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Potential of Coffee Fruit Waste as Main Product of Benteng Alla Utara Village, Enrekang Regency

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ABSTRACT

Farmers in Enrekang Regency, especially in Benteng Alla Utara Village, generally manage coffee plantations as their source of livelihood. The type of coffee produced is Arabica Kalosi Enrekang which is known to have a taste and aroma favored by coffee connoisseurs. Coffee beans are produced to meet the needs of foreign exports in quite large quantities. Processed waste of coffee cherries in the form of coffee pod skins is a waste of production residue that is not utilized optimally by the community. Dried coffee berry skin waste known as cascara has the potential to be developed into health drink and cosmetic dosage forms. Products designed based on the innovative development of local natural ingredients and the needs of the community in general are in the form of herbal teas, syrups, fermented drinks, face masks, creams and body soaps. Products that utilize coffee pod waste can become the superior product of the Enrekang area which can be produced by empowering the community through MSMEs and continuing to prioritize local local wisdom. Superior products can be created by increasing people's skills through product manufacturing training by taking into account standardized product quality parameters with the aim of obtaining safe and quality products.

1. Introduction

Enrekang is one of the districts located in South Sulawesi with a varied topography in the form of hills, mountains, valleys and rivers. However, in general the topography of Enrekang is dominated by around 84.96% mountains (Henry, 2022, Ningsih & Alwi, 2022, Firmiaty et al., 2022). Benteng Alla Utara Village is one of the villages that is part of the Baroko sub-district, Enrekang district (As'ad, et al., 2022). Benteng Alla Utara Village has the potential to be developed into a unique tourist area with the existence of the Fort Alla site it has (Usman et al., 2022) This site is an attractive and aesthetically pleasing rock composed naturally of karst rock which is said to have historically been the last stronghold of the Enrekang people who were conquered by the Dutch colonialists in South Sulawesi. Fort Alla as a heritage fortress from the Dutch colonial period which has high historical value has the potential to be developed as a Geopark with unique characteristics of rock shapes and types. Road access and directions to this place need to be managed even better to make it easier to reach and access directly by visitors. Exploration of the beauty of this fort and the beautiful mountain atmosphere can be developed through the application of both virtual information technology so that people who don't know it can witness it virtually through online media. The majority of the population of Fort Alla work as farmers. The cool climatic conditions provide potential for cultivating various types of plants that can be directed to become plantation tourism objects. One of the main commodities of the community in this village is coffee, which is widely cultivated on plantations and in the community's yard. Kalosi Enrekang Arabica Coffee is one of the best types of coffee in the world that has received a Geographical Indication (GI) certificate which guarantees to consumers the authenticity and quality of Arabica coffee products produced through accountable methods and processes. The IG certificate was issued on 15 February 2013 with ID number G 000000018 as Kalosi Enrekang Arabica Coffee. This can affect the increase in Arabica coffee production in Enrekang to meet export demand to the international world, especially in countries that are fans of Kalosi Arabica coffee with the best special aroma and special taste (Month, 2021).

Figure 1. Natural Conditions in Benteng Alla Utara Village, Enrekang Regency (Personal Collection)

The coffee farmers in Benteng Alla village process coffee beans independently. Coffee fruit waste in the form of fruit peels is used by the community as compost. Coffee pod waste has the potential to be developed into a commodity that is beneficial to the community, one of which is by processing it into health supplements and cosmetics made from coffee pod skin. This commodity can be a souvenir or a superior product characteristic of the Geopark in Benteng Alla Utara Village. Therefore, it is necessary to carry out education to provide knowledge and understanding of the Benteng Alla village community in creating home industry products with local wisdom.

2. Implementation Method

Community Service Activities (PkM) was held in March 2022 in Benteng Alla Utara Village, Baroko District, Enrekang Regency. The implementation of activities through the initial observation stage by examining the potential for development of Benteng Alla Village to become a tourist village through

discussions with the local government and local community leaders. Preliminary observations provide an overview of the potential for the development of coffee fruit waste to become a superior product as well as a local ethnic product that can elevate local wisdom in the village of Benteng Alla Utara through outreach to the community. The next stage is to carry out tours or direct visits to locations that have the potential to become tourist attractions and collect information regarding raw materials for coffee cherries which have the potential to be developed as superior products. Information collection was obtained through direct interviews with community leaders and elements of the local regional government as well as a review of related literature. The data obtained is collected, studied, and processed in the form of qualitative data to draw conclusions. The results of the analysis are several types of superior products made from coffee fruit waste that can be developed by the local community while still prioritizing local wisdom.

