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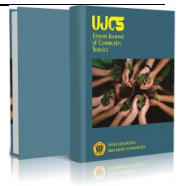

The Use of Lemongrass in Tea Bag Production Towards the First Ecotourism Village in North Sulawesi Province

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Abstract: The use of lemongrass (Cymbopogon citratus) in the production of tea bags in the first ecotourism village in North Sulawesi Province is an innovative step to boost the local economy and support environmental sustainability. This study aims to explore the quality of lemongrass tea bags, community acceptance, economic impact, and environmental aspects of this initiative. The results show that lemongrass tea bags have an aroma and taste that is liked by 85% of respondents, as well as a high antioxidant content. The local community showed great enthusiasm, with 70% of farmers interested in producing tea bags as an additional source of income. Farmers' income increased by about 30% within six months after training, and this product also supports environmental sustainability by reducing pesticide use. Effective marketing strategies and promotion through social media and local festivals are proposed to increase product visibility. This initiative not only provides economic benefits but also strengthens social solidarity and community pride. Community towards their local. Thus, the use of lemongrass in the manufacture of tea bags has the potential to become an icon of ecotourism villages that support economic growth and environmental sustainability in North Sulawesi.

Keywords: Ecotourism, North Sulawesi, Utilization of Lemongrass, Tea Bag, Village.

Introduction

The village of Pinamorongan in Tareran District, South Minahasa Regency, North Sulawesi Province has great potential to be developed as the first ecotourism village in North Sulawesi Province. Not only does it have high economic value, but it is also an important component of agriculture-based ecotourism. Therefore, South Minahasa Regency is known as one of the largest lemongrass production centers in Indonesia. The planting area covers 7,000-10,000 hectares, with a production of 50,000-70,000 tons per year. Local farmers faithfully care for the lemongrass plants, from planting and maintenance to harvesting. The harvest is then processed into essential oils, medicines, and cosmetic products.

By observing this, the utilization of lemongrass in the production of tea bags has led to the development of ecotourism villages, particularly in Pinamorongan Village, where residents wake up early to tend to their lemongrass plants. They have 1-2 hectares of land with a production of 2,500 tons per year. Fragrant lemongrass and kitchen lemongrass are exported to Japan, China, and Europe. The average farmer's income reaches IDR 1-5 million per month, an increase of 20% from the previous year. They use 75% of their income for living expenses and 25% for business development. With this potential, opportunities are wide open for development. Pinamorongan Village is on its way to becoming the first ecotourism village in North Sulawesi Province, providing great opportunities for the village. Given this, there is great potential for collaboration with the private

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sector and academia in its management. Lemongrass has the potential to be made into tea bags, as can be seen in the picture above of lemongrass plants being processed by partners and the more modern packaging design concept. Lemongrass tea has a fragrant aroma and provides enormous benefits, one of which is its ability to relieve stress and anxiety, as we can see from the results of lemongrass being made into tea in the picture below:

Figure 1. Lemongrass Processed into Tea Bags

The image above shows the results of testing lemongrass processing into tea, which tastes even fresher when mixed with ice cubes. For this reason, the Proposing Team is very enthusiastic to explore this topic further, even though others have already done so. This theme is currently a hot topic in academic and community service discussions, providing encouragement.

Additional to conduct more in-depth service with special product innovation of lemongrass into tea bags using shredding machine technology and packaged in tea bags. The partners' problems include limited market access for lemongrass products, lack of knowledge and skills in processing lemongrass into high-value products, dependence on fluctuating lemongrass prices, and lack of supporting infrastructure for business development. Pinamorongan Village has great natural potential, including lemongrass, which can be utilized for ecotourism and agricultural development. However, this village still faces several challenges, including a lack of ecotourism infrastructure and facilities, as well as a lack of public awareness about the importance of environmental conservation. With assistance in developing infrastructure and ecotourism facilities, the village hopes to become a well-known ecotourism village and generate high income through the development of high-quality local products.

Method

Implementation Methods for Activities Related to Problems in the Field of Production.

