



AICEDC

*4th Annual International Conference on Economic
in Developing Countries*

“Economy for Sustainable Development”

October 5th - 6th 2018

PROCEEDINGS



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Jl. Kalimantan No.37 Kampus Bumi Tegal Boto
Jember, Jawa Timur, Indonesia 68121

Telp/Fax : (0331)337990 / (0331)332150

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Email: feb.unej@gmail.com

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Empirical Study if Cassava Production and Productivity Development in Jember Regency

Lilis Yulianti¹, I Wayan Subagiarta², M. Abd. Nasir³
^{1,2,3}Universitas Jember, Jl Kalimantan No 37, Jember 68121, Indonesian

Abstract

The rapidly growing food needs require strategies to achieve self-sufficiency based on the diversity of local food resources. Therefore the development of cassava production and productivity is needed in Jember Regency. By taking samples in 5 Sub-districts namely Arjasa, Mayang, Ledokombo, Tempurejo, and Sumberbaru obtained a strategy in the development of cassava production in Jember Regency. By using descriptive analysis tools in the form of literature review, the results of the analysis show that the potential of natural resources and the number of human resources, as well as the availability of infrastructure, minimize the weaknesses of availability and benchmark prices of raw materials and fluctuations in cassava prices in local and regional markets. Therefore, there needs to be a real effort in terms of benchmarking the price of cassava production inputs such as seeds, fertilizers, and pesticides so that they can support agricultural productivity

Keywords: Cassava, Production, Productivity

1. Introduction

Jember Regency is one of the regencies in the East Java Province, Indonesia is located in the east of Java Island which has a wide agricultural land and plantation area of 9,907,755 ha (BMKG, 2012). Cassava harvest area in Indonesia in 2015 was 949,916 thousand hectares and the production reached 21.8 million tons with a productivity of 22.95 tons/ha. The opportunities for developing cassava are very broad, this is due to the wide availability of land, based on data from BPS (2014) showing that there is a potential of 28.61 million ha of dry land consisting field land of 12.02 million ha, 5 hectares of land, 03 ha and 11.56 million ha of temporary land are not cultivated. These lands are the potential available for the development of cassava cultivation/farming areas. In addition to the availability of ample land, also available a package of cassava cultivation technologies that are location-specific. Jember Regency has various potential commodities in the agriculture sector, one of which is cassava. This is evident from the productivity and the amount of cassava production in Jember which is quite high. Based on data from the Central Statistics Agency of Jember Regency it is known that the productivity and amount of cassava production in 2012 were 174.40 kw/ha and 478,030 kw with a total harvest area of 2,471 ha (BPS, 2013). Potential distribution of cassava in Jember is quite evenly distributed, i.e. there are 28 Sub-districts of 31 Sub-districts in the Regency, including Kencong, Gumukmas, Puger, Wuluhan, Ambul, Tempurejo, Silo, Mayang, Mumbulsari, Ajung, Rambipuji, Baiung, Semboro Sub-districts. , Jombang, Sumberbaru, Tanggul, Bangsalsari, Panti, Sukorambi, Arjasa, Pakusari, Kalisat, Ledokombo, Sumberjambe, Sukowono, Jelbuk, Kaliwates, Sumbersari and Patrang (BPS, 2013).

Cassava has long been considered a subsistence crop for small farmers, but cassava has the opportunity to be cultivated on a large scale to produce industrial processing raw materials. Cassava today is the basic ingredient of various types of products such as various processed foods, flour, feed, alcohol, paper and textile materials, sweeteners and other biodegradable products (Agriculture Research Council, 2017). The types of cassava

derivative products above represent market development opportunities. Cassava product supply chains tend to start with small-scale production units, followed by small-scale product processing units through the process of cassava drying and grinding. As products move through the supply chain, activities such as marketing, processing, and packaging are carried out by several larger-scale units which then distribute the final product to consumers in large quantities. The supply chain of cassava products is structured like an hourglass which is different from the supply chains of other established agricultural commodities. The existence of this hourglass supply chain shows that the growth and development of the cassava product market can benefit a large number of poor farmers who are on poor land and in local processing units (Pingmuanglek et al., 2017).

