

Greenking: Socio-Agropreneur Education to Realize a Sustainable Circular Economy Through the Management of Durian Fruit and Waste into Ecological Products

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ABSTRACT; Pakis Village, Panti District, Jember Regency, has abundant durian agricultural potential, but its utilization is still limited to fresh fruit sales and direct consumption. This condition creates a problem of durian waste that has not been optimally managed, so that circular economy-based innovation is needed. This study aims to develop a socio-agropreneur education model through the Village Student Program to improve community skills in processing durian fruit and waste into ecological products with market value. The study was conducted offline in Pakis Village, involving 25 PKK members as strategic partners. Data were collected through participatory observation, interviews, and documentation of the training process. The results of the activity showed that the community was able to produce several ecological products, including briquettes from durian skin, milk from durian flesh, and ladrang and basreng from durian seeds. This activity has proven effective in increasing creativity, independence, and economic opportunities for the community. Socio-agropreneur education has the potential to be a sustainable strategy in developing a circular economy based on local potential.

KEYWORDS: Sosio Agropreneur, Ekonomi Sirkular, Pengelolaan Limbah Organik, Durian (Buah dan Limbah), Produk Ekologis

I. INTRODUCTION

Durian is a popular fruit in Indonesia, often referred to as “The King of Fruit.” It belongs to the *Bombacaceae* family and is widely cultivated in tropical regions (Asminah et al., 2023). One of the prominent durian-producing areas is Pakis Village, located in Panti Subdistrict, Jember Regency, which possesses significant potential in durian farming with more than 9,000 durian trees spread across household yards and forest areas. Durian is well known for its distinctive taste and aroma, and it contains essential nutrients required by the human body, such as carbohydrates, fats, proteins, fiber, vitamins (vitamin C and B-complex), minerals, antioxidants, and other bioactive compounds, as well as water (Wulandari et al., 2024). This potential has established Pakis Village as a renowned “Durian Village” and the primary source of livelihood for its community. However, the utilization of durian harvests remains limited to fresh fruit sales and direct consumption, without further processing, thereby reducing the opportunity to maximize the added value of the products.

One of the natural potentials in Pakis Village is the abundance of durian trees. Based on observations and interviews with the village head and local residents, the majority of the community earns their livelihood as durian traders. The high demand for durian generates considerable profit, and many visitors come to Pakis Village to enjoy the fruit’s delicacy at affordable prices. However, durian waste has not been properly managed by the local community. Interviews revealed that some residents dispose of the waste indiscriminately into rivers or surrounding environments, while others burn it to reduce its volume. Although the large quantity of durian provides economic benefits, it also creates problems related to waste generation (Sugeng et al., 2021). The accumulation of waste often leads to unpleasant odors, environmental pollution, and the proliferation of pests (Masrifah et al., 2021). These issues arise primarily because the community lacks sufficient knowledge and skills in processing durian waste into high-value products.

Socio-agropreneurship education is an initiative to promote rural community independence in entrepreneurship by emphasizing the utilization of organic resources that can be reproduced into ecological products with marketable value (Novikarumsari et al., 2022). Ecological products are processed with careful consideration of environmental impacts, ranging from raw materials, production processes, distribution, to packaging (Savitri & Marlana, 2023). Socio-agropreneurship education provides an appropriate solution for the Pakis Village community to understand and implement efforts in processing durian fruit and its waste into innovative and environmentally friendly ecological products, thereby fostering a sustainable circular economy. This program not only focuses on product processing but also offers training in product packaging to ensure an attractive presentation and higher

Greenking: Socio-Agropreneur Education to Realize a Sustainable Circular Economy Through the Management of Durian Fruit and Waste into Ecological Products

market value. The urgency of socio-agropreneurship education lies in its role in equipping the community with practical skills to creatively and sustainably process and package durian-based products. This community service activity ultimately aims to enhance community skills in realizing a sustainable circular economy through the utilization of durian fruit and waste as the basis for ecological products.

