

Building Competitive Rural Enterprises through Collaborative Governance: A Model for Strengthening *BUMDes* in Indonesia

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ABSTRACT

Village-Owned Enterprises (*BUMDes*) have emerged as key instruments for rural economic development in Indonesia, yet many face challenges in sustainability, innovation, and stakeholder engagement. This study proposes an integrated strategic model combining the Penta-Helix collaboration framework and value chain analysis to strengthen *BUMDes* performance. Drawing on qualitative case studies from three villages in Kepulauan Meranti Regency—Bina Maju, Semukut, and Tanjung—the research explores how collaboration with government, academia, private sector, media, and community aligns with value creation across enterprise stages. Data were collected through semi-structured interviews and analyzed thematically. Findings reveal strong community and government roles, but limited integration of academic, private, and media actors. The study identifies context-specific gaps and proposes a stakeholder-aligned implementation roadmap to improve *BUMDes* operations. This research contributes a flexible, scalable model for building competitive, collaborative, and resilient rural enterprises, offering both theoretical insight and practical guidance for local governments, development agencies, and *BUMDes* managers.

Keywords: *Village-Owned Enterprise, BUMDes, Penta-Helix Collaboration, Value Chain Analysis, Rural Economic Development, Indonesia*



INTRODUCTION

In Indonesia, the rural economy is greatly impacted by the intersection of agricultural activities, social innovation, and the policies of government, all within the context of globalization. While farming and agriculture facilitated economic growth often seem central to most activities in the countryside and as a region's key driving force for poverty alleviation, in reality, it does not succeed in eradicating poverty. Arham et al. (2020) claim that the agriculture sector's weak performance in alleviating poverty is attributed to factors such as inadequate market opportunities and unstable prices for smallholder farmers (Arham et al., 2020). Globalization also aids in altering the rural agricultural economy by promoting cash crops such as cocoa and palm oil in place of staple foods like rice, (Asih & Rustam, 2022). These transformations are very paradoxical since they are associated with increasing opportunities while at the same time threatening food security and increasing susceptibility to market shocks (Maksum et al., 2023).

Against this backdrop, social entrepreneurship has emerged as an innovative approach to strengthen the economies of rural areas. Rural social entrepreneurship improves access to finance and technical resources, which, in turn, fosters innovation and productivity at the level of small business and farming (Imanuella et al., 2024). Their efforts are complemented at the grassroots level by *BUMDes*, which actively harness stretches of underutilized government assets to promote entrepreneurship and strengthen communities (Nugroho, 2024). Furthermore, other gaps in the supply of and demand for capital to the local economy are filled by rural financial institutions such as rural banks, thus playing a role in the development of the local economy (Wiwoho et al., 2021). However, these rural economic undertakings face stubborn problems such as lack of adequate legal and regulatory frameworks supporting cooperatives and finance (Hakim et al., 2024; Siregar et al., 2024).

Just as any other country in the world, Indonesia is not exempt from global changes. The growth of globalization has primarily impacted developing economies through multiculturalism, where rural micro economies try to adapt to new forms of consumerism. Entrepreneurship is able to respond to the growing tensions of smart globalization through small, tailored enterprises that optimize local resources and efficiently use them for the community, which aids in achieving rural region elevating their standards of living. As a rural advancement initiative, Indonesia adopts Village-Owned Enterprises (*BUMDes*) in which entrepreneurship is augmented alongside the optimal utilization of local resources (Andayana et al., 2024; Silvianita et al., 2023). Experts like Silvianita predict that if fully embraced, these enterprises can significantly alleviate the unemployment crisis by stimulating rural job opportunities. However, Kapti Satoto looks at the functioning of *BUMDes* from a socio-economic angle and notes that their relative efficiency is directly tied to the lack (or, at the very least, the low level) of intervention from above, governmentally driven, support, contradictory to a commonly known phenomenon that state intervention boosts economic effectiveness. Undoubtedly,



these systems face challenges, but many *BUMDes* overcome enormous hurdles through social trust and collaboration, which, in turn, mobilizes other social resources.

While *BUMDes* hold exceptional prospects, they frequently experience issues such as insufficient infrastructural development, straggling technology use, and inadequate human resources. Tackling these problems takes focused collaboration targeting both the integration of technology and capacity (Aritenang, 2021; Dhewanto, 2020). Silvianita et al. (2023) and Andayana et al. (2024) argue that if *BUMDes* are properly managed, they can provide local resources, thereby creating employment opportunities and increasing income at the village level (Andayana et al., 2024; Silvianita et al., 2023). Furthermore, the adoption of collaborative and participatory governance complements international standards concerning local development. The improvement of social capital and development of cooperative networks represent the most important approaches to expanding the coverage and effectiveness of *BUMDes*, which can help sustain economic growth and rural development (Andayana et al., 2024; Aritenang, 2021; Dhewanto, 2020; Imanuella et al., 2024).

In light of these issues, this paper presents a constructive model that incorporates the Penta-Helix collaboration framework alongside Porter's value chain framework to optimize the impact of *BUMDes* (Village-Owned Enterprises) on rural economic development. The Penta-Helix model is implemented by integrating the village economies' context within Indonesia's socio-economic ecosystem. Thus, this paper focuses on the active participation of five essential constituents—the government, academia, business, community, and media—to innovation, value creation, and the market competitiveness of *BUMDes* systems. For purposes of demonstrating the model's relevance and applicability, the study corresponds with three empirical cases from Kepulauan Meranti Regency: Bina Maju Village and Tanjung Village, which showcase differing levels of stakeholder participation, innovation, and integration of rural value chains. This paper provides a conceptual design and practical evidence on policies and strategies aimed at developing Indonesian competitive and sustainable rural economies considering other existing contexts.

LITERATUR REVIEW

Comparative Insights from Developing Regions

Rural enterprises are increasingly recognized as vital components of local economies, contributing significantly to community development and the welfare of rural populations. In Europe, studies by Twuijver et al. highlight how rural social enterprises generate economic benefits through initiatives such as affordable housing, tourist attraction, and local infrastructure maintenance, which collectively enhance business development (van Twuijver et al., 2020). Similarly, the research by Olmedo and O'Shaughnessy emphasizes the critical role of social enterprises in fostering neo-endogenous rural development, where communities leverage local resources to pursue integrated development goals (Olmedo & O'Shaughnessy, 2022).



