

MANGO AGRICULTURAL SUPPLY CHAIN: ACTORS, BUSINESS PROCESS, AND FINANCING SCHEME

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Abstract: Economic globalization provides opportunities for mango farmers in West Java in order to enter modern and export markets. However, these markets require proper quality, quantity, and continuity. The existence of inclusive agribusiness through the supply chain provides an opportunity to increase mango farmers' business performances along in the supply chain. In implementation process, there are financial problems arise, which resulted unravel supply chain. It caused by the mechanism of a payment due to 2-4 weeks after the commodity are delivered. Financial breakthroughs essential to support mango supply chain sustainability, in the form of a agricultural supply chain financing scheme. The research objective are identifying actors who involved in mango supply chain, describing business processes and mapping of mango supply chain, as well as designing financing scheme that appropriate. It applied Value Stream Mapping and descriptive analysis. Research results two types of supply chain which are sold the commodity to traditional market and structured market. Actors who involved in the supply chain are structured market mango farmers, farmer group, exporter/modern retail. Financing scheme that appropriate is an input production financing at farm level and trade financing (factoring) at farmer group-exporter or modern retail in order to resolve late payment from modern retail or exporters. The financing scheme requires the involvement of stakeholders from outside the supply chain as a support include university, government (extension) and credit guarantee institution.

Keywords: Economic globalization, mango, supply chain financing, inclusive agribusiness, and value stream mapping.

1. INTRODUCTION

Mangoes is an exotic fruit from Indonesia that commonly called as The Best Loved Tropical Fruit that sold in higher price and have many lovers from local consumers and foreign consumers. It is why this horticultural commodity has the opportunity to increase small holder income.

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High market demand both from local and export market shows mangoes farming development opportunity. However, mangoes businessmen are facing classic obstacles concerning the inappropriate farming technique without any proper plant handling and planted in mix farming land such as at home garden with limited farming area. The main problem of this phenomena based on several research is the capital incapability that allocated to farm land maintenance and tackle a better post-harvest handling. The development of inclusive agri-business in a commodity value chain that involved farmer as small holder in their commodity marketing sold to modern markets which give a new insight to be a solution for their business obstacles.

In order to accelerate flow of commodity and flow of money, then financing availability for all business actors along the supply chain start from down-stream to up-stream business sub-system should be provide. Agricultural sector financing exposure systematic risks, such as weather and price risks that eventually effected the entire agricultural finance portfolio (GPFI, 2012). Thus, sustainability of a commodity supply chain become a threatening due to cash flow disruptions and working capital necessity accumulation as an effect of the delayed payment from buyers and afterwards give domino impact for the down-stream actors in the supply chain which is farmers. Flow of money is one of four flow in supply chain management that will determine continuity and sustainability of a product (Perdana and Catalia, 2008).

Financing development in agri-business supply chain should be in holistic way. It means development could not be done partially, such as for financing scheme in agricultural supply chain finance for mangoes. Some research based in developing country showed the growth of microfinance institution in rural area that attempt to establish formal business system (Abeysekera, 2006). It is also important for those actors in marketing chain that sold mangoes to modern market, for instance for modern retail, food industry, and export market. Modern market chain development has stimulated agricultural marketing actors to differentiate marketing target to more modern retail (Utami *et. al.*, 2016).

Agricultural supply chain financing scheme will strengthen agri-business cluster development of mangoes commodity, for instance mangoes agri-business cluster in West Java Province as one of mangoes production center in Indonesia. Supply chain financing is a financial and service product flowing to and or through every part of supply chain in order to increase return on investment and competitiveness growth in supply chain. Therefore, supply chain financing could encounter business risk and funding return to financial provider will borne by all the actors in the supply chain (USAID, 2010).

This research will explore actors who involved in mangoes agribusiness supply chain with modern market orientation and how these actors apply their business

process. This research will also describe the financing scheme that appropriate for all the actors in mangoes commodity business.

2. THEORETICAL ANALYSIS

Scott and Westbrook (1991) described Supply Chain Managements the chain linking each element of the manufacturing and supply process from raw materials to the end user, and Van der Vorst, *et. al.* (2007), define supply chain as a series of decision making and implementation process including the flow of product, information, money, and logistic in order to fulfill the needs of end consumers. Supply chain is not only provided by producers and distributors, but also consider the flow of transportation, warehousing, retailers, and consumers. It is also define as network of companies that working together to create and deliver a product to need consumers. Those companies are suppliers, industries, distributors, retails, stores, and other supporting companies that serve logistic services (Pujawan, 2010).