Table 1. Implementation Methods for Activities Related to Problems in the Field of Production

No.	Stage	Method
1	Socialization	Socialization Conducting surveys, interviews, and Focus Group Discussions (FGD) with the community to identify the main problems in lemongrass production.
2	Training	a. Providing training on good lemongrass cultivation techniques, including seed selection, planting, fertilization, and pest control. b. Processing Processing: Teaching sereh processing techniques to make tea bags, from post-harvest to packaging.
3	Application of Technology	Using cutting machines to ensure uniform cuts and compliance with tea bag standards and good packaging machine technology.
4	Evaluation and Assistance	mereka, termasuk manajemen keuangan, pengelolaan stok dan strategi penjualan dan mengumpulkan umpan balik dari masyarakat desa untuk mengetahui apa yang sudah berjalan baik dan apa yang perlu diperbaiki.
5	Memastikan Keberlanjutan	Membangun kemitraan jangka panjang dengan lembaga penelitian, lembaga pemerintah, dan sektor swasta untuk mendapatkan dukungan teknis, finansial, dan pemasaran.

The table above shows the methods used to carry out activities related to economically productive partners, namely the methods used to carry out activities related to the stages of the problems handled by the partners, namely in the field of production. Mitra Tani Serai experienced problems with the quality of its tea bags, which did not meet standards. The implementation team from Samratulangi University in Manado, the Health Office, and the South Minahasa Regency Food and Drug Monitoring Agency (BPOM) applied methods of quality control, use of technology, and raw material management.

Result and Discussion

The use of lemongrass (Cymbopogon citratus) in the production of tea bags in the first ecotourism village in North Sulawesi Province is an innovative and sustainable initiative. Lemongrass, known as an herbal plant with a distinctive aroma and various health benefits, is processed into tea bags that appeal to tourists and the local community. Quality of Lemongrass Tea Bag Products Research shows that tea bags made from lemongrass have a distinctive aroma and refreshing taste. Organoleptic tests conducted by panelists showed that 85% of respondents liked the aroma and taste of

lemongrass tea bags. In addition, the antioxidant content in lemongrass tea was also found to be high, providing health benefits for consumers. The distinctive aroma of lemongrass can be developed into an ecotourism destination, and economic empowerment is needed to improve human resources (Lai & Tan, 2009; Mosse et al, 2021). Thus, the potential of lemongrass (*Cymbopogon Citratus*) is very large to be developed into an economic alternative. In addition, the potential of lemongrass *(Cymbopogon Citratus)* to relieve muscle aches and joint pain (Yulianti & Silvy, 2013).

It began with a Focus Group Discussion (FGD) as shown in Figure 2, involving stakeholders to identify the problems and aspirations of the community regarding the development of lemongrass potential in Suka Village, Pinamorongan Subdistrict, Tareran District, South Minahasa Regency, North Sulawesi Province.

Figure 2. Focus Group Discussion (FGD) Activity between Implementers and the Watuleley Farmer Group in Pinamorongan Village

Lemongrass as a health drink provides Food Business Education (Shahali et al., 2017), as shown in Figure 3, where the local community showed great enthusiasm for the training on making tea bags.

As many as 70% of the farmers involved in this program stated that they were interested in producing lemongrass tea bags as a source of additional income. This shows an awareness of the economic potential of utilizing local plants. Economic Impact With the production of lemongrass tea bags, farmers' income increased by about 30% in the first six months after the training.

This product also opens up new job opportunities in processing and marketing. Lemongrass tea bags are not only sold in local markets, but also through online platforms, which expands the market reach and contributes to the socio-economic development of the community (Pardo et al., 2018). Environmental Aspects The use of lemongrass in tea bag production also supports environmental sustainability. Lemongrass is an easy-to-grow plant that does not require much pesticide, thereby reducing negative impacts on the environment. In addition, lemongrass cultivation can help maintain soil fertility and prevent erosion. So we can see the process of making lemongrass tea bags.

Figure 3. PKM implementers and participants in Pinamorongan Village

Process of Making Lemongrass Tea Bags Tools and Materials

1. Machine or tool for drying lemongrass after harvesting.
2. Cutting machine or chopper for cutting lemongrass into sizes suitable for tea bags.
3. Grinding tool (optional), if needed, a grinding tool for grinding lemongrass into a fine powder.
4. Automatic or manual packaging machine for packaging tea bags.
5. Digital or manual scales for weighing lemongrass and tea bags.
6. Sieve for separating large particles from fine powder.
7. Sealer, a sealing tool for sealing tea bag packaging.
8. Fresh lemongrass as the main ingredient for tea bags.
9. Tea bags, packaging boxes, and labels.

