IDENTIFICATION OF CASSAVA CRACKERS LONG TERM AGROINDUSTRIAL RELATIONSHIP PATTERN AND ANALYSIS OF SUPPLY CHAIN EXISTENCE

Rini Dwiastuti[1] and Tatiek Koerniawati Andajani[2]

Abstract

Cassava is always been economically valuable agriculture commodity since it can be produced into a lot of agroindustry product such as cassava crackers. In order to survive in competing business circumstance, cassava crackers producers should produce better, cheaper and faster product. This research is aimed to study the contractual relationship pattern which can be categorized into five dimension satisfaction, trust, communication, mutual interdependency and commitment. Research finding states that although there was a long term relationship among agents, yet there wasn't any supply chain.

Keywords: *supply chain, agroindustrial long term relationshop, satisfaction, trust, communication, mutual interdependency, commitment.*

Introduction

Cassava *(Manihot esculenta)* is always been economically valuable agriculture commodity since it could be produced into a lot of agroindustry product such a cassava starch, animal feed, biofuel raw material, etc. Cassava is the third largest source of food carbohydrates in the tropic and used as major staple food in the developing world, providing a basic diet for around 500 million people. Cassava is also one of the most drought-tolerant crops. It can be growed on marginal soil.

Based on FAO, world production of cassaca root was estimated to be 184 million tonnes in 2002, rising to 230 million tonnes in 2008. Thailand is the largest exporting country of dried cassava, the second largest exporting country is Vietnam, followed by Indonesia and Costa Rica. Cassava plays a particularly important role in agriculture developing countries, because it does well on poor soils and with low rainfall. Cassava is perennial crop so it can be harvested as required.

About 40% of cassava in the region is destined for human consumption (FAOSTAT, 1997). In Indonesia, the level is about two-thirds. Most of the reminder is processed for

[1] Agribusiness Study Program, Agriculture Faculty University of Brawijaya, Malang, Indonesia, e-mail: tatiek.fp@ub.ac.id; tatiek.k.a@gmail.com
[2] Agribusiness Study Program, Agriculture Faculty University of Brawijaya, Malang, Indonesia, e-mail: rini_fp@yahoo.com

industrial purpose, principally pellets for animal feed and starch. Raw roots are not traded on any significant scale.

In time of famine or food shortage, cassava is used to substitute rice. In 2011, modified cassava flour (mocal,mocaf) is became common, and some isntant noodle producers have used it silently to, especially for low-end instant noodles as a part substitute of pricy flour (http://en.wikipedia.org/wiki).

Cassava based dishes are widely consumed wherever the plant is cultivated; some have regional, national or ethnic importance. In Indonesia, cassava is an important food. It can be cooked by frying or boiling, or processed by fermentation to make tapai and gethuk cake, while the starch is made into cassava crackers (kerupuk singkong).

Cassava is traded in three forms: as human food, as a starch, and as animal feed ingridient. Under this condition, price and quality competition exists in the starch, animal feed and other utilization of cassava. Basic economic theory and experience show that changes in production, processing or marketing of cassava need to be integrated and coordinated to provide consistent, long-term benefit across the system. Increased production in a constrained market simply depresses prices for producers. Expand markets without ability to increase production capacity can restrain market growth due to excessive price increases.

Even though today the market for cassava are much better developed in Indonesia, attention to the continued balance in production, processing and marketing need to be warranted. The integration of actors –R&D institution, farmers, processors, marketers and consumers does not always develop optimally in a totally free market atmosphere (Ospina et al, 1996).

Articulation of actors, disconnection between demand and supply, integration of small farmers and lack of an entrepreunerial drive in marketing practices of cassava crackers seem to be part the main underlying value chain issues. The biggest challenge ahead is that, the response to developing the cassava sector is comprehensive and dynamic and requires a private sector driven approach to ensure the effective participation of the value chain actors in decision.

This research was contributed to study cassava crackers agroindustry. Agroindustry has good prospect as the demand is always increasing over time. Under tight competition, cassava crackers agroindustry should be able to produce better, faster and cheaper product.

Make a long term contractual relationship is the best solution for good distribution and marketing practices.