Other definition acknowledges supply chain as organization system point to distributing production goods and services to its customers (Pranoto, 2002). The chain create here is likewise a network from various organizations that have inter-connection to each other and carried same purpose to organize product procurement and distribution. The relationship between the actors along the chain, such as producers (farmer, farmer groups, farmer unity) and customer (exporters, modern market, food services) that based on commitment and trust will create value (Sadeli and Utami, 2013). According to Kaplinsky and Morris (2002), a value chain is "the full range of activities involved in getting a product or service from conception, through the different phases of production and delivery to the final consumer". Meanwhile, value chain finance is the flowing to and/or financial service and products over involvement of the entire value chain contributors with growth objective that address and alleviate limitations (Fries, 2007). Value chain finance proposes opportunity to growth agricultural financing that support rural agriculture business develop efficiency and settlements and improve relation strength among value chain participants (FAO, 2012).

There are three kinds of flows in supply chain to be managed and supervised. First is the flow of goods from up-stream and down-stream. For instance, is raw material that sent from suppliers to industry. After product being processed, it will distribute to retail and it end at end consumers. Second is the flow of money and other similar material from down-stream to up-stream. Third is the flow of information that conducts from up-stream to down-stream and vice versa (Pujawan, 2010). Based on Calvin Miller and Linda Jones (2010), the flow of goods, the flow of information, and the flow of finance in a commodity supply chain could be describe as the figure followed:

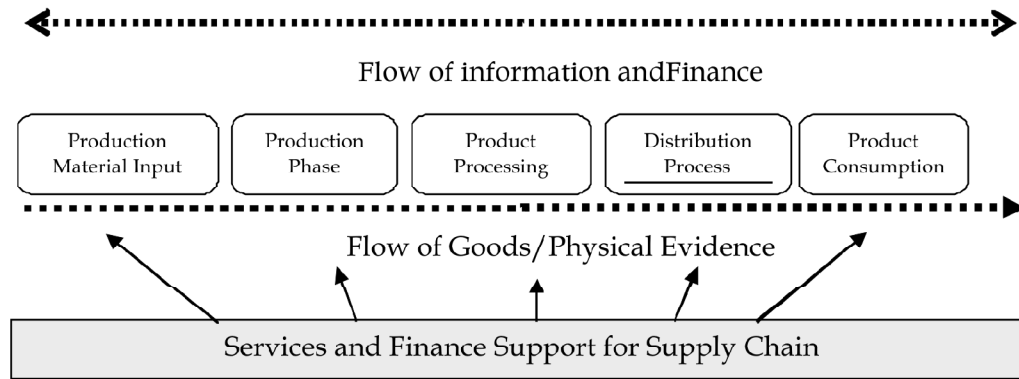


Figure 1: Flow of Goods, Information, and Money in Product Supply Chain

Source: Calvin Miller and Linda Jones (2010).

Collaboration among the actors in supply chain financing depicted by the commitment from various resources, capabilities, information, and risks based on medium term or long term business contract. Supply chain financing can benefit all parties that involved in the supply chain when they operate an appropriate role (Karyani *et al.*, 2015). Supply chain finance instrumental distribution consists of three constitutive elements, there are as follow

1. institution actors;
2. supply chain management characteristics; and
3. finance function.

These elements are supply chain finance framework that used as consideration factor in finance decision making in a value chain (Hofmann, 2005). This condition is caused due to financial need throughout the chain is diverse and varied. From production to packaging and commercialization, time is the key element. Timeliness in the financing of activities in a chain is obligatory; otherwise, strangulation occurs and prevents the proper functioning of the chain processes.

3. METHODOLOGY

Research object is mangoes supply chain financing with modern market orientation in West Java, which is done in two regencies of mangoes production center, there are Cirebon and Majalengka. Meanwhile, research subject was covered all mangoes agri-business actors along the supply chain of every agri-business sub system from up-stream and down-stream who were involved in the chain.

Qualitative research was used in this research, due to the necessity of describing research study on agriculture institution roles and comprehension on research

object phenomena as envisaged in the reality (Idrus, 2007). Case study was applied as research technique as a method that is used to give in-depth and intensive study of an element or a target group on research subject (Moehar, 2002).

The needs of supply chain financing identified by supply chain mapping that described the flow of information, goods, and money. Business process and needs of financing of some particular actors in the chain will create financing scheme with each actor capacity in the chain as its consideration.

