

Implementation of Sanitation Practices in the Agricultural and Livestock Sectors to Support Environmental Health

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Sanitation plays an important role in maintaining environmental health and supporting sustainable agricultural and livestock production. This study aimed to evaluate the implementation of sanitation practices in Hiyung chili farming and cattle farming in Tambarangan Village, South Tapin Regency, South Kalimantan. A descriptive quantitative approach was employed through direct field observations, interviews with farmers and livestock breeders, and documentation of sanitation conditions. The assessment focused on five indicators: waste management, water quality management, facility cleanliness, biosecurity practices, and environmental conditions. The results showed that the overall sanitation score reached 80%, which was categorized as good. Facility cleanliness achieved the highest score, indicating that routine cleaning activities were consistently implemented in both agricultural and livestock sectors. Waste management and water quality management were also categorized as good, particularly through the utilization of cattle manure as organic fertilizer for Hiyung chili cultivation. However, biosecurity practices received a moderate score, suggesting the need for improved disease prevention measures and sanitation monitoring. Overall, the findings demonstrate that proper sanitation practices contribute positively to environmental health by reducing pollution risks, improving waste utilization, and supporting sustainable agricultural and livestock production systems. Continuous improvement in sanitation management and biosecurity implementation is recommended to enhance environmental sustainability in the study area.

Keywords: sanitation, environmental health, Hiyung chili, cattle farming, waste management, sustainable agriculture.

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1. Introduction

Sanitation is a fundamental component of the agricultural and livestock sectors that plays a crucial role in maintaining environmental quality and protecting public health. Effective sanitation practices are essential for controlling sources of pollution arising from farming activities, waste management, water use, and the handling of agricultural and livestock products. As global food demand continues to increase due to population growth, agricultural and livestock production activities have expanded significantly, leading to higher volumes of organic and inorganic waste. Without proper management, these wastes can contaminate soil, water, and air resources and increase the risk of disease transmission among animals and humans (Li et al., 2024).

Agriculture and livestock production are among the major contributors to environmental degradation when sanitation measures are inadequately implemented. Animal manure, wastewater, and feed residues can serve as reservoirs for pathogenic microorganisms that may cause zoonotic diseases. Furthermore, the excessive or improper use of fertilizers and pesticides in agricultural activities can negatively affect environmental quality and disrupt ecosystem balance. According to Herrero et al. (2023), sustainable management practices, including sanitation and waste control, are essential to minimizing environmental impacts while maintaining agricultural productivity.

Sanitation in agriculture encompasses several aspects, including irrigation water quality management, field hygiene, proper fertilizer and pesticide application, and the treatment of agricultural waste. In the livestock sector, sanitation involves maintaining clean housing facilities, managing animal waste, ensuring access to clean water, controlling disease vectors, and implementing biosecurity measures to prevent disease outbreaks. Research conducted by Li et al. (2024) demonstrated that effective sanitation and biosecurity programs can significantly reduce the incidence of infectious diseases in livestock while simultaneously decreasing environmental contamination surrounding production facilities.

The implementation of proper sanitation practices not only benefits environmental health but also enhances productivity and the quality of agricultural and livestock products. A clean production environment helps reduce the risk of food contamination by harmful microorganisms, thereby improving food safety and consumer confidence. In addition, properly managed agricultural and livestock waste can be converted into valuable resources such as organic fertilizers and renewable energy, contributing to the development of a circular and sustainable agricultural system (Zhang et al., 2023). The implementation of sanitation in the agricultural and livestock sectors is a strategic approach to supporting environmental health, ensuring food safety, and promoting sustainable resource management. Strengthening sanitation practices through improved awareness, technology adoption, and environmental management policies is essential for achieving sustainable agricultural and livestock production systems that contribute positively to both human well-being and environmental sustainability.

2. Literature Review and Problem Statement

Environmental sanitation has become an increasingly important component of agricultural and livestock production systems due to its role in maintaining environmental quality, improving productivity, and supporting sustainable resource management. Sanitation practices include waste management, water quality control, hygiene maintenance, and disease prevention measures that help minimize the negative impacts of farming activities on the environment. According to Bhatia and Sindhu (2024), effective sanitation and waste management strategies contribute to reducing pollution while enhancing nutrient recycling and resource efficiency. Despite these benefits, many agricultural and livestock operations continue to face challenges in implementing comprehensive sanitation programs, resulting in environmental concerns that require greater attention.