The development of rural enterprises is becoming an essential part of the socioeconomic policies of developing nations, which are influenced by varying socio-economic conditions, cultural contexts, and policy frameworks. This review aims to integrate concepts pertaining to rural enterprise development from different regions and summarize important lessons learned. In the Indian context, Gowda et al. demonstrate that rural enterprises, particularly those focused on agricultural practices, can secure livelihoods for vulnerable populations by employing innovative training programs aimed at empowering youth and women, thereby highlighting the intersection of social equity and economic performance in rural entrepreneurship (Chandre Gowda et al., 2023). Such models show promise in promoting financial inclusion and sustainable development practices, which have far-reaching implications for rural resilience.

In Chile, Modrego and Foster (2021) illustrate that high-tech driven entrepreneurship models often overlook the unique opportunities for innovation available in rural areas. Their research advocates for policies geared towards rural realities which empower diverse creative initiatives rooted in community strengths and local assets (Modrego & Foster, 2021). In Africa, Kabagerayo et al. (2022) highlight the significant but underappreciated roles of women entrepreneurs from rural areas within active social and economic participation (Kabagerayo et al., 2022). The authors note that protective support tailor-made specifically for these women does not exist, wherein lies their failure to achieve optimal impact. They propose comprehensive strategies aimed at feminizing developmental outcomes by creating responsive-gendered entrepreneurial scaffolding architecture towards stability.

Southeast Asia offers informative examples through community-based capacity-building programs. Landicho and Ramirez (2023) describe projects building local ownership-sustaining technical skills, sustainability integration, and localized ownership while providing replicable models for other developing areas with similar characteristics. Technology and sustainability are also transforming rural entrepreneurship (Landicho & Ramirez, 2023). Viona and Febby (2025) analyze the intersection of green entrepreneurship in Southeast Asia as a holistic economic driver because it serves both environmental and economic objectives. However, limited digital skills, infrastructure, or accessibility hinders advance. The authors advocate for technology access to skill training as prerequisites to tap this potential (Viona & Febby, 2025).

Penta-Helix collaboration: Origin, components, past applications.

The Penta-Helix collaboration model stands as an all-inclusive response to tackle the unsolved problems of sustainable development concerning the five sectors of collaboration: academia, business, community, government, and media (ABCGM). Developed from the Triple Helix concept (Etzkowitz & Leydesdorff, 2000), Penta-Helix is an advancement to the earlier model which underscored the intertwining of the academia, industry, and government. The Penta-Helix model adds community and media as pillars on the model to emphasize the need for the active involvement of



additional stakeholders (Marta et al., 2024). Its supportive principles rest on the theory of collaborative governance which argues that the more nuanced issues such as the pollution crisis, the state of public health services, or the unequal distribution of wealth in society will need action and solutions from multiple sectors working together (Ginting et al., 2023; Sari, 2022).

The Penta-Helix model is composed of unique components, each with its own highly tailored function. For example, the contribution of Academia involves conducting relevant research, innovating, and teaching, which provides evidence-based policymaking encapsulated in systemic frameworks and policies (Pradhipta et al., 2021; Sudiana et al., 2020). Furthermore, the Business Sector contributes critical monetary finances, technology, an expanded market for goods, economic opportunities, and job creation especially in the rural areas (Azwar et al., 2023; Nurhaeni et al., 2024). The communities are the backbone of the local development, and therefore ensure that initiatives are implemented where local people values and priorities are taken into account alongside social capital and participatory governance (Ulil Absor & Ratriana, 2024). Moreover, the local and national governments support the initiative by providing administrative aid in the form of relevant policies allied to institutional funds, steering collaborative endeavors (Devian et al., 2024; Wahidah & Suherman, 2022). Finally, the role of media aids in the primary channel for the general public to engage with the development initiatives, so that greater public attention can be directed towards fostering awareness in constructive growth (Hajar et al., 2024; Sentanu et al., 2021).

The Penta-Helix model's real-world use cases demonstrate its effectiveness in different industries and its implementation in various regions. As an example, in environmental management the model was applied in the attempt to mitigate forest and land fires in East Kotawaringin Regency, where stakeholders worked together to combine socio-economics with sustainable land use and developed implementable actions (Devian et al., 2024). In tourism, Penta-Helix collaborations have facilitated community-driven tourism initiatives that mobilize culture and local resources, furthering the economic vitality of the rural areas and sustainable employment opportunities (Azwar et al., 2023; Ratna Susanti et al., 2022). These examples further demonstrate that the model not only promotes effective multi-stakeholder partnerships, but also adds value to the transformational impact of strategies through contextualization.

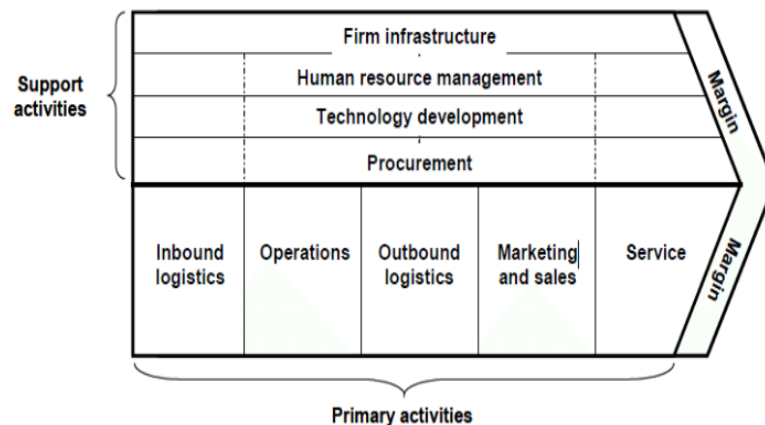
The Penta-Helix model has demonstrated its alignment with the efforts to achieve the Sustainable Development Goals (SDGs), beyond its environmental and economic components, particularly through community empowerment projects aimed at enhancing community welfare and inclusivity (Simanjuntak et al., 2024). In public health, the model substantially contributed to the stunting issues in Brebes Regency, as the consideration of numerous stakeholders facilitated the implementation of fairer and more comprehensive programs (Ulil Absor & Ratriana, 2024). These examples illustrate the overarching problem that this model is able to address - the underdevelopment resulting from a combination of local knowledge, institutional support, public

involvement, and technical skills needed in different regions. Thus, the Penta-Helix is a profound model for sustainable development at varied levels and scopes.

