



## Community-Based Livestock Management: A Participatory Approach to Waste and Product Optimization in Karang Tunggal, Kutai Kartanegara

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### Abstract

Karang Tunggal Village, located in Kutai Kartanegara Regency, has excellent potential in the livestock sector, especially in producing livestock products such as meat and milk. However, managing livestock products and waste still faces various obstacles, including a lack of awareness among farmers regarding efficient and sustainable management practices. This research aims to analyze the application of a participatory approach in education on managing livestock products and waste by directly involving the livestock community. This approach allows farmers to actively participate in every process stage, from problem identification to implementing solutions based on local needs. The data in this research was obtained through in-depth interviews, field observations, and focus group discussions (FGD) involving local breeders and related stakeholders. The research results show increased quality of livestock products, especially regarding cleanliness, food safety, and selling value. Apart from that, there has been a waste reduction that was previously simply thrown away, with innovations in using waste as organic fertilizer and additional feed for livestock. The adoption of more sustainable livestock practices is also starting to be implemented by livestock farmers, improving their economic welfare. Furthermore, this program opens up opportunities for developing value-added processed products, such as pasteurized milk and processed meat, which can increase farmers' income. Collaboration between farmers in managing joint businesses is also growing, creating a more solid livestock ecosystem. Apart from the economic impact, this participatory approach also increases farmers' awareness of the importance of sustainability and better environmental management, which contributes to the sustainability of the livestock sector in Karang Tunggal Village.

**Keywords:** Animal Waste Processing; Participatory Approach; Sustainability.

### Abstrak

*Desa Karang Tunggal, yang terletak di Kabupaten Kutai Kartanegara, memiliki potensi besar dalam sektor peternakan, terutama dalam produksi hasil ternak seperti daging dan susu. Namun, pengelolaan hasil ternak dan limbahnya masih menghadapi berbagai kendala, termasuk kurangnya kesadaran peternak terhadap praktik manajemen yang efisien dan berkelanjutan. Penelitian ini bertujuan untuk menganalisis penerapan pendekatan*

*partisipatif dalam edukasi pengelolaan hasil ternak dan limbah dengan melibatkan komunitas peternak secara langsung. Pendekatan ini memungkinkan peternak untuk berpartisipasi aktif dalam setiap tahapan proses, mulai dari identifikasi permasalahan hingga penerapan solusi berbasis kebutuhan lokal. Data dalam penelitian ini diperoleh melalui wawancara mendalam, observasi lapangan, dan diskusi kelompok terarah (FGD) yang melibatkan peternak setempat serta pemangku kepentingan terkait. Hasil penelitian menunjukkan adanya peningkatan kualitas produk ternak yang dihasilkan, terutama dari segi kebersihan, keamanan pangan, dan nilai jual. Selain itu, terjadi pengurangan limbah yang sebelumnya dibuang begitu saja, dengan adanya inovasi dalam pemanfaatan limbah sebagai pupuk organik dan pakan tambahan bagi ternak. Penerapan praktik peternakan yang lebih berkelanjutan juga mulai diterapkan oleh peternak, yang berkontribusi pada peningkatan kesejahteraan ekonomi mereka. Lebih lanjut, program ini membuka peluang bagi pengembangan produk olahan bernilai tambah, seperti susu pasteurisasi dan olahan daging, yang dapat meningkatkan pendapatan peternak. Kolaborasi antarpeternak dalam mengelola usaha bersama juga semakin meningkat, menciptakan ekosistem peternakan yang lebih solid. Selain dampak ekonomi, pendekatan partisipatif ini juga meningkatkan kesadaran peternak akan pentingnya keberlanjutan dan pengelolaan lingkungan yang lebih baik, yang secara keseluruhan berkontribusi terhadap keberlanjutan sektor peternakan di Desa Karang Tunggal.*

***Kata-kata Kunci:*** Keberlanjutan; Pendekatan Partisipatif; Pengolahan Limbah Ternak.

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## **INTRODUCTION**

Karang Tunggal Village, located in Tenggara Seberang District, Kutai Kartanegara Regency, has excellent potential in the livestock sector. The diversity of natural resources and the presence of a large proportion of the population who depend on livestock make this village a strategic area for sustainable livestock development. Karang Tunggal has a supportive tropical climate, with fertile land suitable for cultivating various types of livestock, especially beef cattle and other livestock. Livestock farming in this village is the main livelihood, and it not only supplies local consumption needs but also has the potential to meet regional and even national markets. However, even though it has great potential, the livestock sector in this village still faces several challenges that need to be overcome immediately.

