Utilization of Corn Cobs for Charcoal Briquettes as an Alternative for Waste Management and Enhancing The Economic Potential of The Community in Samataring Village, Kelara District, Jeneponto Regency

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ABSTRACT

Corn cobs have not yet been fully utilized in Samataring Village, Kelara District, Jeneponto Regency. The purpose of this activity was to educate the community on how to use corn cobs to make charcoal briquettes as an option for waste disposal and as an income-generating activity. To achieve the goals of this activity, we used a participatory approach which involved observation, planning, socialization, demonstration on how to create charcoal briquettes, and evaluation. During the demonstration phase, participants learned about carbonization, grinding, binder addition, molding and drying. Results indicated that the community learned about the possibility of using corn cobs to create charcoal briquettes. Some residents actually created their own charcoal briquettes to grill chicken for their family dinner. This indicates that corn cobs may be converted into a valuable product that provides opportunities for continued economic development. In order to ensure the sustainability of this program, the participation of the community and Karang Taruna will be encouraged in creating and expanding charcoal briquette production.

1. Introduction

In addition to being an agricultural country, Indonesia produces vast amounts of agricultural waste. For example, corn cobs are a common type of agricultural waste. Typically, corn cobs are not used effectively and in many instances they are burned, creating a potential threat to the environment (Hakim et al., 2026). The burning of corn cobs illustrates the need for more efficient methods of managing agricultural waste so as to generate added value. A possible strategy for managing agricultural waste is to utilize the waste to produce goods that can be re-used (Prastyo et al., 2025). Utilizing agricultural waste to produce goods that can be re-used would help to minimize the amount of waste generated, while at the same time increase the usefulness of the waste that had been underutilized.

The other application of using corn cobs is as a raw material for making briquettes. Briquettes are a type of solid alternative fuel that can be used to provide an environmentally friendly and sustainable source of energy (Rifdah et al., 2018). Using corn cobs as a raw material for briquettes does two things, which is by reduces the dependence of the community on fossil fuels and it provides a way to deal with some of the organic waste problems in the community (Salim et al., 2026). In addition, converting corn cobs into briquettes increases the usefulness of agricultural waste that was once under-used. There may be opportunities for generating income from products made from local resources. At the same time, this practice will increase people's understanding and skills related to managing waste in productive ways.

The majority of the population in Samataring Village, Kelara District, Jeneponto Regency, works as farmers, primarily growing maize. As such, every harvest period, there are large amounts of corn cob waste produced. Based upon observations and initial interviews with village government officials and community leaders, the team implementing the project determined that the waste generated from the corn cob harvests had not been well managed. In fact, most of the waste was either left to sit and decompose on the ground or was burned. Thus, the waste generated from the corn cob harvests represented both a potential threat to the environment through pollution, as well as an unrealized economic opportunity.

This event demonstrates that there are challenges associated with managing waste produced by agricultural practices, but it also demonstrates that there are local resources that may be developed. Previously, corn cobs had been little used. However, they may be processed into reusable products, such as charcoal briquettes. As a result, an educational outreach effort was made available to the public. During this educational outreach effort, information was provided about using corn cobs to produce charcoal briquettes, as well as providing a demonstration of how to make charcoal briquettes using corn cobs. This activity did not just provide information; it demonstrated the process used to produce charcoal briquettes using corn cobs, so that the public could understand what is involved in making use of corn cobs.

The process uses a participatory approach, with the participation of the community, village government, community leaders, and Youth Organization (Karang Taruna) in the implementation. A participatory approach places the community at the center of the process so that programs can be developed according to the conditions and needs of each community (Asri et al., 2026; Safitri et al., 2026). The Youth Organization is involved in order to provide long-term continuity to the project; they will continue to work with the community to use corn cobs even when the KKN (Student Community Service) program has ended.

This project will train people in Samataring Village about how to transform corn cobs into charcoal briquettes. Corn cob waste is a major problem for many farmers. There are too many

corn cobs and they are left in the fields. Charcoal briquettes made from corn cobs can serve as a substitute for traditional fuels like firewood or coal (Dhafiyah & Yumeina, 2025). Research by Yumeina and Fardatullah (2025) shows that corn cob waste can be used to create charcoal briquettes as an alternative fuel source. In Tombolo Village, Gantarangkeke District, Bantaeng Regency, the researchers trained villagers to process corn cobs. This resource was previously unused. Their study showed that using corn cobs to make charcoal briquettes helps decrease agricultural waste and increase the value of the raw material (Yumeina & Fardatullah, 2025). Another aspect of this initiative is demonstrating how corn cobs can be used practically by demonstrating how to make charcoal briquettes with members of the community and the Karang Taruna (Youth Organization). These demonstrations will help ensure the long-term viability of the program at the village level.

