



# Improving the Process for the Production of Traditional Bali "Tandusan" Coconut Oil to Extend the Storage of Ecotourism in Family Welfare Program (PKK) Groups Merta Nadi Banjar Lantangidung, Gianyar, Bali

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## ABSTRACT

The Community Partnership Program and Traditional Coconut Oil Processing Training "Tandusan" activities will be carried out by Family Welfare Program (PKK) Groups Merta Br. Lantangidung, Batuan, Sukawati, Gianyar, Bali. Based on research, coconut-based oil is a source of medium-chain fatty acids (C8, C10, and C12), which can reach 61.93%. Medium-chain fatty acids have great benefits for human health. Barren coconut oil production in Br. Lantangidung, Sukawati, was done by women. Women's empowerment needs to be continued; this is important because women play a role in increasing resources and empowering the economy in the village. The goal to be achieved is to provide appropriate technology for coconut processing, which has the potential to be widely available in Batuan Village, Sukawati, as "Tandusan" coconut oil for health and consumption. During the hands-on training, additional materials will be provided on packaging technology, production process sanitation and hygiene, and marketing so that the trainees can properly manage their business. The methods used to implement this training are interviews, face-to-face counselling, and direct practice. The output target achieved is that partners know 100% of good processing methods, simple product packaging and labelling, broader marketing, entrepreneurship, and business management.

## 1. INTRODUCTION

### 1.1. Research Background

Indonesia is a country that has potential in the agricultural sector. From plantations, Indonesia has a superior commodity, namely coconut. Coconut is a plantation crop spread in almost all parts of Indonesia [1]. Bali, as an area that belongs to the tropical category, makes coconut trees grow prolifically. So it is not surprising that coconuts in Bali have high economic value. Coconut tree products ranging from leaves (young and old), flowers, fruit (young and old), and stems are all used by people in Bali [2].

Batuan Village is located in Sukawati District, Gianyar Regency, Bali Province. Batuan village is generally a lowland area stretching from north to south with an area of +410 ha.

According to the statistical data above, it can be concluded that Batuan Village is an agricultural area topographically. Apart from that, Batuan Village is divided administratively into 17 official banjars or hamlets. The boundaries of the Batuan Village area are North: Batuan Kaler Village; South: Sukawati Village; West: Central Singapadu Village; East: Kemenuh Village [3].

Agricultural-based industrial development in a broad sense as part of long-term economic development efforts must have strong linkages with other sectors and have a broad impact on increasing added value, providing employment and utilization opportunities, and developing processing technology through mutually beneficial activities between producer farmers and the processing industry and rural economic development. Brother Most of the Lantangidung people's livelihoods are as farmers and silver craftsmen [4]. Some residents grow coconuts for daily food consumption.



Coconut (*Cocos nucifera* L.) is one of the plantation commodities with an important role in economic activities in Indonesia as a producer of vegetable oil, which is much needed by the industrial sector [5]. Palm oil has expanded to various uses, including cooking, industrial, and fuel or biodiesel. This is due to its high-pressure oxidation resistance, ability to dissolve chemicals not soluble in other solvents, and high coating ability [6].

Farmers generally process coconuts into primary products like copra and coconut granules. Coconut fruit consists of four components: 33% coir, 15% shell, 22% coconut water, and 30% fruit flesh. The need for coconut products such as crude coconut oil, Virgin Coconut Oil (VCO), coconut water, coconut sugar, and traditional Balinese "barren" oil [7] For the production of coconut oil, people still use traditional techniques that require a lot of energy. Hence, the production costs are very high [8].

Coconut oil production in Br. Lantangidung, Sukawati, is done by women. Women's empowerment needs to be continued, which is important because women play a role in increasing resources and empowering the economy in the villages [9]. The business prospects for the small coconut oil industry remained good, owing, among other things, to the fact that more traditional cocoa oil is scarce. Still, demand for it tends to rise and the increasing tendency of consumers to prefer fried oil free of preservatives [10].

The production of coconut oil by machinery in the village of Tegal Cangkring has met the SNI standard 01-2902-1992 because of the physical colour of the limestone, the characteristic aroma of the oil, and the fact that there are no deposits. The next problem is the low production due to the shortage of supplies and facilities, such as inadequate industrial houses, i.e., small, fuzzy, non-hygienic houses of food processing industries with limited capital, as long as the used coconut shaving machines are old or often damaged. The coconut extraction tools are still done manually [11].

Products produced by the food home industry are generally characterized by an unfavourable picture, namely that they are processed with a low level of sanitation and hygiene, using raw materials with a low level of quality and freshness, food safety is not guaranteed, the technology used is passed down from generation to generation, the packaging technology that is used is inadequate, and a family manages the business with an inadequate level of management ability. Therefore, it is necessary to develop processing technology with several improvement efforts by applying the basic food processing process. Quality management and safety of raw materials and products must be studied for business and product marketing development [12].