4. FINDING AND INTERPRETATION

4.1. Actors in Mango Agribusiness Supply Chain

There are several actors along the supply chain that involve in mango agribusiness. These actors are farmers, farmers group, suppliers and buyers who has different kind of role and activities in order to support mango agribusiness.

Table 1
Supply Chain Actors of Mangoes Agribusiness

<i>Actors</i>	<i>Characteristic</i>
Farmers	The mangoes farmers are located at the agribusiness sub-system on farm, which act as the producers of mangoes. In doing their activities, the farmers need information regarding to the input factors, as well as the markets, which are related to mangoes commodities needed by the consumers sold to either traditional markets (on the spot) or structured markets with contract basis. Accordingly, in order to obtain a high quality product, the farmers must be have the knowledge regarding the appropriate cultivation techniques, as well as the input factors that support the good harvest in terms of quality and quantity. In addition, farmer done an off season farming technique to meet market demand throughout the year.
Farmer groups	The farmer groups are channels for information and discussion regarding the quality, quantity, and continuity of the mangoes crops adapted to the contract. Nevertheless, the farmer groups are also a platform to distribute the input factors collectively and to help the distribution of mangoes crops from the farmers to Buyer/exporter.
Supplier	Suppliers are actors who buy mangoes from farmer non member of farmer group. They are supplies theirs mangoes to traditional market and exporter.
Buyers	Buyers are actors who need mangoes commodities based on contracts. They are exporters and modern markets. Buyers purchase the harvested mangoes through farmer group according to a contract that has been agreed in regards to the quantity, quality, continuity, prices, and payment method. In order to fulfil buyer need of mangoes supplies, they also bought mangoes from supplier or wholesaler who provides certain product qualifications. These buyers tackled two types or grading to satisfy modern retail and export product requirements. Mangoes buyers are reside in Cirebon regency, while wholesalers are from both Cirebon and Majalengka Regency.

4.2. Supply Chain Mapping

Some of mangoes farmers sold the mangoes that they have produced to business buyer, which are mango Industry Company, Supplier Company, trader and traditional market. Their preferences to sell the products are based on who offering highest price. These farmers have no trader agreement with all the buyer, but there is an unwritten agreement with trader who give a financing for mangoes cultivation in the form of money and production facility goods. Farmers who accept this financing surely sold their product to financing provider.

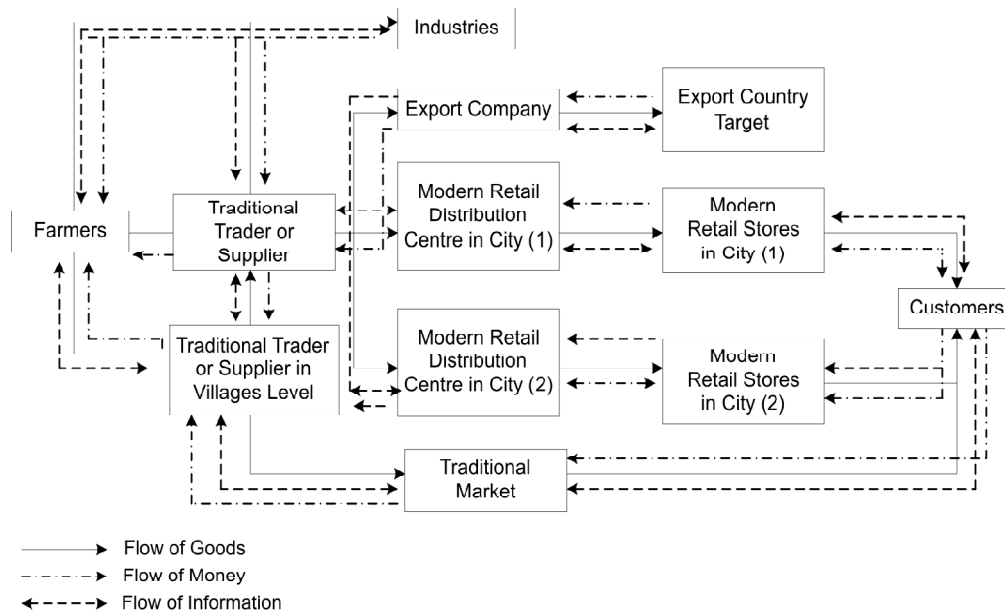


Figure 2: Supply Chain Mapping

However, other farmers sold mangoes through farmer group then distribute mangoes to traditional markets and supplier companies. It depends on the buyer demand concerning quality of the mangoes. Traditional markets have lower quality standard than supplier companies. Supplier companies that set a high quality mangoes based on their customer demand, usually they allocate the mangoes to their business customer, who's come from modern market and export market such as Singapore, Dubai, Bahrain, Abu Dhabi and Oman. The Payment execution is approximately not more than one month from modern market and export market to supplier companies. However, supplier companies payout the mangoes that received from the farmer or farmer group at the same day. Occasionally, supplier companies give a financing to mangoes farmer group to ensure cultivation execution of mangoes that impact to mangoes supply continuity. After the farmer groups distribute the money to the farmer group member, then the mangoes farmer would receive they payment.