Value Chain

The adoption of Porter's Value Chain Model has had a major impact on the operational effectiveness and productivity of rural businesses. In *Competitive Advantage*, Michael Porter describes this model, as outlined in figure 1, as separating each organization's activities into primary and support categories, so that firms can assess each activity's contribution towards value addition or cost reduction (Nemati & Weber, 2022; Porter, 2008). The framework aids in the identification of the most strategically important activities that provide value especially for rural enterprises that aim to achieve sustainability and expansion in highly competitive markets.

Figure 1. Porter's value chain framework



Source: (Porter, 2008)

Inbound logistics, operations, outbound logistics, marketing and sales are referred to as primary activities while firm infrastructure, human resource management, technology development and procurement are referred to as support activities (Kambu & Bisay, 2023; Pratiwi et al., 2024). This understanding helps the firms to identify some of the predominant organizational inefficiency weaknesses, bound by organizational strengths, and streamline the operations to improve customer value and profit margin (Zhang et al., 2022). This model is used for companies trying to improve their competitive advantage and better allocate resources and optimize processes.

In integrating the Value Chain Model, there is further economic development and entrepreneurial growth for rural enterprises. These types of businesses tend to face challenges like lack of resources and insufficient infrastructure. Implementing the Value Chain framework allows these businesses to determine the particular competencies they possess and improve their connections with the wider market. For instance, in the Batik Trusmi industrial cluster in Cirebon,



practitioners of value chain analysis have helped promote development initiatives at the regional level for various stakeholder groups (Pratiwi et al., 2024). Likewise, some social enterprises have advanced economic opportunities for local farmers through value chain interventions for social and ecological outcomes (Zhang et al., 2022).

With regards to competition, the Value Chain Model focuses on cost efficiency and strategic response. Ruan (2020) highlights how strategic cost management from the model enables better response to market pressures. This is more advantageous for rural firms with distinctive and unrivaled local resources that are facing competitive challenges (Ruan, 2020). Moreover, Kambu and Bisay (2023) emphasizes that local value chains can be bettered with cooperation from all actors in agriculture, including suppliers and producers. These types of joint actions enhance the dependability and performance of rural enterprises in the market (Kambu & Bisay, 2023).

Applying the Value Chain Model to rural settings, even with its benefits, poses some difficulties (Nesamvuni et al., 2023). Exploring dynamics, for example, in the street food sector can highlight gaps for further development or growth. Zheng et al. (2024) further argue that the logistics of the countryside are highly improved with their value analyzed, and so does the efficiency of the supply chain. Furthermore, adopting technological advancements helps modernize value chains in the countryside (Zheng et al., 2024). Helmold and Terry (2021) present an example of how the digital transformation of a value chain can advance rural businesses enabling them to compete and prosper in the digital economy. Such improvements ensure that rural enterprises can adequately respond to the demands of current markets (Helmold & Terry, 2021).

Integration of Penta-Helix and Value Chain as a strategy for rural innovation and competitiveness

Merging the Penta-Helix model and Value Chain Theory presents a compelling approach to enhancing rural enterprise innovation, competitiveness, and sustainability. As mounting socio-economic issues such as access to markets and inadequate infrastructure dominate a rural area, the collaboration of academics, businesses, the community, government, and media emerges as crucial. This collaboration advances not only improves institutional capacity, but also inclusive growth and development. With the aid of these five stakeholders, rural enterprises will be better placed for economic sustainability and enduring achievement.

The theoretical foundation of this integration lies in combining Michael Porter's Value Chain Theory with the multi-stakeholder approach of the Penta-Helix model. Porter's theory, originally designed to analyze organizational efficiency and competitiveness, is broadened through the Penta-Helix lens, which emphasizes collaborative innovation and localized development solutions (Rosyadi et al., 2021). This hybrid model promotes the sharing of knowledge, skills, and resources across



stakeholders, allowing rural enterprises to refine their internal processes while also responding to external market demands (Ndlovu et al., 2025; Tabares et al., 2022). Each actor contributes distinct yet complementary strengths—academia with research and education, businesses with capital and market insights, communities with localized knowledge, governments with policy support, and media with communication and advocacy capacities.

The collaborative stakeholders' participation greatly improves inclusiveness in rural areas and empowers marginalized groups through vertical and horizontal linkages. For example, local academic institutions produce relevant research and development, while local businesses are able to track market shifts and provide guidance on product development. Community members, guided by local culture, provide labor and traditional skills, while the government provides regulatory and infrastructural support. The media, on the other hand, actively participates in spreading the word and publicizing the success of these initiatives and encouraging public involvement (Ndlovu et al., 2025; Rosyadi et al., 2021). As Tabares et al. (2022) argue, there is a gap that effective governance systems need to fill; that of ensuring these partnerships utilize local resources and encourage local, bottom-up innovation. Such an approach enables rural ventures to enhance their value propositions and maintain competitiveness even with rapidly changing market conditions (Tabares et al., 2022).

Ultimately, having people come together is fundamental in implementing this multi-faceted framework within rural value chains. As Devaux et al., (2019) stated, working together enables different stakeholders along the value chain to contribute in sharing best practices and developing inventive solutions collaboratively (Devaux et al., 2019). This has worked well in areas such as rural tourism, which depends on local cultural heritage, and community engagement for sustainable development (Azwar et al., 2023; Pradhipta et al., 2021). Beyond that, employing the Penta-Helix model increases flexibility to respond to prevailing market dynamics and shifts in consumer behavior, further enhancing rural enterprise development (Ndlovu et al., 2025; Yan & Cao, 2024). With coordinated network efforts, these enterprises construct defensive and adaptive market systems that ensure sustained developments for rural societies.

