



Cross-sector collaboration between ranchers and farmers in waste utilization to achieve sustainable food

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ABSTRACT

Background: Indonesia's food security still faces various obstacles, including a meat production deficit, feed price fluctuations, and declining soil quality due to the use of chemical fertilizers. This study aims to review opportunities for collaboration between farmers and ranchers in the utilization of waste to support a sustainable food system. **Methods:** This study uses a descriptive qualitative approach through literature study and conceptual analysis, examining scientific sources related to food security, waste utilization, and the integration of agriculture and animal husbandry. **Findings:** The utilization of livestock manure as organic fertilizer and corn stalks as silage feed increases resource efficiency and also demonstrates environmental awareness, such as improving soil quality and reducing dependence on imported fertilizers and feed. Collaboration through the KPPKP Food Security Care Farmer-Livestock Breeder Group strengthens relationships between policy makers, academics, and the community in supporting sustainable production. **Conclusion:** The integration of waste utilization between farmers and ranchers has the potential to strengthen national food security through the optimization of local resources. **Novelty/Originality of this article:** This study proposes a model of cross-sector collaboration based on structured waste utilization through the KPPKP institution as a strategic link between all parties.

KEYWORDS: food security; meat production; farmers.

1. Introduction

Livestock farming plays a crucial role in ensuring global food security (Azis et al. 2024). The link between food security and the food production sector cannot be ignored, because food security cannot be achieved by relying solely on imported markets without empowering local markets to meet the consumption needs of a country's population. Strong food security is not only an indicator of a nation's welfare but also a reflection of the country's resilience in facing various crises. Therefore, food security in every country must be given serious attention, but Indonesia still faces various obstacles that make food security increasingly difficult to achieve. Based on Law No. 18 of 2012 concerning food, food security is a condition in which food is available for the country and individuals, reflected in the availability of sufficient food, both in terms of quantity and quality, that is safe, diverse, nutritious, evenly distributed, and affordable, and not contrary to the religion, beliefs, and culture of the community, in order to live healthy, active, and productive lives

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in a sustainable manner. Based on data from the Ministry of Agriculture, beef production and consumption in Indonesia from 2023 to 2027 is expected to experience a deficit. In 2023, beef and buffalo production is projected to have a deficit of 286,200 tons (Pusat Data dan Sistem Informasi Pertanian, 2023). In 2024, with an estimated beef production of 416.7 thousand tons plus buffalo meat of around 16.2 thousand tons, the total supply will be 432.9 thousand tons, while national consumption is estimated to reach 724.2 thousand tons, resulting in a meat deficit of 291.3 thousand tons. In 2025, 2026, and 2027, meat deficits are still expected to occur, amounting to 294.5 thousand tons, 288.3 thousand tons, and 279.1 thousand tons, respectively. This is a worrying situation, considering that Indonesia is only able to meet 60.77% of its total needs. The current high price of beef is a result of the imbalance between production and high public demand for beef. In addition to beef production not meeting domestic demand, cattle from production centers are not well distributed to consumer areas (Chafid, 2023).

The livestock sector is the most limited food supply sector, especially in the field of ruminants. Food security is not only determined by the level of availability, but also by ease of access and control, without dependence on unstable import markets. In the import process, control is held entirely by the supplier, which means that it is very possible for the supplying country to be reluctant to provide its products to the importing country (Zulaeha et al., 2024). Most farmers in Indonesia are classified as smallholder farmers who still use traditional methods on a relatively small scale. In managing their businesses, smallholder farmers often face various problems, such as a lack of government support for access to quality feed and the stability of conventional feed prices. Feed is a major factor in the livestock production process. However, fluctuating feed prices are an obstacle for smallholder farmers in obtaining high-quality feed. Fluctuations in feed prices, which are a major component of production costs, are one of the major problems facing this sector. Changes in feed prices directly impact production efficiency and farmer profits because feed accounts for 60-70% of production costs. Dependence on imported raw materials such as corn, soybeans, and fish meal is one of the many causes of feed price increases in Indonesia. Feed prices are highly dependent on trade policies, currency exchange rates, commodity price increases in the global market, and this dependence. However, fluctuating feed prices are an obstacle for smallholder farmers in obtaining high-quality feed. Small farmers often face concerns about feed quality or seek cheaper feed, but this poses a high risk to their livestock. Alternative feeds such as fermented local materials and agricultural waste have been used, but further research is needed to ensure their effectiveness.

