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Article

Agricultural Innovation and Halal Food Security Through Outreach Activities In Balai Balai Panjang

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Abstract

Balai Panjang Village, Lareh Sago Halaban Subdistrict, Limapuluh Kota Regency, possesses significant potential in the agricultural and socio-economic sectors; however, its utilization remains limited due to structural and managerial constraints, particularly regarding the village's economic institutions through the Jalur Gemilang Village-Owned Enterprise (BUMNag). This outreach program aims to enhance halal food security through community empowerment and the revitalization of the BUMNag. Activities were carried out through outreach, training in the processing of local agricultural products—such as banana nuggets and cookies—and guidance on agricultural innovations based on appropriate technology. The results of the activities demonstrate an increase in community knowledge regarding the diversification of local food products, the application of appropriate technology, and awareness of the importance of halal food security. Additionally, the community has become more capable of managing local products creatively and competitively. With the revitalization of the BUMNag, it is hoped that this institution can once again serve as a driving force for a self-reliant and sustainable village economy. These findings indicate that community empowerment through participatory approaches and appropriate technology can enhance local capacity in the development of a halal food-based economy.

INTRODUCTION

The agricultural sector is one of the main pillars of economic development in developing countries, including Indonesia, as it plays a vital role in food security, job creation, and supporting the economic resilience of rural communities. According to the FAO (Food and Agriculture Organization, 2022), more than 25% of the world's population relies on the agricultural sector for their livelihoods; however, the main challenges faced include low productivity, degradation of natural resources, and unequal access to modern agricultural technology. In Indonesia, the role of the agricultural sector is also highly significant, with its contribution to the national GDP reaching 12.4% in 2023 (BPS, 2024). Nevertheless, many rural areas still face classic challenges such as technological limitations, low human resource capacity, and weak local economic institutions. To address these issues, the government is promoting the strengthening of the village economy through the establishment of Village-Owned Enterprises (BUMDes) or Nagari-Owned Enterprises (BUMNag) as drivers of an economy based on local potential (Ministry of Villages, Development of Disadvantaged Regions, and Transmigration, 2023).

Balai Panjang Village, located in Lareh Sago Halaban Subdistrict, Limapuluh Kota Regency, West Sumatra Province, covers an area of 25.09 km² and has a population of 5,689. Most of the residents work in the agriculture and smallholder plantation sectors, particularly in rice, corn, and gambier cultivation. This area is known for its fertile soil and sufficient water availability, making it one of the region's potential agricultural hubs. However, this potential has not been fully realized due to various structural, technical, and managerial constraints. Based on interviews with village officials and BUMNag management, the community faces challenges such as limited business management capacity, a lack of agribusiness training, and low adoption of modern agricultural technologies like hydroponics and sensor-based automated irrigation. BUMNag Jalur Gemilang, established in 2019, is expected to serve as the driving force for the village's economy. However, to date, this BUMNag has not established any active business units and has stagnated because only about 30% of its board members are active, and it lacks an administrative system, financial reports, or an operational business plan. This situation highlights the need for systematic and targeted support so that BUMNag can function as an instrument for strengthening the village economy and empowering the community in a sustainable manner.

Previously, various community empowerment programs at the village level focused primarily on basic training or social activities, without incorporating business models or appropriate technology support. This outreach program initiative aims to bridge that gap by integrating the institutional strengthening of village-owned enterprises (BUMNag), the adoption of modern agricultural technology, and halal agribusiness training based on local potential. This approach represents a novelty in outreach activities because it is not only oriented toward increasing agricultural production but also toward building a halal and sustainable economic ecosystem at the village level. Additionally, this program combines academic and participatory approaches, where the community is actively involved in planning, implementation, and evaluation of activities, ensuring that the outcomes are more contextually relevant and have long-term utility.

This outreach program initiative aims to enhance the capacity of the Balai Panjang community in managing agricultural products and strengthening economic institutions through halal agribusiness training and the application of appropriate technologies in the agricultural sector. The urgency of this initiative stems from the pressing need to optimize local agricultural potential and revitalize the Jalur Gemilang Village-Owned Enterprise (BUMNag) so that it can serve as a driving force for the village's economy. Through the application of innovative agricultural technologies such as hydroponics and automated irrigation, it is hoped that agricultural productivity and efficiency will increase, while halal agribusiness training is expected to open new business opportunities and improve community welfare. Ultimately, this initiative is expected to create a Nagari Balai Panjang that is self-reliant, empowered, and prosperous economically, socially, and environmentally.

Balai Panjang Village, Lareh Sago Halaban Subdistrict, Limapuluh Kota Regency, is one of the areas with high agricultural potential in West Sumatra Province. Fertile soil and abundant water supplies make this village one of the region's potential food production hubs. According to data from the Limapuluh Kota Regency Central Statistics Agency (2023), the agricultural sector remains the backbone of the local economy, with over 70% of the population working as farmers and small-scale entrepreneurs in agriculture and plantations. However, this significant potential has not been fully realized due to institutional limitations, low human resource capacity, and limited adoption of modern agricultural technologies.