2. Method

This community service project took place at the Samataring Village Office, Kelara District, Jeneponto Regency on September 10, 2026. This project was conducted with the Samataring Village community including the village government, community leaders and Youth Organizations (Karang Taruna). This project used a participatory approach where the community became an active participant in their own development. This approach is in line with the Participatory Rural Appraisal (PRA) principles that the community is involved in identifying problems, identifying needs and carrying out actions (Hudayana et al., 2019; Sulaeman et al., 2023). This project was carried out in the following stages:

1) Observation and Identifying Needs: In the beginning phase of our work, we conducted a site visit in Samataring Village where we met with local government representatives and community members. During this visit, we observed how the community uses corn cob waste. Our observation indicated that the corn cob waste produced through agriculture was not utilized effectively. Based on these observations, we decided to develop a process to create charcoal briquettes using corn cobs.
2) Program Planning: Once the community's conditions and needs have been identified, activity planning takes place. This stage involves determining the format of the activities, preparing the necessary materials and equipment, and readying the content to be presented to the community.
3) Dissemination: Carried out by providing information to the community regarding the utilization of corn cobs, the benefits of processing them, and the introduction of charcoal briquettes as a form of agricultural waste utilization.
4) Demonstrating The Making of Charcoal Briquettes: The demonstration was carried out to show directly the process of processing corn cobs into charcoal briquettes. The stages demonstrated include the process of burning corn cobs, grinding charcoal, mixing with adhesive, molding, and drying.
5) Program Evaluation: The evaluation is conducted descriptively based on observations made during the activity, community involvement, and the utilization of the produced briquettes. Activity documentation serves as evidence of the program's implementation.

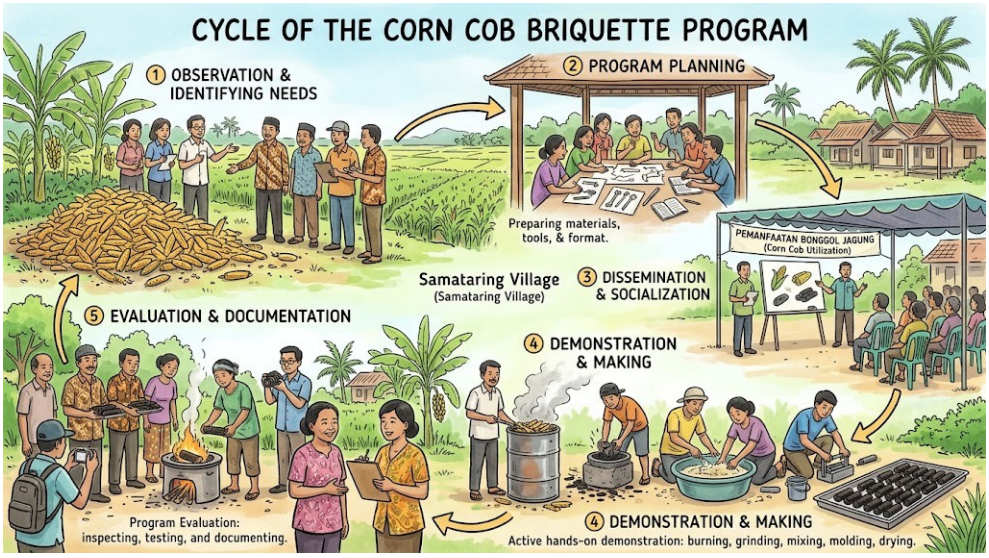


Figure 1. The Illustration of Student Community Service Program

3. Results and Discussion

The initial studies show that Samataring village has high agricultural capacity, especially in terms of corn production. The reason for this is because many villagers produce corn as their main agricultural product. However, there are problems with how the villagers use corn after they harvest it. For example, most of the left-over corn cobs are not used again and are usually thrown away. This means that there may be a problem with agricultural waste being produced. As such, the villagers have started an initiative to make charcoal briquettes out of corn cobs. By doing this, the villagers are showing that corn cobs can be used again after they have been processed.



Figure 2. Initial Condition Observation and Initial Communication with Locals

The door-to-door observation and engagement process with each of the village officials and several community leaders took place during a period of about one week. During this phase we discussed our goals, collected ideas/suggestions, identified the needs of the Samataring Village community which would serve as a basis for developing the work program. The results of the observations helped us determine what type of activities were appropriate for the Samataring Village community based upon their unique situation. As a result, the implemented programs did not just provide information; they also demonstrated

how the Samataring Village community could use the waste material in the local area to create products or services. The next step is work program planning. Based on observations and problem identification, the utilization of corn cob waste to produce charcoal briquettes has been selected as a flagship program, given the abundance of corn cob waste and its currently suboptimal utilization in Samataring Village.



Figure 3. Program Seminar

The next part of the day was dedicated to presenting how to use corn cobs for producing charcoal briquettes. The purpose of this segment was to educate the community about problems related to corn cob waste, what the product could do for them and what steps were involved in making the charcoal briquette. This portion of the day was used as an introduction prior to the actual demonstration so the community would have a basic idea of what the day's activity was about and what steps were going to be demonstrated.