One of the community's main challenges is managing livestock products, which is not yet optimal. Many breeders still sell livestock products in raw form without further processing.<sup>1</sup> For example, beef is sold in regular cuts, milk is not processed into processed products such as cheese or yogurt, and eggs are only sold without packaging or processing. This results in the added value that farmers should be able to obtain being lost. Apart from

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<sup>1</sup> Ni Nengah Yastini, "Masalah yang Dihadapi Kelompok Peternak dalam Mengembangkan Agribisnis Ternak Sapi (Kasus Kelompok Astiti Karya di Desa Tembok, Kabupaten Buleleng)," *dwijenAGRO* 1, no. 1 (2010): 49–55, <http://ejournal.undwi.ac.id/index.php/dwijenagro/article/view/262>.

that, by-products from livestock, such as livestock waste, have not been utilized optimally. Livestock waste, which consists of manure and leftover feed, is often simply thrown away or not appropriately managed. This waste has the potential to be processed into organic fertilizer, which can improve the quality of soil and agricultural products, or even become an alternative energy source, such as biogas, which can be used for household or livestock purposes.<sup>2</sup>

Apart from that, limited knowledge and modern technology are inhibiting factors in increasing the productivity and efficiency of the livestock sector. Many breeders in Karang Tunggal Village still rely on traditional methods in raising and processing livestock. Using efficient technology, such as specially formulated feed or technology processing livestock products, is minimal. This causes the low competitiveness of the livestock products produced. The lack of easy access to the latest information regarding modern livestock cultivation techniques and the lack of training for farmers means that the potential of the livestock sector cannot be utilized optimally. In addition, a lack of knowledge regarding waste management and efficiency in using natural resources also worsens existing conditions.<sup>3</sup>

To overcome these challenges, a participatory approach offers solutions that focus on community empowerment through direct involvement in every program planning and implementation stage. This approach prioritizes collaboration between breeders, government, and other institutions to increase breeders' capacity to manage livestock and livestock waste. One way to achieve this is by providing training on livestock and waste management technology based on local needs and community cultural wisdom.<sup>4</sup> The participatory approach aims to increase community knowledge and skills and ensures that the programs developed can be accepted and implemented well by local communities. With this approach, it is hoped that more efficient and sustainable livestock can be created and improve farmers' overall welfare.<sup>5</sup>

In addition, through this approach, it is hoped that farmers can better understand the importance of managing livestock products optimally and sustainably. By utilizing livestock

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<sup>2</sup> Viqkah Finasti dan Ega Rizki Biliannanda, "Analisis Probabilitas Pemanfaatan Biogas dari Limbah Ternak Sapi untuk Kebutuhan Energi Rumah Tangga di Desa Sidoluhur," *Krepa: Kreativitas pada Pengabdian Masyarakat* 3, no. 4 (2024): 41–55, <https://ejournal.warunayama.org/index.php/krepa/article/view/6408>.

<sup>3</sup> Siti Azizah et al., *Tantangan dan Peluang Peternakan Cagar Alam Besowo* (Demak: Yayasan Drestanta Pelita Indonesia, 2024), <https://publisher.yayasandpi.or.id/index.php/dpipress/article/view/1597>.

<sup>4</sup> Dede Aprylasari, Siti Azizah, dan Titanio Auditya Pribadi, "Group Dynamics Among Beef Cattle Farmers in Merak Hamlet, Sumberwaru Village, Situbondo Regency," *Agriwar Journal* 4, no. 1 (2024): 25–33, <https://ejournalwarmadewa.id/index.php/agriwar/article/view/9699>.

<sup>5</sup> Azizah et al., *Tantangan dan Peluang Peternakan Cagar Alam Besowo*.

waste in high-value products such as organic fertilizer or biogas, as well as processing livestock products into processed products, farmers can increase their income. Training programs based on a participatory approach can also help breeders reduce dependence on less efficient traditional methods and focus more on implementing appropriate technology that suits local conditions.<sup>6</sup> This article aims to examine the effectiveness of the participatory approach in improving the management of livestock products and waste in Karang Tunggal Village and understand how this approach can increase livestock productivity and farmer welfare. In addition, this article will provide recommendations on how to utilize existing resource potential optimally and sustainably through managing livestock waste and increasing the added value of livestock products. Thus, it is hoped that livestock development in this village will not only improve farmers' welfare but also positively impact the local economy as a whole.

