



SME’s sustainability and the utilization of vegetable oil waste to support environmentally friendly production process

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ARTICLE INFO	ABSTRACT
<p>Article history Received: 2023-04-18 Revised: 2023-05-13 Accepted: 2023-05-22 Published: 2023-06-20</p> <p>Keywords Business sustainability Vegetable oil waste environment MSMEs</p>	<p><i>Community service is a process of self-empowerment for the benefit of society. The community empowerment movement, whatever its form, is part of community service. The problem regarding the large amount of vegetable oil waste for MSME actors both in Indonesia, especially in big cities is getting more complicated. The increasing amount requires immediate handling because it can damage the environment when disposed of carelessly. In this community service activity, the service team involved Micro, Small and Medium Enterprises in Bandar Lampung. In addition, this dedication also involves foreign university partners, namely the MARA University of Technology (UiTM) in its implementation. This service focuses on the utilization of vegetable oil waste that has been used and then used to produce value-added products such as biodiesel. This award will be held from 8 to 14 October 2022. The purpose of holding this service is how to manage used oil waste resulting from the MSME production process. This is because the waste oil produced is often just carelessly disposed of into the surrounding environment which will certainly have a negative impact on environmental sustainability. Later, when it becomes biodiesel, besides being an added economic value, it will also support environmental sustainability by creating an alternative source of renewable energy. The conclusion from this service is that the participants have the knowledge and ability to process waste vegetable oil into biodiesel.</i></p>
<p>Kata kunci Keberlanjutan bisnis Limbah minyak nabati lingkungan UMKM</p>	<p>Keberlanjutan UMKM dan pemanfaatan limbah minyak nabati untuk mendukung proses produksi yang ramah lingkungan. Pengabdian masyarakat merupakan proses pemberdayaan diri untuk kepentingan masyarakat. Gerakan pemberdayaan masyarakat, apapun bentuknya, adalah bagian dari pengabdian kepada masyarakat. Masalah banyaknya limbah minyak nabati bagi pelaku UMKM baik di Indonesia, khususnya di kota-kota besar semakin pelik. Jumlahnya yang terus meningkat membutuhkan penanganan segera karena dapat merusak lingkungan bila dibuang sembarangan. Dalam kegiatan pengabdian masyarakat ini, tim pengabdian melibatkan Usaha Mikro, Kecil dan Menengah yang ada di Bandar Lampung. Selain itu, pengabdian ini juga melibatkan mitra perguruan tinggi asing yaitu MARA University of Technology (UiTM) dalam pelaksanaannya. Pengabdian ini berfokus pada pemanfaatan limbah minyak nabati yang telah dimanfaatkan kemudian dimanfaatkan untuk menghasilkan produk bernilai tambah seperti biodiesel. Penghargaan ini akan diselenggarakan mulai 8 hingga 14 Oktober 2022. Tujuan diselenggarakannya pengabdian ini adalah bagaimana mengelola limbah oli bekas yang dihasilkan dari proses produksi UMKM. Peralnya, limbah minyak yang dihasilkan seringkali dibuang begitu saja ke lingkungan sekitar yang tentunya akan berdampak buruk bagi kelestarian lingkungan. Nantinya, bila menjadi biodiesel, selain menjadi nilai tambah ekonomi, juga akan mendukung kelestarian lingkungan dengan menciptakan sumber energi alternatif terbarukan. Kesimpulan dari pengabdian ini adalah peserta memiliki pengetahuan dan kemampuan mengolah limbah minyak nabati menjadi biodiesel.</p>

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INTRODUCTION

Community service is a process of self-empowerment for the benefit of society. Community service should be continuous and long-term because building a community requires a long process. There are many aspects that must be touched to make a society good, its character, culture, to the way of thinking we must also touch to truly create a civilized society. In addition, the implementation of community service is also a manifestation of the Tridharma of Higher Education.

Forms of community service also vary, not always fixated on quick social services with makeshift groceries as is done by political parties ahead of elections. Organizing free education or empowering the human resources of an area, even buying local products is also a form of community service. A community empowerment movement, whatever its form, is part of community service. Many examples of community service are emerging nowadays, and the majority are initiated by young intellectuals such as Indonesia Mengajar, Indo Historia, or non-profit and non-profit NGOs.

By forming an advanced society, an advanced civilization will indirectly be formed because a civilization originates from a group of people who influence and complement each other. If there is just one good society, then its kindness will spread to other communities and until finally the whole community will be good too, starting from a small community and then growing into a large community to a large community. In this community service activity, the service team involved Micro, Small and Medium Enterprises in Bandar Lampung. In addition, this dedication also involves foreign university partners, namely the MARA University of Technology (UiTM) in its implementation. This service focuses on the utilization of vegetable oil waste that has been used and then used to become products that have added value. This is because the SMEs involved use a lot of vegetable oil to process the products produced by these SMEs, so this activity is considered to have a positive impact on SMEs participating in this activity.