Figure 4. Utilizing Corn Corb to Charcoal Briquettes How-To

Following the presentation, an ongoing demonstration took place which demonstrated how to produce charcoal briquettes using corn cobs. This demonstration was performed live so that members of the community could view each phase of the production process; from the raw materials used to the final briquette produced. First, the corn cobs were carbonized. Second, the corn cobs were pulverized to create a finer charcoal powder. Third, the charcoal powder was mixed with a binding agent to produce a mixture. Fourth, this mixture was formed and pressed together to create the shape of the mold being utilized. Finally, once the pressing process was complete, the briquettes were allowed to dry until they were ready for utilization.



Figure 5. Charcoal Briquettes Making Process

This project allowed the public to experience first-hand the use of corn cobs. This experience was supposed to help people understand each stage of the process of making charcoal briquettes using corn cobs rather than just listening to someone speak about it (Pangga et al., 2021). The final result of this project was the creation of charcoal briquettes from corn cobs. The charcoal briquettes are an illustration of how corn cobs, which were once considered waste products, can now be used as a source of energy (Ilmi & Nurjannah, 2025). Additionally, the creation of charcoal briquettes using corn cobs provides a way for the community to manage agricultural waste in a different manner than before. Although there was no laboratory tests performed on the charcoal briquettes for quality including calorific value, moisture content, ash content, combustion properties. Therefore, the technical quality of the charcoal briquettes cannot be quantified within this paper.



Figure 6. The Final Product and Testing Process

The response to this activity from those who participated in the outreach and demonstration events was positive. This positive reaction can be seen through the community's participation in the activities and through the fact that several residents attempted to use the briquettes developed. Some of these residents have even used the corn cob briquettes on a regular basis for their household requirements, including using them as a

source of fuel to roast chickens. These examples demonstrate that what was presented at the activity extended past the demonstration phase and was used for real-life purposes. The above-mentioned examples suggest an early adoption of the use of corn cob briquettes as a form of fuel. However, since no quantitative data was collected concerning the degree to which the community has accepted or is satisfied with the product, there are no percentages presented here.

The utilization of corn cobs to produce briquettes may provide a means for waste management while at the same time providing the opportunity for a profitable venture. Corn cobs that were previously considered waste products from farming operations are now capable of producing products that are useful and commercially viable (Delfitriani et al., 2024). This program is currently at its earliest stages in terms of commercial application. Cost-benefit analysis, pricing, and profit assessments are yet to be conducted. Therefore, this project has not yet resulted in increased income for the local community (Insandi et al., 2019). However, future programs based upon the production, packaging, pricing, marketing, and management of these briquette products could lead to the development of a sustainable business enterprise operated by members of the local community or the Youth Organization (Karang Taruna).

The activity was supported by the participation of the village government, community leaders, local residents and the youth organization (Karang Taruna). The supply of corn cobs was also a supporting factor. In addition, the enthusiasm displayed by the community during the presentation and demonstrations helped contribute to the success of the activity. However, in order to continue developing this program, we will need to address issues related to production sustainability, equipment availability, community skills and management of products and marketing; especially if the briquette production becomes a commercial enterprise.

Program sustainability is maintained by involving the local community and the Karang Taruna. The Karang Taruna can act as a partner in maintaining the use of corn cobs, as well as developing production activities if the community wishes to maintain them. In addition to being used for household consumption, the utilization of corn cobs can also be developed into products that have market value. However, developing products that have market value requires continuous assistance in terms of production processes, quality control of briquettes, packaging, marketing and business management. It is expected that the sustainability of using corn cobs will allow the initiative of utilizing corn cobs to continue being used by the residents of Samataring Village according to their needs and abilities.

4. Conclusion

In Samataring Village, Kelara District, Jeneponto Regency, the use of corn cobs to produce charcoal briquettes was developed through a participatory process which included observations and needs assessment, program development, community outreach, demonstration of charcoal briquette production techniques, and evaluation of activities. The development of this process allowed the residents of the area to gain knowledge and practical experience in utilizing corn cobs as a source of raw materials for charcoal briquettes. The demonstration was able to show each step of the process of producing charcoal briquettes; carbonization, grinding down the charcoal, mixing it with a binding agent, molding the mixture, and then drying it. In addition to gaining knowledge on how to make charcoal briquettes, residents were able to test the resulting charcoal briquettes for their own personal

uses such as for grilling chicken, showing that the transformation of corn cobs into charcoal briquettes is a viable method of managing agricultural waste.

As a product of economic value, corn cob briquettes may provide additional opportunities for waste management; however, at present, it is difficult to determine if these briquettes can be commercially produced. To date, there has been no assessment of production costs, revenue generated, or the impact on household incomes. Therefore, the identified economic potential of corn cob briquettes will require continued support and development. Sustainability of this program can be achieved through the active engagement of both the community and the local youth organization (Karang Taruna), who will continue to use corn cobs and develop briquette production based upon what best serves their community. Future support should focus on building capacity in terms of production, packaging, marketing, and entrepreneurship so that corn cob utilization continues to grow long after the KKN program ends.

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