

Conference Paper

## Supply Chain Management for Development of The Agroindustry Cassava In Trenggalek District

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### ABSTRACT

This study aims to determine: the mechanism of supply chain management; chain management model supply; and performance of the cassava supply chain in Trenggalek Regency. Method research is descriptive. The research location was determined intentionally. The data analysis method is descriptive method with the Food Supply Chain Network framework approach according to Vorst dan Performance measurement is done through the calculation of marketing margin and farmer's share. Research result shows that the target market is domestic while the development target is in the form of technology improvement, increased coordination and collaboration, and procurement of formal contractual agreements. Cooperation is carried out on the basis of an oral contract between members, the transaction system is carried out in cash and there is government support in the form of capital, equipment, and resource development training man. The supply chain management model consists of farmers, collectors, market traders, and agro-industry cassava as a chain actor, each of which performs different activities depending on the the inputs and the resulting outputs. The most efficient channel is Channel 1 (Petani (cassava) → market traders (cassava) → cassava agroindustry). The channel is considered efficient because it has relatively low marketing margin value, relatively high farmer's share and profit and cost ratio higher than other channels.

*Keywords: Supply chain management, supply chain performance, cassava agroindustry, vorst*

### Introduction

The agricultural sector still plays an important role in the Indonesian economy. According to (Badan Pusat Statistik, 2017) during the 2012 period, the GDP of the agricultural sector played the largest role of IDR 1,039,440.7 billion or 13.75 percent, but its role declined in 2016 to IDR 1,210,749.8 billion or 13, 31 percent. Meanwhile, the trade sector and the manufacturing sector during 2012-2016 played a slightly lower role, respectively, by IDR. 1,067,911.5 billion or 14.13 percent to IDR. 1,255,759.4 billion or 13.8 percent for the trade sector and IDR. 1,697. 787.2 billion or 22.46 percent to IDR 2,016,876.8 billion or 22.17 percent for the manufacturing sector. This shows that the decline in the agricultural sector should be followed by an increase in the role of the trade sector and especially the manufacturing sector, but this is not the case. Therefore, efforts to improve the processing industry need to be increased.

The development of agricultural industrialization after the new order depends more on regional/regional development, such as efforts to increase the added value of agricultural commodities into processed commodities. One of the interesting efforts to industrialize agriculture by local governments is the industrialization of cassava. The increase in added value of cassava industrialization is indicated by the development of exports of fresh cassava into processed cassava. According to (Badan Pusat Statistik, 2017), in 2012 the export value of fresh

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cassava amounted to US\$ 169,000 increased in processed cassava exports to US\$ 17,683,000, while in 2016 the export value of fresh cassava was US\$ 632,000 and increased in 2016. the export value of processed cassava is US\$ 11,989,000. This means that there has been a significant decrease in the change from fresh exports to exports of processed products, which indicates that agricultural industrialization has not lived up to expectations.

The development of cassava industrialization is seen as the right transmission to bridge the process of economic transformation in Indonesia from the agricultural sector to the industrial sector. But on the other hand there are still obstacles that must be faced in developing Indonesian cassava industrialization, namely: the low availability of guarantees and quality of raw materials, the inability of processed agricultural products to be accepted by the international market, people who still have low skills, inadequate infrastructure, technology has not developed, funding for farmers and industry is still relatively small, marketing has not developed and there are no real policies that encourage the development of cassava industrialization (Priyono, 2011). In general, the development of agricultural industrialization depends on the relationship between farming, processing industries and markets. If the developed farming supports the processing industry, there will be an integration that connects agricultural production with the processing industry efficiently so as to create added value in the processing industry. In addition, the linkage between the processing industry and the market will open up new markets for processed products (Rustiadi & Wafda, 2008).

Other obstacles that underlie cassava industrialization are the long marketing chain, inefficient supply of raw materials, risk-taking skills due to lack of institutional support and so on (Mukhopadhyay & Chung, 2016). In addition, cassava industrialization does not yet have an efficient system because most of them have the characteristics of small and medium industries. While the socio-economic factors that affect the constraints of cassava industrialization such as age, farmer's education level, length of farming, number of dependents, area of farming and capital among farmers are different. This relates to the total income of farmers and their families as an effort to improve the welfare of farmers and their families through increased production. From some of these obstacles, the expectations generated from the development of cassava industrialization will have an impact on increasing productivity and quality production in the agricultural sector, increasing added value, increasing farmer welfare and price stability due to continuous demand for raw materials (Girei & Salihu, 2013).