These obstacles are not only found in the livestock sector but also in the agricultural sector. In addition to unstable crop prices, fertilizer shortages and soil damage due to the use of chemical fertilizers are becoming increasingly alarming. Professor Iswandi Anas Chaniago of IPB University revealed that 72 percent of agricultural land in Indonesia is currently unhealthy due to a lack of organic matter (Dirman 2022). Indonesia, which is essentially an agrarian country, seems to have lost its grip. These various problems have made the younger generation reluctant to continue farming in this country. If this continues, it is not impossible that Indonesia will experience a shortage in food production, which will have a direct impact on national food self-sufficiency. Data from the Central Statistics Agency/*Badan Pusat Statistik* (BPS) shows that the number of young people aged 16-30 working in the agricultural sector continues to decline, from 20.79% in 2017 to 18% in 2022, and in 2023, the number of millennial farmers will only be 21.93% of the total number of farmers (Zakari et al., 2025.)

However, to support this principle, strong policies and effective collaboration between the government, academics, and industry players are needed. The goal of this community service activity is to analyze issues related to animal feed and agricultural fertilizers. This activity evaluates the relationship between the use of agricultural raw materials for animal feed and the availability of organic fertilizers and the sustainability of agricultural systems, as well as discussing the roles of livestock farmers, farmers, the government, and strategies for optimizing local resources. Thus, it is hoped that this group can contribute to the development of sustainable agricultural and livestock systems. The various activities and

experiences that have been carried out are the main points that led to the creation of this idea.

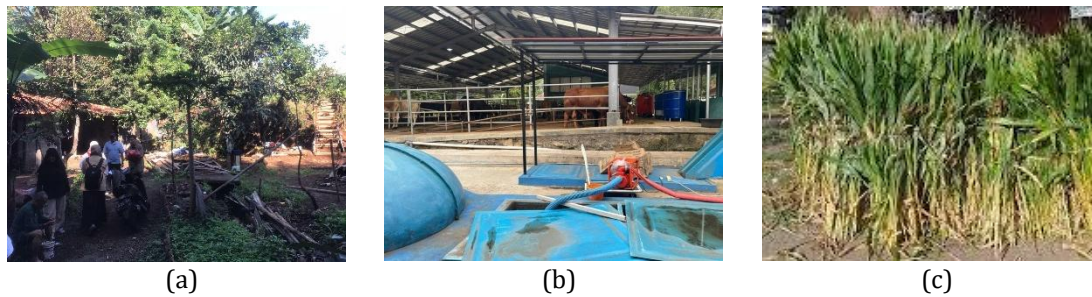


Fig. 1. Activities: (a) community outreach; (b) utilization of waste cow manure at Vocational School into compost fertilizer; (c) corn

2. Methods

A descriptive qualitative approach was used with literature study and conceptual analysis methods to estimate and plan the extent to which KPPKP's capabilities could be successful. The main objective of this group of farmers and ranchers concerned with food security was to assess the potential for collaboration between farmers and ranchers in utilizing agricultural and livestock waste to support sustainable food security. The data used consisted of secondary data and scientific references. Data were collected through systematic literature review, namely by searching, identifying, and selecting relevant literature using the keywords "food security," "collaboration between farmers and ranchers," "utilization of agricultural waste," and "corn silage." The data obtained was analyzed using qualitative descriptive analysis, which consisted of selecting and filtering important information relevant to the research focus, compiling the findings in narrative form, tables, or charts illustrating the relationship between the livestock and agricultural sectors, and interpreting the review results to produce a conceptual model of sustainable collaboration between farmers and livestock breeders. This study focuses on the context of food security in Indonesia, reviewing the conditions of smallholder farmers and livestock breeders in various regions. The activity was conducted as a desk study during the period of July-August 2025. This activity is based on the concept of integrated farming, where livestock waste is used as organic fertilizer for agriculture, and agricultural waste (corn stalks) is used as animal feed. This system creates a mutualistic relationship that contributes to resource efficiency with the hope of increasing productivity and strengthening national food security.

3. Results and Discussion

Synergistic relationships between various actors are a fundamental prerequisite for sustainable farmer and rancher empowerment. In this context, the Farmer and Rancher Group for Food Security/*Koalisi Rakyat untuk Kedaulatan Pangan (KPPKP)* serve as a strategic coordination center that bridges interests, resources, and knowledge across sectors. On the upstream side, KPPKP involves government agencies and academics who play a role in policy formulation, regulatory framework provision, and research-based knowledge development. Meanwhile, on the downstream side, KPPKP oversees farmers, ranchers, and communities as the main actors who deal directly with the realities of food production, distribution, and consumption.

The main role of KPPKP lies in its ability to facilitate two-way information flow between policymakers and field actors. Through this mechanism, the needs, challenges, and aspirations of farmers and ranchers can be articulated systematically, so that the policies and programs designed are not merely top-down, but responsive to empirical conditions. This ensures that communication can continue uninterrupted from upstream to

downstream. On the other hand, the community acts as both beneficiaries and providers of social feedback, enabling continuous evaluation of the impact of KPPKP programs. The continuous interaction between these actors forms a pattern of multi-stakeholder collaboration that collectively promotes the welfare of farmers, ranchers, and the wider community.

