

Optimizing the benefits of palm fruit skin to help increase income and reduce poverty in the palang area, tuban regency.

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Abstract

Palang District, Tuban Regency has great potential in the development of the siwalan processing industry because there are many siwalan trees in this area. Almost all parts of the siwalan tree are used by the surrounding community to be sold such as wood, leaves, water and fruit which have very high economic value, but there is one part that is wasted and produces waste, namely the skin of the siwalan fruit itself, the processing of which has not been optimal so that it produces waste on a large scale, siwalan skin which is waste can be optimized for use in various crafts that can increase income and of course have a good impact on the environment. This study analyzes the market potential and value chain of processed siwalan fruit skin products. Through literature studies, market surveys, and interviews with industry players and suppliers of siwalan fruit, it is hoped that it can identify siwalan skin derivative products that have high market demand. In addition, this study will also map the value chain of these products from waste collection to distribution of the final product so that a sustainable business model can be designed that can increase community income.

Keywords : Siwalan; Income; Waste.

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INTRODUCTION

Indonesia is a very large country and has a very large population of around 281,603,800 people (BPS, 2024). This very large population has caused the level of consumption in Indonesia to soar very high, resulting in a lot of waste in Indonesia. According to the National Waste Management of the Ministry of Environment and Forestry in 2022, the results of input from 202 districts/cities throughout Indonesia stated that the amount of national waste accumulation reached 21.1 million tons. Of the total national waste production, 65.71% (13.9 million tons) can be managed, while the remaining 34.29% (7.2 million tons) has not been managed properly. Waste is actually divided into 2 types, namely organic and

inorganic waste, where inorganic waste is more dangerous for the environment because it is very difficult to decompose.

The palm fruit or known as the lontar fruit, is the fruit of the lontar tree (*Borassus flabellifer*) which is widely found in tropical areas, including in Indonesia, especially in Java, Bali, and Nusa Tenggara. This fruit is often consumed directly as fresh fruit, or processed into various types of food and drinks. In addition to the fruit, the lontar tree also has many other benefits. For example, the leaves are often used as woven materials, and the trunk can be used as building materials or firewood. Of the various benefits of the lontar fruit, most people only take the flesh of the fruit and result in the accumulation of waste from the lontar fruit fiber that is wasted. Wasted lontar fiber actually has a lot of potential for use that can be utilized. Proper management of this waste can help reduce environmental impacts and even provide economic value to the community (Hardiyanti, 2021).

The skin of the lontar fruit (*Borassus flabellifer*) which is often considered waste has enormous potential if it can be utilized properly. In Tuban Regency, especially in the Palang area, optimization of aren fruit skin is still very minimal even though it has quite large potential in increasing community income and reducing poverty rates. The processing of aren fruit skin not only has a positive impact on the economy, but also contributes to environmental sustainability by reducing organic waste (Artiningsih, 2016). By utilizing this waste effectively, people can reduce environmental pollution and create new sustainable businesses. Siwalan, which grows well in tropical areas, is often only used in a limited way, namely as a direct consumption ingredient or a drink from its sap. Meanwhile, the abundant siwalan fruit skin is often considered waste, even though it has high economic value if processed properly (Esti Handradi, 2022).

Siwalan is rich in fiber and beneficial phytochemical compounds, such as flavonoids and saponins, which can be used in various industries, including health and food. The results of the study showed that siwalan fruit skin can be extracted to produce natural dyes and raw materials for food products with high selling value. For example, anthocyanin extract from siwalan fruit skin can be used as a natural dye using ethanol solvent, has a yield of around 5.2% and a reddish color characteristic that is stable to temperatures up to 100°C (Ni Komang Ayu Artiningsih, 2016). In addition, siwalan fruit skin can also be processed into cellulose which has the potential to be used in the pharmaceutical industry, such as as a substitute for animal gelatin, with an isolation process through hydrolysis, delignification, and bleaching, and obtains a cellulose yield of 12.3% (Esti Handradi, 2022). Processing siwalan fruit skin also contributes to environmental sustainability by reducing organic waste. The skin of the siwalan fruit can be processed into syrup and nata so that it can reduce the amount of useless waste and increase the economic value of the area. The process of making syrup and nata includes sterilizing the container, filtering the siwalan fruit juice, adding granulated sugar and NPK, and adjusting the pH to 4.5 (Rina Pratiwi Pudja, 2014).

By utilizing the skin of the palm fruit as a raw material for processed products and creative industries, the community can significantly increase their income so that economic empowerment through innovation in processing the skin of the palm fruit can be carried out properly and based on assets (Asset Based Community Development). This approach emphasizes the optimization of local potential and community involvement in the processing process (Bela, 2024). Through training and mentoring, the community is expected to be able to develop existing potential so that it can become an additional source of income to meet existing needs. The mentoring and training carried out include the selection of materials, processing to distribution, all of which are expected to be able to develop existing human resource potential.