## **RESEARCH METHODS**

This research uses a participatory approach. The participatory approach is an approach that involves the community in decision-making processes, problem-solving, and collective action.<sup>7</sup> This approach is intended so that every decision and step truly reflects the needs and potential in the field. The method used in this research consists of four main stages: identification of needs, training and workshops, implementation and mentoring, and evaluation.

In the first stage, Needs Identification, group discussions were held with 10 farmer groups in Karang Tunggal Village. This process aims to explore the main problems breeders face and the educational needs they feel are important. With this approach, breeders can convey the problems they face in livestock activities, such as managing livestock products and waste. In this stage, a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis is also carried out to understand the livestock community's strengths, weaknesses, opportunities, and threats. The results of this analysis will be the basis for designing interventions appropriate to actual conditions in the field.

The next stage is Training and Workshops. In this stage, farmers are given training on various aspects of more efficient livestock product management. Topics taught include

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<sup>6</sup> Dede Aprylasari et al., "Peasant Women Empowerment as a Conflict Resolution Strategy in Sidomulyo Hamlet, Baluran National Park," *Jurnal Ilmu-ilmu Peternakan* 32, no. 3 (2022): 437–451, <https://jiip.ub.ac.id/index.php/jiip/article/view/2630>.

<sup>7</sup> J.R Raco, *Metode Penelitian Kualitatif, Jenis, Karakteristik dan Keunggulannya* (Jakarta: PT. Gramedia Widiasarana Indonesia, 2010).

milk processing, meat packaging, and making organic fertilizer from livestock waste. This training also covers livestock business management to increase farmers' understanding of the importance of managing livestock businesses more professionally and efficiently. In addition, farmers are given training on marketing processed products, which aims to help them gain greater profits by selling products in a more valuable form.<sup>8</sup>

After training, the next stage is Implementation and Mentoring. At this stage, breeders begin to apply the techniques taught during training. An expert team of practitioners and academics provided intensive assistance for three months to ensure that breeders could adopt new techniques well.<sup>9</sup> This assistance includes direct guidance in the field, solving problems that arise, and evaluating the application of the techniques taught. This assistance is also designed to build farmers' confidence in managing their businesses more efficiently and sustainably.

The final stage is Evaluation, which is carried out to assess the success of the program that has been implemented. This evaluation was conducted through surveys and in-depth interviews with breeders to obtain feedback regarding the training and assistance provided. Aspects evaluated include changes in livestock productivity, waste management efficiency, and farmer satisfaction with the program being implemented. This evaluation is important to determine whether the program's initial objectives, namely increasing productivity and welfare of farmers, have been achieved.<sup>10</sup> The results of this evaluation can also be used as material for improving the program in the future so that it can be more targeted and provide more significant benefits for the livestock community. By using a participatory approach that involves breeders at every stage, it is hoped that this program can have a sustainable positive impact, increase the capacity of breeders, and improve their overall welfare.

## RESULTS AND DISCUSSION

The participatory approach applied in this research has produced several significant achievements in developing the livestock sector in Karang Tunggal Village. A process

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<sup>8</sup> Anna Birgitte Milford, Gudbrand Lien, dan Matthew Reed, "Different Sales Channels for Different Farmers: Local and Mainstream Marketing of Organic Fruits and Vegetables in Norway," *Journal of Rural Studies* 88 (2021): 279–288, <https://www.sciencedirect.com/science/article/abs/pii/S0743016721002424?via%3Dihub>.

<sup>9</sup> Rubens Pasha Jans et al., "Optimalisasi Digital Marketing dalam Meningkatkan Omzet di Sentra Wisata Kuliner Semolowaru, Kota Surabaya," *JPP IPTEK: Jurnal Pengabdian dan Penerapan IPTEK* 8, no. 2 (2024): 181–192, <https://ejurnal.itats.ac.id/jpp-iptek/article/view/6748>.

