



EMPOWERMENT OF PALM SUGAR PROCESSING GROUPS THROUGH COUNSELING ON EXPLORING THE POTENTIAL FOR SUSTAINABLE PALM SUGAR IN POLINGGONA VILLAGE, POLINGGONA DISTRICT, KOLAKA REGENCY

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Abstract

Polinggona Village is an area in the Polinggona District, Kolaka Regency, where the community has traditionally processed palm sap into palm sugar as a source of livelihood. This business is still run traditionally, resulting in unstable production results, prone to failure, and knowledge regarding proper cultivation and processing practices is not well documented. This activity aims to explore the potential, local wisdom, and problems of palm sugar processing groups, as well as provide counseling to support the sustainability of palm sugar businesses in Polinggona Village. The implementation method consists of three stages: observation and interviews, in-depth to explore potential, counseling and group discussions, and mentoring and evaluation. The activity involved palm sugar processing groups in Polinggona Village as target partners. The results of the activity indicate that palm sugar production is strongly influenced by the season, the cleanliness of tapping tools, and limited fuel and cooking equipment. While some practical knowledge of farmers regarding the physical characteristics of productive trees and the use of natural materials to assist in palm sugar processing is not fully in line with general references in previous research, particularly regarding the age of tapping and the volume of sap produced. This extension successfully identified the gap between theory and field practice, providing the basis for developing a follow-up empowerment program, including training in production technology, product diversification, and marketing. This activity is a crucial first step in documenting the local wisdom of palm sugar processors while strengthening the sustainability of palm sugar as a leading regional product.

Keywords: Palm Sugar, Extension, Potential Exploration, Sustainability

INTRODUCTION

The sugar palm (*Arenga pinnata*) is a community plantation commodity that is spread almost throughout Indonesia, from Sumatra to the eastern part of the archipelago. (Fatasyar et al., 2023). Nationally, the area of palm plantations and production continues to show an increasing trend from year to year, with Sulawesi being one of the islands with the highest palm sugar productivity in Indonesia. (Suri et al., 2024). Southeast Sulawesi Province itself is known to have an area of around 3,070 hectares of sugar palm plantations with a potential production of 14,220 thousand liters of sugar palm sap per year, which shows that this province has great potential for the development of a community-based palm sugar agro-industry.

Kolaka Regency is one of the palm sugar producing areas in Southeast Sulawesi, with Polinggona District as one of its production centers. This district consists of six villages and one sub-district, one of which is Polinggona Village, where the majority of the population works as farmers and plantation workers. (Angka, 2024). The potential of palm sugar in this sub-district has previously been raised through community empowerment activities in Lamondape Village, which is still in the same sub-district, and shows that palm sugar processing groups in this area face problems in the aspects of production, marketing, and business management, with incomes that are even below the regional minimum wage of Kolaka Regency. (Purbaningsih dkk., 2023a; Purbaningsih dkk., 2023b). These

conditions indicate that the palm sugar business's challenges are cross-village/sub-district in Polinggona District, so potential exploration and mentoring are also needed for palm sugar processing groups in Polinggona Village.

Initial observations and in-depth interviews with palm sugar processors in Polinggona Village indicate that this business is still run traditionally and relies heavily on inherited experience. Palm sap and palm sugar production fluctuates with the seasons, fuel wood availability is increasingly limited, especially during the rainy season, and cooking equipment, such as woks, is still limited in size, resulting in relatively low daily production capacity. This situation aligns with findings from the palm sugar business in Tondei Village, North Sulawesi, which also faces constraints such as limited production equipment, fluctuating fuel prices, and limited market access. (Lumowa et al., 2025). Furthermore, some farmers' practical knowledge regarding the productive age of sugar palm trees and the volume of sap produced in the field differs from general references in various studies. Therefore, this information is crucial to explore and document to form the basis for developing business sustainability strategies that are more tailored to local conditions.

