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Corn Cob Briquette Processing as One of the Renewable Energy in Margomulyo Village

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Abstract: *Margomulyo Village has a fairly large area of rice fields, plantations and dry fields where the majority of commodities are rice and corn. The existence of corn chips as a superior product and icon of village MSMEs can be drawn a line that corn cob waste is also wasteful. Briquettes are one of the waste management options where corn cobs contain high carbon materials. So that it can be used as a source of renewable energy for future needs. The purpose of making corn cob briquettes is to minimize waste disposal from corn cobs in Margomulyo Village.*

Keywords: *Briquettes, Corn Cobs, Renewable Energy*

Abstrak: Desa Margomulyo memiliki area persawahan, perkebunan, dan tegalan yang cukup luas dimana mayoritas komoditasnya adalah padi dan jagung. Keberadaan emping jagung sebagai produk unggulan dan ikon UMKM desa dapat ditarik garis bahwa limbah tongkol jagung juga merupakan limbah. Briket merupakan salah satu opsi pengelolaan limbah dimana tongkol jagung mengandung bahan karbon yang tinggi. Sehingga dapat dimanfaatkan sebagai sumber energi terbarukan untuk kebutuhan di masa depan. Tujuan pembuatan briket tongkol jagung ini adalah untuk meminimalisir pembuangan limbah tongkol jagung di Desa Margomulyo.

Kata kunci: Briket, Tongkol Jagung, Energi Terbarukan

1. INTRODUCTION

In Indonesia, there are many alternative renewable energy sources, including biomass or organic waste materials. Some organic materials such as coconut shells, corn cobs, wood waste and so on have great potential to become renewable energy (Katiandagho et al., 2023) . One of the uses is by processing it into a briquette. Briquettes are an alternative fuel from materials containing carbon and have been heated at high temperatures (Sudradjat et al., 2006). Formed through a combustion process from dry materials without air and then formed in such a way as to become a porous solid (Muhammad et al., 2013).

Most of the area of Margomulyo Village consists of agricultural land, plantations and dry fields which produce the main commodity in the form of rice. Not only that, corn has become the second largest commodity with an income that can reach 30 tons per year. Corn agricultural products have been processed into superior products and icons of UMKM from Margomulyo Village. Seeing the development of food processing that has spread to the general public, it is certain that corn has great potential to continue to be developed in the future.

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The utilization of waste from corn cobs here is considered less than optimal. Often corn cobs are simply thrown away without further processing. Corn cobs actually contain quite high carbon compounds so that they can be used as activated charcoal fuel. According to its content, if processed as briquettes or charcoal, corn cobs tend to last a long time because they have a low ash content of around 0.91%. Thus, corn cobs, although classified as waste, can be developed into renewable alternative fuels.

The purpose of this study is to determine the potential of corn cobs in Margomulyo Village to be processed as alternative fuel by processing them into briquettes. Renewable energy sources that can be used as sustainable fuel for the surrounding community.

The research is expected to be able to increase insight as well as provide solutions for the community around Margomulyo Village to answer the problem of agricultural waste which is often underestimated.

2. RESEARCH METHODS

The KKN Posko 37 Team carried out community service activities by conducting socialization of training on making briquettes from corn cobs as a renewable energy solution in Margomulyo Village using the *Asset Based Community Development (ABCD) approach method* (Faizah et al., 2022) . This is adjusted to several potentials and problems in Margomulyo Village which are considered suitable for using the above method. The *Asset Based Community Development (ABCD) method* is a method of providing an initial understanding to the community, recording, analyzing and optimizing important assets around them (Riyanti & Raharjo, 2021) . The goal is to provide new insights to the surrounding community so that they can better utilize the materials around them into something useful for life in the future.

3. RESULTS AND DISCUSSION

The service period of the UIN Walisongo KKN team in Margomulyo Village, Pegandon District, Kendal Regency carried one of the themes, namely the socialization of training on managing corn cob waste into renewable energy source briquettes. Held on August 8-10, 2024. This activity was given to the PKK mothers of Margomulyo Village to become new insights that would later be able to support the economy and optimize the processing of agricultural waste.

Briquettes can be said to be solid particles made from agricultural products that have gone through a combustion process without air or under pressure. They do not get

additional materials but only materials as adhesives (Salihi et al., 2023) . Briquettes are one of the options for managing agricultural waste that has a long shelf life compared to others. Management into briquettes has another advantage because it can be an economic value if it can be developed properly by the community. Briquettes are biomass energy that comes from biological sources and have been widely carried out by previous researchers (Kapita et al., 2021) .

The KKN Posko 37 Team has conducted interviews and surveys with local residents to obtain valid information that can be processed and analyzed in the future. Of course, based on existing data and sources, to ensure that briquette training can run optimally. The information obtained is that corn chips are a superior product as well as an icon of MSMEs from Margomulyo Village. This is because the second largest commodity in Margomulyo Village is corn. Corn income in this village can reach 30 tons per year (Margomulyo et al., 2020) .

There are several stages in making briquettes for the implementation of briquette training in Margomulyo Village, including the following:

a. Corn Harvesting Process

   Initially, corn cobs can be used well if they are completely dry, this will affect the quality of the briquettes and the burning process later. So it is very important to pay attention to whether the corn cobs are dry or not.

b. The combustion process

   The process of burning corn cobs is also no less important to note, because corn cobs should not be burned for too long until they turn ash. Good burning results are corn cobs that are still intact and blackish in color. Burning can be done in a can or if on a large scale can use a barrel then closed by turning off the fire. In the traditional process can use kerosene to facilitate burning.

c. Smoothing and Gluing process

   This process can be done after getting good quality during the previous burning process. Corn cobs can be mashed, sieved to get fine particles. If everything is done, you can use tapioca flour solution as a briquette adhesive. The comparison that can be used is 10% for tapioca flour or starch and 90% crushed charcoal (Hasan & Ghofur, 2019) .

d. Briquette printing process and drying

After the mixing process above, the briquettes can be molded according to the desired size to facilitate use and packaging later. Then, dried to remove water content in the previous mixing process with tapioca flour to obtain quality charcoal.

Figure 1. Corn Cob Charcoal Filtering Process

Figure 2. Drying Corn Cob Briquettes

In the implementation of this briquette training program, there were several obstacles, namely in time and readiness in packaging. The drying process which takes quite a long time to adjust to the hot sun conditions, causing a slight delay in the packaging process.

4. CONCLUSION AND SUGGESTIONS

Based on the results of community service activities, the following can be concluded. Processing briquettes from corn cobs can answer the problems in Margomulyo Village. As a basic material for creating renewable energy sources that can support human needs in the future, it can also increase the income value of the surrounding community. Making briquettes is also expected to be a solution to reduce corn cob waste so that it is not thrown away and left alone. Because if utilized and processed properly, it can produce

high economic value. This training also provides insight for the community regarding the utilization of organic waste.

There are suggestions for further research related to the effectiveness of Corn cob Briquettes. An in-depth study of the use of corn cob briquettes as energy fuel both in terms of combustion efficiency and its impact on the environment.

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