Vol. 7 No 1 Juni 2025
p-ISSN: 2715-8799 e-ISSN: 2715-9108

Training on Processing Used Cooking Waste into Solid Soap and Liquid Soap at the Karang Taruna of Palur Village.

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Abstract
creating a clean environment, one of which is collecting used cooking oil so that it does not pollute the environment and can have a bad impact on health. One of the uses of used cooking oil that can be turned into a product that has a selling value is soap. The purpose of this PKM is to increase understanding and training in liquid soap and solid soap that can be sold to increase the income of Karang Taruna Saras Muda Palur Village. The methods used are socialization, soap making training and entrepreneurship training. This PKM produces a processed product from used cooking oil waste and increases partner understanding after the pretest and posttest. From the activities above, it can be concluded that the results of the PKM related to the utilization of used cooking oil waste carried out by Karang Taruna Saras Muda Palur Mojolaban Sukoharjo have been carried out well and smoothly.

Keywords: *Karang Taruna; Soap; Used cooking oil; PKM*

INTRODUCTION

One of the food ingredients that is very much needed by the community in everyday life as a frying medium for cooking food is cooking oil. The cooking oil used by the community is generally produced by bulk cooking oil or CPO (Crude Palm Oil). Every day the use of cooking oil is increasing because cooking oil is easily available in traditional markets and supermarkets[1].

Karang Taruna Saras Muda is a community group consisting of young men and women in Palur Village, Sukoharjo Regency who are quite active in various activities in the village community, one of which is playing a role in creating villages with a clean environment. Figure 1 shows a map of the partner locations with PT Tim PKM.

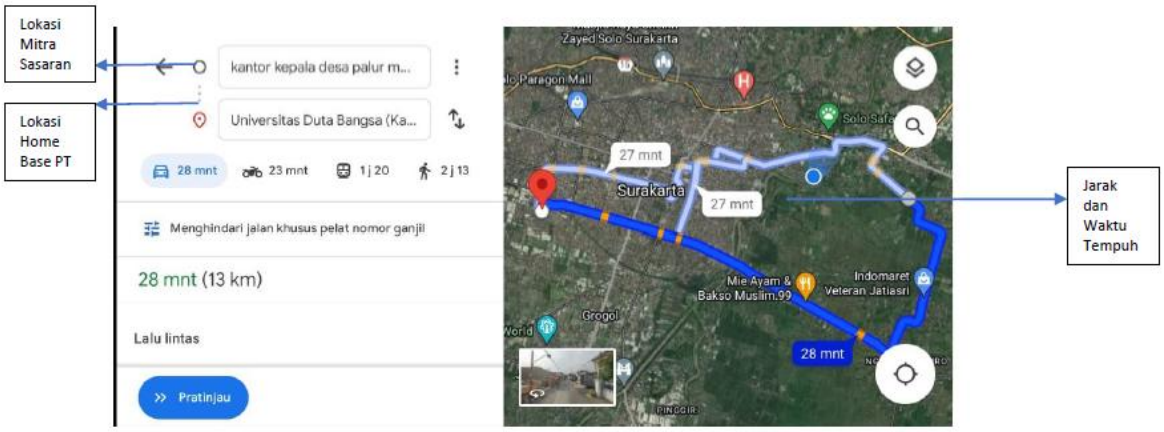

Figure 1. Distance between partner locations and PT

One of the efforts of the youth organization to create a clean environment is to collect used cooking oil so that it does not pollute the environment and have a bad impact on health [2] . Meanwhile, the disposal of used cooking oil into water channels can damage the environmental ecosystem because the nature of the oil which does not mix with water causes accumulation in water channels [3]. Rate increase *Chemical Oxygen Demand* (COD) and *Biological Oxygen Demand* (BOD) caused by the water surface being covered with

a layer of oil will prevent sunlight from entering the water, resulting in the death of existing biota and disrupting the balance of the ecosystem [4].From the above [5].problems, Karang Taruna has a solution, namely taking the initiative to encourage housewives to collect used cooking oil waste so that it does not pollute the environment.. Figure 1 shows the activeness of the youth organization in an effort to create a clean environment by accommodating used cooking waste collected from one of the residents' houses.

Figure 2. Collection of Used Cooking Waste by Karang Taruna of Palur Village

Recycling used cooking oil can produce more valuable products that can be utilized by the community. Used cooking oil contains unsaturated fatty acids such as linoleic acid, oleic acid, and triglyceride acids that can be utilized in oil-based products such as wax, liquid soap, and solid [6].