In the agricultural sector, inadequate sanitation practices may lead to the accumulation of crop residues, nutrient runoff, and contamination of soil and water resources. These issues can negatively affect ecosystem functions and reduce the long-term sustainability of agricultural production. Proper management of agricultural waste and farming inputs is therefore essential for maintaining environmental balance and preserving natural resources. However, variations in knowledge, infrastructure, and management capacity often limit the adoption of sanitation measures, creating gaps between recommended practices and their implementation in the field.

Sanitation plays a vital role in livestock production, where large quantities of manure, wastewater, and other organic wastes are generated daily. Poor hygiene conditions and ineffective waste management can increase the risk of pathogen proliferation, environmental contamination, and disease transmission among animals and humans. Militzer et al. (2023) emphasized that biosecurity and sanitation measures are fundamental for reducing health risks and improving the sustainability of livestock systems. Nevertheless, sanitation standards remain inconsistent across different farming operations, highlighting the need for more effective management and monitoring strategies.

Furthermore, sanitation is increasingly recognized through the One Health approach, which emphasizes the interconnected relationship between human, animal, and environmental health. Pinto Jimenez et al. (2023) reported that improved sanitation and hygiene interventions in animal agriculture can reduce infection risks, antimicrobial use, and antimicrobial resistance. Despite growing awareness of these benefits, challenges related to sanitation implementation continue to persist in many agricultural and livestock settings. Therefore, it is necessary to examine the application of sanitation practices in these sectors to better understand their contribution to environmental health and identify strategies for promoting sustainable and environmentally responsible production systems.

3. Method

This study employed a descriptive quantitative research design to evaluate the implementation of sanitation practices in the agricultural and livestock sectors and their contribution to environmental health. The research was conducted in Tambarangan Village, South Tapin Regency, South Kalimantan, focusing on cayenne pepper (*Capsicum frutescens* L.) cultivation, locally known as Hiyung chili, and cattle farming activities.

Data were collected through direct field observations, interviews with farmers and cattle breeders, and documentation of sanitation facilities and environmental conditions. The observation focused on several sanitation aspects, including waste management, water source sanitation, cleanliness of agricultural and livestock facilities, manure handling practices, drainage systems, and environmental hygiene around the production areas.

A structured observation checklist was used to assess the implementation of sanitation practices in both agricultural and livestock activities. Information obtained from interviews was used to complement the observational data and provide a better understanding of farmers' and breeders' sanitation management practices.

The collected data were analyzed using descriptive statistical methods, including frequency distributions, percentages, and average scores. The results were presented in tables and figures to describe the level of sanitation implementation in Hiyung chili cultivation and cattle farming activities. The findings were interpreted to evaluate the contribution of sanitation practices to environmental health and sustainable agricultural and livestock production in Tambarangan Village.

4. Result and Discussion

The implementation of sanitation practices in the agricultural and livestock sectors in Tambarangan Village, South Tapin Regency, was assessed through observations of Hiyung chili farming and cattle farming activities. The assessment covered waste management, water quality management, facility cleanliness, biosecurity practices, and environmental conditions. The results are presented in Table 1.

Table 1. Assessment Results of Sanitation Practices in Hiyung Chili Farming and Cattle Farming in Tambarangan Village

Indicator	Score (1–5)	Category
Waste Management	4	Good
Water Quality Management	4	Good
Facility Cleanliness	5	Excellent
Biosecurity Practices	3	Moderate
Environmental Condition	4	Good
Total Score	20	

Maximum Score	25	
Sanitation Score (%)	80%	Good

Based on Table 1, the overall sanitation score reached 80%, indicating that sanitation implementation in both Hiyung chili cultivation and cattle farming was categorized as good. This result demonstrates that farmers and livestock breeders in Tambarangan Village have generally applied sanitation measures that support environmental health and sustainable agricultural production.

Facility cleanliness obtained the highest score (5), reflecting the routine maintenance conducted by farmers and breeders. Agricultural lands were generally free from excessive weeds and crop residues, while cattle sheds were cleaned regularly to remove manure and other waste materials. Good facility sanitation is essential for reducing pest populations, preventing disease outbreaks, and maintaining a healthy production environment. Previous studies have shown that proper sanitation practices contribute significantly to increased productivity and reduced disease incidence in agricultural and livestock systems.

Waste management was categorized as good, with a score of 4. The observation revealed that crop residues and livestock manure were generally managed appropriately. In several farming areas, cattle manure was utilized as organic fertilizer for Hiyung chili cultivation. This practice represents an integrated farming approach that promotes nutrient recycling and reduces the accumulation of livestock waste. The use of organic fertilizer also contributes to improving soil fertility and reducing dependence on synthetic agricultural inputs.

