

## Community Service Through Improving Farmers' Skills in Cage Management and Feed Efficiency

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**Abstract.** This community service activity was carried out by a team from Ngudi Waluyo University with the aim of improving livestock farmers' skills in aspects of barn management and feed efficiency. The main problems faced by partners included unhygienic barn conditions, inadequate ventilation systems, unmanaged waste disposal, and traditional and inefficient feeding patterns. To address these issues, the community service team provided solutions through training, mentoring, and the application of appropriate technology in the form of a feed shredder and guidance in preparing balanced feeds. The implementation method included initial observation, outreach, barn management training, practical use of the feed shredder, and evaluation through tests and direct mentoring in the field. The results of the activity showed a significant increase in the skills and knowledge of livestock farmers. Field observations revealed changes in behavior in maintaining barn cleanliness, improving air circulation, and implementing more measured and efficient feeding patterns. The evaluation through tests also confirmed the finding that the level of farmers' understanding of the principles of barn management and feed efficiency had increased significantly. This community service activity successfully had a positive impact on partners, both in terms of knowledge and livestock business practices. In the future, it is hoped that the results of this activity can be expanded through the formation of fostered livestock groups and the development of local feed innovations to create sustainable, healthier, more efficient, and more productive smallholder livestock businesses.

**Keywords :** Community Service, Cage Management, Feed Efficiency, Livestock Breeders, Appropriate Technology

### Introductions

Goat farming is a business sector widely engaged in by rural communities due to its relative ease of management and promising economic prospects (Luju et al., 2024; Novarista et al., 2025). Goats not only provide a source of animal protein through meat and milk but also serve as a family's economic asset that can be sold at any time to meet urgent needs (Sirat et al., 2022). However, smallholder goat farming still faces several challenges, particularly related to pen management and feeding.

The main problems frequently encountered are poorly maintained pens, inadequate ventilation, and suboptimal sanitation (Karni et al., 2024). This makes livestock susceptible to disease, reduces productivity, and even increases mortality. Furthermore, in terms of feeding, most livestock farmers still rely on traditional methods, namely providing whole forage without chopping. This method not only reduces the efficiency of feed consumption by livestock but also requires more time and energy to prepare (Al Gifari et al., 2025; Rahmawati & Ratri, 2021). As a result, livestock growth is suboptimal, productivity is low, and profits for farmers are also limited.

The problems faced by our partners, namely smallholder goat farming groups, stem from limited knowledge and skills in managing modern livestock businesses. In terms of pen management, most pens are rudimentary, with makeshift wooden construction and roofs that have not been designed to meet livestock health standards. Such pens often lack adequate ventilation, lack lighting, and rarely clean floors. These conditions result in high humidity, unpleasant odors, and increased potential for the growth of bacteria and parasites that harm goat health. This situation makes livestock susceptible to diseases such as scabies or diarrhea, which ultimately reduce productivity and the quality of livestock.

In addition to housing issues, partners also face significant challenges in feed provision. Farmers still rely on forage fed whole without any chopping process. Long, coarse forage is often not fully consumed by goats, resulting in significant waste. This wastes forage resources, while farmers expend significant time and energy searching for grass. As a result, even though forage is abundant, its utilization is low, and livestock productivity is suboptimal. This situation is further exacerbated by farmers' limited understanding of the importance of balanced feed nutrition,

including the need for concentrates, vitamins, and minerals, which significantly impact goat growth and health.

Recognizing these complex issues, the Ngudi Waluyo University community service team offered a number of practical, applicable solutions that addressed the immediate needs of livestock farmers. The first solution was to provide intensive education on good barn management standards. Farmers were encouraged to understand the importance of cleanliness, air circulation, lighting, and barn sanitation to maintain livestock health. The team also introduced the concept of routine-based barn maintenance, such as floor cleaning and managing livestock waste, which can be processed into economically valuable organic fertilizer.