The development of cassava industrialization by farmers, industry players and markets should be directed at creating coordination. However, there is no system that regulates coordination between local governments and the private sector in managing agriculture which should be a complete agribusiness system. Therefore, efforts are being made to overcome these problems by increasing cassava industrialization activities by integrating the development of the agribusiness subsystem starting from the activities of the production facilities subsystem, farming, product processing to the marketing subsystem, with active collaboration from the various institutions involved. It is hoped that it will increase added value and will increase demand for cassava as a raw material for the agricultural industry (Omolara et al., 2017).

## **Material and Methods**

### ***Determination of research location and time***

The location of this research is in East Java, namely Trenggalek Regency. The research location was chosen purposively from 14 sub-districts, taking 7 sub-districts, namely Dongko sub-district, Pule sub-district, Karanganyar sub-district, Pogalan sub-district, Trenggalek sub-district, Tugu sub-district, and Bendungan sub-district. Considering that this location is an area that has an average cassava plant potential of 245.59 kw/ha and there is cassava industrialization supported by adequate infrastructure. This research was conducted for approximately 2 months.

### **Sampling method**

The sample is part of the number and characteristics possessed by the population, therefore samples taken from the population must be truly representative (representing) (Sugiyono, 2017). The sampling technique uses a non-probability sampling approach, which is a technique that does not provide equal opportunities or opportunities for each element or member of the population to be selected as a sample. The research units studied are individuals who work as cassava farmers who are related to agribusiness sector policies and the completeness of the data needed in the study. Determination of respondents in this study using simple random sampling technique.

In determining the research area, purposive sampling was carried out. The areas in question are Trenggalek District, Dongko District, Pule District, Karangany District, Pogaran District and Tugu District. The methods used in this research are descriptive and analytic methods. According to Nazir (2014), descriptive method is a method in examining the status of a group of people, an object, a set of conditions, a system of thought, or a class of events in the present. The analytical research method is to test the hypotheses and interpret the results of the analysis. Methods of data collection is done by using observation and interview techniques. The sampling method in this study used purposive sampling and snowball sampling.

Sampling is the process of having a sufficient number of elements from the population, so that research on samples and an understanding of their properties and characteristics will enable researchers to generalize these traits or characteristics to population elements. The reason for taking the sample is due to the large population size, so it is not possible to take the whole. This is hindered by factors of time, cost, and human resources (Sekaran, 2006).

Based on the first problem to be investigated, the researcher wants to know the product flow, financial flow, and information flow in the cassava supply chain in the Dongko sub-district, Pule sub-district, Karangany sub-district, Pogalan sub-district, Trenggalek sub-district, Tugu sub-district, and Bendungan sub-district. In order to answer the formulation of the first problem, the researcher used a descriptive analysis approach. Descriptive analysis is used to provide an overview of product flow, financial flow, and information flow in the cassava supply chain in Trenggalek Regency.

## **Results and Discussion**

### **The state of agriculture in Trenggalek Regency**

Development related to regional development pays more attention to development in the agricultural sector, this is because the agricultural sector in addition to producing food for the population will absorb labor and as a supporter of the development of other sectors, namely the industrial sector as a supplier of raw materials. The agricultural sector in Trenggalek Regency plays a major role in improving the economy through the formation of Gross Regional Domestic Product (GRDP), providing food and industrial raw materials as well as providing jobs. This can be seen from the GRDP in Trenggalek Regency where the agricultural sector is the largest contributor to 27.49 percent. Gross Regional Domestic Product (GRDP) in the economic sector in Trenggalek Regency comes from the agriculture, forestry and fisheries, mining and quarrying, processing industry, electricity and gas procurement, water supply, waste treatment, waste and recycling, construction, wholesale and retail, transportation and warehousing, providing accommodation and food and drink, information and communication, financial and insurance services, real estate, government administration, defense and compulsory social security and other services. The economic sector will determine the amount of GRDP in Trenggalek Regency.

