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The Impact of Creative Activities Involving Cooking Oil Waste on Sustainable Environments

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ABSTRACT
Disposal of cooking oil waste into public places has adverse effects on the environment such as clogged drains, polluted rivers, and soil damaged by the loss of mineral resources. Clogged drains cause pest breeding, while contaminated water sources have an impact on the destruction of aquatic life. Despite various efforts, the issue of pollution continues to occur in line with uncontrolled development as well as increasing population growth. The objective of this study is to identify the impact of the implementation of creative activities on environmental preservation. The study uses qualitative methodology as its main research approach. Researchers collect information through key data collection methods such as interviews, observations, and fieldwork. Secondary methods are derived from data sources such as books, journals, and magazines. The results of this study found that the creative activities implemented became one of the solutions in the effort to reduce the disposal of cooking oil waste by taking a recycling and reuse approach. In fact, this activity can also make room for the locals to learn how to recycle cooking oil waste into a useful ingredient. Therefore, this study should be continued by intensifying creative activities to increase public knowledge and awareness of the potential of cooking oil waste to reduce environmental pollution, especially water pollution. This action matches the government's call for the success of the Sustainable Development Goals (SDGs), which focuses on the 12th goal of Responsible Consumption and Production.

Keywords: *Creative activities, recycle, waste cooking oil, sustainable environment*

1. INTRODUCTION

Environmental pollution is a significant problem that has become the primary coverage of today's newspapers and has become more serious lately. There are many causes of this, among others, due to uncontrolled development and high population growth, especially in large cities, which result in more and more resources needed to increase production to sustain the lives and consumption of the population. Many people nowadays are aware of the degradation of the environment due to negative impacts. Environmental degradation has reached a crisis and can be considered a disaster. Among the

areas of concern are pollution in major cities, traffic congestion, flash floods, water pollution, air pollution, noise, and soil.

There is no denying that development is significant for the progress of a country. Yet development that does not consider environmental capabilities will undoubtedly render the concept of continuous development unrealized. As a result, not only will this generation experience problems, but future generations will inherit the problems created at the moment. Therefore, there are various issues and problems regarding the deteriorating quality of the environment, exacerbated by various weaknesses and constraints in addressing such issues and problems.

According to Kafli & Isa, (2017) is said that there is more than 80 percent of the rivers in major cities in the country are dubbed the 'Dead River'. It is caused by the uncontrolled disposal of waste from industrial waste which is increasing every year. These rivers lose the ability of ecosystems to supply clean water, process sewage, and maintain their productivity. Among the rivers categorized as polluted rivers in Malaysia include Sungai Juru in Penang, Sungai Segget in Johor, and Sungai Klang in Selangor.

Malaysia's ecological status is not as bad as most other developing countries in the world. Although the Environmental Quality Act (EQA) was enforced in 1974, the water quality in the interior of Malaysia, especially in the rivers, is deteriorating. Most of the rivers are polluted due to pollution at the water source and in non-water sources (Al-Mamun & Zainuddin, 2013). However, it has been recorded that a large amount of pollution is caused by untreated waste. Nevertheless, it is not too late to take some bold steps to effectively control untreated sullage discharge, which plays a significant role in the status of the rivers.

According to Frota de Albuquerque Landi et al., (2022) Global waste is expected to grow substantially by 2050, therefore, defining an effective waste management strategy is a crucial topic for both industry and academia. Nowadays, food and green waste, in particular, represent a large share of total waste production. All this considered, effectively processing and eventually reusing materials such as waste cooking oil is of paramount importance.

Through primary data, researchers found out that the source of the river's pollution is not only waste from industrial environments. In fact, it is also caused by residential and shop environments caused by the dumping of cooking oil waste into drains and ditches. Cooking oil is an essential ingredient used in cooking preparation and a convenient ingredient that leads to clogging piping systems. Because of this problem, researchers are searching for suitable solutions to prevent cooking oil from turning into waste, and that it should be made into recyclable material instead.

