Proceedings Conference on Economics and Business Innovation
Volume 3, Issue 1, 2023

Training on Biomass Waste Biobriquettes Alternative Fuel Making for Youth Organisations in Lampar Village, Tamansari District, Boyolali Regency

Unna Ria Safitri[1], Muhammad Abdul Aziz[2], Miranto Sri Agus Prasetyo[3], Ratih Dwi Lestari[4], Titik Handayani[5]

[1] University of Boyolali, Indonesia
[2] University of Boyolali, Indonesia
[3] University of Boyolali, Indonesia
[4] University of Boyolali, Indonesia
[5] University of Boyolali, Indonesia
*Corresponding Author: unna@gmail.com

ABSTRACT

Lampar Village has natural potential in the form of abundant coconut trees. Until now, the utilisation of coconut trees has not been maximised, both the fruit, shell and leaves. Based on this situation, Lampar Village was chosen as the location for the Field Work Lecture. The method used is training with the following stages: (1) Observation, (2) Socialisation, (3) Training. This service activity was carried out on 31 January 2023 which aims to take advantage of the potential of local resources which has an impact on improving the community's economy. From these activities, the community is able to process coconut shell waste into briquettes.

Keywords: Empowerment, Briquette Waste Processing

Received: January, **Accepted**: February, **Published**: March

INTRODUCTION

Kuliah Kerja Nyata (KKN) is part of the implementation of higher education that places students outside the campus to live with the community to help and assist in exploring the potential of existing human resources and natural resources. Based on a letter from the Research and Community Service Institute of Boyolali University, the KKN location in 2023 is located in Lampar Village, Tamansari District, Boyolali Regency, which is located in the southernmost part of Boyolali bordering Klaten Regency. The Central Bureau of Statistics recorded that the national production of durian fruit reached 1.35 million tonnes with a population of 3,364,997 trees in 2021, while Indonesia's coconut tree population has 81 billion trees, covering nearly 46% of its land area. The tropical rainy climate makes Indonesia have fertile soil to grow various trees. From the results of observations that have been made, Lampar Village has the potential for abundant coconut trees and durian trees, but the waste processing has not been maximised. The purpose of this activity is to empower the community in processing coconut shell and durian skin waste into briquettes so that they have a higher economic value and increase the income of the people of Dukuh Plosorejo, Lampar Village.

Community empowerment is an economic development concept that encapsulates community values to build a new paradigm of human-centred, participatory, empowering and sustainable development.. One way to unlock the potential of coconut and durian is by recycling waste. Coconut and durian plantations produce scraps and waste that are not maximally utilised. While durian produces solid waste, the waste produced in coconut plantations includes solid waste, liquid waste, there are three types of gas. One of the utilisation of coconut solid waste is as a renewable energy source or alternative fuel. One form of recycling is briquettes (Anggoro et al., 2018). The use of coconut shell briquettes is one solution to explore alternative energy sources and reduce pollution. For this reason, efforts are needed to increase public understanding and awareness of the formation and utilisation of coconut shell charcoal briquettes as an alternative fuel (Budi, 2017). Therefore, it is necessary to find other energy sources that can replace oil and gas with suitable properties both from combustion and mechanics (Triantoro et al., 2020).

Coconut shell and durian husk charcoal briquettes have the ability to produce high heat, are non-toxic, smokeless, burn longer than other conventional solid fuels, have the potential to replace charcoal, and have several advantages, including being more environmentally friendly (Iskandar et al., 2019). Some countries in the world have started to use and develop modern energy in the form of briquettes from various types of waste. This overview of possibilities can be used as an innovation in waste disposal. Such ideas should be supported by community participation. This does not rule out the possibility of making the

Received: January, **Accepted**: February, **Published**: March

wheels of the community's economic rotation better (Febrina, 2019.). Based on the background and observations, the author tries to develop it further by utilising coconut fibre and durian fibre which are widely available in Lampar Village, Tamansari District, Boyolali Regency. This activity is also one of the community service programmes of the Real Work Lecture (KKN) Programme held by the Community Service Research Institute (LPPM) of Boyolali University.

