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Agricultural By-products for Sustainable Agricultural Use in Livestock Farming: Accessibility for Livestock and Poultry farmers in Southern Negros

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Abstract

This study explores the accessibility and feasibility of utilizing agricultural by-products specifically bagasse, molasses, cassava peels, cornmeal, and rice hulls as alternative livestock and poultry feed components for smallholder farmers in Southern Negros, Philippines. Using a quantitative-descriptive approach, the research involved surveys and field observations among farmers and feed retailers across Bayawan City and neighboring municipalities. Findings reveal that many farmers are already using agricultural by-products in their feeding practices, demonstrating a baseline familiarity with these materials. However, a considerable number remain limited by a lack of technical knowledge, inadequate access to processing tools, and minimal exposure to best practices in feed formulation. Despite these barriers, respondents widely acknowledged the practicality, affordability, and environmental benefit of adopting locally sourced by-products in livestock feeding. There is strong interest in the development of a community-based feed production facility that would improve supply accessibility and reduce dependence on high-cost commercial feeds. This study concludes that agricultural by-products have significant potential to enhance local feed systems, promote inclusive agricultural practices, and strengthen the economic resilience of farming communities in Southern Negros. The findings offer valuable insights for policymakers, agri-entrepreneurs, and development stakeholders aiming to improve feed accessibility through the better use of existing local resources.

Keywords: Agricultural by-products, livestock feed, rural sustainability, Southern Negros, livestock and poultry farming, molasses

Introduction

Agriculture serves as a backbone for many rural economies in the Philippines, particularly in Negros Oriental, where farming and livestock production are central to livelihoods. As one of the country's leading agricultural provinces, Negros Oriental depends heavily on this sector to ensure food security and employment, with Bayawan City recognized as its "Agricultural Capital." Known for its reliance on crop and livestock farming, Bayawan City exemplifies how agriculture drives local economic activity. However, this sector is increasingly burdened by the escalating costs of livestock feed and the inefficient management of agricultural waste. The Philippine Statistics Authority (PSA, 2020) highlights the significance of agriculture in fostering rural development, but challenges persist in optimizing its sustainability and profitability. The Department of Agriculture (DA, 2021) notes that agricultural by-products, such as rice hulls, bagasse (sugarcane residue), cassava peels, corn husks, and molasses, remain underutilized despite their potential as cost-effective, nutrient-rich livestock feed alternatives. Their continued neglect contributes to environmental degradation and limits opportunities for smallholder farmers to reduce input costs and increase income.

Recent studies underscore the need for sustainable agricultural practices to address these issues. Garcia et al. (2021) suggest that using agricultural residues for livestock feed can significantly lower production costs while reducing dependence on imported grains. Ghisellini et al. (2021) and the Ellen MacArthur Foundation (2020) emphasize the application of circular economy principles—such as resource recycling, reuse, and optimization—to mitigate waste, reduce emissions, and enhance value creation from agricultural by-products. Cruz and Domingo (2021) further advocate for community-driven approaches to empower rural stakeholders and integrate sustainability with economic growth. These findings highlight the potential of circular agricultural practices in addressing both economic and environmental challenges in rural communities.

Grounded in these insights, this study seeks to develop a circular economy framework to repurpose agricultural by-products into livestock feed in Bayawan City, Negros Oriental. The research will focus on identifying locally available agricultural residues, evaluating their economic, environmental, and technical feasibility, and understanding the benefits and challenges of establishing a feed processing enterprise. By involving local stakeholders, the study aims to design an inclusive and practical framework aligned with community needs. The research emphasizes the promotion of sustainable agriculture through reduced feed costs, improved waste management, and enhanced rural

livelihoods. Ultimately, it aims to create a scalable model that can be applied in other agricultural regions, contributing to broader efforts to strengthen the agricultural sector while addressing pressing environmental concerns.

Literature Review

The use of agricultural by-products in feed processing offers a sustainable solution to escalating feed costs and the issue of agricultural waste management. Recent studies highlight the nutritional benefits of cassava and cornmeal in animal diets, emphasizing their economic efficiency and compatibility as substitutes for conventional feed components. Cassava, rich in carbohydrates, serves as a potent energy source, while cornmeal provides essential nutrients such as starch, proteins, and lipids, enhancing livestock growth and productivity. However, proper processing of cassava peels is necessary to mitigate anti-nutritional elements, ensuring safety and effectiveness in feed formulations (Adeola & Eniola, 2021).

