Improving *Cinnamomum Burmannii Blume* Value Chains for Farmer Livelihood in Kerinci, Indonesia

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Abstract

Cinnamon is the most common baking spice in the world. It comes from a small evergreen tree that's part of the *Lauraceae* family. Genus *Cinnamomum* regroups some species whose stem bark is harvested, conditioned and traded as cinnamon in the international market. Over the centuries, the species have been domesticated so that now at least six different ones are grown in Southeast Asia. One of the species is *burmannii*, also known as Koerintji Cinnamon, which generates income for numerous smallholder farmers in Kerinci district, Jambi, Indonesia. Koerintji cinnamon is known for its unparalleled quality that comes with its sharp and sweet flavour, with a slightly bitter edge. However, international market requirements for product certification and quality standards make it difficult for a farmer to comply. Our research will address issues related to (improvement of) productivity, sustainability and value chains faced by cinnamon producers in Kerinci, to strengthen their product's value chains. Smallholder farmers are very vulnerable to a well-functioning market, and thus empowering the value chains of agricultural products will increase farmers resilience to have access to the market. The research will analyse the development of agricultural value chains, certification & standards on trade mechanism to help farmers earn a better income and prospects.

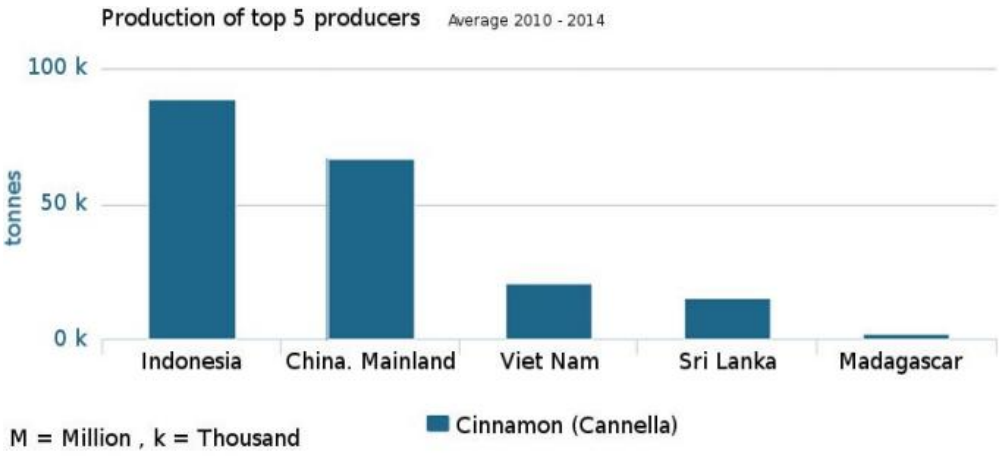
Keywords: Cinnamomum Burmannii Blume, Value Chains, Farmer, Livelihood, Kerinci, Indonesia

Introduction

Indonesia contributes to spices which can be found in millions household worldwide. Various of spices which are produced and later on exported from Indonesia are cloves, nutmeg, pepper, ginger, turmeric, cinnamon and others. Spices are mainly applied as food additives at industrial level and commonly used for their taste and flavour (Mandal, DebMandal, Saha, & Pal, 2011). Brown (2003) noted that the 15th century marked the blossoming of the international spice trade in Indonesia, at that time known as Nusantara, with the increasing demands of Maluku spices from its two biggest markets, namely China and Europe. At the beginning of 17th century, Dutch East India Company (VOC) began to establish its influence in Indonesia, by building trading offices, warehouses and forts in Batavia with the goal to monopolised spice commodity trade. Cinnamon was one the spices that were traded by the VOC and gained substantial profit.

FAO (United Nations Food and Agriculture Organization) reports that 46.7% of world cinnamon production comes from Indonesia with production in 2014 reaching 93 thousand tons which are used for flavouring additive in a variety of cuisines, sweet and savoury dishes (FAO, 2014). The demand of spice market in the international market is growing in line with population growth and spice demand in the global market continues to increase, including Cinnamon which is popular as Koerintji Cinnamon / Cassia / Cassia Vera and Indonesian Cinnamon. Cinnamon is obtained from the trees belonging to genus *Cinnamomum* (Chen, 2014). Cinnamon is an essential age-old spice and aromatic crop having wide applications in flavouring, perfumery and medicine.

Figure 1: Global production of cinnamon, 2010-2014



Source: FAOSTAT, 2014

Genus *Cinnamomum (Lauraceae)* regroups some species whose stem barks are harvested, sundried and traded as cinnamon categorised spice commodity in the

international market. The best bark comes from the trunk; the bigger the trunk, the thicker and valuable the bark. Cinnamon is considered as a high-value commodity because every part of the tree has market potentials, i.e., stem, leaves, root, and twigs used for pharmaceutical and perfume industry (Jayasekar, 2009). Suyanto et al. (2007) noted that the cinnamon species that were growing in Kerinci were native to Kerinci and traditionally harvested from the forest along the Bukit Barisan mountain range. Cinnamon is now the dominant crop in Kerinci, and the majority of farmers cultivating this spice are smallholders. Cinnamon wood used by local villagers as building materials and furniture. Over the centuries, human use for food (Jayasekar, 2009). There are numerous uses of cinnamon in the traditional kitchen, and it can also be used in incense, perfumes and pharmaceuticals (Bhagya, Raveendra, & Lalithya, 2015). Over the centuries, the species have been domesticated so that now at least six different ones are grown in South East Asia (Barceloux, 2008). About 250 species of cinnamon have identified, four of which are used to obtain the spice cinnamon. Cinnamon is divided into four different type of cinnamon, such as; Ceylon cinnamon (*Cinnamomum zeylanicum Blume*), native from Sri Lanka; Cassia cinnamon or Chinese cinnamon (*Cinnamomum aromaticum Nees*) from China; Indonesian cassia (*Cinnamomum burmannii* (Nees & T. Nees) *Blume*) from Indonesian islands of Sumatra and Java and Vietnamese cinnamon (*Cinnamomum loureiroi Ness*) from Vietnam (Rismunandar, 1995).

Cinnamomum burmannii Blume is a native plant from Indonesia and also known for its commercial name as Koerintji Cinnamon that generates income to small growers in Kerinci district located in Jambi, the island of Sumatera, Indonesia. The tree grows in West Sumatra in the region known as Kerinci; it is a regency of Jambi province (hence the name Koerintji) near the city of Padang. According FAO, between 2000 and 2014, Indonesia is the largest producer of cinnamon (83,176.79 tons), followed by China (53,176.79 tons), Sri Lanka (13,938.21 tons), Vietnam (13,894.43 tons) and Madagascar (1797.36 tons). The latest cinnamon price in September 2017 for cinnamon powder is Rp.60.000-65.000 / KG, while for cinnamon stick size of 8-10 cm is Rp.40.000-45.000 / kg (Jambi Province Plantation Office, 2017).