METHODOLOGY

The method used to implement this programme is to provide training to the community which aims to facilitate the application of the method and increase community understanding and awareness. Recycling coconut shell scraps to provide resale value, using alternative energy, interacting about the use of alternative energy, and introducing some forms of briquettes themselves. Charcoal briquettes were produced from coconut fibre and durian fibre. Stages of Implementation can be seen in Table 1

Table 1 Implementation of activities

NO	Activities	Implementation	Location	Description
1	Observation	18-25 Januari 2023	Lampar Village	Didapati pohon kelapa yang banyak dan tumbuh subur
2	Socialisation	31 Januari 2023	Lampar Village	Dihadiri oleh bapak bayan, rt, dan karangtaruna
3	Training	1 Februari 2023	Lampar Village	Dihadiri oleh karangtaruna Dukuh Plosorejo

Based on Table 1, it can be explained that the work steps in this programme activity are as follows:

a) Observation, this activity was carried out by walking around the residential area in Dukuh Plosorejo, Lampar Village. This area, which is located on the slopes of Mount Merapi, has coconut and durian trees in almost every yard of the house, there is a lot of coconut shell waste which is only left as waste. In addition, in several locations, durian coir waste was found at the durian trader's location which piled up, reducing the

Received: January, **Accepted**: February, **Published**: March

aesthetics of the environment and causing pollution if the waste continued to accumulate.

b) Socialisation, According to Maclever socialisation is the process of learning norms, values, roles, and all other prerequisites necessary to enable effective participation in social life. Meanwhile, the notion of socialisation in a broad sense is a process of interaction and learning that a person does from the time he is born until the end of his life in a community culture. Through the process of socialisation, a person can understand and carry out their rights and obligations based on their respective status roles according to the culture of the community in Dukuh Plosorejo. The socialisation is intended to provide procedures for making briquettes from coconut shells with a mixture of durian skin and starch flour to be used as briquettes as a renewable alternative energy with low pollution but perfect combustion and durability. This activity begins by meeting the head of the hamlet, the head of the RT and the head of Karangtaruna in the village area, as well as conveying permission that an activity entitled "Alternative Fuel, Smokeless Briquettes from Biomass Waste by Boyolali University KKN Students" will be carried out. This activity will be planned to be held at the KKN Group 3 Post, RW 2 Lampar Village on 31 January 2023.

c) Briquette making training and assistance, this activity will be carried out on 1 February 2023 which is an activity to make briquettes from coconut shell charcoal and durian coir accompanied by the author himself. This activity is planned to invite 30 participants from Karangtaruna Dukuh Plosorejo RW 2 Lampar Village who will practice how to make briquettes starting with the process of filtering the pounded charcoal, the process of mixing coconut shell charcoal powder and durian peel with starch that has been heated by fire, the printing process which uses a paralon mould, mixing the ingredients until they are evenly mixed, the process of printing the dough mixture into the mould until it is solid and then slowly removed to form a tube.

RESULTS AND DISCUSSION

DISCUSSION

This Work Programme activity was carried out because the author felt that after the observation activities took place, the surrounding community in Dukuh Plosorejo, Lampar Village, was still unfamiliar with waste. Especially coconut shell and durian coir waste which is very unfortunate if it is just piled up so that it makes it accumulate and pollute the view and provide air pollution. The purpose

Received: January, **Accepted**: February, **Published**: March

of this activity is to help the community around Dukuh Plosorejo know the impact of environmental pollution that will occur later, also encourage creativity in handling waste and also instil habits to Karangtaruna about the use of alternative energy. Limited innovation in youth activities due to lack of knowledge of youth members, because some of them think that a good job at this time is to become an employee with a definite monthly wage. therefore the author and members decided to make socialisation as well as a briquette making pilot with 30 youth members who live in Dukuh Plosorejo, Lampar Village. It is hoped that it can provide understanding to youth members and can change their mindset for the progress of the place where they live, besides that it also facilitates the coordination obtained in determining the time and place of its implementation. During the implementation of training on the introduction of alternative energy and making briquettes, members of the youth organisation were very enthusiastic in following every process of making the briquettes. Briquettes themselves are a block of burnable material that is used as fuel to start and maintain a flame. The activity is shown in figure 1 below:

Figure 1 Socialisation of briquette making

It is hoped that from this activity, each member of the karangtaruna can realise the potential around their area by processing waste from coconut trees and durian coir into briquettes and it is hoped that each member of the karangtaruna understands that they can also make their own briquettes later. at this time alternative energy is the best alternative in minimising the consumption of fossil fuels which are increasingly depleting reserves in this world..