The Farmer and Rancher Group for Food Security/*Koalisi Rakyat untuk Kedaulatan Pangan (KPPKP)* promotion strategy is designed to reach various actors through an integrated offline and online approach. The combination of these two approaches is important to ensure that information is received evenly, both by farmers and ranchers in the field and by stakeholders outside the community. The offline promotion strategy focuses on direct interaction and strengthening community networks. KPPKP utilizes face-to-face forums such as farmer and rancher group meetings, village deliberations, and extension activities as the main media for socialization. The online promotion strategy is aimed at expanding the reach of information and increasing KPPKP's exposure in the digital space. Social media such as WhatsApp Groups, Facebook, Instagram, and YouTube are used to disseminate information on activities, training announcements, and documentation of the successes of farmers and ranchers.

As a basis for understanding the role and dynamics of collaboration in the Farmer and Rancher Group for Food Security/*Koalisi Rakyat untuk Kedaulatan Pangan (KPPKP)*, it is necessary to map the actors or stakeholders who are directly or indirectly involved. Each actor has complementary functions, interests, and contributions in supporting the sustainability of the KPPKP program. The relationships between these stakeholders form a collaborative system that enables the exchange of information and resources, as well as participatory decision-making. Therefore, the identification and analysis of stakeholders is an important step in describing the coordination structure, interaction patterns, and communication flows established within the KPPKP. The mapping of KPPKP stakeholders can be seen in the following figure:

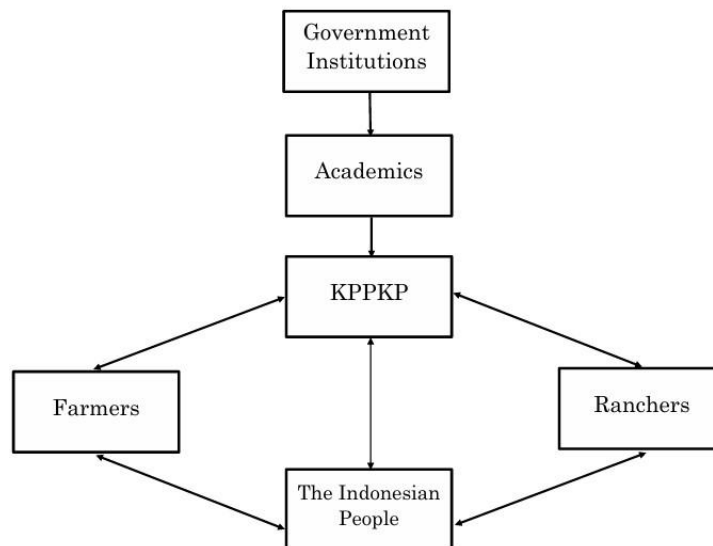


Fig. 2. Stakeholders: Farmers and ranchers concerned with food security

The existence of various stakeholders in the Farmer and Rancher Group for Food Security/*Koalisi Rakyat untuk Kedaulatan Pangan (KPPKP)* reflects food security governance that cannot be resolved on a sectoral basis. The relationships between these stakeholders form a collaborative system that requires coordination, alignment of roles, and structured communication. In this context, KPPKP functions as a hub connecting the interests and objectives of the sectors involved. Each stakeholder operates within their respective roles but remains connected through a common framework facilitated by KPPKP. The involvement of various roles in a single collaborative forum strengthens KPPKP's

position as an organization working towards national food security. This approach emphasizes that the success of food security is largely determined by the ability of these roles to build coordinated cooperation.

3.1 Government institutions

The government has a strategic role in supporting the implementation of the Farmer and Rancher Group for Food Security/*Koalisi Rakyat untuk Kedaulatan Pangan (KPPKP)* program. Indonesia is a country where most of the population lives in rural areas, so agriculture not only provides essential food for millions of people but also serves as the backbone of the national economy (Ade et al., 2024). It is imperative for the government to participate in ensuring food security, and therefore KPPKP is present as an option to serve as a bridge or implementer of government policies to continue to fight for national food security. The government can play various roles, one of which is as a provider of various facilities that support increased production and cooperation at various levels of society, such as providing distribution posts or procuring logistics transportation equipment. In addition, the formulation of policies that support the implementation of these programs, training, provision of capital and market access, and assistance to academics are steps that must be taken by the government so that the implementation of the KPPKP work program runs optimally and has a real impact. The government has several roles in community empowerment, namely as a regulator, dynamizer, facilitator, and catalyst (Hidayat et al., 2025)