This study will try to approach, understand, and at the same time explain the implementation of the initial cycle of cooking oil waste through creative activities carried out by the local community staggered to help reduce the discharge of cooking oil waste into drains and ditches. The objectives of this study are also in line with the answers sought in this study, including (1) what creative activities were carried out; (2) what processes are implemented in the reuse of cooking oil waste; (3) what is the impact of creative activities involving waste cooking oil on sustainable environments.

2. LITERATURE REVIEW

2.1 Creative Activities

According to (Nagayoshi & Nakamura, 2021) creative activities are created as the process of making something new and meaningful. This also considers that it occurs when people combine and integrate different types of information to solve problems and create new values at the social or individual levels. Creativity also defines as “the ability to come up with ideas or artifacts that are new, surprising, and valuable.” In other words, creation is not merely about creating new things but also about bringing benefits to people.

A creativity exercise is an invention endeavour focused on building creative skills, like problem-solving, communication and innovation, rather than improving a specific creative ability, like painting or dancing. This activity is a teaching method to help individuals with specific needs to achieve maximum cognitive, emotional, social and psychomotor development in the teaching and learning process (Yasmin Hussain, 2013). For example, the activity of forming dough is one art activity that helps the development of children who have problems recognising alphabets.

Learning and teaching involving interventions and visual arts media can also help develop children's mental health. This method also helps them how to combine images with themes. The assessment of the stage of childhood proficiency ability is taken approximately from formalistic rules through the principles of visual arts language (Lindo & Ceballos, 2020).

Intensive experience in creative activities is an essential tool for developing one's creative thinking. This creativity is the ability to create something of value by combining skills in terms of proficiency and imagination. The combined results of this skill and imagination can stimulate children's minds to be more creative in producing works of art. Creativity is derived from the Greek ‘creare' — meaning 'to fulfil’ (Sumardianshah Silah et al., 2013)

In addition, this process uses images and art media to help form individual creativity and response to create products reflecting the development, ability, personality, interest, concern, and concern of an individual (Yasmin, 2013). It is also used as a therapeutic activity to form emotions and human behaviour.

2.2 Recycle

According to Act 672, Solid Waste and Public Cleansing Management, recycling can be defined as collecting and separating to produce an output. Therefore, recycling occurs when a waste material is processed according to the recycling procedure and eventually produces the equivalent product. Recycling is converting residual waste materials into other materials with a particular value (Perbadanan Pengurusan Sisa Pepejal Dan Pembersihan Awam, 2013).

In other words, recycling can refer to activities involving the modification, adaptation, and construction of materials to produce new supplies from the original material. This recycling activity is one of the initiatives to reduce solid waste and proves to be an efficient way to conserve the environment. However, this waste collection system for recycling poses some problems, especially in the implementation phase, where it requires high cost, massive space and confusion on the recycling system (Muhamad Azahar Abas, 2013).

With this recycling activity, waste or used, old materials can produce something that is useful and functional to be put forth as new items. It includes reusing the items as their original function or distributes them to much-needed parties. Recyclable items are papers, newspapers, magazines and books; materials made up of iron, metal, aluminium and cans; materials made up of boxes, glass, glass bottles and mirror containers and materials made up of plastic such as bottle and food packaging (Norsyazwani Jaafar, 2009).

2.3 Waste Cooking Oil

According to a 2016 pollution study statistic, each household consumes two kilograms of cooking oil per month, while 45% of unused cooking oil is thrown away. The dumping of waste cooking oil into drainages and sewerage systems clogs channel systems. Furthermore, waste dumped into landfills causes environmental problems, especially the pollution of water and soil. It also promotes the breeding of pests that then affects the health of residents (Kalam et al., 2011).

Cooking oil used from the premise sink that flows into the wastewater system cause problems to wastewater treatment plants - or they are integrated into the food chain through animal feeding, thus causing potential health problems for humans. The release of waste cooking oil into the waters also

alters the oxygenation process and destroys aquatic life in the ocean. This is caused by the oil layer covering the water surface which then prevents oxygen from dissolving. The by product of oil degradation mixing with water increases the demand for chemical oxygen (COD), thereby polluting the water (Ibrahim Kabir et al., 2014)

At the same time, the dumping of cooking oil into sinks result in water pollution as the oil discharged into the sink goes through the buffer and eventually gets channelled into the water source. Oil layers will thus form, thereby polluting water sources and threatening aquatic life (Mohamad Fazli Sabri & Teoh Yong Yong, 2006). Many traders who use cooking oil to fry food use it repeatedly to save capital. This is dangerous because the same cooking oil should only be used three times — more than this, and it can damage people's health (Liyana Rosman, 2018).