The average productivity of cassava in Trenggalek Regency in the 2015-2020 period is 246.24 kw/ha. In addition, the average productivity of cassava in East Java is 221.5 kw/ha. This is not balanced with the growth rate of cassava productivity which has an average achievement of -1.78. Distribution of the growth rate of cassava productivity in East Java and Trenggalek District.

The cassava commodity in Trenggalek Regency still has a profitable opportunity to be used as a processed material that has added value. Cassava farmers who initially only grow cassava for

their own consumption have not been able to become commercial farmers, so there needs to be consistent assistance at the industrial level.

Table 1. Data on cassava productivity in Trenggalek Regency 2015-2020 (kw/ha)

Year	East Java	Trenggalek Regency	Productivity rate (Trenggalek Regency)
2015	202	225,16	-
2016	224	266,26	0,18
2017	214	240,58	-9,64
2018	231	258,18	0,07
2019	215	240,59	-6.81
2020	243	246,68	0,02
<b>Rata-Rata</b>	<b>221,5</b>	<b>246,24</b>	<b>-1,78</b>

Source: BPS East Java 2021; Trenggalek Regency Agriculture and Food Service, 2021 (Processed)

Small industry and folk crafts are the most common forms of industry in rural areas. This activity is one of the important potentials in the rural economic system as well as an alternative for solving the problem of the lack of employment opportunities in the countryside, especially in the agricultural sector which is increasingly receding, besides that it can play a role in improving the economy of the people in Trenggalek Regency.

#### ***Cassava Agroindustry supply chain in Trenggalek Regency***

A supply chain of cassava consists of the availability of raw materials and finished products from raw material suppliers to manufacturers, the flow of finished goods from producers to distributors, the flow of finished goods from distributors to wholesalers, and the flow of finished goods from wholesalers to retailers. Regarding physical flows originating from downstream in the form of finished products previously from retailers. The chain from retailer to consumer. The product flow will return to the supplier if there is damage to the product in the form of expiration or not meeting consumer specifications. The financial chain will be provided in the form of cash, credit policies and prices after product delivery. Regarding the flow of information needed for the supply chain is the integration of physical, financial and information chains in the supply chain are:

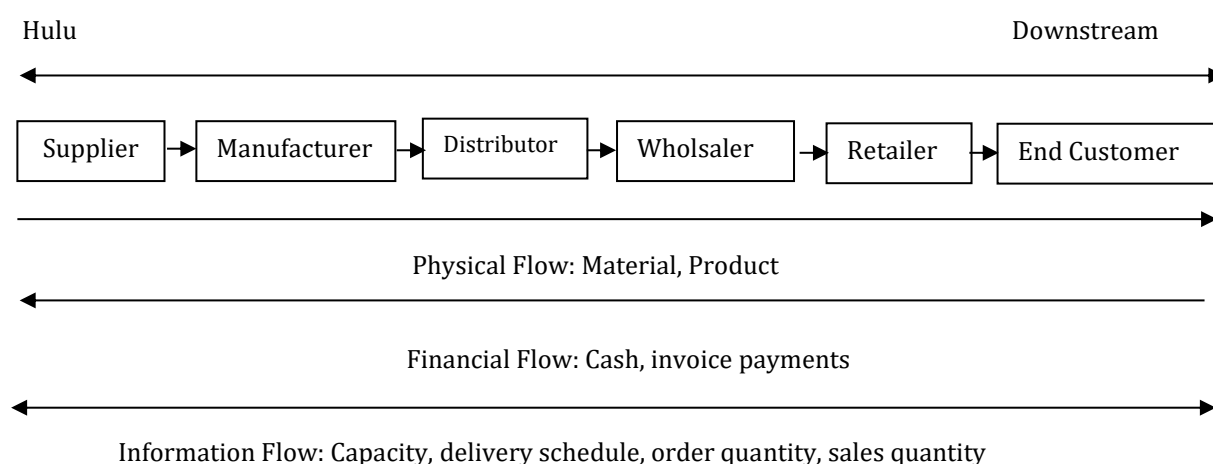


Figure 1. Physical flow, financial flow, and supply chain information flow (Pujawan & Er., M., 2017).

