

**EVALUATION OF THE SUSTAINABILITY OF
THE SHEEP FARMING ASSISTANCE PROGRAM *PENTAHHELIX* BASED
(POAC Managerial Analysis of the Kayadi Gate Program in Darma District
Kuningan Regency, Indonesia)**



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ABSTRACT

Livestock assistance programs are among the policy instruments widely used in rural poverty alleviation efforts, but their sustainability is often hindered by weak management and poor stakeholder collaboration. This study aims to evaluate the implementation and sustainability of the Gerbang Kaya Program for sheep livestock commodities in Darma District, Kuningan Regency, using the *Pentahelix approach* and the POAC (*Planning, Organizing, Actuating, and Controlling*) managerial framework. This study uses a qualitative case study approach. Data were collected through in-depth interviews with key actors involved in the program, including government officials, academics, business leaders, communities, and the media. The results of the study indicate that, in the planning phase, the program has been prepared administratively based on extreme poverty data, but there is still minimal farmer participation, so technical needs and field readiness have not been fully accommodated. In terms of organization, the Pentahelix collaboration is *unbalanced; the roles of government and farmers are relatively dominant, while the contributions of academics, business actors, and the media remain limited*. This condition affects weak technical support, market access, and information dissemination. In terms of *actuation, program implementation showed varying results across recipient groups, influenced by differences in farmers' technical capacity* and the intensity of assistance. Meanwhile, the *controlling aspect* tended to be administrative in nature and was not yet supported by farmer performance or economic indicators. A business sustainability evaluation showed that four out of five farmer groups maintained and developed their sheep farming businesses through population growth and independent reinvestment, while one group experienced total failure due to high livestock mortality. These findings confirm that the sustainability of livestock assistance programs is not solely determined by adherence to POAC managerial principles, but is strongly influenced by the quality of functional, sustainable Pentahelix collaboration. This research contributes to the development of program evaluation studies by emphasizing the importance of analyzing multi-actor collaboration in ensuring the sustainability of community-based livestock empowerment programs.

Keywords: business sustainability; *pentahelix*; POAC; program evaluation; sheep livestock assistance.

INTRODUCTION

Rural poverty remains a complex structural problem in developing countries, including Indonesia. Although national poverty rates have declined, the gap between urban and rural areas remains relatively high. This is due to limited access by rural communities to technology, markets, and sustainable institutional support (Tesfa et al., 2025; Wurzinger et al., 2021). In this context, poverty alleviation efforts cannot rely solely on short-term social assistance but require economic empowerment strategies grounded in local potential to create sustainable businesses (Toro-Mujica et al., 2014; Kara, 2025). Abdullah et al. (2024) indicate that weak local institutional capacity is a



significant factor hampering the effectiveness of economic empowerment programs in rural areas. Simanjuntak et al. (2024) emphasize that aid-based programs without adaptive management mechanisms tend to produce short-term and unsustainable impacts.

The livestock sector, particularly small-scale sheep farming, has strategic potential to support rural economic empowerment. Sheep farming is relatively accessible to poor households due to its low initial capital requirements, flexibility in scale, and ability to utilize local resources (Tesfa et al., 2025; Jimma et al., 2024). Lolita et al. (2020) found that livestock assistance can increase livestock farmers' incomes if supported by participatory planning and adequate technical assistance, consistent with findings of increased incomes in community-based breeding programs (Tesfa et al., 2025; Kara, 2025). Various livestock assistance programs have been implemented as poverty alleviation instruments, but their effectiveness and sustainability vary widely across regions and recipient groups. Several studies have shown that the failure of livestock assistance programs is often due to weak participatory planning, low technical capacity of farmers, and limited institutional support after assistance is disbursed (Flórez et al., 2022; Tiambo et al., 2026). Yuniza et al. (2023) identified low technical capacity of livestock farmers as the primary cause of livestock business failure after aid. Wahyuningtiyas et al. (2025) emphasized that the sustainability of smallholder livestock businesses is heavily influenced by institutional support and sustainable market access, as demonstrated in stakeholder collaboration studies on CBBP (Wurzinger et al., 2021; Tesfa et al., 2025).