The concept of sustainability has been discussed by many experts from various disciplines. Jeffrey Sachs in his book "The Age of Sustainable Development" (2015) defines sustainability as development that meets the needs of the current generation without compromising the ability of future generations to meet their own needs. Herman Daly in his book "Ecological Economics: Principles and Applications" (2010) states that sustainability is related to the capacity of a system to defend itself, namely the capacity to maintain biological diversity, natural resources, and the physical environment. Meanwhile, Paul Hawken in his book "Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming" (2017) views sustainability as a condition in which we can live and develop without threatening our own lives and well-being. Meanwhile, Johan Rockström and his colleagues in the article "Planetary Boundaries: A Safe Operating Space for Humanity" (2015) identified nine planetary boundaries that must be maintained so that humans can live and develop in sustainability.

John Elkington in his book "Cannibals with Forks: The Triple Bottom Line of 21st Century Business" (1999) proposes the concept of "triple bottom line" (people, planet, profit) as a way to consider sustainability in making business decisions.

The conclusion from the expert opinions above is that sustainability is an important concept in development which must consider the needs of the current generation without compromising the ability of future generations to meet their own needs.

Sustainability is related to the capacity of a system to sustain itself, namely the capacity to maintain the diversity of biological, natural resources, and physical environment. To achieve sustainability, it is necessary to maintain nine planetary boundaries that must be maintained so that humans can live and develop in sustainability. In addition, it is also necessary to consider the "triple bottom line" (people, planet, profit) in making business decisions as a way to consider sustainability.

Cooking oil is oil obtained from purified vegetable or animal fats, is liquid at room temperature and is often used to fry food (Erna & Wiwit, 2017). The high use of used cooking oil results in the disposal of waste oil into the environment which can cause pollution which can be harmful to the environment (Sundoro et al., 2020). Another big problem is that waste cooking oil is disposed of carelessly in the environment, which can cause environmental pollution (Ginting et al., 2020). Utilization of used cooking oil waste has proven to be an example of a business to increase MSMEs and be able to create a creative community economy that is environmentally friendly (Damayanti et al., 2020). Vegetable oil waste is waste generated from the processing of vegetable oils, such as coconut oil, palm oil, soybean oil, and so on. Vegetable oil waste contains organic and inorganic compounds that have the potential to pollute the environment if not managed properly.

According to experts, vegetable oil waste can have a negative impact on the environment and human health, including: (1) Water and soil pollution: Vegetable oil waste that is not properly managed can contaminate water and soil, which can damage the quality of water and soil which can cause disruption to aquatic and soil ecosystems (Sriwiyarat et al., 2018). (2) Increase in BOD and COD: The content of organic compounds in vegetable oil waste can increase Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) in water, so that it can disrupt the balance of aquatic ecosystems (Pratiwi et al., 2019). (3) Increase in gaseous waste: Vegetable oil waste that is discharged into the environment can produce toxic gases such as methane gas and hydrogen sulfide gas which can damage air quality (Abdurrahman et al., 2020).

In overcoming the negative impact of waste vegetable oil on the environment, good waste management efforts are needed, such as treating waste using physical, chemical and biological methods, as well as utilizing waste as alternative fuels or industrial raw materials. In addition, it is necessary to carry out strict supervision of vegetable oil waste that is discharged into the environment to prevent environmental pollution.

Outreach to MSMEs (Micro, Small and Medium Enterprises) regarding the processing of vegetable oil waste is an important step in the effort to create a healthy environment (Selly et al., 2023). Through socialization, MSMEs can understand the importance of good and environmentally friendly management of vegetable oil waste and processing

techniques that can be carried out. With socialization to MSMEs regarding the processing of vegetable oil waste, it is hoped that it can create a healthier environment, foster awareness and social responsibility of MSMEs, and improve the quality of the products produced. Experts generally agree that socialization of the utilization of waste vegetable oil in MSMEs is very important to preserve the environment. Some of them emphasized the importance of implementing environmentally friendly practices in small and medium industries, including waste treatment. Puspitasari, et al. (2019) in the journal *Environmental Science* explained that socialization of waste vegetable oil processing to MSMEs can reduce the negative impact that waste produces on the environment and encourage the implementation of environmentally friendly practices in small industries. Meanwhile, Verawaty, et al. (2018) in the journal *Environmental Engineering* explained that the dissemination of the use of vegetable oil waste to MSMEs can increase the understanding and awareness of business actors about the importance of treating waste properly to preserve the environment.