<sup>10</sup> Atrika Iriani dan Bambang Suprianto, "Peningkatan Kapabilitas Organisasi melalui Pendampingan Implementasi Gerakan Sumsel Mandiri Pangan (GSMP)," *Jurnal Kabar Masyarakat* 2, no. 2 (2024): 313–324, <https://jurnal.itbsemarang.ac.id/index.php/JKB/article/view/2180>.

involving the active participation of breeders in every stage of the activity provides a more significant and sustainable impact. These achievements are not only limited to improving technical skills but also include more efficient waste management, increasing farmer incomes, and creating closer collaboration between farmers in managing their businesses.

### ***Skills Improvement***

One of the main results of implementing this program is increasing the technical skills of farmers in processing livestock products into goods that have added value. The training focused on making processed products such as yogurt, cheese, sausages, and liquid organic fertilizer, which has given farmers more profound knowledge and skills in utilizing livestock products. This training increases technical capacity and introduces farmers to business management concepts that are more structured and based on entrepreneurial principles. For example, simpler techniques for making sausages and nuggets from livestock products allow them to introduce their products to a broader market, thereby increasing the competitiveness of local products.<sup>11</sup>

### ***Waste Reduction***

Waste produced by livestock often becomes a serious environmental problem. Previously, many breeders threw away livestock waste without utilizing the existing potential. However, through the waste management training, they succeeded in turning this waste into valuable resources.<sup>12</sup> For example, liquid waste from livestock pens is used to produce biogas as a more environmentally friendly alternative fuel. Apart from that, solid livestock waste is processed into liquid organic fertilizer, which can increase agricultural land fertility, thus supporting the sustainability of agriculture in the area. This waste management provides economic benefits for farmers and reduces negative impacts on the environment, such as water and soil pollution.

### ***Increased Income***

One of this program's main objectives is to improve farmers' welfare. By improving the quality of livestock products and product diversification, breeders have succeeded in increasing the selling value of their products. Processed products such as cheese and yogurt from goat's milk and sausages and nuggets from livestock meat now have greater appeal in

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<sup>11</sup> Dimas Novendra Alfianto dan Rossy Lambelanova, "Pemberdayaan Usaha Mikro Kecil Menengah Susu Sapi Perah di Kabupaten Boyolali Provinsi Jawa Tengah," *J-3P: Jurnal Pembangunan Pemberdayaan Pemerintahan* 6, no. 2 (2021): 91–114, <https://ejournal.ipdn.ac.id/JPDPP/article/view/1960>.

<sup>12</sup> Asep Setiawan, "Pengelolaan Limbah Ternak pada Kawasan Budidaya Ternak Sapi Potong di Kabupaten Majalengka (Waste Management at Beef Cattle Raising Area in Majalengka)," *Jurnal Ilmu Ternak Universitas Padjadjaran* 13, no. 1 (2013): 24–30, <https://jurnal.unpad.ac.id/jurnalilmuternak/article/view/5117>.

the market. In addition, these products have opened up new market opportunities, especially in urban areas, which are more interested in value-added livestock-based processed products. This increase in income also has a direct impact on improving the quality of life of farmers and the welfare of their families.

### ***Community Collaboration***

One of the most successful aspects of this program is the creation of closer collaboration between breeders. Through group discussions and cooperation in running livestock product processing business units, breeders can share resources and knowledge. Farmer groups are now working together to establish livestock processing cooperatives, which allow them to purchase raw materials and equipment in large quantities at lower prices. Apart from that, they can also jointly market their products, thereby strengthening their bargaining power in the market. This collaboration also creates a sense of mutual support between fellow breeders, which encourages creating a more solid and mutually helpful community.

### **Challenges and Opportunities**

Even though the results obtained are very positive, this program still faces several challenges that need to be addressed so that its sustainability and positive impact can be felt in the long term.

#### ***Resource Limitations***

One of farmers' most prominent challenges is limited access to the tools and materials needed to process livestock products. Some farmers, especially those in more remote areas, do not have adequate equipment to produce value-added goods. To overcome this, further support is needed to provide adequate production tools and facilities and assistance to help farmers make optimal use of existing equipment.

#### ***Long Term Commitment***

The sustainability of this program requires a long-term commitment from all parties involved, including the government, non-governmental organizations, and the private sector. Farmers' risk of returning to less efficient traditional methods is significant without ongoing assistance. Therefore, it is important to ensure that this program is not just done once but can be continued with consistent support in terms of technical assistance, ongoing training, and provision of resources.