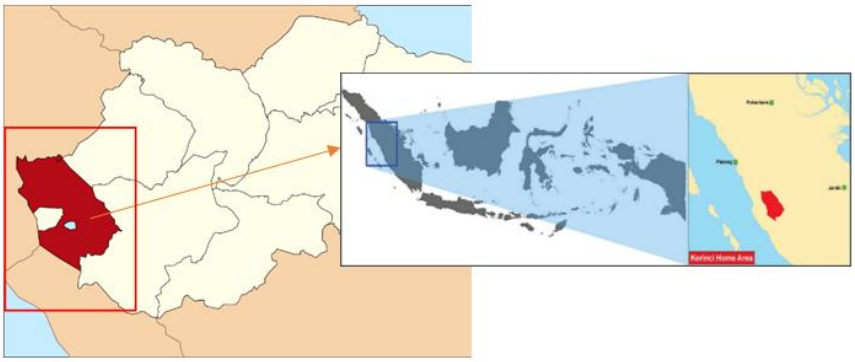
The research problem are, more specific that adding value to the value chain process which to improve the farmer's livelihood and environmental practices. This research aimed to identify the constraints of the value chain and sustainable livelihood improvement for cinnamon farmers in Kerinci. These systems are often applauded for their biodiversity conservation value while improving farmers' livelihoods by increasing overall productivity, profitability and sustainability (Atangana et al., 2014 in Jezeer & Verweij, 2015).

Method

To understand of value chain improvement, the researcher conducted various analysis including field research to small growers and buyers.

Study Area and Ethnographic Background

Kerinci district is the primary location for ground research because the region is the centre of cinnamon production in Indonesia (Wangsa & Nuryati, 2007). Covering an area of 3,808.50km2 (BPS Kerinci, 2016), Kerinci is the smallest district of Jambi Province. It is located almost 400km from Jambi City, the capital of the province, and is accessible by land and air transportation which can be seen in Picture 1 bellow.



Picture 1. Map of Kerinci Regency, Jambi Province

Source: Google map

The research was conducted in Talang Kemuning village of *Bukit Kerman* district, Kerinci regency of Jambi province in Indonesia from January and October 2017 (2 months). North of the village is the *Lolo Kecil*, the south by *Bintang Marak* village, the east side by *Lempur* village and on the west of the village is on the border with *Tanjung Sham* village. The distance from Talang Kemuning to Sungai Penuh District capital 39 km and Jambi Province capital 380 km.

Research Object

Talang Kemuning covered an area of 1,600 ha, with a hilly and mountainous area. The village had a tropical climate during whole year with an average temperature of 22 degree Celsius. The population of Talang Kemuning village was of 1,200 inhabitants and a total of 520 families. In a total of 90% of the community were subsistence farmers, while 10% worked as civil workers and other types of the sector. In the research conducted in January 2017, was identified that up to 40% of the community had high school education.

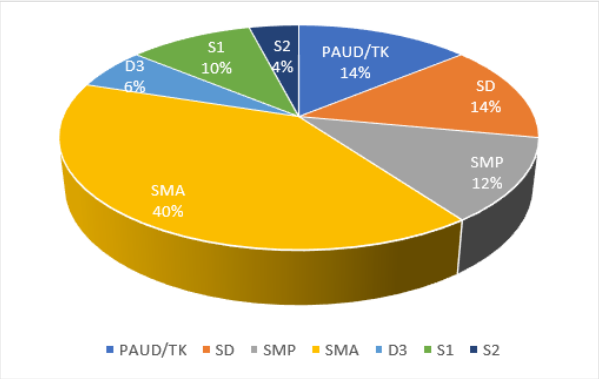


Figure 1. Education Level of Talang Kemuning Community, (Source: Village data 2015)

The object of this research is the traditional farmers (small growers), farmers who are affiliated with farmer association named Kelompok Tani Sakti Alam Kerinci (TAKTIK) and cinnamon collectors "toke" in Talang Kemuning as well as the related buyers in the trading channel of the farmers. The place where the sample was taken had been chosen purposely by choosing the producer and supplier.

Data Collection Techniques

Data collected included research sites general conditions, social and cultural conditions, Korintje Cinnamon production and processing, and community revenues from Cinnamon. Data collection was conducted through participatory observation using structured questionnaire. In January 2017, there was 40 respondent randomly selected from Talang Kemuning community who is a member of TAKTIK. Further research conducted in October 2017 involving stakeholder which was purposively selected in a total of 20 important respondents who were in the value chain process of the cinnamon sector. Research samples are smallholder farmers who produce and sells cinnamon. Collecting samples and other trading agents involved in the channel and cost of cinnamon trade. This research is to identify the variables that can affect the improvement of farmer's livelihoods with various approaches indicator in the form of increasing the value chain in achieving the welfare of cinnamon farmers. As described earlier, prior to the ground survey, an initial round (January 2007) on this evaluation's impact measures, key informant interviews were conducted in the village concurrent with farmers, middleman (*Toke*), RIKOLTO (Non-Government Organization/NGO), village chiefs, Kerinci & Jambi Province Plantation Office,

and other community leaders to discuss cinnamon business in their villages. Topics included *cinnamomum burmannii* plant, local policy for cinnamon, livelihood and standardization may have become resourceful for research. The findings also collected by using questionnaire design, as they provided a detailed portrait of farmers' socio-economic context. Continuing to explore the gap for the research,

another visit to Talang Kemuning conducted in October 2017, with the goal to have a focus group discussions (FGDs). Actors, which are participating the FGD was selected purposively and was conducted using stakeholder analysis. FGDs were conducted as follows: ten (10) with TAKTIK farmers about value chain process between farmers and input providers and buyers, 5 (five) about farmers' perception of the market access, and 8 (eight) with other stakeholders that are making a derived product of cinnamon bark.

Also, twenty key informant interviews were conducted with community leaders and local NGO. FGD (October 2017) provided information about the linkages between treatment farmers and others in the value chain, including input providers and buyers. Participants were invited purposively from a list of stakeholder provided by RIKOLTO by location. The list included early adopters of TAKTIK, as well as those included in the survey sample frame.

Result

Koerintji Cinnamon Productivity

Cinnamomum burmannii (Cinnamon) is a plant family *Lauraceae* which are common in tropical and sub-tropical regions. (Rismunandar and Paimin, 2001). *Korintje cinnamon, or kayu manis [Indonesian language], "sweet wood", or kulit manis, "sweet bark (skin)", is also known as the botanical term cinnamomum burmannii. Cinnamon trees fit in an agroforestry system since it does not need much labour and is therefore suited to be combined with other more labour intensive crops (Michon et al., 1986).*

The cinnamon tree has smooth branches and aromatic bark and leaves. The leaves are commonly green, glossy and the fruits are like dark berries. The full description taxonomy of *Cinnamomum burmannii Nees Ex Blume* can be seen in Table 2 bellow.

