

Waste Reduction and Economic Development from Used Cooking Oil into Aromatherapy Candles in Glagahwaru Village

Hidayati, H.¹, Ummah, Y. P. M.², Amalia, B.³ & Absor, M. U.⁴

^{1,2,3,4}Universitas Muria Kudus, INDONESIA

Received 16 September 2022, Revised 30 September 2022, Accepted 14 October 2022, Available online 15 October 2022

To Cite This Article:

<https://doi.org/10.53797/iccmjssh.v1i6.9.2022>

Abstract: Cooking oil is a basic requirement in food processing, but repeated use can result in oil damage and environmental pollution. Processing used cooking oil waste into aromatherapy candles is an alternative to reduce this negative impact. Aromatherapy candles have economic value and have the potential to be a source of additional income. This program aims to empower members of PKK in Glagahwaru Village to utilize the potential of used cooking oil waste and improve their welfare. The training was carried out through KKN activities involving the members of KKN in Glagahwaru and also the members of PKK in Glagahwaru. The implementation stages included observation, education, and training in making aromatherapy candles from used cooking oil. The research results show that aromatherapy candles from used cooking oil waste have economic potential and are environmentally friendly. This program is able to increase public awareness of the repeated use of cooking oil and reduce environmental pollution due to used cooking oil waste. Apart from that, the business opportunity of producing and selling aromatherapy candles is also an alternative income for PKK members in Glagahwaru village.

Keywords: Used Cooking Oil, Aromatherapy Candles, Waste Processing

1. Introduction

One of our basic needs is cooking oil, which is used to prepare food. The use of cooking oil as a frying medium is becoming increasingly important. Usually used for frying food, cooking oil is oil made from refined vegetable or animal fats and is liquid at room temperature. According to Taqwa et al., (2019), plants such as coconut, cereals, almonds, corn, soybeans, and canola are often used to make vegetable cooking oil. Previously utilized cooking oils, such as corn oil, vegetable oil, ghee, and other types, are waste and are used for daily household purposes. Used cooking oil is oil that has been used four times or more and its quality has decreased. According to Boden (2008), food fat should not contain more than 50% free fatty acids. The widespread practice of reusing used cooking oil came about as a result of the large amount of oil used by homes and fried food vendors for frying, mainly as a cost-saving measure. Cooking oil is widely used by households and fried food vendors so that it can reduce the quality of the oil and affect the taste of the fried food (LPPOM MUI, 2010).

Cooking oil deterioration occurs due to repeated use because unsaturated fats oxidize and produce peroxide chemicals (Nayak, 2016). Oil damage can have an impact on a person's health as well as the nutritional value and quality of fried foods. In addition, if done repeatedly, dumping used kitchen waste into the environment can pollute the environment. Various initiatives have been developed to address this to prevent used kitchen waste from polluting the environment. One alternative to reduce environmental pollution is to recycle used kitchen waste into valuable materials. There are several alternatives to utilize used cooking waste, such as producing biodiesel. Making aromatherapy candles with cooking waste is a simple process. In addition, because aromatherapy candles have marketable economic value, they can be used as an additional source of income for PKK women in Glagahwaru Village.

*Corresponding author: hanik.hidayati@umk.ac.id

<https://iccmjssh.com/> All right reserved.

Candles have been used extensively throughout history to create atmosphere in addition to providing light. These are aromatherapy candles, not ordinary candles. Candles made from scented materials that are good for relieving stress and treating headaches are known as aromatherapy candles. The use of aromatherapy candles has many benefits, including decreased stress and anxiety (Halligudi & Al Ojaili, 2013). Candles for aromatherapy are another use for conventional candles. Aromatherapy candles are made with various ingredients. One of them uses aromatherapy-scented essential oils known as aroma oils. The practice of aromatherapy provides a relaxing effect and a refreshing aroma (Halder et al., 2018). Burning aromatherapy candles has a healing effect. Materials for making aromatherapy candles include paraffin, stearin, fragrance, dryobalanops oil dye, lemongrass, orange leaves, and village-owned household waste, especially used frying oil. The aromatherapy candle production training can increase the community's capacity to develop a creative economy by utilizing the existing potential in the village. To create candles that are hard enough and burn perfectly, various formulas have been developed. Candles for aromatherapy have a lot of business potential. The production is simple, the supplies are readily available, the cost is affordable, and the income from the sale of aromatherapy candles is very high.

Aromatherapy candles can be used as beautiful wedding mementos in addition to being used to decorate and refresh the room (Orey, 2019). It is important to appropriately utilize the potential of the environment in the area around the community, for example by processing it into a product that can be produced and has a high market value. As a result, individual income may increase. To assist government initiatives in effective and sustainable management of natural resources and the environment, it is necessary to identify the potential of natural resources and the environment around the community based on local knowledge (Lin & Liu, 2016).