The Pentahelix approach is increasingly used in the design and implementation of development programs, including in the agriculture and livestock sectors. This approach emphasizes the importance of collaboration between five key actors: government, academics, business actors, communities, and the media in creating sustainable development (Wurzinger et al., 2021). Conceptually, Pentahelix is believed to increase program effectiveness through resource synergy, knowledge transfer, strengthened market access, and increased transparency and public accountability (Tesfa et al., 2025). However, implementing Pentahelix in practice often faces challenges, such as imbalances in roles among actors, weak coordination, and the dominance of certain actors in decision-making (Muljono et al., 2022; Labatut & Hooge, 2016). Hasan et al. (2018) show that imbalances in roles among actors often render Pentahelix collaboration symbolic. Mahu et al. (2026) suggested that the dominance of non-state actors has the potential to hinder program innovation, as is also reflected in the crisis of cooperation in livestock breeding programs (Labatut & Hooge, 2016).

Empirical studies on the implementation of Pentahelix in community-based livestock assistance programs are still relatively limited and tend to be descriptive in nature. Fauzi and Kurniawan (2025) noted that most studies identify Pentahelix actors without analyzing the quality of their interactions or their contributions to program performance. Mahu et al. (2026) explained that most studies emphasize the presence of Pentahelix actors without critically analyzing how the quality of this collaboration affects program performance and the sustainability of livestock farmers' businesses. Furthermore, evaluations of livestock assistance programs generally focus on administrative aspects and compliance with implementation, while analyses of managerial dynamics and causal relationships across implementation stages are scarce (Pujiharto, 2018; Tiambo et al., 2026). Based on this literature review, there is still limited research that simultaneously analyzes the managerial function of POAC and the quality of Pentahelix collaboration in explaining the sustainability of livestock assistance programs. This absence of an analysis of the causal relationship between managerial dynamics and multi-actor collaboration is the novelty of this study.

Based on this, this study positions itself at the intersection of program evaluation studies and multi-actor collaboration. This study not only evaluates the implementation of the Gerbang Kaya Program as a sheep livestock assistance program but also analyzes how the application of the POAC managerial framework interacts with the dynamics of Pentahelix collaboration in influencing the sustainability of livestock businesses, as recommended in studies on the sustainability of community-based livestock breeding (Tesfa et al., 2025; Yousuf et al., 2025). By using a case study approach in Darma District, Kuningan Regency, this study is expected to provide a deeper understanding of the structural and managerial factors that determine the success or failure of community empowerment-based livestock assistance programs.

Specifically, the objectives of this study are: (1) to evaluate the implementation of the Gerbang Kaya Program based on the POAC stages, (2) to analyze the roles and levels of involvement of Pentahelix actors in the program, and (3) to examine the implications of Pentahelix collaboration on the sustainability of sheep farming businesses in beneficiary groups. The findings of this study are expected to provide theoretical contributions to the development of program evaluation studies based on multi-actor collaboration, as well as practical contributions to local governments and

stakeholders in designing more sustainable livestock assistance programs oriented towards farmer independence (Tesfa et al., 2025; Tiambo et al., 2026).

MATERIALS AND METHODS

Research Design and Approach

This research uses a qualitative approach with a case study design. This approach was chosen because it allows researchers to deeply explore the dynamics of program implementation, interactions between actors, and the social and institutional contexts that influence the sustainability of the Gerbang Kaya Program. Case studies are considered appropriate because the research focuses on a specific program within a specific regional context, where the boundaries between the phenomenon being studied and its context cannot be clearly separated.

Location and Time of Research

The research was conducted in Darma District, Kuningan Regency, West Java Province, from March to April 2025. This location was chosen purposively because it is one of the areas with a relatively high level of extreme poverty and is the location for the implementation of the Gerbang Kaya Program for sheep livestock commodities.