Flow of mangoes and money should support by flow of information in order to synchronize all the demand and supply from all actors. At present, information flow used only for price and quantity of mangoes. In addition, farmer knowledge about the quality that demands by their customer is important, so that specification of mangoes quality need to be shared from the buyer to the farmers. There are different kind of tools that used to share information. Besides directly discussion in the meeting, internet and telephone are used to discuss information between supplier companies and their business buyer.

4.3. Financing Scheme

4.3.1. Financing Scheme of Pre-harvest in Mangoes Supply Chain with Modern Market Orientation

Pre-harvest financing is a financing which required for production purposes. Immature plant that have not produce mango need this type of financing in a long period to cover several cost such as investment cost, operation cost until three or four years. In the other hand, plants that have already produce mango only need maintenance costs. Financial institution such as bank gives a credit to the cooperatives or farmer group, not directly to the farmer individually. Cooperative have a role as financial manager and provision of production (Renaldi *et. al.*, 2013).

Table 2
Role of Actors Mango Agribusiness Supply Chain in Pre Harvest Financing

<i>Actors</i>	<i>Role of Actors</i>
Farmers' groups/cooperative	Actor who drafting contracts with structured market (modern retail/exporter) and the needs of production supplies, as well as the financing plan of productions.
Farmers	Farmer as the recipient of the means of production to maintenance techniques that have been trained by extension officers especially for technical off season along with members of farmer groups/cooperatives.
Agent/distributor	Agent or distributor as a provider of production supplies
Banks/financial institutions	Actor who providing a credit for lending production cost
Other Stake Holder	Universities, Credit Guarantee Institution and Extension as a supporting actors

Differences between supply chain pre-harvest financing and convention credits farming is availability of contract within buyer and cooperative or farmer group. Pre harvest financing in the supply chain applied cooperative or farmer group have already contract with buyer such as Supplier Company. They receive credit in the form of production supplies such as pesticide, fertilizer and seed which

distributed through production supplies agent or distributor. Actors who involved in this pre harvest financing are shown in the Table 2.

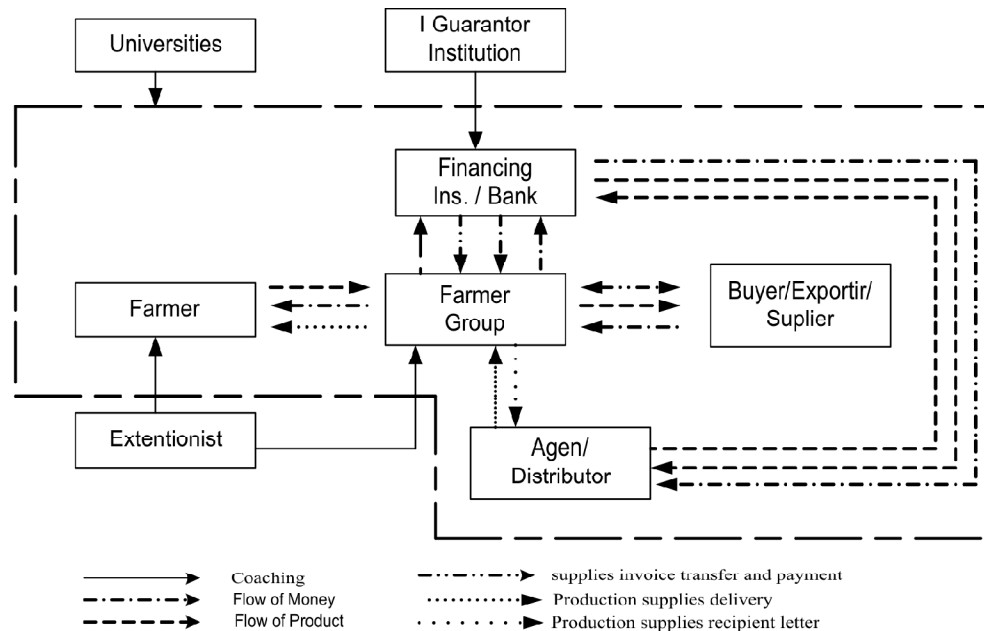


Figure 3: Pre-Harvest Financing Scheme for Modern Market Supply Chain

Stage or Procedure Production Facility Financing Scheme are as follows:

