

USE OF BAGS AS CHARCOAL BRICKETS AS A WASTE SOLUTION IN LANGSA CITY IN ALUE DUA VILLAGE, LANGSA BARO DISTRICT, LANGSA CITY

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Abstract

There is quite a lot of sugarcane bagasse waste in Langsa City which is not utilized properly and only ends up in the city landfill. This sugarcane bagasse waste can be processed and utilized into a high-value product, namely charcoal briquettes. Where currently the demand for energy sources that are environmentally friendly and have affordable prices is very popular with the public both at home and abroad. Therefore, to reduce sugarcane bagasse waste and make it of high economic value, training was held on making charcoal briquettes from bagasse and improving the community's economy. This service activity will be carried out in Alue Dua Village, Langsa Baro District. The output of this activity is the creation of briquette charcoal products and increasing partner income. The results achieved in this activity were to increase the partners' insight into processing sugarcane bagasse into charcoal briquettes. In the future, partners also hope that there will be training related to digital marketing for the products they produce.

Keywords: *Bagasse, Sugarcane, Briquettes, Income*

INTRODUCTION

Scarcity and increases in oil prices will continue to occur because oil is non-renewable, so there is a need for alternative energy that is renewable in abundant quantities and at prices that are affordable to the public (1). In Indonesia, alternative energy sources are originating from biomass and organic waste. To increase its economic value, biomass can be processed into charcoal briquettes (2). Bagasse is the remainder of sugar cane milling after extracting or removing the juice. (3) However, most of this bagasse has not been utilized optimally (4). Storing bagasse for a long period will cause problems because it is flammable, pollutes the environment and requires large areas of land for disposal (5). There have been several efforts to minimize sugarcane bagasse by using it as animal feed, fertilizer, and pulp, but these efforts are still not optimal. Sugarcane bagasse contains active carbon because it is lignocellulosic biomass which has a high carbon content (6). In Aceh Province, especially in Langsa City, sugar cane bagasse is found in quite large quantities and has not been utilized properly. In Langsa City, many sugarcane juice sellers produce sugarcane bagasse waste which piles up around the city every day. All of the bagasse waste is then transported by cleaning staff and then disposed of at the city's final disposal site (TPA). Even though this waste has high economic value and has great added value.

Therefore, it is necessary to process and utilize this waste so that it has high economic value and becomes charcoal briquettes. Due to the large number of sugar cane ice sellers in this city who are in almost every corner of Langsa City every day, in the afternoon, a lot of sugar cane bagasse is left behind. Where the cleaning staff are quite overwhelmed in terms of transporting the waste because the amount is quite large. The bagasse waste is then only thrown into the city's final disposal site and is not utilized properly. Sugar cane bagasse can be made into goods that have high economic value, one of which is charcoal briquettes. Currently, the demand for energy sources that are environmentally friendly and at affordable prices is quite large and this is a business opportunity that can be taken up by the community so that they can have a good income. Demand for charcoal briquettes does not only come from within the country but many come from abroad who emphasize the environmentally friendly aspect. By exporting these briquettes, of course, the price is quite high and is a promising business opportunity in the future. The activity of processing and

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making sugarcane bagasse waste into charcoal briquettes will be carried out in Alue Dua Village, Langsa Baro District. With the hope that making these briquettes will increase people's income and reduce sugarcane bagasse waste around Langsa City.

METHOD

The Community Service Activity Plan regarding the use of bagasse as charcoal briquettes as a waste solution in Alue Dua Paya Bujok Seuleumak Village, Langsa Baro District, Langsa City in 7 September 2023, is outlined in the following stages:

a) Coordination of Activities

At the start of the activity, the implementing team will coordinate with partners. This will make it easier for the implementation team to determine the location for Community Service, find out the problems faced by partners, and provide alternative solutions to overcome problems.

b) Socialization

Socialization of activities was carried out in the form of lectures by presenting training material face to face to provide clearer information and knowledge to partners about the aims and objectives of the service team for holding training on the use of bagasse as charcoal briquettes.

c) Training

Training activities will be held by practising directly with partners about making sugarcane bagasse as charcoal briquettes. Apart from using sugar cane bagasse as the main source of briquettes, tapioca flour is also used.

d) Mentoring

Assistance will be provided by the service implementation team by visiting the training location in Alue Dua Seuleumak Village, Langsa Baro District, Langsa City twice a month to monitor and evaluate the progress of the activities carried out. In sub-stages c and d, the service team, assisted by students, will prepare tools and materials first. Evaluation; The service team provides a post-test as a form of evaluation of whether partners understand the solution to the problem being offered. Success indicator: partners understand the methods of manufacturing, packaging and marketing chitin and chitosan as well as their applications with an average percentage of understanding >75%.

d. Monitoring:

Monitoring activities ensure the sustainability of the results of technology transfer and training that the team has provided.

