

Analysis of BUMDes Circular Economy-based Business Unit Development (Case Study in Sanankerto Village, Malang Regency)

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Abstract: BUMDes Kerto Raharjo has several business units including ecotourism, a grocery store, and a bioconversion house for organic waste with maggot cultivation or based on a circular economy. To the best of the researcher's knowledge, empirical studies on the topic of circular business are still lacking, particularly at the BUMDes business unit level which significantly analyses the development of business units. Therefore, this study aims to analyze the development of BUMDes circular economy-based business units as well as the supporting and inhibiting factors faced. This research uses a qualitative approach with a case study design. Afterward, the cases were analyzed by adopting the Miles & Huberman interactive model. The results showed that business unit development was conducted with different products or services (diversification). Supporting factors in business unit development include organizational commitment to sustainability, technology, university involvement, as well as the involvement of the Regional Research and Development Agency. Meanwhile, inhibiting factors in the development of business units include the lack of raw materials, limited financial support independently, low community involvement in sorting, low involvement of supply partners, and the absence of regulatory/mechanism innovations. This research seeks to contribute to existing knowledge and is a stepping stone for the refinement and stabilization of business unit development.

Introduction

Village development is one of the main concerns of the Indonesian government, because it is an area where most people live ((Maulidiah & Megawati, 2022), (Adisasmita, 2018), (Prayitno & Subagiyo, 2018). Village development is necessary so that villages can become socially powerful, culturally dignified, politically sovereign, and economically empowered. One program that encourages village economic empowerment is the establishment of BUMDes (Village-Owned Enterprises). To mobilize its activities, BUMDes is encouraged to have a creative and innovative working capacity to create business units (Government Regulation of the Republic of Indonesia Number 43 of 2014 on the Implementation of Law Number 6 of 2014 on Villages, 2014).

Sanankerto is located in the Turen sub-district, Malang district, and is classified as a rural village that has established a BUMDes. The BUMDes named Kerto Raharjo has a breakthrough business unit of Boon Pring ecotourism. Boon Pring ecotourism is the largest bamboo vegetation laboratory in Indonesia equipped with a reservoir where endemic freshwater fish breed, various water rides, outbound areas, people's markets, as well as meeting rooms. Since the opening of the Boon Pring ecotourism business unit, the turnover of BUMDes Kerto Raharjo has increased. This is evident from the BUMDes' significant contribution to the village PA (Village Original Income), as presented in Figure 1 below.

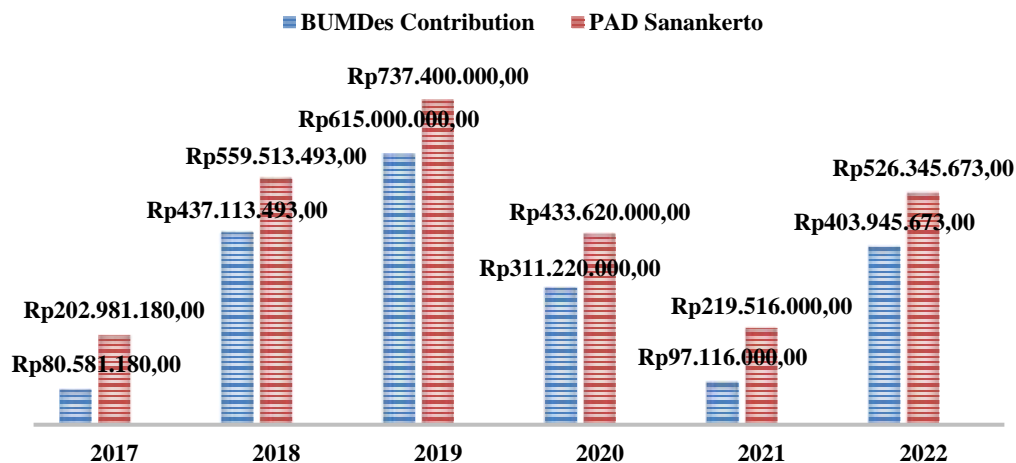


Figure 1 Contribution of BUMDes Kerto Raharjo to Sanankerto Village PA
Source: (BUMDesa Kerto Raharjo (2022) & Research Activities (2023), Data Processed)