Table 2. Taxonomy of *Cinnamomum burmannii* (Nees & Th. Nees) *Nees ex Blume*

Note: (http://ntbg.org/plants/plant_details, National Plant Database, 2005)

Cinnamomum burmannii (Nees & Th. Nees) Nees Ex Blume	
Kingdom	Plantae – Plants
Subkingdom	Tracheobionta - Vascular plants
Super division	Spermatophyta - Seed plants
Division	Magnoliophyta - Flowering plants
Class	Magnoliopsida - Dicotyledons
Subclass	Magnoliidae
Order	Laurales
Family	Lauraceae - Laurel family
Genus	Cinnamomum Schaeffer - Cinnamon
Species	Cinnamomum burmannii (Nees & Th. Nees) Nees ex Blume
Synonyms	*Laurus burmannii Nees (Wagner et al. 1999), Cinnamomum pedunculatum Nees (Bailey and Bailey 1976).*
Nomenclature	*The genus name, Cinnamomum, is derived from the Greek word for*

	cinnamon, kinnamomon (Wagner et al. 1999).
Common names : Korintje Cinnamon, Padang Cassia, or Indonesian cinnamon	

The characteristic of Koerintji cinnamon is illustrated in the table as followed.

Table 2. Characteristic of Koerintji cinnamon (Ravindran, 2004)

Species	*Cinnamomum burmannii* (Nees & Th. Nees) *Nees ex Blume*
Taste	Strong and peppery taste
Colour	Reddish-brown to dark brown
Bark	The surface is rough, consist of thin or thick scraped single and double quills
Grows in	West Sumatera, North Sumatera, Bengkulu, West Java, Central Java, East Java and Maluku

Taxonomically, Koerintji cinnamon species are different from the species that are native to Sri Lanka (*Cinnamomum zeylanicum*), commonly known as Ceylon cinnamon or true cinnamon (Babu & Ravindran, 2003). From this point forward, unless otherwise stated, any mention of 'cinnamon' would specifically refer to the species *Cinnamomum burmannii*.

Cinnamon plantation in Kerinci region is recognized as the centre of production of quality, high essential-oil crops for cinnamon bark and the skin of the bark is grey with a distinctive aroma and sweet taste (Paimin, 2001), see on Picture 2 & 3. On the research January 2017, it was identified and measured that the cinnamon tree which grows in the tropical evergreen forest can grow up to 10-15 m in its natural condition. At the harvesting process, other commodities can also be obtained from a cinnamon tree, i.e., stem, leaves, root, and twigs, because these parts also contain beneficial constituents (Kaul et al,. 2003). Cinnamon is considered as a high-value plant because every part of the plant, besides functioning as a spice, can also be used for pharmaceutical and perfume (Jayasekar, 2009). The leaves of the tree have a dark green and reddish color with the ovate-oblong in shape and 7-18 cm long. Kerinci cinnamon plants have young red leaves and are cultivated in the highlands of Kerinci district. The flowers are small yellowish-white coloured, arranged in panicles, with a distinct colour. The fruit is purple, 1 cm long berry containing a single seed.

Picture 2. 25 years old (production of powder) & Picture 3. 5-10 years old tree

Note: Photos from Cinnamon Plantation, Kerinci, 2017

In 2015 RIKOLTO's' research paper stated that following climatic factors have great effect on the cinnamon tree to grow well in Kerinci which is explained below;

Rainfall: the tree requires an equal amount of rain throughout the year with an amount of about 2,000 - 2,500 mm / year. Too much rain will affect the low yield of the bark.

Temperature: the tree can grow well at an average temperature of 25 degrees Celsius and by the weather situation in Kerinci.

Humidity: the tree grows well in the humidity situation 70 - 90%. Higher the moisture condition it has a better growth condition for the tree.

Sunlight: affects the process of plant photosynthesis where it takes about 40-70% of sunlight

Soil condition: suitable soil type for cinnamon growth is that soil contains humus, crumbs, sandy and lactose. However, it can also grow on soil types of andosols, red, yellow podzolic and Mediterranean. Acidity (pH) of ground suitable for cinnamon is pH 5.0 - 6.5.

Cinnamon trees fit in an agroforestry system since it does not need much labour and is therefore suited to be combined with other more labour intensive crops (Michon et al., 1986).

The process starts with seeding at the nursery, farm preparation, planting and maintenance. During this maintenance phase is when farmers usually do intercrop, up until the cinnamon plants are around four or five years of age. Pruning of cinnamon trees is usually done when a tree is around seven to ten years old. This is done to give space for the plants to grow more optimally. During this maintenance phase, farmers also use pesticides (insecticides, herbicides, and fungicides) to control pests that might disrupt the growth of the plants. Although the cultivation method is similar to Ceylon cinnamon, Koerintji cinnamon is harvested and processed differently. Harvesting conditions and methods of production often determine the quality of cinnamon (Rismunandar, Paimin, F.B, 2001). As a perennial crop, there are usually two harvesting methods. The first one is done just before the trees reach ten years of age. The first method is called *santangan* in local terms, which is done by peeling the bark of the tree. When the young red leaves are present, such as seen in Picture 4 bellow, or the plants are flowering; low peeling can be done by extracting the bark of around 2-3 cm wide. However, during this time, farmers rarely harvest their cinnamon as the bark is rather difficult to peel. High peeling is done when the plants are not in the flowering period. Since it would be easier to peel the bark at this time, farmers extract a wider area of around 7-8 cm in width and 80-100 cm in length.

Picture 4. Traditional peeling by Talang Kemuning peelers
Source: Author, 2017

The second method of harvesting, called *tebang habis* (clear-cutting) is usually done when the plants are over ten years old, and it involves cutting down the whole tree, followed by peeling the bark. The bark of a tree that is between 10-15 years old is used to make cinnamon sticks, while the older trees usually produce thicker cinnamon bark of higher quality. This process is then followed by scraping the bark

to clean the outer layer of the skin. If the tree is ten years or younger, the bark would be used to make sticks. For this purpose, each bark sheet will be cut to 2.5 cm in width. Meanwhile, if the bark comes from a tree that is over 15 years old, they will be made into quills, so they do not need to be cut into smaller widths. This process is followed by washing and soaking the bark for around 12 hours to remove dirt and scraps from the bark. After that comes the sun-drying process. All bark needs to be dried under direct sunlight; a process that usually takes around 3-4 days. To maintain cleanliness, farmers need to line the ground with tarp sheets so that the bark does not come into direct contact with the ground. During this drying process, the bark curls up into quills and turns reddish brown. Dried cinnamon quills or sticks ideally have a water content of 10-14% (Pannell et al., 1991). The cinnamon is then sorted according to their grades, which depends on some factors, such as type (scraped, un-scraped, quills, sticks, and chips), appearance, and volatile oil. In the case of making cinnamon sticks, the long sticks are cut using an electrical saw according to the required length and then sorted further to prepare for storage and packaging.

Thousands of workers are connected with this industry in Kerinci and interact as a social gathering as implicitly way, see picture 4 for the production of Cinnamon farming in Talang Kemuning.

Picture 7. Production of cinnamon bark

Source: Author, 2017

Upgrading productivity can be in the concept of improving the value chain process, as Giuliani (2003) point out in their seminal paper, 'upgrading within a value chain implies escalating on the value ladder, moving away from activities in which competition is of the 'low road' type, and entry barriers are low. There are four types of upgrading identified by Humphrey and Schmitz (2000) and used by Giuliani (2003), as followed and describe in Picture 4;

Process upgrading, where the transforming production process has been reorganized or improved processing technology introduced, such as cinnamon tea from left-over dried bark.

