Agility Model of Empowerment for Village-Owned Enterprises (BUMDes) in Indonesia

Gugun Geusan Akbar[1], Mila Karmila[2]
[1,2]Universitas Garut, Indonesia
Email: gugun.ga@fisip.uniga.ac.id

Abstract

This article explores the concept of agility in the context of empowering Village-Owned Enterprises (BUMDes) in Indonesia. Facing complex challenges in a dynamic environment, BUMDes requires a more adaptive and responsive approach to enhance its performance. Through a dynamic systems approach, this article identifies key factors influencing BUMDes agility, including human resource capacity, technology adoption, collaboration, and local government support. Furthermore, the article emphasizes the importance of operational transparency, oversight, strategic planning, and human resource development as core processes in achieving agility. The outcomes of this process include improved BUMDes performance, increased revenue, and a positive impact on community empowerment. By implementing the proposed model, BUMDes can be more responsive to changes, improve its performance, and contribute more effectively to village development. This article provides valuable insights for policymakers, practitioners, and researchers interested in BUMDes empowerment and organizational agility.

Keywords: *Agility, BUMDes Empowerment, Dynamic System, Community Empowerment.*

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A. INTRODUCTION

In various countries, small and micro enterprises (SMEs) have been recognized as the backbone of the economy. In the United States, for example, SMEs account for more than 44% of total economic activity (Haltiwanger et al., 2013). In the European Union, about 99% of all businesses are SMEs, providing two out of three private jobs (European Commission, 2015). In Indonesia, SMEs also make a significant contribution to GDP and employment absorption. Research by Suryana & Arifin (2019) shows that SMEs in Indonesia contribute up to 60% to the national GDP. In addition, research by Pradnyana et al. (2021) also indicates that SMEs play a crucial role in employment absorption in remote areas. Regional economies and small and micro enterprises (SMEs) play a vital role in supporting the national economy in various countries. In Indonesia, SMEs significantly contribute to GDP and employment absorption. Research by Suryana & Arifin (2019) shows that SMEs in Indonesia contribute up to 60% to the national GDP. Moreover, research by Pradnyana et al. (2021) also indicates that SMEs play a crucial role in employment absorption in remote areas. In this context, Village-Owned Enterprises (BUMDes) emerge as one of the instruments that can strengthen regional economies and SMEs.

BUMDes is an entity formed by village governments and communities to manage economic aspects at the village level. Although it has great potential in improving the welfare of village communities, BUMDes often face various challenges, including in terms of organizational agility. Field facts and several studies have shown

that one of the reasons for the underdevelopment of BUMDes is governance issues. (Adnani, Kania, & Pasundan, 2020), (Kesawa, Pradipta, & Afrivania, 2019). The governance issues that have led to the lack of progress in BUMDes include weak marketing. (Ibrahim, 2020), a lack of ability to interact with stakeholders, (Kurniasih, Setyoko, Imron, & Wijaya, 2019), lack of human capital (Zuhdiyaty, Maryunani, & Syafitri, 2019), the absence of the ability to synergize, (Saputra, Anggiriawan, Sanjaya, Jayanti, & Manurung, 2019), as well as financial management skills, (Purbawati, 2019), (I. Kania, Akbar, & Budiman, 2019). In various studies, it has also been identified that the management of BUMDes organizations is still not optimal (Kania, Ulumudin, & Akbar, 2020) (A. I. Kania, 2020). From several studies conducted, it can be stated that the biggest challenge for BUMDes is to create an organization that possesses agility, capable of addressing various deficiencies, weaknesses, challenges, and obstacles adaptively, flexibly, quickly, creatively, and with collaborative capabilities.

Organizational agility here refers to the ability of an organization to respond to changes that occur, whether it's market changes, technology, or regulations. In today's VUCA era, organizational agility becomes increasingly important. BUMDes in various regions face serious challenges, including a decline in community purchasing power and changes in consumption patterns (Fuadi et al., 2022; Sofianto & Risandewi, 2021). Therefore, understanding and enhancing the organizational agility of BUMDes has become an urgent necessity.

To understand and address this issue, this research will use the Soft System Dynamic Methodology (SSDM) approach. SSDM is a methodology that combines Soft System Methodology (SSM) and System Dynamics (SD), designed to assist stakeholders in understanding and solving complex and unstructured problems (Lubis & Muda, 2016). This methodology offers a comprehensive and systemic framework, allowing for an understanding of complex and unstructured problems in the context of BUMDes organizational agility, and to identify effective solutions to address these issues.

B. LITERATURE REVIEW

According to a study conducted by Wijaya and Sutrisno (2020), BUMDes in several regions in Indonesia still face issues in terms of management and governance. This indicates that there is a need to enhance organizational agility in BUMDes to respond to changes more effectively. Furthermore, research by Rahmawati and Kurniawan (2019) also shows that many BUMDes have not been able to optimize their local resource potential. This suggests that there is a significant opportunity to improve organizational agility in BUMDes, which in turn will assist in optimizing the potential of local resources. Therefore, the objective of this research is first, to model the organizational agility of BUMDes based on theories of social system principles, and second, to simulate the organizational agility issues in BUMDes to achieve core solutions in enhancing organizational agility in the long run..