Setyaningsih, et al. (2018) in the journal *Environmental Engineering Application* explained that socialization of the use of vegetable oil waste to MSMEs can help business actors choose the right and environmentally friendly processing technology and improve the quality of the products produced. Meanwhile Sudarmanto, (2019) in his book "Industrial Environmental Management" explained that the socialization of the use of vegetable oil waste to MSMEs needs to be carried out continuously and involve various parties so that the implementation of environmentally friendly practices can take place in a sustainable manner.

From the opinions of the experts above, it can be concluded that the socialization of the use of waste vegetable oil to MSMEs is very important to preserve the environment and encourage the implementation of environmentally friendly practices in small industries. This can be done in various ways, such as seminars, training, workshops, brochures and social media, as well as involving various related parties in an effort to preserve the environment in a sustainable manner. Waste (waste) management is a systemic, holistic and sustainable activity which includes activities in reducing and handling waste (UU No. 18 of 2008). Management steps start from start to disposal, covering collection, transportation, treatment, and disposal, accompanied by monitoring and regulation of waste management (Waste Management, 2021).

The purpose of holding this service is how to manage used oil waste resulting from the MSME production process. This is because the waste oil produced is often just disposed of carelessly into the surrounding environment which will certainly have a negative impact on environmental sustainability. On the other hand, waste vegetable oil can have a bad effect if it contaminates water because it can kill the biota in it. In addition, this service also aims to turn this vegetable oil waste into added value by processing it into products such as biodiesel. Later, when it becomes biodiesel, besides being an added economic value, it will also support environmental sustainability by creating an alternative source of renewable energy.

This dedication is in line with SDGs goal number 12, namely sustainable waste management which is a form of responsibility for consumption and production that has been carried out (Arminah and Adina, 2021). Sustainable development is development that meets the needs of the current generation without compromising meeting the needs of future generations which involves three aspects, namely economic, social and environmental (WCED, 1987 in Askar, 2004). Based on research by Ruhyat and Firdaus (2006) it is known that used cooking oil is the most appropriate type of vegetable oil to be used as biodiesel material. This is because used cooking oil has a high free fatty acid content (Evy and Fatwir, 2012). Biodiesel itself is an important fuel because it provides less pollution compared to petroleum fuels and can be used without re-modification of diesel engines (Bismo, et.al. 2005 in Halid et.al., 2016).

METHOD

This activity was carried out in a hybrid manner where MSMEs in Bandar Lampung were concentrated in one place in the FEB Unila student center building. Meanwhile, Malaysian MSMEs gathered online at the MARA University of Technology Cawangan Johor Malaysia. This service activity was carried out in a series of International Joint Community Service in a hybrid manner involving 30 Bandar Lampung MSMEs and a number of experts from Malaysia with the theme Sustainable Entrepreneurship carried out for one week, from 8 to 14 October 2022. This Services is helm hybrid from Sumantri Brodjonegoro Street, Kemiling District, Bandarlampung City, Lampung and Cawangan Johor Malaysia. In its implementation, it was explained about Business Sustainability and Utilization of Vegetables Oil Waste which aims to increase the added value of vegetable oil waste.

The measurement of success in this service is seen from how the service participants apply the principles of processing waste vegetable oil into biodiesel, starting from basic knowledge to knowledge of the process of making biodiesel.

RESULTS AND DISCUSSION

The series of International Joint Community Service FEB Unila 2022 activities with Universiti Teknologi MARA (UiTM) Cawangan Johor were held on 12 October 2022 in a hybrid manner. This activity was filled with the provision of material by Dr. Keumala Hayati, S.E., M.Sc. from the Faculty of Economics and Business, University of Lampung, Mr. Efli Ramli, S.E., Director of PT. Mahligai Indococo Fiber, Dr. Muhammad Razif Bin Ramlan from the Head of the Environmental and Industrial Security Division, Pasir Gudang Cawangan City Council, Johor, and Dr. Mohd Lokman Ibrahim from the Research Management Center, UiTM Cawangan Johor, Malaysia. This activity was attended by service participants from Indonesia consisting of MSMEs in Lampung Province, represented by 30 MSMEs, present offline at the FEB Unila Student Center Building. Meanwhile, the service participants from Malaysia, which consisted of MSMEs in Cawangan Johor, attended online (Figure 1).

