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Community Empowerment: Used Cooking Oil Recycle to Produce Handwash Soap as a Commercial Souvenir Product in Surakarta

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Abstract–A community service program was held in Surakarta city, in a boarding school named Kanzus Sholawat to solve the cooking oil waste problem. The used oil which locally is alluded to jelantah oil, blackish brown colored, contains exceptionally high levels of cholesterol, carcinogen, and it may cause harm for human wellbeing. Jelantah oil ordinarily will be directly thrown to the environment, hence may cause water and soil contamination. Agreeing to this, it is essential to teach individuals to do minimization and reuse to the utilized oil (jelantah). Besides, the individuals will be prepared to commercialize the items as a souvenir gift item. The jelantah oil will be processed into handwash cleanser products with a feasible, simple, and cheap procedure and utilizing effortlessly obtained material. To start, a 500 ml of used cooking oil is filtered and mixed with 160 grams of NaOH flakes soluted in 200 ml of water. Some drops of fragrance is added to make the soap perfumed. The purpose of this community service is to provide assistance to the Kanzus Sholawat Surakarta Foundation to take the economic value from the oil waste by commercializing the recycle product. The program will be carried out by training and education to handle the jelantah oil into handwash cleanser, and persistent assessment to make sure the Kanzus Sholawat Surakarta students and adjacent community get the optimal benefits. Pre-order sale system using e-commerce is also expected to be implemented by the students, to make this program sustainable.

Keywords: used cooking oil; soap; community service; Surakarta.

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1. INTRODUCTION

Cooking oil is commonly a vegetable-based oil that has a limited shelf life. After repeated use, cooking oil will become used cooking oil or used cooking oil. Cooking oil cannot be used multiple times, and need to be disposed after several times of use. If the used cooking oil is still used for cooking activities, it can have a negative impact on health (Wijaya et al., 2014). Multiple-use of used cooking oil may cause carcinogenic free radicals such as peroxides, epoxides, and others. Consumption of foods containing peroxide can cause colon cancer (Rahayu, et al., 2020).

The used cooking oil produced by households is disposed of with domestic waste or disposed of through sewers. This can also cause problems, like clogging the sewer systems. Used cooking oil at low temperatures will freeze so that if it is discharged through the drain pipe it will cause blockages and disrupt the flow of wastewater (Wijaya, et al., 2014). Used cooking oil can also pollute water and soil. The oil that is also wasted into the river will prevent the entry of air into the water, because the oil is in the upper layer of the water, and this can interfere with the survival of organisms in the river. Used cooking oil that is dumped into the ground can reduce soil fertility (Matusinec, et al., 2020).

The handling of used cooking oil can be done independently by the community. Used cooking oil can be used to make soap. This is because used cooking oil contains hydroxide (Na or K) from natural fatty acids derived from vegetable or animal fats. This soap-making process is based on a saponification reaction with the addition of alkali hydroxide (i.e. sodium or potassium hydroxide). To remove harmful substances and smell bad, used cooking oil must first be treated with a filtration method (Tsai, 2019).

Kanzus Sholawat Surakarta Foundation is located in Gentan Village, Baki Village, Sukoharjo, Central Java. This foundation is located in the middle of a residential area, with various routine activities every day. This foundation was only established in early 2021 and has the vision to develop an environment-based pesantren education curriculum. The foundation is inhabited by a number of female students and is also a center for spiritual activities for local residents on a regular basis.

With a variety of existing activities, the Kanzus Sholawat Surakarta Foundation produces several types of waste which are routinely produced every day. The waste includes cooking oil from cooking activities, plastic waste from packaging, food wrapping cardboard, paper waste, and various other types of waste. For now, waste management still relies on local waste managers who pick up trash on a regular basis, and use makeshift sewers to the surrounding ditches.

Waste cooking oil is quite a lot generated from daily activities in Kanzus Sholawat Surakarta. Currently, waste cooking oil is discharged directly into the public canal behind the building without going through any processing. This has the potential to increase the burden of environmental pollution in the surrounding canal, as well as waste the economic potential of the used cooking oil.