Cassava cracker producers in Mojorejo village faced big selling opportunity because the demand of cassava cracker tend to increase over time. Nevertheless, cassava cracker producer can not fulfill this increased demand due to their production capacity limititation. There are several reasons which cause such limitations, ie: 1) lack of cassava as main raw material due to seasonal supply;2) increase of cassava price; 3) limitedness of production equipment capacity.

Supply chain approach can be implemented efficiently through long term contractual relationship between marketing agents. Long term contractual relationship should consists at least 5 dimensions, that are satisfaction, mutual trust, power dependence, satisfacton, communication and commitment. This research was aimed to: 1) identify long term relationship between cassava cracker distribution agent through 5 dimension mentioned before;2) analyze the existence of supply chains between marketing agents and producer.

Literature Review

Cassava, is a highly productive crop in terms of food calories produced per unit land area per unit of time, significantly higher than other staple crops. Cassava can produce food calories at rates exceeding 250.000cal/hectare/day compared with 176.000 for rice, 110.000 for wheat and 200.000 for maize.

Cassava is attractive as nutrition source in certain ecosystem because cassava is one of the most drought-tolerant crops, can be successfully grown on marginal soils, and gives reasonable yields where many other crops do not grow well. Cassava is well adapted within latitudes 30^0 north and south of the equator, at elevations between sea level and 2.000 meters above sea level, in equatorial temperatures, with rainfalls of 50 milimeters to five meters annually and to poor soils with pH rangging form acidic to alkaline (http://en.wikipedia.org/wiki).

Cassava is a simple crop to maintain as it has no definite maturation point and can therefore be left in the ground from seven months to two years after planting and then harvested as needed. In addition, it can recover from pest damage and diseases. Cassava provides farmer with the flexibility to opt for more capital intensive, efficient production processes as they develop, as production practices can be completely manual, partially

mechanised or animal powered especially in terms of land preparation.Cassava is a labour intensive crop to harvest, and as a result can provide employment to unskilled labour in rural areas.

Cassava is highly perishable, bulky crop and must therefore be processed before it is transported, which opens up opportunities for small scale farmers to get involved in producing simple value added products. The broad categories for cassava as human consumption, animal consumption and industrial applications have different supply and demand side drivers, which means developing a generic agricultural and industrial strategy for cassava product is not a useful exercise.

Cassava has a wide range of applications, ranging from food products to industrial staarches. The processes required to produce these products vary in complexity which gives different parties the flexibility to pursue markets that suit their skill and resource base.

Starch can be modified by either physical, chemical or enzymatic processes, producing different forms of modified starch with distinctly different properties and different uses. Modified starches are used in many different types of foods as well as industry, mainly for production of high quality paper, for textile sizing and some animal feeds. One of the main users of modified starch is the paper industry. Other main users of modified starch are in the food industry, textiles, in agriculture and in animal feed, while smaller amounts are used in construction materials, in casting, oil drilling and medicines.

Cassava starch also can be used for the production of many types of sweeteners after hydrolyzation by either acids or enzymes, or both. These sweeteners include maltose, glucose syrup, glucose and fructose, which can be further processed into variouse oligo-saccharides (Jin Shuren, 2001).

Nowadays, Indonesia wants to be produce ethanol using fresh cassava as raw material. The alcohol was used as automotive fuel, either mixed with gasoline for which no motor modification is required as pure anhydrous ethanol, in which case the carburator and some other parts need to be modified (de Souza Lima, 1980).

Cassava based products can only be competitive in the world market if the cost of processing and the cost of the raw materials is lower than thos of competing crops. The traditional products in the internal markets are gaplek (dried cassava chunks used in a variety of local dishes) and krupuk, a crispy snack wafer made form cassava starch. Production systems in Indonesia are in general more complex than elsewhere in Asia.

Growth in non food and feed usage at the global level has surged in recent years. Under these circumstances, demand for cassava tend to increase over time. In other word, there is tight competition between cassava users. Krupuk or cassava cracker producer in order to meet their raw material needs, have to build long term relationship with their supplier. These strong, long term relatioship will be able to ensure good supply chain management practices.

