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Policy strategy in making Situbondo regency as a cassava entrepreneur city using the work breakdown structure method

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ABSTRACT

Agricultural land in Situbondo Regency is dominated by sub-optimal land with a total area of 21,963 ha (70% of the agricultural land area in Situbondo Regency). One alternative commodity that can be developed to optimize the function of sub-optimal is cassava. However, cassava development faces potential and opportunities, challenges and obstacles, so to making Situbondo Regency as a Cassava Entrepreneur City, an appropriate and comprehensive policy strategy is needed from the Situbondo Regency government. The purpose of this study is to formulate a Policy Strategy in Making Situbondo Regency as a Cassava Entrepreneur City, and to find out the business model for cassava development in Situbondo Regency. The method used in formulating the strategy is the Work Breakdown Structure Method. Research results show that The strategy to make Situbondo Regency a cassava entrepreneur city is Providing quality and competitive cassava in a sustainable manner, Development of an intermediate industry using Situbondo specific cassava raw materials and/or other products, and Development of a high value added industry based on cassava and its intermediate products. The business model that is suitable for developing cassava in Situbondo Regency is one that uses the principle of zero waste process, as an integrated business model.

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1. INTRODUCTION

Agricultural land in Situbondo Regency is dominated by sub-optimal land with a total area of 21,963 ha (70% of agricultural land area in Situbondo Regency) (BPS, 2024). The land is dry land with flat to undulating topography. The productivity of plants on sub-optimal land is generally low, however, with proper soil and water management, the productivity of plants cultivated on sub-optimal dry land can still be increased profitably.

The Situbondo Regency Government has made various efforts to increase land productivity, both by providing irrigation facilities and infrastructure (for accessible land) and by providing drilled wells. To date, 3 drilled wells have been built by the Situbondo Regency Government, namely in (1) Sopet Village, Jangkar Subdistrict, (2) Jatisari Village, Arjasa Subdistrict, and (3) Tambak Ukir Village, Kendit Subdistrict (Tomi, 2020). The maximum capacity of these wells can only irrigate 40 ha of land. Thus, there are still many dry lands that have not received access to these water sources. Therefore, efforts are still needed to find new water sources and other efforts to optimize the function of dry land.

One alternative commodity that can be developed to optimize the function of dry land is cassava. Cassava can grow on dry land and suboptimal dry land. The land is generally in the form of dry fields. The potential land for cassava development is spread across almost all subdistricts in the Situbondo area. Cassava productivity in Situbondo has only reached an average of 16.7 tons/ha (BPS, 2024), whereas cassava productivity can reach 60 tons/ha (Teguh et al., 2022). This is due to the lack of soil capacity to retain water and low soil organic matter. In addition, the community on the land tends to have limitations in both technological access and other economic access. Therefore, efforts are needed to improve the capacity of the land. These efforts need to be coordinated in a research institution that focuses on managing suboptimal land by involving the local community.

Based on the potential and opportunities, challenges and obstacles, in order to achieve the big goal of making Situbondo Regency a Cassava Entrepreneur City to improve community welfare, it will face several problems, both in terms of providing raw materials, processing and utilization of cassava, marketing and government policies.

In previous studies, many have described the potential of cassava in Situbondo Regency, but no one has researched the problems of cassava from upstream to downstream as a cassava business chain, so that cassava as a business faces many obstacles. As an effort to solve the problems that will be faced by the Regional Government in realizing Situbondo Regency as a city as a Cassava Entrepreneur City, an appropriate and comprehensive policy strategy is needed from the Situbondo Regency regional government to solve several of these problems. The Situbondo Regional Government can conduct comparative studies to other regions to get a lot of input in formulating a policy to realize the Cassava Entrepreneur City. The policy strategy can include cassava cultivation strategies, development of its agro-industry and marketing patterns.

In formulating the right strategy related to cassava development, it can refer to the results of previous research. Previous research results. Cassava-Based Agroindustry Development Strategy in Wonogiri Regency includes 1) intensification and extensification of cassava cultivation, 2) dissemination of technological innovation leading to efficiency in the production process, 3) optimizing cassava clusters, 4) improving the business management of cassava-based agroindustry actors, and 5) developing partnerships in marketing(Surya et al., 2016).