METHODS

Research Design

This study adopts a qualitative case study approach to explore how Village-Owned Enterprises (*BUMDes*) in Indonesia engage with various stakeholders in implementing collaborative rural development strategies. The primary aim is to propose and contextualize a strategic model that integrates the Penta-Helix framework with Porter's value chain theory, based on empirical insights from three *BUMDes* in Kepulauan Meranti Regency. The case study method is chosen for its strength in enabling an in-depth investigation of contemporary phenomena within real-life settings, especially when boundaries between the phenomenon and context are not clearly defined (Yin, 2014).



The research is both exploratory and illustrative: exploratory in developing a conceptual model for stakeholder collaboration in *BUMDes*, and illustrative in providing real-world cases that reflect how different elements of the model emerge or are lacking in practice.

Research Setting

The study was conducted in Kepulauan Meranti Regency, located in Riau Province, Indonesia. This region was chosen for three reasons:

- (1) it represents rural areas with relatively low human development and high poverty rates
- (2) it has active *BUMDes* operating in various sectors (agriculture, ecotourism, and financial services), and
- (3) it faces both challenges and opportunities due to its strategic location near the Malacca Strait—a global trade route.

Three villages were selected as illustrative cases:

- Bina Maju Village – *BUMDes* focuses on agricultural product aggregation and rural finance.
- Semukut Village – *BUMDes* operates in agricultural (Rubber) marketing and Water Transportation.
- Tanjung Village – *BUMDes* developed a successful ecotourism site from an abandoned reservoir.

Each case reflects a different configuration of stakeholder engagement, value chain activity, and innovation capacity.

Data Collection

Data were collected using three qualitative techniques:

- a. Semi-structured interviews with 36 key informants, including:
 - 5 regional government officials (district and regency level)
 - 9 subdistrict heads
 - 9 village facilitators
 - 5 village heads
 - 5 *BUMDes* managers
 - 3 leaders of farmer groups

Interview topics included *BUMDes* operations, stakeholder involvement, value creation activities, governance challenges, and technology adoption.



- b. Document analysis, including:
 - Village development plans
 - Annual financial reports from *BUMDes*
 - Government policy documents and local regulations
 - *BUMDes* business proposals and media promotional materials
- c. Direct observation of *BUMDes* activities, such as product processing, marketing, and meetings with stakeholders. Field visits were conducted across all three villages.

Data were collected in Bahasa Indonesia and later translated into English for analysis.

Data Analysis

Data analysis followed the thematic coding approach (Braun & Clarke, 2006), using an iterative and inductive strategy. The steps were:

- a. Data familiarization – Reading interview transcripts and field notes multiple times to identify recurring ideas.
- b. Initial coding – Labeling segments of data that corresponded to Penta-Helix elements (e.g., government support, academic input, private sector role, media exposure, community participation).
- c. Pattern identification – Mapping each stakeholder’s contributions across the stages of the value chain (input, processing, marketing, service delivery).
- d. Cross-case comparison – Synthesizing similarities and differences across the three villages to highlight enabling and constraining factors.

NVivo software was used to assist with data coding and management.

Model Validation

To ensure that the proposed integration of the Penta-Helix framework and value chain theory is grounded in empirical reality, the conceptual model was iteratively refined based on field data. A triangulation approach was employed by comparing insights from:

- Stakeholder interviews
- *BUMDes* operational documents
- Observations from site visits
- Existing literature on rural innovation and collaboration models

The model was also validated informally through a feedback loop with key informants. After the initial model was drafted, summary visuals and explanation were shared with several *BUMDes* managers and village facilitators to gather comments and correct any misinterpretations. Their feedback helped improve the clarity of stakeholder roles and identify potential gaps in collaboration mechanisms.



Although formal Delphi or focus group methods were not used due to resource and time constraints, this consultative process strengthened the practical relevance and contextual fit of the model.

RESULT

Developing Conceptual Framework

Rural economic development in Indonesia is at a strategic crossroads. While Village-Owned Enterprises (*BUMDes*) were established to serve as catalysts for rural transformation, their performance and sustainability are often constrained by limited institutional capacity, fragmented stakeholder support, and insufficient market integration. To address these challenges, this study proposes an integrated conceptual model that combines the Penta-Helix collaboration framework with Porter's value chain analysis. This integrated model aims to enhance the competitiveness, innovation capacity, and sustainability of *BUMDes* by situating them within a collaborative, multi-stakeholder ecosystem that supports value creation across every stage of enterprise development.

Penta-Helix Collaboration Model

The Penta-Helix model is a strategic framework for collaborative governance and innovation that brings together five key stakeholders: government, academia, private sector, community, and mass media. Developed from the Triple Helix concept (Etzkowitz & Leydesdorff, 2000), which emphasized the synergy between university, industry, and government, the Penta-Helix expands this interaction by incorporating civil society (community) and communication institutions (media)—both of which play crucial roles in participatory development and knowledge dissemination.

In the context of *BUMDes* and rural Indonesia, each actor in the Penta-Helix plays a vital and complementary role:

- Government functions as the regulator and facilitator, shaping the legal and institutional environment and providing funding mechanisms such as village funds.
- Academia acts as an incubator of innovation, offering technical training, research expertise, and certification services that help build local capacity.
- Private Sector contributes as an enabler, providing access to markets, financial investment, infrastructure, and technology transfer.
- Community, through *BUMDes*, is the executor and beneficiary, leveraging local knowledge and participation to implement development programs and manage enterprises.
- Mass Media serves as an amplifier, building public awareness, promoting products and services, and legitimizing the role of *BUMDes* in local and national development.

This model ensures that innovation and development are not driven solely by top-down policy or bottom-up community action but by a networked system of co-creation, in which all actors are



actively engaged in solving rural development challenges and enhancing local enterprise performance.

Value Chain Framework

The value chain framework, as conceptualized by Porter, provides a systematic way to analyze how value is added through a series of activities—starting from raw material inputs and continuing through production, marketing, distribution, and after-sales services. It has become a central analytical tool in development studies, especially in assessing the efficiency, competitiveness, and sustainability of local enterprises.