Soap is a compound of sodium and potassium with fatty acids from vegetable oil or animal fat in solid, soft, liquid and foaming form and is used as a cleaner (Silia*et al*., 2017). The process of making soap (saponification reaction) is a chemical process. For this reason, the right ratio of oil and alkali is needed to produce good soap, too high an alkali concentration will cause the free alkali content of the soap produced to be high [7]. However, if the oil concentration is high, the free fatty acid content will be high (Silia*et al*., 2017),

Based on the analysis of problems found during joint observation activities with partner villages, several priority problems were found that were in accordance with the needs of partner villages, including:

1. The first problem is the partners' minimal knowledge in processing used cooking oil waste into a product that has benefits by using appropriate technology because if used cooking oil waste is not handled properly it will pollute the surrounding environment.
2. The second problem is the lack of innovation in processing used cooking oil waste into products that have economic value to increase partner income and partner entrepreneurial knowledge such as making plans, choosing attractive product and packaging designs, creating online websites for sales, and calculating selling prices.

Based on these findings,partners need assistance and find the right solution, related to the processing of used cooking oil waste that can be utilized and used in everyday life in the surrounding community.

The objectives of this activity are (a) to provide education through socialization in order to increase public awareness to maintain environmental cleanliness and awareness of the potential for disease due to the use of cooking oil that is used repeatedly. (b) to train the use of used cooking oil into useful soap and provide opportunities for partners to learn entrepreneurship.

The solution offered is the utilization of used cooking oil waste which is converted into soap so that the added value of used cooking oil can cause environmental damage to have value and its benefits can be felt by the community in Palur Village, with empowerment of village communities based on appropriate technology. In implementing the activity, several approaches were carried out, namely counseling, training, mentoring and empowerment as well as strengthening institutions. *(Capacity Building)* unemployed productive youth. Universities as facilitators and channeling technology combined with the PKM program will accelerate the achievement of the program. There are two solutions offered by the PKM Proposing Team to partners, namely: (1). The PKM Proposing Team carries out socialization activities and training workshops on making mosquito repellent candles that are in accordance with the conditions of the local village needs. The following is Figure 1 of the flow of socialization and soap making workshops.

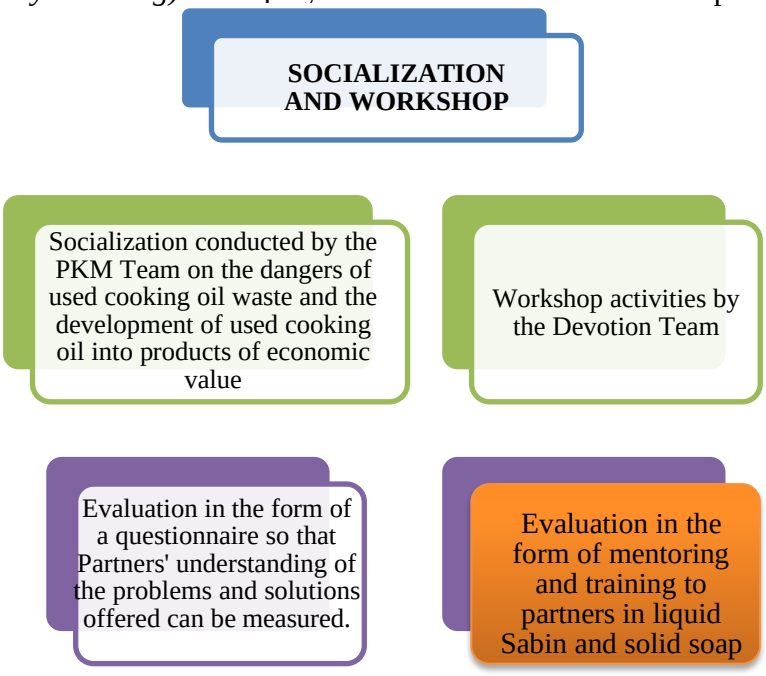

Figure 3. Flow of Socialization and Soap Making Workshop

In this PKM activity, partners provide a place, as well as other necessities such as tables, chairs, LCD projectors, and pointers. actively participate in every activity. In addition, following the socialization of the use and training of soap making provided by the resource person, so that the understanding and knowledge of used cooking oil waste and increasingly skilled in transforming used cooking oil into soap. After that, partners are trained and then partners will try directly under the supervision of the PKM team, so that the techniques and steps in making soap can be maximized.