Given the potential of the market and the need for processed coconut products, especially oil for health, efforts are needed to master its processing technology so that it can be a new enterprise and increase the income of the community through various activities and containers that can bring together citizens. Besides that, Br. Lantangidung is now known as a tourist area, so it has an opportunity as a food product market. This situation allows the people to cultivate their agriculture, one of the most popular coconut oils that can be marketed as a characteristic of the village of Batuan. Khalayak, the target we set this time, is the head of the household of PKK Merta Nadi Br members. Lantangidung is from a society that is not economically productive but is strongly committed to becoming an entrepreneur. Besides, it can also be

used as an additional source of livelihood that plays a role in helping increase the family's income.

There are activities of devotion to the community expected of the communities of Br. Lantangidung, Batuan, and Sukawati. They have skills and insights in managing local natural resources and a spirit of entrepreneurship so that they can open up business opportunities related to the conditions of the village of Batuan. By providing training activities in post-harvest technology and processing of coconut oil products, it is hoped that society will be able to produce and market its processed products, thereby increasing the income and well-being of the family. With this data, to reduce the number of families who do not have a fixed job, especially the household mothers, it is proposed to dedicate community training in coconut oil processing "tandusan".

## 1.2. Literature Review

According to research, coconut-based oils are a source of medium-chain fatty acids (C8, C10, and C12), reaching 61.93%. Medium-chain fatty acids have great benefits for human health [13]. The coconut oil products we make are of high quality and last about 4-6 months after manufacture compared to other coconut oils that can last 2-3 months. This benefits prospective consumers, mainly the community around students and household mothers in great need of fried oil. The production of coconut oil can be done in several ways one of the ways is by enzymatic means, that is, using the enzyme protolitic that breaks the protein bond, which is the emulsifier in the coconut base in the making of cocoa oil [14].

The advantage of coconut oil is that it has more saturated fat (fat without double bonds), making it more stable. at high temperatures and has a lower degree of oxidation [15].

Processed coconut oil products that are developing in the community are processed by direct heating to high temperatures, and without standing coconut milk, the results of the chemical quality analysis show that all quality components are moisture content, impurity content, job number, peroxide value, saponification number, and free fatty acids. does not meet the quality requirements of SNI 01-2902-1992 coconut oil. The results of the physical quality analysis show that all quality components, namely color, smell, taste, and presence or absence of sediment, do not meet the quality standards. The technology for repairing coconut oil by standing the coconut milk and using uniform raw materials shows very good results, physically with a clear color, a distinctive aroma of coconut oil, and no sediment and chemically with the established coconut oil quality standards. SNI 012902-1992 [16].

## 1.3. Research Objective

The objectives of this community service activity include: A) In the agricultural sector, namely: 1) Training on the transfer of efficient and appropriate technological innovations in processing coconuts into traditional Balinese "barren" coconut oil, which is fuel-efficient and of good quality; 2) Counseling knowledge on good processing methods, processing sanitation, and hygiene, as well as product packaging and labelling; and 3) providing knowledge on how to obtain a Production Permit from the Health Office or P-IRT. B) In the field of Economics: 1) Programs to increase knowledge about entrepreneurship, business management, and bookkeeping; and 2) Providing equipment assistance to produce in sufficient capacity and have working capital for further production.

## 2. MATERIALS AND METHODS

### 2.1. Materials and Equipment

The raw material used is old coconut fruit, taken around Br. Lantangidung, Batuan, Sukawati. The only additional ingredient is boiling water. Other supporting materials are cotton, tissue, and filter paper. The equipment used is a Strainer, Coconut grater Machine, Mixer, Stove, Scales, Basin, Large Pot, fry Pan, Stirring Spoon, Tray, Knife, and several other types of equipment.

### 2.2. Implementation

The implementation of Community Service Activities is carried out in several stages: 1) Assessment of the location; 2) Approach by coordinating with PKK management and members Merta Nadi, Br. Lantangidung, Sukawati; 3) Selection of meeting and training venues; 2) Interviews, discussions, questions and answers regarding problems faced by partners; and planning activities that show steps for solutions to problems faced by partners. 3) Implementation of training and practice for the manufacture of "barren" coconut oil products, packaging, and labeling of the resulting products. 4) For the training to be carried out, the donated equipment is handed over to partners to support the manufacture of the product to be carried out.