Talking about the potential of used cooking oil waste, not many people know and understand that used cooking oil waste can also be recycled Wan Nasriha & Zanaton, (2013). To reduce pollution and at the same time maintain the surrounding nature, the 3R concept: Reduce, Reuse and Recycle, must be implemented in everyday life. While the 'reduction' concept can be implemented by reducing cooking oil or choosing alternative cooking methods that do not use cooking oil, such as boiling, burning and frying without oil Satinah Awang et al., (2015). Furthermore, the reuse concept can be implemented by reprocessing used cooking oil to be used as other ingredients, such as wax and soap.

Finally, the concept of recycling can be implemented by collecting used cooking oil waste that can no longer be used and then sending it to recycling centres. There, this waste will go through several physical, chemical and biological processes to produce fuel for vehicles, thus replacing petrol and diesel (Wan Nasriha & Zanaton, 2013).

In short, used cooking oil can be recycled and has many other uses that benefit the environment and human beings. However, if we look at the issue of pollution caused by clogged pipelines, there is still no end in sight. Here it can be concluded that the level of awareness of our society towards recycling used cooking oil is at a moderate level as they do not at all make this activity part of their life practices. Referring to a study that was carried out by Satinah Awang et al., (2015) there is a low level of knowledge about re-conducting used cooking oil. This study matches the opinion of Erry Arham Azmi et al (2021)which said that the community does not know where to place the remaining used cooking oil.

2.4 Environmental Sustainable

The culture of loving the environment is essential and needs to be nurtured in today's society, especially among children, so that future generations can experience a peaceful life with a clean and harmonious environment. It is a process of early exposure and education in continuing environmental conservation efforts. This awareness of the importance of taking care of the environment has long been noted by previous researchers beginning in 1798 through the Malthusian Theory of Population (Thomas Malthus, 2008)

Various global joint venture programs have been implemented by the United Nations (UN) to achieve sustainability missions for the benefit of current and future generations, among them the Millennium Development Goals (MDGs). The concept targeted eight sustainability goals to be achieved within fifteen years from 2000 to 2015. Meanwhile, the Sustainable Development Goals (SDGs) program organised by the World Health Organisation (WHO) seek to achieve 17 sustainability goals from 2015 to 2030. This target has been agreed upon by most countries, including Malaysia (United Nations, 2016)

Figure 1 Sustainable Development Goals (SDG)
(Source: United Nation, 2016, Copyright Consent: Permissible to Publish)

In all 17 of these Goals, the researchers focused on Sustainable Development Goal 12 titled "Responsible Consumption and Production". It aims to implement responsible management of environmentally friendly chemical and waste disposal throughout its life cycle. Apply to recycle and reuse activities as well as reduce the emissions of these chemical and waste materials into the air, water, and soil to minimize adverse effects on human health and nature. Ahmad Suhaimi, (2019) said that this effort needs to be implemented and the involvement of companies, especially large and transnational companies should adopt green and sustainable practices such as recycling as well as significant use of all. In fact, each layer also needs to acquire relevant information and awareness for sustainable development and lifestyle in harmony with nature.

Figure 2 Sustainable Development Goal 12 titled: Responsible Consumption and Production
(Source: mampankini, 2019, Copyright Consent: Permissible to Publish)

3. METHODOLOGY

The approach used in this study prioritizes the researcher's involvement in the field by going through an in-depth observation process and meetings and collecting related documents (Cresswell, 2017). The study was conducted over two years, starting in 2020 to 2022. For the initial phase, the used cooking oil campaign collection was carried out in the surrounding areas of Perak, Kuala Lumpur, Melaka, and Johor. This campaign was also spread among residents through the WhatsApp platform and Facebook pages. Through this campaign, the researcher came down to the spaciousness and met the community around the location while explaining the importance of re-delivering the used cooking oil.