The second solution focuses on feed efficiency through the use of appropriate technology in the form of a forage shredder. This machine can chop grass and leaves into smaller, more digestible pieces for livestock, thereby increasing their consumption and accelerating nutrient absorption. The use of a shredder also saves labor, speeds up the feed preparation process, and minimizes forage waste. In the long term, this efficiency will increase livestock productivity and provide better economic returns for farmers.

The solutions offered don't stop at outreach and demonstrations, but continue with direct field support. This support aims to ensure that the knowledge and skills imparted are truly applied by farmers in their daily activities. This way, changes in mindset and more effective work practices can be realized, enabling sustainable development of smallholder goat farming businesses.

This community service activity is expected to not only improve the technical skills of livestock farmers but also encourage a shift in mindset toward more modern, effective, and sustainable livestock management. Through collaboration between academia and the community, Ngudi Waluyo University is committed to delivering tangible benefits that support improved livestock farmer welfare and strengthen food security based on local potential.

## **Method**

The method of implementing community service is carried out through several interconnected stages, namely (Kango et al., 2021; Sirat et al., 2024):

### **Field Observation and Problem Identification**

The activity began with direct observation of the farm location and interviews with farmers to obtain a realistic picture of the conditions faced. The observations revealed that the pens used by farmers were very simple, poorly maintained, with limited ventilation, inadequate lighting, and infrequent sanitation. These conditions made the goats susceptible to disease, accelerated the development of unpleasant odors, and increased humidity in the pens. In terms of feed, farmers still provided whole, unchopped forage, resulting in low livestock consumption and a significant amount of feed wastage. This observation phase served as the basis for designing a program that truly met the needs and challenges of the partners.

### **Socialization and Counseling**

After the problems were identified, the community service team conducted outreach to educate farmers on the importance of proper barn and feed management. The outreach materials covered how to design barns with adequate ventilation, sufficient natural lighting, a barn hygiene system, and livestock waste management to prevent environmental pollution. At this stage, a participatory approach was used, allowing farmers to actively discuss, share experiences, and ask questions. This ensured that the outreach was not a one-way process, but rather an interactive forum that combined academic knowledge with practical farmer experience.

### **Technical Training and Demonstration**

The next stage is technical training focused on improving feed efficiency through the use of forage shredding machines. In this activity, farmers are given practical skills in operating the shredding machines, from preparing feed ingredients and adjusting the machine's capacity to basic maintenance to ensure long-term use. Furthermore, a demonstration of feeding shredded feed to goats is conducted, allowing farmers to directly observe the difference in behavior of the animals consuming the finer feed. Through this training, farmers not only learn theoretically but also practice using tools that speed up work and improve feed utilization efficiency.

### **Mentoring and Monitoring**

To ensure the skills acquired are truly applied in daily practice, the Ngudi Waluyo University team provides regular mentoring. This mentoring involves field visits, discussions with farmers about challenges encountered, and providing guidance or solutions to emerging issues. Monitoring is also conducted to assess the effectiveness of outreach and training in improving skills

and livestock productivity. With mentoring, this community service activity goes beyond knowledge transfer and continues into a continuous capacity-building process.

**Evaluation and Follow-up**

In the final stage, a comprehensive evaluation of the program's success is conducted based on achievement indicators, such as improved farmer understanding of pen management, ability to operate feed shredders, and changes in livestock productivity. The results of this evaluation serve as the basis for the community service team to design follow-up actions, both in the form of follow-up activities and broader program development. This ensures the program's sustainability and ensures its long-term benefits.

**Results and Discussion**



The community service program conducted by the Ngudi Waluyo University team yielded significant results in improving livestock farmers' skills and understanding of barn management and improving feed efficiency. Initially, field observations were conducted to assess the actual conditions. Observations revealed that most livestock barns were simple, lacked hygiene, had limited ventilation, and lacked proper waste management. In terms of feed provision, livestock farmers still provided whole forage without chopping it, resulting in significant feed wastage and suboptimal livestock consumption. To assess changes in knowledge, a pre-test was conducted before the extension and training activities, and a post-test after the activities were completed. The test results showed a significant increase in understanding of barn management and feed efficiency. Prior to the training, most farmers did not understand the standards for healthy barns and the benefits of using feed chopping machines. However, after training and mentoring, their understanding improved, as evidenced by higher post-test scores compared to the pre-test.