In 2017, BUMDes contributed Rp80,581,180.00 of the total village PA acquisition of Rp202,981,180.00; in 2018, BUMDes contributed Rp437,113,493.00 of the total village PA acquisition of Rp559,513,493.00; in 2019, BUMDes contributed Rp615,000,000.00 of the total village PA acquisition of Rp737,400. 000.00; meanwhile, in 2020, the turnover of BUMDes decreased due to the Covid-19 pandemic so that BUMDes contributed Rp311,220,000.00 of the total village PA acquisition of Rp433,620,000.00; and in 2021, the turnover of BUMDes decreased again so that BUMDes contributed Rp97,116,000.00 of the total village PA acquisition of Rp219,516,000.00. Next, in 2022, the BUMDes' turnover improved or was even

higher than the previous two periods, with the BUMDes contributing IDR 403,945,673 of the total village PA acquisition of IDR 526,345,673.

The Boon Pring ecotourism business unit, which did not operate optimally during the COVID-19 pandemic, had initiated BUMDes Kerto Raharjo to develop other business units. This was done to sustain BUMDes activities during the recession. Precisely in 2021, BUMDes Raharjo developed a grocery store business unit and an organic waste bioconversion house with maggot cultivation. The wholesale shop business unit named Arto Raharjo is based on the absence of a wholesale shop in rural areas. Furthermore, the business unit of the organic waste bioconversion house with maggot cultivation is based on the level of popularity of Sanankerto village along with the popularity of Boon Pring ecotourism which is directly proportional to the village's waste production. The composition of organic waste is waste that will only be left in landfills, is mixed in nature whether vegetable or animal, and decays quickly, which can contribute to global warming and the spread of diseases. In this case, BUMDes is trying to give a sense that waste does not have to be waste but can be reorganized into business opportunities. The development of business units continues while trying to maximize existing potential. For BUMDes, the business unit of the organic waste bioconversion house with maggot cultivation or those based on the circular economy is one of the spaces to run village businesses more ethically and sustainably.

To the best of the researcher's knowledge, empirical studies on the topic of circular business are still lacking (Fedele & Formisano, 2023); (Maher et al., 2023); (Sumarsono et al., 2023); (Grafstrom & Aasma, 2021); (Jesus & Mendonca, 2018)). That is, only about 20%(Pieroni et al., 2019). At the BUMDes business unit level which significantly analyses the development of the business unit. For example, (Adianto & Mayarni, 2021) examine the development of savings and loan service business units, credit goods, financial businesses (BRI Link), and one-stop shops of BUMDes Bintang Muda Jaya Sako Margasari village, Kuantan Singingi district. Likewise, (Azlan et al., 2020) in their research allude to the development of the Creative BUMDes weaving craft business in Masalili village, Kontunaga sub-district, Muna district. In other research, (Mawastya & Risanto, 2016) observed the implementation of the village market development strategy with the McKinsey 7S model approach of BUMDes Gedok Wetan, Turen sub-district, Malang district.

It is important to further examine the development of BUMDes circular economy-based business units (case study in Sanankerto village, Malang district). Hopefully, it can provide a better and more comprehensive understanding of the phenomenon of business unit development. Therefore, the main objective of this research is to describe the development of business units. The next objective is to identify the supporting factors that support it, as well as the inhibiting factors that slow down or make it not run smoothly.

Research Method

The approach used to answer the research questions is qualitative with a case study design. This is because this approach enables in-depth investigation and understanding of social phenomena within a particular research context or setting.

The research was conducted at the home business unit of organic waste bioconversion with maggot cultivation, or circular economy-based BUMDes Kerto Raharjo, Sanankerto village, Malang district. In this case, the selection of the research location was based on the BUMDes integrating economic value alongside issues of environmental protection, community development, or rural social issues. Then, the researcher tried to discuss it with the Regional Research and Development Agency of Malang district. The final decision led to the selected research subjects. Research conducted in September 2022-September 2023.

Research data was collected in the form of primary and secondary data. Primary data was obtained from situations, conditions, environments, words, and actions. The rest of, the secondary data was obtained from various supporting documents in the form of related academic articles, websites, and public or internal documents. Thus, the research results become more complete, strong, and meaningful. The data collection techniques used include interviews, observation, and documentation. Each semi-structured interview was conducted face-to-face or through a Zoom meeting and lasted between 12-120 minutes. The participating informants were selected by purposeful sampling, i.e. they knew about the business unit and were connected. Thus, involving the BUMDes Director, BUMDes employees, village secretary, Head of the Livestock Agribusiness Study Programme of Polbangtan Malang, Balitbangda Researcher of Malang Regency, suppliers, and consumers of the business unit. Then, observation was conducted through passive participation. Meanwhile, documentation has the same function as observation, namely as a complement whose role cannot be ignored. Data were analyzed by adopting an interactive model (Miles & Huberman, 1992), This includes data reduction, data presentation, and conclusion and verification. Finally, data validity checking was carried out using triangulation techniques.

