



Building Resilient Rural Livestock Systems: Capacity Enhancement and Sustainable Growth in Karang Tungal, East Kalimantan

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Abstract: The community service program implemented in Karang Tungal Village, Tenggara Seberang District, Kutai Kartanegara Regency, East Kalimantan, aims to strengthen breeders' capacity and support sustainable livestock development with the concept of assisted villages. Through a participatory and collaborative approach, this program involved ten livestock groups and twelve representatives from village officials, GAPoktan, field extension officers, sub-district officials, and the Agriculture and Livestock Service of Kutai Kartanegara district, with a total of 72 participants. The main activities include identifying needs, training, workshops, and discussions regarding sustainable livestock practices. The main focus of this program is the development of livestock areas, feed management, optimization of livestock production and reproduction, application of appropriate technology, and strategies to increase the competitiveness of livestock products. The results of this program show significant improvements in farmers' technical skills, feed stability through planting superior grasses and reduced dependence on commercial feeds. This program increases livestock productivity and income and encourages more sustainable and competitive livestock practices. These findings make Karang Tungal Village a potential model for sustainable livestock development in East Kalimantan.

1. INTRODUCTION

Karang Tungal Village is one of the villages in Tenggara Seberang District, Kutai Kartanegara Regency, East Kalimantan Province. Karang Tungal Village is a village that has great potential in the agricultural and livestock sectors. With fertile land and abundant natural resources, the opportunity to develop the agricultural sector and livestock subsector is still very open (Paggasa & Abdillah, 2022). Most residents in Karang Tungal Village depend on the agricultural and livestock sectors for their livelihoods, including the beef cattle and beef goat farming business. This livestock business is one of the economic supports that fully contributes to people's lives. The high demand shows the excellent market potential for beef and goat meat, which local breeders still need to fulfill, making livestock businesses in this area trendy among the

residents of Karang Tunggal Village (Susanto & Prasetyo, 2017). However, behind the potential, various challenges hamper the growth and sustainability of the livestock sub-sector.

One of the challenges residents in Karang Tunggal Village face is the limited knowledge and skills required to implement livestock businesses, especially in modern technology. Many breeders still use traditional methods of raising livestock; for example, there is a need for knowledge in feed management and livestock reproduction, resulting in low livestock productivity (Mashur et al., 2021). Apart from that, there is competitiveness in livestock products, which must be mastered by the residents of Karang Tunggal Village in order to reach a broader market. Apart from limitations in skills and mastery of technology, environmental sustainability is another challenge that needs to be faced. Farming businesses that are not environmentally friendly can cause land degradation, water pollution, and biodiversity loss (Priyanto et al., 2022). Efforts are needed to overcome existing challenges, one of which is by having a comprehensive and targeted service program. This service program focuses on strengthening breeders' capacity in Karang Tunggal Village through training, mentoring, and applying appropriate technology. This empowerment program prioritizes the principle of sustainable development, which is carried out not only to increase short-term livestock productivity but also to preserve natural resources and improve the community's quality of life in the long term (Prihanta et al., 2019). Through efforts to integrate sustainable livestock business practices, it is hoped that Karang Tunggal Village can become a model or example for other villages in East Kalimantan in building a challenging and sustainable livestock sub-sector.

Collaborative program efforts between local government, academics, and local livestock communities are expected to create a livestock community that can have independent and sustainable businesses. Another hope of this service program is to create economic independence for village communities and increase social welfare in Karang Tunggal Village.

2. METHOD

This service was carried out in Karang Tunggal Village, Tenggarong Seberang District, East Kalimantan, with a participatory and collaborative approach involving ten livestock groups and twelve representatives from village officials, Gapoktan, field extension officers, sub-district officials, and the Agriculture and Livestock Service of Kutai Kartanegara district, with a total of Participants reached 72 people. The service stage begins with identifying needs and potential

through field observations and resident discussions. This stage aims to discover the actual conditions of livestock farming in the village and the challenges breeders face (Ahmad & Sulistyowati, 2021). The next stage is training and mentoring, according to the problems that have been identified. At this stage, the aim is to strengthen residents' skills in animal husbandry, such as animal feed management, application of appropriate technology, and other practices. This training is delivered using a participatory method, where residents are encouraged to share experiences and contribute actively to the learning process (Mashur et al., 2021). Besides training, workshops and group discussions are also held to explore specific topics, such as marketing livestock products and sustainable management of natural resources. This activity provides a space for residents to explore solutions and strategies that can be implemented in their local context. The final stage is evaluation and follow-up, which assesses the activity's success and its impact on increasing the capacity of Karang Tunggal village residents.