The challenge in developing the cassava industry from upstream to downstream is how to equip farmers with the knowledge and tools needed to produce products that meet market growth requirements. Second, how to deal with market growth that leads to changing supply chains (Agriculture Research Council, 2017). As such, changes in the structure of the supply chain must be evaluated when assessing market opportunities. Institutionalization is an important factor that drives the performance of the management of agricultural resources. Institutions produce regulations or policies which are the *rules of the game* in resource management. Each party has different roles and activities in managing agricultural resources. Conflicts between farmers and high transaction costs that tend to be inefficient are problems faced by agricultural entrepreneurs in the agricultural sector. The amount of transaction costs determined unilaterally by the buyer is unknown to the farmer resulting in an *imperfect market*. Therefore this study aims to develop cassava production and productivity in Jember Regency.

2. Theory Basis

Classical/neoclassical economies assume that transactions are *free of cost*. In other words, transactions can take place following the market mechanism without the need for a fee. This view is contrary to the thinking of a new institutional economics that believes otherwise. The market will not run perfectly if the economic actors do not have information about the goods to be transacted. For this reason, some economists believe that transactions can take place if there is information. Information gathering costs money (Lin and Nugent, 1995). Lin and Nugent (1995) discuss the relationship between institutions and economic development by emphasizing two main problems namely the importance of institutions and institutional determinants. In the institutional model, transaction costs include direct costs for obtaining information, negotiating to reach an agreement, and conveying all relevant information to the parties concerned, as well as indirect costs arising from opportunistic behavior from economic actors related to information that is not imperfect and risk (Coase, 1960; Lin and Nugent, 1995). Therefore, the assumption that transactions can run without costs is shaken. Thus, transaction costs become an important unit of analysis in institutional economics.

To understand what transaction costs are, the following various understandings are conveyed by experts. Williamson as one of the leading activists of institutional economics believes that transactions are the transfer/movement of goods from one stage to another through separate technology. One stage is complete and the next stage is started (Williamson 1985).

Meanwhile, according to Furubotn and Richter (2000), transactions are the movement of goods, services, information, knowledge, etc. from one place (community) to another place (community) or transferring goods from producers to consumers, or moving goods from one individual to other individuals. This is called a physical transaction /delivery.

In addition to the definition of physical movement, the transaction also includes the acquisition or transfer of ownership rights to the goods from the owner to another party. Transactions are seen from the legal aspect. A broader understanding of transactions was conveyed by Max Weber. According to him, transactions are actions that are needed to establish, maintain and or change social relations (Williamson, 1979). This definition includes the formation and effort of maintaining an institutional framework in which economic transaction processes can occur.

Oliver Williamson defines transaction costs as costs to run an economic system (Williamson, 1985). Douglas North called it a fee for specifying and enforcing contracts that underlie exchanges, thus automatically covering the costs of political and economic organizations. Thus, it covers the costs of negotiating, measuring, and forcing an exchange (North 1990).

3. Research Methodology

This research is a type of *Action Research* because it covers two stages of aspects, namely aspects of basic research studies including strengthening production and productivity of farming. While aspects of action or enrichment include the development and assistance of businesses and the preparation of strategies for increasing competitiveness. It also requires evaluation or monitoring stages. Determination of the location of the study was done intentionally or *purposive sampling*, namely in Arjasa Sub-districts, Sumberbaru Sub-districts, Tempurejo Sub-districts, Mayang Sub-districts, and Ledokombo Sub-districts in Jember Regency. The reason for selecting locations is that the four Sub-districts are cassava production centers. Targeting activities or respondents are farmers as producers to final consumers and *stakeholders* related. The method used is quantitative and qualitative in the form of existing data and tabulation of perception data through techniques *in-depth interviews*. The analysis technique used is descriptive quantitative, qualitative approaches. Qualitative research is intended as a type of research that is not obtained through statistical procedures. Qualitative methods can be used to uncover and understand something behind a phenomenon (Strauss and Corbin, 2003).

