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Empowerment of PKK Members in Utilizing Fragrant Lemongrass Oil as a Floor Cleaner Production Material in Sukasari Village, Seluma Regency, Bengkulu Province, 2023

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Abstract

The purpose of this activity is to increase the knowledge and skills of PKK members in Sukasari village in developing products from lemongrass oil. This can increase the selling value of lemongrass oil that has been produced, so that it can increase community income. The methods used were socialization, demonstration and self-assistance in making cleaners, packaging and labeling fragrant lemongrass floor cleaner products. At the socialization stage, participants received material and there was a discussion session. Participants were given a questionnaire to see their level of understanding of the material provided. After the participants were given counseling and demonstrations of product making, it was seen that there was an increase in the knowledge and skills of the participants in making these products independently. Also, it was seen that participants were interested in developing this product into a commercial product. The conclusion of this activity is that participants are able to produce this product independently. This product will be used for personal household needs and developed by the local BUMDes to become a commercial preparation.

A. Introduction

Improving the social welfare of the community can be done in various ways and approaches, one of which is community empowerment. Empowerment can be carried out with various target groups, one of which is the empowerment of the PKK group.

Sukasari Village is one of the villages located in Periukan District, Seluma Regency. The main economic potential of Seluma district is agriculture (53.65%). However, the management, quality and marketing of agricultural products are still not optimal. The potential of Sukasari Village is coconut and lemongrass plants (Ferina et al., 2019). Seluma Regency participates in the National Appropriate Technology Development (TTGN) program. This TTGN aims to accelerate the transfer of technology to the community, especially village communities, in an effective manner and to encourage the community to be creative and innovate in processing superior regional products so that they are more valuable and can compete and participate in promoting and popularizing them. From this program, Sukasari Village displayed an innovation in the form of a tool for making lemongrass oil (Jurkaninová et al., 2024).

Lemongrass (*Cymbopogon nardus*) is an upright, perennial grass plant that has very deep and strong roots. Essential oils can be extracted from the leaves and stalk of this aromatic grass plants (Kumoro et al., 2021). *Cymbopogon nardus* contains secondary metabolites found in its leaves. The essential oil produced by

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citronella is a monoterpene compound which acts as the best antibacterial agent, because it is bactericidal and bacteriostatic (Mahmud et al., 2022; Montañer et al., 2023; Sukamdi et al., 2021). Citronella oil contains chemical compounds, namely citronellal, geraniol and citronellol (Kiani et al., 2022; Saada et al., 2020). Citronellal has many properties as an inhibitor of bacterial growth and antioxidan (Tahya et al., 2022) . The essential oil of lemongrass has been utilised since the old-times in traditional medicine as a natural remedy to improve circulation, control menstrual cycles, enhance digestion or improve immunity. It is also used to produce perfumes, flavours, detergents, and pharmaceuticals (Kumoro et al., 2021; Sharma et al., 2019).

Currently, Sukasari Village has developed products made from lemongrass, namely lemongrass drinks and lemongrass oil (Ferina et al., 2019). Marketing of lemongrass drinks is still limited due to its short shelf life. The lemongrass oil produced has not been developed into a comercial product such as floor cleaner as a Household cleaning product. Household cleaning products play a pivotal role in maintaining cleanliness and hygiene within our living spaces However, the conventional chemical-laden formulations often pose significant environmental and health concerns. In response to this challenge, the quest for sustainable and eco-friendly cleaning solutions has gained momentum in recent years (Castiello et al., 2023; Larson, 2022).

The products produced can later be sold to the public through collaboration with shops. So, this product can increase and open new business opportunities for the surrounding community. This business does not require special time so it does not interfere with her routine activities as a housewife, the work is flexible and easy and does not require special skills. Apart from being easy, this side business can improve the economy of the surrounding community because raw materials can be obtained easily, and Sukasari Village already has the facilities and infrastructure to refine citronella oil (Jurkaninová et al., 2024). However, in carrying out this activity, the PKK mobilization team faced several problems, including human resources and skills. The resource in question is the ability to create and process the results of distilling lemongrass into floor soap products, because so far the community has never developed products from distilling lemongrass.

The formulation of the citronella soap floor cleaning product used in this program is the result of research conducted by the team previously (Indriasari et al., 2023). The ingredients needed are citronella oil (15 gram), Hydroxyethyl Cellulose/HEC, glyserin, sodium hydroxide, citric acid, sodium benzoate, texapon and destilled water. Hydroxyethyl Cellulose used as a surfactant and viscosity enhancer and Glycerin used to disolved HEC(D'Avino et al., 2022; Mondal et al., 2023). Sodium Hydroxide (NaOH) used as the main ingredient in the saponification process where oil or fat is converted into soap. Without the help of NaOH, the soap chemical process will not occur (Larson, 2022). Citric acid as cleaning agent (Bruchard et al., 2023; Eramo et al., 2024). Texapon or SLS as a foam maker (Tran et al., 2020). Sodium benzoat as preservative (Kumar et al., 2023). And destiled water as solvent.

The products produced comply with the SNI 1842:2019 standard for floor soap (Nirwana et al., 2023). The pH value for this preparation is 8. Based on SNI 1842:2019, the pH of floor soap ranges from 6-11. The free alkali value that meets the standards for floor cleaning fluids for free alkali content must not exceed <0.2 w/w. The percentage of active substances with free alkali values is directly proportional. This means that the higher the percentage of active substance used, the higher the free alkali value produced. This is because the saponification reaction between oil and NaOH is not perfect, so that the added NaOH is not bound by the oil to form soap and glycerol (Hutapea & Hidayati, 2023).