1. Contracts Preparation

Preparation of a written contract between the farmer groups or cooperatives with the supplier company, modern market (modern retail, manufacturing or exporters). The contract explain the agreement about delivery quantity, product quality, delivery schedule and frequency, average product price and payment system. In this case the Supplier Company or modern market acts as an off taker.

2. Production Plan Preparation

Farmer group or cooperative prepare production system include production supplies need and production financing need based on numbers of trees that managed by farmer group or cooperative.

3. Pre Harvest Financing Submission

The production plan submitted to the bank/financial institution with a copy of a contract document between the farmer groups of farmers/cooperatives with suppliers and modern market (modern retail/exporter) and a letter of recommendation from a supplier and modern market (modern retail/exporter).

4. *Pre Harvest Financing Verification*

Banks/financial institutions verify production plan to farmer groups and modern market. At this stage the banks also can verify the farmers/farmer group members and escort agencies farmer groups consisting of university/government/other agencies.

5. *Pre Harvest Financing - Production Supplies Financing*

The banks/financial institutions agree to finance production supplies with the terms agreed upon in the form of production inputs as needed with the appropriate time according to plan production schedules.

6. *Issuance Requirement production*

Banks/financial institutions issuing production supplies letter to an agent/distributor.

7. *Submission of the means of production*

Agent/distributor of production supplies handed over the means of production (seed, fertilizers, pesticides, etc.) to farmers' groups as needed.

8. *Letter of Acceptance Means of Production*

Farmer groups issued a letter of acceptance of the means of production which has been submitted by the agent/distributor.

9. *Distribution of Production Facility*

Farmer groups distributing inputs to farmers based on farmers necessity.

10. *Submission of Production Supplies Invoice Sales*

Agent/distributor production supplies filed a sales invoice production supplies and a letter of acceptance from the farmer groups to banks/financial institutions.

11. *Payment of the means of production*

Banks/financial institutions make payments to an agent/distributor of production supplies in accordance with invoice.

12. *Delivery of Products*

After the harvest, farmers deliver mango accordance with the specifications of structured market demand (market modern/exporters) to farmers' groups.

13. Distribution of Products

After the previous post-harvest handling which consists of sorting, grading, packaging and labeling, mango from farmer group members distributed to the modern market/exporter.

14. Payments to Farmers

Farmers receive payments from farmers' groups after deducting the cost of production.

15. Credit Payments

Loan payments to banks or financial institutions made after the farmer groups received payment from modern market/exporter.

4.3.2 Financing Scheme of Trade Services in Mangoes Supply Chain with Modern Market Orientation

Trade financing scheme applied to provide additional working capital in form of financing for farmer groups to pay their farmer members or co-operative company who sold mangoes production to the farmer groups by the time mangoes production is fit to modern market demand. This mean financing is appropriate for farmers or co-operative companies or farmer group who sold their product to modern market with contractual guarantees. Farmers need the cash money for financing their cultivation costs and also for their living costs.

This kind of financing could applied in certain condition as if payment from buyers in modern market will receive by farmer groups or co-operative companies require certain time of period (delayed term of payments). Trade services financing entail a similar understanding between farmer groups and financial institutions who provide funding concerning payment system that implemented by these modern market. Mangoes supply chain actors who cover to this trade services financing are as table below.

Table 3
Role of Actors Mango Agribusiness Supply Chain in Trade Financing

<i>Actors</i>	<i>Role of Actors</i>
Farmers' groups/cooperative	Actor who involved in the making of contractual agreement with modern market (modern retails or export companies) and followed by cash cycle and trade financing plan.
Farmers	Actor as Farmers as payment recipient with certain value that determined based on agreement regarding price by production volume unit according to market target specifications.
Banks/financial institutions	Bank or other financial institutions that participating to distribute trade finance funding.