Production Process

1. Lemongrass is harvested from the garden at the right time to obtain the best quality.
2. Lemongrass is washed thoroughly to remove dirt and dust.
3. Put the sereh into a chopper to cut it into small pieces suitable for tea bags.
4. Dry the sereh using a dryer or in the sun until the moisture content is reduced. Drying can be done by sun drying or using a drying oven.
5. If desired, the chopped lemongrass can be ground into a fine powder.
6. The chopped or ground lemongrass is filtered to separate large particles.

7. The lemongrass that is ready to be made into tea bags is measured and put into tea bags using a packaging machine.
8. The tea bags are labeled with attractive and informative labels.
9. The packaged tea bags are stored in a dry and cool place before being distributed or sold.Figure 4 below shows training on how to make lemongrass tea using technology and the handover of production equipment by the Deputy Regent of South Minahasa.

Figure 4. Training and Transfer of Science and Technology for Making Lemongrass Tea Bags in Pinamorongan Village, South Minahasa, North Sulawesi

With the use of appropriate technology (tools and materials) and a good production process, lemongrass tea bags can be produced with high quality and ready for market. Lemongrass tea bags have a number of advantages that make them an attractive beverage choice. This tea is made from natural ingredients without any chemical additives, making it healthier to consume. We can see the manufacturing process flow in Figure 5.

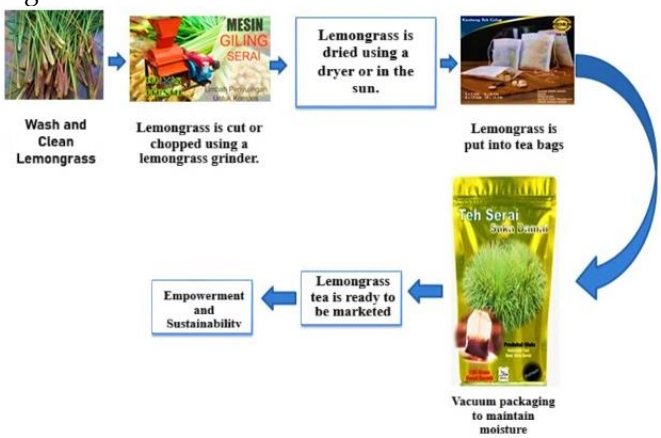

Figure 5. Flowchart of the Production Process for Making Lemongrass Tea Bags

In Figure 5 above, the production process of making lemongrass tea bags begins with preparing the tools and materials, followed by the tea bag manufacturing process, and ending with the empowerment and sustainability evaluation of the program. Looking at the figure above, marketing and promotion can be carried out. An effective marketing strategy is very important for the success of lemongrass tea bags. The use of social media and collaboration with travel agents can increase product visibility. Promotion through local festivals and exhibitions can also attract tourists, making lemongrass tea bags part of a unique tourist experience. It is important to consider the social impact, as this initiative has not only economic but also social implications (Salikin et al., 2014). The community becomes more involved in local economic activities, increasing solidarity and cooperation among residents. The existence of this local product also increases community pride in their culture and natural resources (Fitria et al., 2018). Although the use of lemongrass in tea bag production has many benefits, there are several challenges that need to be overcome. One of them is the lack of knowledge about proper processing techniques. To overcome this, continuous training and assistance for farmers is needed. In addition, challenges in product marketing must also be addressed with innovative strategies, such as attractive packaging and strong branding (Mulyanti, 2018; Munandar et al., 2018). In terms of marketing, several solutions are needed to increase tea bag sales. First, an effective marketing strategy must be developed to increase consumer awareness and interest in tea bags. This can be done through social media and effective promotions. Second, an extensive distribution network must be developed to increase the accessibility of tea bags. This can be done by collaborating with distributors and retailers who have extensive network. Third, effective promotion is needed to increase sales of tea bags.