3. RESULTS AND DISCUSSION

Training activities and FGD (Focus Group Discussion)

The training activities carried out in Karang Tunggal Village are the main activities of the service program being implemented. This training involved ten farmer groups consisting of the Surya Mandiri, Sido Mulyo, Sido Mukti, Rawa Makmur, Sumber Rejeki, Sinar Pagi, Dewi Sri, Suka Sari, Suka Jadi and Suka Maju farmer groups. Apart from that, it was also attended by 11 representatives of village officials and agricultural services, including 1) Representatives of PPS Karang Tunggal, 2) Representative of PPL Karang Tunggal, 3) Representative of BPP Kec. Tenggarong Seberang, 4) Chairman of BPD, 5) Head of Rejo Makmur Hamlet, 6) Head of Karang Tunggal Village, 7) Representative of District Animal Husbandry Service Staff. Kutai Kartanegara, 8) Representatives from Tenggarong Seberang Subdistrict, 9) Chair of (Karang Tunggal Village Gapoktan, 10) Members of the Etam Bestari Group, which consists of 22 people, 11) 2 Karang Tunggal Cattle Breeders.

In this training, the material presented includes:

1) Development of livestock areas, where the public is directed to understand the concepts and practices related to developing effective and sustainable livestock areas in this material. The discussions included optimal land use and integration of livestock activities with agriculture to create a more efficient production system. Farmers are introduced to various land management

techniques, such as pasture rotation, which aims to maintain soil fertility and ensure the land's long-term productivity (Susanto & Prasetyo, 2017). Land intensification was also discussed to help breeders get maximum results from available land by using efficient inputs. Integrating livestock and agricultural activities is the main focus in creating a more efficient and sustainable production system. Livestock waste, such as cow dung, can be used as organic fertilizer for plants, while agricultural waste, such as straw, can be processed into cheap and high-quality animal feed (Priyanto et al, 2022). This strategy not only increases productivity but also helps in managing resources more sustainably.

2) Feed management: This material discusses the availability of quality animal feed throughout the year. In this session, the livestock farming community was introduced to various feed management techniques, such as processing fermented feed, adequate feed storage, and the use and utilization of local ingredients that are cheap but highly nutritious (Setiawan et al., 2023). One of the techniques introduced is fermented feed processing. This technique allows farmers to preserve feed efficiently to remain available even during the dry season or when feed prices soar (Paggasa & Abdillah, 2022). The training material also includes effective feed storage methods to prevent damage and ensure feed quality is maintained (Muhtarom et al. 2023). Using cheap but highly nutritious local ingredients is also an essential part of the feed management taught in this training. Farmers are encouraged to utilize the resources around them, such as agricultural waste and wild plants, which can be processed into quality feed without incurring high costs (Suyatna et al., 2018). This feed management capability is essential to increase feed efficiency and reduce feed costs, thereby increasing livestock productivity.

3) Optimizing livestock production and reproduction. This material focuses on key elements or factors that determine the success of livestock businesses, including selecting superior seeds, livestock health management, and reproductive management (Nusu et al., 2023). Selecting superior seeds is an essential first step because high-quality seeds can increase livestock productivity significantly (Aku et al., 2020). This training discusses Livestock health management in depth, including disease prevention measures, vaccination, and appropriate treatment (Sukoco et al., 2023). Disease prevention through vaccination and appropriate treatment is crucial to maintaining livestock health and minimizing losses (Setiawan & Marwanto, 2017). Reproduction management is also a primary focus, with the aim that breeders can optimize the number and quality of offspring produced. With good reproductive management, the production cycle can run

smoothly and efficiently (Rahayu et al., 2019). Apart from that, this material also emphasizes the importance of recording and evaluating at each production stage. Accurate data allows farmers to make better decisions, such as when to sell livestock or how to organize feeding to achieve maximum efficiency (Junaidi & Purnomo, 2019). This data-based approach is expected to increase the success of livestock businesses, reduce risks, and strengthen the competitiveness of livestock products in an increasingly competitive market.

4) Appropriate technology. Material regarding appropriate technology benefits the livestock community in today's modern and digital era. In this session, breeders were introduced to various technological innovations relevant to the surrounding conditions and livestock tools that can help increase work efficiency and production results (Pratiwi et al., 2019). The appropriate technology in question includes feed-chopping machines, which can speed up providing animal feed (Jasman & Purwantono, 2022). This machine helps simplify feed processing and ensures feed is available consistently. In addition, automatic irrigation systems were introduced to optimize water use in pastures so that livestock can operate more efficiently and sustainably (Nursyamsi et al, 2014). Farmers are also taught how to use digital applications for livestock management. This application is helpful in various aspects, from recording livestock health data and feeding management to regulating reproduction (Setiawan et al., 2023). By utilizing this appropriate technology, farmers are expected to be able to optimize existing resources, reduce the risk of human error, and make smarter decisions based on available data (Sukoco et al., 2023). Applying this technology allows farmers to adapt to market changes and increase consumer demands, thereby increasing the competitiveness of their livestock products in the broader market.