Based on these issues, the work program dedicated to this activity is directed at providing outreach and exploring the potential for sustainable palm sugar production. This involves exploring, verifying, and documenting local farmer knowledge about sugar palm cultivation and processing, while also providing knowledge reinforcement based on the results of recent research. This approach is crucial because the sustainability of sugar palm farming is determined not only by production and market aspects, but also by the farmers' entrepreneurial orientation and capacity in managing their resources. (Sunarya et al., 2021). Extension, as stipulated in Law Number 16 of 2006 concerning the Agricultural, Fisheries, and Forestry Extension System, is a learning process for key stakeholders and businesses to access information, technology, and resources to increase their business productivity. Therefore, this approach is relevant for use as the framework for this community service activity.

The reliability of this extension approach is supported by various research findings and technical guidelines. The Indonesian Ministry of Agriculture (2014), through its Aren Cultivation Guidelines, explains that the age at which sugar palms begin to produce varies between 5 and 10 years, depending on the variety (early-ripening and late-ripening palms). Other studies report that sugar palms generally mature at 6-12 years, with peak tapping at 8-9 years, and sap productivity ranging from 8-22 liters per tree per day. (Hortus, 2024). In terms of product quality, the natural additional ingredients used in the palm sugar processing process, such as lime water, grated coconut and sliced candlenuts, also influence the shelf life and quality of the palm sugar produced. (Fatasyar et al., 2023). Thus, local farmer practices related to these natural ingredients become a relevant aspect to be explored further.

This community service activity aims to: (1) explore and document the potential, local wisdom, and problems faced by palm sugar processing groups in Polinggona Village; (2) provide counseling to increase farmers' understanding of palm sugar cultivation and processing practices that are more appropriate to local conditions; and (3) formulate recommendations for sustainable palm sugar business

strategies as a basis for further empowerment programs. The expected benefits are the availability of data and mapping of the real conditions of palm sugar businesses in Polinggona Village that can serve as a reference for village, sub-district, and university governments in designing further empowerment programs, as previously done for the palm sugar business group in Lamondape Village in the same sub-district.

IMPLEMENTATION METHOD

This community service activity was carried out in Polinggona Village, Polinggona District, Kolaka Regency, Southeast Sulawesi Province, an area without a coastline and where the majority of the population works as farmers and gardeners, including palm oil growers. (Angka, 2024). The program will be implemented in stages in 2026, starting with observation and interviews, counseling, and discussions with palm sugar processors. This program will take place on June 27-28, 2026.

The target audience for this program is a purposively selected palm sugar processing group in Polinggona Village. These groups include palm sugar tappers and palm sugar processors who have actively run their businesses for generations. Partners will be selected through coordination with the heads of the palm sugar processing groups in Polinggona Village to identify entrepreneurs who meet the criteria.

The program will consist of three stages. The first stage involves field observations and semi-structured in-depth interviews with palm sugar processors to explore potential, local wisdom, production process stages, production risks, and challenges faced. The second stage involves counseling and discussions with the processing groups, which will provide verification results between field findings and scientific studies related to improved and safer cultivation and processing. The third stage is mentoring and monitoring to ensure the implementation of the outreach results and serve as the basis for developing recommendations for follow-up programs.

Indicators of success for this activity include: (1) comprehensive identification of the potential, local wisdom, and key issues of palm sugar processing groups in Polinggona Village; (2) increased participant understanding of the factors influencing the success and risk of failure in palm sugar production; and (3) development of strategic recommendations for the sustainability of the palm sugar business based on real-world conditions.

Evaluation of the activity implementation was conducted through reflective discussions with participants at the end of the outreach session to assess their understanding of the material presented, as well as through relevant scientific documentation and verification. Further evaluation is planned through periodic mentoring to monitor the implementation of the outreach results in partner palm sugar processing practices.