METHOD

1. **The preparation stages carried out by the PKM TEAM and students involved in PKM include:**
   a. Observation to the partner village. In this observation, the activities carried out were first a survey of the partner's location, then an interview was conducted with the Partner, namely the head of the youth organization and the Youth Organization Supervisor of Palur Village and analyzed the situation and problems that occurred in the partner village. The implementation was carried out 4 times.
   b. The socialization was held by a meeting by the Proposing Team and a demonstration of the use of used cooking oil and formulating solid and liquid soaps, then a consumer interest test

was conducted by students to 20 respondents. Tables 1 and 2 show the formulas for liquid and solid soaps, which can be seen below:

Table 1. Liquid Soap Formula

Liquid Soap Ingredients	Heavy
used cooking oil	30 grams
Texapon	390 grams
Sodium Sulfat	180 grams
Citric acid	159 grams
EDTA	3 grams
Comperland	30 grams
fragrance	5 ml
Coloring	enough
Air 1,2 Liter	1,2 Liter

Table 2. Solid Soap Formula

Solid Soap Ingredients	Heavy
used cooking oil	30 grams
Olive oil	390 grams
VCO	180 grams
NaOH	159 grams
Air	3 grams
Fragrance	5 ml
Coloring	enough

2. **At the implementation stage in the field, the partners involved are all members of the youth organization.**
   a. **Socialization to partners**. This implementation is a socialization of the use of used cooking oil to make products such as aromatherapy candles, soap, and oil lamps. This activity also socializes how to make solid soap, clarify used cooking oil with zeolite for soap ingredients. The socialization and demonstration event for the use of used cooking oil guided by the PKM TEAM and 2 students and PKM resource persons was carried out at the partner's place and it is expected that all members of the youth organization will participate in the activity. And the place that will be used for training is the Palur Village Meeting Hall.
   b. **Application of soap making technology**. This training was carried out after socialization with Partners and PKM Teams and student teams held in the Palur village meeting hall. The process of making soap is first soaked in used cooking oil with activated charcoal and zeolite for a day, then filtered and soaked using bleaching earth. After that, prepare the tools and materials for making soap after the soap is finished, it is packaged in attractive packaging.
   c. Entrepreneurship training is conducted on a different day from soap making training with the following steps:
      1) Make plans, prepare products
      2) Building a website.
      3) Count selling price**,**

RESULTS AND DISCUSSION

The activities on the first day began with a socialization activity from a team of lecturers and students related to the purification and processing of used cooking oil into solid soap and liquid soap. The socialization was carried out simultaneously with the practice of

refining and processing used cooking oil, the team of lecturers provided explanations and directions related to the tools and materials used in the training, in addition to providing methods for processing and the benefits of used cooking oil. Figure 1 shows the enthusiasm of partners in participating in the socialization.

Figure 4. The enthusiasm of the youth organization in socializing the use of used cooking waste

After the socialization, soap making training was carried out. Before the waste oil is used as a raw material for soap, it is purified with zeolite and activated charcoal, left for 24 hours, then filtered and bleaching earth is added for 24 hours and filtered, then it can be used as a raw material for soap. The material presented in the socialization, in addition to purifying used cooking oil, also includes the function of soap, the soap making process, the composition of soap, and how to store soap after it is made. According to Widijintie et al. (2022), absorbents or adsorbents in the form of activated carbon used in the purification process can restore the color of used cooking oil, where activated carbon will react to absorb the color that causes the turbidity. Refined used cooking oil is processed into solid soap and liquid soap.(Widijantie*et al*., 2022). Figure 5 shows the PKM Team and partners during the soap making training. Processing used cooking oil waste into solid soap can provide a new breakthrough on one way of processing waste that does not pollute the environment (Jurnal*et al*., 2022).

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Figure 5. Soap making training

Entrepreneurship socialization about business opportunities from the use of used cooking oil to youth organizations that have been educated on how to do marketing and sales, by utilizing digital marketing so that it can be a source of income for youth organizations, by being taught attractive packaging, and making product innovations from used cooking oil. The results of this activity received a positive response where the participants were very enthusiastic and active. The entrepreneurship training activities carried out to train youth organizations in marketing soap products are very useful by training youth organizations in creating branding, websites, marketplaces to market soap products can be seen in Figure 6.