Informants and Informant Determination Techniques

Research informants were selected using purposive sampling, with consideration given to their direct involvement and knowledge of the Gerbang Kaya Program. Informants comprised the leading actors in the *Pentahelix approach*, namely:

1. The government, including officials from the Kuningan Regency Fisheries and Animal Husbandry Service and Regional Technical Implementation Unit (UPTD) officers involved in program planning, implementation, and mentoring.
2. Academics, namely lecturers or researchers who have a scientific background in the field of animal husbandry or community empowerment, and have been involved in mentoring activities or program studies.
3. Business actors, including livestock traders or livestock production facility providers, who have the potential to play a role in the sheep farming business value chain.
4. The community, namely the heads and members of the livestock farmer groups receiving sheep livestock assistance from the Gerbang Kaya Program.
5. Media, namely, the party that disseminates program information at the local level.

The number of informants was adjusted according to the principle of data saturation, with data collection ending when the information obtained was repetitive and did not yield significant new findings. This approach was used to ensure the depth and validity of qualitative data.

Data Collection Technique

The research data consisted of primary and secondary data. Primary data were obtained through in-depth semi-structured interviews with informants. Interview guidelines were developed based on the POAC framework and the *Pentahelix actor roles, allowing the extraction of information on the program's planning, organizing, implementing, and controlling processes, as well as the dynamics of collaboration among actors*. Secondary data were collected through a documentary study of official program documents, activity reports, local government policies, and previous research relevant to the evaluation of livestock assistance programs and multi-actor collaboration—the use of secondary data aimed to strengthen the analysis and triangulate the primary data.

Data Analysis Techniques

Data analysis was conducted qualitatively through three main stages: data reduction, data presentation, and conclusion drawing. Data reduction involved sorting and focusing on information relevant to the research objectives. Data presentation was carried out by grouping findings into themes, arranged according to the POAC stages and aspects of program sustainability. Conclusions were drawn through the interpretation of patterns and causal relationships, and through the comparison of field findings with related literature. (Nowell et al., 2017).

The novelty in this research data analysis lies in the integration of the POAC managerial framework with the Pentahelix collaborative approach. The data presentation systematically follows the POAC stages (Planning, Organizing, Actuating, and Controlling) and is linked to each Pentahelix actor's role and level of involvement. The contribution of this data analysis is to provide a qualitative evaluation framework that not only assesses compliance with program implementation but also

explains the structural and managerial mechanisms that influence the sustainability of community-based livestock empowerment programs.

Research Analysis Framework and Indicators

This research's analytical framework integrates the POAC managerial model with the *Pentahelix approach*. POAC is used as an evaluation tool to assess program managerial performance, while *the Pentahelix approach* is used to analyze the quality of collaboration between actors.

Evaluation indicators at each POAC stage include: (1) *Planning*, namely the level of livestock farmer participation, the suitability of planning to technical needs, and the clarity of program objectives; (2) *Organizing*, namely the division of roles and the level of involvement of *Pentahelix actors*; (3) *Actuating*, namely the implementation of assistance activities, technical assistance, and livestock management practices at the group level; and (4) *Controlling*, namely the program monitoring and evaluation mechanism.

The sustainability of sheep farming businesses was analyzed qualitatively using indicators such as livestock population growth, business continuity after assistance, and the level of farmer independence in decision-making and business investment. This framework was used to answer the research question of how and why managerial dynamics and *Pentahelix collaboration* influence the sustainability of the Gerbang Kaya Program.

RESULTS AND DISCUSSION

Evaluation of the Implementation of the Rich Gate Program

1. Evaluation of the *Planning Stage*

Evaluation of the planning stage of the Gerbang Kaya Program, which focuses on the suitability of program objectives, formulation of activities, and readiness of supporting resources.

Table 1 *planning stage* of the Gerbang Kaya program

Planning Indicators	Evaluation Criteria	Field Findings	Evaluation Results
Beneficiary involvement	Level of participation of farmers in program formulation	Farmers were not involved in the initial planning of the program	Low
Needs analysis	Suitability of technical and social needs with field conditions	Needs are identified in general	Currently
Target setting	Accuracy of location and target group	Based on extreme poverty data	Enough
Program objectives	Clarity and relevance of goals	The goal is clear but not yet operational	Currently
Preparation of an action plan	Availability of risk-based operational plans	The plan is general and administrative in nature	Currently

Information: Low farmer involvement in the planning stage leads to a weak sense of program ownership and a mismatch between program design and farmers' technical capacity in the field. The *planning stage* primarily serves as an administrative procedure rather than a risk mitigation tool for livestock farming.