Like any qualitative study, an art study also involves almost the same study procedures and strategies. According to Roger & Blomgren, (2019) qualitative methods are obtained through field data, interviews, photography, and video recording. This study is based on the fieldwork of participating in the process of recycling cooking oil waste into a form of creative art conducted by locals and researchers. The researchers recorded each step in the process conducted by participants in shaping and building creativity from the beginning of production until the final stage of the formation of the creative soap.

3.1 Conceptual Framework

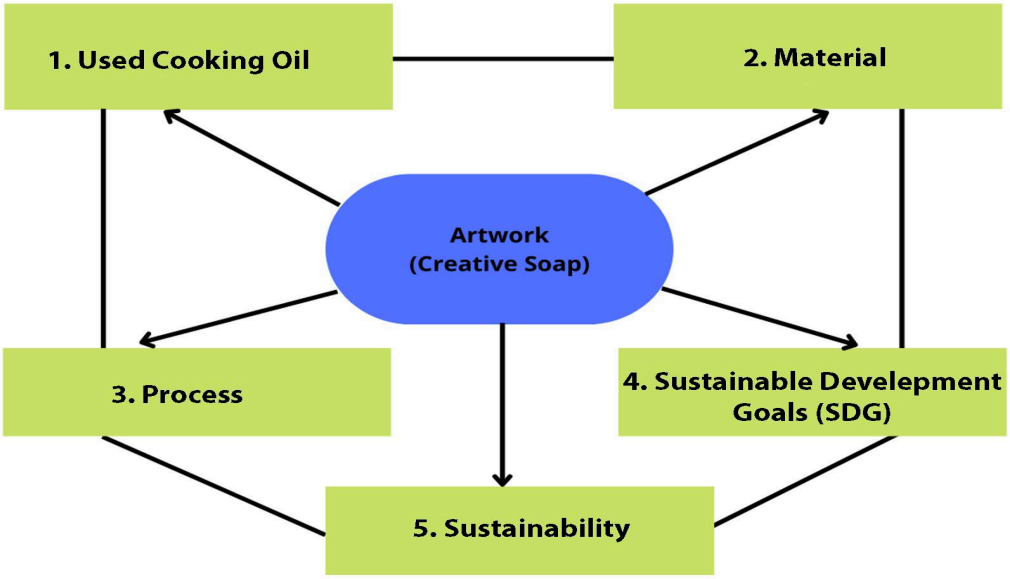

Figure 3 Relation between creative activities with a sustainable environment (Source: Sukria Fihatmadja, 2005)

The conceptual framework shown above (Figure 3), can explain that a work of art is part of the language of humanity. It results from a background that is interconnected to each other. During the implementation of this creative activity, participants will go through the stage of processing the material from used cooking oil to produce creative soap. Then, reusing cooking oil waste to create something more beneficial, thus supporting the efforts of Sustainable Development Goal 12: Responsible Consumption and Production in helping to preserve nature. Therefore, this cycle indirectly helps reduce the discharge of cooking oil waste into public places to prevent continuous water pollution. Tjetjep Rohendi Rohidi (2011) also stated that the process of producing a work of art is an activity that can build interaction between individuals.

This indicates that there is a crucial cycle that is frequently linked in the process of making *Creative Soap* (blue box), which begins with the use of *Used Cooking Oil* (green box), is then combined with *Material* (green box), is then put through a *Process* (green box), and is finally put through the government's *Sustainable Development Goals (SDG)* to help *Sustainability* (green box) in the nation.

3.2 Research Design Framework

Figure 4 below shows the procedure for collecting data on the impact of creative activities involving cooking oil waste on sustainable environments. This design framework starts with the process of Literature Review, Interview, Observation/Fieldwork, Analysis and Finding, Conclusion, and Acknowledgment.

This study started by collecting information through secondary methods derived from data sources such as journals, books, and magazines related to the study case. Then proceed with required data collection methods such as interviews, observations, and fieldwork. This stage begins with the interview session on the local community's awareness of the importance of protecting the environment related to the country's biggest problem, water pollution. The local community is also aware of the consequences of uncontrolled waste disposal on the environment.