The concept of organizational agility is rooted in two concepts, namely the organization's adaptability (reactive aspect) and organizational flexibility (proactive

aspect) (Sherehiy, Karwowski, & Layer, 2007). Organizational agility involves an organization's ability to sense environmental changes (sensing) and to easily respond (responding) by reconfiguring resources, processes, and strategies (Overby, Bharadwaj, & Sambamurthy, 2006). From these concepts, it can be stated that agility is not just about organizational management, but about the ability to sense and respond that an organization possesses when facing challenging new situations. Another concept proposed by Felipe (Felipe, Roldán, & Leal-Rodríguez, 2016) further emphasizes the importance of organizational agility as the deliberate response capability developed by organizations to enable efficient behavior in highly dynamic environments, not only by reacting quickly to changes but also through the organization's potential actions in anticipating and capturing opportunities, especially through innovation and learning. Sambamurthy (Overby et al., 2006) states that organizational agility consists of three interrelated dimensions: customer agility (leveraging the voice of the customer to gain market intelligence), partnering agility (learning from business partners to enhance the company's market response), and operational agility (quickly redesigning processes to exploit dynamic market conditions)..

Research on agility has evolved over the past decade. Originating from methods to develop software effectively and efficiently, the concept of agility has now expanded and is utilized across various fields of study and organizations (Nuottila, Aaltonen, & Kujala, 2016). In the organizational context, agility can be defined as the ability to respond flexibly to various environmental changes, quickly adjust product and service offerings (Singh, Sharma, Hill, & Schnackenberg, 2013), and efficiently and effectively direct resources to create and capture opportunities, as well as protect value to achieve higher returns (Felipe et al., 2016), (Teece, Peteratd, & Leih, 2016). From this understanding, organizational agility is a characteristic that allows for the integration and organization of resources and knowledge, not just the rapid application of knowledge (Cegarra-Navarro, Soto-Acosta, & Wensley, 2016).

In Indonesia, research on organizational agility has been extensively conducted. In terms of the type of organizations, research has been carried out, for example, on government organizations (Vernanda, 2020), (Amalia, 2020), Industry (Fitriani, Raharjo, Hardian, & Prasetyo, 2021), (Ariadi, Surachman, Sumiati, & Rohman, 2021), micro, small, and medium enterprises (Younus & Abumandil, 2021), (Pranatasari & Dharma, 1875), and education (Sujono, Setiawan, & Haryono, 2020) (Joshua & Mogea, 2020). Meanwhile, in terms of the scope of study, the agile concept has been implemented in various fields of study and research, such as business and marketing (Pranatasari & Dharma, 1875), bureaucracy (Aripin, Rulinawaty, & Samboteng, 2021), Human Resources (McMackin & Heffernan, 2020), talent development (Kasmad, Aripin, & Samboteng, 2020), leadership (Hulu, Patuninno, Puspasari, Juniyanto, & Pramudita, 2020), dynamic governance (Widya Wicaksono, 2020), agriculture (Rahmawati, Jannah, & Chusyairi, 2019), and even in cultural studies (Apriliyanti, Latif, & Mutiarin, 2021) and ethics (Samboteng & Arifin, 2020).

From previous research, it is known that the concept of agility will be a determinant for organizations to survive and thrive in today's highly competitive era. However, research with BUMDes as the subject has never been conducted before. Meanwhile, with the potential and strategic position they hold, BUMDes has the opportunity to become the economic locomotive of the village that can make a real contribution to the village community. In building the BUMDes organizational agility model, this research will combine the agile organization theory concept (Singh et al., 2013) as the research analytical tool with the soft system dynamic methodology approach (Paucar-Caceres & Rodriguez-Ulloa, 2007) to enrich information aimed at producing added value to previous research..

Soft System Dynamic Methodology

SSDM is a combination of two renowned methodologies in the systems movement from two different system thinking paradigms: SD and SSM (Rodriguez-Ulloa and Paucar-Caceres, 2005). Lane and Oliva (1998) state that the SD literature does not sufficiently clarify how to identify and examine various issues that should be the focus of the model. Meanwhile, determining the main issues in problematic socio-political situations is a challenging endeavor filled with subjective assessments from various involved parties. SSM creates and presents various perspectives on a problem and addresses the socio-political elements of intervention. The SD theory itself does not provide a practical way to assist stakeholders in producing different worldviews that could inspire potential issues to focus on model creation. This can be addressed by implementing SSM as a complementary methodology (Lane and Oliva, 1998). Moreover, the solutions provided by the SD approach have not been examined for cultural feasibility and systemic desirability for real-world application; SSM pays serious attention to the feasibility and desirability of solutions (Rodríguez-Ulloa et al., 2011). SSDM has 10 steps to implement changes in social systems (Paucar-Caceres and Rodriguez-Ulloa, 2007). Stages 1 and 2 of SSDM originate from SSM to understand where within the reference system something is not functioning well and needs improvement. First, the problem situation is viewed openly, not as a system. Second, the real system and its problem points are depicted in the form of rich pictures.

According to Paucar-Caceres and Rodriguez-Ulloa (2007), the first two stages are preferred over the initial SD stages because they reinforce the SD consensus causal loop diagrams for problem situations where various stakeholders with different actors and beneficiaries are involved. Stage 3 (root definition) in SSDM is also taken from SSM, describing the transformation process believed to have been carried out in the real world. The CATWOE analysis from SSM is applied at this stage to recognize all stakeholders, including system owners, actors, and customers, and their worldviews to be involved in the modeling process equally. Consensus root definitions can be applied for modeling purposes. At Stage 4, a problematic situation context diagram is designed with low complexity, equivalent to the subsystem diagrams in SD. Context diagrams are created according to the specific worldview (W) from each stakeholder's root definition or consensus root definition. Once the problematic SD context diagram