Product upgrading, where natural products are developed into diverse and more sophisticated product lines, with higher values per unit volume, for example, Cinnamon Powder.

Functional upgrading, which refers to cases where new, superior functions are developed in the value chain.

Internal upgrading, which occurs when new research or technology enables a product to shift from one sector into a different commodity. It is potential for extraction of commercial products from cinnamon leaf seeds, which would allow a shift to high-value pharmaceutical use (instead of being discarded); or production of niche-market pulp-paper from the cinnamon tree trunk.

III.2 Cinnamon World Market and Koerintji Cinnamon Challenges

Indonesia as the world's leading cinnamon producer up to accounting for 43% of the total world's production in 2014. Cinnamon with the international trade code HS 0906 (Harmonized system code for cinnamon-cinnamon tree flower) is largely export from sub-tropical countries, including Indonesia as the largest producer. Indonesia produces over 91,400 tons of cinnamon every year, worth about $85 million which can be seen in table 3. Almost all cinnamon produced in Indonesia come from because of its plantation area to 40,962 ha or 75% that can produce more than 50,000 tons/year (RIKOLTO, 2016), where the cinnamon tree flourishes.

Table 3. World's Top Cinnamon Producing Countries 2014

Rank	Country	Production (Ton)
1	Indonesia	91,400
2	China	71,146
3	Vietnam	31,674
4	Sri Lanka	16,766

Source: wordatlas.com, John Misachi

Indonesian cinnamon products exported are cinnamon bark, essential oil and cinnamon powder which is used as raw material for industry and raw material (Ragimun, 2012). Arifin (2013) explains that cinnamon is one type of spice that is widely used as an ingredient of flavour and taste in foods and beverages, additives on the manufacture of perfumes and drugs. The cinnamon bark can be used directly in the original or powdered form, or already processed into essential oils and oleoresins (Smith, 1986). Indonesia is still the market leader in Cinnamon business to compare with other producing countries who have similarity product, which can be seen in Figure 2.

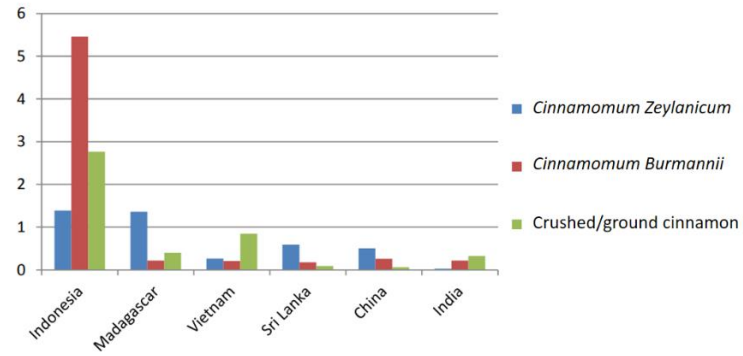


Figure 2. Developing-country suppliers of cinnamon to Europe, by level of processing, 2015, in 1,000 tons*, Source: Eurostat, 2016

Cinnamon product that is exported to European countries are the barks of a cinnamon tree which are sundried and transformed into quills later on categorised into three types of grades depending on the tree ages, which are;
Grade AA/KA: This kind of grade is produced from the bark of cinnamon tree stem that has been through a process so that the bark is dry and the epidermis part is removed. The AA had a light brown colour and harvested after the age of 15-20 years, resulting in outstanding quality. In the market, cinnamon with this grade is sold at the highest price (see picture 3 below).
Grade KB: This grade is almost the same as AA, the difference lies in the epidemic is not removed. The colour is dark brown. This quality can be generated after the tree is over seven years old. This type is usually sold at a lower price than the type AA
Grade KC: This class is called a fraction of cinnamon. This type is generated from KB type cinnamon. In the market, this type is traded at the lowest level compared to the two types mentioned earlier.

Picture 4. Grade AA, Koerintji Cinnamon

Note: The picture above shows a 25 years old bark, with the thickness to 5 cm.

The cinnamon market in the EU continues to provide opportunities for exporters from developing countries, including from Indonesia to conduct business. Imports and prices will continue to increase in the coming years, but the highest demands

concurred in 2014 that nearly 18,000 tons are imported to the EU, see Figure 3 (CBI, 2016).

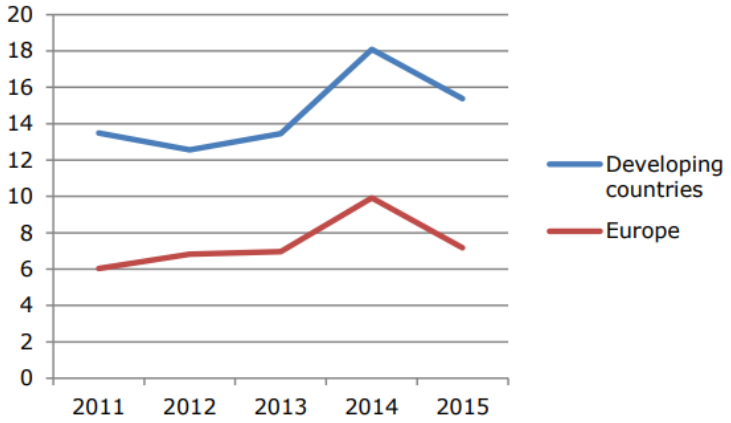


Figure 3: European imports of cinnamon, Ceylon cinnamon and cassia 2011-2015, in 1,000 tons*

Source: Eurostat, 2016

Based on the research and survey conducted in October 2017 in general, there are four supply chain channels involved in the cinnamon products, which are the farmers as producers, small collectors, large collectors and exporters. Each has their different roles and functions in value chain from farmers to exporter, that **1. Farmers**

The trade management functions of fewer farmers are only exchange. The farmer's exchange function is the sales function. Farmers do not perform purchasing functions because farmers act as producers. As a producer, farmers sell cinnamon in the form of three systems, namely:

Farmers with produced the bark, which includes all of the plantings, sorting to grade and drying process.

Farmers sell directly on land with a stem selling system. This system has been going down and down, where the small collectors (toke) measure the volume of cinnamon per stem then multiplied by the number of sweet skins for one piece. In some cases, farmers do not harvest because toke will do the process of harvesting and transportation.

Farmers perform trade management functions. First, the exchange function is the farmer performs the sales function. Second is the physical function where farmers are carried out in the form of transportation and storage. Farmers transport their produce to large collectors. The third is the function of farmers as sorting, that is the separation of products that are not by the quality standards set by collecting traders.

The majority of farmers (about 80%) in Talang Kemuning do not conduct nursery management and cultivate cinnamon as fulltime activity. Most of these growers are

part-timers, engaged in other occupations as the main livelihood. They hire personnel to manage their plantations including peelers and transporters. Since their part-time engagement, these holders lack the proper knowledge and strong commitment to control their production.

