4. Implementation and monitoring

After the training, participants are expected to implement GMP in their Robusta coffee production. The community services team will regularly monitor the participants' implementation of GMP and

provide further guidance if necessary. This monitoring aims to determine to what extent participants can successfully implement the technology and knowledge provided.

5. Evaluation and retest

After the implementation phase, a post-test was conducted to measure participants' knowledge and skills changes after training and mentoring. This post-test included the same questionnaires and interviews as the pre-test and direct observation of participants' Robusta coffee production practices. The post-test results were compared to the pre-test results to determine the extent of the increase in knowledge and skills.

6. Data analysis and reporting

Pre-test and post-test data were analyzed to determine the effectiveness of this community service program. The analysis was conducted by comparing the pre-test and post-test results and identifying factors contributing to the improvement (or lack thereof) in implementing GMP. The results of this analysis were then compiled into a report with findings, conclusions, and recommendations for the further development of the charity program.

7. Dissemination of results and recommendations

The final phase is the dissemination of the results of the community service to various stakeholders, including local governments, academics and coffee growers' organizations. This dissemination aims to communicate the program's success and challenges and recommend further development. Therefore, this community service method benefits Wonodadi Village and can be applied to other areas with similar potential.

The measuring instrument used in data collection is a pre-test and post-test questionnaire that has been tested with validity and reliability tests. Furthermore, the data is analyzed using descriptive statistics to compare the pre-test and post-test results.

3. Results and Discussion

Implementing the Technology Transfer Program to apply good manufacturing practices (GMP) in Robusta coffee production in Wonodadi Village, Buayan District, aims to improve product quality and empower local communities through education and direct practice. The pre-and post-test methods used in this program provide an overview of the effectiveness of the training and mentoring provided to coffee farmers in the village.

In the program's initial phase, a pre-test was conducted to measure basic knowledge and skills related to GMP [5]. The pre-test results showed that most participants had limited knowledge of GMP standards. Although farmers were familiar with coffee production activities, many did not understand the importance of raw material control and documentation, as shown by the average 60% and 40% scores in each production phase. The results of the analysis are shown in Figure 1.

The preliminary test also showed that most farmers used traditional methods in the production process of Robusta coffee that did not fully meet the quality standards expected by the modern market [6]. Issues such as lack of attention to equipment cleanliness and less hygienic packaging were the main findings that needed to be improved through this technology transfer program [7].

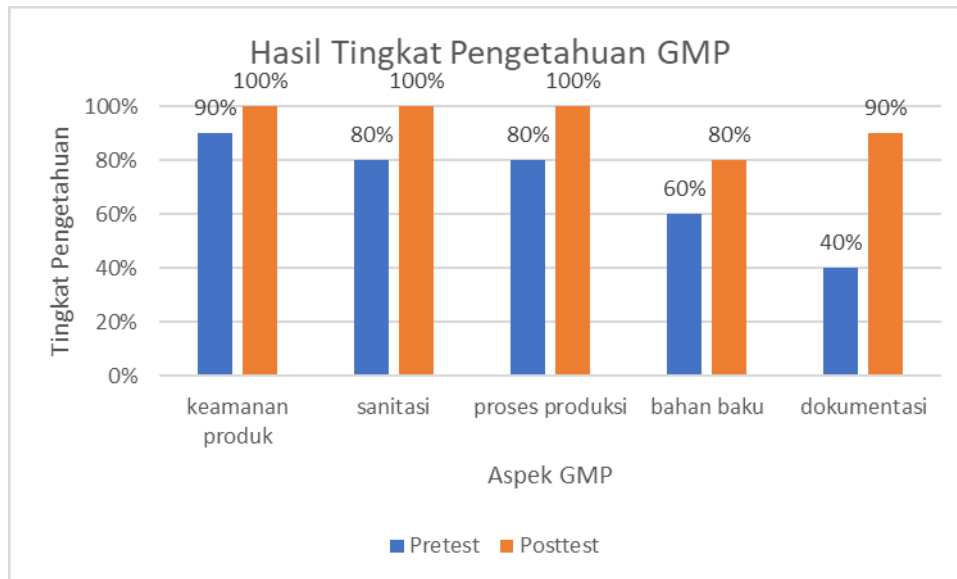


Fig. 1. Results of the analysis Knowledge level on GMP aspects before and after technology transfer

