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Corn Cob Utilization Through Mushroom Cultivation As A Community Economic Empowerment Strategy

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Abstract

Corn cobs are one of the agricultural wastes that are still widely found and have not been optimally utilized by the community. Cobs of corn have the potential to be used as a medium for cultivating janggel mushrooms so that they can provide added value to local resources. Previous research shows that training on the use of corn cobs as a medium for making janggel mushrooms can provide added value and encourage people to use agricultural waste more productively. Departing from this potential, this activity was carried out as part of the Real Work Lecture (KKN) program which aims to provide understanding to the community about the use of corn cobs as a medium for cultivating janggel mushrooms and opportunities for sustainable development. The method used is qualitative descriptive with a participatory approach through observation, information delivery, and discussions with the community. The results of the activity show that socialization can introduce alternatives to the use of corn cobs and increase public understanding of the potential of local resources as economic opportunities. Thus, the use of corn cobs through janggel mushroom cultivation has the potential to be developed as one of the efforts to empower the community and strengthen the local resource-based economy in a sustainable manner. Keywords: corn cob, mushroom, economic value, community, sustainability

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INTRODUCTION

Real Work Lecture (KKN) is a form of implementation of the Tri Dharma of Higher Education which provides opportunities for students to be directly involved in community service activities. Through KKN, students can learn about the social, economic, and cultural conditions of the community while playing a role in identifying problems and potentials in the community. The implementation of KKN is not only oriented towards solving existing problems, but also encourages the community to participate in developing local potentials that can provide benefits in a sustainable manner. Community empowerment through KKN activities basically places the community as an important part of the process of developing potential and increasing community independence (Permatasari, 2025).

One of the potentials that can be developed in people's lives comes from the agricultural sector. Agricultural activities not only produce the main product in the form of crops, but also produce various types of waste or by-products that often have not been utilized optimally. One of them is corn cobs which are generally considered waste and are discarded after the seeds are used. In fact, corn cobs still have the potential to be developed into more useful materials and have economic value. The proper use of agricultural waste can be an alternative in reducing environmental problems while supporting the more productive use of local resources (Dewi et al., 2024).

The use of local potential is also closely related to community empowerment efforts. The development of resources available in the community can be carried out by paying attention to the level of community participation, the availability of resources, and existing institutional support. With the management of local potential in accordance with community conditions, previously underutilized resources can be directed to more productive activities and have economic benefits (Bulkis et al., 2026). Therefore, the use of agricultural waste such as corn cobs is not only seen from the aspect of waste reduction, but also from its opportunity to be developed into productive activities for the community.

One form of utilization of corn cobs that has been developed is its use as a medium for cultivating janggel mushrooms. Corn cobs can be used as a medium in mushroom cultivation because the material still has ingredients that can support mushroom growth. This utilization allows waste that was previously not used to be processed into something more valuable and has the potential to provide economic benefits for the community. Ahmed Al Ayubi et al. (2024) show that corn cobs can be used into mushrooms that have economic value through processing and cultivation processes that can be carried out by utilizing materials available in the surrounding environment.

The results of previous service activities also show that the use of corn cobs as a mushroom cultivation medium can be applied in community empowerment activities.

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Lestari et al. (2023) carried out socialization and training on the use of corn cob waste as a medium for growing janggel mushrooms to the community in Karang Rejo Village, Balikpapan. These activities were carried out through several stages, namely surveys, program socialization, direct practice, monitoring, and evaluation. The results of the evaluation showed that most participants considered the process of using corn cobs to be relatively easy to do and the materials used were easy to obtain. In addition, the research of Indriani et al. (2024) also showed that there is a use of corn cobs as a medium for mushroom cultivation through activities involving the community. These findings show that corn cobs have the potential to be used not only as an alternative in waste management, but also as a material in productive activities that can be developed by the community.