Result and Discussion

Case Study Description

Sanankerto Village is one of fifteen villages in the Turen sub-district of Malang district. Sanankerto village has an area of 363.00 ha, which is divided into residential areas, rice fields, moorland, and plantations, and the rest is public facilities, forest land, and other uses. Bamboo forests and village springs can also be found, which are utilized for ecotourism purposes.

The BUMDes (Village-Owned Enterprise) of Sanankerto Village, named Kerto Raharjo, has a vision of 'Realising the Welfare of the Sanankerto Village Community through Economic Business Development and Social Services'. Meanwhile, some of its business units include ecotourism, grocery stores, and organic waste bioconversion houses with maggot cultivation.

The business unit of the organic waste bioconversion house with maggot cultivation was developed in 2021. Whereas, organic waste raw materials are often obtained from restaurants in the form of food waste, sometimes obtained from BUMDes-owned grocery stores in the form of expired food products and obtained from farmers in the form of wiwilan or vegetable residues. The maggot and some of its derivative products can be used as animal feed and alternative fertilizer. The business unit operates in one location with a daily capacity

of 1.5 tonnes of organic waste. However, large-scale production has not yet been launched. The business unit has also become an educational platform for the surrounding community who want to, some universities, and is gaining popularity among villages or tourists. Not surprisingly, the BUMDes has started to realize the development of the business unit into an educational vehicle.

BUMDes Development of BUMDes Circular Economy-based Business Units

In fact, in the early days, the business unit ran only on maggot and maggot-derived products including fresh maggot, dried maggot, maggot eggs, and kasgot fertiliser. Over time, the business unit expanded to comparative studies or education on maggot cultivation. Which is in the process of being worked on, the business unit is arranging and building fish ponds (animal husbandry) and greenhouses (agriculture) to be connected with maggots. Thus, there is a series that will then be packaged into an edupark area. As I said.

"So, I synergized it with the greenhouse and the fish farming that is intensively reared."

In addition, supported by KM's statement.

"This is used as an edupark there. So there are several interrelated items: maggot, fishery, agriculture, then it becomes an edupark. Now we have started cleaning for that, have organized a place for bigger fisheries, and others."

"It can be the product or the knowledge. Because, there are several items: maggot (from hatchery to sales), fishery (hatchery, enlargement, care), as well as agriculture. So, our consumers are not only maggot consumers, but also the education world, the government world, and the general public."

Some opinions indicate that business unit development is done with different products or services (product diversification). In this regard, the products or services of the business unit will be in the form of maggot cultivation and fish farming products (animal husbandry), greenhouse products (agriculture), as well as edu-tourism rides (tourism). This will expand the market reach of not only maggot consumers, but also the world of education, the world of government, and the general public.

BUMDes Supporting Factors in the Development of BUMDes Circular Economy-based Business Units

Firstly, BUMDes Kerto Raharjo is an organization with the principle of sustainability. SA suggests the following.

"I continue to motivate this unit if you just follow it and believe that everything will have its blessings. Everything that is done seriously will be worthy of worship and become a blessing, including caring for the environment and the sustainability of our village."

Furthermore, MY added.

"We want to make Sanankerto a complete, integrated, and sustainable tourism village. What's that in English, comprehensive, integrated, and sustainable."

Overall, it is clear that the commitments of several key informants reflect the commitments or principles of BUMDes. Namely, the sustainability of the village, including

environmental concerns, and social and economic benefits. Thus, the commitment or basic principles of BUMDes permeate into every activity and decision.

Secondly, technology is required to convert organic waste into valuable products. As stated by SA.

"Meanwhile, organic waste is disposed of on the village's cropland. In my opinion, it would be problematic in the long run. Finally, we created maggot cultivation or natural conversion of organic waste using maggot. We produce wet maggot, dry maggot, kasgot, and maggot eggs."

It can be concluded that natural conversion or bioconversion technology using maggots is the basic thing that supports the business unit. It is necessary in managing organic waste and producing value-added products, in the form of maggot and several maggot-derived products.

Third, the involvement of higher education institutions in terms of labor capacity building. In practice, according to SA.