Training materials were developed based on the pre-test results to address the identified knowledge and skills gaps. The training included introducing the concept of GMP, standard-compliant production techniques for Robusta coffee, and direct field exercises. According to GMP principles, participants were instructed on performing each production stage, from coffee bean selection to drying and packaging.

Participants also received intensive technical support during the training process, as shown in Figure 2. This support was carried out to ensure farmers could apply GMP in their daily production activities [8]. The support team actively provided guidance, answered questions, and helped solve problems that participants encountered during the production process.



Fig. 2. Community Service Program

After the training period, a post-test was conducted to assess the extent to which the participants' knowledge and skills had improved after participating in the training and guidance. Figure 1 shows the post-test results, significantly improving the participants' understanding of GMP, especially raw materials and documentation. Most participants could explain and apply GMP concepts well in their daily practice.

A comparison of the results of the pre-test and the post-test showed that the average level of knowledge of the participants improved. Participants who previously did not understand the importance of checking raw materials and documentation now have a higher level of awareness and can apply the correct GMP steps at each production stage. This improvement not only affects the quality of Robusta coffee products produced but also the willingness of Wonodadi Village to develop educational tourism based on coffee production.

The consistent implementation of GMP has positively impacted the quality of Robusta coffee products from Wonodadi Village. The coffee products produced are cleaner, more consistent in taste and neatly packaged. This opens up opportunities for Robusta Coffee from Wonodadi Village to compete in a broader market, including domestic and international markets [9].

In addition, improving the quality of Robusta coffee production also supports the development of educational tourism in Wonodadi Village. Tourists visiting this village can enjoy the natural beauty and local culture and learn about the process of producing high-quality coffee. This program has helped position Wonodadi Village as a unique educational tourism destination, offering a hands-on learning experience from trained coffee farmers.

The success of GMP implementation in Wonodadi Village is supported by several factors, including the active participation of participants in every phase of training and resources, both human and financial, and mentorship, support from the local government represented by the Forestry Commission, Branch VIII, and Universitas Jenderal Soedirman, Purwokerto, Central Java in providing supporting facilities such as adequate production equipment and business stands as shown in Figure 3.



Fig. 3. Coffee Shop Products and Development in Tourist Locations

The technology transfer program to implement GMP in Robusta coffee production in Wonodadi village has shown positive results. The pre-and post-tests used in this program are evidence of the increase in participants' knowledge and skills after training and mentoring. This increase affects the quality of Robusta coffee products and supports the development of educational tourism in the village.

In order to maintain the sustainability of the program, it is recommended to provide regular training and develop more advanced production technologies. In addition, it is recommended that this service model be introduced in other villages with similar potential to provide more extensive benefits to rural communities in Indonesia.

4. Conclusion

Implementing the technology transfer program to apply good manufacturing practices (GMP) to Robusta coffee production in Wonodadi Village, Buayan District, has improved product quality and strengthened local communities. The pre-test results showed that the farmers' basic knowledge and skills on GMP were still limited, and they scored low on average in raw material control and documentation. After intensive training and support, the post-test results showed significantly improved participants' understanding of GMP, especially on raw material control and documentation. The implications of implementing GMP for coffee production in KTH Tani Jaya are that the coffee produced is safe for consumption, and its quality is guaranteed to compete in the market and increase the income of KTH Tani Jaya members. The research suggestion that can be done is to apply statistical quality control so that the quality of the products produced is always consistent with maintaining consumer loyalty.

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