Applied to *BUMDes*, the value chain includes the following core stages:

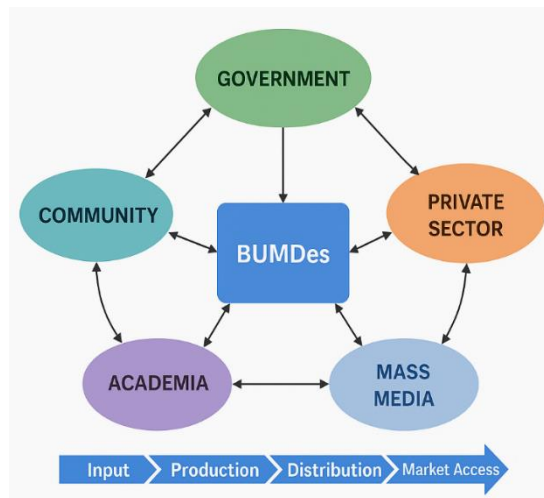
1. Input Sourcing – Access to seeds, tools, knowledge, capital, or raw materials.
2. Processing & Production – Activities that transform inputs into saleable goods or services.
3. Packaging & Distribution – Ensuring products reach markets in a competitive and cost-effective manner.
4. Marketing & Branding – Strategies to differentiate products, reach consumers, and build brand identity.
5. Customer Service – Engaging with end-users to ensure satisfaction, receive feedback, and ensure continuous improvement.

The value chain framework enables the identification of bottlenecks and missed opportunities within *BUMDes* operations. For example, a village enterprise that excels in production but lacks access to market data or branding support may fail to scale. Conversely, effective packaging and promotion may not yield results if input quality or institutional trust is lacking. Thus, linking the value chain with Penta-Helix collaboration enables a targeted, stage-specific approach to stakeholder engagement.

Integrated Penta-Helix Value Chain Model for BUMDes

This study proposes a hybrid model that embeds the roles of Penta-Helix stakeholders into each stage of the *BUMDes* value chain, as outlined in figure 2 below. Instead of treating collaboration and value creation as separate processes, this model aligns stakeholder contributions with the functional needs of rural enterprises. The result is a structured strategy that identifies who contributes what, when, and how in the life cycle of a *BUMDes* enterprise.

Figure 2. Integrated Penta-Helix Collaboration in the Village Value Chain



Source: Author's own elaboration based on literature synthesis.

In this model:

- Government plays a critical role in input sourcing through regulations, subsidies, and enabling infrastructure.
- Academia contributes to the production stage through research, innovation, and training.
- Private Sector supports production and distribution through technology and logistical support.
- Mass Media enhances the marketing and branding stage by promoting local products and increasing public awareness.
- Community (via *BUMDes*) is involved throughout, particularly in managing the enterprise and ensuring cultural relevance and local ownership.

This model reflects a dual focus: vertical integration of activities in the value chain and horizontal coordination among stakeholders in the Penta-Helix system.

Strategic Roles Across the Value Chain

The following table summarizes the mapping of Penta-Helix actors to value chain activities:

Table 1. The Mapping Summary of Penta-Helix actors to value chain activities

<i>Value Chain Stage</i>	<i>Relevant Penta-Helix Actors</i>	<i>Contribution</i>
<i>Input Sourcing</i>	Government, Private Sector, Community	Regulatory support, seed funding, community knowledge
<i>Processing & Production</i>	Academia, <i>BUMDes</i> , Private Sector	Technical training, product innovation, machinery
<i>Marketing & Branding</i>	Mass Media, Private Sector, <i>BUMDes</i>	Product promotion, packaging, digital outreach
<i>Distribution</i>	Government, Private Sector, <i>BUMDes</i>	Infrastructure, logistics partnerships
<i>Customer Service</i>	<i>BUMDes</i> , Community, Academia	Local service delivery, feedback collection, continuous improvement

Source: Developed by the author based on synthesis of theoretical frameworks and empirical patterns from BUMDes case studies.

By explicitly aligning the Penta-Helix model with value chain stages, the proposed framework provides a practical and adaptable strategy for strengthening *BUMDes* as agents of competitive and sustainable rural economic development. This model will be applied and illustrated in the following section through empirical cases from three villages in Kepulauan Meranti.

Empirical Cases: Stakeholder Collaboration and Enterprise Dynamics in Three Village-Owned Enterprises

This section presents empirical evidence from three Village-Owned Enterprises (*BUMDes*) located in Kepulauan Meranti Regency, Riau Province, Indonesia. The cases—Bina Maju, Semukut, and Tanjung—demonstrate distinct approaches to enterprise development and illustrate varying levels of Penta-Helix stakeholder engagement across value chain activities. Data for these cases were collected through structured interviews with *BUMDes* directors and analyzed thematically to reflect their business models, stakeholder collaboration, and operational challenges.

1. BUMDes Usaha Jaya – Bina Maju Village

Established in 2017, *BUMDes* Usaha Jaya in Bina Maju Village evolved from a former Village Economic Enterprise (UED-SP). Its foundation was driven by a combination of village leadership, local facilitators, and financial support from the provincial government. Over time, the enterprise expanded its activities to include a flagship unit in semi-organic rice trading and production, as well as other services such as general trade and machine rentals.



(1) Business Process and Value Chain Functions

The enterprise's value chain begins with upstream cooperation with local farmer groups. *BUMDes* purchases unhusked rice (*gabah*) at market-aligned prices and supports production quality through technical assistance. In the downstream segment, it partners with private distributors, including religious charities and social aid programs, to distribute rice to boarding schools, food vendors, and BPNT program agents. *BUMDes* also operates a *Brilink financial service* and general retail.

(2) Stakeholder Engagement

- Government: Provided legal and financial support through village regulations and budget allocations.
- Community: Engaged in governance and daily operations; young people assist with logistics and distribution.
- Private Sector: Collaborates with religious and social foundations for rice distribution; however, technological and investment partnerships remain limited.
- Academia: No evidence of formal engagement with research institutions or training providers.
- Media: Promotional efforts rely on informal networks and word-of-mouth; no formal media strategy in place.

(3) Challenges

The *BUMDes* faces competition from private rice traders, logistical bottlenecks due to limited transport, and production constraints from outdated machinery, which limits product quality to medium-grade rice. Financial constraints hinder expansion despite consistent market demand.

(4) Strategic Responses

The management seeks to address these issues by building cooperative relationships with traders for capital and scaling logistics capacity to maintain customer satisfaction and service reliability. Efforts are also made to improve internal discipline and maintain supplier-buyer relationships.