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2. METHOD

Making soap from used cooking oil requires several stages, starting from cleaning used cooking oil, preparing ingredients, and making soap. The following is the method of making soap from used cooking oil (Chandra et al, 2020):

A. Waste Cleaning

1. Put cold charcoal or hot charcoal (after being made into coals) into cooking cooking and let stand for 1-2 days. The size of the charcoal is made small so that the surface that is in contact with the oil is more.
2. Filtering used cooking oil with a cloth/sieve.
3. Waste cooking is ready to be processed into soap.

B. Material Preparation

1. Prepare clean, filtered cooking cooking as much as 0.5 liters or 450 grams
2. Prepare 80 grams of NaOH
3. Prepare 170 grams of water for coffee or lemongrass/pandan blended water. Next, strain the coffee/pandan/lemongrass blended water. Coffee/pandan/citronella water is used to disguise the smell of cooking oil.

C. Soap Making

1. Dissolve the NaOH little by little into the coffee/pandan/lemongrass water by stirring slowly until it runs out.
2. The NaOH reaction is an exothermic reaction that gives off heat.
3. After the NaOH dissolves let stand and wait until it becomes room temperature.
4. After the NaOH solution and cold coffee/pandan/lemongrass water enter the used cooking oil little by little with stirring. After all the used cooking oil is poured, keep stirring for 15-20 minutes until traces. Trace is indicated by thick traces when the stirrer is lifted.
5. Put the solution into the mold or pan.
6. Let stand for 12-24 hours until hardened.
7. Remove the hardened soap from the mold.
8. Store in an open container, leave in a protected open space for 3-4 weeks (Curing Process).
9. Soap is ready to be packaged and used for washing dishes, rags, cleaning the bathroom and so on (not for bathing).

3. RESULT AND DISCUSSION

Within the planning stage, a survey of the area of the Islamic boarding school of the Kanzus Sholawat Foundation in Surakarta was carried out and coordination was carried out with the chairman of the foundation regarding the program to be actualized. At this stage, observations were moreover made of the day by day activities of Kanzus Sholawat students, particularly those related to cooking. Kanzus Sholawat is occupied by around 40 students who generate a lot of utilized cooking oil each day. This

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cooking oil was at first as it were disposed straightforwardly through the dishwasher which was directly connected to the open sewer at the back of the building.

After the initial sruvery and study was conducted, the planning of the community service program was communicated with the head of the foundation and Kanzus Sholawat students. At that time, it was also socialized to gather used cooking oil from kitchen activities, and halt dumping it straightforwardly into open sewers.

The training activity for processing used cooking oil into soap was carried out in the morning of July 30, 2021, online and offline by complying with health protocols during the pandemic. The lecturers, students, and local residents listened to the explanation given by the UPN "Veteran" Jawa Timur community service team regarding the benefits of processing used cooking oil, especially in terms of the environment and the economic benefits that can be obtained from processing waste that is usually disposed of.

Figure 1. Socialization and training on the use of used jelantah oil

After the opening activities and the delivery of the material, it was followed by training in making soap from used cooking oil. The students had participated in trying to make soap from used cooking oil according to the method described in previous chapter. In this training, it was determined the composition of 500 ml of used cooking oil, 160 grams of caustic soda, 200 ml of water, and a few drops of deodorizer until you can smell the fragrance when stirring. This dose is enough to fully fill 3 soap molds, each mold consisting of 8 slots.

After the demonstration by the community service team, students and female students were invited to try the process of making soap from used cooking oil for themselves. Questions and answers were conducted to increase students' understanding of the processing of used cooking oil.

The soap that is made requires a curing or hardening period of one week to stabilize the caustic soda so that it is not harmful to the skin, and so that the soap mixture hardens completely. The resulting

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soap product has a green tea aroma, produces quite a lot of foam, and removes oil from the skin when used for washing hands. It is important to be noted that the produced soap is only recommended for handwash use, not to be used as body soap or face wash.

