

Village Food Security through Local Enterprises: Governance and Policy Alignment in the Feasibility of BUMDes Agribusiness

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Abstract. Village-Owned Enterprises (BUMDes) play a strategic role in realizing food security and self-sufficiency based on the villages. However, the implementation of this program requires the readiness in terms of institutional capacity, governance, and the integrated policies. This study aims to assess the feasibility of BUMDes in implementing the food security programs through a descriptive qualitative approach. Data were collected through in-depth interviews, participatory observation, and document studies from 32 assisted villages in Suruh and Pabelan Districts, Semarang Regency. The results show that the success of the program is highly determined by three main pillars, namely synchronization of village policies with food programs, transparent and participatory governance of BUMDes, and the readiness of local human resources to manage the food business units. This study suggests the need for an integrative model among village governments, academics, and BUMDes actors to formulate the data-driven and local-based policies.

1 Introduction

The growing global population requires an increase in the agricultural production to meet the global food demand. Due to the substantial population growth, agricultural land keeps shrinking every day[1]. In Indonesia, the population has exceeded about 270 million people. This condition necessitates an increase in the food security for its population. This is further driven by the instability of the world security situation, with the increasingly intense warfare, the raising fears of a potential third world war, which threatens the global food security and directly impacts the citizens of Indonesia.

The increase in the global population and climate change have triggered a series of problems, such as the increase of carbon dioxide (CO₂), more frequent droughts, and temperature changes that are substantial obstacles to crop yields and food security[2]. Food security is heavily dependent on several climate variables, including temperature, water availability, and weather conditions for crop production [3]. A high dependence on the climate variables results in any disturbance, regardless of its scale, which will impact the

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productivity of crops, fisheries, and livestock. These issues in turn will exacerbate the government's failure to achieve the food self-sufficiency.

Food security has been a critical policy agenda in the face of the worsening global challenges, namely climate change, supply chain disruptions, and socio-economic inequalities. In Indonesia, the food sovereignty issue is not only a national target, but also a village-level responsibility, particularly since the implementation of Law No. 6/2014 concerning Villages. This law provides the legal foundation for community-based development through the establishment of Village-Owned Enterprises (Badan Usaha Milik Desa or BUMDes in Indonesian language). These enterprises are expected to serve as the economic engines in rural areas, by supporting agricultural resilience and local food systems.

The government policy during President Prabowo's reign has established a program called the Village Food Security Program, for achieving the Food Self-Sufficiency. This program applies to all villages in the region of Indonesia, including Semarang Regency. The Food Security Program requires the use of Village Funds of at least 20%. Semarang Regency Regional Regulation No. 10 of 2023 regarding the Village-Owned Enterprises, in Article 42, states that;

- (1) The capital participation of the Village and/or village community for the increase of capital in the Village-Owned Enterprises/joint Village-Owned Enterprises as referred to in Article 41 paragraph (1) letter b is used for: a. the development of business activities of the Village-Owned Enterprises/joint Village-Owned Enterprises and/or Business Units of the Village-Owned Enterprises/joint Village-Owned Enterprises; b. strengthening the capital structure and increasing the business capacity; and/or; c. the assignment of the Village-Owned Enterprises/joint Village-Owned Enterprises to carry out certain activities.
- (2) The investment of village capital for the development of the activities in Village-Owned Enterprises/Joint Village-Owned Enterprises and/or the Units of Village-Owned Enterprises/Joint Village-Owned Enterprises as referred to in paragraph (1) letter a must first be preceded by a feasibility study conducted by a team established by the Village involving a professional and independent third party.
- (3) The third party referred to in paragraph (2) is a university or other professionals and independent institutions.
- (4) The third party as referred to in paragraph (4) may be facilitated by the Regional Government by involving universities or other professional, competent institutions that have signed a cooperation agreement with the Regional Government.

Referring to the aforementioned policy, in the technical implementation of the Food Security Acceleration Program, a feasibility study is required to involve higher education institutions that have collaborated with the Semarang Regency Government. The available village data in Semarang Regency are presented in the table below.

