

Appropriate Technology Innovation “Biopharmaka Grinder” as a Means of Optimizing the Economy of the Senduro Community Lumajang

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ABSTRACT

Lumajang Regency, Senduro District, East Java is famous as a center for the production of spices and herbs. Due to its abundant natural potential, various biopharmaceutical plants have been developed and are now major players in the local agricultural industry. The area is rich in natural resources, including vast agricultural lands and a climate that supports the cultivation of many medicinal plants. However, the challenge often faced by farmers is the lack of efficient processing equipment, which hinders the realization of the full potential of these biopharmaceutical components. Appropriate technological innovation The tool known as the “Biopharmaceutical Grinder” is intended to maximize the grinding of several biopharmaceutical raw materials, including spices, herbal plants, and other natural components. Biopharmaceutical Grinder can increase the output and market value of local goods by creating an instrument that is easy to use and friendly to rural communities. The creation and distribution of the Biopharmaceutical Grinder is expected to enhance Senduro's position as a center for biopharmaceutical processing in East Java and make it a model for other regions that want to utilize their natural resources in an environmentally responsible manner.

Keywords: Appropriate Technology Innovation, Biopharmaka Grinder, Herbal Plant Processing and Local Economic Sustainability.



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INTRODUCTION

The government's strong focus on the growth of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia is proof that the government is giving high priority to the growth of the MSME sector. This is understandable considering that MSMEs actually have a significant impact on the nation's economy—almost half of Indonesia's population makes a living in this industry.(Windusancono, 2021).

More than 64 million MSME units are spread across Indonesia, contributing more than 60% of the country's GDP and employing around 97% of the workforce, according to figures from the Ministry of Cooperatives and SMEs. In addition, MSMEs encourage economic equality for the community by providing business options to people in rural and remote areas, reducing their need to move to big cities to find work. The herbal medicine and beverage MSME sector is one sector that has a lot of potential but still receives a lot of attention. This industrial MSME is quite promising in Senduro Village, Lumajang Regency, East Java, because of the wealth of natural resources in the area and the long-standing habit of using herbal medicine to maintain a healthy lifestyle. This area is home to many medicinal plants, including kencur, ginger, turmeric, and other spices. These plants are used as the main raw materials for the production of herbal medicine products. This product is more than just a drink; it is part of the local culture because of the practice of consuming herbal medicine from generation to generation.(Serfiyani, Hariyani, & Serfiyani, 2020).

However, despite its enormous potential, the Senduro Village herbal medicine UMKM still faces a number of challenges that hinder the growth of its company. Limited production technology is one of the main issues. Processing raw materials is labor-intensive and slow due to the use of traditional manual production techniques. This has an impact on the quality of the products produced in addition to decreasing time efficiency. Herbal products made manually are often inconsistent in texture and quality, making it difficult to meet the standards of the larger market. In addition, UMKM can only serve local customers because of their limited ability to meet broad market demand due to poor production capacity. Marketing is another challenge that needs to be overcome. Marketing of herbal products produced by UMKM in Senduro Village is still limited to conventional methods and has a limited audience. UMKM has difficulty competing with similar products sold through e-commerce platforms due to lack of knowledge and application of digital technology. In today's digital era, a company's ability to market its products online is very important in determining its success, especially herbal products that have large local and international market potential.(Riswanto, Joko, Napisah, Boa, & Devy Kusumaningrum, 2024).

The right technological solutions and support for digital marketing are needed to address these issues. The "Biopharmaca Grinder" introduction program is an effort to help MSMEs diversify their herbal medicine product lines and improve the effectiveness and quality of herbal medicine manufacturing. Biopharmaceutical Grinder is a state-of-the-art device specifically designed to facilitate the grinding of herbal ingredients to produce higher quality and reliable products. In addition, this program also provides marketing support through social media and e-commerce, as well as training in making new products such as ginger simplicia with the aim of increasing the market reach of MSMEs. This technological advancement is expected to make MSMEs in Senduro Village more competitive and able to develop their markets. In addition to increasing the income and productivity of MSMEs, this initiative will help the welfare of the community in general. This strategy has the potential to be a model for the growth of other MSMEs in the herbal medicine industry, which will ultimately improve Indonesia's position as one of the leading producers of herbal products in the world.