has been depicted, it will serve as a basis for creating causal loop diagrams with higher complexity. Then, the problematic situation structure is modeled in the form of stock and flow diagrams based on SD, and after its calibration and sensitivity analysis are conducted, the system behavior can be simulated concerning different causal variable conditions. Stage 5 is the comparison of the SD model with the rich picture to determine whether the sensitivity analysis results align with the problematic situation behavior as stated in the rich picture or not? Stage 6, taken from SSM, investigates culturally feasible and systemically desirable solutions to enhance the system. However, the feasibility and desirability analysis will be incomplete if the effects of prospective "solution" alternatives over time are not evaluated, which requires a move to Stage 7 of SSDM. At Stage 7, SD supports SSM by applying computer system modeling and simulation tools. Stage 8 describes the transformation process, required to improve the problematic situation in the form of a solution-oriented root definition. When a good balance is found among Stages 2, 8, and 7, at Stage 9, the researcher must return to Stage 6 to determine the culturally feasible and systemically desirable changes found in the previous stages. Learning points are emphasized by the sensitivity analysis of the "problem-oriented model" at Stage 4, and the "solution-oriented model" at Stage 7, as well as implementation efforts, if any, in the real world (Stage 9). Several SSDM applications can be found in Paucar-Caceres and Rodriguez-Ulloa (2007) and Rodríguez-Ulloa et al. (2011).

C. METHODS

In this study, the primary focus is on the Village-Owned Enterprises (BUMDes) located in Garut Regency. According to the latest data, there are 359 BUMDes established in Garut Regency. Considering this significant number, this study employs a sampling method to select a number of BUMDes to be the subjects of the research. A total of 30 BUMDes were chosen as samples for this study.

In addition to using questionnaires, this study also involves in-depth interviews to gain a more qualitative and comprehensive perspective on the organizational agility of BUMDes. The sample for these in-depth interviews consists of 15 individuals selected from various stakeholder groups associated with BUMDes. These groups include Village Heads, BUMDes Managers, Village Supervisory Bodies, the Village Community Empowerment Department, and Academics.

In designing the organizational agility model for BUMDes, in accordance with the Soft System Dynamic Methodology, there are nine steps consisting of: a. Step 1 and 2 These steps are for identifying, understanding, and outlining problems where the system perceives something is not working "well" and something needs to be done to "improve" the problematic situation (unstructured problem situation and structured problem situation or "rich picture").

1. In steps 1 and 2, what is done is capturing the factual conditions in the field through questionnaires and interviews. Questionnaires were distributed to 30 Bumdes managers to find out various quantitative matters, such as the availability of capital, resources, financial balance, etc. Meanwhile, interviews

were conducted to explore qualitative matters like community support, Village Heads, village potential, etc.

2. Step 3 (root definition) Explains the transformation process that is believed to have been carried out in the real world. CATWOE analysis (customers, actors, transformation process, owner, Weltanschauung, and environmental constraints) is performed. In step 3, in-depth interviews were conducted with BUMDes managers and Village Heads. This step is taken to recognize all stakeholders, including the owner, actors, and system customers, and their views to participate equally in the modelling process.
3. Step 4 Design a problematic situation context diagram at a low complexity level, which is then used as a basis to create a causal loop diagram with a higher complexity level. After calibration and sensitivity analysis are performed, the system behavior can be simulated with different conditions of causal variables.
4. Step 5 Comparing the System Dynamics model with the rich picture to determine whether the sensitivity analysis results match the problematic situation behavior as expressed in the rich picture or not. In this step 5, the first FGD is conducted to get input from the parties.
5. Step 6 Investigate culturally feasible and systemically desired solutions to enhance system agility.
6. Step 7 Modelling simulation with computerized systemic simulation.
7. Step 8 Explains the transformation process, which is required to improve the problematic situation in the form of a problem-oriented root definition. Agreement by all stakeholders is made. In step 8, the second FGD is conducted to get agreement and input on the model to be created.
8. Step 9 Construct the BUMDes Agile Organization model.

D. RESULTS AND DISCUSSION

1. Stages 1 and 2: unstructured problem situations and structured problem situations (rich picture)

As stated in the introduction, unstructured situations arise from BUMDes management problems that have long been identified. To structure the nature of complex problems, organizational agility is categorized into five categories based on Aghina's theory (2017), namely, strategy, structure, process, people and technology, based on the perspectives of stakeholders. A complete picture of BUMDes governance is presented in Figure 1. The main stakeholders involved in the system and their main mental models according to the causes of weak BUMDes governance in the form of five main categories of strategy, structure, process, people and technology are depicted in the picture. These stages are equivalent to "defining the problem" in the Dynamic System stage. By capturing the main causes of weak BUMDes governance in a rich picture, the main transformation processes and worldviews that trigger these processes are captured to create hypotheses following a causal structure that can reproduce behavior.

