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Business Ecosystem Development in Corporate Business Strategy

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Abstract

Purpose: The objective of this research is to identify the parties involved in the agro-business ecosystem in Kabupaten Bandung and determine the factors influencing the development of strategies at PT BANDUNG DAYA SENTOSA as a Regional Government-Owned Enterprise (BUMD) operating in the Agribusiness sector.

Research methodology: This study uses a business ecosystem approach to map the roles and parties involved in the agro-business ecosystem in Kabupaten Bandung. This study employed a qualitative research method with a case study design.

Results: Through multi-agent-based ecosystem modeling and business model reconfiguration, it can be concluded that adaptability and collaboration among actors in the agribusiness ecosystem in Kabupaten Bandung are key to success. The Regional Government-Owned Enterprise Bandung Daya Sentosa (BDS) has the potential to become an innovation hub and enhance its role through the development of innovative agricultural products and utilization of digital technology.

Conclusions: PT Bandung Daya Sentosa (BDS) has demonstrated strong potential to lead national agribusiness innovation by leveraging digital platforms like BDSMart and implementing multi-actor ecosystem strategies. Collaboration and adaptability among stakeholders are key to driving sustainable growth in the Bandung Regency agricultural sector. Through strategic use of technology and stakeholder engagement, BDS strengthens its role as a connector, innovator, and enabler in the agribusiness ecosystem.

Limitations: This study is context-specific to the agribusiness ecosystem in Bandung Regency, and its findings may not be directly transferable to other regions with different economic, cultural, or policy environments.

Contributions: PT Bandung Daya Sentosa acts as a key integrator and innovator in the agribusiness ecosystem, fostering collaboration among stakeholders. Farmers contribute as primary producers, supported by training, finance, and technology. Academics, government, media, and logistics providers each play vital roles in enabling innovation, governance, market reach, and the smooth distribution of goods, collectively enhancing ecosystem resilience and sustainability.

Keywords: *Business Ecosystem, Local Government, Regional Government-Owned Enterprise (BUMD), Strategic Management.*

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1. Introduction

The agricultural sector plays a very important role in the economy of the people in the Bandung Regency. The agricultural sector in Bandung Regency is the third largest contributor to GRDP after the processing industry and trade (Bandung Regency Economic Masterplan 2021-2026: 2021). Despite not having as much agricultural land as neighboring areas, such as Sukabumi or Garut, Bandung Regency

has a large potential agricultural market because it supports the food needs of Bandung City and DKI Jakarta. As one of the food production centers in West Java, Bandung Regency must be at the forefront of taking part in the direction of national and West Java development. The distribution network in Bandung Regency must be ready when the Provincial Distribution Center in West Java is established.

Although the agricultural sector makes a significant economic contribution to the Bandung Regency, it is not yet optimal. In general, farmers have not yet obtained welfare that is proportional to their efforts. Low and unstable commodity prices at the farm level are one of the reasons for the low welfare of farmers, in addition to limited agricultural land area. Supply chains, which are key in this regard, have traditionally been run by middle men and intermediary traders. Their role is practically unregulated and tends to be inefficient, so that at certain times there is often a shortage of supply that results in high final prices or prices at the farm level that are too low (Economic Masterplan of Bandung Regency 2021-2026).

Efforts and strategies are required so that the food commodities produced can be accommodated and absorbed upstream properly, distributed from production centers to downstream market centers and industries more smoothly, and availability increases through increased production, food reserves, and procurement from other regions that require a good distribution network. With the collaboration of the Bandung Regency Government through capital participation to support the role of BUMD Trade, Industry and Agro, it is hoped that it can contribute to increasing economic activities for the welfare and prosperity of the people and increase Regional Original Revenue.

Based on Government Regulation Number 54 of 2017 concerning Regional-Owned Enterprises, one of the requirements for the establishment of BUMDs is to conduct business feasibility based on Permendagri Number 52 of 2012 concerning Regional Government Investment Management, in which direct investments made by the government Regional-Owned Enterprises must be carried out based on investment feasibility analysis, portfolio analysis, and risk analysis. The obligation of the Bandung Regency Government in improving the regional economy must support the welfare of the community and develop businesses in the Bandung Regency Government. Therefore, to optimize competence and increase revenue for the Bandung Regency Government, it requires a Regional Owned Enterprise (BUMD) that will realize and run a business to optimize all resources so that the results can increase regional income, which has an impact on improving the quality of human resources and increasing regional income and national income.