METHODS

This study uses secondary data, namely data collected randomly within a specified period of time and in line with the issue of cognitive conflict. It can be found online, in scientific publications, books, research results, and other sources. After being collected, the data is checked(Rachmawati & Supardi, 2021). Descriptive research is this type of research. Research with a descriptive focus seeks to collect data about the state of a phenomenon that exists, especially the symptoms that exist at the time the research is conducted. Descriptive research focuses on describing "what is" about a characteristic, symptom, or condition rather than testing a particular hypothesis. Although not always the case, descriptive research sometimes seeks to prove the claim.

Data Collection Techniques To obtain the data needed in this study, the researcher used the following methods:

1. Interview
(Sugiyono, 2017), Interviews are used as a data collection method when researchers want to find out more in-depth information about respondents and when researchers want to conduct initial studies to identify problems that require further investigation.
2. Documentation
(Hasan, 2022), The process of producing different documents using proper evidence obtained from records from several sources is called documentation. Also, the effort to capture and organize data in the form of written words, images, and videos is called documentation. You must have a location or space where documents can be stored to handle this data.
3. Observation
(Prawiyogi, Sadiah, Purwanugraha, & Elisa, 2021), observation or what is also called observation includes the activity of paying attention to an object using all the senses, so observation is a method of collecting data using the five senses accompanied by detailed recording of the research object.

RESULTS AND DISCUSSION

The Biopharmaceutical Grinder technology innovation initiative implemented in Senduro Village, Lumajang, aims to address three major issues faced by local MSMEs: inadequate marketing, lack of innovative products, and production constraints. Through the development of innovative new products, e-commerce optimization, and appropriate technical techniques, this curriculum offers practical answers.

Solutions that can be provided to support economic optimization in Senduro are:

1. Solutions in the Production Field: Implementation of Biopharmaceutical Grinder
Before this program was implemented, the manual technique of making herbal drinks such as syrup and instant ginger produced products with varying quality and took quite a long time. Because they were only able to create in small quantities, craftsmen were often unable to meet demand. Solutions in the Field of Product Innovation: Ginger Simplisia. This initiative presents innovation in the form of Simplisia Jahe or dried ginger that can be further processed for various needs, such as raw materials for herbal medicine and other traditional medicines, as a means of product diversification. Longer shelf life and greater market potential are two advantages of simplisia ginger, especially in the health and beauty sectors.
2. Marketing Solutions: E-commerce Optimization
Before this initiative, the only way to sell "Kartika Sari" UMKM goods was through direct sales at home or consignment of products at a nearby store. To prevent a large increase in sales turnover, this strategy limits the market.

In optimizing the economy through appropriate Biofarmaka Grinder technology in Senduro, several studies were conducted, including:

1. Product Innovation Training and Mentoring
2. E-commerce Marketing Training and Mentoring
3. Handover of Ginger Production Optimization Tools (Syrup, Instant, Rhizome)

With the presence of technology Biopharmaceutical Grinder is expected to facilitate increased productivity and efficiency in making herbal drinks when equipped with the right technology. In addition, it can increase digital marketing through e-commerce and create a new product called "Simplisia Jahe". This activity is expected to strengthen the local economy by creating new markets and generating more income. In this activity, the purpose of training and product innovation support is to improve partners' ability to develop new products such as "Simplisia Jahe" and improve the quality and variety of products available. Partners receive support in managing innovation efficiently

so that they can expand their marketing reach and become more competitive in the market.



Figure 1. Product Innovation Training and Mentoring

Source : Privat Collection

Training and mentoring in e-commerce marketing includes providing partners with instructions on how to use digital platforms such as Facebook and WhatsApp Business for online product promotion. Among these activities is e-commerce optimization, where partners receive training on managing social media accounts, creating content, and reaching out to clients through buying and selling groups. To ensure that partners can implement their own digital marketing plans, support is provided periodically.



Figure 2. E-commerce Marketing Training and Mentoring

Source : Privat Collection

Its function is to expand market reach, increase sales, and make marketing more efficient. With digital marketing, partners can reach more consumers effectively, increase competitiveness, and reduce traditional marketing costs.