Meanwhile, cassava development in North Sumatra requires the implementation of cassava agribusiness development. The development of upstream and downstream agro-industries requires a strong, interrelated, profitable, requiring, strengthening, and sustainable partnership chain. Cassava farming policy needs to be carried out by using superior varieties and applying the cultivation technology of cassava farming. The upstream and downstream industrial development policies are carried out by implementing optimization of business scale, maximizing profits, appropriate technology, and increasing promotion or product dissemination. The cassava agribusiness development model needs to be firmly applied to the upstream and downstream industries in a partnership that is interconnected and sustainable. This upstream and downstream agro- industrial partnership model will become a complete, strong, and sustainable economic activity if ethical principles and business morals are used as the main basis for establishing a business partnership relationship (Krisdiana et al., 2023) .

Cassava development strategies can also be modeled as tourist destinations, such as those carried out in Bukti Village, Kubutambahan District, Buleleng Regency, Bali. These strategies include 1) preserving the uniqueness of cassava varieties, 2) developing cassava tourism infrastructure, and 3)

collaborating to create tour packages with surrounding tourist attractions and forming social media and actively promoting (Ayu et al., 2023).

Based on the description above, the purpose of this study is to formulate a Policy Strategy in Realizing Situbondo Regency as a Cassava Entrepreneur City. The method used in formulating the strategy is the Work Breakdown Structure (WBS) method. The WBS method has several advantages in formulating strategy, particularly in terms of clarity, project management, and communication. The WBS breaks down a project into smaller, more manageable components, simplifying planning, scheduling, resource allocation, and risk management. It also increases accountability and facilitates project monitoring.

2. RESEARCH METHOD

This research was conducted for 3 months with the research location in the subdistricts in Situbondo Regency which have quite large land potential for cassava development, namely Banyuputih, Arjasa, Asembagus, Sumber-malang, Kendit, Panarukan, Panji, Banyuglugur, Bungatan and Kapongan subdistricts. The selection of these sub-districts was based on the suitability of the type and structure of the soil for cassava cultivation, apart from that, there are already many cassava plants in these sub-districts.

2.1 Data collection technique

The data collected in this study consisted of primary and secondary data. Primary data is data collected directly by the researcher from the research object in the field. Secondary data is data collected indirectly from the research object, but through examining documents related to the object. Primary data sources were obtained through two methods: observation and interviews. The characteristics of the respondents involved in the interviews consisted of several experts with extensive knowledge, understanding, and insight into the research object. The respondents (experts) were selected to answer the objectives of this study. The respondents (experts) in this study numbered 15 experts: 5 academics, 5 regional government officials, and 5 parties involved in the cassava business chain. The method used to determine the respondents (experts) was purposive sampling, considering their level of knowledge and experience in the cassava business chain. Secondary data sources were obtained through research or studies by other parties, such as government and private institutions, as well as other relevant agencies..

2.2 Analysis Method

The analysis method used in this study is the Work Breakdown Structure (WBS) method. Work Breakdown Structure (WBS) is a hierarchical division of tasks that is deliverable-oriented and should be carried out by the project executor to meet project objectives and requirements (Damanik et al., 2023) The Work Breakdown Structure analysis is designed to formulate strategies for the development and management of cassava in Situbondo Regency as an effort to making Situbondo Regency as a city of Cassava Entrepreneurs. The results of the WBS analysis are structured strategic policy steps. The results of the WBS analysis are policy recommendations that need to be carried out by the Regional Government for the development of cassava in Situbondo Regency.

The technical description and operational steps of the WBS in this research are as follows:

1) Identify Work Elements:
   Main Components: Begin by identifying the main research objectives and expected outcomes (deliverables).
   Level Breakdown: Break the main objective into smaller, more specific components. For example, in scientific research, this could be the data collection, data analysis, report writing, and presentation stages.
   Work Packages: Continue by breaking each component down into smaller tasks (work packages) that are manageable and trackable.

2) Define Deliverables:
   Each work package must have clearly defined deliverables.
   These deliverables must be specific, measurable, achievable, relevant, and time-bound (SMART).
3) Validate the WBS Structure:
   Completeness: Ensure all aspects of the research are covered in the WBS.
   Linkages: Check that each task and work package is interrelated and supports the achievement of the deliverables.
   Realistic: Ensure the schedule and resources allocated to each task are realistic and achievable.
   Review: Involve relevant research team members or experts to review and validate the WBS.
   Iterate: Make revisions as needed based on feedback from the validation process.