One of the concepts of agricultural sector development that is related to the development of the industrial, trade, and tourism sectors in the Regency/City area is agnostic development. Based on the synthesis of Suroyo (2014), agropolitan is a concept offered by Friedmann and Douglass (1975) as a solution to the unbalanced development between urban and rural areas. The concept of agropolitan is also closely related to the concept of agribusiness, which according to Rustiadi (2006), explains that agribusiness is a business based on agricultural businesses that prioritize market forces (market driven) consisting of upstream subsystems, farming subsystems, downstream subsystems and supporting subsystems.

Based on the above background and phenomena, it can be concluded that the importance of business ecosystems in the business world is very influential. The business ecosystem will create efficiency and effectiveness that make it easy and relatively cheap to compete for organizational strategies, especially digital organizational strategies that shift conventional strategies. The importance of business ecosystem development is key to success in a business or an organization. The business ecosystem creates relationships between actors, which is in accordance with the concept of a social network that is useful for understanding the relationships of each actor (Naab & Bans-Akutey, 2021). The business ecosystem is very important for companies because it is a complex and interrelated way in which companies interact with their markets and customers. The business ecosystem consists of all interrelated elements in the economy, including customers, business partners, competitors, suppliers, governments, and other organizations that affect the business.

The following are some reasons why business ecosystems are important to companies. The first is determining the success of the company and the business ecosystem can influence the success of the company. If the business ecosystem is healthy, a company can thrive and survive in the long run. However, if the business ecosystem is not healthy, the company may face challenges in terms of growth and even risk bankruptcy. Secondly, opening new opportunities: A strong and healthy business ecosystem can open up new opportunities for a company. This can include new opportunities in the market, new product development, or partnerships with other organizations to expand their reach and services. The third stabilizes the business: A stable business ecosystem can help a company remain stable in difficult times, such as economic recession or sudden market changes. In these cases, a strong and diverse business ecosystem can help companies find ways to survive and thrive. Lastly managing risk: Business ecosystems can also help companies manage risk. By establishing good relationships with suppliers and business partners, companies can reduce the risk of dependence on one or a few parties and reduce the risk of disasters or other disruptions.

As such, business ecosystems are critical in helping companies achieve long-term success and survive in ever-changing markets. Companies must pay attention and carefully manage their relationships with all elements in the business ecosystem to ensure their future success. Based on the explanation above, the researcher is interested in conducting a study entitled "Business Ecosystem Development in the Formulation of Company Business Strategy (Case Study of PT Bandung Daya Sentosa (Perseroda).

2. Literature Review

2.1. Digital Transformation

Definition of digital transformation according to Power and Heavin (2018) "Digital transformation is charging or lives, or Jobs, or organizations and or world Each of us makes choices that Impact how we use digital data and digital technology" meaning that digital transformation has changed how we live our work our organization and also our world. Each of us makes choices that impact how we use digital data and technology.

Herbert (2017) defined digital transformation as follows: "Digital transformation involves breaking down these barriers, removing the contains imposed buy-outdated logic and leveraging technology to create revenue streams, drive down costs, and enhance the user experience" Digital transformation involves breaking down barriers, removing the limits imposed by outdated logic, and leveraging technology to create new revenue streams, lower costs, and improve the user experience.

Utoyo (2010) defines digital transformation as not limited to technology but more than that. Transformation is more about redefining the company's value proposition to provide the best convenience and experience for its consumers.

2.2. Ecosystem

Quoting from Putra (2019), the term ecosystem is essentially used in the field of biological science in the ecology section. However, in accordance with the development of science and technology, ecosystem science has been introduced to the economic and business literature. Ecology and economics have many similarities. In ecology, the currency used in transactions is not rupiah or dollars but material, energy, and information. The flow of material energy and information from one or several communities is the main focus in ecology, similar to the flow of money in economics. Therefore, ecology can also be considered a natural economy that conducts transactions in the form of material, energy, and information.

Tansley (1935) introduced the term ecosystem Tansley (1935)in a biological context. He describes it as the whole of living and nonliving organisms interacting with one other and with their environment of course; this biological interpretation should not be taken too literally. Nonetheless, it has some similarities when comparing it with its economic counterpart."

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environment. Of course, this interpretation of biology should not be taken literally. Nonetheless, there are some similarities when comparing it to economics."

"Moore (1996) was the first one to use it in an economic context. He argued that entrepreneurship does not exist in a vacum, hereby emphasizing the importance of its environment".