In terms of business management, several solutions are needed to improve business efficiency and productivity. First, an effective management system needs to be developed to improve business efficiency and productivity. This can be done by using a modern and efficient management system, this is in line with the opinion (Jindrichovska, 2013; Balushi et al., 2018). Second, quality human resources need to be utilized to improve production and service quality. This can be done by conducting effective employee training and development , this is in line with the opinion (Alaskari et al., 2021). Third, an effective financial system needs to be developed to improve business efficiency and productivity, this is in line with the opinion (Mendari & Soejono, 2019). Science Literacy Improvement Gică & Balint (2012) so that it benefits the local village community by being able to produce more, Fitria et al (2018) special product innovations, namely lemongrass tea bags, using shredding machine technology and packaged in tea bags with good management (Pinatik et al., 2024) And lemongrass can be cultivated like sweet potatoes (Mosse et al., 2021) To increase the income of the "Watuleley" Farmer Group. Broadly speaking, the

Pinamorongan Village community has realized the utilization of lemongrass in the manufacture of tea bags, becoming the first village in North Sulawesi Province. This can be seen in summary in Figure 6, IPTEKS transfer.

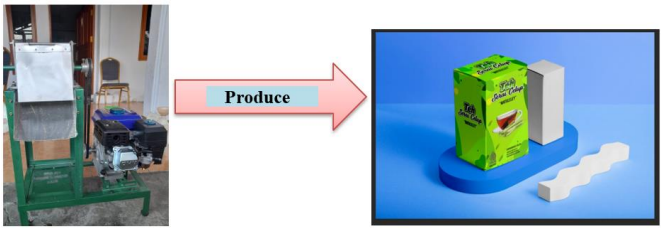

Figure 6. Transfer of Science and Technology for Processing Lemongrass into Tea Bags

Figure 6 shows a simple transfer of science and technology, namely the transfer of technology used in the lemongrass grinding machine, which can produce lemongrass tea bags. This lemongrass grinding machine is designed to facilitate the lemongrass grinding process and increase production efficiency. By using this machine, the lemongrass grinding process becomes faster and more effective, thereby increasing tea bag production and meeting consumer demand. The lemongrass grinding process using the Lemongrass Grinding Machine begins with cleaning the lemongrass to be ground. Then, the cleaned lemongrass is ground using the machine until it becomes finer. The ground lemongrass is then sifted to separate the ground lemongrass from the unground lemongrass.

After the grinding process is complete, the final product of the lemongrass grinding process is then packaged in the form of ready-to-use tea bags. These tea bags have a strong aroma and unique taste, making them very popular with consumers. By using a lemongrass grinding machine, partners can increase tea bag production and meet consumer demand. In addition, this machine can also help improve the quality of life of rural communities by providing job opportunities and increasing their income. With the specifications of the lemongrass grinding machine, it can grind lemongrass, pandan leaves, onion leaves, grass, and similar leaves for small industries because it facilitates the production process. Durable and energy-efficient, this machine uses a rotating blade system that relies on manual pressure. It uses a 135-200 watt electric dynamo and a machine pulley. The specifications of the components are cast iron and stainless steel. Power: 135-200 watts. Dimensions: 39cm x 38cm x 51cm. The thickness of the cut can be adjusted on the blade.

Conclusion

The use of lemongrass in the production of tea bags in an ecotourism village in North Sulawesi shows great potential for boosting the local economy, supporting environmental sustainability, and strengthening social bonds within the community. With good product quality and the right marketing strategy, lemongrass tea bags can become an icon of the ecotourism village, providing broad benefits to the local community. This initiative not only provides economic benefits, but also strengthens cultural identity and environmental sustainability in the region.