#### ***Product Marketing***

Even though the quality of farmers' products has improved, access to a broader market remains an obstacle. Many breeders have difficulty reaching more extensive markets,

both at the provincial and national levels. Therefore, more effective and innovative marketing strategies are needed to introduce their products to a broader market. One way to overcome this problem is to utilize digital technology to market products online so farmers can reach consumers outside their area. However, even though there are challenges, the opportunities that exist are also quite significant and can be utilized to overcome these obstacles.<sup>13</sup>

### ***Government Support***

The government can provide further support in developing the livestock sector through policies that support small and medium breeders, such as providing easy access to production equipment and raw materials. Apart from that, policies prioritizing the development of processed livestock products can help expand markets and increase the competitiveness of local products.<sup>14</sup>

### ***Collaboration with the Private Sector***

Partnerships with the private sector are critical to increasing livestock product production capacity and marketing. Private companies can help by providing new, more efficient technology and bridging breeders with a broader market. The private sector can also provide training and capacity development for breeders in processing and marketing livestock products.<sup>15</sup>

### ***Continuous Education***

To ensure the sustainability of this program, ongoing education is essential. By involving educational institutions in this program, the knowledge and skills acquired by farmers can continue to be updated and improved. This program can also be used as a learning model that can be applied in other areas with similar potential so that the benefits can be widely felt. Continuous education will help farmers adapt to the latest technological developments and provide better insight into market trends and more efficient business management techniques.<sup>16</sup>

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<sup>13</sup> Miftahul Azis dan Esty Asriyana Suryana, “Komparasi dan Implementasi Kebijakan Digitalisasi Pertanian: Peluang dan Tantangan,” *Jurnal Risalah Kebijakan Pertanian dan Lingkungan* 10, no. 3 (2023): 179–198, <https://journal.ipb.ac.id/index.php/jkebijakan/article/view/51083>.

<sup>14</sup> Rina Nuryati et al., “Pemetaan Sosial (Social Mapping) Masyarakat dalam Upaya Mendukung Pengembangan Usahatani Polikultur Perkebunan Terintegrasi (UTPPT),” *Jurnal Agristan* 2, no. 1 (2020): 1–50, <https://jurnal.unsil.ac.id/index.php/agristan/article/view/2342>.

<sup>15</sup> Dessy Anggar Sary, “Evaluasi Program Pemberdayaan Petani Melalui Teknologi Dan Informasi Pertanian Usaha Ternak Domba,” *Economics Development Analysis Journal* 2, no. 4 (2015): 446–455.

<sup>16</sup> Delly Paramita, Khotimah Umami Handayani, dan Reiki Nauli Harahap, “Mempromosikan Efisiensi Sumber Daya melalui Eco-Lokalisme: Analisis Keberlanjutan Desa Energi Berdikari Berbasis Biogas,” *Jurnal Aplikasi dan Inovasi Iptek* 6, no. 1 (2024): 1–19, <https://jasintek.denpasarinstitute.com/index.php/jasintek/article/view/152>.



Overall, although the challenges faced are pretty significant, the opportunities provide great hope for the sustainability and development of this program. With the proper support and consistent implementation, this program can benefit livestock farmers significantly, improve their welfare, and contribute to more sustainable local economic development.

## **CONCLUSION**

The participatory approach in the livestock product and waste management program in Karang Tunggul Village has significantly improved farmers' technical skills. This program has introduced new knowledge on processing livestock products and utilizing waste, fostering innovation and efficiency. Additionally, it has strengthened collaboration among farmers, creating a supportive environment where they can exchange experiences and develop solutions to common challenges. Beyond technical improvements, the program has increased farmers' awareness of sustainability in livestock practices. Their active involvement has enhanced their understanding and encouraged them to adopt more responsible and environmentally friendly methods. This shift is essential in ensuring that livestock farming in the village remains viable and sustainable in the long run.

However, maintaining and expanding the program's positive impact requires support from various stakeholders, including local governments, the private sector, and educational institutions. These parties are crucial in providing technical assistance, supplying necessary equipment, and expanding market access for livestock products. Such support will help sustain the improvements achieved through the program and encourage further advancements in livestock management. A long-term commitment and synergy among stakeholders are essential to maximizing the program's benefits. By ensuring ongoing collaboration and investment, the initiative can contribute to the long-term welfare of farmers and the overall sustainability of livestock farming in Karang Tunggul Village. With the proper support, this participatory approach can serve as a model for other rural communities seeking to enhance their agricultural and livestock sectors.

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