Another important aspect of the entrepreneurial ecosystem is the interconnectedness of the actors (Motoyama, 2014). The interaction between the firm and its environment implies the notion of co-development (MooreMoore (1996), where co-development refers to "a two-way interaction where both parties have an effect on each other's potential for success, which may lead to changes in some way" (Peltoniemi, 2004). From some of the above opinions, it can be concluded that the business ecosystem is dependent on business actors, companies, and the business environment that interacts with each other, which provides opportunities to achieve their respective success.

In Putra (2019) research conducted by Moore (1993), Putra (2019) states that businesses work hard to do a better job, be more efficient, and provide better service to consumers. While improvements are needed, many companies fail because they do not recognize, understand, or deal with the environment outside the internal company. To achieve success, businesses and organizations must have knowledge and be able to adapt to changes in the surrounding environment or ecosystem. According to Moore (1993), cited in Tricahyono and Purnamasari (2018), the term business ecosystem includes not only extended supply chains and companies but also other stakeholders, such as industry associations and governments. A business ecosystem consists of producers, organizations, communities, government agencies, non-government agencies, media consumers, suppliers, research institutions, and other stakeholders.

In addition, there is also research that has been conducted by Hadzic, Hadzic, and Dillon (2008) that has designed a digital ecosystem to help collaboration in a hospital environment called the digital health ecosystem. The concept of a digital business ecosystem or business ecosystem itself is to know and mention several sources in many ways (Hadzic et al., 2008).

Thus, it can be concluded that the roles of individuals, business communities, producer cooperatives, academic institutions, media, and consumers have a reciprocal and close relationship and cannot be separated from one another in the business ecosystem.

2.3. Framework

Moore (1993) and Rodliyah Tricahyono and Purnamasari (2018) state that businesses work hard to do better jobs, are more efficient, and provide better services to consumers. While improvements are needed, many companies fail because they do not recognize, understand, or deal with the environment outside the internal company. To achieve success, businesses and organizations must be knowledgeable and able to adapt to changes in the surrounding environment or ecosystem. In addition, successful businesses and organizations must develop long-term, mutually beneficial relationships with other actors in the business ecosystem. Business ecosystems use ecological concepts and are developed by examining the relationships and interrelationships of each actor in an ecosystem. It is formed by the reciprocal relationship between living organisms and their environment, where the ecosystem involves all organisms that interact with each other, plus the environment, and are in the same place.

Battistella (2012) analyzed a method for modeling and forecasting business ecosystems as structures that interact with each other. Business ecosystems use ecological concepts and are developed by examining the relationships and interrelationships of each actor in an ecosystem. Ecosystems are formed by reciprocal relationships between living organisms and their environment. A biological ecosystem involves all organisms that interact with each other along with the environment and are in the same place. A business ecosystem consists of all individuals (producers), organizations, governments, consumers, media, suppliers, and universities.

Various conditions can affect ecosystem strategy configuration decisions, such as competition and cooperation opportunities and the role of suppliers in the ecosystem. The inability to configure the right ecosystem strategy for a particular context can hinder the benefits of digitization opportunities (Kamaladin, 2021).

Kamaladin (2021) in their research article present a decision tree framework to help configure the right ecosystem strategy based on their industry customer context assessment. This framework includes the following three steps.

1. An overall assessment of the industrial customer context
2. Assessing the appropriate role in the ecosystem (leader or follower)
3. Assessing the appropriate balance between cooperation and competition (predominantly cooperation or competition).

3. Methodology

3.1. Type of Research

This study used qualitative research methods and descriptive research types. According to Nasehudin and Gozali (2012), a method is a framework for carrying out an action or thinking to organize ideas that are directed and related to goals and objectives. This type of research seeks to transform the object of the research into a form that can be presented, such as field notes, interview results, conversations, photographs, recordings, and memos (Indrawati, 2015). According to Ghony (2012), qualitative research produces findings that cannot be obtained using statistical procedures or quantitative means.

Descriptive research is conducted when the researcher already knows the factors or variables to measure an object or field, but does not yet know the relationship between these factors or variables (Indrawati, 2015). According to (Creswell, 2012); D. Sugiyono (2013) there are five kinds of qualitative methods, but in this study, the qualitative method used is a case study. A case study is a type of qualitative research in which researchers conduct an in-depth exploration of programs, events, processes, and activities for one or more people. A case is bound by time and activities, and researchers collect data in detail using various data collection procedures over time.

A case study is a detailed qualitative research model of an individual or a particular social unit over a period (Herdiansyah, 2012:76).