3. Results and Discussion

3.1 Local Government and Community Support

The arrival of the KODELN International PKM Team received a warm welcome from partners, namely the local government (District Head of Baroko, Head of the Tourism Office of Enrekang Regency, Head of Benteng Alla Village) and the local community. Great hopes for the development of the potential of Benteng Alla Village to become a Tourism Village and can be recognized internationally. Efforts in fulfilling the requirements of the Tourism Village sought by the local government, especially the Tourism Office, are the establishment of a Tourism Awareness Group (Pokdarwis). One of the programs planned to support the Tourism Village program is superior products which are one of the tourist attractions.

Figure 2. Welcoming and Discussion Activities with local government and community leaders in Benteng Alla Utara Village (Private Collection)

The people of Benteng Ala village have made coffee plants a source of livelihood as well as a commodity unique to the Enrekang area. Processing of coffee beans is carried out by groups of farmers who are members of the Farmers Cooperative. The coffee beans of Benteng Alla village have a distinctive taste which is the main attraction for coffee connoisseurs. The Chairman of the Cooperative, Mr. Patola, in his statement said that he had succeeded in delivering Benteng Alla Coffee as the best coffee with a unique taste at the coffee contest in Bali in 2016. Coffee products have been clustered into grades 1 – 5 and the processed coffee beans of Benteng Alla village include in Grade 3. This has also

attracted the attention of the largest coffee shop company in the world, namely Starbucks, to partner with Benteng Alla coffee farmers and make the Benteng Alla Village coffee beans an export commodity to several countries such as Australia and America.

The processing of coffee cherries into coffee beans also produces waste in the form of coffee grounds and coffee cherries. The local community turned this waste into several simple home products in the form of cosmetics, namely coffee masks, body lotions and soaps. This product is still in the process of market testing and has not been managed as seriously as coffee bean products. Some of the factors constraining the development of cosmetic products made from coffee waste include the lack of public knowledge about formulation, the lack of good and safe cosmetic preparations, the lack of skills in processing coffee bean waste into cosmetic products and the stigma of society which has also transformed to become more consumptive. In the opinion of the head of the cooperative, "The Farmer's Brain is in the Eyes", meaning that his mind is more focused on the results he sees, it gives faster profits, so that is what is prioritized to be managed. This view causes many coffee farmers in Benteng Alla Village to switch to cultivating other crops such as vegetables whose yields are enjoyed more quickly than coffee which has a longer harvest period, even though the yields are more profitable than vegetables. The strategy of introducing the benefits of coffee pod skin is expected to change the community's stigma so that it can increase the cultivation of coffee plants as a superior crop that can be maintained.

Figure 3. Processed coffee products in the form of packaged coffee and coffee bean-based cosmetics made by the people of Benteng Alla Village (Private Collection).

The increase in coffee production caused by the increasing market share of coffee in Indonesia has also had an impact on increasing the amount of coffee cherries waste which is the material left over from coffee beans that is not utilized by the community. This waste becomes the raw material to produce useful products for the needs of the local community and can even become a superior product that is the hallmark of Enrekang Regency. Several household products made from coffee beans in the form of cosmetics in the form of solid soaps, face masks and creams have been produced in a simple way by the local community. The high public interest in natural cosmetic products and home industry products is one of the factors in developing business opportunities that can be applied to the Benteng Alla village community as an effort to support local government programs to improve the economic level and welfare of the local community.

3.2 Design of Main Products from Coffee Fruit Peel

Waste Coffee pod skin as a by-product or coffee bean processing waste can be an innovative product that has economic value and can increase the income of coffee-producing regions. The dried coffee berry skin is known as cascara. Coffee fruit skin contains active compounds in the form of tannins, pectin, caffeine, chlorogenic acid, caffeic acid and anthocyanins (Sari et al., 2021). The content of active compounds, especially anthocyanins, have antioxidant activity which reaches 93.80% (Subeki et al., 2019) as a reference for designing several types of innovative products that can be made from coffee fruit waste such as Health Drinks and Cosmetics. Superior products are expected to be able to provide a

special attraction for the local community and visitors with the characteristics of the Enrekang area as regional local wisdom.