Table 1. Villages in Semarang Regency

No.	Districts	Villages
1	Pabelan	Karanggondang, Sukoharjo, Sumberejo, Ujung-Ujung, Segiri, Semowo, Terban, Tukang, Bendungan, Glawan, Jembrak, Kadirejo, Giling, Bejaten, Kauman Lor, Pabelan, Padaan
2	Suruh	Beji Lor, Dersansari, Jatirejo, Kebowan, Bonomerto, Ketanggi, Medayu, Sukorejo, Kedungringin, Cukilan, Dadapayam, Gunung tumpeng, Krandon Lor, Plumbon, Purworejo, Reksosari, Suruh

Villages serve as the basis for the development and the strengthening of local-based food security. Collaboration between universities and villages is established for analyzing market structures, business feasibility, and the quantum-based entrepreneurial behavior to shape food security outcomes. Several factors, such as land size, crop diversity, and barriers to the market entry, are very important. Having food security benefits from larger land ownership, greater crop diversity, higher yields from fisheries and livestock, and better access to the markets, BUMDes is capable of providing higher productivity and more stable food supplies. In contrast, BUMDes, having the food insecurity, faces difficulties in terms of smaller land ownership, the lack of diversification, and a greater dependence on the local markets, which make them more vulnerable to the food insecurity[4].

The university serves as an independent third party for assessing and measuring the potential feasibility of BUMDes businesses. The feasibility of BUMDes businesses consists of several sectors, namely fisheries, livestock, and agriculture. The main assessment criteria for these businesses are included in the Financial and Marketing Sectors. The government's expectation is that every BUMDes in the village can produce a sustainable food commodity and turn into a business that earns profit for the village, in addition to the main goal that this program will serve as a foundation for achieving Indonesia's food sovereignty. This program will not succeed without the support of the competent Human Resources and decent Digital Literacy and Entrepreneurship, for anticipating the Quantum Computing age in particular.

As a part of the national effort to strengthen the food security, the Indonesian government has allocated a minimum of 20% from the village funds, specifically for the food-related programs. In practice, this policy encourages the establishment and development of BUMDes to manage the agribusiness units, namely rice cultivation, catfish farming, or the processed food products. However, there are remaining questions regarding the readiness and feasibility of these enterprises to manage food security programs sustainably. Various challenges have been observed, such as poor institutional governance, the lack of the strategic business planning, minimal market analysis, and the limited human resource capacity.

This research aims to explore the feasibility of BUMDes food-related ventures by focusing on three interrelated dimensions, namely policy alignment, governance practices, and institutional readiness. Using a qualitative descriptive approach, the study investigates how local policies and governance structures shape the capacity of BUMDes to design and implement the viable food-based enterprises. The study also explores the extent to which support systems, namely academic assistance, village planning mechanisms, and community engagement, contribute to or hinder the realization of sustainable food systems at the village level.

2 Theoretical Background

2.1 Village Business Feasibility Study

A feasibility study involves an analysis that considers the forecasted relevant costs and benefits to gauge the practicality and viability of a proposed project. The forecasts of cost and benefit play a pivotal role in such evaluation. However, uncertainties in forecasts are not adequately considered during implementation of the feasibility study. Analysts often rely solely on the point estimates derived from prediction models that oversimplify the future[5].

A feasibility study for the village enterprises usually observes five main areas as follows:

1) Market feasibility

Is there enough local demand for the product or service, and what does the competition look like?

2) **Technical feasibility**

Does the village have the right tools, infrastructure, and production capacity to run the business?

3) **Financial feasibility**

How much money is needed to start, what are the expected profits, and what risks are involved?

4) **Institutional feasibility**

Is the organization ready, well-managed, and does it have skilled people to run the enterprise?

5) **Legal and regulatory feasibility**

Does the business follow village rules and government regulations?

When it comes to policy and governance, the success of BUMDes initiatives depends on two main aspects, namely how well the project fits with the existing policies (**policy alignment**) and how strong the organization is (**institutional capacity**). Feasibility is not merely about whether or not a business idea can work, but it is also about whether or not the village environment, including its rules, leadership, and community involvement, will support the project. That is the reason of its importance to include early feasibility assessments when planning the food-related BUMDes projects. This action helps make sure that the project will have a lasting impact and support bigger goals, namely **food sovereignty** and the **strengthening of local economy**.

