

**CASSAVA SUB-SECTOR GROWTH STRATEGY
IN
EAST JAVA AND EAST NUSA TENGGARA
October 2015**

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1. Executive summary

With an annual production of 24 million MT, Indonesia is the third largest producer of cassava (after Nigeria and Thailand) and the third biggest exporter, with an export volume of around 195,000 MT annually. Indonesian cassava production increased by about 9 percent between 2009 and 2013, and national and international demand for cassava is also increasing. World demand for cassava imports in the form of dried cassava, cassava starch and cassava chips are 9.6 million MT in 2012.

Indonesia's national production is unable to meet the high demands of domestic consumption – East Java alone needs an estimated 7 million MT of cassava, more than double of its current production. The gap is currently being met by imported starch. There are opportunities to increase production to meet domestic and global demand for cassava chips and reduce imports of starch.

East Java is the third largest cassava producer in Indonesia, contributing 13% to national production. Cassava is the largest production crop in Trenggalek district, and the second largest (after rice) in Sampang district. Trenggalek has approximately 23,200 farmers growing cassava; an estimated 11,600 are from low-income households. Sampang district has an estimated 55,000 farmers growing cassava, most of whom are considered poor. Compared to the average national productivity rate of 22.4 MTs/ha, the productivity of Trenggalek's cassava farmers is relatively high (at an average of 23.2 MTs/ha), while that of farmers in Sampang is relatively low (average 13.2 MTs/ha).

The province of NTT contributes 3.3 percent to national production of cassava. In Timor Tengah Utara (TTU) district, cassava is the second staple crop after maize and thus very important for food security. Cassava accounts for an estimated 54 percent of total food production in the district and is planted across 24 sub-districts. An estimated 75 percent (some 37,500) of farmers in TTU grow cassava, and most are considered poor. Compared to the average national productivity rate, that of TTU's cassava farmers is very low (average 9.8 MTs/ha).

Around half of the cassava farmers in TTU are women. Apart from that women plays critical role in decision making in regards to what input to be used and how much to spend on inputs. They are very critical in primary and secondary processing at the household level.

PRISMA has chosen East Java and NTT to start the pilot because (a) growth potential here is high, (b) farmers in the region have difficulty accessing extension services and appropriate agro inputs, and (c) farmers in the districts find it difficult to access the high value commercial markets which supply to the large-scale cassava industries.

The major challenges to the cassava sector in East Java and NTT are:

- Low productivity. Farmers have little knowledge of modern, appropriate and efficient farming techniques and practices, which results in low productivity compared to its potential. This is caused by a) limited access to appropriate agro inputs, and b) lack of access to extension services.
- Low quality of processed cassava. Inferior quality primary and secondary processing directly results in the substandard quality of the processed cassava. This is also caused by a) limited availability of processing services, and b) lack of access to primary processing knowledge.

- Limited access to high value markets. Farmers have little awareness of the potential economic value of cassava, which affects how they sell it, namely, in small quantities at the local market. This is caused by limited numbers of large or industrial-scale traders in the area and disconnect with the existing large traders/buyers and producers.

PRISMA's vision of change is that by 2018, farmers in Trenggalek, Sampang, Sumenep and TTU will improve their productivity, quality and consistent supply of cassava to meet the demands of processing companies. Its market value will have increased, attracting more farmers to go into cassava production, which will increase national production to meet local and international demands. This vision can be achieved through:

- Private sector partners/exporters providing farmers with better access to extension services, appropriate agronomical inputs, and better secondary processing services.
- Traders and businesses providing better market access to farmers.

To achieve this vision, PRISMA will collaborate with the private sector to:

1. Increase access to good agriculture practice and fertiliser provision
 - a. Promote the sale and use of organic fertiliser.
 - b. The private sector partner will provide ToT training and information on good farming practices, specifically on business development, for distributors who will then become a key trainer for farmers.
 - c. Develop a marketing and promotion strategy and activity plan to help intermediate service providers educate, promote, and sell their extension services to the farmers.
 - d. Involve women in the GAP trainings as they are key actor in household decision making.
2. Promoting rewarding system and Gap to increase the quality and regularity of fresh cassava supply.
 - a. Strengthen training in GAP and disseminate knowledge.
 - b. The private sector partner will provide experts to organise a) ToT for local collectors, and b) organize demonstration plots. The trained collectors will afterward deliver this technical advice to their male and female farmers.
3. Developing a consistent supply of cassava chips for local animal feed industry.
 - a. Develop a new animal feed production business in NTT that will use cassava chips as one of the key input creating new market access for the crop.
 - b. Develop extension services which focus on good agriculture practices (GAP) and good processing practices (GPP)
 - c. Introducing slicer renting services for cassava. Partner will provide technical assistance to ISP (who manage slicer renting services).