The evaluation results indicate that the planning phase of the Gerbang Kaya Program has been systematically implemented at the administrative level, particularly in determining locations and target groups based on extreme poverty data. However, this planning has not been fully participatory. Farmer involvement in identifying technical needs and business readiness remains relatively low, as reflected in the limited space for farmers to report on actual conditions related to feed availability, housing, and livestock farming experience.

This situation has created a gap between the program design and the beneficiaries' actual capacity. Some livestock farming groups experienced difficulties in the initial phase of livestock management due to limited technical knowledge and supporting facilities. This finding aligns with Putri et al. (2024) and Yuniza et al. (2023), who confirm that weak participatory planning in livestock assistance programs contributes to low levels of business sustainability.

This research's contribution to the planning stage lies in confirming that planning weaknesses are not merely technical issues but a failure of the POAC's managerial function in integrating social context and local capacity into program design. Thus, this research enriches program evaluation

studies by demonstrating that poverty-driven planning without substantive beneficiary participation potentially creates the risk of failure from the early stages of implementation.

From a managerial perspective, the planning stage has not fully functioned as a risk mitigation tool. In the planning phase, POAC is still understood as an administrative procedure rather than an analytical process for anticipating technical and social obstacles. This explains why some groups thrive while others fail in subsequent implementation stages.

2. Evaluation of the Organizing Stage

This evaluation emphasizes task division, coordination patterns, and synergy among actors to support the effectiveness of program implementation.

Table 2 Roles and levels of involvement of *Pentahelix* actors in the Gerbang Kaya program

<i>Pentahelix</i> Actor	Ideal Function	Actual Contribution	Engagement Level	Implications
Government	Coordination, funding, and supervision	Controlling program and implementation	Tall	Program dependence on the government
Breeder	Livestock management and maintenance	Main implementation of daily activities	Tall	Short-term operational sustainability
Academics	Technical assistance and evaluation	Sporadic involvement	Low	Minimal knowledge transfer
Businessmen	Input providers and market access	Not institutionally integrated	Low	Weak market support
Media	Public dissemination and transparency	Minimal role	Low	Low public accountability

Information: *The Pentahelix* collaboration in this program is unbalanced and tends to be symbolic. Contributions from other actors do not balance the dominance of the government and farmers, so the potential for cross-sector synergy has not been realized functionally.

The organizational stage demonstrates the unequal roles of *Pentahelix* actors. Local governments play a dominant role in coordination and decision-making, while academics, business actors, and the media remain sporadic and uninstitutionalized. Farmers, on the other hand, bear primary responsibility for livestock management, yet receive inadequate institutional support.

This imbalance indicates that the *Pentahelix approach* in the Gerbang Kaya Program is more symbolic than functional. The minimal involvement of academics limits knowledge transfer and technical innovation, while the weak role of business actors hinders the integration of livestock farmers into the market chain. This finding reinforces the argument of Muljono et al. (2022) that unbalanced multi-actor collaboration tends to result in programs that are dependent on the government and vulnerable to sustainability.

A significant contribution of this research to the organizing stage is that it reveals that the failure to establish a balanced collaborative structure results in the *Pentahelix* functioning not as a sustainability support system, but rather as a fragmented working relationship. This finding emphasizes that organizing within the POAC framework must be understood as a process of strategic role allocation among actors, not simply the formation of a formal program structure.

The organizing function has not yet succeeded in establishing a clear and sustainable collaborative work structure. The absence of a cross-actor coordination mechanism has underutilized the *Pentahelix's* potential.

3. Evaluation of the Implementation Stage (Actuating)

Evaluation focuses on the execution of activities, group participation, and the suitability of business implementation in line with established plans. Program implementation showed significant performance variations across beneficiary groups. Groups with livestock farming experience and access to more intensive mentoring tended to demonstrate better livestock management practices, such as regular feeding, adequate pen sanitation, and rapid response to livestock health problems. Conversely, groups with low technical capacity experienced high livestock mortality rates.