"There is no formal education requirement for the BUMDes workforce. If I am not mistaken, the formal education of the maggot business unit workforce is pursuing package C and the equivalent of junior high school. However, we equip them non-formally through training for their abilities/skills. That is, more effective job descriptions, improving the quality of employees."

The same thing was stated by AR.

"In the past, we did not know how to treat maggots. In general, flies bring germs and bacteria that are sources of disease. So, for the theory or knowledge we get from Polbangtan. For the practice, we try and keep trying."

The same thing was stated by KM.

"Initially, the BUMDes cooperated with Polbangtan to be assisted with maggot cultivation."

Analysis of the data collected shows that universities are there to assist early in the knowledge of the business unit until finally the business unit masters it.

Fourth, the involvement of the Regional Research and Development Agency. An excerpt from the interview with SA explains.

"We also collaborate with the Balitbangda of Malang Regency in the context of research to increase the bargaining value of maggot. Every week for more than 6 months, the growth of the fish is measured. So, it has been scientifically proven between fish that are given maggot and fish that are not given maggot."

The quote from the interview with EP explains.

"We as an R&D institution conducted a study there. And, we give recommendations if you want to develop it further, what is the term 'great potential' and 'feasible'. Besides being a BUMDes business unit, it can also empower mothers to participate in cultivation, and the results are handed over to BUMDes to be marketed."

Looking at the data collected, it appears that the support of Balitbangda as a non-profit R&D institution also plays an important role. By recognizing the value of maggot as an

alternative feed, it can increase its bargaining power. On the other hand, Balitbangda provides recommendations for business unit development.

Thus, BUMDes circular economy-based business units cannot achieve their goals on their own but require support from the environment in which they operate.

Inhibiting Factors in the Development of BUMDes Circular Economy-based Business Units

Firstly, the availability of organic waste supply appears to be very important for the business unit. However, in practice, the availability of organic waste supply is still lacking or requires special attention. Here is a further explanation from MY.

"It's just that, in practice and what I dug up from the children, the feed is still an obstacle."

SA further shared.

"We once had a request from Wagir for 400kg of maggot per day for quail feed. However, we couldn't afford it because we already have several customers who collect at least once a week. Even then, our production still did not meet the target due to the shortage of raw materials."

It can be said that the lack of supply of organic waste means that production cannot be maximized, and hinders progress or opportunities.

Second, the next critical factor of business activities that is also common is financial support. What is illustrated from MY's statement is that the capital and financial support of the business unit is limited independently.

"Meanwhile, we have our capital through the BUMDes Business Development Fund. The edupark is small at first."

Strengthened by KM's statement.

"We are still independent using the BUMDes Development Fund. But, actually, yesterday there was a collaboration with UMM to submit a proposal to Kedaireka. Incidentally, we were not successful yesterday."

The limited financial support of business units using BUMDes' capital often results in limited application or application of innovations. I said.

"And some of these considerations made me develop it but not immediately, just slowly while learning."

Thirdly, there is low community involvement in waste segregation due to deep-rooted habits. Generally, the composition of waste is still mixed. Here is what AR said during data collection.

"This process has stepped up to sorting waste at home. Why, to minimize the cost of our work. Both in terms of time and energy. But it is still slow."

Supported by AW's statement.

"The waste is mixed. There is a desire for the waste to be sorted, deposited with me, or taken by me, and then used as maggot feed. It's easier that way."

Also, supported by MB's statement.

"But I am very sorry that I cannot do the sorting."

Taking into account the results of the data collection, it can be said that if sorting is done by the business unit itself, it will take more time and be more complicated. On the other hand, the low level of community involvement in sorting is what causes problems.

Fourth, supply partners help reduce the time and hassle of the business unit in collecting organic waste. MY's statement below details the relationship between supply partners and the business unit.

"Maybe because in the community it is not sorted and there is too much plastic. In the end, we collect it from restaurants, we can get a lot of it right away."

AR said.

"We collaborate with 'Pak Untung' restaurant, occasionally importing from Gadang market."

Based on the results of the interviews, it can be concluded that the involvement of supply partners, especially waste-producing industries or business activities that match the needs of the business unit, would be very helpful. However, the business unit's supply partners are still limited to the 'Warung Pak Untung 4' restaurant.

Fifth, there is no regulatory innovation or established mechanism that supports the business unit. I said.

"Mostly with the approval of BUMDes to develop this maggot business unit. There is still no policy that supports or otherwise."