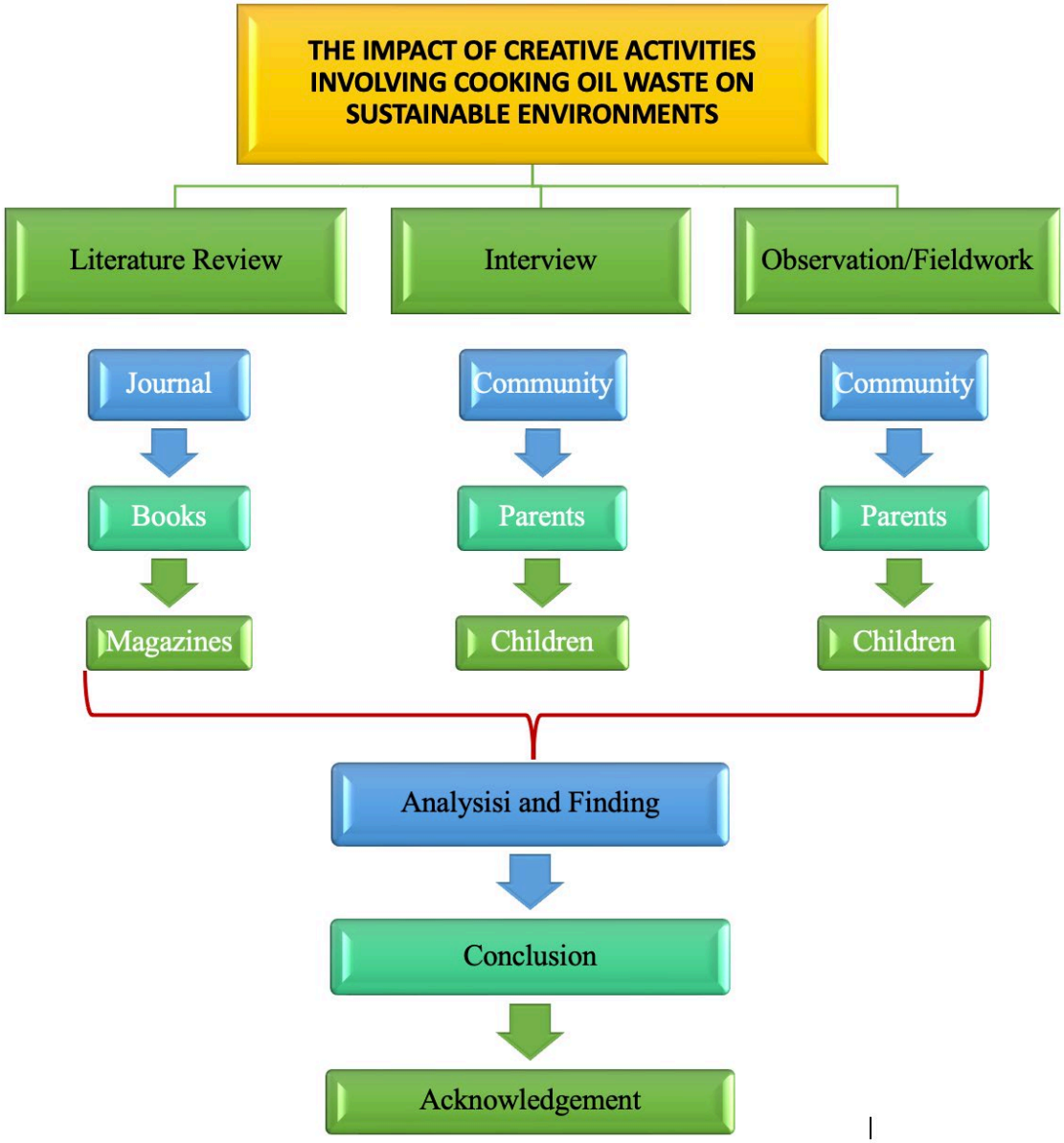

Figure 4 Research design on the impact of creative activities involving cooking oil waste on a sustainable environment

Further observations found that the impact of this water pollution is at an alarming level. The main cause of pollution is caused by the uncontrolled disposal of waste from industrial and caused by

residential and shop environments caused by the dumping of cooking oil waste into drains and ditches. Therefore, the researchers continued this study by conducting fieldwork with the local community. This activity will not only be able to reuse cooking oil waste but also help the local community to understand and realize the importance of reusing the material efficiently.