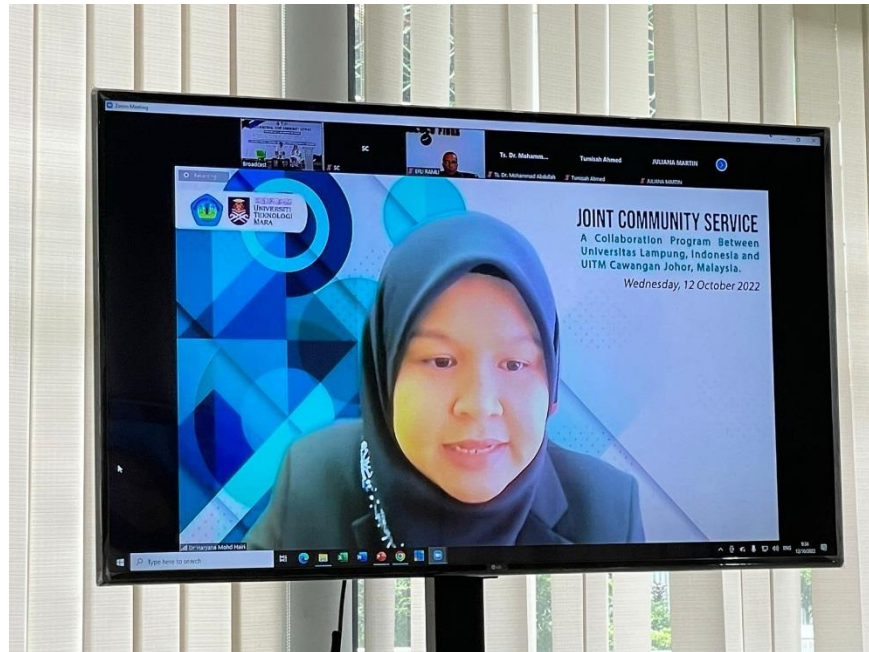


Figure 1. Presentation of material from UiTM Cawangan Johor Malaysia

In its implementation, this activity was opened by the Dean of FEB Unila who was then welcomed by the UiTM in a welcoming speech by the Chancellor of UiTM which in this case was represented by Dr. Haryana Mohd Hairi as Assistant Chancellor of UiTM Cawangan Johor, Malaysia. This event was then continued with the presentation of the material presented for the first time by Mr. Efli Ramli, S.E., who conveyed the utilization of coconut waste into Cocopeat to answer the Cocopeat export needs needed by the global market. Furthermore, the material presented by Dr. Keumala Hayati, S.E., M.Si who is also an academic/lecturer at FEB Unila is about business sustainability, where MSME actors are expected not only to be concerned with profit alone, but are also expected to be able to empower the products they sell into products that are also environmentally friendly (Figure 2).



Figure 2. The process of brainstorming waste vegetable oil processing into biodiesel

Presentation of material from UiTM Cawangan Johor, delivered for the first time by Dr. Mohd Razif from Majlis Bandaraya Pasir Gudang, Johor, Malaysia (Legal Entity Industry). In this presentation, Dr. Razif conveyed several things related to what was done by the Malaysian side in managing waste vegetable oil that had been used by industry. The presentation of this material also raises questions from MSME actors in Bandar Lampung regarding whether it is possible

for MSME actors in Bandar Lampung to export the waste vegetable oil produced to Malaysia. This was also welcomed by the Malaysian side. The last presentation of the material is the processing of waste vegetable oil into biodiesel which can be used as a renewable energy source. This material was delivered by Dr. Mohd Lokman bin Ibrahim as an academic from UiTM.

This event ended with a question and answer session and discussion between participants and speakers so that it was concluded that MSMEs in Bandar Lampung really needed community service activities like this to add insight and knowledge from MSME actors in utilizing vegetable oil waste. The event then ended with closing remarks delivered by the Deputy Dean for Academic and Cooperation, where in this remarks it was stated that FEB Unila would continue to listen to the needs of MSME actors so that MSME actors in Bandar Lampung would be more advanced and have a sustainable business in the future.

This service encourages MSME actors in Indonesia and Malaysia to jointly reduce environmental pollution from excessive disposal of vegetable oil waste into the environment. This, if left unchecked, will damage the environmental ecosystem and even if it pollutes water, it can kill the biota that live in it. In fact, the waste vegetable oil has added value if it is processed into other products. Apart from added economic value, the processing of waste vegetable oil can also be an environmental responsibility in accordance with the concept of SDGs point 12, namely waste management which is a form of responsibility for consumption and production that has been carried out. We as living beings who consume and produce certainly have environmental responsibilities as well. In accordance with a number of previous studies, this service encourages MSME actors to process the waste vegetable oil produced into biodiesel. Biodiesel product was chosen as a product of processed vegetable oil waste based on a number of studies such as Ruhyat and Firdaus (2006); Askar (2004); Halid et.al., (2016) that vegetable oil is the best material for making biodiesel and biodiesel itself is a fuel that is much lower than existing fuels in producing pollution

CONCLUSION

The implementation of the International Join Community Service is going well. This was shown by the enthusiasm of the participants during the question and answer session. During the material delivery process, participants actively interacted and asked questions about the material being explained. This activity is very useful for participants to further improve the quality of their production, so that the products they produce can compete internationally. From this service also make the participants have the knowledge and ability to process waste vegetable oil into biodiesel.

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