The regulations made by the government must be able to encourage collaboration between various parties and ensure the creation of a conducive environment so that policies can be considered to be in favor of farmers and ranchers, while also encouraging various parties to strengthen the production and marketing chain. In the future, policies that favor farmers and ranchers will encourage and motivate them to continue to promote and support production towards food self-sufficiency. Thus, the existence of KPPKP can develop optimally, increase productivity, and contribute directly to various things that support the realization of national food security. Article 3 of Law No. 18 of 2012 concerning Food stipulates that food management must be carried out to meet basic human needs by providing benefits in a fair, equitable, and sustainable manner based on food sovereignty, food independence, and food security (Identitas Unhas, 2025). Without the participation of the government, this program will be difficult to grow and develop because the government is not only the enabler of food security but also the executor and the most responsible party.

3.2 Academics

The role of academics in the implementation of KPPKP is dualistic, encompassing both academic oversight and active participation in supporting the effectiveness and sustainability of the program. This dual role positions academics not only as supporting actors, but also as guarantors of scientific quality and policy rationality at the implementation level. Within this framework, academics consist of two main groups students and lecturers who have different but complementary functions in creating synergy between knowledge development and field practice based on community needs.

Students act as social agents and innovators who contribute to strengthening programs through the application of theoretical, methodological, and technological knowledge acquired during the academic learning process. Student involvement in KPPKP reflects an experiential learning approach, which emphasizes the importance of learning based on direct experience to integrate theory with practice in a contextual manner. Through this role, students are not only involved in technical activities but also function as agents of change who promote public awareness of the importance of balanced nutrition, healthy consumption patterns, and the use of technological innovations in local food systems. Thus, student contributions expand the dimensions of the KPPKP program from mere production intervention to transforming community behavior and knowledge.

Meanwhile, lecturers perform the function of academic supervisors and scientific mentors who ensure that student involvement is carried out in accordance with scientific standards, professional ethics, and the strategic objectives of KPPKP. This role is in line with the principle of scholarly supervision, which emphasizes that academic mentoring is not only administrative in nature but also includes critical, reflective, and evidence-based guidance. Through this role, lecturers contribute to maintaining the quality of program interventions so that they do not deviate from the relevant theoretical and empirical frameworks, while also ensuring that field activities produce measurable and sustainable impacts. In a broader context, lecturer involvement affirms that food security is a collective responsibility involving not only the government and key players in the agricultural sector, but also academics, industry, and other non-state actors who play a role in innovation and food system development (Romadhona et al., 2025).

In addition to the individual roles of students and lecturers, academics institutionally contribute strategically through research-based extension and knowledge dissemination activities. These extension activities serve as a knowledge transfer mechanism that disseminates the latest scientific findings on collaborative practices between farmers and ranchers, agricultural innovations, agroecological approaches, and community-based partnership models. Various studies show that this kind of evidence-based approach plays an important role in increasing the adaptive capacity of communities while strengthening the sustainability of the agriculture and livestock sectors. Thus, the role of academics in KPPKP is not only supportive, but also a strategic element that ensures the program runs effectively, is adaptive to local dynamics, and is oriented towards strengthening community capacity in the long term.

3.3 Farmers and ranchers concerned with food security

The Farmer and Rancher Group for Food Security/*Koalisi Rakyat untuk Kedaulatan Pangan (KPPKP)* was established with the aim of becoming a major actor in bridging and facilitating collaboration between ranchers and farmers under government supervision and supported by academic expertise. The KPPKP logo represents the mutually beneficial relationship in a sustainable agriculture and livestock system. The yellow color symbolizes corn as the main commodity produced, while the green color represents manure waste that is reused as organic fertilizer to improve soil fertility and avoid excessive chemical fertilizers. The hand element in the logo reflects the concept of mutualism, namely the reciprocal interaction between farmers and ranchers in optimizing resources and protecting the environment through waste management and mutual support to create an efficient system for achieving food security. Overall, this logo emphasizes the principle of sustainability through efficient resource utilization, waste reduction, and strengthening harmonious relationships between humans and ecosystems. On the other hand, the Farmer and Rancher Group for Food Security/*Koalisi Rakyat untuk Kedaulatan Pangan (KPPKP)* is the direct executor in realizing the symbols contained therein.