4. Analysis Results

Examining a business chain on the development of a product is the most important thing in maintaining the sustainability of production, in addition to getting detailed information about the added value generated in each business chain. The business chain can be approached by the value chain method (*value chain*) which is an instrument of economic development-oriented to participatory methods and active actions aimed at supporting the growth of small and weak economic groups. The value chain is arranged in concrete steps systematically, can be applied by local governments, the private sector and the community to be further applied in their respective regions in accordance with the problems faced and the final outcomes expected.

The active role of many parties and a conducive environment is a crucial supporting factor in supporting the increase of superior products that have the greatest potential in driving the economic growth of a region. Such conditions can be imaged in the carrying capacity of natural and human resources that can never be separated to advance the economy, given that these resources are important elements to support the progress of development.

The area of cassava plantations in Jember Regency is around 795 Ha in 2018, much smaller compared to rice farming. This condition confirms the low interest of farmers in cassava cultivation. Policies related to the development of local resource-based products

and the provision of incentives to support the upstream to downstream agricultural industries in order to drive the business climate in Jember Regency, especially for cassava agricultural commodities are not optimal.

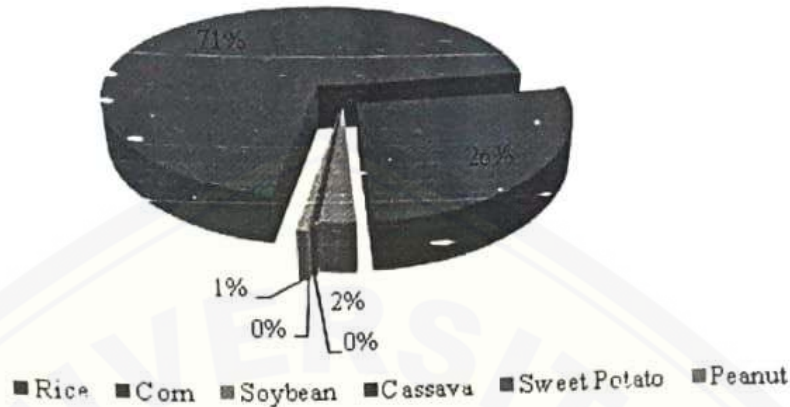


Figure 1. Area of Paddy and Secondary Crops Agricultural Land in Jember Regency in 2018

(Source: Central Statistics Agency of Jember Regency, 2018, processed)

Cassava or cassava is one of the agricultural commodities which is considered to have potential as a superior agro-industry with a variety of processed products that can be produced (Wibowo et al., 2013). Cassava has a content that is rich in beta carotene, where the compound has many benefits that are good for human health. Cassava can be made as a quality food commodity. Various opinions and opinions came to the surface, both at the conceptual and practical levels. At least many community leaders and practitioners in agriculture and economic development assess cassava as very potential in an effort to realize national food security and is one of the varieties of food based on local resources. Therefore, cassava-based agro-industry began to develop in Jember Regency.

Policies to increase food availability tend to focus on rice, corn and soybean commodities as the main food commodities. While the policy to increase food availability for cassava commodities, the increase in productivity growth is more adjusted to the ability of farmers and market absorption. In other words, the rate of increase in cassava production varies depending on the ability of farmers and market absorption. So far market access is one of the main obstacles in increasing the productivity of cassava plants. Farmers find it difficult to distribute their crops, especially in areas far from market reach (Williamson, 1985).

Policies related to cassava plant management carried out by the Jember District Agriculture Office and by the Jember Regency Industry and Trade Office are only based on the 2011-2015 Strategic Plan (Rienstra) (Halif, 2013; Indrayati, 2013; Tanuwijaya, 2013). While there is no policy in the form of laws or regional regulations related to the management or cultivation of cassava plants or the protection of farmers (Williamson, 1979; Zucker, 1987; Woolck, 1998). The implementation of the policies stated in the Strategic Plan above depends on the situation and conditions, where the implementation has not been optimal in a number of areas in Jember Regency (Riawati, 2013). The implementation of post-park policies at the industry and trade level is also not optimal (Swedberg, 1991; Dutilly-Diane, 2003). At the industry level, the provision of non-bajitarian assistance such as production-style assistance to process cassava into quality derivative products and have a sale value

so far has not been implemented due to administrative constraints at the local government level (Fukuyama, 1995; Furubotn, 2005). On the other side of the trade level, policies for the process of distribution and market penetration have not been implemented, causing the selling value of cassava commodities to decrease (Indrayati, 2013; Tuan, 2012). Delay in distribution as a result of low market absorption has an impact on the lower selling price which encourages farmers to switch to other food crop commodities (Coleman, 1988; North, 1990; Schultz *et al.*, 2013).