Molasses, a sugarcane by-product, is recognized for enhancing feed palatability and energy density. Research identifies molasses as a source of easily digestible carbohydrates and minerals, including calcium, potassium, and magnesium. Its natural sweetness boosts feed intake among livestock, making it a valuable additive in feed formulations. Molasses also facilitates the delivery of supplements, promoting animal health and productivity (Kumar et al., 2021).

Rice hulls, a widely available agricultural residue, are explored for their role as a fiber source in animal feed. Composed mainly of lignin, cellulose, and silica, rice hulls contribute to digestive health in ruminants. Although low in protein and energy, they provide bulk and support satiety when combined with nutrient-rich ingredients. However, excessive use may lead to digestive complications, necessitating careful feed formulation (Chavez & Santos, 2022).

Bagasse, the fibrous residue left after sugar extraction, emerges as a promising feed component. Studies reveal that treatments involving Lactobacillus, cellulose, and molasses enhance bagasse's nutritional value, improving digestibility and energy content. This innovation reduces feed costs and contributes to agricultural waste management (Garcia et al., 2023).

Advances in feed technology have also explored alternative by-products. Lim et al. (2023) demonstrated that banana peel flour, combined with molasses, serves as an effective feed ingredient, delivering energy and essential nutrients while reducing costs. Likewise, research on coconut meal highlights its high protein content, making it a suitable alternative to traditional protein sources (Rajaram et al., 2022).

Ramirez et al. (2022) observed that integrating locally sourced by-products into feed production significantly reduces reliance on expensive commercial feeds while maintaining livestock health. Zhang and Li (2021) demonstrated that processed rice hulls enhance ruminant digestion efficiency when appropriately incorporated into feed formulations. Gonzales et al. (2023) emphasized that combining molasses with fibrous residues improves livestock growth rates and feed conversion efficiency. These studies collectively validate the potential of agricultural by-products as sustainable solutions to feed production challenges.

The Department of Agriculture (DA, 2021) advocates for the strategic utilization of by-products in local feed production to mitigate rising conventional feed costs. Utilizing cassava, cornmeal, molasses, rice hulls, and bagasse allows rural communities to produce nutritionally balanced, cost-effective feeds. This strategy aligns with circular economy principles, enhancing economic resilience and environmental stewardship by reducing waste and optimizing resources.

Lopez et al. (2023) highlighted the potential of biochar derived from agricultural residues as a feed additive, improving feed conversion rates and lowering methane emissions in ruminants. Advances in bioprocessing technology, such as the fermentation of rice bran, have also been shown to enhance digestibility and nutrient availability (Tran & Nguyen, 2023).

These findings underscore the value of utilizing agricultural by-products to address feed production challenges, contributing to a sustainable agricultural economy in Bayawan City. This framework ensures efficient resource use, promotes economic inclusivity, and establishes a replicable model for other agricultural regions in Negros Oriental and beyond.