Table 1. Research Characteristics

No	Research Characteristics	Type
1	By method	Qualitative
2	By purpose	Descriptive
3	By type of inquiry	Case Study
4	Based on researcher involvement	Does not intervene in the data

Source: Processed data (2023)

3.2. Operational variables

A variable is a description of the state of the research object in the abstract; therefore, in a study, it needs to be described so that the abstract variable becomes measurable in a process commonly called variable operationalization. Variable operationalization is the process of reducing the variables contained in the research problem into the smallest parts so that the size classification can be known, making it easier to obtain the data needed for the assessment of research problems (Indrawati, 2015; D. N. Suharto, 2020; S. Suharto & Hoti, 2023; S. Suharto, Japlani, & Ali, 2021).

As stated in Chapter II Subchapter of the Framework of Thought, to obtain the necessary data, researchers conducted data collection techniques with sources from internal and external companies.

Data collection sourced from internal informants of PT Bandung Daya Sentosa (Perseroda) aims to obtain the right ecosystem strategy configuration for PT Bandung Daya Sentosa (Perseroda) by referring to the ecosystem configuration matrix (Kamaladin et al., 2021).

3.3. Data Collection and Data Sources

In qualitative research, data sources are obtained from primary data, and data collection techniques are performed as follows bellow.

3.3.1 Observation

This observation technique makes it possible to record behavior or events when they occur (Ahmadi,2014; Yahya & Yani, 2023).

3.3.2 Interview

According to Patton in Ahmadi (2014), in-depth and intensive interviews were conducted to understand people's perceptions, feelings, and knowledge.

3.3.3 Documentation

Documents are records of events that have occurred. Documents can take the form of writing, pictures, or the monumental works of a person. Document studies complement the use of observation and interview methods in qualitative research (P. Sugiyono, 2017; Syarif & Riza, 2022; Syarif, Rumengan, & Gunawan, 2021).

3.4. Data Analysis Technique

Quoted from Soares (2018) According to D. Sugiyono (2013) qualitative data analysis is the process of systematically searching and compiling data obtained from interviews, field notes, and documentation, by organizing data into categories, breaking it down into units, synthesizing, compiling into patterns, choosing which ones are important and which ones will be studied, and making conclusions so that they are easily understood. This study uses the Miles and Huberman (1992) model analysis technique, which is explained as follows:

3.4.1. Analysis Before in the Field

Data analysis before researchers enter the field is carried out using data from preliminary studies or is still temporary and will continue to develop after researchers are in the field. P. Sugiyono (2017) stated that in qualitative research, the research focus is temporary and will develop after the field. If a formulated research focus does not exist in the field, the researcher can change it accordingly (D. Sugiyono, 2013).

3.4.2. Analysis while in the Field Miles and Huberman Model

Data analysis in qualitative research was carried out during data collection and after completion of data collection during a certain period. An analysis of the answers that will be asked during the interview was carried out before the interview process took place. If the answers submitted by the interviewees during the interview were not satisfactory, the research questions were repeated until a certain stage when the data were considered credible. The Miles and Huberman (1992) in P. Sugiyono (2017) emphasizes analysis activities that are carried out interactively and continuously until the data is saturated. Activities in data analysis include data reduction, display, and conclusion drawing/verification. Before entering data reduction, researchers first conducted anticipatory data reduction. Anticipatory data reduction arises when researchers decide which conceptual model to use, the object to be studied, the research questions to be used, and the data collection methods to be used (Agustina, Sukmasari, Andi, & Oktavia, 2022; P. Sugiyono, 2017).

4. Results and discussions

4.1 Ecosystem Strategy

The orchestra strategy emphasizes the role of leadership through collaborative coordination among various parties in a complementary ecosystem with the aim of increasing value creation. This approach views an ecosystem as an entity that has added value beyond the sum of its individual parts. As revealed

by Mr. Yanuar as the President Director of PT Bandung Daya Sentosa (BDS), the Company was established in Bandung Regency with the aim of taking part in the agro-business, from trading to industry, with a focus on food. The company aims to be a large national company that contributes to the development of society and the government and uses resources optimally. Bandung Daya Sentosa is committed to becoming an independent company that aligns its business activities with community and government developments. The company's mission involves trading value-added activities and its ability to support the community.

This interview highlights the importance of PT Bandung Daya Sentosa in dealing with technological developments and economic changes, particularly in the coffee industry. The largest factory in Asia is an ambitious project that can significantly impact a company's growth. The interviewee also emphasized the importance of understanding and participating in a business ecosystem that involves many parties, both in terms of digital marketing, support for local communities and a deep understanding of customer needs. Overall, a focus on quality, innovation, and community support appears to be the key pillar of a company's business strategy.