2. *BUMDes Bhakti Pertiwi – Semukut Village*

BUMDes Bhakti Pertiwi, established in 2017, emerged as a response to the opportunities created by Indonesia's Village Law (Law No. 6 of 2014), which encouraged rural economic autonomy. The initiative was driven by the village government and supported by community consensus during village meetings. The *BUMDes* operates three main business units: natural rubber trading, water transportation services, and general goods retail.



(1) Business Process and Value Chain Functions

a. Rubber Trading:

The *BUMDes* aggregates raw rubber produced by local farmers. It purchases latex (*ojol*) directly from villagers, stores it until volumes are sufficient, and sells it to external processing companies in Riau, North Sumatra, and the Riau Islands. This model has led to price stabilization and improved incomes for local rubber producers, raising selling prices from IDR 5,000 to up to IDR 6,500 per kilogram.

b. Water Transportation (*Kempang*):

Capitalizing on the village's location along the Renget Strait, the *BUMDes* runs a 24-hour ferry service that connects Semukut with neighboring areas. This unit directly competes with private providers, offering lower fares (from IDR 10,000 to IDR 6,000) and better reliability.

c. Retail Trade:

Sells daily necessities and household goods to the local population, especially targeting rubber farmers and ferry users.

(2) Stakeholder Engagement

- **Government:** Plays a significant role as the sole financial backer of *BUMDes* operations and provides ongoing administrative support.
- **Community:** High involvement, both as suppliers (rubber farmers), users (transport customers), and employees (youth working in operations).
- **Academia:** Indirect engagement; the University of Riau once invited the director to a capacity-building seminar and engaged the *BUMDes* in early discussions on partnership models.
- **Private Sector:** Some exploratory collaboration with a petroleum distributor (Pertashop program) and PT. MTI for fuel supply; however, partnerships remain limited in operational scope.
- **Media:** No structured communication strategy; marketing is mainly done through loyalty programs, including raffle coupons for ferry passengers.

(3) Challenges

The rubber unit faces price volatility, limited working capital, and delays in payments from buyers. Customers frequently request credit purchases, affecting cash flow. Transportation services must contend with maintenance costs and weather-related risks, while retail operations are impacted by supply chain irregularities.



(4) Strategic Responses

To maintain business continuity, the *BUMDes* implements a price stabilization strategy, ensures product quality, and cultivates trust with both farmers and corporate buyers. The enterprise also leverages community loyalty through membership systems and aims to formalize cooperation with larger buyers through Memoranda of Understanding (MoUs).

This case highlights how a *BUMDes* can serve as both an economic aggregator and public service provider in a geographically fragmented rural area. Although academic and private sector engagement remains limited, the case demonstrates that strong village governance and community buy-in can create a foundation for enterprise resilience and expansion.

3. *BUMDes Tanjung Mandiri – Tanjung Village*

BUMDes Tanjung Mandiri, established in 2019, was initiated through village deliberation (Musyawarah Desa) and structured in accordance with the Village Law framework. Its formation was aimed at strengthening local economic resilience through the development of community-based enterprises that leverage local assets. Currently, the *BUMDes* manages three core business units: Telaga Air Merah ecotourism, retail trade, and river crossing transportation services.

(1) Business Process and Value Chain Functions

a. Ecotourism:

The tourism unit is based on a restored water reservoir repurposed into a family-friendly recreational park. The *BUMDes* has created photo spots, provides hospitality training for staff, and organizes seasonal events to attract visitors. Promotions are conducted mainly through social media and word-of-mouth.

b. Retail Trade:

Sells daily goods, especially to employees of a company operating within the village, with which the *BUMDes* has established a service agreement.

c. Transportation Services:

Provides boat transportation for villagers crossing rivers to access markets, schools, and healthcare. This unit meets essential connectivity needs and supports village mobility.

(2) Stakeholder Engagement

- **Government:** Acts as regulator and facilitator, supporting the *BUMDes* through village regulations, business licensing, and financial capital via village funds. The government also mediates coordination with external actors when infrastructure or legal support is needed.



- Community: Active in both development and service operations. Residents contribute ideas during the planning phase and work in tourism and transportation services.
- Private Sector: A company operating in the village area supports *BUMDes* activities through Corporate Social Responsibility (CSR) funding, particularly in the tourism sector. Contributions include infrastructure improvement, promotional support, and logistics coordination.
- Media: The *BUMDes* actively utilizes social media platforms to promote Telaga Air Merah and inform the public about events and services.
- Academia: There is no evidence of formal collaboration with higher education institutions in tourism design, training, or evaluation.

(3) Challenges

The *BUMDes* faces significant challenges in:

- Infrastructure: Poor road access and transport facilities limit tourist mobility and reduce repeat visits.
- Human Capital: Staff lack formal training in hospitality, business modeling, and service analytics.
- Market Competition: Growing numbers of village-based tourism sites in the region have intensified competition for visitors and public attention.

(4) Strategic Responses

To address these challenges, the *BUMDes* focuses on:

- Regular coordination with the village government to seek infrastructure support.
- Expanding cooperation with the local company through service delivery agreements.
- Enhancing customer experience by organizing monthly and annual events to maintain visitor interest.
- Using digital promotion and visual branding via social media to attract broader audiences.

This case illustrates how strategic community leadership, combined with targeted CSR support, can transform underutilized village assets into viable economic ventures. Tanjung's experience suggests that even in the absence of academic collaboration, a *BUMDes* can thrive by aligning local creativity with external resources—provided that infrastructure and human capital are progressively addressed.



DISCUSSION

This study explored how the integration of the Penta-Helix collaboration model and value chain theory can guide the strategic development of Village-Owned Enterprises (*BUMDes*) in rural Indonesia. The empirical insights from Bina Maju Village, Semukut Village, and Tanjung Village provide grounded evidence of how *BUMDes* respond to local economic realities through a mix of community initiative, public support, and selective external collaboration. While the three cases differ in sectoral focus and stakeholder composition, several key themes emerge that inform a nuanced understanding of collaborative rural enterprise development.

Government and Community: The Backbone of Rural Enterprise

In all three cases, the government–community axis functions as the foundational pillar for *BUMDes* operation and continuity. Village governments provide legal infrastructure, seed capital, and regulatory guidance, as evident in the formal establishment processes and sustained support observed in all sites. Meanwhile, communities—through both formal participation and labor contribution—ensure operational legitimacy and resilience.