3.3 Creative Activities

The fieldwork started with creative activities to produce creative soaps using cooking oil waste and some other mixed ingredients. The process of producing this creative soap goes through 2 stages, including (1) mixing ingredients to produce bars of soap; and (2) forming and carving bars of soap to produce creative soaps. Through this creative activity, participants were also exposed to the effects of uncontrolled disposal of used cooking oil waste in public places and the importance of protecting the environment for future generations.

3.3.1 Materials

Participants were taught and briefed in this session on safety measures and the materials needed to produce the creative soap. The researchers prepare all the material needed; participants only need to bring used cooking oil from their homes. They explained the steps to recycle used cooking oil, and the ingredients used were cooking oil waste, clean water, sodium hydroxide, coconut oil, and fragrance essence. All of these substances are non-harmful to the participants and are free of chemical mixtures.

Additionally, according to (Ahmadi & Seyedin, 2019) that sodium hydroxide also known as lye and caustic soda, is an inorganic compound with the formula NaOH. It is a white solid ionic compound made up of sodium cations Na+ and hydroxide anions OH. Sodium hydroxide is a caustic base and alkali that decomposes proteins in normal conditions. NaOH is also very soluble in water, releases heat when dissolved, and is dangerous for children if not monitored. Table 1 below refers to the detail of the material required by a participant.

Table 1: Material details

No	Items	Details (ml/oz)
1.	Cooking Oil Waste	500 ml
2.	Clean Water	250 ml
3.	Sodium Hydroxide (NaOH)	4.5 oz
4.	Coconut Oil	44 ml
5.	Fragrance Essence	10 ml

3.3.2 Process Making

A process making is an activity that takes place over time, and which has a precise aim regarding the result to be achieved. The concept of a process is hierarchical which means that a process may consist of a partially ordered set of subprocesses (Gerrit Muller, 2021). Therefore, the process requires the carefulness of the participants to follow one of one the instructions prepared by the researcher to facilitate the process of producing creative soap.

Under the monitoring and supervision of the researchers, participants were supplied with infographics and ways to mix ingredients to produce creative soap. By combining the elements, participants can produce 3 to 4 bars of soap. From these bar soaps, participants were left to his/her own creativity in shaping and creating creative soaps. These processes aim to improve their cognitive skills while also advocating for their right to holistic development, especially in terms of physical development. Then, through this activity, researchers identified the participant's abilities and weaknesses in mixing ingredients, shaping, and carving form to produce creative soaps.

