

Development of environmentally conscious animal food supply to meet protein consumption in Blitar district

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Abstract

Developing environmentally friendly livestock food provision in Blitar Regency through duck farming is one of the strategic efforts to increase community animal protein consumption while maintaining environmental sustainability. This community service program is designed with a participatory approach, education, and application of appropriate technology. The methods used include surveys, farmer training, implementation of technology to increase livestock productivity, use of biodigesters, and strengthening farmer institutions. The evaluation results showed a significant increase in farmer knowledge and skills, with an average post-test score increasing by 40% compared to the pre-test. The adoption of appropriate technology, such as feed biofermentation, and biodigesters, has succeeded in reducing production costs by 30%. Livestock productivity increased with production, while duck mortality rates decreased from 15% to 5%. Strengthening farmer institutions through the formation of farmer groups also increases the organizational capacity and bargaining power of farmers, including in accessing government financing and support. This program not only has a positive impact on farmer welfare but also contributes to meeting the community's animal protein needs and better environmental management. The sustainability of this program is expected to be achieved through supervision and synergy between the government, academics, and the private sector. This holistic approach shows great potential for replication in other areas with similar conditions.

1. Introduction

Blitar Regency, as one of the agricultural areas in East Java Province, has great potential in the livestock sector to support the fulfillment of animal protein-based food needs. Sources of animal protein, such as meat, milk, and eggs, are important in meeting the community's nutritional needs. Reviewing national nutritional needs, animal protein consumption in Indonesia is still relatively low compared to neighboring countries in Southeast Asia, such as Malaysia and Thailand (Tono et al., 2023). Therefore, developing an environmentally friendly livestock sector is one of the strategic steps to increase food security while maintaining ecosystem sustainability.

Blitar is known as the largest center for chicken egg production in Indonesia. Still, the livestock potential in this region has not been optimally utilized for the diversification of animal protein products. The main challenges faced include production efficiency, environmental sustainability, and the distribution of products to areas in need. The concept of environmentally friendly livestock farming or "green livestock farming" can be a relevant solution. This concept integrates livestock practices with sustainability principles, such as waste management, use of local feed, and reduction of greenhouse gas emissions (FAO, 2019).

The importance of providing environmentally friendly livestock food is not only related to increasing protein consumption, but also has a direct impact on social, economic, and ecological aspects. Socially, increasing access to quality livestock food can help reduce stunting rates, which are still a problem in Indonesia. According to UNICEF (2021), stunting in Indonesia is influenced by the lack of adequate protein intake in daily diets. Economically, developing the livestock sector can create jobs and increase people's income. Meanwhile, ecologically, implementing environmentally friendly livestock principles can

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reduce the negative impacts of livestock activities on the environment, such as water and soil pollution due to livestock waste. The development of environmentally friendly livestock has become a global concern. According to FAO (2019), livestock has a significant contribution to climate change, land use, and pollution. Therefore, an integrated approach is needed to manage natural resources sustainably and meet food needs. Duck farming has advantages over other types of livestock in terms of adaptation to various environmental conditions, feed efficiency, and the quality of the products produced. Duck meat and eggs are sources of animal protein that are rich in nutrients, such as essential amino acids, vitamins, and minerals. In addition, ducks are also able to utilize agricultural waste, such as rice bran and harvest residues, as alternative feed sources. This makes duck farming one of the economical and environmentally friendly solutions in meeting animal protein needs (Kaharap et al., 2023).

The development of environmentally friendly duck farming includes various aspects, ranging from feed management, and livestock health, to waste management. The application of appropriate technology in duck farming, such as feed biofermentation and the use of biodigesters for waste management, can increase production efficiency while reducing negative impacts on the environment (Hidayat et al., 2024). In Blitar Regency, the potential for applying this technology is very large considering the availability of abundant local raw materials and the high enthusiasm of the community for innovation in the livestock sector. The development of duck farming in Blitar Regency also requires support from government policies and synergy between various parties. The environmentally friendly livestock development program requires an active role from local governments, academics, business actors, and the community. Supportive policies, such as providing access to financing, training, and technical assistance, are key factors in the success of the program (Sedyastuti, K, 2018).

Related to animal protein consumption, previous studies have shown that people in Blitar Regency have a high preference for local livestock products, such as eggs and duck meat. Duck products are not only in demand for daily consumption but also have high economic value in the culinary industry, such as processed salted egg products and roast duck meat (Purwanto, 2021). Duck product development does not only focus on production aspects but also product diversification to increase added value and competitiveness in the market. Other community-based approaches are also important in supporting the sustainability of duck livestock development programs. Livestock farmer groups can act as agents of change that encourage the adoption of environmentally friendly technologies and increase the capacity of farmers. Case studies in other areas show that the success.