Implementation of Community Service activities for PKK members Merta Nadi Br. Lantangidung can run smoothly thanks to the good cooperation between the management and PKK members of Merta Nadi Br. Lantangidung, official and customary officials, and the service team. The contributions from partners to the implementation of activities are: a) Partners who are training participants have complied with all agreements that have been made in accordance with the statement of willingness to cooperate in this Community Service activity; b) Partners with full discipline and responsibility, comply with all agreements and carry out all series of activities until all planned activities end; c) Partners have contributed to this activity by providing training venues and preparing coconut raw materials to be used in training; d) After the end of this Community Service activity, partners are expected to be able to pass on their skills to other community members to take advantage of the potential of existing coconuts; e) After the Community Service activities end, partners are expected to be able to practice and continue the business properly and the businesses that are initiated can develop; f) The partner's contribution to support this Community Service activity is in the form of an additional consumption fee at night of Rp. 300,000.- and the cost of electricity during the activity is Rp. 200,000.-. The total partner contribution fee is Rp. 500,000.-.

## 3. RESULT AND DISCUSSION

### 3.1. Result

As an initial stage, an approach and coordination with PKK partners Merta Nadi, Banjar Lantangidung, Batuan, Sukawati, and Banjar Adat Kelihan were carried out to finalize the planned training activities that had been agreed upon during the assessment. At the meeting, it was agreed that 12 PKK Merta Nadi and Banjar Lantangidung representatives would participate in the "Bandung Traditional Coconut Oil Making" Training.



**Figure 1.** Assessment by PKM teams with PKK Chair Merta Nadi, Banjar Lantangidung

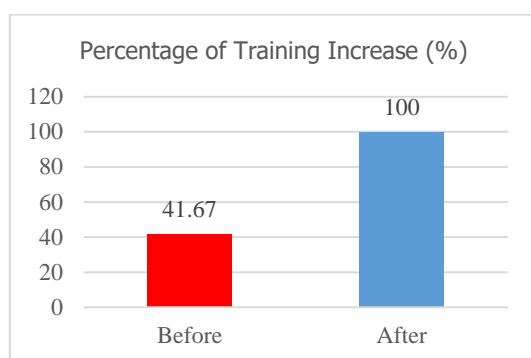
The first meeting (I) of the service team was held on Saturday, August 5, 2023, with all training participants attended by representatives of PKK members Merta Nadi and Banjar Lantangidung, with activities carried out including: 1) The opening ceremony of the activity by the Head of the Community Service Team as well as providing remarks and directions for the smooth running of this activity; 2) Remarks and descriptions from the Chairperson of PKK Merta Nadi and Banjar Lantangidung regarding the planned training activities to be carried out so that all participants and instructors who will assist during the activity can have the same perception and the activities run smoothly; 3) Delivering training and production equipment that will be donated to PKK partners Merta Nadi and Banjar Lantangidung to support the manufacture of products during the training and can be produced after the completion of the training activities; 4) Prepare and discuss planned activity schedules with Merta Nadi PKK partners, Banjar Lantangidung, who will be training participants, so that they can arrange the time for their activities and that activities can take place as planned and, in terms of time, be efficient and adapt to the activities of the participants; 5) Discussions and questions and answers regarding problems faced by partners, so that this activity can be well planned to determine steps for solutions to problems faced so far; 6) Distribution of learning modules so that trainees can learn and attend training more smoothly.

After being interspersed with rest programs, lectures and counselling activities were carried out at the first meeting as supporting or general material. For this activity, PKK partner Merta Nadi, Banjar Lantangidung, was given a lecture on material about coconut and its prospects as a raw material for processed traditional "Beverage" oil as well as its nutritional value and benefits, consumer protection, sanitation, hygiene, product packaging, and labelling, policy and the importance of product licensing preparations for the community, and entrepreneurship, institutional strengthening, partnerships, entrepreneurship, and marketing with Dr. Anak Agung Sri Mahyuni, SE. M. Agb., from the Food Technology Study Program, Bali Dwipa University.

For this lecture activity, the committee provided a training module containing materials from the lecture above and a training module for making traditional coconut oil "Tandusan". In this way, it is hoped that PKK partners Merta Nadi, Banjar Lantangidung will understand the lecture material related to entrepreneurship

and have files that can be retrieved at any time if they forget the theory and materials from the training. The material is given so that the trainees will open their horizons and be excited to participate in the training.

The second meeting was held on Sunday, August 6, 2023, and the training participants were given training on making traditional coconut oil "Tandusan" using the cream separation technique with direct heating to shorten the time in making this traditional cocoa oil using coconut from the garden produced by farmers in Banjar Lantangidung. Students were guided by instructors in the Food Science and Technology Studies Program, Faculty of Agriculture, University of Warmadewa. Hopefully, the pupils can follow the training well. Instructors guide training participants. Activities are evaluated and monitored at each meeting so deficiencies and errors can be corrected immediately at subsequent meetings. The results of the presentation of the evaluation of the training of the traditional oil manufacturing "tandusan" can be seen in Figure 2.