In contrast, LA emphasized the following.

"However, there should be a lot of involvement in this maggot business. From the community elements, especially to make them aware, it is a must, then the government elements. So, we have to collaborate on all fronts. For example, working with neighborhood associations to sort the maggots and collect them later. Don't forget the contribution for the residents, so it's not just being told to sort. Yes, special garbage cans that are free, or we value per kilo of organic waste Rp500.00-Rp1,000.00, or month we buy electricity credit. If not like that, our people still don't realize that."

Discussion

BUMDes Development of BUMDes Circular Economy-based Business Units

When examined in depth, the development of business units is inseparable from diverse products (product diversification). Starting from maggot and several maggot-derived products, then expanding to comparative studies or maggot cultivation education. Currently, what is in the process of being worked on is the arrangement and construction of an educational vehicle / edupark (integrating maggot-fisheries-greenhouse). Thus, the output/output of the business unit will include the results of maggot cultivation and the results of fish farming (animal husbandry), the results of the greenhouse (agriculture), as well as the ecotourism vehicle (tourism); which can support each other in fulfilling the needs of raw materials/production materials. And, in its implementation, it focuses on efforts to reach

consumers not only from maggot consumers, but also the world of education, the world of government, and the general public.

It has the same information as the record (Hoang et al., 2021) of diversified farming, e.g. combined crop and livestock production; and many countries including Viet Nam have promoted non-agricultural businesses based on agriculture, e.g. ecotourism. This has the same information as the notes (Syardiensah et al., 2020) About the pandanus mat weaving industry in the Peureulak sub-district, East Aceh district, there is a commitment to business development, which initially only produces pandanus mats, then makes tissue holders, pencil cases, slippers, pillowcases, and car seat mats. After that, it has the same information as the note (Murtadlo, 2013) about the business of Malangan Batik craftsmen in Druju village, Malang district in their development efforts including the implementation of new product development.

However, the development of the business unit is proceeding slowly, step by step due to several limitations. At its core, this development requires effort, time, and skills, including risk.

BUMDes Supporting Factors in the Development of BUMDes Circular Economy-based Business Units

Some supporting factors that are also important are as follows. BUMDes Kerto Raharjo is an organization with a commitment to sustainability. When other businesses or business activities are not used to (Unal et al., 2018); or even a lack of willingness to embrace such principles (Tambovceva et al., 2021). It is recognized that environmental concerns and social benefits are at the core of developing business units. This means that there is a motivation beyond economic gain, which is to have a positive impact on the environment. In line with the study results (Maher et al., 2023) the circular economy niche is led by risk-taking businesses with environmental concerns and a passion for creating change. In line with the study results (Unal et al., 2018) about Alisea (an Italian office supplies company with a reuse and recycle model) that summarises its vision of "Lighting the Way on Innovation, Waste Materials, and Together Leading to a More Sustainable Economy where Everyone Benefits". Not only that, in line with the study results (Long et al., 2018) sustainability is in the DNA of businesses that embrace circular business or as a principle that permeates all activities and decisions.

Innovative bioconversion technology using maggots facilitates business units in organic waste management. In the process, maggot will reduce the mass of organic waste and convert it into protein and fat. [(Mukti et al., 2021). The result is maggot and several maggot-derived products that can be used as animal feed and alternative fertilizers. Another common reality is that technology enables the conversion of agricultural waste into biomaterials, feed, foodstuffs, and biomolecules (Donner et al., 2021). In connection with this, the expression (Bartolacci et al., 2023) reinforcing, i.e. technology helps transform environmental, social, and economic burdens into valuable resources.

A supportive external environment means that there is collaboration and partnership of the business unit with nearby stakeholders. As described earlier, the labor force of the maggot business unit, especially in terms of formal education, is still low. Of course, it is a little difficult to run a business unit with these qualifications. However, BUMDes then really pays attention to and seeks workforce development. Labor development is carried out by mentoring in collaboration with Polbangtan Malang, or providing training. Polbangtan Malang assists the business unit's initial knowledge of bioconversion technology using maggot. In turn, learning for the workforce is accelerated or the workforce can have sufficient expertise, which allows them to manage the business unit more effectively and mature over time. In line with the research results (Adianto & Mayarni, 2021) about BUMDes Bintang Muda Jaya it provides training to managers so that they are more competitive.