2. Method

Program Targets

The community service method that will be applied in developing the provision of environmentally friendly livestock food in Blitar Regency is the Mitra Karya livestock group. This method involves a participatory approach, education, and appropriate technology that supports environmental sustainability and improves the welfare of livestock farmers.

Program Implementation Stages

The program implementation activities include several steps. The first step in implementing community service is identifying local needs and potential. This activity involves a field survey to collect data related to the condition of duck farming in Blitar Regency, including the types of ducks raised, maintenance systems, availability of feed resources, and challenges faced by farmers. This data will be analyzed to develop a community service program that is relevant and based on community needs. In addition, in-depth interviews with livestock farmers and local community leaders will be conducted to explore local perspectives and build collaborative commitments.

The second stage is the implementation of training and education for farmers. Training materials include environmentally friendly feed management, duck health management, good farming practices, and livestock waste management. This training will be held in stages, utilizing presentation media, field demonstrations, and training modules. Technical assistance will also be provided intensively to ensure the application of the knowledge gained in daily practice.

The Third Stage is the application of appropriate technology to support environmentally friendly duck farming. The technology that will be introduced includes a biofermentation system to increase feed efficiency, the use of biodigesters to process waste into biogas, and solid waste processing techniques into organic fertilizer. The implementation of this technology is carried out through a pilot project in selected farmer groups, which are expected to become models that can be replicated by other farmers.

The Fourth Stage is strengthening farmer institutions through the formation or revitalization of livestock farmer groups. This group will be facilitated to become a forum for discussion, sharing experiences, and advocacy for farmer needs. In addition, groups will also be encouraged to develop joint businesses, such as processing duck products into value-added products, such as salted eggs or processed duck meat. With this approach, it is hoped that farmers can increase the economic value of their livestock.

The Fifth Step is program monitoring and evaluation. Monitoring is carried out periodically to ensure that program implementation is running according to plan, while evaluation is carried out to assess the impact of the program on increasing duck livestock production, farmer welfare, and environmental sustainability. The results of this evaluation will be the basis for improving community service programs in the future.

3. Result and Discussion

1. Improving Farmers' Knowledge and Skills through Training

The implementation of intensive training held during this community service program has succeeded in improving the knowledge and skills of duck farmers in Blitar Regency. Training participants gained a better understanding of biofermentation-based feed management, livestock health management, and good farming practices. Evaluations conducted through pre-tests and post-tests showed an increase in the average score of farmers' understanding by 40%. In addition, direct simulations in training allow farmers to practice the knowledge they have gained, making it easier to apply in the field.

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Figure 1. Group training for duck farmers in Slorok Village, Blitar Regency

The training included theoretical and practical sessions designed to ensure optimal knowledge transfer. In the theoretical session, farmers were given knowledge about the importance of feed efficiency and the impact of livestock waste on the environment, while in the practical session, farmers were taught how to mix feed ingredients using biofermentation techniques, detect signs of disease in ducks, and create

an effective feeding schedule. In addition, the training also utilized a field demonstration method, where farmers directly observed and practiced the technology being introduced. For example, a simulation of the operation of a biodigester was conducted to demonstrate how to process waste into biogas that can be used for cooking. With this approach, the training succeeded in building farmers' confidence in implementing the technology on their own farms.

Group discussions and case studies were also an integral part of the training, allowing farmers to share experiences, ask questions, and get solutions to problems faced. This approach created a collaborative learning atmosphere, where farmers not only learned from the instructor but also from their group mates. As a result, relationships between farmers became closer, and the farmer community as a whole became stronger in facing common challenges.

2. Adoption of Appropriate Technology

This program has also succeeded in introducing appropriate technology to farmers. Feed biofermentation technology, biodigesters for processing waste into biogas, and solid waste processing techniques into organic fertilizers have been adopted by most of the program's participating farmers. According to Hidayat et al. (2024), biofermentation technology can increase feed efficiency by up to 30% by utilizing locally available raw materials. The results of a post-program survey showed that 75% of farmers had used biofermentation technology in providing feed, which helped reduce feed costs by up to 30%. The use of biodigesters also produces biogas that is used for household energy needs, thereby reducing dependence on fossil fuels.

3. Increasing Livestock Productivity

The implementation of appropriate technology and the application of good maintenance management have a positive impact on duck livestock productivity. Average egg production increased from 60% to 80% of the genetic potential of the ducks raised. In addition, the mortality rate of ducks decreased from 15% to 5% due to the implementation of a better livestock health program. This increase in productivity not only increases the income of farmers but also contributes to meeting the community's animal protein needs.