In terms of digitalization capabilities, the interviewees did not provide a definitive answer regarding PT Bandung Daya Sentosa's digitalization capabilities. These points are still under evaluation and development. The availability and success of implementing digital technology are relevant factors in leading initiatives according to customer needs. Strategic relationships with customers and potential partners are still under development. Engagement with customers and partners is seen as a strategic factor that will develop in the future but has not yet reached a definitive conclusion. Regarding the influence of other parties, especially the government and local parliaments, the interviewees mentioned that there was still a regulatory process involving the agribusiness ecosystem. However, there is no firm conclusion on how the local parliament can accept and support Bandung Daya Sentosa as a leader in business.

Interviewees stated that Bandung Daya Sentosa, as a BUMD under the Bandung Regency Government, could rely on voluntary support and cooperation from relevant parties. The potential to coordinate collaboration and the open exchange of data with economic actors was considered positive, especially with digital applications. The integration of digital systems is considered beneficial, particularly in providing higher benefits through digital applications. The use of digital technology is expected to bring economic benefits and mitigate risks by sharing knowledge and data.

These interviews show that PT Bandung Daya Sentosa is still on the journey of development in terms of digitization capabilities, strategic relationships, and data collaboration. The role of the government and the DPRD is also an aspect that needs to be further explained in terms of regulation and support. In addition, the importance of the benefits of digital system integration and the role of trust in managing data were emphasized as key elements for company growth and sustainability in the digital era.

Alternatively, in the agro-business ecosystem, PT Bandung Daya Sentosa may adopt a complementary strategy. Instead of taking on a leadership role, the company can be complementary in the ecosystem, adopt a follower role, and seek to complement other offerings to create higher value.

In this interview, the interviewees discussed the actors involved in PT Bandung Daya Sentosa's business ecosystem, particularly in the context of digital marketing and application of the digital economy. Actors in the Ecosystem, suppliers, and consumers: Many parties, including suppliers and consumers, are involved in the ecosystem. The role of suppliers as providers of goods, especially farmers and consumers as recipients and users of products, is crucial. Suppliers: The role of suppliers in an ecosystem is important. They act as links between suppliers and consumers, ensuring the availability and distribution of goods. Role of Community: Interviewees highlighted the importance of the community, especially in the application of digital marketing and digital economy applications. Communities can include farmers, consumers, and other business actors.

This interview shows the complexity of PT Bandung Daya Sentosa's business ecosystem, with the role of various actors, from suppliers to consumers. Understanding the crucial role of processors, integrating digital aspects, and emphasizing the role of the community are key points. Another important point, not only for customers but also for maintaining customer engagement, confirms that business success is not only measured by transactions but also by long-term relationships.

Another alternative is a protector strategy. In the context of agro-business, PT Bandung Daya Sentosa may choose to be a protector, "stuck in the middle" and having to accept the role of a follower. In this case, the company may be reluctant to share business knowledge openly for fear of losing its competitive position, but still tries to protect its interests in the agro-business ecosystem.

In an interview with Mr. Ganjar, who is the Commissioner of Bandung Daya Sentosa, expressed his hope for the future of the company in the span of one to five years. In the short term (to 1-2 years), the company can generate sufficient profits to sustain its own operations. The priority is to achieve financial sustainability and stability. The medium-term focus (to 3-4 years) is on maintaining the company's viability. This includes molding a strong and positive corporate identity and image in the eyes of Bandung Regency's people.

In the long term (next five years), the broader hope is that Bandung Daya Sentosa will not only be a business entity but will also provide significant benefits to the entire community of Bandung Regency. Efforts to create a community by involving the community have become a strategy to build support and trust among citizens. Community Engagement and Trust, an additional expectation is that Bandung Daya Sentosa can build a close and mutually beneficial relationship with the people of Bandung Regency. The desire to create trust and a sense of loyalty from the community are the key elements of the company's strategy.

To achieve short-to long-term success, the interviewees highlighted the importance of the company's financial stability, strong identity, and the positive benefits it can provide to the community. The focus on building an adventurous community by engaging with the people of Bandung Regency is considered a strategic move to build sustainable support and create a positive long-term impact.

Bandung Daya Sentosa Company has a mission to become a national agribusiness company that contributes to the development of society and government. A company's strategy involves upstream resource development, business diversification, education, and risk mitigation. Cooperation with farmers and creation of an efficient supply chain are the focus of achieving the company's goals. Overall, Bandung Daya Sentosa has a holistic vision to play an active role in developing the agribusiness sector, and has a positive impact on society and the national economy.