One of the economic institutions expected to drive the village's economic development is the Village-Owned Enterprise (BUMNag). In Balai Panjang Village, the Jalur Gemilang BUMNag was established in 2019 with the aim of stimulating the local economy through businesses based on local potential, such as agriculture, the trade of agricultural products, and food processing. However, field observations and interviews with the management indicate that this BUMNag has not been operating effectively. Approximately 30% of the management is active in routine activities, while the rest are inactive due to the lack of clear division of tasks, insufficient internal coordination, and the absence of a well-established administrative and financial reporting system.

Challenges are also evident in the areas of human resources and entrepreneurial capacity. Most community leaders and residents lack managerial skills, agribusiness knowledge, and an understanding of halal-based business management. The absence of ongoing training and mentoring has caused community economic activities to stagnate and fail to grow. Agricultural practices remain traditional and subsistence-oriented, with crops sold in their raw form without any post-harvest processing. This situation

results in low product value-added and dependence on middlemen who dictate the selling price of agricultural produce. Additionally, the limited use of appropriate technology poses a major challenge in improving the efficiency and productivity of the agricultural sector. Farmers in Nagari Balai Panjang still rely on manual irrigation systems and conventional methods for soil preparation. There has been no implementation of innovations such as hydroponic systems, sensor-based automatic irrigation, or the digitization of agricultural data that could help manage farming operations more efficiently. On the other hand, the potential for developing halal food products has also not been fully tapped. In fact, market demand for halal agricultural and processed products continues to rise at the national and global levels (Halal Industry Report, 2023).

Institutionally, BUMNag Jalur Gemilang faces challenges in building community trust and participation. Low community engagement, particularly among the younger generation, is slowing down the renewal of the agricultural workforce and innovation in village enterprises. This situation highlights an urgent need for comprehensive and targeted community empowerment programs that not only strengthen individual capacities but also build a self-reliant, innovative, and sustainable village economic system.

This outreach program initiative was launched to address these challenges by promoting the institutional strengthening of BUMNag, the adoption of innovative agricultural technologies, and the development of halal agribusiness based on local potential. Through a participatory approach and direct mentoring, it is hoped that the community of Nagari Balai Panjang can enhance their ability to manage the village's economic potential professionally and competitively.

EXPERIMENTAL SECTION

This outreach activity was implemented using a participatory approach, which involves the community as active participants in every stage of the activity. This approach aims to ensure that participants are not merely beneficiaries but also play a direct role in the learning process, the implementation of innovations, and the sustainability of the activity's outcomes.

The activity was carried out through the following main stages:

1. Activity Socialization Stage

This stage serves as the initial step to introduce the objectives, benefits, and implementation plan of the activity to the target community. The socialization was held in the Hall of the Balai Panjang Village Office, involving various community groups such as farmer groups, livestock groups, PKK cadres, village youth, and the management of BUMNag Balai Panjang. The socialization activities included:

- Presentation of the outreach program and its benefits for local economic development.
- An open discussion between the outreach team and participants regarding the potential for processing local agricultural products, particularly bananas.
- An assessment of the community's needs and readiness to participate in training and mentoring.

This phase aims to establish two-way communication, foster a sense of ownership toward the program, and ensure that the activities proceed in alignment with the local context and community needs.

2. Agricultural Product Processing Training Phase

The second phase consists of technical training on processing agricultural products into value-added processed goods, specifically banana nuggets and cookies. This activity is conducted in person using demonstration and hands-on practice methods.

The training series includes:

- Introduction to raw materials and product formulation: participants are introduced to the characteristics of bananas as a raw material, as well as the selection of safe and high-quality supporting ingredients.

- Processing demonstration: the outreach team demonstrates the steps for making banana nuggets and cookies, from ingredient preparation, processing, and packaging to storage.
- Hands-on practice: participants directly try the processing steps under the guidance of instructors.
- Discussion and evaluation of processed products: assessments of product texture, taste, and appearance are conducted as a shared learning experience.

Through this training, participants are expected to acquire basic skills in processing local agricultural products into innovative, nutritious, and economically valuable food products.

3. Mentoring Phase for the Implementation of Halal Agricultural Innovations and Appropriate Technologies

Following the training, the outreach team provided intensive mentoring to ensure that the skills acquired could be applied sustainably at both the household and business group levels. The mentoring focused on two main aspects:

Implementation of halal agricultural innovations, including:

- Understanding the principles and standards of the Halal Product Assurance System (SJPH) in food processing.
- Mentoring on the implementation of Good Manufacturing Practices (GMP) and sanitation in food production.
- Guidance on preparing simple documentation related to halal production for micro-enterprises.