4. Institutional Strengthening

The Mitra Karya livestock farmer group involved in this program experienced strengthening in terms of organizational management and institutional functions (Figure 2). Facilitated by the community service team, this group succeeded in compiling a joint work plan, increasing administrative capacity, and building networks with other stakeholders, including the local government. The farmer group also began to access financing programs from banking institutions and obtained support for the development of livestock businesses. The synergy between group members became stronger, thus creating better collaboration in facing livestock challenges.



Figure 2. Institutional strengthening of Mitra Karya groups

4. Conclusion

The results of this community service program show that a holistic approach involving training, appropriate technology, and institutional strengthening has succeeded in increasing the capacity and welfare of livestock farmers in Blitar Regency. The positive impact of this program is not only felt by individual farmers but also by local communities through increased availability of livestock-based food and better environmental management. The next step is to ensure the sustainability of the program with continued supervision and support from all related parties.

Author Contributions

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References

- Tono, Ariani, M., & Suryana, A. (2023). Kinerja Ketahanan Pangan Indonesia: Pembelajaran dari Penilaian dengan Kriteria Global dan Nasional. *Analisis Kebijakan Pertanian*, 21(1), 1-20.
- Elahi, K. Q. I. (2009). UNDP on good governance. *International Journal of Social Economics*, 36(12), 1167-1180.
- Food and Agriculture Organization (2019). Transforming the livestock sector through the Sustainable Development Goals. In brief. ome. 12 pp. icence: BY- 3.0 .IGO. [cited 2024 Des 2024]. Tersedia dari: www.fao.org/3/a-i6583e.pdf
- Hidayat, F., Siregar, A. H., & Angelica, C. (2024). Strategi Komunikasi Lingkungan Dalam Upaya Inovasi Substitusi Aquafaba Yang Berimplikasi Pada Peningkatan Kompetensi UMKM Menuju UMKM Go Green Di Kota Medan. *SEIKO: Journal of Management & Business*, 7(2), 909-916.
- Kaharap, Y., Dotrimensi, D., Setiawan, F., & Nasution, R. P. S. (2023). Pelatihan pengembangan maggot sebagai pakan ternak di desa karang tunggal, kec parenggean sebagai model kewirausahaan sosial masyarakat. *AKM: Aksi Kepada Masyarakat*, 3(2), 307-326.
- Lingga, R., Adibrata, S., Putri, S. G., Sari, A. D., & Jeniver, J. (2023). Performa Bebek Petelur yang Dibudidayakan pada Skala Rumah Tangga di Pekarangan Rumah yang Diberi Pakan Berprobiotik. *Jurnal Peternakan*, 20(2), 65-71.
- Purwanto, M. B. (2021). Makanan Khas Jawa (Bebek Goreng) Sebagai Salah Satu Daya Tarik Wisata Kuliner Di Kota Palembang Pada Rm Bebek Gendut. *Jurnal Pariwisata Darussalam*, 1(1), 22-28.
- Sahban, M. A., & Se, M. M. (2018). Kolaborasi Pembangunan Ekonomi di Negara Berkembang (Vol. 1). Sah Media.
- Sedyastuti, K. (2018). Analisis pemberdayaan UMKM dan peningkatan daya saing dalam kancah pasar global. *INOBIIS: Jurnal Inovasi Bisnis Dan Manajemen Indonesia*, 2(1), 117-127.
- Suryana, E. A., Martianto, D., & Baliwati, Y. F. (2019). Pola konsumsi dan permintaan pangan sumber protein hewani di Provinsi nusa tenggara barat dan nusa tenggara timur. *Analisis Kebijakan Pertanian*, 17(1), 1-12.
- Syakir, M. (2020, January). Dukungan teknologi peternakan dan veteriner dalam mewujudkan kedaulatan pangan hewani. In *Prosiding Seminar Nasional Teknologi Peternakan dan Veteriner* (pp. 3-11).
- Tono, Ariani, M., & Suryana, A. (2023). Kinerja Ketahanan Pangan Indonesia: Pembelajaran dari Penilaian dengan Kriteria Global dan Nasional. *Analisis Kebijakan Pertanian*, 21(1), 1-20.
- Ulum, M. C., & Anggaini, N. L. V. (2020). *Community empowerment: teori dan praktik pemberdayaan komunitas*. Universitas Brawijaya Press.
- UNICEF (2021) *Tekad dan Upaya Baru untuk Anak-anak*. Laporan tahunan.