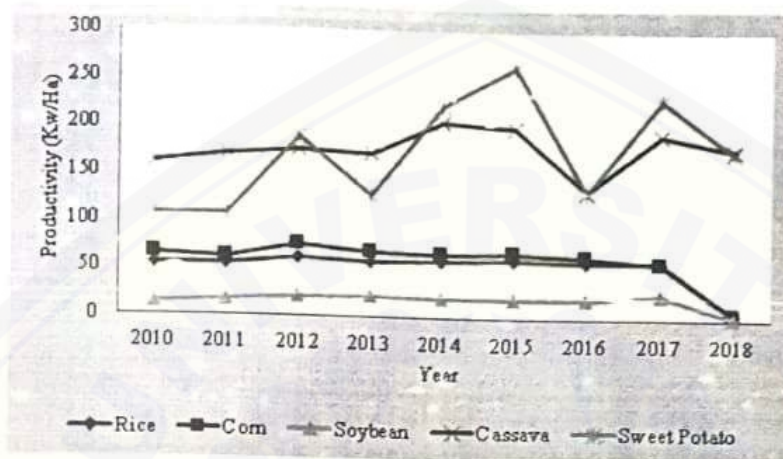


Figure 2. The productivity of Food Plants in Jember Regency in 2010-2018
 (Source: Central Statistics Agency of Jember Regency, 2018, processed)

Figure 2. confirms that the productivity of cassava or cassava is higher when compared to the productivity of food crops such as rice, corn, soybeans, and sweet potatoes. The productivity of rice and cassava is the most volatile compared to the other three commodities. The productivity of rice and cassava in Jember Regency both decreased from 2015 to 2018, but at the same point, the area of rice cropland increased while the area of cassava cropland actually declined (Central Statistics Agency of Jember Regency, 2019). At this point, it can be stressed that there was a significant decrease in cassava cultivation in Jember Regency

The availability of abundant and potential natural resources (raw materials) must be followed by an increase in the quality of human resources who are able to process and utilize them in creating a product that has a higher added value, so as to avoid dependence on the importing raw material which is actually more capable process it into more useful products. In other words, a very large quantity of ownership of natural resources and human resources will be very meaningless and weak if not accompanied by an increase in the quality of human resources and the carrying capacity of science and technology.

In addition, the sustainability of a development cannot be separated by an important institution, namely the local government. Institutionally, the supporting institutions consist of 3 institutions, namely the government (including political institutions and public sector institutions), the private sector (including companies and other economic institutions, and society (consisting of individuals and community groups), which means the effectiveness and efficiency of economic development improvement can be done through the synergy of public sector management, the private sector and the community that interact and coordinate with each other in order to be able to carry out their respective roles and functions properly.

The role of government is very important in realizing a prosperous society's economy because the government has the function of regulating and facilitating 2 (two) institutions

the others are private sector and community. The facilities provided can include supporting infrastructure and facilities, which can be in the form of short and long term development plans of a Regency/city which can then be realized in the form of tangible facilities to support the program, such as easy access to roads and bridges, access to health, access to education and training, access to capital, access to transfer of knowledge and technology and market access that can be reached by all elements of society in carrying out their economic activities. Because it is generally known, the basic problem in regional development is the ability to implement development policies based on the characteristics of the area concerned (endogenous development) by clearly and decisively using the potential of human resources, institutions, and physical resources locally (area). Thus, local governments can at least implement innovative economic development programs to address the challenges of economic independence.

Each business actor has its own role and function in the cassava commodity value chain. The quality and quantity of production results are influenced by how much the business actors contribute according to their respective roles. Therefore, each business actor is closely related to other business actors in supporting aspects of product distribution continuity. The following are the specifications of business actors in the cassava commodity value chain.