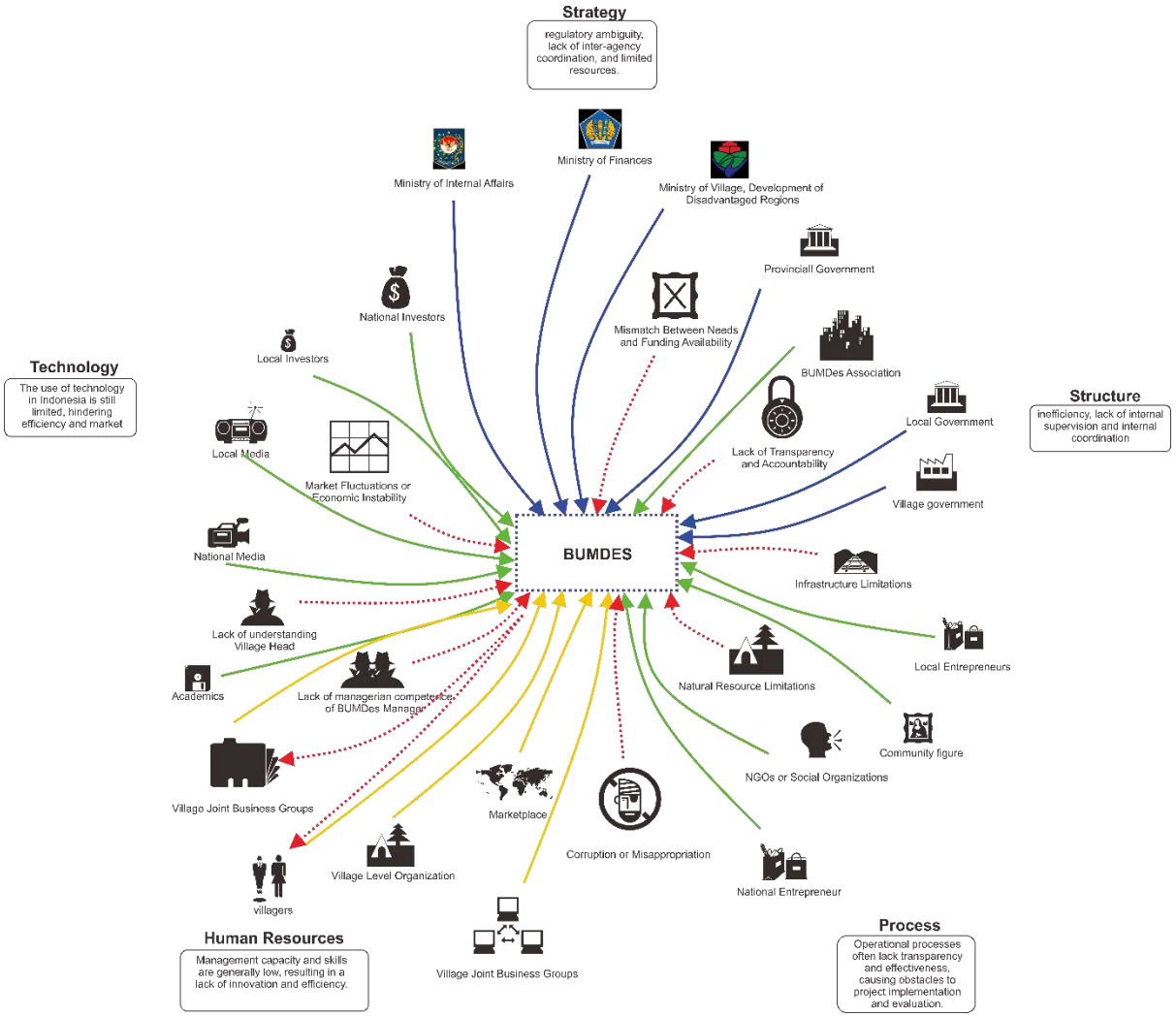


Figure 1 Rich Picture of BUMDes Governance in Indonesia

2. Stage 3: problem-oriented root definition for BUMDes empowerment

Problem-oriented root definition is a phrase or sentence that describes the transformation process of the current problematic system, its objectives, those who will be involved in it, those who are affiliated, those who are affected by it and those who have an impact on it. CATWOE is used to develop the root definition. The CATWOE analysis of the current problem will be shown in Figure 2.

In various applications of the System Dynamic model, they do not explicitly consider the concept of worldview during the creation of causal diagrams and SD. The causal diagram in Stage 4 will be the product of the main consensus worldview, which is defined as "capacity building and empowerment of BUMDes creates better opportunities for village communities." The main transformation process in the system is to increase the capacity of BUMDes, strengthen collaboration and partnerships, and increase transparency and accountability. In accordance with the CATWOE analysis, various consensus-oriented root definitions were extracted from various stakeholders (actors, customers, and owners), based on which the following consensus was obtained: A system of human activities owned by the Government (central and regional) - which increases opportunities for BUMDes empowerment,

increases capacity and collaboration, resulting in more effective empowerment. This system positively serves BUMDes members, BUMDes managers, BUMDes partners, and village communities. This system has a negative impact on those who are not involved in BUMDes or those who do not benefit from empowerment. Empowerment opportunities increase due to education and training, increased resources, and the presence of support from the central and regional governments. Deficiencies in detection and control mechanisms arising from the complex nature of BUMDes and protracted bureaucracy, along with staff income issues and rising poverty rates in the community and weak internal controls from external parties add to the demand for empowerment.

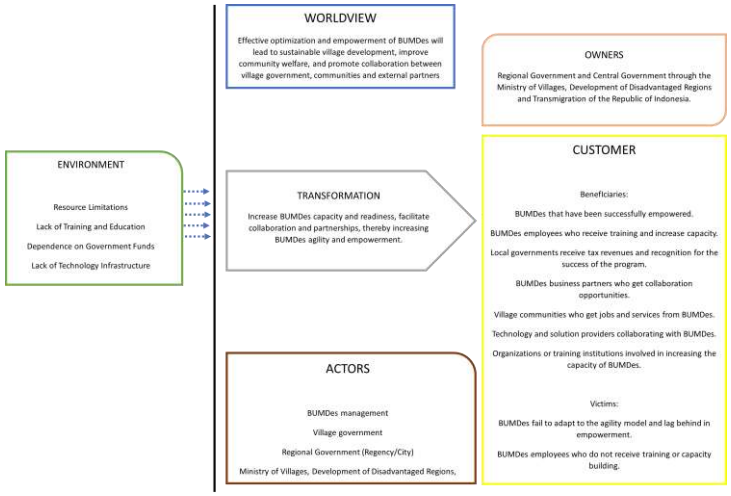


Figure 2. CATWOE Analysis on BUMDes Empowerment and Agility Problems in Indonesia

3. Step 4: Building a Problem-Oriented Dynamic Model

After obtaining and validating the consensus definition of the root problem by the stakeholders involved, this step is followed by obtaining a problem-oriented conceptual model that is equivalent to a sub-system diagram in system dynamics. The problem-oriented conceptual model illustrates how the transformation process, including increasing transparency, increasing human resource capacity, optimizing resources, collaboration and partnership, technology adoption, and responding to market changes, occurs in the system, as shown in Figure 3.