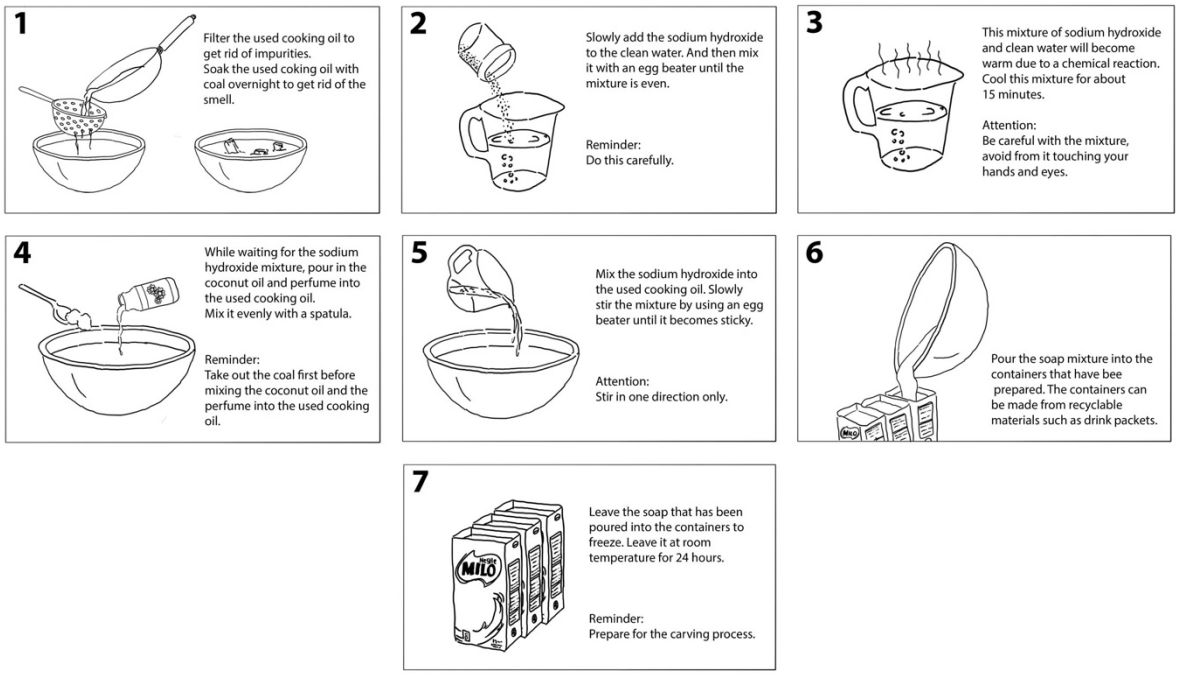

Figure 5 Infographic of how to mix ingredients to produce bars of soap
(Source: Authors' illustration, 2020)

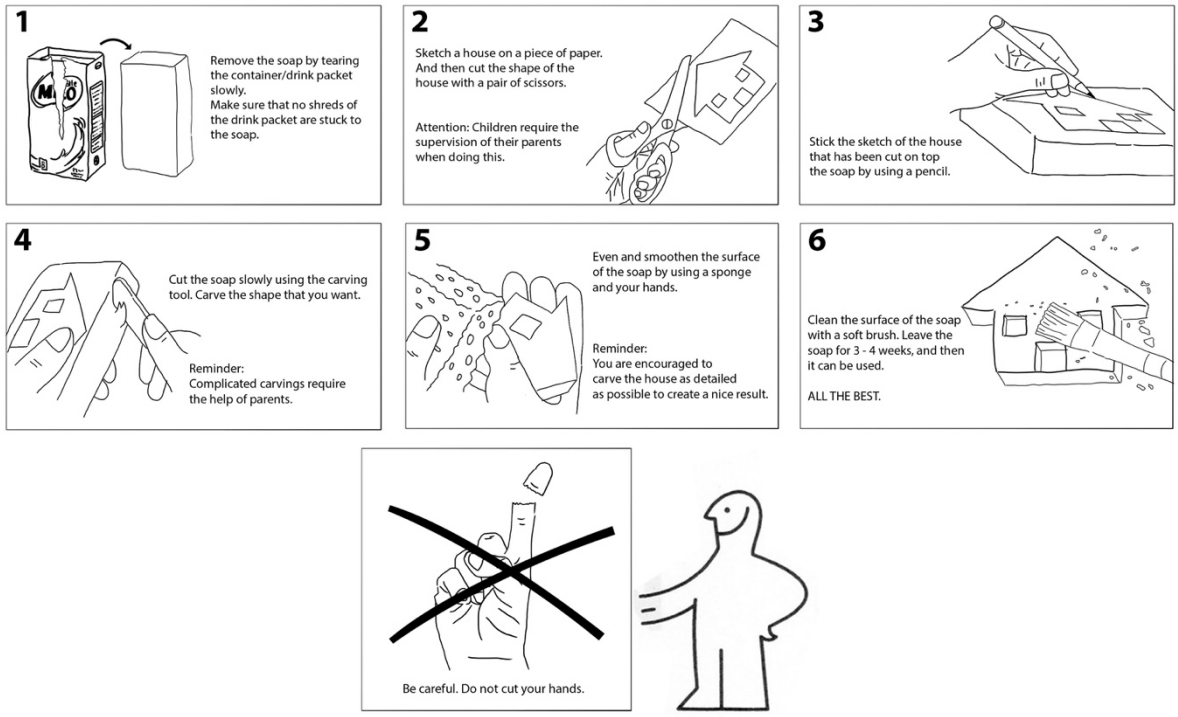

Figure 6 Infographic of how to shape and carve bars of soap to produce creative soaps
(Source: Authors' illustration, 2020)

4. ANALYSIS AND FINDING

Table 2 below shows the list of creative activities carried out in 4 states in Malaysia, including Perak, Selangor, Melaka, and Johor. The participants who participated in this creative activity, such as schools, universities, associations, and local communities, were implemented in stages from 02 nd January 2021 until 01 st September 2022. The most frequently carried out creative activities were in the state of Perak 5 times, followed by the states of Selangor, Melaka, and Johor, each carried out once.