The flow of information in the cassava supply chain in Trenggalek Regency flows in two directions, namely information from upstream to downstream and vice versa. The exchange of information that occurs between farmers and cassava middlemen is information about the availability of cassava, the price of cassava, the method of payment for cassava, and the process of transporting cassava. Information related to the availability of cassava is provided by farmers to middlemen, this information can be conveyed directly or indirectly using communication media such as telephones or cellphones. The exchange of information that occurs between middlemen and cassava agroindustry includes information on the price of cassava, quantity or quantity of cassava to be purchased, the transportation process, and information on when to order cassava.

The exchange of information between the three institutions, namely agro-industry, retailers, and final consumers is information related to the price of processed cassava products produced from cassava processing, the amount of processing needed, and how to pay for the products purchased. Before making a transaction, the retailer and the end consumer provide information regarding the amount of cassava needed and information about the time of taking the tape product. On the other hand, the agro-industry provides information related to the price of the processed cassava.

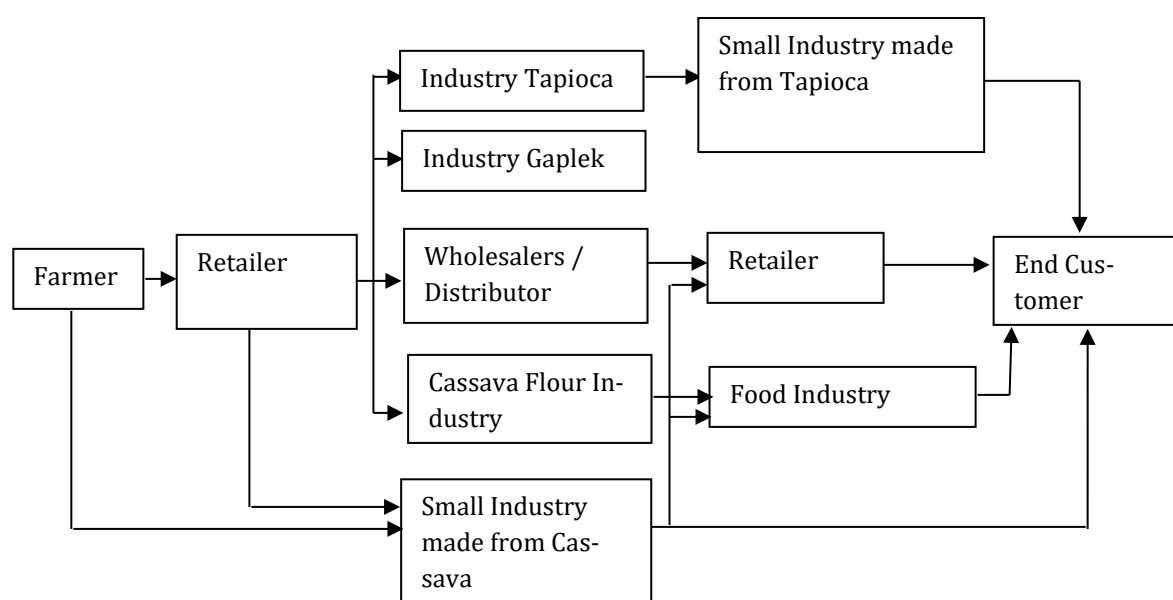


Figure 2. Cassava marketing supply chain

The picture above describes the performance of the cassava supply chain including all the activities carried out by farmers to achieve their ultimate goal. Moreover, the distribution process of cassava production cannot be separated from the supply chain. Each cassava product in the supply chain has its own characteristics. The cassava supply chain is processed with various derivative products such as cassava chips, cassava and tapioca flour. As a raw material, cassava occupies the top of the supply chain and has certain characteristics that distinguish it from other raw materials.

Most of the products sold by actors in the cassava supply chain are in the domestic market. This is because land is scarce for any small rural trader of any cassava farm. For traders with large areas at the canton or district level, cassava cultivation is very intensive, resulting in more production, as they require large areas of land.

## Conclusion

Cassava has great potential to be developed into semi-finished products and finished products. Abundant production is a source of income for cassava farmers. Cassava as a high carbohydrate food source is used as a raw material for tapioca flour, cassava flour, and other industries. The development of cassava processed food agroindustry takes place on a domestic industrial scale because it uses simple technology and is carried out by farmer groups and individuals. Developing cassava supply chains can add value and increase income for farmers and communities.

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