II. METHOD

The implementation of this community service program was carried out fully offline in Pakis Village, Panti Sub-district, Jember Regency, which is one of the fostered villages of the University of Jember. The face-to-face approach was intended to optimize the achievement of the program's planned targets. The implementation of the program consisted of three main stages, namely:

a. Pre-Program

In the initial stage, a team was formed consisting of students from Science Education, History Education, International Relations, and Agrotechnology. Following the team formation, supervision and coordination were provided by academic supervisors from the Department of Science Education, Faculty of Teacher Training and Education. The team conducted discussions to determine the target community and identify existing problems. The results of these discussions indicated that Pakis Village, located in Panti Sub-district, Jember Regency, was selected as the partner village.

b. Program Implementation

The implementation stage began with field observations and interviews with the village head and local authorities to identify potentials and challenges. This was followed by program planning and obtaining approval and support from village stakeholders. Once permission was granted, the program was executed through socialization activities aimed at raising awareness among the villagers about the importance of durian fruit and waste management as part of sustainable circular economy practices. These activities were conducted directly in the village. Subsequently, training sessions were organized to build the community's technical capacity in processing durian into value-added products. The training covered four main products: briquettes from durian husks, milk from durian flesh, and snacks from durian seeds such as ladrang and basreng. Weekly monitoring and evaluation were also conducted to track the progress of ecological product processing from durian fruit and waste.

c. Pasca Program

Through the community service and mentoring activities that had been carried out, it was expected that Pakis Village would gain long-term benefits for continuous development. In addition, the program produced academic outputs for the student team, including final reports and scientific articles to be published in community service journals, as well as simple intellectual property rights (IPR) registrations, serving as references for future research and community programs. The outcomes of this program activities were also disseminated through social media, mass media, and YouTube as educational content..

III.RESULT

The community service program conducted in Pakis Village, Panti Sub-district, Jember Regency, focused on community empowerment activities around the Kampung Durian Panti tourism area. Community empowerment is a process of enabling people to become more capable and improve their living conditions (Kiki Endah, 2020). According to Darwis et al. (2022), empowerment consists of three core concepts: enabling, empowering, and fostering independence. In this program, the primary target of empowerment activities was the Family Welfare Movement (PKK) organization in Pakis Village, which plays a strategic role in mobilizing community participation. This effort was particularly significant as it aligns with the mandate of Law No. 6 of 2014 on Villages, which emphasizes the importance of autonomous local governance and community participation in development to improve rural welfare (Government of the Republic of Indonesia, 2014). Through empowerment, it was expected that the people of Panti could develop independence, creativity, and innovation in utilizing local potential, specifically durian fruit and its waste into high-value products that contribute to improving the local economy.



Figure 1. Field Observation of Community Problems in Pakis Village

Greenking: Socio-Agropreneur Education to Realize a Sustainable Circular Economy Through the Management of Durian Fruit and Waste into Ecological Products

The community service activities carried out by the Promahadesa Pakis team empowered the community through highly beneficial programs, namely socialization and training. The first activity was socialization, which can be defined as a communication process that helps the community to learn, adapt, and think in order to participate actively within the social environment (Ilmiyah et al., 2022). This activity was conducted at the Pakis Village Hall. During the session, the PKK members were informed about the existing problems, local potential, and the strategic value of Pakis Village as a “golden village,” emphasizing the need to optimize its utilization as a Durian Tourism Village.



Figure 2. Socialization Activities on Socio-Agropreneurship Education

The second activity was training, which refers to a series of exercises or activities designed to improve quality, expertise, competence, and skills, both during and after occupying a particular role or profession (Suratman & Eriyanti, 2020). The training was attended enthusiastically by members of the PKK organization, who demonstrated high levels of engagement. The program was divided into three areas of focus: processing durian flesh into durian milk, transforming durian husks into briquettes, and producing food products such as basreng and ladrang from durian seeds. The PKK participants were divided into three equally sized groups. In the training sessions, they were not only taught how to process these products but also guided through the packaging stage to ensure that the products could be marketed and sold to generate additional income. This training was expected to enable the community of Pakis Village to not only recognize the problems and potentials within their village but also to practice firsthand how durian fruit and waste from the Kampung Durian tourism area could be transformed into high-value products.