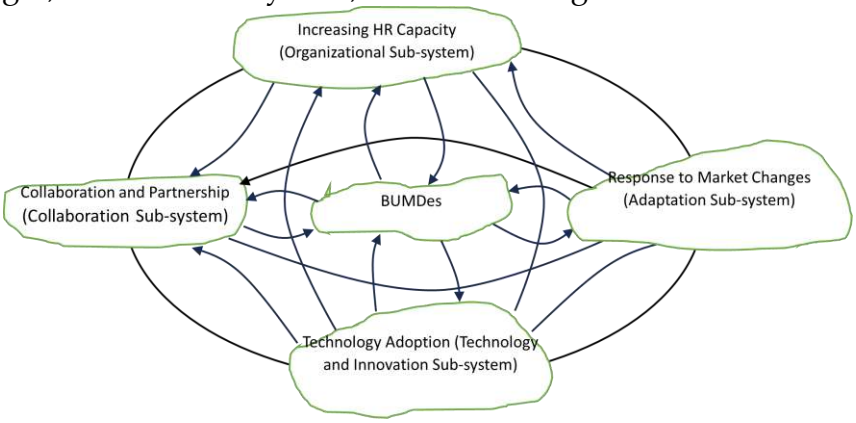


Figure 3. Consensual Problem Oriented Context Diagram of BUMDes

The main subsystems of this model are organizational capacity, technology and innovation, collaboration and partnership, and adaptation to change. We have linked the subsystem of human resource capacity building to the organizational aspect, the subsystem of technology adoption to the technology and innovation aspect, the subsystem of collaboration and partnership to the collaboration aspect, and the subsystem of market response to change to the adaptation aspect in the social system of BUMDes empowerment. According to Parsons' theory, BUMDes must have four balanced structural functions to maintain a stable order. Failure to interact between each subsystem can hinder BUMDes empowerment.

Given the complexity of BUMDes in terms of its regulation, as well as various financial policies and regulations, resource management by local governments is a challenge. If transparency increases, collaboration and partnership will increase, which in turn will increase BUMDes capacity. However, if transparency decreases, collaboration and partnership will decrease, which will hinder BUMDes empowerment.

Lack of transparency in the organizational capacity subsystem creates opportunities for inefficiencies. The efficiency of the technology and innovation subsystem affects the adoption of new technologies. As technology adoption increases, the demand for human resource training and development also increases, which in turn increases BUMDes capacity. However, if human resource training and development are inadequate, then the adoption of new technologies will be hampered.

The context diagram is considered as the basis for extracting a causal loop diagram with a higher level of complexity. For each sub-system identified in the problem-oriented diagram, using research literature and background and BUMDes expert views, effective variables, including endogenous and exogenous variables, are identified; after that, a causal loop diagram of the problem is developed as in Figure 4.

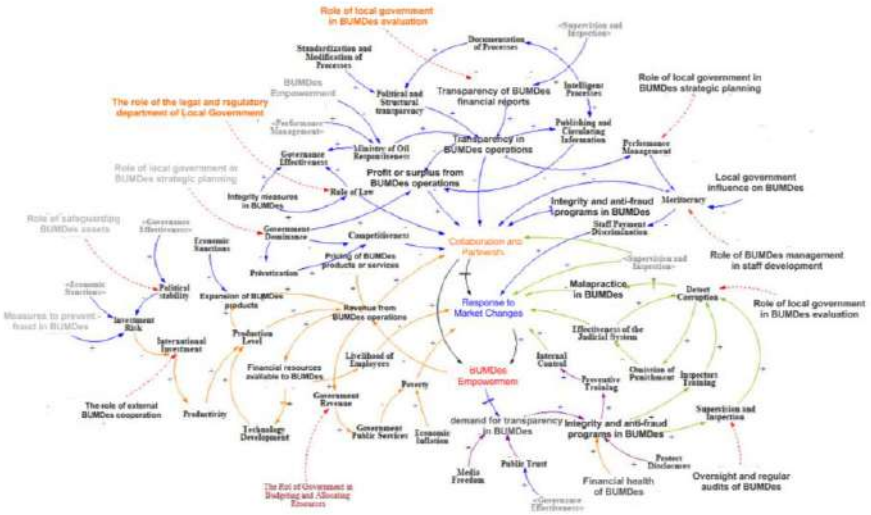


Figure 4. Causal Loop Diagram BUMDes

4. Stage 5 Problem-Oriented Stock and Flow Diagram

The stock and flow diagram is developed according to the main subsystems identified in the rich picture, which is structured in a context diagram and modeled in a causal loop diagram. The relationships in the flow diagram have been formulated based on documents and quantitative data collected from the Ministry of Villages, Development of Disadvantaged Regions and Transmigration, the Central Statistics Agency, the Ministry of Finance, and several other official statistics from the local governments and BUMDes involved.