3. RESULTS AND DISCUSSIONS

3.1 Problems of cassava development in Situbondo Regency

Based on the results of discussions with experts, it was shown that the structure and type of soil in Situbondo Regency (sampling research location) is very suitable for cassava cultivation. On the other hand, the people of Situbondo Regency already have technical skills in cassava cultivation. However, cassava development in Situbondo Regency still shows less encouraging progress, this is because cassava cultivation has not yet adopted modern technology and still refers to hereditary techniques. Furthermore, the cassava business chain is still not well organized. Therefore, the presence of the Regional Government is very necessary in the form of the birth of policies that test the ideal of realizing Situbondo Regency as a cassava city.

Based on the results of the analysis of potential and opportunities, challenges and obstacles faced by Situbondo Regency in developing cassava, in order to achieve the big goal of "making Situbondo Regency a Cassava Entrepreneur City to improve community welfare" it faces several problems, both in terms of raw material provision, cassava processing and utilization, marketing and government policies. The details of these problems (Table 1).

Table 1. Problems and Alternative Solutions for Cassava in Situbondo Regency

The Problem	Problem Description	Alternative Solution
Raw material	Cassava prices fluctuate, which has an impact on uncertainty in cassava based businesses.	Increasing farmer productivity (currently only 17 tons/ha, whereas the potential reaches 40 tons/ha) by making cassava the main crop, providing seeds, cultivation techniques, providing added value, financial support, and managing institutions..
	The availability of cassava is not continuous throughout the year, so production is hampered by the rainy season	Development of new cassava varieties that are more productive, resistant to water stress and suitable as raw materials. It is also necessary to develop harvesting and soil processing equipment that is suitable for various seasonal conditions..
Processing and Utilization	Product quality is not maintained, and depends on the season	Implementation of production SOPs, and improvement of production facilities
	Low production efficiency	Application of good peeling technology and utilization of waste into valuable products
	Low added value	New product and benefits development
Marketing	The market potential for Situbondo cassava based products is not yet known	Mapping market potential based on region, product and customer which also serves to develop distribution and marketing systems

	Market knowledge of Situbondo cassava based products is still unknown	Promotion and socialization of products to both institutions/manufacturers and the community. It is also necessary to develop outlets and workshops for processing and utilizing cassava, such as MOCAF, tapioca, feed and other products that directly serve as examples for the community, as well as the use of social media networks.
Policy	The region government has not focused on developing cassava	Encourage region governments to make cassava a strategic commodity, which means having special programs for farmers, for example providing seeds, organic fertilizer and so on. Encourage the government to develop cassava based industries and businesses, such as MOCAF, tapioca, and livestock; and facilitate the growth of derivative businesses.

Primary Data Source, processed (2024)

1. Raw Material Provision Problems

Cassava as a raw material for industry must be available continuously throughout the year, high quality, competitive and sustainable (Rozi et al., 2021). Providing quality, competitive and continuously available cassava throughout the year requires integrated strategic steps that are focused on the objectives of increasing land productivity, ensuring cassava production and availability throughout the year, and ensuring the availability of cassava seeds with superior characteristics.

To achieve the objectives of these steps, cooperation between sectors is needed to map land and evaluate the quality of available land resources, develop technology to increase cassava land productivity, develop environmentally friendly marginal land cassava cultivation technology, develop mechanization, optimize cassava cultivation management, post-harvest technology engineering, cassava germplasm evaluation, superior seed production engineering, and stakeholder social engineering.

2. Processing and Utilization Problems

Cassava based industry in Situbondo Regency is currently not available, so it is necessary to develop an intermediate industry using Situbondo specific cassava raw materials (MOCAF/Tapioca and/or other products). Furthermore, in collaboration with other cassava based industries, several problems will be faced in the processing and utilization aspects of cassava in various products, including: product quality that is not maintained, and depending on the season.

Therefore, it is necessary to carry out a production process development program with the revitalization of modern machines and equipment. Efforts are also needed to encourage credit facilities by banks with cheaper interest rates and simpler processes so that they will support the acceleration of the revitalization process of the production process. Improving the quality of infrastructure to reduce costs, so that cassava-based products (for example fermented rice/ tapay) will have higher competitiveness is also recommended. No less important is the program for providing quality tape yeast specific to Situbondo, because so far tape yeast has been very dependent on companies outside the region.