Agricultural By-product	**Nutritional Value**	**Traditional Farming Application**
Cassava pomace and peels	**Protein**: 2.0–3.0% **Fiber**: 12.015.0 **Carbohydrates (Starch)**: 70.0–80.0% **Fat**: 1.0–2.0% **Ash**: 2.0–3.0% **Minerals**: Calcium (0.03–0.05%), Phosphorus (0.01–0.03%), Potassium (0.20–0.25%)	Used in small-scale farming as an energy source for livestock, reducing feed costs in backyard farms
Cornmeal	**Protein**: 6.1–17.8% (avg. 11.4%) **Fiber**: 0.9–5.2% **Carbohydrates (Starch)**: 48.7–87.9% (avg. 66.7%) **Fat**: 3.7–7.3% **Ash**: 1.2–1.9% **Minerals**: Phosphorus (0.3–0.4%), Magnesium (0.1–0.2%), Potassium (0.2–0.4%), Zinc (0.003–0.005%)	Ideal for small backyard farms to supplement feed for chickens, pigs, and other small livestock
Molasses	**Protein**: 2.0–4.0% **Fiber**: Low **Total Sugars (Carbohydrates)**: 59.0–69.0% **Fat**: 0.3–0.8% **Ash**: 6.0–10.0% **Minerals**: Calcium (0.8–1.0%), Potassium (3.0–5.0%), Magnesium (0.3–0.5%), Iron (0.02–0.05%)	Used in backyard farming to improve feed palatability and energy content, especially for poultry and pigs
Rice Hulls	**Protein**: 2.5–3.5% **Fiber**: 41.8% **Carbohydrates (Lignin and Cellulose)**: 19.6–20.0% **Fat**: 1.0–1.5% **Ash**: 14.0–20.0% **Minerals**: Silica (15.0–20.0%), Calcium (0.02–0.03%), Phosphorus (0.01–0.02%)	Used in backyard farming for chicken bedding, composting, and as a roughage source for livestock; also used as a low-cost fuel source
Bagasse	**Protein**: 1.0–2.0% **Fiber**: 45.0–55.0% **Carbohydrates (NFE)**: 35.0–45.0% **Fat**: 0.5–1.0% **Ash**: 1.0–2.0% **Minerals**: Calcium (0.05–0.1%), Potassium (0.1–0.2%), Iron (0.01–0.03%)	Can be used in backyard farming as a supplemental roughage for ruminants like cows and goats; Primarily used as fuel in sugar mills, also serves as an energy source in small-scale operations

Table 1. A table that presents a framework for traditional farming applications, focusing on how agricultural by-products can be effectively utilized, their nutritional value, and their common uses. Data adapted from Philippine Society of Animal Nutritionists (2020) and Gerpacio, A. L., Castillo, L. S., & Castillo, C. P. (*n.d.*).

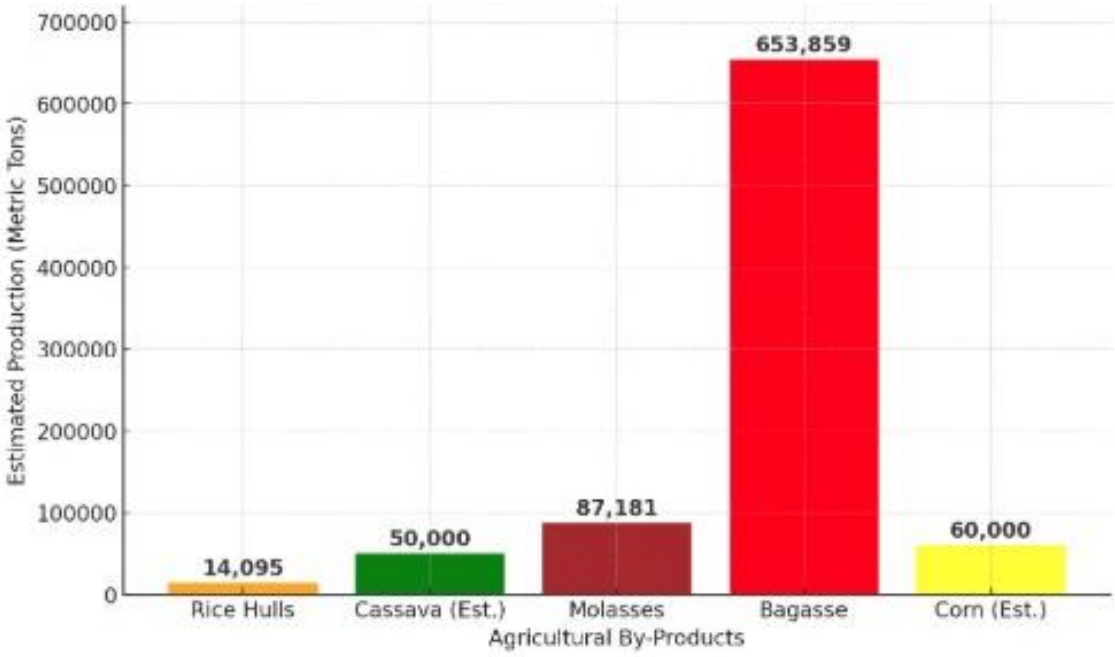

Figure 1. A graph illustrating the estimated production of agricultural by-products in Negros Oriental in metric tons. Data adapted from the Department of Agriculture (2025) and the Philippine Statistics Authority (PSA, 2024).