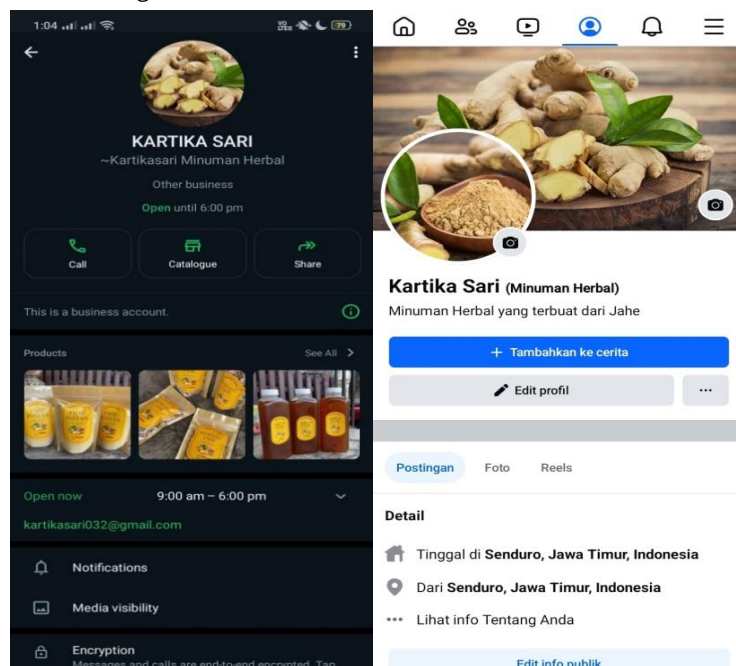


Figure 3. E-commerce

Source : Privat Collection

To indicate the achievement of the desired thing. Indicators are a reference in achieving target goals. Indicators are used to find out progress in achieving something. Indicators are a sign of achieving a goal. Here are some expected indicators:

Table 1. Indicators

Expected Indicators	Before	After
Increase in Production Amount	Ginger production (syrup, instant, and simple) is still limited and depends on manual labor.	There was a significant increase in the number of ginger products (syrup, instant, and rhizome) produced by partners after using the tool.
Product Quality Improvement	Product quality is inconsistent and often varies between production batches.	Better and more consistent quality standards compared to previous manual methods.
Shorter Production Time	Production time is quite long because the entire process is done manually.	The reduction in production time required to produce ginger products, indicates efficient use of equipment.
Increase Sales Turnover	Sales are not optimal due to limited production capacity and product quality.	Increased sales due to increased production capacity and product quality.

These indicators are expected to be a driver for the community in optimizing the economy through appropriate technology Biofarmaka Grinder in Senduro. Efforts to realize this, the Community Service Team for Beginners of the Widya Gama Lumajang Institute of Technology and Business handed over ginger production optimization tools (syrup, instant, rhizome) with partner Kartika Sari in Senduro.



Figure 4. Handover of Ginger Production Optimization Tools (Syrup, Instant, Rhizome)
Source : Privat Collection

In this activity, business partners will receive Biopharmaceutical Grinder equipment used to process ginger into syrup products, instant ginger, and rhizomes. To increase yields, partners receive instructions on how to use and maintain the equipment when the equipment is delivered. This aims to make this instrument able to take over the role of tiring and uncertain manual processes so as to produce a faster and more effective production process. The provision of this equipment aims to increase production efficiency by accelerating the ginger processing process and increasing its quality and capacity. This technology helps partners meet increasing market demand by enabling them to create goods in greater quantities and of higher quality. In addition, by using relevant technology more effectively, this activity also helps partners reduce production costs.



Figure 5. Innovation of Appropriate Technology Biopharmaceutical Grinder
Source : Privat Collection

By implementing the Handover of Ginger Production Optimization Tools (Syrup, Instant, Rhizome) as proof of the implementation of economic optimization in Senduro, the output that the team expects is an increase in herbal drink production through the use of Biofarmaka Grinder and the development of new products such as ginger simplicia. In addition, digital marketing through e-commerce is expected to increase partner sales turnover.

CONCLUSION

The technological innovation initiative in accordance with the Biofarmaka Grinder has contributed to increasing the production and quality of Senduro herbal products. Compared with the previous manual process, the use of this equipment makes the production process more efficient and produces goods that meet higher quality requirements. In addition, by utilizing ginger simplicia, this discovery expands market prospects and diversifies product lines, especially in the health and beauty sector.

In the marketing industry, corporate partners have significantly increased market exposure and revenue by maximizing e-commerce using digital platforms such as Facebook and WhatsApp. Businesses today can become more competitive by implementing digital marketing technology, which also facilitates wider product marketing. Overall, these efforts not only increase product output and quality but also help local communities become more economically independent. The economy of Senduro Village residents can become more advanced and sustainable by utilizing digital marketing, product diversity, and technological innovation.

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