Although previous research and service activities have shown that corn cobs can be used as a medium for janggel mushroom cultivation and have been applied through community training and empowerment activities, its application is still related to the conditions and potentials owned by each region. Previous activities, such as those carried out by Lestari et al. (2023), have focused on communities in Karang Rejo Village, Balikpapan, with different local conditions and resources. Therefore, the use of corn cobs as a medium for janggel mushroom cultivation in the context of KKN activities in Sarimatondang Village is important to be studied as a form of implementing the use of local resources in accordance with the conditions of the local community. Thus, this activity not only adopts the use of corn cobs that has been carried out previously, but also looks at how the introduction and socialization of such use can be applied in the context of community empowerment in Sarimatondang Village.

Based on this potential, KKN students carried out socialization activities regarding the use of corn cobs as a medium for cultivating janggel mushrooms to the people of Sarimatondang. This activity aims to introduce alternatives to the use of corn cobs that were previously underutilized, provide an understanding of the process and potential of janggel mushroom cultivation, and encourage the community to see opportunities for the development of local resources into more productive activities. With these activities, the use of corn cobs is expected to be an alternative in reducing agricultural waste while opening up opportunities for economic value development for the community. This article aims to describe the implementation of socialization activities on the use of corn cobs as a medium for janggel mushroom cultivation and discuss its potential as a form of community empowerment and the use of local resources in Sarimatondang Village.

METHODS

This activity was carried out as part of the Real Work Lecture (KKN) program of the State Islamic University of North Sumatra in Sarimatondang Village, Sidamanik

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District, Simalungun Regency, on July 31, 2026–August 30, 2026. The activity focused on the use of corn cobs as a medium for cultivating janggel mushrooms which was carried out with the community. The method used in this activity is a qualitative descriptive method with a participatory approach. This approach is used to describe the process of implementing activities, community involvement, knowledge shared, and the potential sustainability of the program implemented. The participatory approach is considered appropriate because the community does not only receive information, but is also involved in the process of activities directly. This is in line with the implementation of community service activities that place community involvement as an important part of the learning process and delivery of information.

Information collection was carried out through observation of the environment and the potential of corn cobs available in the community, discussions with the community, delivery of materials on the use of corn cobs, and demonstrations about the process of cultivating janggel mushrooms. Documentation of activities is also used as supporting data to describe the implementation of the program.

The stages of the activity consist of several stages. The first stage is **Observation**, namely looking at the condition and potential of local materials that can be utilized. The second stage is **Socialization**, namely providing information to the community about the use of corn cobs and opportunities for janggel mushroom cultivation. The third stage is **Demonstration**, which is to show directly the stages or how to use corn cobs as a medium for cultivating janggel mushrooms to the community. The demonstration was carried out so that the community could get a clearer picture of the process that could be carried out if the activity wanted to be developed independently. The last stage is **Simple evaluation** through discussions to find out the community's understanding and response and discuss the possibility of activities being continued after the KKN program is completed.

The data obtained were then analyzed descriptively by linking the results of observations during the activity with the program objectives, namely the use of local resources, increasing economic value, and the sustainability of activities in the community.

RESULTS AND DISCUSSION

The Utilization of Corn Cobs as Local Economic Potential

Based on the results of observations during the implementation of KKN activities in Sarimatondang Village, corn cobs produced from community agricultural activities have not been optimally utilized and still tend to be seen as leftover agricultural products. This condition is the basis for socialization regarding the use of corn cobs as a medium for cultivating janggel mushrooms. Through these activities, the community is provided with

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information about the potential of corn cobs and the stages of their use as a cultivation medium. In addition to delivering material directly, demonstrations were carried out through video shows the stages of making janggel mushroom cultivation media using corn cobs.

The delivery of materials and demonstrations through video provided an overview to the community of alternatives to the use of corn cobs that were previously underutilized. The activity introduced that materials available in the surrounding environment could be used for more productive activities. This is in line with Ahmed Al Ayubi et al. (2024) who showed that corn cobs can be used in mushroom cultivation that has economic value. Thus, socialization and demonstrations carried out through KKN activities are the first step in introducing the use of local resources and opening up public insight into the economic potential of corn cobs.

Cultivation of Janggel Corn Mushroom as an Effort to Increase Economic Value

The use of corn cobs as a medium for janggel mushroom cultivation was introduced to the community as an alternative to provide added value to materials that were previously underutilized. In KKN activities, the presentation of janggel mushroom cultivation was carried out through socialization and demonstrations using videos that showed the stages of making media and the cultivation process. The presentation provided an overview to the community about alternative uses of corn cobs in mushroom cultivation activities.