Small collectors

They are often called toke (local language) or known as a middleman. The functions performed are for physical exchange. First, the exchange function performed by local traders in the form of buying and selling. Local traders purchase products to farmers. The second function is the physical retailer made in the form of loading and unloading and transportation. Also, small collectors also perform grading, sorting and storage functions. Toke often have a monopoly on information regarding cinnamon market conditions, including stock availability and price, giving them significant control over the farm gate price (Jaya, et al., 2009). Since toke typically has access to significant financial resources, they can buy cinnamon from some farmers at a low cost, especially when the farmers are in dire need of money. Burgers (2004) noted that the profit margin of the toke in the Kerinci cinnamon value chains is significantly more significant than that of any other actor (over 60%).

Large Collectors

Large collectors or *saudagar* (local language) or trader, is an individual or enterprise that buys cinnamon products from toke. They usually operate at the district level and collect their supply from the *toke* in various villages within the district. Although not very common, there have been cases where *saudagar* buy cinnamon directly from farmers. They have a significant enough initial capital to buy in advance in large volumes. Based on the information given by farmers in October 2017 that large collectors also purchase land from farmers sold below the market average, so they have enough cinnamon plantation in Kerinci.

Exporter

Distinguished exporters from local exporters and exporters outside the region to abroad. These exporters have direct access to the end buyers where the highest price of cinnamon is earned them. Exporters also diversify or further product development, packaging and laboratory tests to check the quality of cinnamon.

The cinnamon industry is not profitable for the farmers in Kerinci due to its oligopsony market. Kerinci cinnamon farmers are growing by thousands of people reaching 12,243 households in 2013, while local collectors are only a few. The collector is also acting as a trader, which also consists of small collectors and large collectors and exporter. This condition causes the farmers do not have bargaining position so that farmers are often harmed. This can be attributed to the income between farmers, and the collectors are very unequal, i.e. farmers earn a maximum of RP. 40,000 / kg (2,5 Euro/ KG) while wholesalers or exporters can earn up to Rp.

160,000 / kg (10 Euro/kg) after going through the manufacturing and packaging process which can be seen in Table 4 as followed.

Table 4. Income comparison in cinnamon business

Farmer Income (after 9 years)	
Income from Cinnamon (9 years)	Rp. 484,000,000,-
Total Cost Production (9 years)	Rp. 194,580,000,-
Profit	**Rp. 289,420,000,-**

€ 1 = Rp 15,675

Subject	Large (Ha)	Population (stem)	Vol/Stem (KG)	Sell Price (Rp)	Income (Rp)		
					9 year	1 year	1 month
Grower	1	4,400	1	40,000	289,420,000	32,157,000	2,680,000 (~ 180 €/m)
Wholesale Trader	1	4,400	1	160,000	1,936,000,000	215,100,000	17,923,000

(-) Operational Cost

Raw Material : bark | Processed : powder

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Source: Develop by research in January 2017

Particularly in agroforestry industry based value chains, value addition has become an essential need for enhancing or develop competitiveness and sustainability. The reason for needing such a change in a value chain is, according to Andreas Stamm et al. (2003), "the demand in large markets is becoming more diverse and consumption patterns increasingly globalised.

One of the reasons for the low prices in cinnamon is the long trading channel between intermediates, as spices produced by smallholders at local, national and international levels (Wangsa, 2007). Due to these long value chains, the profits of smallholders are small compared with the middleman.

III.3 Cinnamon and Livelihood Impact

Kerinci regency extends across several sub-districts Batang Merangin, Gunung Raya, Bukit Kerman, Danau Kerinci, Keliling Danau, Sitinjau Laut, Air Hangat, Depati Tujuh, Siluak, Siluak Mukai, Gunung Kerinci, Kayu Aro etc. The majority of the people living in these sub-districts including Talang Kemuning depend on Korintje Cinnamon and the other commodities for their livelihood. Forests are portrayed as central to the poverty alleviation efforts of millions of rural smallholders across the developing world (Sunderlin et al., 2005). A cinnamon tree that grows in the forest can also contribute to livelihoods have been investigated in some manners, for example, according to three different functions: safety nets, support of current consumption, and a pathway out of poverty (Vedeld et al., 2007). Cinnamon provides a significant role in the local economy for the farmer living Kerinci region. It is one of the essential

factors that may contribute to the economy of the district of Kerinci (Askar Jaya, 2009).

However, cinnamon farmers depend entirely on post-harvest time which they have to wait years for production and typically cultivate the bark to support their livelihood. Since 2007, the Kerinci district faced a high open unemployment rate of over 15,000 people, caused by the decrease in employment in the agricultural sector (Moravia, Barus, & Pribadi, 2009). One of the factors is related to the plantation ownership by in Kerinci, which identified on the research on January 2017. Jambi province plantation office stated that in the year of 2015, there is 40,962 ha used for cinnamon plantation. Amount of production of Koerintji cinnamon can reach to 53,623 ton which conducted in a total of 12,843 growers, see table below for description for commodities which are most planted in Kerinci regency. The plantations are spread throughout Kerinci that covers an area of 40,962 ha size are inherent since generations. Dimensions and locations of the plantations can be seen in following table(s) 4 and 5.

Table 4. Land area of cinnamon plantations in Jambi Province

Note: Department of agriculture and plantation, Jambi, 2015

No	Location	Land Area (ha)
1	Bungo	233
2	Kerinci	40,962
3	Merangin	5,017
4	Sarolangun	633
5	Sungai Penuh	347

The cinnamon plantations in Kerinci are spread in several locations, but the most significant farmer plantation is in Gunung Raya with a total area of 11,224 Ha^2. The spread of cinnamon plantations can be seen in table 1.4 below.

Table 5. Locations of cinnamon plantations in Kerinci regency

Note: Department of agriculture and plantation, Kerinci, 2015

No	Location	Planted Area	Yearly Production (Tons)	Number of Farmers
1	Gunung Raya	11,224	14,357	2,216
2	Batang Merangin	10,735	27,275	2,415
3	Danau Korintje	1,195	764	327
4	Keliling Danau	4,623	3,209	327
5	Sitinjau Laut	72	26	156
6	Air Hangat	1,365	75	1,044
7	Air Hangat Timur	1,034	646	737
8	Gunung Korintje	2,801	1,741	1,624

9	Kulit Aro	3,847	2,981	1,128
10	Depati VII	300	23	265
11	Siulak	1,405	617	983
12	Gunung Tujuh	2,361	1,248	1,021
Total		40,962	52,980	12,243

The table above calculated that cinnamon farmers in Kerinci have less than 3 ha cinnamon plantation per household and produce an average of 2,234 KG/year of cinnamon bark. According to the research conducted in January 2017, was identified that farmers mostly rent the land from other parties yearly. Plantation size can have an impact on the number of crops that are harvested. One tree trunk can produce at least 20 KG cinnamon (Wangsa & Nuryati, 2007). Based on the interviews conducted in October 2017 that 46% of 50 respondents are renting land for plantation which can be seen in Table 5. Soentoro (1981) stated that the land in Indonesia is important as a set for rural communities because it can deliver a natural resource that can be managed into a source of income. The larger land ownership. The greater possibility of the household to obtain a higher profit for the farmers.