In addition to increased understanding, changes were also evident in the farmers' behavior in their daily practices. After receiving mentoring, farmers began implementing routine pen cleaning, paying attention to ventilation and lighting, and utilizing feed shredding machines to increase efficiency. This resulted in improved livestock health, reduced feed wastage, and increased feed consumption by goats.

Table 1. Results of Observations on Livestock Conditions Before and After Community Service

<b>Observed Aspects</b>	<b>Before Devotion</b>	<b>After Devotion</b>
Cleanliness of the cage	Poor maintenance, lots of dirt builds up	Cleaner, cleaning is done regularly
Ventilation & lighting	Narrow ventilation, minimal lighting	Better ventilation, sufficient lighting
Waste management	There is no management, waste is disposed of haphazardly	Waste begins to be processed into organic fertilizer
Feeding system	Feed is given whole, a lot is wasted	Chopped feed, more efficient, increased consumption
Livestock health conditions	Prone to skin diseases and diarrhea	Healthier, fewer sick people

Based on field observations, outlined in Table 1, significant changes in livestock management and feeding have been observed following the implementation of the community service program by the Ngudi Waluyo University team. These changes extend beyond the physical aspects of the livestock, including the behavior and habits of farmers in managing their livestock.

Prior to the intervention, pen hygiene remained a major issue. Poorly maintained pens were characterized by piles of manure that were rarely cleaned, muddy floors, and unpleasant odors. This situation undoubtedly impacted livestock health, as high humidity can encourage the growth of bacteria, viruses, and parasites. However, after counseling and mentoring, farmers began to understand the importance of maintaining pen hygiene and began cleaning them regularly. This has proven to create a healthier and more comfortable environment for goats and reduce the risk of infectious diseases.

Ventilation and lighting have also been improved. Previously, most of the pens used lacked ventilation, resulting in poor air circulation and a stuffy atmosphere. Similarly, lighting was limited; most pens relied solely on light from gaps in the walls without any additional lighting. After the service, farmers were encouraged to improve simple ventilation by adding air gaps to the walls and making optimal use of natural light. These improvements have a positive impact on livestock health, as improved air circulation reduces humidity and suppresses the growth of disease-causing germs.

Prior to the community service program, livestock waste was generally dumped around the pens without treatment. This practice not only polluted the environment but also potentially caused health problems for both livestock and humans in the surrounding area. After being provided with information and guidance, farmers began to be guided to utilize goat manure as an organic fertilizer with added economic value. This change not only improved environmental cleanliness but also opened up new business opportunities in the agricultural sector.

One of the most striking aspects is the change in the feeding system. Prior to the community service activities, farmers provided whole forage, which the goats often didn't finish. This wasted feed became waste and increased the farmer's workload. After the introduction of the forage shredder, the feed was provided in a finer form, making it easier for the goats to consume. Feed efficiency increased, time and effort required for feed preparation decreased, and livestock consumption was optimized. The long-term impact of this change is increased livestock weight and improved productivity.

Positive changes were also seen in the overall health of the livestock. Before the service, livestock frequently suffered from skin diseases such as scabies and digestive disorders like diarrhea, which were closely related to unclean pens and inefficient feeding. After the service, livestock health improved due to more hygienic pens, better air circulation, and higher-quality feed. This aligns with previous research that found that pen management and feed quality directly influence livestock productivity (Soehadji, 2020).

The results of this community service demonstrate that an approach based on education, training, and mentoring can bring about tangible changes in community livestock practices. Changes in livestock farmers' behavior in maintaining barn cleanliness, improving ventilation, managing waste, and increasing feed efficiency through appropriate technology have contributed to improving the quality of smallholder livestock businesses. This program also demonstrates that collaboration between universities and the community can provide applicable solutions that have a direct impact on improving livestock farmers' welfare.