Methodology

This section outlines the systematic approach used to evaluate the utilization of agricultural by-products for sustainable agricultural use in livestock farming. A quantitative descriptive method is employed to assess technical, financial, and market factors. Data is collected through structured surveys on measurable indicators such as production costs, potential revenues, and market demand trends. Information is sourced from local farmers, raw material suppliers, and industry databases to ensure accuracy and relevance.

The study also details the process from the acquisition of agricultural by-products to the final feed production. The first stage involves sourcing raw materials, such as rice hulls, corn, cassava pomace and peels, bagasse, and molasses, from local farms and processing plants. These raw materials undergo an initial sorting and quality assessment to ensure they meet nutritional and safety standards. After collection, the materials are processed using techniques such as drying, grinding, fermenting, and pelleting to enhance digestibility and nutrient retention. Once processed, the ingredients are blended according to formulated feed ratios that balance protein, fiber, carbohydrates, and essential minerals to optimize livestock nutrition. The final step involves packaging and storage to maintain feed quality before distribution to farmers and livestock producers. This methodology ensures that the study comprehensively examines the process, from raw material acquisition to the production of nutrient rich, cost-effective livestock feed, contributing to the overall sustainability of the agricultural sector.

Research Design

This study adopts a quantitative descriptive research design to systematically evaluate the technical, financial, and market factors involved in the proposed livestock feed processing business. By employing this approach, the study aims to assess the viability and sustainability of the business, ensuring that its objectives are grounded in practical research and aligned with key industry standards. The research design provides a comprehensive framework for analyzing critical elements, contributing to the understanding of the potential success and challenges of the proposed business.

Research Environment

The research is conducted in Bayawan City and nearby municipalities such as Sta. Catalina, Basay, Siaton, Zamboanguita, and Tanjay City in Negros Oriental, an area known for its agricultural productivity and access to key raw materials. Bayawan City is strategically located, making it an ideal place for the proposed livestock feed processing facility. The city is home to two major sugar mills, Sta. Catalina Tolong Milling Corporation in Caranoche, Sta. Catalina, and HDJ Bayawan Agri-Venture Corp. in Bugay, Bayawan City, providing a steady supply of molasses and bagasse, while the surrounding region supports farming of corn and cassava. Bayawan City is centrally located, allowing easy access to livestock farmers in the city and neighboring areas such as Sta. Catalina, Basay, Siaton, Zamboanguita, and Tanjay City. Bayawan City, located in the southern part of Negros Oriental, Philippines, has a total land area of approximately 69,908 hectares, making it one of the largest cities in the province. A significant portion of this land, around 63%, is dedicated to agriculture, emphasizing the city's strong dependence on farming. The fertile plains and rolling hills of Bayawan are primarily used for cultivating sugarcane, rice, corn, and various high-value crops. Additionally, the city has areas dedicated to livestock and aquaculture, supporting its reputation as an agricultural hub in Negros Oriental.

The agricultural sector plays a crucial role in Bayawan's economy, with a large percentage of its population engaged in farming and agri-business. Many households rely on crop production, and livestock for their livelihood, either as small-scale farmers or as workers in large plantations. The area benefits from well-developed transportation networks, established farming communities, and strong local government support for agriculture, making it a suitable location for producing and distributing affordable, livestock and poultry feed.

Research Participants

A total of 100 livestock and poultry farmers from Bayawan City and nearby municipalities in Southern Negros participated in the study. Respondents included small- to medium-scale farmers engaged in backyard and mixed crop-livestock farming systems. A non-probability purposive sampling technique was initially employed to identify farmers with direct experience in utilizing or considering the use of agricultural by-products for feed. To expand the sample and ensure broader representation, snowball sampling was also applied, allowing early participants to refer other qualified individuals within their farming communities. This dual approach was appropriate given the specialized nature of the research and the need to access hard-to-reach populations with practical knowledge of feed practices. The sample size was deemed sufficient for qualitative insight and descriptive analysis of patterns and perceptions surrounding sustainable feed use in the region.