2.2 Food Security Policy at the Village Level

Food security is currently a local priority in many countries, including Indonesia. Village governments play a key role in helping the country achieve national food sovereignty. Thus, with the Village Law No. 6 of 2014, villages have more power to plan their own development. This law allows the village governments to identify their own food resources and to create the food security programs that fit the unique needs of their communities.

In the context of village development, food security is defined not only in terms of food availability, but also accessibility, affordability, cultural acceptability, and sustainability. Sustainable alternative protein sources have been explored to address the increasing global protein demand as driven by the population growth, while mitigating the environmental impacts[6]. The Indonesian Ministry of Villages (Kemendes PDTT) emphasizes that **a minimum of 20% of the village funds** must be allocated for several programs directly or indirectly related to the food security, including community farming, seed banks, village granaries, local livestock production, and even market access for food products.

Village food security policies are usually written in form of the planning documents, namely the **Village Medium-Term Development Plan (RPJMDes)** and the **Village Work Plan (RKPDDes)**. However, research shows that these plans are often without clear steps, measurable goals, or taking into account what local people and organizations can actually do. Because of this factor, village governments often focus on the short-term programs, like providing livestock or seeds, instead of working on the long-term solutions, such as strengthening local institutions, improving supply chains, or encouraging the sustainable food production. Government's food support and policies, as well as an access to the microcredit provided by the government and banks played a vital role for increasing the income and the food security of rural households in the area[7], Pabelan and Suruh Districts in particular.

Moreover, the success of food security policies at the village level often depends on how well they are integrated with operational and business models of the **BUMDes**. When the

food security initiatives are aligned with BUMDes activities, namely the commercialization of agricultural products or the processing of local food commodities, there is a greater chance for the sustainable impact. Conversely, a disconnection between policy and implementation can lead to the failed programs and the wasted resources.

2.3 Village Governance and Role of BUMDes

Village governance is central to the success of rural development initiatives, including the implementation of food security programs. Under Village Law No. 6 of 2014 of the Republic of Indonesia, the village governments are provided with a significant amount of autonomy to plan, organize, and carry out the development agendas based on their local potential. Under this model of decentralization, the village becomes both a decision-making center and a provider of services to its people through such strategic institutions as BUMDes.

Effective village governance is characterized by its transparency, accountability, community participation, and alignment with development planning documents, namely RPJMDes and RKPDes. However, many villages struggle to implement governance principles due to its limited administrative capacity, unclear organizational structures, and weak institutional support systems. In this context, **BUMDes serve as an economic extension of the village governance**, to manage its local resources, and to earn income that benefits the entire community. The performance of BUMDes is not only a reflection of its local entrepreneurial capacity, but also of the quality of village governance itself. When governance is participatory and inclusive, BUMDes tends to be more responsive to the community needs, more transparent in terms of financial management, and more aligned with the broader development goals, namely food sovereignty.

Moreover, BUMDes is expected to play a **strategic role in rural food systems**, particularly by integrating the local agricultural production with market access, the value-added processing, and storage management. The position at the intersection between community economy and governance allows BUMDes to mobilize both institutional and economic resources to address these food security challenges. However, the operationalization of this role requires strong leadership, business literacy, effective policy frameworks, and synergy among village governments, BUMDes managers, and other stakeholders. The absence of these factors often leads to the failed ventures, the unutilized assets, or community distrust.

In the context of the rural food security enterprises, the policy alignment is important in shaping the entrepreneurial ecosystem by ensuring that strategic village business initiatives do not operate in isolation, but are embedded in the formal development agenda. With the proper policy alignment, BUMDes managers are likely to attain legitimacy, security, and clarity in operationalizing their business models. Policy alignment can be observed in the embedding of the enterprise in the RPJMDes, the allocation of village funds for the food-related initiatives, the support for digitalization, and the embedding of BUMDes programs in the national food security policies. The integrated policy measures within the General Agricultural Policy offer the potential to enhance contributions to Food Security and Nutrition. However, these measures require proper 'programming' by local and national governments to realize their full potential[8].