5) Competitiveness strategies for livestock products materials are needed regarding competitive strategies for livestock products, significantly to help livestock farming communities face increasingly tight market competition (Nusu et al., 2023). In this session, breeders are provided with knowledge about various strategies to increase the competitiveness of their products. One crucial aspect discussed is branding. Breeders are instructed on building and managing their product brands to be better known and appreciated in the market (Kurniawan & Prasetyo, 2020). Effective branding helps livestock products stand out among competitors and builds customer loyalty. Improving product quality is also emphasized as the main selling point. Sound quality will differentiate their livestock products from competitors' products and be essential in attracting consumer attention (Karsono et al., 2021). The training material also includes using social media

and other digital platforms to expand marketing reach. Farmers are taught to use social media for promotions, consumer interaction, and building loyal communities. Digital platforms enable more effective marketing and wider reach (Nurtanti et al., 2023). Apart from that, product certification is also an essential focus in training. Certification can increase consumer confidence by ensuring that products meet specific quality standards, which can increase the product's reputation and competitiveness in the market (Priambodo, 2024). Through implementing these strategies, it is hoped that breeders can increase the competitiveness of their products, expand markets, and gain a stronger position in the livestock industry. The following is documentation of the results of training activities and discussions with the livestock community.



Figure 1. Delivery of material by the speaker



Figure 2. Discussion with the livestock community



Figure 3. Question and answer session with the livestock community

Joint grass planting activities for animal feed

Planting superior grass (forage) in Karang Tunggal Village is a strategic step to increase the availability of quality animal feed for local breeders. Through this activity, farmers are invited to be more independent in providing feed, which has been one of the main obstacles in their livestock business. Reliance on commercial feed increases production costs and often creates uncertainty because the feed is only sometimes available consistently, especially in certain seasons. Planting superior grasses, such as odor grass and brachiaria, is carried out collaboratively by farmer groups' members under agronomists' guidance. These experts guide selecting the type of grass that best suits local soil and climate conditions and effective planting techniques to ensure optimal growth (Suwandi et al., 2020). This collaboration strengthens farmers' technical skills in forage cultivation livestock and builds solidarity between breeders in overcoming common problems.

Initial results from this activity are auspicious, with grass plants showing good growth, and it is estimated that they can be harvested shortly. This success gives new hope to breeders because they are no longer utterly dependent on expensive and uncertain commercial feed. In the long term, planting superior grass is expected to be a sustainable solution to meet animal feed needs and open up opportunities for breeders to develop independent feed cultivation businesses (Suriadikarta, 2012). Apart from the direct impact of more stable feed availability, planting grass also has the

potential to increase food security and the farmer's economy. With quality and cheap feed availability, livestock productivity can be increased, ultimately increasing farmer income.

Furthermore, this activity encourages livestock farmers to adopt more sustainable livestock practices, which benefit them economically and maintain the ecological balance in their region. The initial success of this activity is up-and-coming. Grass plants are showing good growth and are expected to be ready for harvest soon. With this quality feed, farmers in Karang Tunggul Village no longer have to rely entirely on commercial feed, which is often unavailable and expensive. Reducing dependence on commercial feed reduces production costs and provides certainty of feed availability, which is very important for maintaining livestock productivity and livestock business stability. Apart from direct economic benefits, such as reducing feed costs and increasing income, planting this superior grass also has a long-term positive impact on food security in the village.

More than just a practical solution, this program encourages farmers to adopt more sustainable farming practices. By reducing dependence on non-renewable feed and increasing the use of cheap but highly nutritious local ingredients, farmers are switching to more environmentally friendly and economical methods. Thus, planting grass for animal feed is an integral part of the strategy for developing robust and sustainable livestock in Karang Tunggul Village. This activity not only provides a short-term solution to feed problems but also paves the way for improving the welfare of farmers and environmental sustainability in the long term. The success of this activity can become a model for other villages that face similar challenges in the livestock sector. The joint grass planting activity can be seen in the following picture.



Figure 4. Activities for planting green fodder together

4. CONCLUSION

The conclusion of the service program in Karang Tunggal Village shows positive and significant results in increasing the capacity of breeders and the sustainability of livestock businesses in the area. The programs involving training, mentoring, and applying appropriate technology have succeeded in strengthening livestock farmers' skills in various important aspects, including feed management, natural resource management, and livestock product competitiveness strategies. The training provided includes modern techniques in feed management, the use of appropriate technology, and effective marketing strategies, which directly impact the productivity and competitiveness of livestock products. In addition, planting superior grass as animal feed shows promising results with good growth, reducing dependence on commercial feed and providing more stable quality feed. This helps farmers reduce production costs, increase income, and encourage more sustainable farming practices. Overall, this program provides practical solutions to feed problems, builds solidarity between farmers, and encourages adopting environmentally friendly practices that support food security and long-term economic prosperity in Karang Tunggal Village. This success makes Karang Tunggal Village a potential model for sustainable livestock development in the East Kalimantan Province region.

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