RESULTS

The process of making briquettes begins with finding coconut shells and durian coir for the burning process, pounding coconut shells and durian skins,

Received: January, **Accepted**: February, **Published**: March

mixing coconut shell charcoal powder, durian coir powder with tapioca flour, printing process, drying process. When this briquette making activity is carried out, it is also conveyed how the process of making briquettes from coconut shells and durian fibre where the equipment and materials that will be needed must be provided. The manufacturing activity can be seen in Figure 2 below:

Figure 2. Briquette making

The equipment used are buckets or used containers, mashing tools, sieves, pans, basins, and moulds. After that, the materials are coconut shells and durian fibre, tapioca flour, and water. The manufacture begins with drying coconut shells and durian coir, then burning the coconut shells and durian coir, then the material is crushed with a masher until it becomes powder, the powder is then sieved to get the desired fine shape and containerised. Then the process of boiling the adhesive material in the form of tapioca flour and also water is cooked over the fire so that it mixes and thickens well. Then mix the coconut shell charcoal powder and durian coir with tapioca starch adhesive and then put it into the paralon to be moulded and cut into small sizes. After all these steps have been done, the briquettes will be heated for 2-5 days in the sun, but can be put in a dryer at 100C in 3 hours. Briquettes are burnable blocks used as fuel to start and sustain fires. The most widely used briquettes are coal briquettes, gambu briquettes. The picture of the briquettes that have been presented can be seen in Figure 3 below:

Received: January, **Accepted**: February, **Published**: March

Figure 3. Dried briquettes

After the briquette-making activity was completed, it was also explained to the youth members that coconut shell and durian husk briquettes have several advantages compared to other common solid fuels, including being able to provide high heat, safe, smokeless, longer coals of 30 - 40 minutes, therefore these briquettes have the opportunity to replace coal, and are safer for the environment.

Something that is desired after all the activities that have been carried out is that the youth members realise how to maintain the environment they live in so that it can look beautiful without accumulating garbage. Especially coconut waste and durian coir which at this time they already know how to manage, not letting it pile up so that it does not cause the impression of slums, especially later in the end it can cause severe environmental pollution. The management of the utilisation of coconut shell charcoal and durian fibre into briquettes will hopefully be used as an alternative fuel to oil and gas. After several programmes have been implemented, there is praise from some members of the Karangtaruna because they get results in the form of additional knowledge about the use and processing of waste that can be done easily and beautify their environment.

CONCLUSIONS

From the programme that has been implemented, it is concluded that the members of the youth group are still unfamiliar with how to reuse coconut shell waste and durian coir, a factor that results in the accumulation of waste in the yard of the house or next to the durian seller's shop in Dukuh Plosorejo, Lampar Village, besides that some of them also do not understand that briquettes are a substitute for fossil fuels. This programme is one way to promote briquettes to members of Karangtaruna because things like this must continue to be carried out to increase their understanding. As well as providing material about the use of renewable energy, because the world's stock of fossil fuels is already decreasing in number. The desired benefit of this programme is that Karangtaruna can produce

Received: January, **Accepted**: February, **Published**: March

their own briquettes which later they can become an entrepreneur or make their area a briquette producer on a national and even international scale if it continues to be developed, as well as providing an understanding of the concern for the use of the environment around them to later be able to advance the wheels of their regional economy.

ACKNOWLEDGEMENT

Thank you to the Head of Tamansari Sub-District, the Head of Lampar Village and the community and Karangtaruna because we have been well received and supported by all KKN activities held in Lampar Village, precisely in Dukuh Plosorejo. If there are words, manners and behaviour that are less pleasing, please forgive us.

REFERENCES

Anggoro, D. D., Wibawa, M. H. D., & Fathoni, M. Z. (2018). Pembuatan Briket Arang Dari Campuran Tempurung Kelapa dan Serbuk Gergaji Kayu Sengon. Teknik, 38(2), 76. https://doi.org/10.14710/teknik.v38i2.13985

Budi, E. (2017). Pemanfaatan Briket Arang Tempurung Kelapa Sebagai Sumber Energi Alternatif. Sarwahita, 14(01), 81–84. https://doi.org/10.21009/sarwahita.141.10.