Research Instruments

1. Survey Questionnaires

The two survey questionnaires are original research instruments specifically designed to address the unique objectives of this research, which focuses on understanding the use of agricultural by-products in feed production, identifying challenges, and exploring potential solutions for sustainability in Negros Oriental. Both questionnaires include a Visayan translation to ensure accessibility for local respondents.

1.1 Survey Questionnaire for Livestock/Poultry Farmers

1.2 Survey Questionnaire for Feed Retailers

2**.** Observation Checklists**:** To assess raw material availability and production feasibility.

Research Procedure

The research will begin with preliminary planning to identify raw material suppliers and map key areas in Bayawan City and Sta. Catalina with high concentrations of livestock and poultry farms, as well as top feed retailers. Comprehensive questionnaires will be developed to address feed quality, affordability, and preferences. These will be distributed through a combination of physical visits and digital platforms, with the support of local agricultural offices or cooperatives to ensure wide reach and participation. Direct engagement with farmers and retailers during distribution will provide additional qualitative insights. Structured interviews with agricultural officers, feed production specialists, and business consultants will be conducted to gather technical and market-related knowledge. On-site observations of raw material sources and existing feed production facilities will evaluate logistical feasibility and operational requirements. The collected data will be cross-verified and analyzed to refine the feed production model and ensure its practicality and relevance to the local context.

Results

1.Profile of the Respondents

Table 1

Age Distribution of Respondents

Age Range	Count	Percent of Total (%)	Cumulative Percent (%)
20–29	11	11	11
30–39	23	23	34
40–49	32	32	66
50–59	28	28	94
60 and above	6	6	100

Note. Majority of respondents fall within the 40–59 age group, indicating an experienced farmer demographic.

Table 1 presents the demographic profile of the 100 livestock and poultry farmers from Bayawan City and Santa Catalina, Southern Negros. The majority of respondents fall within the 40–59 age bracket, suggesting a mature and experienced population actively engaged in farm management and decision-making processes. Gender distribution was fairly balanced, with a slight female majority, indicating inclusive participation in livestock production. Most farmers managed small to medium-scale farms with 10 to 50 animals, representative of rural, resource-sensitive agricultural systems.

The profile of these respondents implies that initiatives involving feed innovation, particularly those utilizing agricultural by-products, should be designed to respect existing practices while introducing accessible improvements. Tailored training programs can build on the farmers' existing knowledge base and promote collaborative gender-inclusive approaches. According to Ismail, Manalo, and Cruz (2022), experienced farmers show greater adaptive capacity when innovations are introduced through participatory learning strategies, which foster sustained behavioral change. Their findings also highlight that the inclusion of women in training and leadership roles in agriculture correlates with higher community adoption rates for sustainable technologies.

2. Availability and Utilization of Agricultural By-products

Table 2

Utilization of Agricultural By-products by Farmers

Use of By-products	Count	Percent of Total (%)	Cumulative Percent (%)
Uses	59	59	59
Does not use	41	41	100

Note. While many farmers already incorporate by-products into their practices, a considerable portion still does not.

Table 2 outlines the extent to which farmers in the study area utilize accessible agricultural by-products in their feed practices. The most common materials included bagasse, molasses, cassava peels, rice hulls, and cornmeal. Although many farmers have integrated these into their feeding systems, a significant number remain unacquainted with processing techniques or lack the tools necessary for formulation.
Most farmers sourced their feed from commercial suppliers rather than producing their own, but many also practiced forage integration, showing flexibility and interest in cost-effective alternatives. Conversely, feed retailers had not yet included agricultural by-products in their offerings, pointing to a disconnect between grassroots demand and commercial feed distribution channels.

This gap presents an opportunity to formalize the integration of by-products into local feed supply chains through education, policy support, and investment in micro-processing technologies. As underscored by Chukwuma et al. (2021), successful integration of agro-industrial residues into livestock feed hinges on knowledge dissemination and decentralized feed mixing units. Their study confirms that locally sourced feed components reduce dependency on expensive commercial brands and improve feed sovereignty among smallholder farmers.