Water quality management also received a score of 4, indicating favorable sanitation conditions. Most agricultural and livestock areas had adequate drainage systems that prevented water stagnation and reduced the risk of contamination. Proper water management is important because contaminated water can serve as a medium for the spread of pathogens and negatively affect both agricultural productivity and environmental quality.

Biosecurity practices received the lowest score (3) among the assessed indicators. Although basic preventive measures such as routine cleaning and limited control of livestock movement were implemented, more comprehensive biosecurity procedures, including regular disinfection and disease monitoring, were not consistently practiced. Strengthening biosecurity measures is important to minimize the risk of disease transmission and improve livestock health management.

Environmental conditions surrounding the agricultural and livestock activities were generally good, as indicated by a score of 4. The study area showed minimal waste accumulation, limited odor problems, and relatively clean surroundings. These findings suggest that the sanitation practices implemented by farmers and breeders have contributed positively to environmental health by reducing pollution risks and maintaining the quality of natural resources.

The results indicate that sanitation practices in Hiyung chili farming and cattle farming in Tambarangan Village have been implemented effectively and provide positive contributions to environmental health. The integration of livestock and agricultural activities through the utilization of cattle manure as organic fertilizer demonstrates a sustainable approach to waste management. Nevertheless, improvements in biosecurity implementation and continued sanitation awareness among farmers and breeders are needed to further enhance environmental sustainability and agricultural productivity.

5. Conclusion

The implementation of sanitation practices in Hiyung chili farming and cattle farming in Tambarangan Village, South Tapin Regency, was categorized as good, achieving an overall sanitation score of 80%. The

results indicate that farmers and livestock breeders have generally implemented appropriate sanitation measures, particularly in facility cleanliness, waste management, water quality management, and environmental maintenance. The utilization of cattle manure as organic fertilizer in Hiyung chili cultivation also demonstrates an integrated and sustainable farming system that supports nutrient recycling and reduces environmental pollution.

Although the overall sanitation condition was satisfactory, biosecurity practices still require improvement to enhance disease prevention and livestock health management. Therefore, continuous efforts to strengthen sanitation awareness, improve waste handling systems, and implement more comprehensive biosecurity measures are necessary. Proper sanitation practices play an important role in maintaining environmental health, supporting agricultural productivity, and promoting sustainable agricultural and livestock development in Tambarangan Village.

6. References

- Bhatia, T., & Sindhu, S. S. (2024). *Sustainable management of organic agricultural wastes: Contributions in nutrients availability, pollution mitigation and crop production*. Discover Agriculture, 2, 130. <https://doi.org/10.1007/s44279-024-00147-7>
- Herrero, M., Henderson, B., Havlík, P., Thornton, P. K., Conant, R. T., Smith, P., Wirsenius, S., Hristov, A. N., Gerber, P. J., Gill, M., & Butterbach-Bahl, K. (2023). *Sustainable livestock production and its role in environmental health*. Nature Food, 4(5), 385–394.
- Kitchenham, B. (2004). *Procedures for Performing Systematic Reviews*. Keele University Technical Report TR/SE-0401. Keele University, United Kingdom.
- Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P. A., Clarke, M., Devereaux, P. J., Kleijnen, J., & Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: Explanation and elaboration. *PLoS Medicine*, 6(7), e1000100. <https://doi.org/10.1371/journal.pmed.1000100>
- Li, Y., Wang, H., Zhang, X., Liu, Q., & Chen, Z. (2024). *Biosecurity and sanitation management practices in livestock farming for disease prevention and environmental protection*. Frontiers in Veterinary Science, 11, 1352148.
- Militzer, N., McLaws, M., Rozstalnyy, A., Li, Y., Dhingra, M., Auplish, A., Mintiens, K., Sabirovic, M., von Dobschuetz, S., & Heilmann, M. (2023). *Characterising biosecurity initiatives globally to support the development of a progressive management pathway for terrestrial animals: A scoping review*. Animals, 13(16), 2672. <https://doi.org/10.3390/ani13162672>
- Pinto Jimenez, C. E., Keesstra, S., Tandon, P., Cumming, O., Pickering, A. J., Moodley, A., & Chandler, C. I. R. (2023). *Biosecurity and water, sanitation, and hygiene (WASH) interventions in animal agricultural settings for reducing infection burden, antibiotic use, and antibiotic resistance: A One Health systematic review*. The Lancet Planetary Health, 7(5), e418–e434.
- Zhang, L., Zhao, Y., Wang, J., & Sun, H. (2023). *Agricultural waste management and environmental sustainability: Recent advances and future perspectives*. Environmental Research, 224, 115524.