Fig. 3. Logo of Farmers and Ranchers Concerned with Food Security

Farmer and Rancher Group for Food Security/*Koalisi Rakyat untuk Kedaulatan Pangan (KPPKP)* will identify through data collection and embrace or recruit farmers and ranchers who are then grouped together. KPPKP will create a pattern of cross-collaboration between ranching groups and farming groups so that resources can be utilized evenly without shortages or surpluses in each region, if the farming group in region A has a population of 1.000 livestock units that can produce 1000 kg of manure per day, then the livestock group will be paired with a farmer group that needs and can use the manure as fertilizer in the amount produced by livestock group A, considering various other factors such as the distribution process. This step will produce a scheme that encourages resource optimization. In addition, an equally important role is to provide scientific education to farmers and livestock breeders who are members of these groups in terms of cultivation processes, both farming and livestock breeding, business, and waste management before distribution to cross-sectors, so that errors or mistakes in the management process can be minimized from the outset, thereby ensuring sustainability through a focus on improvement and development towards a better future. The hope is that farmers will not need to worry about high feed prices or the availability of forage on their land because forage will be supplied from agricultural waste, allowing farmers to focus on development and cultivation of their livestock. For farmers, the use of expensive chemical fertilizers that damage the soil can be minimized and replaced by organic fertilizers from livestock manure supplied by farmers. Although it cannot replace all the needs of both sectors, the reduction and optimization of initial raw materials will greatly benefit the progress of both sectors.

For the community, KPPKP can be an agent that provides direct benefits through education and social action so that the community can gain a new perspective in assessing a phenomenon that occurs and can also participate in building the market as smart and healthy consumers. Thus, food security can begin with the community and then continue to spread to the highest levels. The community must also be involved in educating the younger generation to move towards a better direction, starting from home, so that intelligent, healthy, and high-quality generations can continue to be born and grow up in this country. The next great generation will give birth to innovation and continue ideas and hopes in responding to various challenges that continue to evolve with the times. Thus, the hope for national food security can be driven to continue toward realization and contribute to advancing Indonesia's vision for 2045.

3.4 Ranchers

One business sector that plays an important role in the Indonesian economy, particularly in supporting food security and providing sources of animal protein for the community (Lastri et al., 2025). The livestock sector contributes significantly to supporting national food security, particularly through the provision of animal protein such as meat, eggs, and milk produced by small household-based livestock farmers. Commodities such as beef cattle, goats, native chickens, and ducks are local sources of protein that not only meet consumption needs but also serve an economic function for farming households (Irma et al., 2025). Farmers play an important role in supporting the national food security system. However, the contribution of smallholder livestock farming to food security has not been optimal due to various constraints, such as limited feed, high production costs, animal diseases, and a lack of technological support.

Smallholder farmers often face difficulties in obtaining quality feed at affordable prices, which results in low livestock productivity (Irma et al., 2025). Limited access to quality feed not only affects livestock growth and production performance but also has implications for the overall efficiency of smallholder livestock businesses. On the other hand, raising cattle is very profitable, as it not only produces meat or milk but also manure. Cattle manure has economic value because it is an organic fertilizer needed by all types of plants (Mirnadi & Hartati, 2017). Cattle farming waste is generally not managed properly, and many farmers even dump waste directly into public waterways. Problems like this have a direct impact on the environment and trigger environmental pollution (Fidela et al., 2024). The advantages

of manure are that it can increase humus, improve soil structure, and increase the life of decomposing microorganisms (Mirnadi & Hartati, 2017).

In the context of collaboration between livestock farmers and crop farmers, the distribution of livestock manure to crop farmers is a highly strategic program. Livestock manure, which has long been considered waste, has high value as organic fertilizer for agriculture. Livestock farming, as a sub-sector of agriculture, continues to make a positive contribution to Indonesia's Gross Domestic Product (GDP) growth (Lastri et al., 2025). The contribution of the agricultural sector to GDP growth is 13.33%. From an analysis of the role of the agricultural, forestry, and fisheries sectors in GDP, it can be seen that the largest contribution comes from the agricultural, livestock, and essential services subsectors at 77%. The livestock sub-sector itself contributes 1.5% to the agricultural sector according to constant prices (BPS, 2025). Therefore, synergistic collaboration between livestock farmers and crop farmers is needed so that it can have a positive impact on both parties. The distribution process of livestock waste can be carried out in a planned and sustainable manner through organizational forums, such as the Farmer and Livestock Farmer Group for Food Security. Through this collaboration, livestock farmers benefit because the livestock waste produced can be distributed and utilized optimally. This synergy creates a mutually beneficial relationship

The role of livestock farming is not limited to the management of livestock but also contributes to the sustainability of the agricultural sector. This shows that livestock farmers play a role in the provision of animal foodstuffs such as beef. Meanwhile, the domestic cattle population cannot meet the needs of Indonesia's population, so beef imports are needed to meet the demand for animal protein (Prasetywati & Basuki, 2019). Therefore, the role of farmers in distributing livestock manure to farmers and receiving corn silage from farmers through the Farmer and Livestock Breeder Group for Food Security is a concrete step in strengthening national food security. This collaboration not only increases the efficiency of local resource utilization but also strengthens social relations between farmers and livestock breeders. Collaboration between livestock farmers and farmers plays an important role in creating a sustainable integrated agricultural system. Through this system, livestock waste is processed into organic fertilizer, while agricultural products such as corn are used as high-protein animal feed. This mutually supportive cycle not only reduces dependence on imported fertilizers and feed but also reduces food imports.