LITERATURE REVIEW

Economic and Cultural Potential of Siwalan Fruit

The siwalan fruit (*Borassus flabellifer*) or better known in Indonesia as lontar is a tropical plant that is rich in benefits. In addition to the fruit which can be consumed directly, the sap, leaves, and trunk of the siwalan tree also have high economic value. Research conducted by Supriyadi (2022) shows that siwalan fruit contains various vitamins, minerals, and antioxidants that are beneficial for health. The morphology of siwalan fruit is similar to sugar palm fruit, white and transparent, but the texture is rather hard. This plant is easy to cultivate and has a complete vitamin and mineral content, such as vitamins B and C, zinc, potassium, phosphorus, thiamine, and riboflavin (Artiningsih, 2016). The potential of siwalan fruit as a functional food ingredient and a source of income for the community has attracted the interest of researchers and business actors. With proper cultivation, siwalan can become a superior commodity and contribute to improving community welfare, especially in siwalan producing areas.

Although the Palang region has enormous agricultural potential, this potential has not been fully optimized. This is reflected in several facts:

- **Secondary crops:** The Palang area also has great potential for the development of secondary crops such as corn, peanuts, soybeans, and green beans. The varieties of secondary crops planted in this area are quite diverse, with corn and soybeans being the most common varieties.
- **Cultivation Practices:** Farmers in the Palang area generally use conventional cultivation methods that involve the use of chemical fertilizers and pesticides. However, some farmers have also started to switch to organic farming practices to improve product quality and protect the environment.

Challenges and Opportunities: Palang Region faces several challenges in the agricultural sector, such as declining market prices, limited access to capital and technology, and climate change that affects crop productivity. However, there are opportunities to develop a wider marketing network and increase the added value

of secondary crops through diversification and development of processed products (Siti Sa'diyatul Ahadiyah, 2022).

Benefits of Siwalan Fruit Skin

The skin of the siwalan fruit (*Borassus flabellifer*) is a very potential source of bioactive compounds. Research by Putri and Rahmawati (2023) showed that the skin of the siwalan fruit is rich in flavonoids, alkaloids, saponins, phenols, and lignin. These compounds have strong antibacterial, anti-inflammatory, and antioxidant activities. Flavonoids, for example, act as antioxidants that protect cells from damage caused by free radicals. Meanwhile, alkaloids and saponins have the potential as antimicrobial agents. The diversity of bioactive compounds in the skin of the siwalan fruit makes it a promising raw material for the development of pharmaceutical products, cosmetics, and various other industrial applications.

Strategy for Optimizing the Benefits of Siwalan Fruit Skin by Forming a Joint Business Group

The formation of a joint business group is a strategic step in optimizing the use of palm fruit skin. Collaboration between group members can increase production efficiency, expand market access, and improve product competitiveness. In addition, synergy with government programs can provide the support needed for business success. Through value chain analysis, business groups can identify opportunities to increase operational efficiency and reduce production costs. Thus, business groups can produce quality palm fruit skin processed products at competitive prices, so that they can increase community income and contribute to regional economic growth (Nurul Badriyah, 2022).

Economic and Social Impacts

Innovations in processing palm bark have great potential to increase community income through:

- Job Creation:

With the existence of a new industry based on processed palm bark, new jobs will be opened for the surrounding community because the community will get additional income. This can help reduce poverty levels in the area.

- Increased Revenue:

Communities involved in the production and marketing of processed palm bark products can experience a significant increase in income because it will be something new for tourists. Diversification of processed products provides wider market opportunities not only for the surrounding community. (Badriah, 2022)

RESEARCH METHODS

Research is an important part of science that plays an important role in the development of science. Research occupies the most important position in science,

namely developing and maintaining it from extinction because it is always updated according to current conditions (Bungin, 2021)

This research is based on a qualitative paradigm using literature analysis techniques. Qualitative research is research that provides a systematic, factual, and accurate description of the facts, nature, and relationships of phenomena studied qualitatively (Muhammad Rijal Fadli, 2021). By using qualitative data, we collect a number of related information from journals and books validly, so that the data can be accepted properly and correctly.

Qualitative research is research that aims to understand the phenomena as they are experienced by research subjects, such as behavior, perception, motivation, actions and so on holistically, and by means of description in the form of words and language, in a specific context that is natural and by utilizing various natural methods (Moleong, 2003)

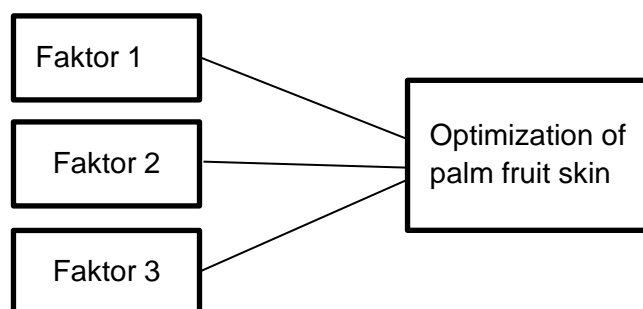
The purpose of qualitative research is to explain a phenomenon as deeply as possible by collecting data as deeply as possible, which shows the importance of the depth and detail of the data studied. One of the reasons for using a qualitative approach is the researcher's experience in which this method can be used to find and understand what is hidden behind phenomena that are sometimes difficult to understand satisfactorily.