RESULTS AND DISCUSSION

This service has been carried out in stages consisting of the preparation stage, implementation stage and evaluation stage.

a. Preparation Stages

The service team made preparations starting with a site survey. The coordination that has been carried out with partner leaders has determined the priorities of the problems to be resolved and the solutions offered to resolve these problems. The solutions offered are: (1) Reducing environmental pollution through processing sugarcane bagasse into charcoal briquettes. (2) In the production sector, production problems can be developed by processing sugarcane bagasse waste into charcoal briquettes as a by-product, so that the products produced by sugarcane ice traders in Alue Dua Village are not just sugarcane juice. (3) At this stage the service provider has prepared all the equipment and materials in the form of PowerPoint presentations, pretest questions, posttest questions, and questionnaires regarding participant satisfaction with service activities.

b. Implementation Stage

Before entering the socialization or counselling stage, the chief executive gave a speech, then a speech by the partners, namely the Alue Dua Gampong Community Empowerment Group (PMG). Next, the service team gave a pretest to the participants. The pretest consists of 10 questions regarding partners' knowledge regarding products produced from sugarcane bagasse waste. The pretest was given in the form of a questionnaire and its implementation was guided by the service team because several participants had difficulty understanding, reading and writing the pretest questions (Figure 1).



Figure 1. Pre-Test

The pretest results showed that participants' initial knowledge about chitin and chitosan by-products was very low, where the participants' overall score on the pretest was zero. After carrying out the pretest, the activity continued with the delivery of material regarding the use of the resulting sugarcane bagasse waste. Service participants are also given insight into the benefits and products that will be produced. In general, sugar cane bagasse is only thrown away and becomes waste in Langsa City. Even though sugar cane bagasse has ingredients that can make it an organic fuel. The material is delivered by the service team in turns using PowerPoint and posters.



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After delivering the material, a question and answer session was held regarding the training material. The participants' enthusiasm was very high as seen from the many questions. After being given socialization, the service team practised how to make charcoal briquettes. In general, making charcoal briquettes starts from: bagasse → dried → cooked using an iron container → until black and becomes dust → sifted → mixed with starch → added with a little water → molded → dried in the sun → charcoal briquette products are formed.

a. Evaluation Stage

At the evaluation stage, the service team gave a post-test to all participants. The posttest given still uses the same questions as the pretest which consists of 10 questions. Figure 3 shows a comparison of pretest and posttest scores for all activity participants.

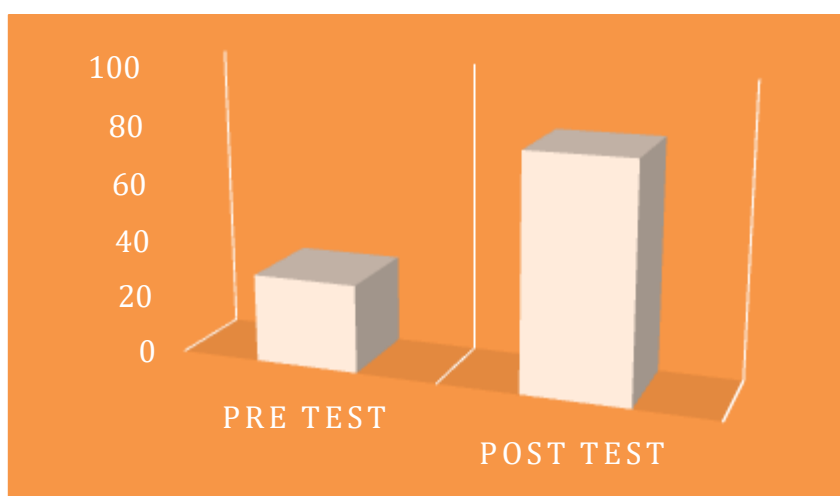


Figure 3. Pre-Test and Post-Test Result

From the pre-test, and post-test given after and before the counseling and workshop, pre-test and post-test scores were obtained. The collected data was processed using the Wilcoxon Signed Test (non-parametric statistics). The software used to analyze the data is SPSS 16. This test is to analyze differences in the level of partner knowledge development before and after by-product development activities. From the table above, you can see the scores after and before the counselling and workshop. With $\alpha=5\%$ the service team wants to test the level of knowledge development of counselling and workshop participants. The level of knowledge referred to is the sample's knowledge regarding by-product development. So a hypothesis can be formulated as follows:

H_0)= Median of the difference between the two variables = 0, there is no difference in the level of farmers' knowledge before and after the outreach activities and workshops were held.

H_1)= Median of the difference between the two variables $\neq 0$, there is a difference in the level of farmers' knowledge before and after the extension activities and workshops were held.

After the data was processed with SPSS 16, the results in Figure 6 were obtained. From the results, the significance was $(0.016) < \alpha_{0.05}$. Thus, it can be concluded that H_0 was rejected and H_1 was accepted, meaning that there was a difference in the level of knowledge of service participants before and after the outreach activities and workshops were held.

CONCLUSION

The results achieved in this activity were the addition of partners' insight regarding the use of bagasse in charcoal briquettes with economic value in the form of outreach activities and workshops

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