Table 5. Number and Percentage of household by land ownership in Talang Kemuning

	Land Ownership	Household	
		Number	(%)
1	Small (0.5 - 1 ha)	15	30
2	Medium (>1 - 2 ha)	8	16
3	Large (> 2.0 - 3.0)	4	8
4	Others: Rent	23	46

To support their daily income, the farmers conduct intercropping like oranges, avocado, cocoa and other sort fruits and vegetable are easy to be sold in the market. As a traditional farmer, any attempt to enrich nor improve their livelihoods requires an integrated value-chain approach. The United Nations stated that sustainable livelihoods could serve as an integrating factor that allows policies to address 'development, sustainable resource management, and poverty eradication simultaneously' (Krantz, 2001). Farmers in Talang Kemuning started to conduct intercropping to support their livelihood, which can be seen in Picture 6.

Picture 6. Intercropping cocoa tree in Kerinci

Source: author, January 2017

Farmers in Talang Kemuning choose to gain more of their livelihood from agriculture through processes of intercropping to have other income generating earning activities. Another research founding is that the farmers are changing from cinnamon towards coffee. In general, horticulture commodities are than cinnamon; it can also be harvested faster. Some farmers have already switched to grow coffee and cocoa instead. At this moment, coffee and cocoa is a cherished crop to take in the place of cinnamon.

Upgrading standards and Profitability Impact

Branding the Korintje cinnamon product by putting trademarks of traceability and certification can have an important role in the future of Indonesia spices export markets. Putting labels, trademarks and food safety certifications can impact on a result that consumers are willing to pay more for the product that is certified and meet the standards regulations which categorized as a premium product and second, access to a wider share of the market due to consumer awareness that product is good quality (Jaffee, 2007). Consumers in Europe are increasingly interested in consuming a product which has 'clean & green' labels because related to health and security of the product that will be consumed. When the products have claimed for its sustainability and traceability campaign, it is crucial to ensure that those claims can be traced (traceability). It requires a system of traceability through a chain of operations to implement for Korintje Cinnamon product. But, if the cinnamon farmers in Kerinci can achieve the demanding quality standards, surely can benefit a farmer in the future. The farmer should, therefore, choose and decide whether or not a particular set of standards is a good for their cinnamon for their livelihoods improvement.

Standard and certification have a vital role to access EU spice market. Therefore, it is wise to have certified labels and comply with the sustainability standards which is essential for the EU consumers. The new environmental regulation and health standards had brought decreasing demand of Koerintji Cinnamon product in the last

few years. Small growers have difficulties to comply with the requirement because of their traditional farming methods, including the scalp of the skin, see picture 7.

Picture 7. Traditional scalping of the bark

Source: October 2017

Importance comply with the standard is related to the European legal requirements for food safety (traceability, hygiene and control) in the form of certification. At first, it is required to implement food safety management before entering the EU market, such example BRC, IFS, FSSC22000 and SQF. Social justice, environmental protection also became an important issue for the EU consumers, and that is why FAIR TRADE labelling has a high impact on the end-consumers. The EU regulations also require labelling on the packaging of the product so will provide information for the consumer, such as with the following information according to CBI Product Factsheet, Cinnamon in Europe (2015):

- the name of the product;
- manufacturer details;
- batch number;
- date of manufacture;
- a grade of the product;
- harvest date
- any information that can be used to trace the product back to its origin.

CBI product factsheet (2015) release a report on cinnamon in Europe. In the report, stated that cinnamon exporters should comply with rules and regulation of EU. The rules are food safety and traceability, corporate social responsibility, sustainable product certification and supplier assessment. The European Standard Association (ESA) in 2015 launched the Quality Minima Document on European legal requirements for unprocessed cinnamon which excluded crushed/ground cinnamon and cinnamon treated for microbial reduction as well as additional buyer requirements (CBI, 2015).

Cinnamon production in Kerinci still lacking from its supporting functions in the value chain stream process. Among others, the lack of knowledge to create derivative products, inadequate access to modern farming equipment and market access, and the information prevent local farmers to benefit from their livelihood. Local cinnamon growers are disorganised and cannot actively interact with capital and negotiate with

market actors. Based on the survey in October 2017, that the majority of farmers in Talang Kemuning have minimum have a minimum understanding about legal requirements from the EU such as necessary food safety management, in the example of drying the bark on the street, see Picture 3 below.

Picture 3. Unclean drying process

Note: Photos from farmer house, Kerinci, 2017

It is vital for cinnamon farmers in Kerinci to enhance their compliance capacities of the cinnamon farmers (growers and processors) through certification according to international standards, like the EU standard. Inability to meet the necessary buyer product specifications and hygienic food standards (SPS) will be a bottleneck in the future. ATN as their main commodity buyer had launched in January 2018 a standard specification that must be fulfilled by the Talang Kemung cinnamon farmers, see Picture 9 bellow.

PT. ALAM SARI INTERBUANA
We Deliver Indonesian Spices and Food Commodities

Product Data sheet **C-0906.11.00**
Date: 08-01-2018 Page: 1 of 2
Owner: Quality Coordinator

Cassia VAA sticks

PRODUCT IDENTIFICATION & GENERAL INFORMATION	
Product code	0906.11.01
Product description	Cassia is the dried bark of various laurel trees in the cinnamomun family.
Process description	Cinnamon tree shoots are stripped of bark. The bark is sundried, collected and selected. The product is subsequently cracked, cleaned, sieved, hand-picked and packed after metal detection.
Origin	Indonesia
Composition	Cassia
Legal demands	Products have to comply with all legislation. Most important elements are: - General Food Law (EC) no. 178/2002. - Food Hygiene Law, Regulation (EC) no. 852/2004. - Regulation (EC) no.1881/2006 setting maximum levels of certain contaminants in foodstuffs. - Regulation (EC) no. 396/2005 on maximum residue levels of pesticides in products of plant and animal origin. - Regulation (EC) no. 1829/2003 on genetically modified food en feed - Regulation (EC) no. 834/2007 on organic production.
Labelling	Obligatory label information according to Regulation 2000/13/EG. GMO labelling according to Regulation (EC) no. 1830/2003.

Picture 9. VAA Cassia sticks criteria 2018, Source: PT. Alam Sari Interbuana, 2018

At last, the use of an international standard of ISO 6538:1997 (*cinnamomum burmannii*) and ISO 22000 (Food Safety) for cinnamon can bring advantages and support the cinnamon farmers to enhance their production compliance capacities to meet the conformity requirements of European markets. Building farmers capacity to deliver food hygiene and safety skills development will strengthen their role along the cinnamon value chain. Value chain approach has advantages to address constraints and challenges to improve sustainable practices in farming. In a way to promote inclusive economic growth with the understanding of the environment which can leverage some points along the chain towards small producers, traders or processors. Using value chain as approach and method to see the leverage point for livelihood improvement can start from upstream or downstream process. Upstream actors are the producers, traders or processors who are closely linked to the origin of the product. Downstream value chain actors are the larger traders and processor who has access to the end market. The approach of identifying and addressing specific can emphasise the interventions method along the chain and benefits for pro-poor growth.