Increasing community income is one way to utilize existing potential. Therefore, it is necessary to strengthen community organizations, especially PKK women's groups in Glagahwaru Village, so that they can increase family income without relying solely on the head of the household. This community empowerment program aims to increase the human resource capacity and skills of PKK women in Glagahwaru Village in utilizing the natural potential of the community, especially used cooking oil waste, to produce something of high market value and benefit the local environment at both the economic and social levels. Increasing the ability of PKK women in Glagahwaru Village can encourage regional economic growth, which in turn can improve community welfare. The International Labor Organization (2017) states that to increase community income and create creative ideas for new businesses and employment opportunities, it is necessary to find employment prospects for the community.

2. Methods

The community service program carried out by observation and training in making aromatherapy candles from used cooking oil for members of the Glagahwaru Village PKK mothers is expected to improve the economy and awareness of cleanliness, environmental health and the dangers of repeated use of cooking oil. The training method also involved all members of the Glagahwaru Village Community Service Program.

During the implementation process. The implementation of the activity was carried out for 1 day starting at 15.30 to 17.00 WIB on September 5, 2023. The participants of this service activity are Glagahwaru Village PKK mothers totaling 15 people and several core administrators.

3. Results

3.1 Pre-Implementation

The processing of used cooking oil into candles has several articles that contain the program. There is a program to make aromatherapy candles from used cooking oil in Sorowajan Hamlet, Glugo Pedukuhan, Pangunharjo Village, Sewon District, Bantul Regency (Kenarni, 2022). In addition, the same program was carried out in Tirtonirmolo Kasihan Village, Rogocolo, Bantul (Jamilatun, et al., 2020). In Jetak Hamlet, Bolon Village, Colomadu District, Karanganyar, used cooking oil is processed into colorful candles (Orecchio, 2011). However, no community service program has been carried out to process used cooking oil waste into aromatherapy candles in Pener Village, Taman District, Pemalang Regency, Central Java. It is hoped that through the utilization of used cooking oil into aromatherapy candles, it can increase public awareness to maintain environmental cleanliness and awareness of potential diseases due to the use of cooking oil that is used repeatedly (Mannu et al., 2019). Before conducting the candle-making training, all KKN participants first observed the village head's house. In addition, KKN participants also deepen their knowledge about aromatherapy candles which also have many functions.

Researchers conducted education and training on making aromatherapy candles made from used cooking oil waste to PKK mothers in Glagahwaru Village. The results of this program are in the form of aromatherapy candle products that can be used by PKK women in Glagahwaru Village as a form of reducing used cooking oil waste generated from households, so that with this program, environmental pollution due to used cooking oil waste in Glagahwaru Village can be resolved.

3.2 Implementation

In this activity, the team provided information and training to partner members which included:

3.2.1 Training on making aromatherapy candles from used cooking oil

Apart from being utilized as biodiesel fuel and biofuel, used cooking oil can also be used as an alternative material for candle making. The process of making candles from used cooking oil runs in several stages. Crude glycerin obtained from the mixing process of used cooking oil and several ingredients can be processed into candles. Applied hydrocarbon chemistry is one of the theories applied in the processing of used cooking oil into candles.

3.2.2 Training to keep the environment clean

Used cooking oil or used cooking oil is vegetable cooking oil that has been used for frying and is usually discarded after the color of the oil turns dark brown (Panadare, 2015). Usually, used cooking oil is discarded because it has no use value. Its disposal will become waste that is not good for the environment. Especially if the waste is disposed of in the river, and also if it is disposed of in plastic bags, it will make it difficult to decompose and cause new problems. The disposal of used cooking oil into sewers or on the ground will pollute the water or soil. Environmental pollution caused by liquid waste disposed of in the river should be reduced by waste treatment efforts from households. Used cooking oil that is simply disposed of without any measurable treatment will require environmental remediation that is not only difficult, but also costly (McCarty, 2010).

3.2.3 Entrepreneurship opportunities

The majority of participants in this activity are housewives who do not work outside the home. A large number of housewives can be utilized to support the family economy. Related to economic demands, housewives have a strong urge to be able to help the family economy (Kabeer, 2007). Housewives experience obstacles in increasing family income such as limited capital, technological capabilities, weakness of knowledge in business management (Goh, 2012). From an economic point of view, making aromatherapy candles from used cooking oil can generate a fairly high income because the costs used are not too large and the production can be an item that has economic value. In addition to providing training on making candles from used cooking oil, the team also delivered information related to good product packaging and the stages of opening an online store.