3.5 Farmers

Farmers occupy a strategic position in the farmer-farmer collaboration scheme facilitated by Farmer and Rancher Group for Food Security/*Koalisi Rakyat untuk Kedaulatan Pangan (KPPKP)*. Farmers act as primary food producers and also as providers of essential inputs for the livestock sub-sector. This dual role places farmers as key actors in the integrated national food security system. From a sustainable food system perspective, long-term food crop production is highly dependent on effective, adaptive, and sustainable soil fertility management, particularly through fertilization practices that are not only oriented towards short-term yield increases but also towards soil resource conservation. Integrated farming systems that combine crops and livestock have been shown to improve soil aggregate structure, increase soil carbon and nitrogen content, and enhance microbial diversity, which is crucial for soil nutrient cycles. The results of this study show the long-term benefits of integrated systems for soil health compared to conventional crop rotation (Bansal et al., 2022).

High dependence on chemical (inorganic) fertilizers remains a dominant characteristic of conventional agricultural practices. Various scientific studies show that intensive and repeated use of inorganic fertilizers can trigger a decline in soil quality, including a decrease in organic matter content, disruption of nutrient balance, and a decline in soil biological activity. The integration of crops and livestock in cultivation systems can result in up to three times more organic carbon accumulation in the soil compared to crop-only systems. This supports the goal of climate change mitigation through increased soil carbon stocks

while improving soil fertility and productivity (Embrapa, 2023). Evidence from research on rice paddies shows that the combined use of organic and inorganic fertilizers is significantly more effective in maintaining and improving soil chemical properties such as pH, organic carbon content, and the availability of macro nutrients (N, P, and K) than the use of inorganic fertilizers alone. Specifically, a 75% proportion of organic fertilizer use was reported to yield the most optimal results in maintaining soil quality and crop productivity. These findings are reinforced by a systematic review showing that the application of compost and manure can improve soil structure, increase cation exchange capacity (CEC), maintain soil moisture, and stimulate the activity of soil microorganisms that play an important role in the nutrient cycle (Murtina & Taher, 2021).

The integration of the agricultural and livestock subsectors offers a more ecologically and economically sustainable approach. Livestock manure, which is often viewed as a problematic residue, can be processed through composting and reused as organic fertilizer. Scientific studies show that fertilization systems in ICLS not only improve soil quality in physiological and chemical terms but also increase crop and livestock productivity through more optimal soil microbial activity and nutrient use efficiency (Simões et al., 2025). Various studies show that livestock manure-based compost contributes to improving soil physical properties, such as aggregate stability, while also improving soil chemical and biological quality. Thus, integrated farming practices not only reduce dependence on external inputs but also promote resource circularity in local food systems. ICLS helps maintain or improve soil chemical properties such as phosphate availability and organic matter percentage, which contribute to long-term corn and soybean yields, especially in tropical sandy soils that are prone to fertility degradation (Soares et al. 2024).

On the other hand, livestock farmers face equally significant structural challenges, particularly related to limited access to affordable, quality feed. Commercial feed is often not economical for small-scale farmers, potentially suppressing productivity and the sustainability of livestock businesses. In this context, the use of agricultural waste, such as corn stover, is a local feed alternative with strategic potential. Nutritionally, corn stover does have relatively low crude protein and fiber quality. However, various feed technology approaches such as ensilage and microbial treatment have been proven to significantly increase dry matter and crude protein digestibility (Gao et al., 2019).

Further empirical evidence is demonstrated through research on Ongole calves, where a ration formulation consisting of 50% corn stover and 50% concentrate resulted in higher DM and organic matter digestibility rates, as well as better weight gain compared to other alternative base feeds. These findings confirm that optimizing agricultural waste as animal feed is not only technically feasible but also has the potential to increase livestock production efficiency. Overall, the synergy between farmers and ranchers through an integrated farming approach represents a relevant and scientifically based strategy for strengthening food security, environmental sustainability, and the economic independence of farmers and ranchers. Research on the decomposition of plant residues such as corn stover and weeds in integrated systems shows patterns of nutrient release (N, P, K) that are influenced by fertilization practices, which have a direct impact on the next phase of plant growth (de Bortolli et al. 2024).