3. Perceived Feasibility of By-product-Based Feed

Table 3

Perception on Feed Pricing and Local Material Importance

Criteria	Agreement (%)
Affordable at ₱40/kg	93
Importance of Local Materials	90

Note. High agreement indicates a strong preference for affordability and local sourcing in feed production.

Table 3 reflects respondents' perceptions regarding the viability of using agricultural by-products as a cost-effective feed alternative. The majority of farmers highlighted the unaffordability of commercial feeds as a pressing concern, particularly during off-seasons. A ₱40/kg price point was widely accepted as reasonable. Furthermore, there was strong agreement on the importance of using locally available materials to reduce costs and environmental impact. Feed retailers expressed parallel concerns regarding pricing and supported the idea of a community-based feed facility, provided the products meet acceptable standards.

These findings affirm the feasibility of implementing a by-product-based feed initiative, especially if quality assurance, pricing, and supply consistency are addressed.
As highlighted by Mendoza and Yu (2023), localized feed production using agricultural residues can significantly reduce input costs and stabilize supply chains if matched with government-supported infrastructure and quality control protocols. Their research reinforces the role of decentralized feed systems in improving rural feed access while creating new economic opportunities.

4. Perceived Benefits of a By-product-Based Feed Enterprise

Table 4

Monthly Feed Expenses of Farmers

Monthly Feed Expense (₱)	Count	Percent (%)
Less than 2,500	47	47
2,500–5,000	40	40
More than 5,000	13	13

Note. Most farmers operate within a limited feed budget, emphasizing the need for low-cost alternatives.

Table 4 summarizes the perceived socio-economic benefits of establishing a localized feed processing facility. Both farmers and feed retailers showed strong support for such an enterprise, particularly due to its potential to offer species-specific feed, lower costs, and employment generation. Most respondents reported monthly feed expenses below ₱5,000, underlining the importance of affordability.
Farmers expressed interest in species-specific feed options that cater to their production needs, especially those managing poultry, swine, and cattle. Moreover, respondents highlighted the employment opportunities such a facility would generate, with many showing willingness to participate in cooperatives or skills training programs linked to feed processing and distribution.

This collective interest underscores the socio-economic potential of the initiative to contribute to local livelihood development and community resilience.
The alignment of economic need and social participation creates a conducive environment for sustainable feed models. According to Villanueva et al. (2024), community-managed feed enterprises can promote inclusive development, enhance local income generation, and build regional supply resilience, especially when supported by training and cooperative governance. Their findings validate the notion that participatory rural models offer a strong foundation for circular feed initiatives in resource-sensitive contexts.

5. Anticipated Challenges in Implementation

Table 5

Challenges Identified by Farmers and Retailers

Concern Area	Percent Affected (%)
Technical Training Needed	85
Credit Terms	68
Willingness to Switch Suppliers	76

Note. The need for training and flexible financial systems is critical to successful adoption.

Table 5 highlights key challenges identified by stakeholders in adopting by-product-based feed systems. Farmers emphasized the urgent need for technical training in formulation, mixing, and preservation, while retailers raised concerns about supply consistency and financial arrangements such as credit terms.
Many retailers offer credit to clients, revealing the importance of financial flexibility within the system. Additionally, they noted their openness to switching suppliers if alternative feeds were cheaper and maintained quality, showing a strong market-based motivation for innovation.

Addressing these challenges will require a holistic approach that combines technical training, value chain support, and inclusive financing mechanisms. As noted by Sari and Tan (2021), knowledge gaps in feed processing remain one of the top constraints in smallholder feed adoption, which can be mitigated through extension services, public-private partnerships, and mobile feed labs. Integrating these solutions into local systems would not only improve technical uptake but also bolster the business model's market appeal.

6. Differences in Perception Based on Demographics

Table 6

Openness to Adoption Based on Farming Experience

Years of Experience	Openness to Adopt (%)
Less than 5 years	60
5–10 years	75
More than 10 years	88

Note. Farmers with more experience are more receptive to feed innovation strategies.