In implementing IbM activities, there are many driving and inhibiting factors faced by the service team, among others:

1) Driving Factors

- Most of the participants understood the dangers of repeated use of cooking oil for the balance of the body and environmental health, although some of them admitted that it is still sometimes a pity if oil is only used 1-2x for frying.
- The high interest of the participants in the material provided because they got new knowledge about products made from used cooking oil which were converted into aromatic candles.
- The creativity of PKK women is high and supportive.

2) Inhibiting Factors

- Due to the great curiosity of the Glagahwaru Village PKK mothers of the participants, often objects of sample crafts were taken.

The purpose of this training on making aromatherapy candles from used cooking oil waste is that the residents of Glagahwaru Village are expected to gain useful knowledge about the utilization of used cooking oil waste, as well as the aromatherapy candle products produced can be utilized by residents as a creative business idea or used for personal needs in the village. Their respective homes. With the socialization conducted, it is expected that residents can know the dangers of repeated use of cooking oil for health in the long run. In addition, with this program, it is hoped that environmental pollution that occurs due to used cooking oil waste in Glagahwaru Village can be resolved. There are several stages in making aromatherapy candles from waste cooking oil, including the following (Fig. 1):

- (1) Preparation of tools and materials; used cooking oil, stearin, crayon dyes (yellow and blue) and aromatherapy essence.
- (2) Axis the tool used; pots, stirrer, candle mold, stove, scales and candle wick support
- (3) Site preparation the making of aromatherapy candles was carried out at the Glagahwaru Village KKN post.
- (4) Aromatherapy candle making process from used cooking oil waste:
 - a. Filter the used cooking oil so that it is clear of residue.
 - b. Pour the used cooking oil into a 200 ml measuring cup.
 - c. Weigh 150 grams of stearin.
 - d. Heat the used cooking oil to reduce the odor.

- e. Slowly pour in the stearin and stir until the stearin is completely dissolved in the cooking oil.
- f. Put the dye (crayon) into the mixture of stearin and cooking oil.
- g. Add aromatherapy essence to the mixture.
- h. Pour the mixture into the candle mold.
- i. When the wax is half frozen, plug in the wick.
- j. Set aside and wait for the wax to harden completely.



Fig. 1 - Activity implementation.

3.3 Follow-up

The socialization of alternatives to the use of used cooking oil as a base material for making aromatherapy candles has been carried out and overall went well at Glagahwaru Village. The participants were members of the PKK women of Glagahwaru Village, most of whom are housewives and often use cooking oil repeatedly. The participants were able to receive the socialization delivered well. There was a high interest from the participants to know more about the utilization of used cooking oil as a base material for making aromatherapy candles.

3.4 Evaluation

In general, the socialization in Glagahwaru Village regarding the alternative use of used cooking oil as the main component of making aromatherapy candles went well. PKK women who are mostly housewives and often use cooking oil repeatedly attended the event. The socialization was well delivered and could be utilized by the participants. The participants were eager to learn more about the use of used cooking oil as the main component of aromatherapy candles (**Fig. 2.**).



Fig. 2 - Activity evaluation.

4. Discussion

Candles made from recycled waste cooking oil can be lit on fire and used like any other candle (Pakvilai, 2018). A peaceful or calming scent will be provided by the colorful aromatherapy candles which will also enhance the aesthetics

of the room. Aromatherapy candles can be used as needed; for example, a burning time of one to two hours when the candle is first lit is enough to provide a relaxing room fragrance. Environmental pollution and possible excess consumption of cooking oil can be avoided by making eco-friendly aromatherapy candles from waste cooking oil. The aromatherapy candles are packaged in acrylic molds with various attractive designs, making them suitable items for creative entrepreneurs.

The results of the training on the utilization of used cooking oil to make aromatherapy candles can be seen immediately. This socialization event was well received by the participants and they were very enthusiastic. When household waste can be recycled into handicrafts that can be utilized for daily activities, it can be very innovative. Everyday waste is always generated by household activities every day. The finished aromatherapy candles made from the leftover cooking oil from this activity were taken home and recreated using supplies that were already at home.

Glagahwaru Village PKK mothers taught to be more creative in utilizing domestic waste that has a negative impact on the environment by processing used cooking oil waste into aromatherapy candles. Housewives are eager to help their family's economy (Creed, 2000). With this, they can create goods with high selling value with relatively little initial capital and market them to customers in the Glagahwaru Village area. The family economy can later benefit from the sale of aromatherapy candle goods.