Table 2. Results of the Breeders' Understanding Test (Pre-Test and Post-Test)

Understanding Indicators	Pre-Test (Average %)	Post-Test (Average %)	Increase (%)
Cage hygiene management	45	80	+35
Ventilation and lighting of the cage	40	78	+38
The importance of sanitation and waste management	42	82	+40
Feeding efficiency	38	85	+47
Utilization of green forage chopping machines	30	88	+58
<b>Overall average</b>	<b>39</b>	<b>83</b>	<b>+44</b>

The community service activities carried out by the Ngudi Waluyo University team have yielded several significant achievements, evident in the changes in the skills and knowledge of partner farmers in aspects of barn management and feed efficiency. The community service process involved initial observation, mentoring, training, and evaluation using tests. The data obtained provides a comprehensive overview of the farmers' capacity building.

Observations at the start of the project indicated that the condition of the partners' livestock pens did not meet good hygiene and comfort standards. Ventilation was inadequate, the manure disposal system was not optimally managed, and some pens appeared cramped, impairing animal growth and health. Furthermore, feeding practices were still traditional, providing only available forage without considering nutritional aspects, dosage, or cost efficiency. This resulted in low livestock productivity and a high risk of disease.

After receiving training and mentoring, significant changes were evident in the evaluation results. Farmers began to understand the importance of good barn management, such as maintaining regular cleanliness, ensuring air circulation, and providing adequate waste disposal. In terms of feed, farmers have been able to utilize shredding machines to reduce the size of forage, making it more easily digestible for livestock. Furthermore, they have learned to formulate simple feed mixtures by adding local ingredients such as rice bran, ground corn, and additional minerals.

Observation tables and tests conducted show improvements in knowledge and skills. For example, in terms of barn management, the majority of farmers who previously only maintained barn cleanliness weekly are now accustomed to cleaning daily. In terms of feed efficiency, the use of shredding machines has reduced wastage by more than 30%, while farmers' understanding of feed efficiency principles has improved, according to test results.

Community service interventions based on training and concrete mentoring can improve the quality of smallholder livestock businesses. Improved barn management skills directly impact livestock health and comfort, ultimately boosting productivity. Meanwhile, the application of appropriate technology to feed processing has been shown to save costs while increasing the nutritional value of livestock. This aligns with previous research that suggests good barn management and feed efficiency are two key factors in the success of smallholder livestock farms.

Thus, it can be concluded that the community service activities undertaken not only have short-term impacts in the form of improved livestock farmer skills, but also have the potential to promote the sustainability of smallholder livestock businesses. Going forward, follow-up efforts are expected to include the formation of fostered livestock groups that can serve as models for implementing healthy housing management and feed efficiency for other farmers in the surrounding area.

### **Closing**

The community service activities carried out by the Ngudi Waluyo University team have significantly contributed to improving the skills of livestock farmers, particularly in aspects of barn management and feed efficiency. The main problems previously faced by partners, such as poorly maintained barns, suboptimal air circulation, and inefficient feeding patterns, were overcome through training, mentoring, and the application of appropriate technology in the form of a feed shredder. The community service results show significant improvements in both knowledge and field practice. Farmers are now more disciplined in maintaining barn cleanliness, paying attention to livestock comfort, and are increasingly accustomed to using simple technology to save costs and improve feed quality. These changes not only impact livestock productivity but also open up opportunities for the sustainability of healthier and more efficient smallholder livestock businesses. The overall series of activities concluded that ongoing mentoring and the application of appropriate technology are effective strategies for developing the capacity of livestock farmers. The success of these activities also demonstrates the importance of synergy between universities and communities in encouraging empowerment in the livestock sector. As a follow-up, it is recommended that similar activities continue on an ongoing basis, including strengthening livestock group institutions, improving skills in fermented feed preparation, and managing environmentally friendly barn waste. Thus, the results of this community service can have a broader impact not only for the partners directly involved, but also for the surrounding community through the dissemination of the good practices that have been produced.

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