Table 6 presents respondent openness to adopting by-product-based feeds as influenced by demographic variables such as age, sex, and years of farming experience. The findings suggest minimal differences by sex or age, but greater willingness among more experienced farmers to adopt innovative practices.
This insight suggests that while general acceptance is high, targeted support for younger or newer farmers may enhance adoption rates. Mentorship programs or experiential learning modules could bridge the gap in technical familiarity and encourage broader engagement in sustainable feed practices.

The correlation between experience and openness to innovation supports the findings of Kim, Velasco, and Garcia (2020), who argued that exposure to real-world agricultural challenges strengthens farmers' willingness to adopt unconventional but practical solutions. They emphasized that experience-based learning fosters critical thinking, especially when transitioning to circular or resource-recovery systems in agriculture.

Discussion
The findings of this study affirm the strong potential of agricultural by-products to supplement or even replace conventional livestock feed in rural, resource-constrained settings. A significant portion of respondents recognized the cost-saving benefits of using materials such as bagasse, molasses, cassava peels, and rice hulls. These by-products, often treated as waste, present not only an affordable alternative to commercial feeds but also a means to mitigate agricultural waste accumulation. The environmental value of this approach aligns with broader sustainability goals, especially in regions such as Southern Negros, where the agricultural economy generates substantial residues with untapped feed potential.

Despite the clear benefits, challenges remain in fully realizing the potential of agricultural by-product utilization. A considerable number of respondents—both farmers and feed retailers—cited a lack of access to feed processing technologies and technical knowledge as significant barriers to adoption. This reflects broader systemic limitations

identified in other developing agricultural contexts. As Wilson (2020) noted, the success of circular economy models at the grassroots level often depends on localized capacity-building, including hands-on training, demonstration sites, and technical assistance. Addressing these barriers is essential to ensure equitable participation and maximize the practical adoption of sustainable practices.

Furthermore, the study underscores the importance of decentralizing feed production systems. Stakeholders expressed strong interest in establishing a local feed processing facility—an idea also supported by Smith et al. (2019), who advocated for community-based feed operations to reduce reliance on distant commercial suppliers. Such local facilities offer benefits beyond cost reduction, including supply chain resilience, improved feed customization for local livestock needs, and job creation. When combined with farmer cooperatives or partnerships with local governments, these enterprises can be scaled sustainably and managed inclusively.

The findings also suggest that experience plays a pivotal role in shaping perceptions of feasibility and sustainability. More experienced farmers—those managing a greater number of animals or with longer years in the industry—showed higher receptivity to using agricultural by-products. This aligns with the conclusions of Tran and Nguyen (2023), who found that experiential knowledge positively influences openness to sustainable innovations. Therefore, engaging seasoned farmers as peer trainers or champions of by-product feed use could catalyze broader community adoption, particularly among younger or less experienced practitioners.

Lastly, this study contributes empirical evidence to circular economy frameworks proposed by Ghisellini et al. (2016) and the Ellen MacArthur Foundation (2013). By grounding theoretical principles in the practical realities of Southern Negros, this research showcases how a circular agricultural model can simultaneously address economic, environmental, and social dimensions. It validates the relevance of circular principles in real-world farming contexts and emphasizes the critical need for integrated strategies that combine feed innovation with market-based solutions and inclusive stakeholder participation.

Conclusion

This study affirms the strong potential of agricultural by-products to serve as sustainable, cost-effective alternatives to conventional livestock feed in Southern Negros. The majority of farmers and feed retailers expressed clear support for utilizing materials such as molasses, bagasse, cassava peels, rice hulls, and cornmeal, recognizing their economic and environmental value. Notably, there was unanimous backing for the establishment of a local feed processing facility, alongside high levels of interest in job creation, training, and community-driven initiatives. These responses highlight a strong sense of local readiness and enthusiasm for transitioning to circular agricultural practices that reduce feed costs while maximizing the use of locally available resources.

The study also underscores the viability of circular economy principles in real-world farming systems. The integration of by-products into the livestock feed supply chain offers multiple benefits: lowering production costs, enhancing farm productivity, reducing waste, and fostering local innovation. The proactive attitude of farmers—especially those with more experience—toward adopting sustainable practices illustrates a valuable foundation for future feed initiatives. With proper formulation, training, and community engagement, the region is well-positioned to become a model for sustainable livestock feeding solutions rooted in environmental stewardship and economic resilience.

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