A number of relationships have been estimated using a multivariate linear regression model. We also use a look-up function based on expert judgment to determine the relationship between several qualitative variables. The stock and flow diagram of the BUMDes empowerment system is depicted in Figure 5.

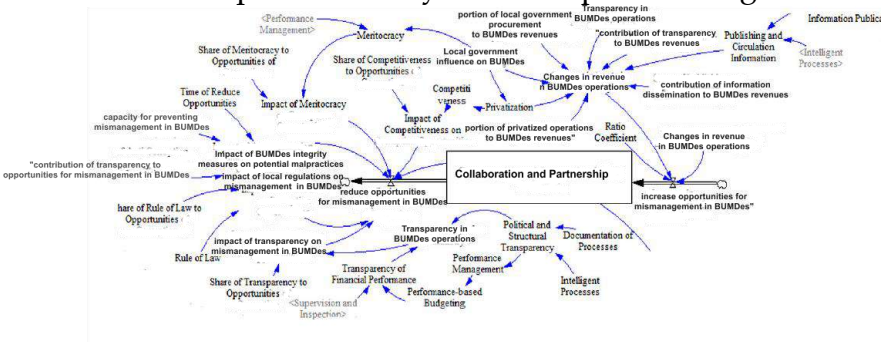


Figure 5 Stock and Flow of BUMDes Empowerment Agility

5. Stage 5 Validation of Problem-Oriented Model with Reality

At this stage, validation of the agreed problem-oriented conceptual model, context diagram, causal loop diagram, and SD model was carried out. The models were validated using the methods applied in the validation of SSM and SD. With the participation of experts and decision makers from BUMDes, all diagrams were discussed and validated; then the consultation resulted in the need to make some changes and adjustments to some model variables and their initial values. After ensuring that all units and dimensions of variables and equations were consistent, the flow model was simulated with VENSIM PLE software. The results obtained from the simulation of various parts of the model showed good agreement with historical trends. The agreement of historical trends with simulated samples certainly cannot justify future behavior, but because the simulated behavior is in accordance with the structure and behavior of the model, it is predicted that the future behavior of the model will be within a logical framework.

Model validation including goodness-of-fit tests, dimensionality tests, boundary condition tests, and integral error tests were carried out, and the behavior of the model variables was approved by experts; then the model was run as a baseline scenario which means continuing the current situation. The base year is considered as 2023, and the simulation horizon is calculated for 20 years. The simulation results of the main variables of interest, including "Opportunity for agility in BUMDes", "Demand for agility in BUMDes", and "Rejection for agility in BUMDes" are presented

in Figures 6-8. As seen in Figure 6, there will be an increasing trend in the opportunity for agility in BUMDes throughout the simulation horizon; however, the trend contains fluctuations and in a short period of time there will be some reduction in opportunities. Although the general trend is increasing for the inflow and outflow variables of the opportunity for non-transparency in BUMDes, the inflow dominates the outflow, so the opportunities will increase in the long run. In other words, although the regulations and efforts made by the local government will reduce the rate of increase in agility with a slight delay. However, the rapid resistance to the rules due to the interests of stakeholders will also result in an increase in the inflow rate, so the behavior of the variables will always change and is not considered a controlling trend in the long run.

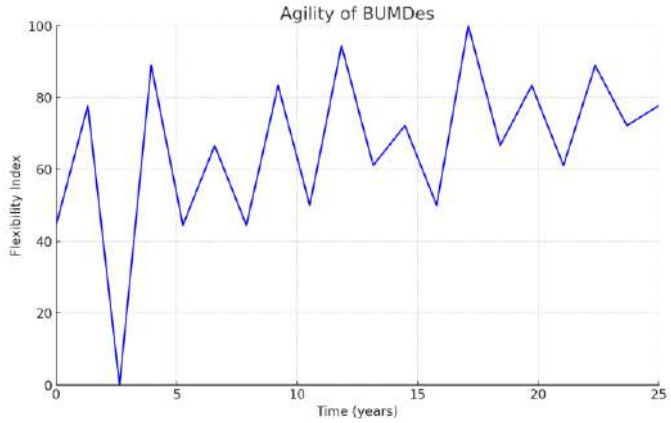


Figure 6: Agility in the Simulation Horizon of 25 Years

As seen in Figure 6, the volume of demand for agility in BUMDes will increase substantially during the third to fourth year of the simulation period and will be as much as the maximum income that can be perceived in the system. The demand for agility will be higher than the actual agility rejection opportunity in the long run, and since the demand for agility is a function of perceived agility, this means that the community perceives the agility opportunity more than what is actually in the system. As seen in Figure 7, the agility in BUMDes is calculated as the minimum sum of the actual agility opportunity and demand, the agility behavior will follow the opportunity behavior because the demand rate is higher than the opportunity in the long run.

6. Stage 6: Systemically Desirable and Culturally Acceptable Changes

At this stage, the sensitivity analysis taken from SD is adopted to be embedded in the SSM stage of identifying systemically desirable and culturally acceptable changes. This is used to determine how sensitive the model is to changes in model parameter values, and to indicate which parameter values are the leverage points of the model. Finding that the system behavior changes significantly for variations in parameter values can identify leverage points in the model - parameters whose specific values can significantly affect the system's behavioral mode; thus, can be manipulated as a scenario analysis to improve the model's behavior.

The desired changes obtained from the research literature as well as the sensitivity analysis in the problem model, which also indicate systemic improvements, are reviewed in terms of their practicality in BUMDes. Furthermore, to strengthen the understanding of problem solving and organizational decision making, using the CATWOE analysis once again, the process of improving integrity in the BUMDes system is examined. From the discussions with stakeholders, several interesting perspectives emerged. The main changes suggested by stakeholders are considered important for the problem-oriented modification of the SD model behavior. Changes are categorized into three policy groups as follows:

(1) Strategy 1 Reduces agility opportunities in BUMDes.