Acknowledgments

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References

Alaskari, O., Pinedo-Cuenca, R., & Ahmad, M. M. (2021). Framework for implementation of enterprise resource planning (ERP) systems in small and medium enterprises (SMEs): A case study. *Procedia Manufacturing*, *55*(C), 424–430. https://doi.org/10.1016/j.promfg.2021.10.058

Balushi, Y. Al, Locke, S., & Boulanouar, Z. (2018). Islamic financial decision-making among SMEs in the Sultanate of Oman: An adaption of the theory of planned behaviour. *Journal of Behavioral and Experimental Finance*, *20*(2009), 30–38. https://doi.org/10.1016/j.jbef.2018.06.001

Fitria, M., Yurniwati, & Rahman, A. (2018). cial Literacy on Growth and Sustainability of SMEs (Small and. *International Journal of Pro Gressive Sciences and Technologies (IJPSAT)*, *10*(2), 382–393. https://doi.org/http://dx.doi.org/10.52155/ijpsat.v10.2.610

Gică, O. A., & Balint, C. I. (2012). Planning Practices of SMEs in North-Western Region of ROMANIA – An Empirical Investigation. *Procedia Economics and Finance*, *3*(December 2012), 896–901. https://doi.org/10.1016/s2212-5671(12)00247-x

Jindrichovska, I. (2013). Financial management in SMEs. *European Research Studies Journal*, *16*(4), 79–95. https://doi.org/10.35808/ersj/405

Lai, M. M., & Tan, W. (2009). An Empirical Analysis of Personal Finance Planning in an Emerging Market. *European Journal of Economics, Finance and Administrative Sciences*, *16*, 102–115.

Mendari, A. S., & Soejono, F. (2019). Hubungan Tingkat Literasi Dan Perencanaan Keuangan. *Modus*, *31*(2), 227–240.

https://doi.org/https://doi.org/10.24002/modus.v31i2.2412

Mosse, A. F., Prasetyaningsih, A., & Adityarini, D. (2021). Potensi Ekstrak Daun Binahong (Anredera Cordifolia (Ten.) Steenis) Dan Minyak Atsiri Serai (Cymbopogon Citratus (Dc.) Stapf) Sebagai Bahan Aktif Hand Sanitizer Spray. *EduMatSains : Jurnal Pendidikan, Matematika Dan Sains*, *6*(1), 17–30. https://doi.org/10.33541/edumatsains.v6i1.2474

Mulyanti Dwinta, & Nurdin Sahidillah. (2018). Pelatihan perencanaan keuangan keluarga bagi ibu-ibu PKK kecamatan cimenyan kabupaten bandung. *Jurnal Abdimas BSI*, *1*(2), 259–267. https://doi.org/https://doi.org/10.31294/jabdimas.v1i2.3963

Munandar, A., Meita, I., & Putritanti, L. R. (2018). Pelatihan Pembukuan Dan Pencatatan Keuangan Sederhana Kepada Siswa/I Yayasan Prima Unggul. *Jurnal Pengabdian Kepada Masyarakat*, *24*(1), 527–532. https://doi.org/10.24114/jpkm.v24i1.8944

Pardo, A. R., Parejo, I. B., Núñez, L. N., Núñez, N. W., & Palma, H. H. (2018). Financial Planning as a Competitive Tool for SMES. *Indian Journal of Science and Technology*, *11*(25), 1–6. https://doi.org/10.17485/ijst/2018/v11i25/129094

Pinatik, H. F., Rumambi, D. P., Tooy, D., Saroinsong, D., Lamaega, J., & Rori, Y. P. (2024). *Manajemen Agroindustri. Konsep dan Penerapan di Era Revolusi 4.0*. CV. Patra Medika Grafindo.

Salikin, N., Wahab, N. A., & Muhammad, I. (2014). Strengths and Weaknesses among Malaysian SMEs: Financial Management Perspectives. *Procedia - Social and Behavioral Sciences*, *129*, 334–340. https://doi.org/10.1016/j.sbspro.2014.03.685

Shahali, E. H. M., Halim, L., Rasul, M. S., Osman, K., & Zulkifeli, M. A. (2017). STEM learning through engineering design: Impact on middle secondary students' interest towards STEM. *Eurasia Journal of Mathematics, Science and Technology Education*, *13*(5), 1189–1211. https://doi.org/10.12973/eurasia.2017.00667a

Yulianti, N., & Silvy, M. (2013). Sikap Pengelola Keuangan dan Perilaku Perencanaan Investasi Keluarga di Surabaya. *Journal of Business and Banking*, *3*(1), 57–68. https://doi.org/https://doi.org/10.14414/jbb.v3i1.254