For instance, in Bina Maju, community farmers are central to the supply chain and are actively engaged in governance and logistics. Similarly, Tanjung’s success in tourism stems from grassroots mobilization, while in Semukut Village, both rubber farmers and transportation users constitute the backbone of the enterprise. These findings affirm previous research on the role of social capital and village autonomy in enabling rural innovation (Widianingsih & Morrell, 2007).

Asymmetry in Penta-Helix Engagement

Despite the centrality of community and government actors, the other three pillars of the Penta-Helix model—academia, private sector, and media—remain unevenly involved:

- **Academia:** Across all cases, academic involvement was either absent or marginal. Only in Semukut Village did the *BUMDes* director report participation in a university-led seminar. The absence of structured knowledge partnerships limits access to training, feasibility assessments, and innovation support.
- **Private Sector:** Engagement is emerging but fragmented. Tanjung stands out for securing CSR-based support from a company operating in the village, which contributed to tourism development. In contrast, Semukut’s exploratory MoUs with a petroleum firm and fuel suppliers remain underutilized, and Bina Maju’s market partnerships are informal and charity-driven, not commercially strategic.
- **Media:** The most promising media engagement is found in Tanjung, where **social media** plays a crucial role in promoting ecotourism. In Bina Maju and Semukut, media remains underutilized, and promotion is mainly reliant on informal networks or direct outreach.



This uneven participation reflects broader structural challenges in rural Indonesia, such as weak institutional connectivity, limited investor confidence, and digital skill gaps. The findings suggest that while the Penta-Helix model is conceptually robust, its operationalization in rural *BUMDes* contexts requires intentional stakeholder facilitation and long-term engagement strategies.

Value Chain Perspective Reveals Stage-Specific Strengths and Gaps

Applying a value chain lens to the three *BUMDes* helps diagnose where stakeholder collaboration is most needed. For example:

- Bina Maju Village demonstrates relative strength in input sourcing and aggregation, with direct purchase schemes for semi-organic rice, but lacks downstream processing and branding capacity.
- Semukut Village effectively manages collection and primary sales of natural rubber and provides a vital transportation service, but faces challenges in price volatility and capital shortages.
- Tanjung Village excels in marketing and customer engagement, particularly in ecotourism, but suffers from infrastructural constraints and limited human resource capacity.

These variations suggest that each *BUMDes* requires a different composition and sequencing of Penta-Helix actors. Not every actor is equally relevant at every stage of the value chain. For instance, academic support is most valuable in production and quality improvement, while private investment is crucial during scaling and distribution.

Toward a Context-Sensitive Collaboration Model

The findings reinforce the value of the proposed integrated Penta-Helix-Value Chain model but also indicate the need for adaptive application. The model should not be understood as a static framework but as a flexible tool that aligns collaboration efforts with specific enterprise stages and contextual needs.

Key implications include:

- Strategic sequencing: Stakeholder engagement must be timed to align with the enterprise's developmental stage.
- Selective intensification: Focused partnerships in critical value chain segments (e.g., branding, finance, R&D) yield higher returns than broad but shallow collaboration.
- Local agency: The success of *BUMDes* is still heavily dependent on the leadership capacity of directors and village governments to initiate, coordinate, and sustain partnerships.



Practical and Policy Recommendations

From a practice and policy standpoint, several actions could enhance the effectiveness of stakeholder collaboration:

- Incentivize academic–village linkages through rural innovation grants and university service-learning programs.
- Institutionalize CSR engagement with *BUMDes* via regional policy frameworks that align corporate social programs with village development goals.
- Build digital marketing capacity through targeted training for *BUMDes* operators and youth, especially in tourism and retail sectors.
- Establish intermediary platforms (e.g., district-level forums) to match *BUMDes* with potential private and academic partners.

Ultimately, a coordinated multi-stakeholder approach, tailored to local potentials and constraints, holds the greatest promise for unlocking the role of *BUMDes* in building competitive and sustainable rural economies.

Strategy Proposal: An Integrated Model for Collaborative and Competitive BUMDes Development

Building on the conceptual insights and empirical findings of this study, this section proposes a strategic model for enhancing the performance, sustainability, and competitiveness of Village-owned Enterprises (*BUMDes*) in Indonesia. The model integrates the Penta-Helix collaboration framework with value chain analysis, while incorporating key lessons from Bina Maju, Semukut, and Tanjung Villages. It is designed to guide local governments, *BUMDes* managers, and development stakeholders in structuring, scaling, and sustaining *BUMDes* through a context-sensitive, actor-oriented, and stage-specific strategy.

Strategic Integration of Collaboration and Value Creation

The strategy model rests on two pillars:

- a. Value Chain Orientation: Recognizing that *BUMDes* operate across diverse sectors—agriculture, services, tourism—this model applies a stage-based logic to value creation, identifying critical points in the chain where value is added or lost (e.g., input sourcing, processing, marketing).
- b. Penta-Helix Actor Alignment: The model specifies which stakeholders (government, academia, private sector, community, media) should be engaged at each value chain stage, based on their core competencies and potential contributions.

- c. This dual structure allows the model to serve both as a diagnostic tool (to identify gaps and collaboration failures) and as a prescriptive guide (to structure future interventions).

The Strategic Collaboration Framework

To translate the integrated Penta-Helix and value chain model into an actionable strategy, this study proposes a structured framework that maps stakeholder roles to value chain stages in the development of *BUMDes*. This framework is designed to assist village governments, *BUMDes* managers, and policy actors in identifying which stakeholders to engage, what their expected contributions are, and at which stage of enterprise development their involvement is most critical.

While the Penta-Helix model emphasizes inclusive and multi-actor governance, its practical application requires more than stakeholder identification—it demands clarity about functional alignment. Similarly, value chain theory highlights how economic value is created through sequential activities, yet often overlooks the social and institutional collaborations necessary to support those activities in rural settings. The proposed framework bridges this gap by integrating who (actor) does what (role) and when (stage) in the enterprise lifecycle.

The table 2 below illustrates the strategic alignment of Penta-Helix actors across five key stages of the *BUMDes* value chain. It serves as both a diagnostic tool to identify current collaboration gaps and a prescriptive guide for planning future partnerships.