The application of appropriate technology in this outreach initiative focuses on efforts to improve community efficiency and self-reliance through the use of simple tools that are easy to operate and suited to local conditions. The technology implemented emphasizes not only functionality but also ease of adaptation by users, ensuring sustainable use. Additionally, training on hygienic and visually appealing product packaging was conducted to enhance market value and competitiveness. To expand marketing reach, participants received guidance on implementing simple digital marketing strategies through the use of social media and local online platforms. This mentoring activity is carried out continuously through field visits, online communication, and evaluation of the results of the implemented innovations, with the aim of fostering the independence and sustainability of the target community's businesses.

IMPLEMENTATION OF ACTIVITIES

The entire series of activities will be held in the Hall of the Balai Panjang Village Office, Halaban Subdistrict, Lima Puluh Kota Regency, from August to October 2025. Participants in the activities include farmer groups, members of the village PKK, village youth, and the management of the Balai Panjang Village-Owned Enterprise (BUMNag).

Through collaboration between the outreach team and the community, this initiative is expected to have a tangible impact on improving the well-being of the village community. This collaboration aims to increase the value of local agricultural products through more innovative and economically valuable processing methods. Additionally, this initiative is expected to foster new entrepreneurship centered on processed banana products, thereby creating job opportunities and strengthening the community's economic self-reliance. Furthermore, the program supports the realization of a food-self-sufficient village and the development of a creative economy based on halal agriculture, serving as a strategic step toward building food security while reinforcing a competitive local identity.

RESULT AND DISCUSSION

This outreach activity demonstrates that the implementation of a participatory approach through outreach and training can enhance the community's capacity to optimize local agriculture-based potential. Based on the results of the activity, the community showed a positive response to the importance of strengthening the village economy through the processing of agricultural products, particularly bananas, which are abundantly available in the area. This aligns with the findings of Rahmawati et al., (2025), This

training program, which is based on local potential, aims to boost the creative economy of rural communities by maximizing the value of local products and expanding business opportunities in rural areas.

The agricultural product processing training, focused on making banana nuggets and banana cookies, provided participants with new skills, particularly for housewives who previously lacked technical knowledge in food processing. These processed products were developed using appropriate technology models, namely the use of simple equipment such as blenders, ovens, baking trays, and hygienic packaging tools that are easy to operate and efficient for household-scale production. The use of simple tools based on the principles of efficiency and ease of operation represents an effective form of technological innovation for enhancing the productivity of rural households and SMEs.



Figure 1. Making banana cookies and banana nuggets

From a socio-cultural perspective, this initiative has also successfully fostered motivation and collaboration among farmer groups. The mentoring process fosters social interactions that strengthen the community's social capital within the context of local socio-economic development. According to Sulastris et al. (2022), collaboration between local communities and intensive mentoring can enhance a sense of ownership regarding innovation outcomes and promote program sustainability. The direct impact of this activity is evident in the increased community awareness of the importance of product diversification, food security based on halal principles, and initiatives to reactivate BUMNag Jalur Gemilang as a platform for managing collective enterprises in the village.

In terms of strengths, this banana processing model is considered suitable for the community's conditions as it utilizes local materials, simple tools, and is easily replicable without requiring significant capital. The resulting products also hold strong market potential as they align with the trend of local fruit-based snacks. However, its weaknesses lie in limited access to production-scale equipment and a lack of advanced knowledge regarding business management and digital marketing.



Figure 2. Women's Group in the Village of Balai Panjang

The level of difficulty in implementing the activities was relatively low, particularly during the training and mentoring phases, as participant enthusiasm was quite high and support from village officials was excellent. The main challenges were encountered primarily during the sustainable production phase and in strengthening local economic institutions. Nevertheless, the potential for expanding these activities is significant, given the abundance of raw materials, strong community support, and the growing market demand for locally processed products.

Table 1. Specifications of Equipment Used in Banana Processing Training

No.	Type of Equipment	Main Specifications	Usage Description
1	Household blender	300 W power, 1.5 L capacity	For blending banana dough and other ingredients
2	Mini electric oven	800 W, 20-liter capacity	Baking banana cookies
3	Aluminum baking pan	20x20 cm	Mold for banana cookie/nugget dough
4	Plastic packaging machine	Manual sealer system	Hygienic product packaging

CONCLUSION

This outreach initiative has successfully achieved its planned objectives through the implementation of a participatory approach involving outreach and training in the processing of agricultural products based on local potential. The methods applied have proven to align with community needs in enhancing technical skills and adding value to banana commodities by transforming them into processed products such as banana nuggets and banana cookies. The implementation of simple, efficient, and user-friendly appropriate technologies has driven increased household productivity as well as new entrepreneurial opportunities at the village level. Socially, this initiative strengthens collaboration among farmer groups, fosters entrepreneurial motivation, and raises awareness regarding product diversification and halal-based food security. Tangible impacts are also evident in the emergence of community initiatives to reactivate BUMNag Jalur Gemilang as a collective economic platform. Although challenges remain regarding production-scale equipment and digital marketing, this initiative provides significant benefits for strengthening the local economy. To ensure the program's sustainability, it is recommended that future activities focus on ongoing business management mentoring, marketing network development, and enhancing the institutional capacity of the village's economic structures.

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