(2) Strategy 2 Reduces agility demands in BUMDes.

(3) Strategy 3 Increases agility capacity in BUMDes.

To serve each type of strategy, a list of policies is defined, and changes are implemented in a solution-oriented dynamic model. The range of changes is defined according to the feasibility of implementation during a one-year time step, so that changes are proportional to the level of fulfillment during a year using the expertise of the relevant departmental authorities and the program objectives that exist in each department of the organization.

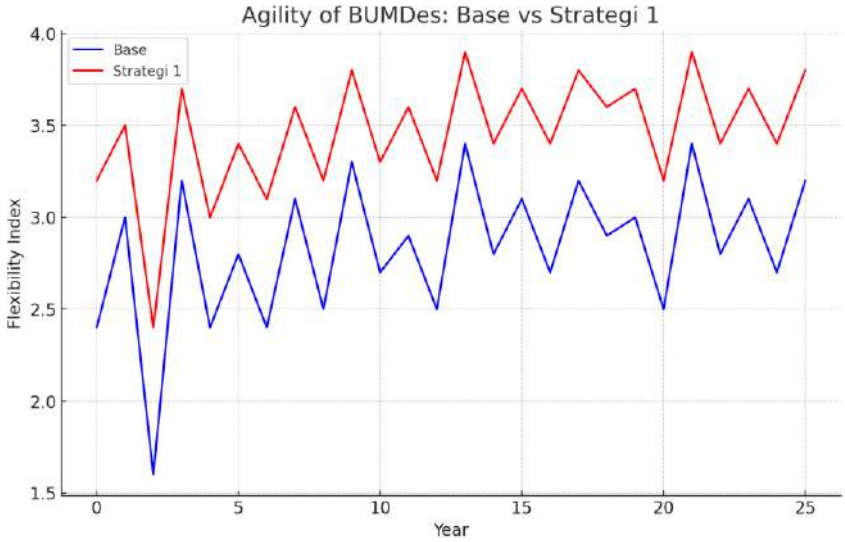


Figure 7. Agility with Strategy 1 in the Simulation Horizon of 25 Years

Reducing agility opportunities in BUMDes: As shown in Figure 7, by applying the policy changes of group 1 to the agility opportunity subsystem, the level of agility opportunities, demand for agility, and thus, agility will decrease compared to the baseline value. However, the general mood of behavior will remain the same with a smaller fluctuation range for agility opportunities and rejection. Since agility opportunities are reduced immediately due to the implementation of the policy in the system during the initial five years, the demand for agility will decrease with a time delay related to the perception of agility opportunities although the demand will stabilize in the long run at a higher level than where the opportunities actually exist. Reducing agility demand in BUMDes: By adopting this group of policies, although the demand for agility will decrease compared to the baseline case in the long run, the

level of agility will not change significantly; only the oscillation range will decrease. In fact, the implementation of the agility demand reduction policy group will not be effective by itself, and even a decrease in demand cannot significantly reduce agility due to the existence of agility opportunities. As a result, even with this group of policies in place, there will always be as much demand as there is agility opportunity (Figure 8).

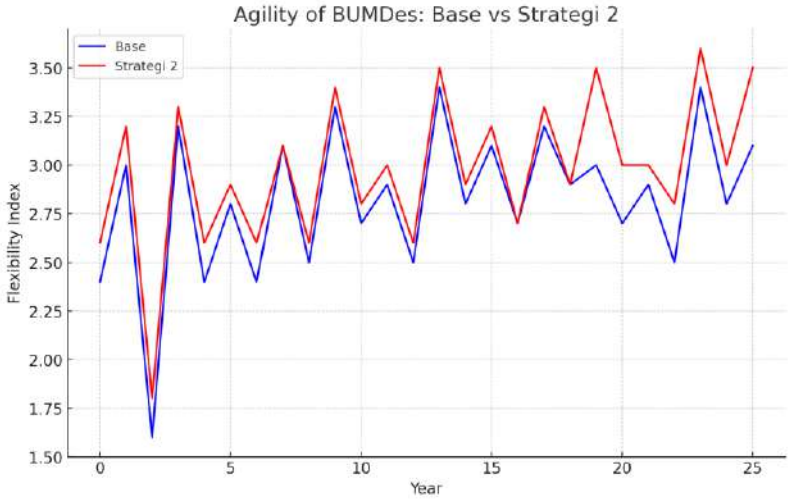


Figure 8. Agility with Strategy 2 in the Simulation Horizon of 20 Years

Increasing integrity capacity: The results obtained from implementing the changes imposed on this strategy will lead to several changes in the behavior of the main variables of interest. These changes are shown in Figure 9. As can be seen, increasing integrity capacity will not serve as a core solution alone; however, it will reduce the average level of agility and rejection of opportunities compared to the baseline values