3.6 The Indonesian people

The Indonesian government has confirmed that it will stop importing strategic commodities such as rice, corn, sugar, and salt in 2025. The decision, which was announced after a closed meeting led by the President and a number of relevant ministers at the end of December, is part of the government's efforts to increase food self-sufficiency by focusing on increasing domestic production (Andriyani, 2015). Indonesia has abundant natural resources but still faces limitations in its ability to process raw materials into value-added products. To meet high domestic demand, the government has implemented a policy of importing semi-finished and finished goods (Wibowo & Marwanti, 2023).

Indonesia's population tends to increase every year. The population growth rate in Indonesia is relatively high. Indonesia's population in 2023–2025 will continue to increase, reaching 284 million people (BPS, 2025). Meanwhile, land for food availability is not increasing but decreasing because it is being converted into non-agricultural infrastructure such as housing/residential areas. This has led to a decline in agricultural productivity and an impact on the availability of food. Population size greatly affects the availability and utilization of food (Tranggono et al., 2023).

Table 1. Indonesia's population in 2023-2025

Years	Mid-Year Population (Thousands)
2023	278,696.2
2024	281,603.8
2025	284,438.8

(BPS, 2025)

Efforts to reduce dependence on imports cannot succeed without community support. This support is manifested through increased awareness in using and marketing local products as a form of active participation in strengthening the national economy and maintaining food security. The Farmers and Ranchers Concerned with Food Security plays a strategic role in strengthening the local economy through the production, processing, and distribution of agricultural and livestock products. These activities not only increase the income of rural communities but also expand employment opportunities and strengthen regional economic independence. In addition, the availability of sustainable agricultural and livestock products helps maintain food price stability and ensures community access to quality products at affordable prices. Thus, the existence of farmer-rancher groups contributes directly to food security and community welfare.

Community participation as consumers and promoters of local products plays an important role in expanding the market reach and increasing the competitiveness of domestic products. Synergy between the community, KPPKP groups, and the government creates a healthy economic cycle at the local level, increases demand for domestic products, and reduces dependence on imported products. Community awareness to buy and support local products is one of the keys to achieving economic independence and strengthening national food security.

3.7 Promotion

Promotion or the process of introducing a service or product so that target consumers and users can become familiar with the product being offered is in line with who says that promotion is essentially a form of marketing communication, meaning marketing activities that seek to disseminate information, influence/persuade, and/or remind the target market about the company and its products so that they are willing to accept, purchase, and remain loyal to the products offered by the company concerned (Punguriseng & Nur, 2022). Meanwhile, Sistaningrum reveals that promotion is an effort or activity of a company to influence “actual consumers” and “potential consumers” so that they are willing to purchase the products offered, either now or in the future (Setiawannoto, 2021). According to Dirgantoro in, the benefit of strategy is as a means to communicate organizational goals and determine which path to take to achieve those goals. Therefore, promotion is very important in the process of building a group, including in the formation of KPPKP. The right promotional steps will clarify the community's attitude in responding to the presence of KPPKP so that KPPKP can be accepted with open arms by the community. Information that is conveyed clearly to the community will reduce the negative potential of unclear information.

3.7.1 strategy

Promotion activities must prioritize activities so that wasted costs and energy can be minimized. Effective promotion can be achieved by considering various factors, one of which is the target consumer. In this case, the target consumers are the community, including farmers, agriculturalists, and consumers. After identifying the target audience, it is equally important to determine the necessary media because knowing which media is easily accessible to the community will make the promotion process much more effective. According to (Zidhan et al, 2024), there are several types of promotional activities, including as follows. Advertising, this is a non-personal form of promotion using various media aimed at stimulating purchases. Personal selling, this is a form of personal promotion using verbal presentations in conversations with potential buyers aimed at stimulating purchases. Sales promotion, this is a form of promotion aimed at stimulating purchases. Publicity, this is a form of non-personal promotion regarding a particular service or business entity by reviewing information/news about it (generally scientific in nature).

In addition, the delivery of information must be attractive so that the target audience can receive the information without feeling coerced. Appeal can be built by ensuring that the information is presented in an attractive, informative, and clear manner. Therefore, the presentation of information can be tailored to consumer tastes. For example, young people are often attracted to information packaged in a humorous way, so the presentation scheme must follow consumer tastes so that consumers can accept the information willingly without coercion, which will later affect the public's ability to digest the information.

3.7.2 Promotional media

Promotional media are tools or instruments used to facilitate promotional activities (Nurwicaksono & Patria, 2024). Promotional media are very important in ensuring that the information provided is clearly conveyed to the public. The selection of the type of promotional media used is a key point. Promotional media must be tailored to the target consumers in the digital era. The selection of promotional media through digital channels is highly relevant because, in addition to being easily accessible by many people, digital media can also shorten the time it takes to convey information so that the public, as consumers, can receive the latest information.