Cassava processing such as tapay must have processing standards to produce products that are consistent in quality(Sari & Rahayu, 2022). The tape production standardization program is carried out through: (1) development of tape industry SOPs and production standard systems, (2) socialization of SOPs and production standard systems, (3) certification of industries that have implemented SOPs and standard systems, and (4) monitoring the implementation of these SOPs and standard systems.

3. Marketing Problems

Marketing is an activity of distributing production results from producers to consumers. To improve the welfare of farmers and producers of cassava-based products, marketing is one of the internal subsystems of the agro-industrial system (Hutasuhut et al., 2024). From a marketing aspect, the main problem faced by cassava-based products in Situbondo Regency is that the market potential for Situbondo cassava based products is not yet known, and also that market knowledge of Situbondo cassava based products is not yet extensive.

Marketing of cassava based products in Situbondo Regency which is still limited to local and in several other cities requires special efforts to expand and increase its volume. Through the study of the potential and marketing strategies economically, socio-humanities and law of cassava and its derivative products, the necessary steps will be known.

Promotion and socialization programs for cassava and its derivatives for institutional and retail sales need to be carried out, so that cassava products are not only distributed through small parties, but also through large parties, especially for restaurants and hotels. In addition, steps are also needed to open outlets for cassava-based products and its derivatives, and open captive markets through local government regulations

4. Policy Problems

Local government policies have an important role in developing cassava-based product development efforts. These policies can be in the form of regulations and facilitation as solutions to problems faced in developing cassava-based products (Zakaria et al., 2021).

Cassava development in Situbondo Regency faces the problem of Government Policy, namely the lack of focus of the local government on cassava development. For this reason, efforts need to be made so that the local government makes cassava a strategic commodity which means special programs for farmers, for example the provision of seeds, organic fertilizers and so on, efforts are also needed to encourage the government to develop cassava based industries and businesses, such as MOCAF, tapioca, and livestock; and facilitate the growth of derivative businesses.

3.2 Cassava Development Strategy in Situbondo Regency

Based on the description of the problems above, the formulation of the Cassava Development Strategy in Situbondo Regency is described in a Work Breakdown Structure (WBS) (Figure 1).

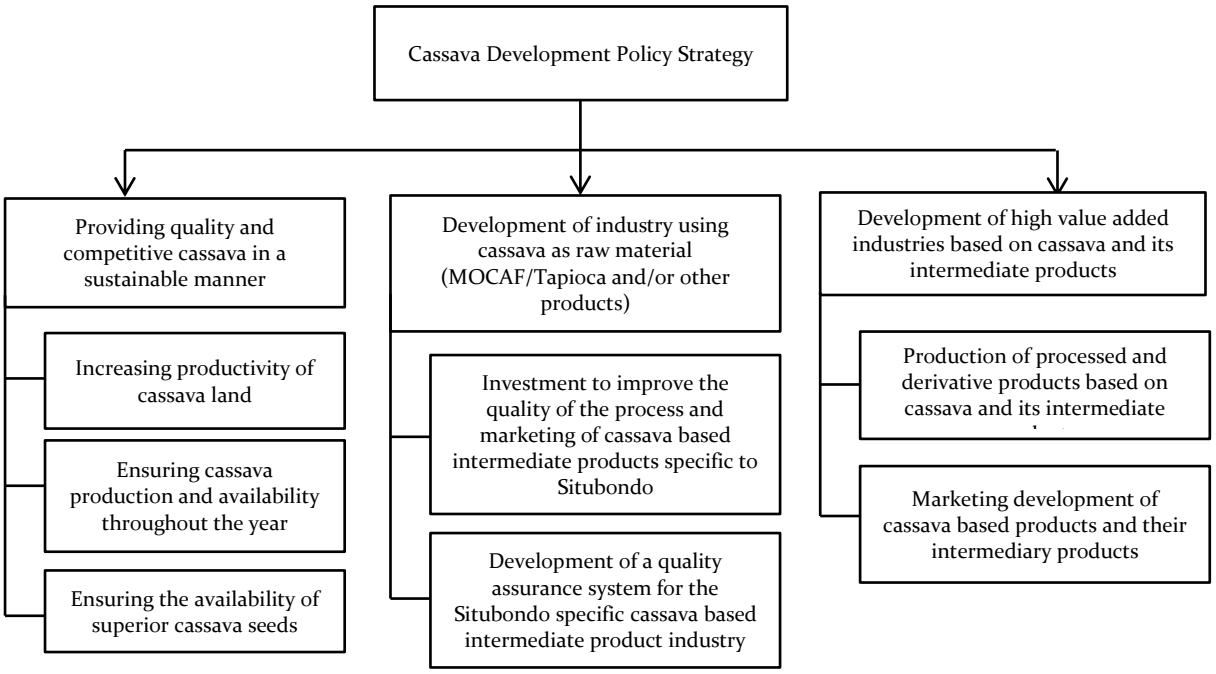

Figure 1. Work Breakdown Structure (WBS) Cassava Development Strategy in Situbondo Regency (Primary Data Source, processed 2024)