Common and accepted definitions of supply chain management is a systematic, strategic coordination of the traditional business functions and the tactics across these business functions withing a particular company and across business within the supply chain, for the purposes of improving the long term performance of the individual companies and the supply chain as a whole (Mentzer *et a.,* 2001). Supply chain management, is the management of a network of interconnected business involved in the provision of product and service packages required by the end customers in supply chain. Supply chain managements spans all movement and storage of raw materials, work in process inventory and finished goods from point of origin to point of consumption. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers and customers.

According to Austin (1992), agroindustry is agriculture supply chain that play important role to enhance agriculture product value added. Agribusiness firms are establishing relationship with their suppliers because these enable them to be more efficient and to be more effective. By developing relationship with their suppliers, buyers and sellers can achieve cost saving through: reduced search and evaluation costs, reduced transaction cost; and the learning effect and relationship specific scale economies. However the primary reason for establishing relationship with supplier is that customers realise that suppliers create value. Developing long term relationship can improve acces to markets and reliable market information (Low,1996) and customers can anticipate improved acces to a more reliable supply of production input, improved product quality and performance (Han et al. 1992) and a higher level of technical interaction in the form of information exchange, potential product adaptations and technical assistance.

Relationship marketing provides a stronger, longer term customer benefit that is more difficult for competitors or to enter the market. Buyers become less sensitive to price competition. Much has been written about the development and maintenance of long term buyer-seller relationships, the greatest support has emerged for the key constructs of

satisfaction and trust (Anderson and Narus, 1990). However, in context of the developing countries, where farmers are often subject to exploitation by opportunistic traders, the power dependence construct is expected to become quite influential in governing the farmers relationship with preferred partners (Batt,2003).

Satisfaction lies at very foundatiion of modern marketing thought. Satisfaction is derived from the result of a comparison between the preferred supplier's performance and the customer's expectations. Whenewer performance exceeds expectations, satisfaction will increase, but whenever performance falls below expectations. Customer will become dissastisfied (Batt,2003).

For any particular potential exchange, trust will be critical if two situational factors are present-risk and incomplete buyer information. Since most sales transactions present some degree of risk and uncertainty to the potential buyer, without some degree of trust, the perceived risk many to be too great for the transaction to occur. More specifically , trust becomes important whenever there is a high level of performance ambiguity, and poor product performance will have a significant, adverse impact on the value derived by the buyer . In such circumstances, trust acts as an information resource that directly reduces the perceived threat of information asymmetry and performance ambiguity (Batt, 2003).

When the outcomes obtained from the from the relationship are important or highly valued, when the outcomes from the relationship are better than the otucomes available from alternative suppliers, and when fewer alternative sources of exchange are avalaible to the firm, dependence is said to increase (Heide and John, 1988 in Batt,2003).

Dependence is also increased when the outcomes available form the relationship are comparatively better than the outcomes available from alternative relationship. Firms dealing with the best trader are more dependent because the outcomes associated from dealing with that trader are better than those available form alternative traders. In this context, dependence is a measure of the overall quality of the outcomes available to the focal firm from the best alternative exchange relationship (Anderson and Narus,1990).

Data Collection and Analysis

In analysing the long term relationship and supply chain existence for cassava crackers, detailed interviews were conducted with 12 unit business using a structured questionaire. Information was sought on production practices adopted by producers and the average price they received for the cassava crackers they sold by month.

Cassava farmers as one of supplier were asked what criteria they believed a market intermediary or cassava cracker producers would use in choosing to purchase fresh cassava from them.

The questionaire was based on the industrial purchasing literature, meanwhile farmers and producer responded to 16 statements about the price, quantity and quality of their offer on importance scale of 1 (not at all important) to 3 (very well). Farmers and producers were also asked to indicate why they perceived they were unable to meet the market intermediary's need and the various constraint that prevented them from improving their offer price, quantity and quality.

Traders were then asked to describe the nature of their relationship with the farmers and collector agents from whom they most often purchased cassava and the nature of their relation ship with the market intermediaries and producers to whom they most frequently sold fresh cassava.At the conclusion of the interview, farmers, producer and traders identified the fresh cassava and cassava crackers wholesaler with whom they most frequently interacted. Information was sought on the price paid during exchange process.