FINDINGS AND DISCUSSION

The level of community needs is increasing day by day along with the development of the era, therefore the utilization of wasted natural resources into an economic value is very helpful in improving the community's economy. Training and mentoring to develop existing Human Resources are needed to be able to utilize existing natural resources. The results of this study are based on in-depth descriptive analysis. Data obtained from interviews with MSME actors and local communities are analyzed and presented descriptively. The following are the main findings of the study which are equipped with tables, graphs, and diagrams to clarify the results of the analysis.

Figure 1.

Research Design



Source : Processed by the author

Understanding Factors of the Potential of Palm Fruit Skin

From the literature read and direct interviews with the community, it is known that many local people do not yet know about the potential income that can be generated from processing siwalan fruit. The understanding data is presented in Table 1, which shows a comparison of the level of understanding of the surrounding community regarding the use of siwalan fruit skin.

Optimization Factors of Palm Fruit Potential Using the ABCD Method

This study found that public interest in the development of palm fruit skin products is very high, seen from the enthusiasm of the people we visited where they began to see promising opportunities from optimizing palm fruit skin. Table 2 shows that the increase in public interest before socialization was carried out and table 3 shows that the increase in public interest after socialization was carried out.

Economic and Social Factors on the Environment and Community Welfare

Seeing the public's enthusiasm for this potential is a very positive thing because it will have a positive impact on the economic and social sectors because it is very helpful in reducing waste and unemployment.

Tabel 1.

Level of Knowledge of the Potential of Palm Bark

Level of Knowledge Potential	Amount Respondents	Percentage (%)
Tall	9	22.5%
Currently	11	27.5%
Low	20	50%
Total	40	100%

Source: Author(s) work

Tabel 2.

Public Interest in Optimizing Siwalan Fruit Before Socialization

Level of public interest	Amount Respondents	Percentage (%)
Tall	6	15%
Currently	5	12.5%
Low	29	72.5%
Total	40	100%

Source: Author(s) work

Tabel 3.

Public Interest in Optimizing Siwalan Fruit After Socialization

Level of public interest	Amount Respondents	Percentage (%)
Tall	35	87.5%
Currently	2	5%
Low	3	7.5%
Total	40	100%

Source: Author(s) work

This table describe that although there is potential big For develop product from skin fruit siwalan , knowledge public about the benefits still very limited . For increase understanding and skills them , more training and socialization programs intensive need carried out , so that the community can utilise potential skin fruit palm tree For increase income them. Based on research , skin fruit palm tree own various benefits that have not been fully utilized by the community . For example , skin This can processed become valuable planting media briquettes economical and helpful reduce waste (Siti Hardiyanti, 2021).

Community service program public show that with proper training , community can Study method process skin palm tree become product useful , so that increase knowledge and skills them . In addition , training is conducted in various village show that activity socialization and training can increase awareness public about potential skin fruit palm fruit (Siti Sa'diyatul Ahadiyah, 2022)

Therefore that , effort For increase understanding public through training and socialization programs it is very important for them can utilise source Power local This optimally for increase income they .

CONCLUSION

Based on the findings of this study, it can be seen that the skin of the siwalan fruit has a very promising potential if it can be processed properly, the abundant natural resources in the Palang area can be optimized when the community is given training and assistance on how to utilize existing resources. This study confirms that good knowledge of existing potentials has a very good and significant impact on society and the environment to support the SDGs that are being designed.

This study also highlights the lack of literacy in the community and the curiosity about what potential can be produced from the surrounding natural resources. People tend to choose to wait rather than pick up the existing economic potential.

This is where the role of the government is really needed to support the potential that exists in the community by helping with capital and training as well as regular monitoring of the community, which is expected to be a solution to overcome poverty and improve community welfare.

LIMITATIONS & FURTHER RESEARCH

This study has several limitations that need to be considered. First, the sample used in this study was limited to the Palang sub-district area only, so the results obtained may be different if the study was conducted in a wider area or research in other areas. Second, the number of samples used in this study was relatively small so that it was not enough to represent the population as a whole. Third, there are still other variables that may affect the results of the study, but were not included in this study.

Further research is needed to address the limitations of this study. First, further research can expand the scope of the area in order to produce better generalizations. Second, further research can include other variables that may affect the results of the analysis. Third, the use of different data collection methods, such as distributing questionnaires offline in a place that has been provided, so that respondents do not experience confusion in filling out the questionnaire so that biased data results can be avoided.

AUTHOR CONTRIBUTION

Authors: As the lead author, I am responsible for designing the research, collecting data, analyzing the results, and compiling the entire manuscript. I am also directly involved in providing training to the community on processing aren fruit skin and helping to build a marketing network for processed products. I also play an active role in identifying the potential for utilizing aren fruit skin and formulating strategies to increase the income of the Palang community.

Declaration of interests

This research aims to optimize the use of palm fruit skin as a resource that can increase community income in the Palang area, Tuban Regency, and contribute to poverty reduction efforts as an effort to achieve the SDGs goals. By identifying the economic potential of palm fruit skin, this research is expected to provide practical solutions for local communities, create new business opportunities, and support sustainable economic development in the area.

Thank-you note

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