Figure 3. Practice Activities on Socio-Agropreneurship Education

IV. DISCUSSION

The extension activities on processing durian fruit and waste still faced several challenges and limitations that require attention for future implementation. One of the main obstacles was the limited availability of facilities and media. During the program, the village hall did not provide a projector, requiring the presenters to bring their own equipment. This condition restricted the effectiveness of material delivery, which could have been more engaging and easier to understand if supported by adequate presentation facilities. In addition, the distribution of modules or visual supporting materials was uneven, leaving some participants unable to follow the content properly. As a result, several participants experienced difficulties in fully comprehending the extension materials. Therefore, the provision of sufficient facilities and learning materials should become a priority to ensure that future extension activities can run more optimally, interactively, and provide maximum benefits for all participants.

Another major challenge during the extension program was the relatively passive attitude of the participants. This was evident from the lack of participation in discussion sessions, limited questions raised, and low enthusiasm in expressing opinions. Such conditions are often rooted in several factors, including limited prior understanding of the material, feelings of shyness, or

Greenking: Socio-Agropreneur Education to Realize a Sustainable Circular Economy Through the Management of Durian Fruit and Waste into Ecological Products

even a lack of self-confidence to speak in public. These barriers hindered the effectiveness of knowledge transfer, as the sessions tended to become one-way communication, preventing participants from fully absorbing the information. Hence, more interactive strategies are needed, such as the use of engaging media, small group discussions, or simulations, to encourage active participation among participants.

In addition, the limited availability of raw materials, particularly durian fruit, posed another challenge in the extension activities. Since the availability of durian depends on the harvest season, the team faced difficulties in consistently providing sufficient raw materials for processing practice. This limitation reduced the effectiveness of demonstrations and lessened participants' enthusiasm toward the activities. Therefore, careful planning is required to adjust the schedule of activities according to fruit availability. Coordination with local farmers and relevant stakeholders can help determine the optimal timing of activities, aligning them with the peak durian harvest season. This strategy would ensure the provision of sufficient fresh durian during the program, thereby minimizing the risk of raw material shortages and enhancing the overall effectiveness of the training.

Another implementation challenge concerned the follow-up activities after the extension sessions were completed. Often, participants' enthusiasm diminished once the program ended. Not all participants had the commitment or sufficient resources to apply the newly acquired knowledge in their daily lives. Without continuous monitoring or mentoring, the knowledge delivered during the program risked being underutilized, thereby reducing the program's long-term impact. In such cases, participants tended to return to their previous habits and ultimately failed to maximize the potential of the knowledge gained from the extension activities.

V. CONCLUSION

Based on the study on the reprocessing of durian waste in Pakis Village, Panti Sub-district, Jember Regency, it can be concluded that the community service program successfully demonstrated that socio-agropreneurship education is an effective strategy for realizing a sustainable circular economy. The field survey results showed that the village's abundant durian potential and waste disposal flow could be optimized effectively. As a result, several ecological products were successfully produced, including ladrang and fried meatballs made from durian seeds, briquettes from durian husks, and milk from durian flesh. The program implementation, which involved the women of the Family Welfare Movement (PKK), was carried out in two stages: socialization and training. In the socialization stage, the team provided education to the audience, emphasizing that durian waste previously considered an environmental problem could be transformed into value-added products such as briquettes, durian milk, basreng, and ladrang. The training stage involved practical sessions with PKK members to process these waste-based materials into ecological products, with the expectation that the outcomes would enhance community creativity and generate business ideas that could be developed into leading MSME products in Pakis Village. Although the program encountered several challenges, such as limited infrastructure, low participation from some audiences, the seasonal nature of raw materials, and insufficient post-program follow-up, the "Green King" initiative can still be regarded as successful in delivering positive impacts for the Pakis community. To achieve broader impact, it is recommended to extend guidance to other villages on processing durian fruit and waste into ecological products. Furthermore, such extension programs should receive support from various stakeholders, including the government and technology providers. Continuous assistance in the form of mentoring and technology-based marketing would maximize the benefits of this initiative, ensuring that durian fruit and waste processing continues to develop and contribute significantly to the local economy.

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Greenking: Socio-Agropreneur Education to Realize a Sustainable Circular Economy Through the Management of Durian Fruit and Waste into Ecological Products

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