Table 2. Strategic Alignment of Penta-Helix Stakeholders Across *BUMDes* Value Chain Stages

Value Chain Stage	Key Activities	Strategic Stakeholders	Targeted Interventions
Input Sourcing	Land access, raw materials, capital	Government, Community, Private Sector	Seed funding, cooperative formation, CSR for capital injection
Production/Processing	Manufacturing, agro-processing, service design	Academia, <i>BUMDes</i> , Community	Technical training, innovation transfer, quality control mechanisms
Distribution & Logistics	Transport, packaging, storage	Private Sector, Government	Public-private infrastructure partnerships, local logistics coordination
Marketing & Branding	Promotion, storytelling, digital outreach	Media, Private Sector, Youth	Social media strategy, brand identity development, tourism/event planning



Customer Service	After-sales care, visitor experience, feedback	Community, Academia, <i>BUMDes</i>	Customer feedback loops, service innovation, impact monitoring
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Source: Developed by the author based on field data (Bina Maju, Semukut, Tanjung) and conceptual synthesis of Penta-Helix collaboration and value chain theory

This structure allows *BUMDes* to map out who should do what, when, and how, while ensuring that no actor operates in isolation. It also helps prevent redundancy and clarifies the roles of emerging actors like CSR-driven companies and digitally literate youth.

Implementation Roadmap

To operationalize the model, the following steps are proposed:

a. Stakeholder Mapping

BUMDes and village governments should conduct a mapping exercise to identify local, regional, and national actors aligned with each value chain function. This includes identifying latent partners (e.g., nearby universities, local media, CSR programs).

b. Capacity Assessment

An internal audit of the *BUMDes*' human resources, infrastructure, and financial capabilities should be undertaken to determine readiness for engaging with external actors and absorbing support.

c. Collaboration Sequencing

Based on the maturity stage of the *BUMDes*, collaborations should be sequenced accordingly:

- Early-stage *BUMDes* should prioritize government and community support.
- Growth-stage *BUMDes* should bring in academia for technical capacity and the private sector for market expansion.
- Scaling-stage *BUMDes* should emphasize branding, innovation, and long-term investment partnerships.

d. Partnership Facilitation and Governance

Village governments, assisted by district-level development offices, should act as facilitators to formalize collaborations through MoUs, CSR agreements, or co-implementation models. Governance mechanisms must ensure accountability, transparency, and shared benefit.



e. Monitoring and Learning Mechanisms

Simple feedback tools (e.g., community forums, digital surveys, annual reviews) should be institutionalized to measure progress, gather lessons, and refine strategies. These mechanisms will also support adaptive management and innovation.

Flexibility and Scalability of the Model

The model is deliberately non-prescriptive to allow for contextual flexibility. It can be adapted to:

- *BUMDes* in resource-based sectors (e.g., agriculture, fisheries)
- *BUMDes* in service sectors (e.g., tourism, transport)
- *BUMDes* with CSR involvement (as seen in Tanjung Village)
- *BUMDes* located in remote or resource-constrained environments, as in Semukut Village

By embedding a modular logic, the model supports scale-up and replication across regions, while being sensitive to local institutional capacities and economic contexts.

Strategic Vision

Ultimately, this strategy proposes a shift from seeing *BUMDes* as isolated village projects toward positioning them as strategically networked rural enterprises—embedded in a web of collaborative relationships and aligned with broader regional development goals. Through structured collaboration and value-based thinking, *BUMDes* can evolve into innovation hubs, economic drivers, and inclusive development platforms that help Indonesian villages thrive in a globalized economy.

CONCLUSION

This combination of the Penta-Helix collaboration model and value chain analytic framework is applied strategically to examine its impact on performance improvement as well as sustainability of Business Managed by the Villagers in Indonesia (*BUMDes*). The findings from the case study of three villages: Bina Maju, Semukut, and Tanjung demonstrates that multi stakeholder collaboration, if integrated with specific value chain activities on particular stages, makes rural enterprises more adaptive, inclusive, and resilient. These conclusions stand out:

Government and community actors are the backbone of *BUMDes* sustenance. Their collaboration constructs the institutional and operational framework within which all other collaboration types are integrated. However, this partnership dualism creates an encapsulated solution that stifles innovation, exposure, growth and is a competitive disadvantage within the market.



Unlike the previous two, the involvement of the academic world, the business world and the press is markedly weak in all studied cases. There is some degree of isolated involvement in the form of CSR, informal business collaborations and training schemes, but these stakeholders have not yet been integrated into the *BUMDes* framework. This serves to demonstrate the gap between the Penta-Helix model's normative principles and the expectation in its many rural operational contexts.

Third, the use of value chain perspective has been effective in diagnosing *BUMDes* internal strengths and external collaboration gaps. It allows practitioners to evaluate where value is created and obliterated in engaging stakeholders in targeted result-oriented frameworks on each milestone.

To solve these gaps, the study has designed a strategic collaboration model that allocates Penta-Helix constituents to particular value chain segments and proposed an implementation plan focused on sequencing, building, and learning. This model proposes a versatile, but practical approach to the escalated problem of the *BUMDes* as rural development accelerators targeted by village policymakers, development planners, and practitioners.

In summation, the Indonesian rural development paradigm has been increasingly marked with decentralization alongside the development of *BUMDes* as the spearheads and catalyzers of rural development. Here, success is not driven rather constrained by financial flows or regulatory frameworks. Pursuing a qualitative cross-sector collaboration approach yields the desired magnitude of impact. By applying the Penta-Helix and value chain interplay in a sensitive manner, rural enterprises stand the chance to be transformed into competitive, inclusive, and futuristic institutions that respond to local and global challenges and opportunities.

However, this study is limited by its reliance on case studies from three villages, which may not fully represent the diverse socio-economic contexts across Indonesia. The lack of longitudinal data and broader comparative analysis also constrains the generalizability of the findings. Future research is recommended to adopt a mixed-method approach, incorporating both qualitative and quantitative data across multiple regions and time periods to capture more nuanced insights. Additionally, exploring the dynamic interplay between the Penta-Helix stakeholders and evolving digital technologies in rural enterprise development could provide richer implications for policy and practice.

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