RESULTS AND DISCUSSION

Overview of the Palm Sugar Production Process

The palm sugar processing group in Polinggona Village has been running its business for generations, with a production pattern dependent on the daily availability of palm sap. According to interviews, the palm sugar production process begins with tapping the sap twice daily, in the morning and evening, using jerry cans as containers and a special tapping knife that must be kept sharp and not used for other purposes. One typical practice observed is the use of buli/boli water, a mixture of lime water and boiled jackfruit wood water prepared at home and used for up to one month. According to the processors, this water helps the sap process properly into sugar. This use of natural ingredients aligns with findings that additional ingredients such as lime water are also used in the palm sugar processing process in various other production centers. (Fatasyar et al., 2023), Therefore, the practice of buli/boli palm sap in Polinggona Village has the potential to become a local wisdom worthy of further scientific verification and could become a distinctive feature of local palm sugar products.

On average, a farmer obtains approximately 17 liters of palm sap per day, which is generally collected over three days before being cooked if the harvest is low. This results in a total of approximately 51 liters of processed palm sap, yielding approximately 10 packs of molded sugar. The sap collected each morning and evening is immediately heated to reduce the water content and remove any foam or impurities that appear on the surface. The final heating process, which turns the palm into sugar, typically takes place from 7:00 a.m. to 11:00 a.m.–12:00 p.m., with the addition of two to three crushed candlenuts as the sugar matures. The sugar's maturity is traditionally determined by the texture of the liquid, which hardens upon cooling or by the "kling" sound when dropped into a hot pan. It is then stirred with a wooden utensil until thickened and then poured into molds.



Figure 1. Extraction of Information Related to Raw Materials

Risk Factors and Production Instability

Results of the potential exploration indicate that palm sugar production in Polinggona Village is heavily influenced by the seasons. During the rainy season, the volume of palm sap produced tends to be higher, but the sugar content is lower, resulting in a lower sugar yield. Conversely, during the dry

season, the volume of palm sap is lower but the sugar content is higher. For example, according to processors, 50 liters of palm sap in the rainy season yields only around 9-10 palm sugar palms, while in the dry season, the same amount of palm sugar yields 12-13 palm sugar palms. This pattern is consistent with the general principles of palm sugar processing, where high water content in the raw material reduces the final product yield and impacts its shelf life. (Fatasyar et al., 2023).

In addition to seasonal factors, the cleanliness of the tapping equipment also affects production success. Jerry cans used to collect sap that are not cleaned regularly and begin to rust risk contamination of the sap, which could lead to failure to solidify into sugar. To anticipate signs of failure during cooking, such as sap that remains liquid even after a long cooking time, processors typically reduce the heat to distribute the heat evenly, stir the sap slowly and continuously, and prevent the sap from spoiling quickly by keeping the container clean. Other challenges faced by partner groups include limited wood fuel, which is increasingly difficult to find, especially during the rainy season. Furthermore, cooking pans are still medium-sized, meaning they can only hold a small amount of sap and often leak. These issues of limited fuel and production equipment align with findings from palm sugar processing groups in Tondei Village, North Sulawesi, who also face fluctuations in fuel availability and limited production equipment as major business constraints. (Lumowa et al., 2025).



Figure 2 Production Risk Interview

Gap between Theory and Field Conditions

One important finding from this potential exploration activity was the gap between theoretical references and actual field conditions regarding the productive lifespan of sugar palm trees. Based on sugar palm cultivation guidelines, (Indonesia., 2015) and other studies, sugar palm trees generally start to be tapped at the age of 5-10 years and reach the best tapping period at the age of 8-9 years after the first flower or sheath appears, with the plant maturing at the age of 6-12 years. (Hortus, 2024). However, interviews with palm sugar processors in Polinggona Village indicate that the age at which sugar palm trees begin to be tapped varies greatly depending on the species, with some palms even flowering at 10 years or older. According to local processors, determining the appropriate start time for tapping depends

more on the plant's physical condition than solely on its age. Similarly, sap volume, according to general studies, is reported to range from 8 to 22 liters per tree per day. (Hortus, 2024), Processors in Polinggona Village stated that the amount of sap produced depends heavily on the type of sugar palm tapped, not solely on adherence to general standards. This finding underscores the importance of local-based outreach, as general technical recommendations need to be aligned with the specific characteristics of sugar palm trees in each region to ensure optimal and sustainable cultivation and tapping practices.