Trade services financing scheme flow process describe as followed:

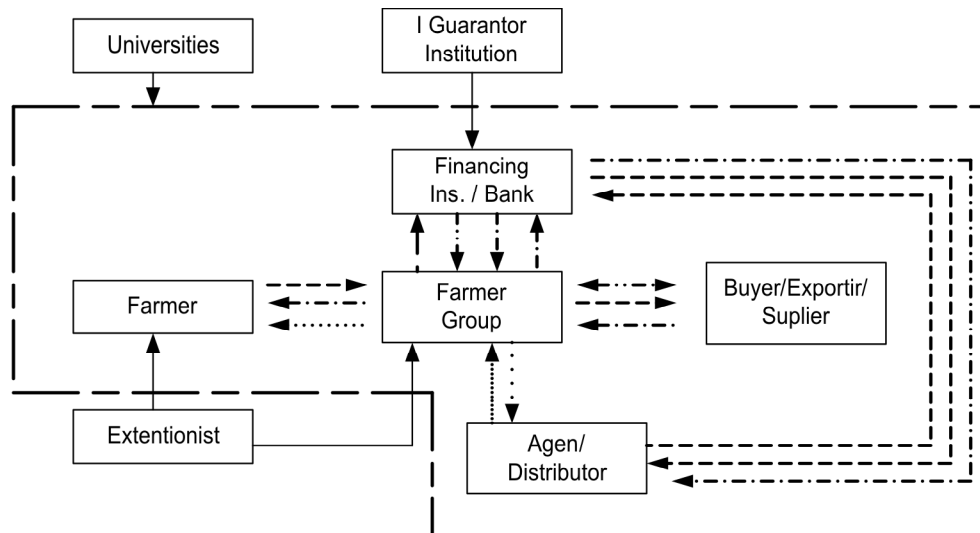


Figure 4: Trade Services Financing Scheme for Modern Market Supply Chain

Stage Procedures of Trade Services Financing Explain as followed

1. Contractual agreement compilations

Written contractual agreement compilations was done between farmer groups or co-operative companies and modern market (modern retails or export companies). This contract would at least explained about agreement on product volume delivery, product qualities, distribution execution, product average price, and payment system. These markets act as off taker and subsequent farmer groups or co-operative companies will compile cash cycle of their business and completing with information of their assets, product delivery information (production output collectivity), cash money inflow and outflow, and trade services financing plan.

2. Trade services financing submissions

As this trade services financing plan and cash cycle being made, then it will be submit to banks or financial institutions along with all documents as requires including contractual agreement copy between farmer groups or co-operative companies and modern markets. It is also need to provide recommendation letter from their modern market as guarantee.

3. Trade services financing verifications

Banks or financial institutions will then verified this trade services financing plan to both farmer groups and its modern markets. In this stage, bank for instance,

would also possibly verified information from farmer members of farmer group and from farmer group facilitators such as government institutions, government extension agents (extortionists), and universities.

4. Trade services financing executions

Banks or financial institutions will approved trade services financing with certain agreement in cash and customized with funding recipient needs for some particular period which proper to the trade services financing plan.

5. Product delivery

After harvest period, farmers will distribute their production output that fit with specific quality for modern market to their farmer group.

6. Product receive letter publications

Farmer group will publish product received letter for their farmer members as an evidence of product receipt from farmers based on certain market demand specifications. This letter will be used as product payment from farmer group to its farmer members.

7. Product distributions

Product from farmer group members will then distribute to buyer whether to modern retails or export companies, after first being precede post harvest handling such as sorting, grading, packing, and labeling.

8. Product receive letter acceptances

Farmer groups will received product receive letter from buyer as product receipt evidence from farmer groups with certain market demand specification as reference for product payment from buyer to farmer group.

9. Invoice letter publications

Farmer group will publish invoice for modern retail or export companies as their buyer based on product receive letter.

10. Payment to farmers

Farmer members will get their payment from farmer group based on published product receive letter. Financing source for this payment was obtained from trade services financing scheme.

11. Funding installment payment

Funding installment payment to bank or other financial institutions will be done after farmer group get their payment from their buyer whether modern retail or export companies.

5. CONCLUSION

Actors involved in the supply chain with modern market-oriented are farmers, farmer group, supplier company and modern market (modern retail and exporter). These actors need a financing to operate their mango agribusiness. This research shows that financing scheme that needed by the actors divided into two type, which pre harvest financing and trade are financing. The scheme of the mango supply chain financing requires contracts and agreements between supply chain actors and security of credit is guaranteed by guarantor institution, and for the success of the production is guided by extension and agriculture department which facilitate universities.

Farmer group function needs to be improved, not only concern to farming technique but also focus on marketing for their products. Also, farmer group needs financing for investment in order to facilitated mango agribusiness activities and support business growth.

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