Reinforced by the results of interviews with interviewees, Mr. Yanuar as President Director of Bandung Daya Sentosa (BDS), provided a future picture of the Company and the strategies carried out. The BDS was established in Bandung Regency with the aim of taking part in the agribusiness business, ranging from trade to industry, with a focus on food.

4.2 Business Ecosystem Architecture Development

4.2.1 Identification of Selected Ecosystem Boundaries

Based on the definition of a business ecosystem, it is important to define the region or community at the beginning of business ecosystem architecture design. Ecosystem boundaries need to be precisely described because the relevant stakeholders and their interactions may differ for different purposes (Ma, 2022). According to the explanation from the interview with one of the commissioners, Mr. Ganjar and Mr. Yanuar as the Directors of PT Bandung Daya Sentosa, who revealed that several variables related to the company's ecosystem, including roles, relationships, activities, initiatives, and related measurements. These variables include various aspects, such as Directors, Board of Commissioners, Shareholders, Suppliers, Consumers, Government, Media, Investors, Universities/Academics, Farmers, Associations, Goods Distribution Partners, and Competitors.

First, regarding the ecosystem variable related to the Board of Directors, the company needs to identify the roles and relationships with its ecosystem partners, such as how the role of the ecosystem or partners is needed to support the company's vision and mission. Furthermore, it is necessary to evaluate the level of cooperation required, the ability to lead initiatives according to customer needs, and strategic relationships with customers and potential partners.

The Board of Commissioners variable focuses on the role and relationship with other ecosystems in the context of business strategy development. Questions such as the level of cooperation required by the company or whether the company has the necessary capabilities to lead initiatives according to customer needs can help determine the direction of the company. For the shareholder variable, the identification of roles and relationships with the agro-business ecosystem is important. In this case, the company needs to evaluate how shareholders can support its vision and mission, as well as the level of cooperation required. Furthermore, the variables of Suppliers, Consumers, Government, Media, Investors, Universities/Academics, Farmers, Associations, Goods Distribution Partners, and Competitors focus on the roles, relationships, activities, initiatives, and measurements of each variable in the context of agro-business ecosystem development. It is important to gain a comprehensive understanding of each of these variables and sub-variables, as it will help companies identify opportunities, evaluate risks, and design more effective strategies for developing agro-business ecosystems.

4.3 Factor analysis

4.3.1 Influencing factors and their impact on elements in the ecosystem

We used the PESTEL method to determine the factors that influence and impact the existing ecosystem. Changes in political, economic, social, technological, environmental, and legal aspects can have a significant impact on the development of agribusiness in Bandung Regency. Below are some potential influences and impacts of changes in each of the PESTEL dimensions.

4.3.1.1 Political Factors

From a political perspective, the Bandung Regency needs to consider the impact of changes in government policies, which can affect company operations and strategies. Any changes in regulations can demand adjustments to strategies and operations, emphasizing the importance of quick response and flexibility in dealing with the dynamics of the political environment. Political stability creates favorable conditions for business growth by increasing investor confidence and creating a solid foundation for overall business conditions.

4.3.1.2 Economic Factors

Economic factors play an important role in fluctuations in exchange rates, inflation rates, and interest rates, which can affect the cost of capital and value of a company's assets. In addition, changes in economic growth may affect people's purchasing power, which will have a direct impact on demand for agro-products. BUMDs should consider low interest rates that can support investment, whereas exchange rate fluctuations can affect the cost of importing and exporting agro-products.

4.3.1.3 Social Factors

Social aspects include changes in consumer trends and preferences, which can have a direct impact on the demand for agro-products. Companies must constantly monitor these changes and adjust their products and marketing strategies accordingly. Social issues such as environmental awareness and worker welfare can also affect a company's reputation. Therefore, it is important to increase corporate social responsibility to support issues that are considered important by society (Anoke, Okafor, & Onu, 2023; Munir, 2021).

4.3.1.4 Technological Factors

Technological influences include advances in production processes, efficiency, and product and service innovations. Investments in new technologies can increase competitiveness in changing markets. However, companies also need to consider system adjustments and employee training to adopt new technologies and fully benefit from technological developments.

4.3.1.5 Environmental Factors

In the environmental dimension, attention should be paid to changes in environmental policies and regulations, which may affect business practices. Climate change, such as changes in weather patterns, can affect the production and availability of raw materials. Therefore, implementing sustainable and environmentally friendly business practices is crucial. Adjustments to the impacts of climate change also need to be considered to maintain the resilience of a company's operations (Fernando & Surjandari, 2021).