The cassava trading chain and its derivative products in Jember Regency are shown in the picture above. Functional farmers in production activities are divided into two types, namely pure farmers and industrial farmers. Pure farmers are farmers who produce cassava and directly sell it without processing their harvest. Cassava yields from pure farmers are sold to traders of industrial farmers. Cassava in Jember Regency is basically not a major commodity. The geographical condition of the sloping Jember Regency and its proximity to the south coast is not suitable for growing cassava. According to interviews with the Secretary of Mayangan Village and the Village Head, in 2014 there was a partnership with the private sector for large-scale cassava cultivation near the coastal area. However, farmers experience crop failure due to poor quality of agricultural products due to sandy soil so that cassava meat becomes too soft and not fit to enter the factory. The farmers are assisted by village officials and then try to sell the cassava crop to the Klakah market, Lumajang Regency but are also rejected for the same reason that is of poor quality so that it will not sell well in the market. This also led to the fact that most cassava farmers in the area suffered heavy losses and decided not to plant cassava.

Cassava farmers who still survive planting cassava are farmers who own fields and tend to be quite far from irrigation channels. The reason for growing cassava on the land is because cassava plants are relatively more adaptable in dry and rain-fed lands than other productive plants such as corn and chili. The pattern of planting cassava farmers in the highlands is to grow cassava for a year, starting in the middle of the rainy season and during the month of Ramadan and harvested during the month of Ramadan as well. The aim is to sell cassava crops to the tape making industry and it is predicted that post-harvest cassava prices will be more profitable as Ramadan approaches. The price stability is more due to the tape industry's need for cassava raw materials because the demand for tape tends to increase during Ramadan and Eid.

Cassava crop trading by pure farmers is carried out with several other economic actors, namely industrial farmers, traders, and small industries. Cassava prices at the level of pure farmers basically fluctuate in the range of IDR. 700-2,500/kg. The price of this study based on the results of the interview showed an average price of IDR1,500/kg. The payment system that applies in Jember Regency is cash payment when there is

a transaction between the seller, namely farmers and buyers, namely traders, industrial farmers, and small industries.

Industrial farmers are farmers who grow cassava as raw material for their industries. The industry is a cassava processed food industry namely cassava chips and cassava tape. The main reason for the industry to grow its own cassava raw materials lies in the instability of cassava stocks and prices on the market and also to reduce the cost of purchasing raw materials. This industry is included in the household scale industry category which is only assisted by a number of temporary workers.

Industrial farmers processing chips get raw material stock not only from their own agricultural products but also through pure farmers and traders. Generally, the purchase of cassava as a raw material is done when the stock of raw materials from the field is not enough to meet production targets. Cassava raw material purchase prices average IDR 1,500/kg at the farm level, and IDR 2,200/kg at the trader level. Furthermore, the results of the production of chips are packaged in small plastic wrap and sell for IDR1,000/pack which is marketed to small kiosks. Average price of IDR 19,000/kg with a profit margin of 30%/kg.

Industrial farmers who process cassava into tape have a longer cropping pattern. Cassava planting and harvesting is done during the rainy season of Ramadan because tape production is carried out in that month. The demand for cassava tape during Ramadan and Eid al-Fitr has increased significantly. Sales of cassava tape production in collaboration with central souvenir stalls of Jember Regency. The selling price of cassava tape is IDR.8000 / pack with an average weight of 7ons / pack. The added value obtained is quite large when compared to the price of cassava/kg at the farm level. However, even though the demand for tape increased during the month of Ramadan and Eid al-Fitr but there were problems that were also experienced by the tape industry farmers, namely the level of tape durability tape by the central kiosk souvenirs.

According to respondents, the amount of tape demand was also offset by tape production and the inclusion of tape from other Sub-districts, especially Bondowoso as the largest tape producer. One respondent of the tape industry farmer said that in Ramadan in 2018, the profit earned from tape sales was only around IDR 2,000,000 for a field area of 0.25 Ha. The small profit earned is due to the return of the tape because it was not sold until the expiration date.