Figure 6. Entrepreneurship training

Community service activities with socialization and training in soap making which are evaluated using a questionnaire. *pre-test* before the activity is compared with the results of *post-test.* After the activity to find out the participants' knowledge was also carried out by Puspita & Adianingsih., (2023) [8] . The pretest was conducted before the delivery of the material to measure the initial understanding of the youth organization regarding the utilization of used cooking oil waste and the clarification of used cooking oil waste as raw materials for soap, while the posttest was conducted after the socialization

and training in making soap. The evaluation results of this PKM were evaluated from the filling in of pre-test compared to the results post*test* (Smirking *et al*., 2024). The success of the training can be seen from several indicators, including the number of participants in the activity, which was attended by 40 people, who participated in the presentation and practice of making environmentally friendly liquid soap in full. Another indicator that shows the success of this activity is the increase in the results of posttest compared to *pretest* from participants. result graph pretest and posttest are shown in Figure 6.

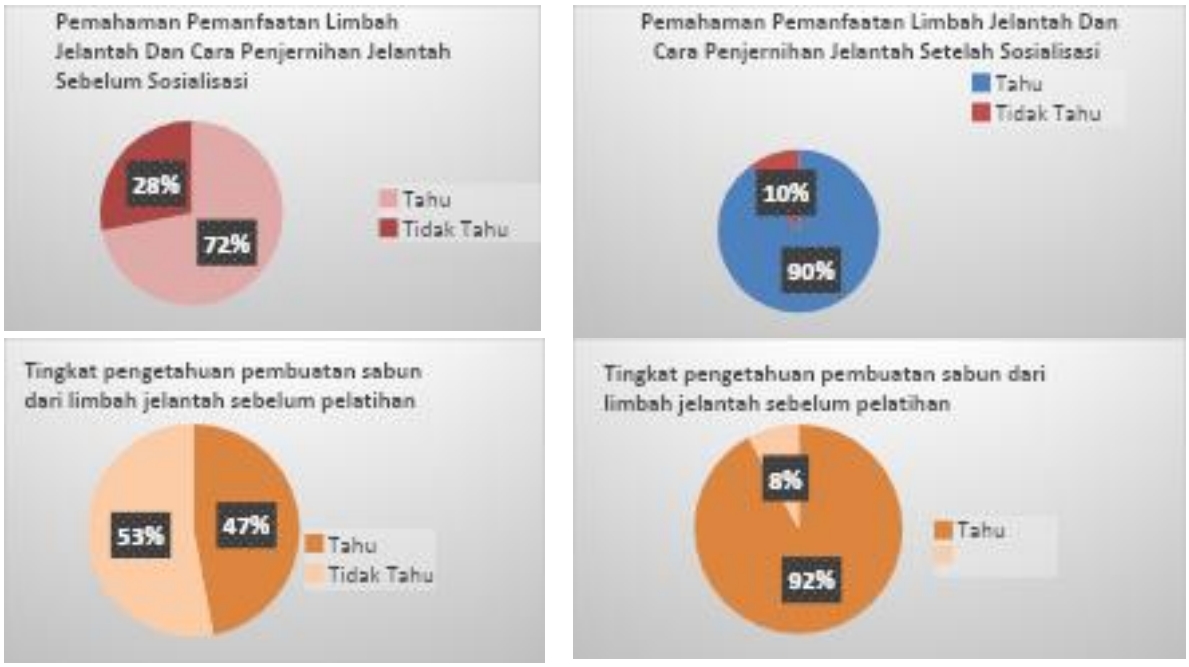

Figure 6. Graphics *Pretest* and *Post Test* Participants in the Soap Making Training from Used Cooking Waste

The results of the graph above show an increase in understanding of soap socialization and training. After the training, participants now have an understanding of the basic ingredients and steps for making environmentally friendly liquid soap using used cooking oil as the main ingredient. Participants also succeeded in creating useful products from used cooking oil that can be used as soap and have economic value. Figure 7 is soap made from used cooking oil

Figure 7. Results of PKM on making soap from used cooking oil waste

CONCLUSION

From the above activities, it can be concluded that the results of PKM related to the utilization of used cooking oil waste carried out by the young Saras youth organization Palur Mojolaban Sukoharjo have been carried out well and smoothly, the participants who attended the PKM activities were very enthusiastic about paying attention and actively asking questions about each stage of the oil purification process with activated charcoal, zeolite and bleaching earth, then the stages of making solid and liquid soap. With this PKM activity, it is hoped that it can increase the insight and knowledge of the participants of the Young Saras Youth Organization of Palur Village regarding the utilization and processing of used cooking oil waste as raw materials that can be utilized into products that have economic value so that they can be marketed and increase income.