The formulation of the Cassava Development Strategy in Situbondo Regency includes 1) Providing quality and competitive cassava in a sustainable manner, 2) Developing an intermediate industry using cassava as raw material (MOCAF/Tapioca and/or other products), and 3) Developing a high value-added industry based on cassava and its intermediate products.

1. Providing Quality And Competitive Cassava In A Sustainable Manner

Providing quality and competitive cassava in a sustainable manner can be done through 1) Increasing the productivity of cassava land, 2) Ensuring the production and availability of cassava throughout the year, and 3) Ensuring the availability of superior cassava seeds.

Increasing the productivity of cassava land can be done through (a) mapping and evaluating the quality of marginal land resources, (b) applying technology to increase cassava land productivity, (c) applying environmentally friendly marginal land cassava cultivation technology, (d) applying mechanization, and (e) social engineering.

Mapping and evaluation of the quality of marginal land resources can be done through (i) mapping and evaluation of the potential and suitability for cassava plants, and setting it out in regional regulations, (ii) monitoring soil fertility after cassava cultivation, (iii) monitoring the water balance on cassava cultivation land, and (iv) monitoring soil biology and the rate of decomposition of organic matter on marginal land.

The application of technology to increase cassava land productivity can be done through (i) a local natural resource organic fertilizer program (compost, biochar, zeolite, montmorillonite, BPF, mol), (ii) a balanced cassava plant fertilization technology extension and guidance program, and (iii) a program to increase water availability for cassava plants through technology that is appropriate for Situbondo district.

The application of environmentally friendly marginal land cassava cultivation technology can be carried out by (i) soil conservation technology programs in plant cultivation (conservation soil processing, rainwater management) through counseling and assistance, (ii) application of location-

specific cassava cultivation technology (strip cropping, superior varieties, provision of seeds, planting distance, optimum fertilizer, (iii) application of integrated pest and disease control technology to increase cassava productivity through programs for providing superior varieties and environmental management, and (iv) application of an integrated cassava-livestock-organic fertilizer farming system.

The application of mechanization can be done through (i) the application of effective and efficient land cultivation through extension and guidance programs, and (ii) the application of effective and efficient harvesting equipment through extension and guidance programs. Meanwhile, social engineering can be done through (i) assistance in farm management for cassava farmers, (ii) development and strengthening of cassava farmer institutions, and (iii) social engineering for farmers to make cassava their main crop

Ensuring cassava production and availability throughout the year can be done through (a) Optimizing cassava cultivation management, which can be done through developing a group management system to ensure availability throughout the year and (b) Engineering post-harvest technology, which can be done through the application of cassava post-harvest technology (storage capacity, low HCN, drying technology).

Ensuring the availability of superior cassava seeds can be done through (a) evaluation of cassava germplasm, namely through identification and collection of superior cassava germplasm in Situbondo Regency, (b) engineering of superior seed production, namely through the provision of superior seeds that are ready to be distributed to farmers, and (c) socio-cultural and legal engineering, namely through (i) social engineering for farmers to meet their own cassava seed needs, (ii) social engineering of producer/farmer and consumer preferences for superior cassava seeds, and (iii) engineering of policies for the use of superior seeds in cassava cultivation.

2. Development Of The Situbondo Specific Cassava Raw Material Industry (MOCAF/Tapioca And/Or Other Products)

The development of the Situbondo Specific Cassava-based intermediate industry (MOCAF/Tapioca and/or other products) can be done through 1) investment to improve the quality of the process and marketing of Situbondo Specific Cassava-based intermediate products, and 2) development of a quality assurance system for the Situbondo Specific Cassava-based intermediate product industry.

The development of the Situbondo Specific Cassava-based intermediate industry (MOCAF/Tapioca and/or other products) can be done through 1) investment to improve the quality of the process and marketing of Situbondo Specific Cassava-based intermediate products, and 2) development of a quality assurance system for the Situbondo Specific Cassava-based intermediate product industry.