Social media can be used to support the communication process, where social media is useful for making it easier for users to access various information, interact with other individuals, and obtain quick feedback (Walandouw et al., 2022). Therefore, the easiest online promotion to do is through social media such as WhatsApp, Instagram, Facebook, and so on. With attractive and creative advertisements, information will be easier for the public to digest. Advances in communication technology have had a major impact on the way people use communication media, especially in building cooperation (Ramdan, 2025). The public will be much more interested and responsive if the information conveyed is easy to digest.

Promotion cannot rely solely on online media. On the other hand, promotion must also be done offline or conventionally, considering that not all Indonesians have access to the digital world. Offline information delivery or branding can be done in various ways, such as going directly to the field to educate the targeted community. Direct socialization activities allow for personal interaction between program managers and the community, so that the message conveyed can be tailored to local needs and conditions. In addition, the use of print media such as pamphlets, posters, and brochures is still relevant for providing complete and structured information. Print media can be placed in strategic locations that are easily accessible to the community, such as village halls, markets, or places of worship, so that the information can be accessed repeatedly by the community. With effective promotion, it is hoped that KPPKP will become widely known, accepted by the community, and make a real contribution to supporting food security through the active involvement of farmers, ranchers, and the community.

4. Conclusion

Cross-sector collaboration between farmers and ranchers through the Food Security Concerned Farmers and Ranchers Group (KPPKP) is one form of cooperation that can support the development of a more integrated and sustainable food system. KPPKP functions as a space for synergy that brings together the interests, resources, and potential of the agricultural and livestock sectors, enabling complementary integration. Through this forum, resource management processes can be carried out in a more planned manner, both in the use of livestock waste as organic fertilizer and agricultural waste as animal feed. This collaborative approach reflects efforts to apply the principles of a circular economy, in which waste is no longer seen as worthless residue, but as a resource that can be reused in an interconnected production system.

The integration of the agricultural and livestock sectors within the KPPKP framework contributes positively to the efficiency and sustainability of both sectors. The use of organic fertilizer derived from livestock waste has the potential to improve soil structure and fertility, increase microorganism activity, and support long-term soil ecosystem balance. In addition, the use of organic fertilizers can help reduce farmers' dependence on chemical fertilizers, which tend to fluctuate in price and have the potential to degrade soil quality when used excessively. On the other hand, the use of agricultural waste as alternative livestock feed can help farmers reduce production costs and dependence on imported feed. The reciprocal relationship between farmers and livestock breeders in KPPKP forms a more efficient and environmentally friendly production system. This integration enables a continuous flow of resources, whereby products from one sector can be utilized by another sector. In this way, agriculture and livestock farming do not operate separately, but as a single entity that supports each other.

The sustainability of collaboration in KPPKP is greatly influenced by the role and support of various stakeholders. The government has a strategic role in providing supportive policies. Academics contribute through mentoring and innovation development. The role of academics is also important in ensuring that the practices applied remain in line with the principles of sustainability. In addition to the government and academics, the community has an equally important role in supporting the success of KPPKP. Community participation as consumers of local products resulting from the collaboration between farmers and ranchers can strengthen the local food value chain.

Therefore, promotional strategies and the selection of promotional media are important aspects that need to be considered in the development of KPPKP. Promotion not only serves as a means of marketing products, but also as a medium of education for the community regarding the added value, environmental benefits, and social contributions of products resulting from the collaboration between farmers and ranchers. Effective promotional strategies need to be planned carefully, considering the characteristics of the product. The use of various promotional media, both conventional and digital, can support the dissemination of information more widely and effectively. The use of digital media can also convey information interactively. In addition to being a marketing tool, promotion also plays a role in strengthening the identity and existence of KPPKP. Within the framework of the Indonesia Emas 2045 vision, food security is one of the important pillars of national development. Achieving this goal requires the active participation of all elements of the nation, including the government, academics, business actors, and the community. Food security cannot be achieved through separate sectoral efforts, but rather through continuous cooperation based on local potential. Small steps taken consistently and collectively, such as collaboration between farmers and ranchers in KPPKP, can make a real contribution to larger development goals.

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Author Contribution

The authors confirm equal contribution regarding the study's conception, methodological design, analysis, and manuscript preparation. All authors have critically reviewed and approved the final version for submission.

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During the preparation of this work, the author(s) used Grammarly to assist in improving grammar, clarity, and academic tone of the manuscript. After using this tool, the author(s) reviewed and edited the content as needed and took full responsibility for the content of the publication.

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