Geographical Indication & Marketing Potentials

Cinnamon farmer association Kerinci received Geographical Indicators (GI) certification in 2015 from Indonesian Ministry of Law and Human Rights, which should benefit and creates jobs in the cinnamon business. The Directorate General conducted a field assessment in Kerinci on 16 February 2016, and following this, the application was announced through a Gazette

Numbered: 03/IG/II/A/2016. It was made public for three months between 25 February 2016 and 25 May 2016. The application was approved on 26 May 2016 (No. ID G 000000043), making Kerinci cinnamon the 43rd product protected by GI in Indonesia. The certificate was officially handed to the Regent of Kerinci by the Indonesian Vice President in Jakarta, 18 July 2016 with the policy Nomor.525/486/Dishutbun/2015. The Indonesian GI name is 'Kayumanis Koerintji' or Koerintji Cinnamon. Through this certification, it can enhance product development rather than just selling raw material (bark of cinnamon). Cinnamon products that have market pontetials according to the RIKOLTO are as followed; (i). Dried Cinnamon bark with grade quality KM, KF, KS and KA. (ii). Cinnamon sticks grade VAA, VA and cutting, (iii). Cinnamon powder. The cinnamon products that which are certified with GI label are organic according to International Organic Certification (EU, USDA and JAS) with the condition not contaminated with nonorganic materials. TAKTIK members in a total of 261 members from 500 have received this GI certification since 2015. As in many developing countries, GIs appeared as an efficient way to promote agricultural products in a context of globalisation and to reduce the risk of the misappropriation of names (Anders & Caswell, 2009; Bramley & Bie´nabe, 2012; Vittori, 2010). Koerintji cinnamon GI certification can provide a value for its qualities and reputation. Moreover, the GI can

enable a marketing and promotional value in the global market. Another potential function of GIs is product differentiation. In a globalised context, GIs can be an effective role as ‘‘decommodified”, by changing the status of an agricultural product from ‘‘commodity” to ‘‘origin product” (Galtier, Belletti, & Marescotti, 2013), which can, in turn, increase the selling price and market share. Jambi province plantation office expects that the GI registration will strengthen the bargaining position and add value to Koerintji cinnamon in international markets, resulting in increased recognition for the quality and unique nature of Kerinci cinnamon. GI can minimize environmental impacts, increase product quality and access to the wider market. It is also anticipated that this GI would play a role in maintaining the body of local wisdom in Kerinci regarding the management of natural resources, thus playing a role in conservation efforts in the region.

However, the situation appears on the October 2017 visit, that product certification can benefit a farmer if a minimum number of farmers adopt this origin-labelled certification with the support and active coordination among actors in the value chain.

Discussion

Improving the value chain approach in Cinnamon

Improving the cinnamon value chain in Kerinci is hypostatically possible. According to Garret (1997), agroforestry can enhance the sustainability of farming systems, diverse farmers’ incomes, provide new products and create a new landscape. To meet Garret’s concept, it needs to be enhanced using the suitable value chain approach, because it is an integral part of tree domestication and agroforestry programs (Leakey, 1998). A value chain describes a full range of individuals and activities starting from production to consumption (Kaplinsky, 2002).

For cinnamon, one reason for the low prices is due to long supply chain process which includes many intermediates (middleman), as different intermediates trade spices produced by smallholders at local, national and international levels (Boomsma and Mangnus, 2011). Due to these long value chains, the profits of farmers are constrained by weak market linkages between smallholders and exporters since the middlemen also try to make a profit, mostly at the expense of the farmers’ benefit. Only in the local part of the value chain already are several intermediaries active, mainly because farmers are dependent on them for transport for example. Farmers who do not receive a fair price will remain dependent on these middlemen, ending with an increasing amount of farmers changing to cash crops.

Constraints in post-harvest cinnamon process arise because of regulations, standards, laws and also informal rules & norms that are not supporting the value chains improvement can be seen in table 7.

Categories	Constraints	Opportunities [January & October 2017]
Product and Market	• Not rewarded fair price • Farmer are price-takers • No access to market (local and international)	• Access to information for price • Access to wholesalers and end-market • Shorten the channel of distribution
Technology & Production	• No ownership of land • No investment in transportation and accommodative infrastructure • Traditional technology	Support by Local and State government for productivity improvement : farming technology, investment schemes, training etc
Human Resources	• Traditional harvesting and farming method • No regeneration of growers • Dependable only on Cinnamon	• Train farmers on improving capacities for farming and business • Organize community farmers to share experience • Need establish farmer forum
Finance & access to capital	• No support from investment bodies • No support from local and state government • Difficult to access to loans	• Establish cooperative • Partnership with local trade union and community banks
Environmental Issues	• Clear cutting • Product hygiene • No environmental certification	Training and facilitating by partners to conduct GAP

Jambi provincial government should issue a policy stating that cinnamon should not be sold as raw materials (bark) but it should be processed through the cinnamon grinding mill to improve its value so that it can be sold both in local and international markets. Jambi provincial government can set and enforce rules to initiate and finance a grinding machine that can make cinnamon powder, essential oils, and oleoresin that has a higher sale value in the market. Another constraint is related to the direct supply chain. Because of the absence of harbour facility in Jambi, the product should be delivered to another city takes another process of trading. The last constraint in the off-farm issues deals with the international standards for agriculture practices that are difficult for small growers to comply. All of those issues eventually ended up in small growers as price takers on the basic gate-price of the cinnamon market.

Even though the income earned from cinnamon plays a vital role for farmers in Talang Kemuning, but the primary concern of cinnamon farmers deals with the extended period of harvest time. One cinnamon tree produces about 20 kg of bark with the range of age up to 20 years for production with a variant of quality and price. Cinnamon tree is cultivated three times for its bark. The first harvest occurred when the tree reaches the age of 6 years, and the second crop is at ten years and the last harvest time is at 15 years old. During that harvest time, the farmers are looking for other solutions to generate income, such as intercropping and planting another product that is more productive. Therefore, it is essential to find a solution for the farmers to produce derivative products and create a product diversification that can give added value and improve the value chains for higher income. According to Humphrey and Schmitz (2001), there are four types of upgrading:

Process improvement, where the transforming production process will reorganise or improve processing technology;

Product development, where natural products will develop into diverse and more sophisticated product lines, with higher values per unit volume;

Functional improvement, which refers to cases where new and superior functions will draw up in the value chains;
Inter-sectoral upgrading, which occurs when new research or technology enables a product to shift from one sector to a different "new area."
The involvement of other parties to improve the value chains for greater farmer income is also important in the outcome, such as described below:
Business, producer associations, universities, NGO's and local government through policy support;
Establishment of research and development (R&D) capabilities of national or regional universities, or R&D facilities of large firms with whom partnerships will form;
Strategic use of labelling, branding, trademarks, and certification.
Majority of small growers in developing countries, including those who are in Koerintji area, are facing series of constraints that often limit their ability to participate competitively in a value chain improvement model including supporting functions. The following are the model of four major constraints that limit the competitiveness of small and medium-sized manufacturers and their entry into value chains (Lie H *et al*., 2012):

- Access to end-market
- Access to skills & capacity improvement
- Collaboration and cooperative building
- Access to finance & incentives

First, access to the end-market is relevant to improve value chains for smallholders. In the context of this model, it refers specifically to the presence of value chain connections between small growers and buyers and how they can be established. It is also crucial for the consumer to be informed about the origin of the products using traceability tools and sustainable measurements. In this case, neither the small-grower organic or chemical pesticide can reduce the climate change impacts. Second, while smallholders work at the farm from their childhood, specific training is often required to improve the productivity and product quality. Such training can include the introduction of new technologies and plant varieties, not only explaining how to comply with food safety and other certification requirements but also how the value chains works [8]. Nevertheless, there are also new agricultural practice adaptations including new cutting that impact on biodiversity loss and land-slide. Third, building coordination and collaboration at two coordination levels that can trigger R&D and infrastructure improvement by any condition. Finally, the last part is access to finance that can support product diversification and technology investment including more environmentally friendly agricultural machinery.