Based on these activities, the use of corn cobs as a cultivation medium shows that there is an opportunity to increase the use value of materials that were previously underutilized. Corn cobs can be directed to be part of productive activities through janggel mushroom cultivation. This is in line with Ahmed Al Ayubi et al. (2024) who discuss the use of corn cobs into mushrooms with economic value. The use of waste as a material that has a use value is also related to efforts to increase the economic value of previously underutilized resources, as discussed by Dewi et al. (2024). Thus, the introduction of janggel mushroom cultivation in KKN activities can be the first step to introduce alternatives to the use of corn cobs that have the potential to provide added value for the community.

However, the potential economic value cannot be stated as an increase in community income because KKN activities are only carried out at the socialization and demonstration stage through videos. This activity does not include the direct mushroom production process, crop yield measurement, production cost calculation, and product marketing. Therefore, the economic benefits obtained by the community cannot be measured quantitatively. This socialization activity is more appropriately seen as the initial stage in providing knowledge about the use of corn cobs, while the development of economic

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value still requires further activities in the form of cultivation, yield management, packaging, and marketing.

The Role of the Community in the Implementation of the Program

The implementation of socialization of the use of corn cobs as a medium for janggel mushroom cultivation involved the people of Sarimatondang Village as participants in the activity. Based on the implementation of the activity, the seminar was attended by around 30 people consisting of village communities, both fathers and mothers, as well as members of naposo (youth) in Sarimatondang Village. The involvement of the community was seen through their participation in participating in the delivery of material and watching demonstrations through videos about the process of using corn cobs as a medium for cultivating janggel mushrooms.

The activity received a good response from the community. The participants' interest in the material was related to their environmental conditions, because corn cobs are the rest of agricultural products available around the community and previously tended not to be used optimally. After participating in the seminar and seeing the process of cultivating janggel mushrooms through videos, the community began to get an overview of alternative uses of corn cobs that can be developed into more productive activities.



Figure 1. Implementation of Seminar on the Utilization of Corn Cobs

The community's response to these activities shows that socialization can be a means to introduce new knowledge about the use of local resources. Through the delivery of materials and demonstrations using videos, the community obtained an overview of the stages of using corn cobs as a medium for cultivating janggel mushrooms. The visualization of the process through video also provides a more concrete picture than the theoretical delivery of material alone.

These findings are in line with Nasution et al. (2023) who show that socialization activities regarding the use of agricultural waste can be used as one of the efforts to increase public awareness of the potential use of waste. In the context of KKN activities

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in Sarimatondang Village, socialization is the initial stage to introduce alternative uses of corn cobs available in the community.

In terms of empowerment, the activity also provides an opportunity for the community to recognize the potential of resources that were previously underutilized. The use of residual agricultural products is not only related to efforts to reduce wasted materials, but can also be directed to produce use and economic value. Fatimah et al. (2024) explained that the use of waste into economic value can be part of community empowerment efforts. This is related to activities in Sarimatondang Village because the community is introduced to alternatives to the use of corn cobs that can be developed as part of productive activities.

However, community involvement in this activity is still at the stage of socialization and information receipt, not yet at the stage of implementing cultivation independently. Therefore, the positive response of the participants cannot be interpreted as evidence that the community has implemented janggel mushroom cultivation or obtained additional income.

Community involvement is also an important factor in determining the sustainability of the use of corn cobs after KKN activities are completed. The knowledge gained through socialization needs to be supported by the community's willingness to apply it according to their conditions and abilities. This is in line with Budi Santosa et al. (2025) who emphasize the importance of community education and innovation in sustainable waste management.

Thus, KKN activities can be seen as the initial stage in building public knowledge and interest in the use of corn cobs. The sustainability of the program still requires mentoring, cultivation practices, yield management, and marketing development. Further evaluation is also needed to find out the extent to which the knowledge that has been provided can be applied in real activities.