This variation indicates that the success of the actuation phase depends heavily on human factors and technical support, not solely on the availability of livestock assistance. This aligns with

findings by Lolita et al. (2020) and by Rahman et al. (2025), who emphasize the importance of ongoing mentoring in empowerment-based livestock assistance programs.

Table 3 Conditions of sheep farming implementation in the beneficiary group

Implementation Aspects	Field Findings	Condition	Implications for Sustainability
Feeding system	The type and frequency of feed are not uniform	Varied	Risk of decreased productivity
Cage conditions	Sanitation and construction are quite adequate	Currently	Susceptible to disease
Livestock health management	Actions are reactive	Limited	High livestock mortality
Technical capacity of farmers	Knowledge and skills are not evenly distributed	Varied	Differences in performance between groups

Information: Variations in livestock management practices reflect differences in technical capacity and intensity of assistance. Groups with low capacity are more vulnerable to business failure, even when receiving the same livestock assistance.

This research's contribution to the actuation phase lies in its empirical finding that livestock assistance program implementation is contextual and heavily influenced by farmers' adaptive capacity and the intensity of cross-actor support. Thus, this research broadens the understanding of the implementation phase in POAC as not a purely technical phase, but rather an arena for dynamic interactions between actor capacity and the quality of collaboration.

The failure of one beneficiary group, resulting in the loss of its entire livestock population, underscores the weakness of corrective intervention mechanisms during implementation. In the context of POAC, the *actuating function* is not balanced by adaptive oversight that can respond quickly to field issues.

4. Evaluation of the *Controlling Stage*

This evaluation emphasizes the monitoring mechanism, follow-up of monitoring results, and the effectiveness of program control in ensuring the achievement of established objectives.

Table 4 Monitoring and evaluation practices of the Gerbang Kaya program

Monitoring Aspects	Indicator	Implementation Status	Impact on Program
Administrative reporting	Activity progress report	Implemented	Procedural accountability
Livestock biological performance	The growth of weight and morality	Limited	Late risk detection
reproductive performance	Child birth rate	Not implemented	Uncontrolled population growth
Economic impact	Changes in livestock farmers' income	Not implemented	Sustainability is not measurable

Information: The monitoring system places more emphasis on administrative compliance than on evaluating biological and economic performance. This limitation hinders the control function as a tool for continuous learning and program improvement.

Administrative reporting mechanisms still dominate the control phase of the Gerbang Kaya Program. Monitoring focuses more on compliance with program procedures than on the biological and economic performance of livestock enterprises. Important indicators such as livestock growth rates, mortality rates, and contribution to household income have not been systematically evaluated.

These limitations prevent the controlling function from functioning as a learning and program improvement tool. Pujiharto (2018) emphasized that performance-based monitoring systems tend to detect risks early and strengthen the sustainability of empowerment programs.

This research's contribution to the controlling aspect is that it demonstrates that a weak control system is a key factor increasing the risk of program failure, particularly in groups with low technical capacity. These findings emphasize that the controlling function in POAC must be

developed as a biological and economic performance-based evaluation mechanism, not simply an administrative accountability instrument.

Roles and Levels of Involvement of *Pentahelix* Actors in the Program

The research findings indicate that the roles and levels of involvement of *Pentahelix* actors in the Gerbang Kaya Program are unbalanced and hierarchical. Local governments and livestock farmers are the dominant actors throughout the program cycle, while academics, business actors, and the media play limited and unsustainable roles, as also observed in various multi-actor collaborations in community-based livestock breeding programs (Tesfa et al., 2025; Wurzinger et al., 2021). These findings confirm that *Pentahelix*, in the context of this program, does not function as a complete collaborative system, but rather as a configuration of actors working in parts, in line with findings on symbolic collaboration due to role imbalances between actors (Labatut & Hooge, 2016).

The main contribution of these findings is that the formal presence of *Pentahelix* actors does not, in itself, guarantee effective collaboration. The minimal role of academics limits knowledge transfer and evidence-based technical evaluation, while weak business involvement hinders the integration of livestock farmers into market value chains, as demonstrated in studies of institutional sustainability and market access in community-based programs (Tesfa et al., 2025; Kara, 2025). The media have also not been used to disseminate information and strengthen program legitimacy in the public sphere, thereby weakening transparency and accountability in multi-actor collaborations (Wurzinger et al., 2021).