Data were entered into SPSS program for analysis. The sample sizes were generally too small to enable any meaningful statistics to calculated. Hence, the majority of the analysis undertaken is descriptive.

Research Findings

Cassava crackers agroindustry in Mojorejo village, Junrejo, Batu city was started since 1977. Initially there were only seven unit business , hereafter became twelve unit business in the same agroindustry. Cassava crackers made by these agroindustry was still produced traditionally. Fresh cassaca and cassava starch as raw materials were obtained form suppliers who lived in Dampit. These suppliers purchased and collected fresh cassava from several locations such as Karangploso, Ngebruk, Singosari, Tumpang, Kalipare, Jabung, Kepatihan, Lambang Kuning and Krangas). Furthermore cassava crackers was packed and labeled by distributor located near Pandaan, Batu, Banyuwangi, Bali, Kalimantan and Surabaya.

Identification of long term relationship was performed based on 5 dimensions: satisfaction, trust, commitment, communication and power dependence.

Based on data analysis it was known that long-term relationship between actors in the marketing channels in terms of satisfaction is still low (average 1.89). Satisfaction of

quantity, quality and price have not been as expected. Trust has not been realized in these relationship (average 2.05). It was because there are no contractual arrangements. Communication was concise enough although the frequency is seldom with the average 2.12. Many of the alternative trading partners provide great opportunities to change partners if they are not suitable. Most of the actors in the distribution channel already has a commitment toward establishing long term cooperation (average 2.2).

The results of supply chain analysis is known that relationships between actors the marketing channels are largely in the third category. It means that there is a long term relationship among distributor and producer agents, but there is no supply chain yet.

Conclusion and Recommendation

Research finding states that although there was a long term relationship among distributor and producer agents, yet there wasn't any supply chain.

References

[1] Austin, J.E. 1992, Agroindustrial Project Analysis.Maryland:The John Hopkins University Press

[2] Chopra, Sunil and Peter Meindl.2001.Supply Chain Management:Strategy,Planning and Operation. Prentice-Hall Inc.New Jersey

[3] Han, S.L.,et al.1993.Buyer Supplier Relationship Today. Industrial Marketing Management, 22,331-338.

[4] Hardani, M., 2012. Identifikasi Hubungan Jangka Panjang dan Analisis Keberadaan Rantai Pasok pada Agroindustri Kerupuk Singkong dalam Rangka Mewujudkan Penganekaragaman Pangan. Universitas Brawijaya. Malang

[5] Low, B.K.H. 1996.Long Term Relationship in Industrial Marketing. Reality of Rhetoric? Industrial Marketing Management, 25,23-35

[6] Ospina,B.,S.Poats and G.Henry. 1996. Integrated Cassava Research and Development Project in Colombia, Ecuador and Brazil: an Overview of CIATs Experiences. *In:* Dufour, D., G.M. O'Brien and R. Best (eds.). Cassava Flour and Starch: Progress in Research and Development. CIRAD/CIAT, Cali, Colombia, pp. 333-357.

Article in a journal:

[7] Anderson, James C.& James A.Narus.1990.A Model of Distributor Firm and Manufacturer Firm Working Partnership,in: Journal of Marketing Vo.54, No 1(Jan.,1990),pp 42-58

[8] Mentzer, J.T., et al. 2001. Defining Supply Chain Management, in: Journal of Business Logistics, Vol.22. No.2, 2001, pp 1-25

Article in a conference proceedings:

[9] Peter J.Batt. 2003.,"Incorporating Measures of Satisfaction,Trust and Power-dependence into an Analysis of Agribusiness Supply Chains",Proc of a Workshop on Agriproduct Supply Chain Management in Developing Countries held in Bali Indonesia, 19-22 August 2003

[10] Wheatley C., Elizabeth J.W., Setyadjit. 2003., "The Benefit of Supply Chain Practice in Developing Countries-Conclusions from International Workshop", Proc. of a Workshop on Agriproduct Supply Chain Management in Developing Countries held in Bali Indonesia, 19-22 August 2003

[11] FAO and IFAD.2004., "Marketing and Distribution Cassava Chips Industry in The EU," Proc. Of The Validation Forum on The Global Cassava Development Strategy, Rome, 2004.