For further development of this PKM, it can be considered by utilizing waste cooking oil as a basic material for making other products such as air fresheners. In addition, in the process of clarifying used cooking oil, waste kepok banana peels can also be used as a substitute for activated carbon.

ACKNOWLEDGEMENT

Gratitude can be conveyed to DRTM Kemenristek/BRIN for the 2024 budget year

with Contract Number 054/UDB.LPPM/A.34-AB/VI/2024 which has provided PKM funds. The team also thanks Karang Taruna Desa Palur who has helped implement this Community Service activity so that it runs smoothly.

BIBLIOGRAPHY

[1] N. (2022). Saputro, Y. A., Fadillah, N., & Khanifah, "Pelatihan Pembuatan Sabun Cuci Piring dari Minyak Jelantah Sebagai Upaya Pemanfaatan Limbah UMKM Tahu Walik Pasca Pandemi Covid-19.," *Soc. J. Pengabdi. Masyarakat, 1(4), 234–240. https//doi.org/10.55824/jpm.v1i4.119*, 2022.

[2] D. (2019)., "Pemanfaatan Minyak Jelantah (Waste Cooking Oil) Dalam Pembuatan Lilin Aroma Terapi Utilization of Waste Cooking Oil in Making Aroma Therapy Candles.," *J. Kesehat. Luwu Raya, 7(2), 37–42. http//jurnalstikesluwuraya.ac.id/index.php/eq/article/view/47*, 2019.

[3] U. A. (2022). Permadi, A., Setyawan, M., Rahmawati, N., Sembiring, N. S., Magister, P., Kimia, T., Industri, F. T., Dahlan, U. A., Pangan, P. T., Industri, F. T., Dahlan, U. A., Kimia, P. T., Industri, F. T., & Dahlan, "Pelatihan pembuatan lilin aromaterapi berbasis minyak jelantah di dusun sidomoyo kragilan godean sleman d.i. yogyakarta.," *Semin. Nas. Penelit. Dan Pengabdi. Kpd. Masyarakat, 4, 182–189.*, 2022.

[4] L. (2020). Siti Aisyah, "Pelatihan Pembuatan Lilin Aromaterapi Dalam Pemanfaatan Limbah Minyak Jelantah.," *J. Abdimas Kartika Wijayakusuma, 1(2), 98–103. https//doi.org/10.26874/jakw.v1i2.69*, 2020.

[5] K. R. (2021). Inayati, N. I., & Dhanti, "Pemanfaatan Minyak Jelantah Sebagai Bahan Dasar Pembuatan Lilin Aromaterapi Sebagai Alternatif Tambahan Penghasilan Pada Anggota Aisyiyah Desa Kebanggan Kec Sumbang.," *Budimas J. Pengabdi. Masyarakat, 3(1), 160–166. https//doi.org/10.29040/budimas.v3i1.2217*, 2021.

[6] R. (2022). Widijantie, N., Lestari, P. S., Hendarto, C. K., Rahmatia, L., & Enriyani, "Pelatihan Pembuatan Sabun Cuci Piring dari Minyak Jelantah di Perumahan Bogor Asri Kelurahan Nanggewer, Kabupaten Bogor, Jawa Barat.," *J. Pengabdi. Masy. AKA, 2(2), 31–34. https//doi.org/10.55075/jpm-aka.v2i2.100*, 2022.

[7] G. F. (2023). Djoru, M. R. B., & Neonufa, "Pelatihan Pembuatan Sabun Cair Dan Sabun Padat Berbasis Minyak Atsiri Pada Siswa Smk Pertanian Pembangunan Negeri Kupang.," *SWARNA J. Pengabdi. Kpd. Masyarakat, 2(5), 510–515. https//doi.org/10.55681/swarna.v2i5.519*, 2023.

[8] S. (2023). Maruya Kusuma, I., Febriani, A., & Nurmiati, "Pelatihan Pembuatan Sabun Padat Pada Kader Pkk Rw 06 Di Kelurahan Cipedak Jakarta Selatan.," *Pros. Semin. Nas. Pengabdi. Kpd. Masyarakat, 2023, 2023. http//journal.unj.ac.id/unj/index.php/snppm*, 2023.