4.3.1.6 Legal Factors

Legal aspects include changes in tax laws and business regulations that can affect cost structures and profitability. Compliance with environmental and labor regulations is a critical aspect in maintaining a company's reputation and operations. Therefore, adjustments to internal policies to comply with new regulations and legal risk management are important steps to mitigate potential sanctions or litigation.

With a deeper understanding of these PESTEL factors, an adaptive, proactive, and sustainable strategy can be formulated. This analysis helps companies remain relevant and competitive amid dynamic changes in the external environment, ensuring business sustainability and positive contributions to the local economy and society.

Table 2. Analyze factors affecting ecosystems

Key Factors	**Government**	**Business Actors**	**Community**	**Academia**	**Media**
Politics	v	v	v		
Economy	v	v	v		v
Social	v	v	v		v
Technology	v	v	v	v	v
Environment	v	v	v		
Law	v	v	v	v	

Source: Processed data (2023)

4.3.2 Potential changes in the ecosystem

Using the PESTEL method to determine the factors affecting PT Bandung Daya Sentosa, we can investigate potential changes in the ecosystem by identifying the impact of each PESTEL dimension. The following is an investigation of the potential changes in ecosystems.

4.3.2.1 Political Factors

First, in terms of politics, changes in government policies and a lack of political stability can impact a company's strategy and operations. These changes may require adjustments and undermine investor confidence.

4.3.2.2 Economic Factors

From an economic perspective, fluctuations in exchange rates, inflation, and interest rates can affect the costs of capital and purchasing power. Low interest rates may favor investment, but exchange rate fluctuations may affect the cost of importing and exporting agro-products, which may affect the competitiveness of the company.

4.3.2.3 Social Factors

Social aspects are also important, as changes in consumer trends and increased environmental awareness can affect demand for agro-products. Therefore, companies need to adapt to these changes, such as adjusting their products and marketing strategies.

4.3.2.4 Economic Factors

In terms of technology, new technological developments can increase competitiveness; however, companies also need to invest in employee training to adopt new technologies.

4.3.2.5 Environmental Factors

The environment plays an important role in policy changes and the impacts of climate change. The Bandung Regency needs to consider the implementation of sustainable business practices and adjustments to climate change to maintain the sustainability of agro-business operations.

4.3.2.6 Legal Factors

Legally, changes in tax laws and business regulations can affect costs and profitability. Compliance with environmental and labor regulations is also crucial in maintaining the reputation and operations of agro-businesses.

4.4 Ecosystem Reconfiguration

The use of the orchestrator strategy for agro-business development in Bandung Regency affects the addition of new actors, changes in value propositions, and interactions between actors in the agro-business ecosystem. The addition of actors and changes in value proposition and interactions between these actors can be explained in table 4.6 and table 4.7 as follows:

Table 3. Actor Addition Value Proposition Ecosystem Reconfiguration Result

Actor	Roles	Value Proposition
PT Bandung Daya Sentosa (BDS)	A BUMD that is a key pillar in the agribusiness ecosystem, can act as a producer or key player in the agribusiness industry in Bandung Regency.	● Become an effective intermediary between farmers and Agro product enthusiasts. ● Provide support to farmers. ● Open opportunities for cooperation and partnerships with various parties, including BPR.
Local Government	Determine business models, regulations, and support.	● Establish BUMDs to manage and develop agricultural businesses. ● Create regulations to create conducive and effective agro businesses through BUMDs.
Supplier	Supplier of goods required by BDS.	● Produces high quality products ● Collaborate with BDS to support the product needs..

Transportation Logistics	Carry out the distribution of goods from producers/suppliers to consumers/buyers	Provide ease of distribution from sellers to buyers
Consumer	As buyers of goods from PT Bandung Daya Sentosa, provide feedback to improve product quality.	Purchase goods sold by BDS
Farmers	Primary producers, play a role in the production process, and receive support to increase agricultural output.	● Plant agricultural products with superior seeds according to market demand ● Receive support and assistance in the agricultural process from upstream to downstream ● Selling crops at fair prices and market certainty
Financial Institution	Provide financial support to Agro businesses and collaborate with PT Bandung Daya Sentosa.	● Provide a variety of banking products and services, such as savings, credit, and other financial products, according to customer needs. ● Offer banking services that are easily accessible and close to the customer's location, supporting convenience and accessibility.
Collectors	Communities that have the same scope of business can act as competitors or can become partners.	Become a distribution partner of the BDS business process
Academia	Provide insights and assessments of business processes, and contribute to strategy development and innovation.	● Make academic studies ● Form FGDs in providing insights and business process assessments to the Company.
Media Platform	Create platforms or communication channels to promote Agro products and provide up-to-date information.	● Create platform applications to support the Agro business ecosystem ● Receive revenue through

				platform creation and management

Source: Processed data

Based on Table 3, there is a shift in the value proposition of Agribusiness in Bandung Regency, which involves various actors who have their respective roles and contributions in carrying out their business processes. In this context, Bandung Daya Sentosa (BUMD), together with various parties, is one of the main entities in the agribusiness sector, forming a complex ecosystem. Further investigation into the roles and potential reconfiguration of these actors can provide a deeper understanding of the dynamics of agribusiness in the Bandung Regency.