B. Research Methods

Implementation of the program is carried out using several methods, namely counseling, manufacturing demonstrations and product manufacturing assistance. The implementation stages are as follows

Table 1. Stages of Program Implementation

Preparation	Implementation	Evaluation
1. Pre-survey (identification of problems and needs of partner areas) 2. Designing programs related to partner needs. 3. Cordination with partner regional leaders regarding planned programs. 4. Preparation of program schedules with partners. 5. Preparation of materials and tools for activities	1. Providing information regarding the potential of lemongrass oil. 2. Demonstration of product production 3. Evaluate participants' understanding of the topic and activities carried out	1. Evaluate floor cleaning products that participants make themselves 2. Discussion of problems found during production 3. Evaluate participant understanding and the benefits participants get after participating in the program

This community service program implemented in October-November 2023 in Sukasari Village, of Seluma Regency. This program was attended by 30 women members of the Sukasari Village PKK. The implementation activity consists of several stages, namely : pre-test and post-test to evaluate participants' knowledge and understanding of the topic of the potential of citronella oil and the production of floor cleaner from citronella oil.

After that, there was a demonstration of making citronella floor cleaner. Participants were given 1 package of tools and materials needed, and also a booklet about production instructions.

Figure 1. Tool And Ingredients Of Citronella Floor Cleaner

First, dissolve HEC in glycerin, stir until HEC is completely dissolved. In a separate container, mix Potassium hydroxide with citric acid and distilled water, stir using a mixer until all ingredients are completely dissolved. Next, add citronella oil, HEC solution and Texapon. Stir with a mixer until a thick and homogeneous preparation is obtained. Leave it for a few moments until the foam disappears, then put the preparation into the bottle (Indriasari et al., 2023).

After the demonstration, the Participants were given the opportunity to make this product themselves. Participants are accompanied by a team during this activity. Next, participants were given the opportunity to make this product themselves based on the instructions and demonstrations that have been given previously. Then, the products created were evaluated. A brief discussion was held regarding the problems found when making the product independently. Next, an evaluation is carried out to assess participant knowledge and the benefits of this program for participants. The evaluation instrument used was a questionnaire.

C. Result and Discussion

Activities are carried out according to a mutually agreed schedule. Program activities begin with an opening by the Head of the Implementation Team, then introductions by the Community Service Team and training participants. Next was the reception and official opening of the activity by regional officials and the Village Enterprise (BUMDES) of Sukasari Village (Figure 2).

Figure 2. Opening Activities for Community Service Program

Then, knowledge information was provided to the participants regarding citronella oil. Previously, the team asked participants to fill out a questionnaire first, to see the participants' knowledge regarding the topic that would be discussed. The results of the questionnaire showed that most participants already knew that citronella oil could be developed into several dosage forms, such as carbolic acid and soap. All participants (100%) have never participated in similar training activities and do not know how to make floor cleaning preparations from citronella oil.

In this session, discussions were also held. Several participants asked questions such as how to get the formula ingredients, whether special equipment is needed in production and several questions related to the production of floor cleaners. All questions have been answered well by the team and the community is satisfied with the answers. Participants were informed that formula ingredients can be obtained easily and are even available in both offline and online stores, and also, no special tools are required to make this product.

In the next stage, a demonstration of making floor soap was carried out, then continued with independent making by participants accompanied by a team (Figure 3) This aims to ensure that participants will be able to make floor soap independently, either for use for their own families or to produce it for entrepreneurship purpose . The enthusiasm of the residents was seen when the demonstration started and the participants followed it well. From the evaluation results, it can be seen that there has been an increase in participants' knowledge and abilities in making floor cleaning preparations.

Figure 3. Demonstration and Practice of Making Lemongrass Oil Floor Cleaner

In the next stage, participants were asked to produce this product independently. The aim of this stage is for participants to be able to make preparations independently. In this activity, participants did not encounter any problems in making, because in the demonstration and direct practice activities, participants were able to make preparations well. The preparations produced by participants are of good quality in terms of preparation and packaging (Figure 4).

Figure 4. Lemongrass Oil Floor Cleaner "Cito Clink"

The next activity is to evaluate the level of participant proficiency in making preparations. Apart from seeing the products produced, evaluation was also carried out in the form of giving questionnaires. There has been an increase in understanding, independent practice skills and community enthusiasm in developing these preparations independently. It can be seen that 90% of participants are interested in making this preparation themselves, because the manufacturing process is relatively easy. 100% of participants benefit from the training provided because it can increase their skills. All participants were satisfied with the method of delivering the material provided because the team used video media to explain the production process and each participant was also given a booklet containing material and an explanation of the production process.

D. Conclusion

Community service activities regarding information and demonstrations on making citronella floor cleaner for PKK members in Sukasari Village, Seluma Regency can increase their knowledge and skills to independently make floor cleaning preparations from citronella oil. Based on the results of the questionnaire evaluation, it can be seen that the participants were very motivated in taking part in the activity and producing citronella floor cleaner for their own use and developed by the local BUMDES (Village-Owned Enterprise) to become a commercial product.

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