3 Methodology

This study employed a **qualitative descriptive approach** to explore the feasibility of *BUMDes* in implementing the food security programs. The qualitative design allowed for a contextual and in-depth understanding of governance practices, policy alignment, institutional readiness, and community dynamics that affect the success or failure of

BUMDes-driven agribusiness initiatives. The research adopted an interpretive paradigm, focusing on the meaning-making, local narratives, and stakeholder perspectives. Respondents in this study area lived in two major districts, namely Pabelan and Suruh, while a total of 160 respondents were selected using the simple random sampling techniques.

Data were collected using three main techniques as follows:

1. **In-depth interviews**, using a semi-structured interview guide to explore perceptions of feasibility, institutional readiness, governance, and food system priorities.
2. **Participant observation**, particularly in the village development meetings, BUMDes activities, and community farming programs.
3. **Document analysis**, including review of RPJMDes, RKPDDes, BUMDes business plans, food security policy documents, and meeting minutes.

All interviews were audio recorded with the consent and transcribed verbatim. Field notes were written to capture informal discussions and situational contexts. Data triangulation was performed across different data sources (interviews, documents, observations) to ensure their credibility. Member checking was also applied by validating the key interpretations with the selected informants.

4 Result and Discussion

4.1 Feasibility Findings of BUMDes Agribusiness Initiatives

The Feasibility Study on BUMDes started from the Food Security Program, and the Semarang Regency’s Regional Regulation No. 10 of 2023 regarding the Village-Owned Enterprises, in Article 42. Of the total number of 208 villages in Semarang Regency, they are divided into some groups of districts, to be assisted by the University, in the Assessment of the Feasibility of their BUMDes business. In this research, Ngudi Waluyo University assisted 2 districts, namely Suruh and Pabelan. The list of village, business potential, and the amount of funds for the Food Resilience Business Activities by BUMDes is stated below.

Table 2. Village Fund Data in Semarang Regency for Food Security.

No.	Districts	Villages	Business Potential	Village Fund (20%)
1	Pabelan	Karanggondang	Agriculture Vegetable	IDR 151,274,000
2	Pabelan	Sukoharjo	Catfish Farming	IDR 173,100,000
3	Pabelan	Sumberrejo	Goat Breeding	IDR 202,500,000
4	Pabelan	Ujung-ujung	Goat Breeding	IDR 173,150,000
5	Pabelan	Segiri	KUB Chicken Farming	IDR 162,000,000
6	Pabelan	Semowo	Layer Chicken Farming	IDR 256,178,500
7	Pabelan	Terban	Corn Cultivation and Goat Breeding	IDR 156,000,000
8	Pabelan	Tukang	Cow Fattening	IDR 160,000,000
9	Pabelan	Bendungan	Oyster Mushroom Agriculture	IDR 137,000,000
10	Pabelan	Glawan	Catfish Breeding and Farming	IDR 159,700,000

No.	Districts	Villages	Business Potential	Village Fund (20%)
11	Pabelan	Jembrak	Goat Breeding and Agriculture Taro “Pratama”	IDR 156,000,000
12	Pabelan	Kadirejo	Layer Chicken Farming	IDR 190,000,000
13	Pabelan	Giling	Layer Chicken Farming	IDR 200,500,000
14	Pabelan	Bejaten	KUB Chicken Farming	IDR 154,291,000
15	Pabelan	Kauman Lor	Tilapia Fish Cultivation and Vegetable Agriculture	IDR 172,311,553
16	Pabelan	Pabelan	Catfish Breeding and Farming	IDR 220,000,000
17	Pabelan	Padaan	Broiler Duck	IDR 156,918,700
18	Suruh	Beji Lor	Red Onion Agriculture	IDR 160,000,000
19	Suruh	Dersansari	Cow Fattening	IDR 155,486,000
20	Suruh	Jatirejo	Tilapia Fish Cultivation	IDR 172,555,000
21	Suruh	Kebowan	Goat Breeding	IDR 192,700,000
22	Suruh	Bonomerto	Catfish Breeding and Farming	IDR 181,588,000
23	Suruh	Ketanggi	Layer Duck	IDR 157,010,000
24	Suruh	Medayu	Cow Fattening	IDR 160,000,000
25	Suruh	Sukorejo	Catfish Breeding and Farming	IDR 183,835,000
26	Suruh	Kedungringin	Goat Breeding and Corn Cultivation	IDR 223,857,000
27	Suruh	Cukilan	Cow Breeding	IDR 218,600,000
28	Suruh	Dadapayam	Broiler Duck	IDR 208,956,000
29	Suruh	Gunung Tumpeng	Broiler Chicken and Cow Breeding	IDR 170,000,000
30	Suruh	Krandon Lor	Layer Chicken and Goat Breeding	IDR 214,000,000
31	Suruh	Plumbon	Mina Padi Cultivation	IDR 214,351,000
32	Suruh	Purworejo	Cow Fattening and Corn Cultivation	IDR 150,000,000
33	Suruh	Reksosari	Cow Fattening and Rice Cultivation	IDR 264,000,000
34	Suruh	Suruh	Catfish Breeding and Farming	IDR 265,487,000