Triantoro, A., Mustofa, A., & Daniah, M. H. (2020). Studi Karakteristik Dan Kualitas Biobriket Campuran Bottom Ash Batubara Dengan Arang Tempurung Kelapa. Jurnal GEOSAPTA, 6(1), 13. https://doi.org/10.20527/jg.v6i1.7824

Iskandar, N., Nugroho, S., & Feliyana, M. F. (2019). Uji Kualitas Produk Briket Arang Tempurung Kelapa Berdasarkan Standar Mutu Sni. Jurnal Ilmiah Momentum, 15(2). https://doi.org/10.36499/jim.v15i2.3073.

Febrina, W. (2019.). Briket Kulit Jengkol Dan Tempurung Kelapa. JURNAL UNITEK, 11(1), 40-50. https://doi.org/10.52072/unitek.v11i1.27.

Eka Putri, R., & Andasuryani, A. (2017). Studi Mutu Briket Arang Dengan Bahan Baku Limbah Biomassa. Jurnal Teknologi Pertanian Andalas, 21(2), 143. https://doi.org/10.25077/jtpa.21.2.143-151.2017.

Ningsih, A. (2019). Analisis kualitas briket arang tempurung kelapa dengan bahan perekat tepung kanji dan tepung sagu sebagai bahan bakar alternatif. JTT (Jurnal Teknologi Terpadu), 7(2), 101–110. https://doi.org/10.32487/jtt.v7i2.708.

Sirajuddin, Z. (2021). Pengaruh Densitas Bahan terhadap Mutu Briket Arang Tempurung Kelapa. Mediagro, 17(1), 26–37. https://doi.org/10.31942/md.v17i1.3750

Kusmartono, B., Situmorang, A., & Yuniwati, M. (2021). Pembuatan Briket Dari Tempurung Kelapa (Cocos Nucivera) Dan Tepung Terigu. Jurnal Teknologi, 14(2), 142–149. https://doi.org/10.34151/jurtek.v14i2.3770.

Iryani, D. A., Haryanto, A., Hidayat, W., Amrul, Telaumbanua, M., Hasanudin, U., Lee, S. H. 2019. Torrefaction Upgrading of Palm Oil Empty Fruit Bunches Biomass Pellets for Gasification Feedstock by Using COMB (Counter

Received: January, **Accepted**: February, **Published**: March

Flow Multi-Baffle) Reactor. 7th TAE (Trend in Agricultural Engineering). 212-2017.

Kimutai, S. K dan Kimutai, I. K. 2019. Investigation of Physical and Combustion Properties of Briquette from Cashew Nut Shell and Cassava Binder. International Journal of Education and Research, 7(11): 15-26.

Mawardi, I., Nurdin., Ariefin., Usman, R, dan Abdel. 2019. Peningkatan Karakteristik Biopellet Kayu Kelapa Sawit Sebagai Energi Alternatif. Prosiding Seminar Nasional Politeknik Negeri Lhokseumawe. Aceh Utara, 3 Oktober 2019. 3(1): A230-A234

Nasrul, Z. A., Maulinda, L., Darma, F., dan Meriatna. 2020. Pengaruh Komposisi Briket Biomassa Kulit Jagung terhadap Karakteristik Briket. Jurnal Teknologi Kimia Unimal, 9(2): 35-42.

Park, S. H., Jang, J. H., Qi, Y., Hidayat, W., Hwang, W., Febrianto, F., and Kim, N. H. 2018. Anatomical and Physical Properties of Indonesian Bamboos Carbonized at Different Temperatures. Journal of the Korean Wood Science and Technology, 46(6): 9-18.

Shobar, S., Sribudiani, E., dan Somadona, S. 2020. Karakteristik Briket Arang dari Limbah Kulit Buah Pinang dengan Berbagai Komposisi Jenis Perekat. Jurnal Sylva Lestari, 8(2): 189-196.

Received: January, **Accepted**: February, **Published**: March