**Figure 2.** Results of the percentage evaluation of the training for making traditional "Tandusan" oil

Furthermore, the third meeting was held after Galungan and Kuningan, namely on August 18, 2023, using training participants to make their "Tandusan" coconut oil without being guided by an instructor. Then, participants were also asked to make their own at home using the coconuts they owned. The implementation of the activities can be seen in Figure 2. The products resulting from this training are then assessed to determine whether they meet the expected final product results, which will then be considered to determine whether they meet the criteria for applying to obtain a product permit in the form of a Home Industry Product Permit (P-IRT). Based on the results of this evaluation, it will be recommended whether the quality of the oil produced by this partner is feasible to obtain a P-IRT product permit so that a recommendation from the Gianyar Regency Health Office will be used as an attachment to the application for a food safety education certificate and P-IRT production certificate to the Investment Office and One-stop Integrated Services for Gianyar Regency. An application for a P-IRT permit for this "Tandusan" product will be submitted after fulfilling all specified administrative requirements. It is hoped that in the future, this "Tandusan" product will become the icon of Banjar Lantangidung, Batuan, Sukawati. Besides that, if the P-IRT permit has been issued, the marketing of traditional coconut oil products can be expanded in traditional markets and department stores, mini markets, and supermarkets because they have been equipped with permits as proof of product legality. The traditional Coconut Oil product "Tandusan" can be seen in Figure 4.



**Figure 3.** Implement training activities and practices for making traditional "Tandusan" Coconut Oil.



**Figure 4.** Traditional "Tandusan" Coconut Oil Products

Assistance in the form of monitoring and evaluation is carried out three times to maintain continuity and achievement of the output targets to be achieved from this Community Service activity, and the service team continues to motivate partners so that they remain enthusiastic and maintain the cohesiveness of PKK partners Merta Nadi and Banjar Lantangidung. The results of this monitoring and assistance are then evaluated and reviewed to be able to make overall improvements to this Community Service activity.

### 3.2. Outcomes

In detail, the results achieved from this community service activity include appropriate technology, mass media publications, activity videos and traditional "Tandusan" coconut oil products.

### 3.3. Benefits

The group acquires skills in developing, refining and processing traditional "Tandusan" coconut oil products. Of the 12 groups of participants, all had mastered the technology of making traditional "Tandusan" coconut oil, so 100% could make traditional "Tandusan" coconut oil well.

### 3.4. Partner's contribution to implementation

Partners are very enthusiastic about the training process. All partners (100%) participate actively in direct practice activities, and partners expect ongoing assistance in developing traditional "Tandusan" coconut oil products.



### 3.5. Implementation of Community Service

#### 3.5.1. Inhibiting factors

Implementation of community service activities at PKK Merta Nadi Br. Lantangidung, Sukawati, Gianyar, and Bali can run smoothly thanks to good cooperation between representatives of Merta Nadi PKK members, the service team, and official and customary officials with the principle of achieving a common goal, namely to improve people's welfare and raise existing agricultural potential and make full use of it into products of higher economic value. However, its implementation is also not free from several obstacles. Obstacles that occur include 1) community activities in the field of custom and religion, which must be considered in preparing the schedule for this community service activity; 2) The activities of each Merta Nadi PKK member as a partner in different activities; 3) Training and counselling materials that are still very new and have never been implemented by partners; 4) Equipment that is still lacking and business capital that is still very minimal.

#### 3.5.2. Supporting factors

PKK Merta Nadi Banjar Lantangidung, Gianyar Regency, Bali is enthusiastic about learning to process coconut fruit into an innovative product, namely traditional "Tandusan" coconut oil. Participants independently want to practice making traditional "Tandusan" coconut oil products until they start marketing.

#### 3.5.3. Solution and follow-up

Obstacles encountered in the implementation of community service can be overcome by communicating with the group leader and village officials so that they can arrange the right time so that this community service activity can be carried out. Extension activities and direct practice can occur smoothly and are attended by 12 group members. The activities carried out have implemented health protocols.

#### 3.5.4. Strategic steps for further realization

Furthermore, the community service team will continue to assist in processing coconut into various other innovative products. The next plan is that the implementation team plans to accompany the group to seek a P-IRT permit so that the product can be marketed more widely. The strategic steps to realize the next plan are making labels and proper packaging for processed moringa products in preparation for applying for permits at the Health Service (P-IRT).

## 4. CONCLUSION

Community service activities have been running smoothly. PKK Merta Nadi Banjar Lantangidung has been able to apply coconut processing technology independently and has produced traditional "Tandusan" coconut oil products. Partners are 100% familiar with good manufacturing practices, processing, simple product packaging and labeling, broader marketing, entrepreneurship, and business management.

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