Saprodi is a distributor of seeds, fertilizers, and pesticides needed in managing agricultural land. Saprodi scattered in agricultural areas and contribute to agriculture in an area. Saprodi in the cassava trade chain in Jember Regency is a provider of fertilizers and pesticides. The results of interviews with several production inputs in the Jember Regency show that production input in Jember Regency does not provide cassava seeds for farmers due to low demand factors. Generally, cassava farmers themselves cultivate cassava seeds from plants that have been harvested in the previous period. Saprodi has more role in the distribution of fertilizers and pesticides needed by cassava farmers. Regarding fertilizer subsidies, according to Saprodi, there are no subsidies specifically given to cassava commodities. The provision of subsidies is not specific to certain commodities, most importantly farmers are incorporated as members of one of the farmer groups.

Traders are specifically divided into two, namely middlemen and retailers, but in this study, both are grouped into one economic agent group, namely as traders. Traders are raw cassava buyers from pure farmers and as cassava sellers in industry and markets. Traders act as distributors of cassava to economic actors in the Jember Regency cassava market. Traders supply cassava from farmers not only in Jember Regency but also in the

surrounding Sub-districts. Cassava prices move according to the quantity of cassava stock in the market. If the amount of cassava decreases or the demand for processed cassava products increases in price, the price of cassava will increase to a range of IDR. 2,000-2500 / kg. But if the opposite happens, then the price of cassava at the farm level will decrease even up to IDR 700 / kg so that farmers experience a loss at that price level. Traders then sell unprocessed cassava to the final market, small industries or industrial farmers.

Industry is an economic actor who runs the production process by processing cassava raw materials into derivative products that are sold to end consumers. In Jember Regency, the existing industry is the home industry and small industry. The home industry processes cassava into tape and is sold in traditional markets and central stalls by the Regency of Jember, as is the case with industrial farmers. The difference is, for the tape industry, there is a continuing effort throughout the year to produce tape, while the tape industry farmers only make it once a year.

The tape industry obtains cassava as raw material from farmers and cassava traders. The purchase price of cassava at the farm level is cheaper than at the level of traders who set an average price of IDR 2,200 / kg. However, the tape industry prefers to buy cassava from traders because of the stable supply of cassava. Sales to central souvenir shops in Jember are set at the same price as the tape industry farmers.

The main problem felt lately by the tape industry is the decline in cassava stocks in the market. According to one respondent, the decline was due to a change in the function of agricultural land and also because of a shift in commodities planted by farmers. Cassava farmers in Jember Regency are transitioning to chili and watermelon plants. The decline can ultimately increase the price of cassava at the farm level.

A small industry is a processing industry with a number of employees of less than 20 people. A small industry in Jember Regency is a cooperative business that produces Mocaf chips to be sold to large factories that produce Mocaf flour. The cooperative cooperates with local farmers in the form of partnerships, and the cooperative becomes a distributor of cassava seeds and also a sole buyer of cassava from farmers who are partners.

The main objective of forming a cooperative is to increase farmers' awareness of the economic value of cassava, as well as improve the welfare of the lives of farmers who partner with cooperatives. In addition to the welfare of farmers, the existence of a Mocaf chip manufacturer can also open new jobs that can accommodate workers from around the factory site. The problem that arises is the price of cassava price fluctuations that cause the price of Mocaf chips is also affected. At the time of this research, the cooperative coach said that the Mocaf chip factory was not currently in production because the purchase price set by the Mocaf flour factory was very cheap. According to the cooperative supervisor, the fall in the price of Mocaf chips was due to cassava imports which disrupted the local price balance. In the end, the price reduction has an impact on the price of cassava at the farm level. Farmers ultimately do not dare to harvest cassava because the selling price is considered detrimental to farmers.

Large industries related to cassava commodities in Jember Regency are Mocaf flour processing plants in Solo Regency. The name Mocaf flour is an abbreviation of Modified Cassava Flour or modified cassava flour. Mocaf flour is also called Motekap flour. Mocaf flour is a modified flour found by Achmad Subagio and is the first in the World. Mocaf flour is cassava flour processed by modifying cassava cells through fermentation that involves microbes (lactic acid bacteria). Mocaf flour is promoted as a substitute or complementary to wheat flour and can save the cost of using flour.

Large industries related to cooperatives that produce Mocaf chips are Mocaf flour producers, namely PT. Bangkit Cassava Mandiri (BCM) which is a subsidiary of the Three

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