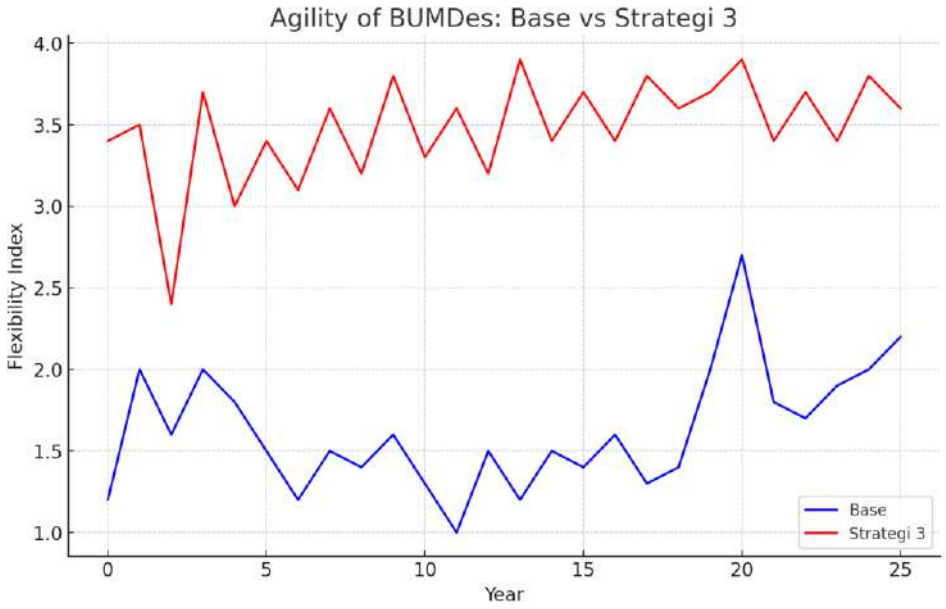


Figure 9. Agility with Strategy 3 in the Simulation Horizon of 25 Years

7. **Step 8: Solution-Oriented Root Definition**

The definition of solution-oriented roots is basically a joint statement regarding solutions to improve the problem situation agreed upon by the planners and decision makers involved.

A system of human activities under the auspices of the Regional Government aims to reduce the chances of rejection, agility demand, and thus, there is no agility growth in BUMDes. This system has a negative impact on non-transparent governance, non-transparent managers, parties seeking personal gain, and parties who use BUMDes for other interests. This system has a positive impact on village communities, village economies, future generations, honest employees, honest managers, investors, and the private sector. By improving the official system through reducing government dominance, improving documentation and intelligence of organizational processes, and disseminating BUMDes information, the Regional Government increases the financial and structural transparency of BUMDes, by improving staff livelihood issues, reducing discrimination in their payments, improving training, increasing the effectiveness of supervisory bodies, and increasing the intensity of law enforcement.

8. **Stage 9: Implementation of Desired and Achievable Changes**

Based on the results obtained from the solution simulation and its impact on the behavior of the target variables in the long term, the following solutions will lead to the reduction of problems in BUMDes:

a. Budget Transparency: Disclosing BUMDes budget and revenue reports to the village government and the community. This will facilitate accountability and oversight of revenue through authentication of government figures. Budget and revenue reports help investors and analysts to get a clear picture of capital value, risk exposure, cost management, and revenue flows. Revenue transparency strengthens BUMDes' social responsibility.
b. Operational Transparency and Independent Audit: Conducting regular and independent audits of BUMDes contracts. This audit is conducted to ensure compliance with regulations and prevent potential irregularities.
c. Transparency in Power Structure: Ensuring transparency in the span of authority, rules, and constitution of the BUMDes administrative system, as well as in staff responsiveness, including monitoring manager performance.
d. Business Process Monitoring: Monitoring BUMDes projects to prevent monopoly by certain organizations or entities.
e. Transparency and Competitiveness in Contracts: Ensure transparency and competitiveness in all BUMDes contracts
f. Implementation of Meritocracy: Comply with the principles of meritocracy and requirements for appointment of positions, especially for BUMDes managers
g. Monitoring Administrative Violations: Monitor the performance of BUMDes supervision and review regulations regarding the types and levels of penalties for violators.

h. Budget Increase that Encourages Agility: Increase agility, training, and increase technology adoption
i. BUMDes Integration: Integrate BUMDes in terms of uniformity of management, consistency of policy, and transparency in responsibility and accountability.

E. CONCLUSION

Planning for complex problems in each sector requires a deep understanding of the problem so that the root cause can be identified. Otherwise, some plans and policies will be designed that will not only fail to solve the existing problems but will also add to the problems by using limited resources and facilities without proper needs analysis. According to several studies, resource-rich BUMDes often cannot develop their potential, characterized by poor governance and a less supportive culture, which results in many problems for village communities, such as inequality in welfare. Our findings expand the existing knowledge on BUMDes modeling in areas that depend on village resources, by considering various aspects of the political and structural, economic, legal and judicial, and cultural and social subsystems, inspired by social theory. Currently, the literature on BUMDes issues is limited and only focuses on one aspect of the problem, while the situation of BUMDes in Indonesia is too complex to be modeled with a one-dimensional oriented method. Therefore, in this study, we apply a special methodology to model the complexity of BUMDes by considering various components. The model we develop considers various BUMDes subsystems with various relevant components. Based on the results of the model sensitivity analysis and stakeholder views, several policies are defined and tested on the model structure.

The purpose of the intervention is to control the behavior of the main variables in the long term. Based on the simulation results, a single policy intervention from each group will not improve BUMDes agility in the long term; on the contrary, the implementation of a combination of policies will significantly improve the behavior of the system in all aspects. Although there is a causal relationship between the various BUMDes subsystems, focusing on only one aspect will not be effective in the long term.

The framework we have developed can be considered as a guide for BUMDes modeling in general, and as a basic model for BUMDes system modeling in certain areas. However, of course there are limitations, which can be opportunities for future research. For example, the system is designed based on a particular theory, while other theories may lead to the consideration of other factors that affect BUMDes. In addition, although the framework presented is generally applicable across countries and industries, the details are designed based on a specific context and may not be fully applicable in other contexts. This should be further investigated in research in various contexts.

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