Table 1. Product processed from waste coffee fruit

No.	Examples of processed products from coffee fruit waste		
	Example of Processed Products	Raw material	Types of products
1	Cascara *Herbal* Tea	Coffee Fruit Skin	Healthy drink
2	*Cascara* syrup	Coffee Fruit Skin	Healthy drink
3	*Cascara* Kombucha	Coffee Fruit Skin	Healthy drink
4	Face mask	Coffee Fruit Skin	Cosmetics
5	Bath soap	Coffee Fruit Skin	Cosmetics
6	Cream	Coffee Fruit Skin	Cosmetics

3.2.1 Health drink

Cascara tea brewed with active chemical content in the form of phenolic compounds that have antioxidant activity (Muzaifa et al., 2020). The use of cascara as an innovative tea product among farmers is still very low due to a lack of public knowledge about the benefits of cascara, for example in Jember province only 3.9% of cascara is processed into tea (Komaria et al., 2020), in Enrekang Regency, especially in Benteng Alla Village, the farming community only uses cascara as fodder and compost. Therefore it is necessary to introduce the potential of processing cascara into herbal dosage forms as health supplements such as herbal teas and cascara-based syrups. The processing method for making herbal tea and cascara syrup is quite easy to do while still paying attention to the preparation quality standards stipulated in the official Standard Preparation Standards such as SNI so that the product is safe to use and of high quality.

Cascara herbal tea can be made into tea bags using tea bags. The initial stage of making tea begins with drying the coffee cherries at a temperature of 45°C for 10 hours using a cabinet dryer type dryer (Sari et al., 2021). The drying method can also be done by drying directly under direct sunlight for 3-4 days or using solar-powered drying machine technology for 1 day (Milawarni et al., 2014). Dried coffee fruit skins can then be processed into herbal beverage preparations such as herbal teas, syrups, and kombucha.

Adding flavoring ingredients to health drink preparations can be done to enhance the unique taste of the drink, for example by adding lemon and honey extract to cascara tea so that it is preferred by consumers (Muzaifa et al., 2022). Flavorings can also be added to syrup and kombucha tea formulas with various flavors that can be adjusted to the tastes of the connoisseurs.

3.2.2 Cosmetics

Based on data from the Central Statistics Agency (BPS) for 2021, it is stated that the cosmetics market which includes the pharmaceutical, chemical and traditional medicine industry sectors has grown by up to 9.61%. Indonesia is expected to become the fifth largest cosmetics market in the world in the next 10-15 years (Rizaty, 2021). This shows that the share of the cosmetics market is very promising to work on. The POM Agency in a press release on 16 September 2022 stated that Indonesia's high biodiversity and culture have produced various traditional heritages, one of which is thematic cosmetics. Thematic cosmetics themselves are perceived as cosmetics that are iconic/identical to an area and use natural ingredients found in that area. Holistically, the market believes that products made from natural ingredients are seen as having more sustainable value because they are minimal in chemicals and side effects on the environment, besides being relatively safe and effective in maintaining healthy skin. Given the large market opportunity, it is necessary to encourage the birth of new cosmetic business actors who take advantage of the growing biodiversity in all corners of Indonesia so that Indonesian thematic cosmetics can be better known by the Indonesian people themselves and the international market.

Coffee pod skin waste in Benteng Alla Village can be made into cosmetic preparations that are beneficial for skin health. The content of antioxidant compounds can counteract free radicals so as to prevent premature aging (Hasballah et al., 2022). Types of cosmetics that have the potential to be developed are face masks, bath soaps, and creams.

3.3 Efforts to Recognize the Potential of Coffee Peel Waste as a Leading Product

The study of the potential utilization of coffee fruit waste into several product dosage forms that can be superior in Benteng Alla Utara Village, Enrekang Regency needs to be introduced to the government and local community leaders as partners. An initial introduction to the potential of coffee berry waste to become preparations for several products such as health drinks and cosmetics was conveyed through presentation slides containing a brief description of the potential and methods of processing coffee berry waste into several products. This method is an initial step that still requires more specific follow-up regarding how to process each product that has the potential to be developed into superior products.

The government of Benteng Alla Utara Village is expected to be able to empower the community which will later be equipped with skills through education or training on proper production methods, so that further collaboration with the local government is needed in achieving the goals and objectives to be achieved to produce safe and quality products. One of the efforts that can be made is to shelter the Benteng Alla village community in a forum to provide assistance regarding the manufacture of good and quality products. The participation of the local government, especially by creating UMKM (Micro, Small and Medium Enterprises) in Benteng Alla Utara Village, has a very positive value in presenting a creative economy in the midst of society. With the presence of these MSMEs, it is hoped that the processed coffee waste products can become products that have high economic value, exist and are sustainable so that they will also boost the welfare of the people of Benteng Alla village.

4. Conclusion

The by-product of coffee cherries processing in the form of dried coffee fruit skin (Cascara) has the potential to be processed into several dosage forms such as health drinks and cosmetics. Preparations that can be produced are herbal teas, syrups, fermented beverages, facial masks, bath soaps, creams. These preparations have the potential to be developed into superior products in Benteng Alla Utara Village, Baroko District, Enrekang Regency by empowering the community through MSMEs.

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6. Author's Note

The authors declare that there is no conflict of interest regarding the publication of this article. The author confirms that the paper is free from plagiarism.

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