Figure 3 Discussion with Palm Sugar Processors Regarding Field Conditions

Local Wisdom and Farmers' Sustainability Orientation

This potential exploration activity also successfully documented a number of local wisdoms that had been the unwritten knowledge of palm sugar processors in Polinggona Village. One example is the farmers' ability to recognize the physical characteristics of productive palm trees: trees with wide leaves tend to produce better sap than trees with vertically growing leaves. Furthermore, farmers understand that palm trees growing wild without a specific planting pattern tend to grow faster and taller than those cultivated with a regular planting pattern. In terms of land sustainability, palm sugar processors in Polinggona Village are known to have no intention of completely replacing palm sugar plantations with oil palms, instead choosing to plant palm sugar palms between oil palm plantations. Some farmers have even begun cultivating palm sugar independently. This land use pattern reflects the farmers' entrepreneurial orientation and commitment to the sustainability of palm sugar farming, as emphasized in the study, which emphasizes that the sustainability strategy for palm sugar farming is largely determined by the farmers' own entrepreneurial attitudes and orientations. (Sunarya et al., 2021).



Figure 4 Sugar palm tree with wide leaves.



Figure 5 Sugar palm tree with vertical leaves.



Figure 6 Interviews Regarding Commodity Conversion

Overall, the results of the potential assessment indicate that the sustainability of the palm sugar business in Polinggona Village faces challenges in technical production (seasons, fuel, equipment), quality (equipment cleanliness, additives), and knowledge (gaps between general guidelines and field conditions). The extension program successfully bridged these gaps through a two-way learning process, where the implementation team provided research-based knowledge reinforcement, while farmers shared their experiences and local wisdom, which have been passed down through generations. This participatory approach aligns with the principle of extension as a learning process for key actors and business owners, as mandated by Law Number 16 of 2006 concerning the Agricultural, Fisheries, and Forestry Extension System.

The findings from this activity also reinforce the results of previous empowerment activities for palm sugar processing groups in Lamondape Village, within the same sub-district, which indicated that production, marketing, and business management issues are common among palm sugar processors in Polinggona District (Purbaningsih dkk.,2023a; Purbaningsih dkk.,2023b). Thus, the results of the potential exploration in Polinggona Village can be the basis for the preparation of further empowerment programs, such as training in printing and packaging technology, diversification of palm sugar processed products, institutional strengthening, and digital-based marketing, as has been implemented

in the palm sugar business group of Lamondape Village through the Quadruple Helix institutional model. (Alfadri, 2023; Purbaningsih et al., 2023a).

CONCLUSION

This community service activity successfully explored and documented the potential, local wisdom, and challenges of palm sugar processing groups in Polinggona Village, Polinggona District, Kolaka Regency. A novel outcome of this activity was the identification of gaps between general theoretical references regarding tapping age and palm sap productivity and actual conditions in the field. It also documented several local farmer insights, such as the physical characteristics of productive palm trees and the use of natural ingredients like buli/boli water in palm sap processing, which have not been widely explored in scientific studies in the region. The benefit of this activity for the community is the availability of a mapping of palm sugar business conditions that can serve as a basis for developing extension programs and further mentoring that are more tailored to local characteristics. Its theoretical contribution is enriching understanding of variations in palm sugar cultivation and processing practices across regions beyond the general guidelines currently used.

It is recommended that future community service activities focus on training in production and packaging technology, diversification of palm sugar processed products, strengthening business group institutions, and digital technology-based marketing, so that the sustainability of the palm sugar business in Polinggona Village can further increase the income and competitiveness of local palm sugar processors.

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