4.4.1 Ecosystem Interaction Reconfiguration

From the results of the reconfiguration of the agribusiness ecosystem in Bandung Regency, there are changes in the interactions of several main actors. The reconstructed ecosystem interactions are presented in Table 4.

Table 4. Interactions on ecosystem reconfiguration

From Actor To Object	Role	Interaction Content	Role	To Actor From Role
BDS	BUMD agribusiness orchestrator	PAD Contributor	Revenue	Local Government
		BDS provides support to suppliers and farmers in the distribution and marketing of agricultural products. BDS participates in the Agro supply chain managed by BDS.	Business, Information, Data	Farmers, Suppliers, Consumers, LogTrans
Local Government	Regulator of strategic policies	make policies related to agricultural development	Regulation	BDS
		provide training	Training	Farmers
Manufacturer	Produce goods	sells products	Business	BDS, Consumer
Transportation Logistics	Providing goods distribution services	Providing goods distribution services from producers to consumers	Services	BDS, Consumer, producer,
Consumer	Buying production	Buy products from producers	Business	BDS

Farmers	Producers/consumers of agricultural production	Produce agricultural products	Business	BDS
Financial institutions	Provide financial support	Provide banking services to customers	Funding and services	BDS producers, consumers, farmers, Logtrans, collectors
Collector	Distributors and Sellers of agricultural products	Provide product distribution services	Business and Services	Farmers, consumers
Academics	Provide views and assessments of business processes, as well as contribute to strategy development and innovation.	Carry out studies and provide input/innovation to the study results	study	BDS, Local Government
Media Platforms	Create a platform or communication channel to promote Agro products and provide the latest information.	Create a digital platform as a means of business distribution	Business	BDS, farmers, producers, consumers

Source: Processed data

From Table 4, there are 16 interactions carried out by all actors involved in the development of agribusiness ecosystems in Bandung Regency with the existence of BUMD BDS.

5. Conclusions

PT Bandung Daya Sentosa (BDS) is pursuing the vision of becoming a national agribusiness company that contributes to the development of society and the government. In its quest for digitalization, the BDS implements four ecosystem strategies: orchestra, dominator, complementary, and protector. Orchestra strategy emphasizes leadership through collaboration to enhance value creation. Alternatively, BDS becomes a dominator by integrating ecosystem actors through digital platforms such as BDSMart. In the digitization steps, BDS focuses on BDSMart as a digital sales platform, understanding its business structure, digital data utilization, and infrastructure development.

The roles of each actor are highly focused on the agricultural ecosystem of the Bandung Regency. The local government sets the rules and provides support, while the BUMD (PT Bandung Daya Sentosa) mediates between farmers and buyers. Extension coordinators provide insights and training to farmers. Farmers as primary producers receive support, while financial institutions such as BPR Kerta Raharja

provide financial support. Academics provide insights that contribute to innovation. Buyers/consumers provide feedback. Logistics Transportation organizes the distribution of goods.

In the PESTEL analysis, PT Bandung Daya Sentosa identified key factors that could affect the business ecosystem. From a political perspective, policy changes and political stability require adjustments to a company's strategy and operations. Economic factors, such as fluctuations in exchange rates and interest rates, can affect the cost of capital and people's purchasing power, while social factors, including changing consumer trends and environmental awareness, require the adaptation of products and marketing strategies.

Through multi-agent-based ecosystem modeling and business model reconfiguration, it can be concluded that adaptability and collaboration between actors in the agribusiness ecosystem in Bandung Regency is the key to success. BUMD Bandung Daya Sentosa (BDS) has the potential to become a center for innovation and increase its role through the development of innovative agricultural products and the use of digital technology. Farmers with BDS support can adopt digital technologies to participate in agricultural e-commerce and increase their direct access to markets. Media as platform creators can play a key role in facilitating collaboration between various actors, providing up-to-date information, and opening up advertising spaces for agricultural companies. Strategic partnerships, innovation, social responsibility, and logistics adaptability are key to maintaining sustainability and competitiveness in a dynamic agribusiness ecosystem.

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