Development of intermediate product processes by providing modern machinery and equipment, namely through (i) a selected industrial development program based on cassava (MOCAF/Tapioca and/or other products), and (ii) a program of assistance and mentoring for selected cassava-based industrial production machinery and equipment.

Cheaper banking credit policies and simpler processes will support the acceleration of business development, namely through bank credit facilities for cassava-based businesses. Meanwhile, improving the quality of infrastructure to reduce costs, so that products will have higher competitiveness, namely through (i) a program to improve farm roads and village roads, and (ii) a program to provide clean water facilities for cassava-based businesses.

The program for providing cassava-based intermediate products with Situbondo-specific quality can be carried out through (i) developing Situbondo-specific quality production technology, (ii) developing Situbondo-specific quality product industry, and (iii) marketing Situbondo-specific quality products.

The development of a quality assurance system for the Situbondo-specific cassava-based intermediate product industry can be carried out through the Standardization of Situbondo-specific cassava-based intermediate products, which consists of (i) development of SOPs for the cassava-based

industry and production standard systems, (ii) socialization of SOPs and production standard systems, (iii) certification of industries that have implemented SOPs and standard systems, and (iv) monitoring the implementation of SOPs and standard systems.

Development Of High Value Added Industries Based On Cassava And Its Intermediate Products The development of high value-added industries based on cassava and its intermediate products can be carried out through 1) the production of processed and derivative products based on cassava and its intermediate products, and 2) the development of marketing of products based on cassava and its intermediate products.

Production of processed and derivative products based on cassava and its intermediate products can be done through (a) development of production processes for processed and derivative products based on cassava and its intermediate products, and (b) industrialization of processed and derivative products based on cassava and its intermediate products. Meanwhile, development of marketing for cassava-based products and its intermediate products can be done through Development of markets for processed and derivative products based on cassava and its intermediate products.

Development of the production process for processed and derivative products based on cassava and its intermediate products can be carried out through (i) engineering technology for the production process for processed and derivative products based on cassava and its intermediate products, (ii) designing production tools for processed and derivative products based on cassava and its intermediate products, (iii) production management for the manufacture of processed and derivative products based on cassava, and (iv) regulatory systems and policies for processed and derivative products based on cassava.

Industrialization of cassava-based processed and derivative products and their intermediate products can be carried out through (i) equipment assistance programs and assistance for cassava-based processed and derivative products, (ii) institutional development of cassava-based processed and derivative products industries.

Marketing development of cassava-based products and their intermediate products can be done through the development of processed and derivative markets for cassava-based products and their intermediate products, which include (i) identification and introduction of the market for cassava-based products and their intermediate products, (ii) training and mentoring programs for marketing processed and derivative products based on cassava and their intermediate products, (iii) promotion and socialization of products for institutional and retail sales of cassava-based products and their intermediate products, (iv) programs for opening outlets for cassava-based products and their intermediate products, (v) networked business development programs for outlets for cassava-based products and their intermediate products, and (vi) issuance of a Regent's regulation on the use of cassava-based products as mamiri at regional government events.

3.3 Cassava Development Business Model

Cassava development in Situbondo Regency is designed in an integrated business model using the zero waste process principle. This program design makes the development of a more productive and environmentally friendly area, which includes business activities: (1) Cassava culture (on farm), (2) MOCAF/Tapioca Industry (3) Animal feed business from cassava skin and other local raw materials, (4) Cattle farming business, (5) Biogas production business from MOCAF/Tapioca liquid waste and cow feces, (6) Organic fertilizer technology from MOCAF liquid waste and cow feces, (6) Organic fertilizer business from liquid waste and solid waste. The relationship between the six business activities (Figure 2).