The feasibility analysis conducted in Suruh District **for example**, revealed that agribusiness initiatives led by BUMDes had a strong potential to support local food security programs,

through freshwater aquaculture in particular. Two primary business models, namely **catfish seedling (hatchery)** and **catfish fattening**, were assessed. Both models were found to be feasible based on technical, market, financial, and institutional indicators.

The feasibility study was carried out using a multi-aspect approach, by integrating financial analysis (such as NPV, IRR, and payback period), technical suitability, market demand assessment, and institutional readiness. The analysis was conducted by a team of academic experts from Ngudi Waluyo University in collaboration with village governments, and was aligned with Semarang Regency's food security initiative.

The **catfish seedling business model** demonstrated a promising viability, particularly in villages with an access to clean water sources and the trained operators. This model had the relatively lower capital requirements, faster turnover cycles, and high demand from the surrounding farmer groups. Financially, the net present value (NPV) was positive, the internal rate of return (IRR) exceeded 15%, and the payback period was less than 2 years—marking it as a low-risk, high-opportunity initiative for the village-level entrepreneurship.

Meanwhile, the **catfish fattening model** was also deemed feasible, especially in terms of its scalability and community involvement. While this model required more capital and operational costs, it provided higher profit margins per production cycle. The market absorption was validated through interviews with local aggregators, cooperatives, and fish traders. Additionally, the business provided a space for inclusive labor, involving village youth and the unemployed residents.

Beyond these financial indicators, the feasibility study also emphasized **institutional and governance factors**. Villages having active BUMDes with clear organizational structures, transparent bookkeeping, and leadership support tended to have a stronger readiness to implement the agribusiness ventures. The process of conducting the feasibility study itself became a platform for the institutional learning, helping local actors understand business logic, financial planning, and market orientation; in which these are skills that are often underdeveloped in rural governance.

These findings suggest that BUMDes, when supported by adequate policy alignment and technical assistance, can serve as the resilient vehicles for strengthening local food systems. Moreover, the use of the participatory feasibility assessments allowed the village stakeholders to evaluate risks, anticipate operational challenges, and build realistic expectations before launching the enterprise.

4.2 Governance and Policy Alignment Observations

The village governance framework in Suruh and Pabelan Districts is the determining factor for the success of BUMDes-driven agribusiness enterprises. The research found that those villages having open governance, decision-making with participation, and the well-defined institutional roles were better able to convert the food security policies into the implementable business plans. In these instances, BUMDes was the implementing arm of the village policy, closing the gap between regulatory requirement and economic execution.

Policy alignment was proven to be a key driver. Villages that incorporated the food security programs into their RPJMDes and RKPDDes showed a greater coherence between development goals and BUMDes business. This alignment was also supported by the national regulation that a minimum of 20% of village fund must be spent on food security initiatives. In practice, these funds were not just channeled for the capital expenditure in aquaculture businesses, but also for capacity development, market facilitation, and infrastructure support.