In both value chains, farmer households try to include into the value chain. The insertion of smallholders in national, regional and global agriculture value chains has essential consequences to reduce poverty in rural areas of developing nations due to their potential to increase incomes and create employment and therefore adds to the

sustainability of their livelihoods (Gereffi and Fernandez-Stark, 2016). The majority of farmers in developing countries face a series of constraints that often limit their capacity to participate competitively in these chains, and there has been considerable concern that these producers are being excluded from substantial growth opportunities. Fernandez-Stark et al. (2012) show a model of four significant constraints were identified that limit the competitiveness of small- and medium-sized producers and their entry into value chains. (1) Access to market; (2) access to training; (3) collaboration and cooperative building; and (4) access to finance. Access to market is relevant to inclusion in value chains for smallholders. In the context of this model, which refers specifically to the presence of value chain linkages between producers and buyers and how they can be established. Second, while smallholders work at the farm from their childhood, specific training is often required to improve productivity and product quality. Such training can include introducing new technologies and plant varieties, how to comply with food safety and other certification requirements, but also how the value chain works (Fernandez-Stark et al., 2012). Third, building coordination and collaboration building occur at two levels. First, horizontal coordination amongst producers facilitates the formation of producer groups or associations, to reach economies of scale to be able to compete in the marketplace, but also to provide opportunities to add value to their product, such as upgrading. Second, vertical coordination and collaboration involve interactions with other actors of the chain to establish linkages, find synergies and share information to improve the performance of the chain as a whole. Chain stakeholders include all the actors that play a role in the development of the industry. Finally, entry into the value chain requires certain investments to cover infrastructure, equipment and obtaining certifications. Small producers, however, often face liquidity and credit constraints and have no access to formal finance channels, both of which limit their potential to make the required investments (Fernandez-Stark et al., 2012).

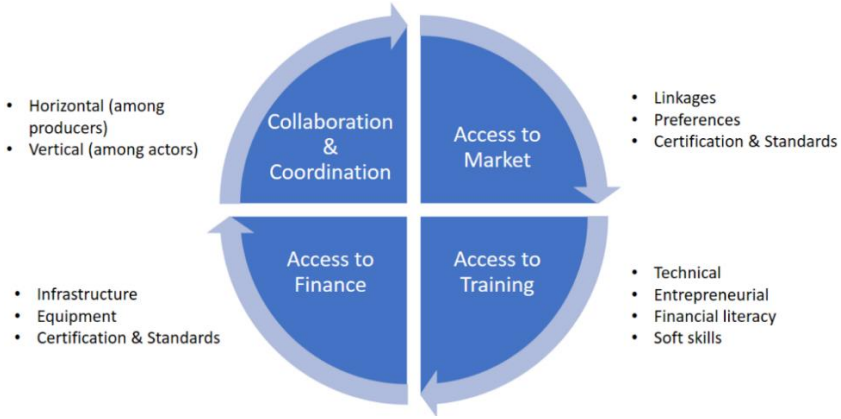

Figure 10. Model for smallholder inclusion in agro-food chains (Fernandez-Stark et al., 2016)

In a way to enhance cinnamon value chains for greater farmer income, can be done on several models such as educating farmers about the sustainable practices for the environment, helping them to access local and international markets, supporting their productivity improvement, promoting good agricultural practices, providing organic fertiliser, and so forth. However, it also necessary for the farmers to increase their knowledge about the regulation standard so they can access EU market.

Another way to maximising the use of the Koerintje Cinnamon GI will have a significant role in the future of Indonesia's spices export markets. Putting on labels, marks and food safety certifications can influence the customers to pay more for the product that is certified and meet the standard regulations and categorised as a premium product. Consumers in Europe are increasingly interested in consuming a product that has a 'clean & green' label because they are aware of the health and security of the product that will be consumed. When the products have claimed for its sustainability and traceability campaign, it is crucial to ensure that those claims can be traced. It requires a system of traceability to be implemented in Koerintji Cinnamon products. However, if the cinnamon farmers in Kerinci can achieve the demanding quality standards, they surely can get more benefit and gain brighter prospects.

Farmers inclusion in the value chain

In a method to enhance farmers capacity, can be done by conducting capacity building and social capital to become instituting farmers who can lead to strengthening their business capacity to meet the premium conformity of EU market. Here below are the constraints related farmers value chain improvement based on the research in October 2017.

Farmers are solely dependent on income from cinnamons and have limited access to financial resources.

Farmers have no access to direct market and depend on *Toke* daily as their direct buyer.

Farmers use traditional farming equipment and have lest interest in product development and innovation

Conclusion

Research in October 2017 found from empirical evidence from the analysis that the value chain in Talang Kemuning, Kerinci is a buyer-driven chain where the buyer "toke" (trader and exporter) have a significant role and power in the cinnamon business. It results in smallholder farmer involving into value-added activities because of the like the concept "business as usual". Cinnamon market channel in Talang Kemuning is a single channel which focuses on the international export market. Intermediaries had a significant role in the value chain process. Trader in Talang Kemuning, play a role in setting the farm-gate price, while cooperative with

the support of local NGO made various attempts to improve the value channel of the farmer in the whole value chain. Upgrading the cinnamon value chain is one of the means for smallholder farmer to regain their role in the value chain. With the concept of upgrading, smallholder farmer can improve their competitiveness in the global market which can improve their livelihood. One of the missing actor in the whole cinnamon value chain is the local and central government.

Involvement of Indonesian government as the main stakeholder in the cinnamon value chain is important because it can bring value to national income (FAO, 2014). Indonesian ministries such as the ministry of agriculture, the ministry of environment and forestry can support the development and coordination of cinnamon value chain in the way of a system of law in a fair price, access to broader market and Investments. Government involvement can lead to greater productivity, and the ability to capture a higher value include methods of cultivating, drying, packaging, research development, education and training in product marketing in the future.

The Indonesian government should also guide smallholder farmer related to international market demands for product certification, and quality standards make it difficult for small growers to meet the request. The international consumer protection agency demands safe products, free from chemical elements harmful to human health, causing exporters to be careful in providing quality commodities, as well as requiring that farmers conduct cultivation according to operational standards.

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