Sustainability of Corn Cob Utilization

Sustainability is an important aspect in the use of corn cobs because the benefits of the activity are not only expected to stop during the KKN program. Based on the results of the activity, the community has obtained information about alternative uses of corn cobs as a medium for cultivating corn cobs. However, the sustainability of this use is highly dependent on the ability and willingness of the community to apply the knowledge that has been obtained after the KKN activities end.

One of the factors that support sustainability is the availability of raw materials. Corn cobs derived from community agricultural activities can be a source of materials relatively close to the community's location. If the material is available sustainably and

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can be collected properly, its use as part of janggel mushroom cultivation has the opportunity to be further developed.

In addition to the availability of raw materials, sustainability also requires cultivation skills and production management. If the activity continues, the community needs to understand the process of maintenance, quality control, crop management, packaging, and marketing. Thus, the use of corn cobs does not stop at the material introduction stage, but can develop into a productive activity if supported by adequate management capabilities.

Budi Santosa et al. (2025) emphasized the importance of education and innovation in sustainable waste management. In the context of this KKN activity, sustainability can be built through strengthening community knowledge and developing activities gradually. Meanwhile, Dewi et al. (2024) show that increasing the economic value of underutilized resources can be related to sustainable economic development efforts. Both of these things reinforce that the use of corn cobs can not only be seen from the economic aspect, but also from the aspect of managing local resources more optimally.

From an economic perspective, the use of corn cobs has the potential to provide additional opportunities if cultivation activities can be carried out consistently and the production products have a market. However, the increase in people's income still depends on several factors, such as production success, product quality, number of harvests, operational costs, selling prices, and the ability of the community to manage and market products.

Therefore, this KKN program is more appropriately seen as the first step in creating economic opportunities**i**, not as a guarantee of direct income increase. The activities carried out have not produced data on the amount of production, production costs, profits, and changes in community income. These limitations are also related to the relatively short duration of KKN implementation.

In addition to the economic aspect, the use of corn cobs is also related to environmental aspects. Materials that were previously underutilized can be directed to be part of productive activities so that their use becomes more optimal. Thus, this activity shows the relationship between the use of local resources, economic opportunities, and efforts to manage the rest of agricultural products.

Thus, the sustainability of the use of corn cobs requires support from the community as the main actor. Students through KKN activities play the role of parties who provide knowledge and introduce alternative uses, while the sustainability of its implementation depends on the ability of the community to develop these activities in accordance with local conditions.

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Future Development Potential

The use of corn cobs as a medium for cultivating janggel mushrooms still has room for further development. Based on the results of KKN activities, the community has obtained information about one of the alternatives for the use of corn cobs. In order for these alternatives to develop into productive activities, advanced stages are needed that not only focus on the cultivation process, but also on yield management and marketing.

The development stage can start from the actual application of cultivation by the community. After the production process is running, the community can evaluate the amount of production, the quality of the harvest, the need for materials, the production cost, and the time required in the cultivation process. This data is important to find out whether cultivation activities can be carried out sustainably and provide economic value in accordance with the resources expended.

Further development can be directed to product quality and packaging. Cultivated products need to be managed properly so that they have an attraction for consumers. Packaging can also be part of efforts to increase the added value of products before they are marketed. In addition, the community needs to consider the market to be targeted so that the production carried out is in accordance with consumer needs.

The marketing aspect is also an important part of the development of activities. Budi Santosa et al. (2025) emphasized the importance of education and innovation in the sustainable management of local potential. In the context of this activity, if janggel mushroom cultivation is further developed, the community can take advantage of social networks and simple digital media to introduce products to a wider range of consumers.

Collective development of activities can also be an alternative. Communities can share roles in corn cob collection, cultivation process, maintenance, yield management, packaging, and marketing. Such a pattern of cooperation can help reduce the dependence of activities on one individual and allow the utilization of resources to be carried out together.

In addition, future development may involve assistance from other parties, such as universities, village governments, or parties who have competence in cultivation and marketing. Assistance is needed, especially because the KKN activities carried out are still in the introduction stage and do not yet include direct production by the community.

Thus, the potential for the development of the use of corn cobs does not only lie in the ability of the material to be used as a medium for cultivating janggel mushrooms, but also in the possibility of building a series of activities ranging from the provision of materials, production, yield management, to marketing. However, this potential still needs to be proven through follow-up activities that produce real production and economic data.