Analytically, these findings extend the *Pentahelix* study by emphasizing the importance of role quality and the intensity of actors' involvement, rather than simply their presence. Thus, this study provides a conceptual contribution that evaluations of multi-actor collaborations need to be directed at the functional dimension, namely the extent to which each actor consistently and complementarily carries out its role in supporting program objectives, as recommended in studies of institutional innovation and shared resource governance (Labatut & Hooge, 2016; Tiambo et al., 2026).

Implications of *Pentahelix* collaboration on the sustainability of sheep farming businesses in beneficiary groups

The sustainability analysis showed that four out of five livestock farming groups maintained and grew their sheep operations, while one group experienced complete failure. This difference in achievement was not solely determined by adherence to the POAC stages. However, it was strongly influenced by the groups' ability to build and utilize collaborative networks, both formal and informal, as demonstrated in studies of community-based livestock breeding that emphasize the importance of local social networks and institutions (Tesfa et al., 2025; Wurzinger et al., 2021).

Successful groups demonstrated functional collaborative practices, such as independent access to markets, knowledge exchange among farmers, and the ability to adapt to limited formal assistance, consistent with findings that increased adaptive capacity and collective learning are key to the sustainability of smallholder livestock businesses (Jimma et al., 2024; Labatut & Hooge, 2016). Conversely, unsuccessful groups relied heavily on program support and lacked adaptive capacity when faced with livestock health issues and market constraints, as identified in evaluations of livestock production sustainability in various rural contexts (Flórez et al., 2022; Tiambo et al., 2026).

The primary contribution of these findings is that normative and administrative *Pentahelix* collaboration is insufficient to ensure the sustainability of livestock assistance programs. Sustainability is more determined by local actors' ability to access and manage cross-actor support sustainably, as demonstrated in studies of stakeholder collaboration in community-based livestock breeding programs (Tesfa et al., 2025; Wurzinger et al., 2021). These findings reinforce the argument of Tatipikalawan and Sangadji (2024) that multi-actor collaboration must be functional, adaptive, and based on field needs to sustain long-term success.

Overall, the implications of this study confirm that the sustainability of the Gerbang Kaya Program is more influenced by the quality of interactions between *Pentahelix* actors and the effectiveness of the POAC managerial function than by the program design itself. Thus, this study makes an important contribution to the development of livestock assistance policies based on multi-actor collaboration, particularly in designing more balanced, sustainable, and self-sufficient rural livestock farmers, as recommended in the literature on institutional sustainability and livestock farmer capacity building (Tesfa et al., 2025; Tiambo et al., 2026).

CONCLUSIONS AND SUGGESTIONS

The formal implementation of the Gerbang Kaya Program has followed the POAC managerial steps. However, its effectiveness has not been uniform across all stages, as an administrative

approach and a lack of participation still dominate planning and implementation. As a result, some technical needs and farmers' field readiness were not optimally identified from the program's inception. Collaboration between Pentahelix actors has not been balanced and functional. The government and livestock farmers are the dominant actors, while the roles of academics, business actors, and the media remain limited. This imbalance in roles has led to weak technical support, limited innovation, and unsustainable market access for beneficiary groups. The sustainability of sheep farming is determined by a combination of the farmer's technical capacity and the quality of Pentahelix collaboration. Some groups maintained and grew their businesses, while the complete failure of another group indicates weak control and inadequate corrective interventions during program implementation. This research contributes to the development of program evaluation studies by demonstrating that adherence to the POAC managerial stages does not automatically guarantee program sustainability. Sustainability is strongly influenced by the quality of *Pentahelix collaboration, which is functional and adaptive, thus positioning Pentahelix as a determining factor* rather than simply a normative approach. The results of this study imply the need to strengthen participatory planning, reorganize the roles of Pentahelix actors for a more balanced approach, develop a monitoring system based on biological and economic performance, and provide adaptive intervention mechanisms for livestock groups at risk of failure. This research is limited to a single study location and a single type of livestock assistance program, so the findings cannot be generalized broadly. Furthermore, the sustainability analysis is qualitative in nature and lacks quantitative measures of long-term economic performance.

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