5. Conclusion

Based on the results of community service activities carried out by all participants of the Glagahwaru KKN Village entitled "Utilization of Used Cooking Waste into Aromatherapy Candles to Reduce Environmental Pollution and Develop the Economy" in the Glagahwaru KKN Village, the following conclusions can be obtained:

- 1) Used cooking oil waste can produce high-value aromatherapy candle products with equipment and materials that are easily available nearby.
- 2) The processing of household waste such as used cooking oil waste has not been done optimally because people do not have an understanding of how to process it so that it has a high selling value.
- 3) The processing of used cooking oil waste by all participants of the KKN Glagahwaru Village into aromatherapy candle products has attracted the attention and interest of the PKK women of Glagahwaru Village.

There was interest from the participants to know more so that later it is expected to increase the creativity and innovation of processed products made from used cooking oil. The socialization material that has been given is socialization on how to make aromatherapy candles, which are relatively easy to make from the basic ingredients, namely used cooking oil, in terms of health and entrepreneurship, aromatherapy candles are quite selling and valuable. In fact, many of the socialization participants provided fresh ideas for product innovation. The output of this activity is an increase in skills to make products made from used cooking oil into aromatic candles, increased awareness of maintaining environmental hygiene and health and the dangers of repeated use of cooking oil, improving the household economy by selling aromatherapy candles made from used cooking oil.

To maintain the sustainability of the goal, some suggestions that can be made in the future are that similar activities need to be carried out more broadly so that the participants also cover a larger scale. In addition, it is necessary to introduce other processed used cooking oil, such as the utilization of used cooking oil into laundry soap so that innovation continues and strives to be economically viable to improve the economic level of participants and families.

Acknowledgement

The authors would like to thank the fellow authors and organizations whose intellectual properties were utilized for this study.

Conflict of Interest

The authors declare no conflicts of interest.

References

- Boden, G. (2008). Obesity and free fatty acids. *Endocrinology and metabolism clinics of North America*, 37(3), 635-646.
- Goh, A. H. (2012). A literature review of the gender-differentiated impacts of climate change on women's and men's assets and well-being in developing countries.
- Halder, D., Barik, B. B., Dasgupta, R. K., & Saumendu, D. (2018). Aroma therapy: An art of healing. *Indian Research Journal of Pharmacy and Science*, 17, 1540-58. <https://doi.org/10.21276/IRJPS.2018.5.3.2>
- Jamilatun, S., Elisthatiana, Y., Aini, S. N., Mufandi, I., & Budiman, A. (2020). Effect of temperature on yield product and characteristics of bio-oil from pyrolysis of *Spirulina platensis* residue. *Elkawnie*, 6(1), 96-108.

- Kabeer, N. (2007). Marriage, motherhood and masculinity in the global economy: reconfigurations of personal and economic life.
- Lin, P. S. S., & Liu, Y. L. (2016). Niching sustainability in an Indigenous community: protected areas, autonomous initiatives, and negotiating power in natural resource management. *Sustainability Science*, 11, 103-113.
- Mannu, A., Ferro, M., Pietro, M. E. D., & Mele, A. (2019). Innovative applications of waste cooking oil as raw material. *Science progress*, 102(2), 153-160.
- McCarty, P. L. (2010). Groundwater contamination by chlorinated solvents: history, remediation technologies and strategies. *In situ remediation of chlorinated solvent plumes*, 1-28.
- Nayak, P. K., Dash, U. M. A., Rayaguru, K., & Krishnan, K. R. (2016). Physio-chemical changes during repeated frying of cooked oil: A Review. *Journal of Food Biochemistry*, 40(3), 371-390.
- Orecchio, S. (2011). Polycyclic aromatic hydrocarbons (PAHs) in indoor emission from decorative candles. *Atmospheric Environment*, 45(10), 1888-1895.
- Orey, C. (2019). *The healing powers of essential oils: a complete guide to Nature's Most magical medicine* (Vol. 8). Citadel Press.
- Pakvilai, N. (2018). Efficiency of Grease Residue from Grease Trap Waste Water Treatment for Candles Production. *International Journal of Environmental Science and Development*, 9(12).
- Panadare, D. C. (2015). Applications of waste cooking oil other than biodiesel: a review. *Iranian Journal of Chemical Engineering (IJChE)*, 12(3), 55-76.
- Taqwa, A., Bow, Y., Effendi, S., Rinditya, G., & Pratama, M. Y. (2019). Analysis of Air Fuel Ratio on Combustion Flames of Mixture Waste Cooking Oil and Diesel using Preheating Method. In *International Conference on Sustainable Agriculture, Food and Energy (SAFE)*. Chiang Mai Rajabhat University-THAILAND.