Next, Balitbangda Malang District as a non-profit R&D institution helped assess the value of maggot and provided recommendations on how to develop the business unit to make it more effective and dynamic. Initially, the business unit faced low acceptance of maggots several times, and some even felt uncomfortable because they looked like maggots and felt unsafe when given directly to livestock. The existence of the Balitbangda of Malang District with research and development conducted in addition to confirming that maggot is safe also shows the added value of maggot. This is consistent with the expression (Jesus & Mendonca, 2018) that public bodies have an important role to play in adequate R&D in circular economy innovations. Other phrases, (Donner et al., 2021) partnerships with research organizations are important for circular businesses.

Inhibiting Factors in the Development of BUMDes Circular Economy-based Business Units

There are several inhibiting factors faced, among others. The potential of organic waste in Sanankerto village is indeed a consideration for BUMDes in developing circular economy-based business units. However, in its implementation, several things cause the business unit to experience a lack of organic waste supply. The lack of supply of organic waste as a raw material resource creates difficulties. Which results in production cannot be maximized, after which it hinders progress or existing opportunities. Simply put, the business unit has not been able to meet consumer demand. As (Vermunt et al., 2019) said the circular business model depends on how much waste is available. Moreover, (Donner et al., 2021) said that the success of the agro-food typology circular business requires the availability of large quantities of raw materials; and is stable (Opstal & Borms, 2023). In the same case, regarding the challenges of developing a circular chemical economy, the industry found it difficult to obtain raw materials of the right purity and on a large scale. (Mc Ewan et al., 2023).

Finance is one of the strengths for business units to move and carry out business unit activities. Limited financial support independently results in the application or application of business unit innovations that are also limited. It is known that the realization of business unit development runs slowly according to the budget. This reality is also a challenge for most circular business model SMEs in the EU (Rizos et al., 2016). Thus, both are in line with (Jesus &

Mendonca, 2018) that financial factors can hinder the expansion of circular economy innovations.

The lack of community involvement in waste segregation is essentially unsupportive of the business unit. As usual, people dispose of waste without paying attention to its composition. Meanwhile, it is difficult for the business unit to sort it out. It takes more time and is more complicated. This situation is reinforced by research (Vermunt et al., 2019) which revealed that the extent to which consumer markets segregate waste will affect circular businesses, and when waste is poorly segregated it adds to the difficulty. Although there were efforts to appeal to the public in the beginning, they chose to stick to their habits. True to the saying (Pomponi & Moncaster, 2016) i.e. the biggest challenge to building circularity deals with one's behavior both as an individual and in society.

The involvement of supply partners is the answer to the complexity of acquiring organic waste in the village environment. With the involvement of suitable supply partners such as restaurants, the business units receive much more organic waste. (Fedele & Formisano, 2023) highlights that circular economy businesses rely on deep collaboration with institutions and economic actors in the region. Meanwhile, the exact business unit supply partners to date have been limited to Warung Pak Untung 4, the occasional BUMDes grocery store business unit, or farmers who are harvesting. This means that the involvement of business unit supply partners is still limited. Findings (Rizos et al., 2016) summarized that more than half of SMEs (54%) cited a lack of support from supply networks as their main barrier in circular economy initiatives. Findings (Grafstrom & Aasma, 2021) summarize the lack of cooperation across the supply chain in the category of circular business model barriers.

Furthermore, the absence of regulatory innovations or well-established and coordinated mechanisms discourages people from contributing. And this has been a potential bottleneck for the business unit until now. (Maher et al., 2023) noted that without policy factors such as incentives, circular economy initiatives remain a low priority. Meanwhile, (Jesus & Mendonca, 2018) highlight regulations with an emphasis on social regulations (e.g. incentives) and the establishment of a conducive environmental setting are factors that facilitate the circular economy. Regarding regulatory innovation or supporting mechanisms, for example, coordinating with neighborhood associations for sorting and collection, and providing incentives for the calculation and payment of organic waste. Providing incentives in the form of calculations and payments for organic waste is a reward for participating in supporting circular economy initiatives. Thus, the community will be more motivated and consider organic waste as a resource that has value and will be processed by business units.

Conclusion

The development of BUMDes circular economy-based business units in Sanankerto village, Malang district is done with different products or services (diversification). Supporting factors in business unit development include organizational commitment to sustainability, technology, university involvement, as well as the involvement of the Regional Research and Development Agency. Meanwhile, the inhibiting factors in the development of business units

include raw materials, limited financial support independently, low community involvement in sorting, low involvement of supply partners, and the absence of innovative regulations/mechanisms.

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