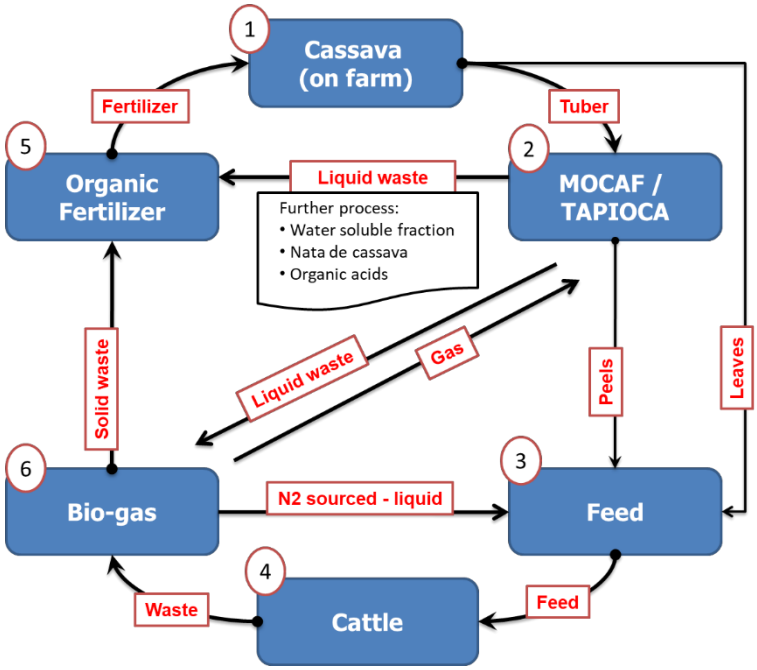

Figure 2. Integrated Cassava Business Model for Situbondo Regency.
(Primary Data Source, processed 2024)

However, some environmental issues arise, and how to overcome them is as follows:

1. Cassava is a plant that is greedy for nutrients. It must be admitted that cassava requires large amounts of nutrients, because cassava produces large biomass (60-100 tons/ha) to be harvested. Thus, the way to overcome this is to add sufficient input during cultivation. For this reason, the role of the organic fertilizer program is very important in this project. The role of organic fertilizer programs is very important in the development of cassava cultivation (Sulistyowati et al., 2023). The local government must design a policy related to the production of organic fertilizer, through cooperation with the private sector or cassava farmer groups (Zulkarnain et al., 2023). Therefore, in providing organic fertilizer, collaboration is needed between the government, farmers and all stakeholders involved in developing cassava cultivation (Ash et al., 2024).
2. Cassava produces open land that is easily damaged. When harvesting, cassava fields must be dismantled, so that the land becomes open which causes land damage. To overcome this, the cultivation technique used is the double track system, where cassava is planted in different tracks from one planting season to another, so that the land is not fully open. This is because the average level of technical, allocative, and economic efficiency of farmers with monoculture planting patterns is indeed lower than with double planting patterns. So the development of cassava cultivation that applies monoculture planting patterns must apply a double track system (Lanamana & Supardi, 2021), because the double track system planting pattern is considered very profitable in terms of production and productivit (Amanah et al., 2017). Large-scale cassava farming can also be more effective by implementing the concept of integrated farming with livestock to restore land fertility (Parmawati, 2024).
3. One of the problems of cassava production is the impact on the ecological and social environment (Afifah et al., 2022). Cassava processing into MOCAF Chips produces liquid organic waste that can produce odors that disturb the environment (Habib et al., 2023) For this reason, liquid waste is processed and utilized for liquid fertilizer and also nata de-cassava (Iswendi et al., 2021).

4. Cassava processing also produces solid waste that can be used as fertilizer (Nanda et al., 2024). Solid waste, both from MOCAF Chips processing and livestock, is processed into fertilizer which is then used together with liquid fertilizer (point 3.) for cassava cultivation (Faisal et al., 2023). However, the use of fertilizer from cassava processing waste to fertilize cassava cultivation land must be tested for its effectiveness and efficiency (Rawung et al., 2018).

4. CONCLUSION

The strategy to make Situbondo Regency a cassava entrepreneur city is 1) Providing quality and competitive cassava in a sustainable manner, (2) Development of an intermediate industry using Situbondo specific cassava raw materials and/or other products, and (3) Development of a high value added industry based on cassava and its intermediate products. The business model that is suitable for developing cassava in Situbondo Regency is one that uses the principle of zero waste process, as an integrated business model. The design of this program makes the development of a more productive and environmentally friendly area, which includes business activities including (1) Cassava culture (on farm), (2) MOCAF industry (3) Animal feed business from cassava skin and other local raw materials, (4) Cattle farming business, (5) Bio-gas production business from MOCAF/Tapioca liquid waste and cow feces, (6) Organic fertilizer technology from MOCAF liquid waste and cow feces, (7) Organic fertilizer business from liquid waste and solid waste. The principle of the zero waste process, as an integrated business model in the development of the cassava business, will provide a socio-economic impact in the form of increasing alternative income for the community and an environmental impact in the form of no waste from the cassava production business that pollutes the environment.

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