Field interviews emphasized that external facilitation—particularly from Ngudi Waluyo University—assisted the villages in adopting the standardized feasibility assessment templates. This did not only enhance the quality of business planning, but also increased its accountability, with the feasibility outcomes being recorded and reported to both community

members and government agencies at higher levels. Governance issues were also apparent. In certain villages, policy alignment was nominal, with the food security noted in the planning documents without any specific operational plans or budgetary provision. Such a disconnection between policy intention and operational implementation routinely resulted in the underperforming BUMDes enterprises or partial implementation of the projects.

Overall data show that governance quality and policy coherence were bidirectional variables that conditioned the readiness and resilience of village enterprises in advancing the food security. Villages that included food security goals in their governance arrangements—, with the support of responsible management and external technical assistance, were better prepared to launch and sustain agribusiness operations. When governance was fragmented or policy was separated from its operational capacity, the feasibility of BUMDes-driven food projects was undermined. Indirectly, this emphasizes that strong institutions or governments must establish the policies to monitor the staple food markets in the real time; develop production centers within regional and local scopes to reduce the dependence on imports, and adopt the trade policies that promote cheap and sustainable food trade[9].

4.3 Institutional Readiness and Human Capital

Institutional readiness was both a facilitator and a constraint in the implementation of BUMDes agribusiness enterprises. Villages with the established BUMDes organizational frameworks, the clearly set organizational hierarchies, and the codified business operating procedures had a greater capacity to manage some complex businesses, such as catfish hatchery and fattening businesses. These institutional attributes guaranteed smoother decision-making processes, transparent financial management, and accountability in the resource utilization.

Human capital, however, emerged as a key success determinant. Although commitment and eagerness to learn were apparent among many BUMDes managers, technical skills in the aquaculture management, the business planning, and market negotiation were frequently in short supply. In some instances, the shortage of competent personnel resulted in the reliance on external facilitators for operational direction and problem-solving. Although such reliance was useful in the short term, it led to concerns regarding the long-term autonomy.

This research also disclosed the differences in the digital literacy of BUMDes staffs. Those villages that embraced digital financial systems and online marketing platforms were more capable of recording transactions, keeping inventory, and increasing their market scope beyond the local area. Meanwhile, those BUMDes, using manual systems only, experienced inefficiency and the limited scalability. Capacity development initiatives were the most successful when integrating technical training, entrepreneurial development, and governance strengthening. Such comprehensive training initiatives did not only improve operational capacity, but also fostered an entrepreneurial culture between managers and staffs. Having the youth from the villages participating in BUMDes management was also observed to introduce innovation and flexibility, particularly in the use of technology and social media promotion.

In short, human capital and institutional readiness are complementary determinants of the sustainable BUMDes performance. Building managerial capability, augmenting technical capacity, and integrating digital technologies into everyday operations are critical to guarantee that village businesses can independently support food security programs over the long haul.

5 Conclusion

This study emphasizes the role of BUMDes as a strategy in improving the local food security systems through the well-aligned policies, effective governance, and strong institutional readiness. Suruh and Pabelan Districts' experience demonstrates that agribusiness activity—freshwater aquaculture in particular—is technically and financially viable with the support of transparent governance, participatory decision-making, and coherent integration within village development planning.

Policy alignments, specifically the inclusion of food security targets within the RPJMDes and RKPDes, stand out as the key success drivers. Villages that implement such policies through specific investments, capacity development, and infrastructure assistance exhibit greater resilience and sustainability in BUMDes-initiated businesses. The engagement of academic institutions in the feasibility studies does not only enhance business plan quality, but also encourages accountability and institutional learning.

Institutional capacity and human capital are also determinants. Villages with the organized BUMDes management, digital literacy, and entrepreneurial skills are more likely to maintain agribusiness enterprises and improve their market outreach. In contrast, the shortcomings in these factors frequently result in the reliance on external facilitators and constrain the long-term autonomy. In general, the results emphasize that sustainable village-level food security demands a synergistic model that combines governance quality, policy coherence, technical feasibility, and human resource development. Promoting coordination among the village government, BUMDes managers, academic partners, and villagers, the rural economies can build the resilient food systems that make significant contributions to Indonesia's overall aspiration for the national food sovereignty.

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