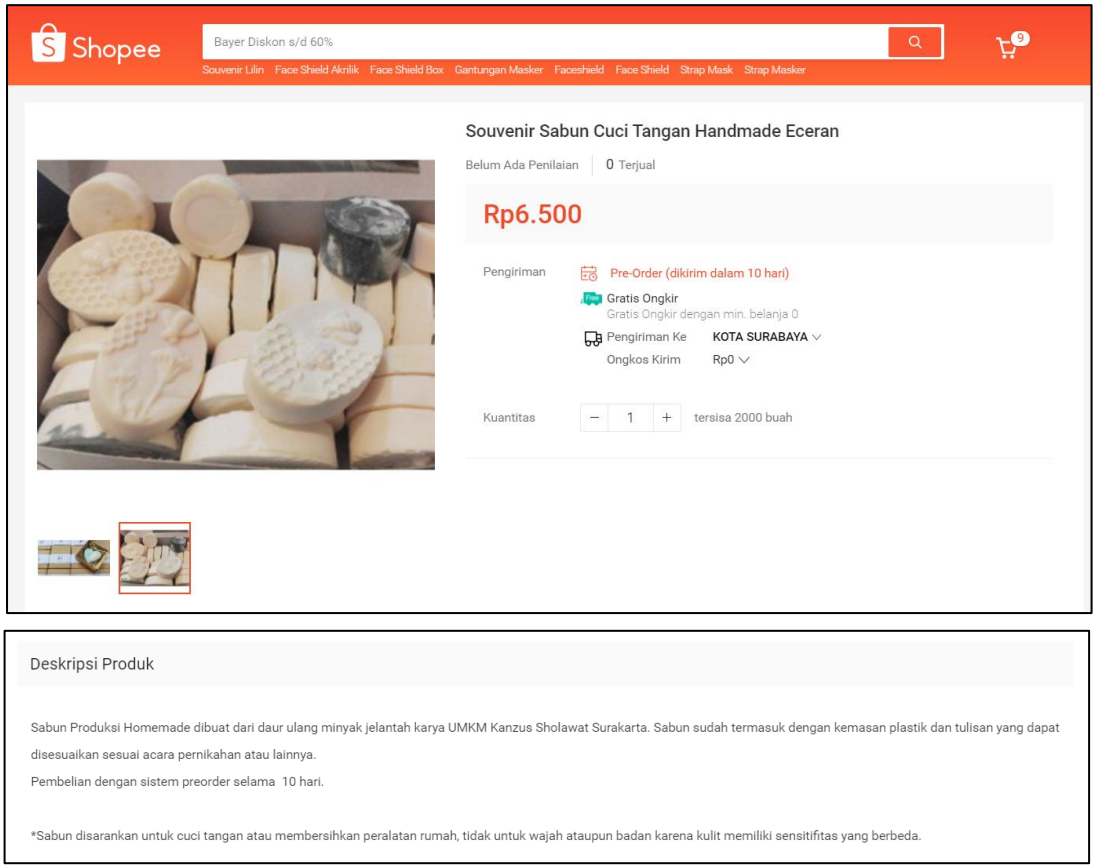

Figure 2. Commercialization of the recycled product

The produced soap is potentially become a commercial product, for example as a souvenir gifts for wedding and other ceremonial events. The students were also introduced with packaging and name tagging with simple art using computer, cooperating with nearby printing service. The students were then socialized with an e-commerce pre-order system to commercialize the recycled products. The e-commerce website used is Shopee, as it is the most well-known website for the students. A 10 days pre-order system let the students prepare the products as there will be enough time to do oil collection, production, packaging, and branding or giving the name tag.

4. CONCLUSION

The jelantah oil had been processed into handwash cleanser products with a feasible, simple, and cheap procedure and utilizing effortlessly obtained material. To start, a 500 ml of used cooking oil is filtered and mixed with 160 grams of NaOH flakes soluted in 200 ml of water. Some drops of fragrance is added to make the soap perfumed. The purpose of this community service is to provide assistance to the Kanzus Sholawat Surakarta Foundation to take the economic value from the oil waste by commercializing the

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