In the end, the sustainability of the program is highly dependent on the availability of raw materials, cultivation skills, the willingness of the community to apply knowledge,

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production management skills, and the existence of a market for harvest sharing. Therefore, the role of students in KKN activities is more appropriately positioned as a provider of knowledge and an initial catalyst, while long-term development lies with the community as the main actor.

DISCUSSION

The results of KKN activities show that the use of corn cobs as a medium for cultivating janggel mushrooms has the potential to be developed as an alternative to the use of local resources. Corn cobs, which previously tended to be seen as leftover agricultural products, were introduced to the community as materials that can be used in productive activities. These findings show that the development of local economic potential can be initiated through increasing knowledge and introduction to alternative resource utilization available in the community.

The use of corn cobs as a cultivation medium also shows an opportunity to increase the use value of agricultural materials that were previously underutilized. This finding is in line with Ahmed Al Ayubi et al. (2024) who discuss the use of corn cobs to produce mushrooms that have economic value. These results show that the rest of agricultural products can be directed into materials that have new functions and have the potential to provide added value. This is also in line with Fatimah et al. (2024) who explain that the use of waste into economic value can be part of community empowerment.

From the aspect of empowerment, socialization activities provide opportunities for the community to gain knowledge about alternative uses of corn cobs. The good response of the participants showed that the material presented was related to the environmental conditions of the community. The use of videos in the activity also provided a visual overview of the cultivation stages so that the community could understand the process introduced more concretely. This finding is in line with Nasution et al. (2023) who show that socialization of the use of agricultural waste can be a means to increase public awareness of the potential of resources in the surrounding environment.

However, the potential economic value found needs to be understood proportionately. KKN activities are still limited to the socialization and demonstration stages, so they cannot show an increase in community income directly. Data on the amount of production, crop yields, production costs, profits, and community income after the implementation of cultivation are not yet available. Therefore, the results of this activity are more accurate in showing economic development opportunities than proving an increase in community income. The cultivation of janggel mushrooms can only be considered to provide real economic benefits if it has been implemented, produces products, and provides measurable profits.

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The sustainability of the use of corn cobs also depends on the ability of the community to apply the knowledge that has been obtained. The availability of raw materials is one of the supporting factors, but it needs to be accompanied by cultivation skills, production management, packaging, and marketing. This is in line with Budi Santosa et al. (2025) who emphasize the importance of education and innovation in the sustainable management of local potential. Dewi et al. (2024) also show that the use of materials that were previously less valuable can be directed to increase economic value as part of sustainable economic development.

Based on the overall findings, KKN activities in Sarimatondang Village can be seen as the initial stage in introducing the use of corn cobs and building the community's knowledge base. The role of students in this activity is mainly as an informant and initial catalyst, while subsequent development requires the involvement of the community as the main actor. Follow-up activities in the form of cultivation practices, production measurement, cost and profit calculation, yield management, and marketing are needed to find out the extent to which the potential for the use of corn cobs can be realized into sustainable economic activities.

CONCLUSION

Based on the results of these activities, the use of corn cobs as a medium for cultivating janggel mushrooms is one of the alternatives to increase the use value of local resources while opening up economic development opportunities for the community. Corn cobs that were previously underutilized can be introduced as a material that has the potential to be used in cultivation activities and generate economic value if further developed.

The KKN program through socialization and demonstrations using videos has provided new knowledge to the community about the use of corn cobs which previously tended to be seen as leftover agricultural products. This activity is the first step in introducing alternative uses of local resources. However, the resulting economic benefits cannot be stated as an increase in community income because activities do not include direct production, crop yield measurement, cost and profit calculation, and product marketing.

The sustainability of the use of corn cobs requires the availability of raw materials, improving cultivation skills, managing production results, and developing packaging and marketing. The main limitation of this activity is the relatively short duration of KKN implementation so that the economic impact on people's income cannot be measured quantitatively. Therefore, further activities need to be directed to direct cultivation practices, production measurement, cost and profit analysis, and marketing development

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so that the economic potential of the use of corn cobs as a medium for cultivating janggel mushrooms can be known more realistically.

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