Table 2: List of creative activities that have been implemented

Date	Participants	State
02nd January 2021	SELAT Association	Perak
16th September 2021	R.E.A.L International School, Ceras Campus	Selangor
02nd October 2021	Community in Seri Iskandar	Perak
13th November 2021	Persatuan Wanita UiTM (PEWANI)	Perak
06th December 2021	UiTM Perak Students	Perak
26th December 2021	Community in Kota Tinggi	Johor
20th August 2022	Lendu International Art Community	Melaka
01st September 2022	NA Generation Association	Perak

Table 3 below shows the use of cooking oil waste according to the session of creative activity that has been implemented. In total, there were 8 sessions that were conducted which is accompanied by a different number of participants and the use of cooking oil. The highest number of participants was in session VII, with 40 entries using 20,000ml of cooking oil waste. Followed by sessions III and VIII, each was 25 participants and used 12,500ml of cooking oil waste. Next, session I of 20 participants used 10,000ml of cooking oil waste, and session V of 17 participants used 8,500ml of cooking oil waste. Last, in sessions II and VI, every 15 participants used 7,500ml of cooking oil waste. For all the sessions of this creative activity, the consumption of used cooking oil was 86,000ml.

Table 3: Use of cooking oil waste according to the session of creative activity

Session	No. of Participants	Cooking Oils Waste (ml)
Session I	20	10,000
Session II	15	7,500
Session III	25	12,500
Session IV	15	7,500
Session V	17	8,500
Session VI	15	7,500
Session VII	40	20,000
Session VIII	25	12,500
Total	**172**	**86,000**

According to the process of producing creative soaps, cooking oil waste is the main ingredient needed. This cooking oil waste is recycled as a wearable material and benefits the local community. By using 500ml of used cooking oil, one participant produced 3 to 4 bars of creative soap per session. Thus, during this creative activity, a total of 172 participants managed to collect 86,000ml of used cooking oil for use in the recycling process.

5. CONCLUSION

Based on the findings of this study, the implementation of this creative activity had a positive effect, especially on the participants. During this time, they took it easy to dispose of cooking oil waste by throwing it into drains and ditches, and now they realized there is a better and more effective way of disposing of it. Therefore, this creative activity is a solution to reduce the discharge of cooking oil waste into public places and assist in efforts to preserve the environment.

By not throwing away this used cooking oil arbitrarily, the participants managed to reduce the breeding of pests such as rats and cockroaches due to clogged sinks and drainage systems. In addition, the impact has been on the safety of water resources such as unpolluted rivers as well as the well-being of aquatic life. In short, this recycled cooking oil waste has uses that benefit humans and the environment.

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AUTHOR CONTRIBUTIONS

All authors contributed equally to this research study.

CONFLICT OF INTEREST

The author(s) declared no potential conflicts of interest with respect to the research, authorship, or publication of this article.

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3. Tujuan permohonan ini adalah bagi membolehkan akses yang lebih meluas oleh pengguna perpustakaan terhadap semua maklumat yang terkandung di dalam penerbitan melalui laman Web PTAR UiTM Cawangan Perak.

Kelulusan daripada pihak tuan dalam perkara ini amat dihargai.

Sekian, terima kasih.

"BERKHIDMAT UNTUK NEGARA"

Setuju.

27.1.2023

PROF. MADYA DR. NUR HISHAM IBRAHIM
REKTOR
UNIVERSITI TEKNOLOGI MARA
CAWANGAN PERAK
KAMPUS SERI ISKANDAR

Saya yang menjalankan amanah,

SITI BASRIYAH SHAIK BAHARUDIN
Timbalan Ketua Pustakawan

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