2. Background

Department for Foreign Affairs and Trade (DFAT) has been a key player in supporting development activities in Indonesia. The Australia Indonesia Partnership for Decentralization - Rural (AIP - Rural) aims to increase rural incomes in 5 provinces of Eastern Indonesia. The goal of Promoting Rural Income through Support for Markets in Agriculture (PRISMA) is to contribute to a 30% or more increase in net incomes for 300,000 poor rural female and male farmers by December 2018.

To enable a quicker start for the new project by identifying potential partners, building up their capacity to take on the role of market facilitators, AIP-Rural commissioned Swisscontact – Swiss Foundation for Technical Cooperation – to implement a small project called IMDI (Introducing Market Development in Indonesia) from October 2012 till 31 March 2014. The cassava sector was selected because of its importance in many households' economy in East Java and East Nusa Tenggara.

This Growth Strategy Document (GSD) on the Cassava sector in three districts in Indonesia – Trenggalek and Sampang in East Java Province and Timor Tengah Utara and in East Nusa Tenggara (NTT) – has been produced by SNV Indonesia through IMDI from research in early 2013. The document is not intended as a comprehensive sector report; rather it is to provide a logic and rationale for market-based interventions which can support the cassava sector to the benefit of small-holder producers.

3. Sector description

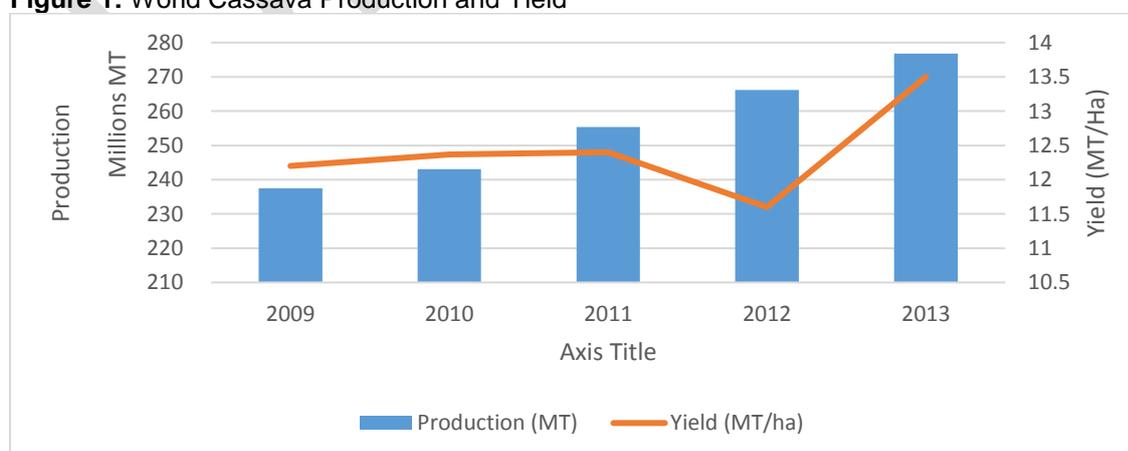
3.1 Sector profile

The sector profile provides information on the current status and potential of the target sector. This has been derived mainly from secondary data and literature relevant to the cassava sector.

3.1.1 Overall context

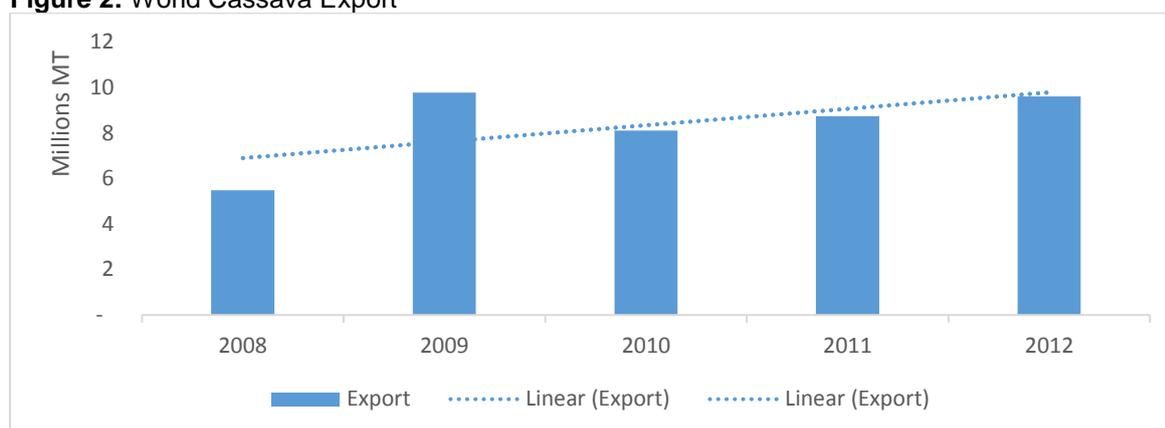
The global production of cassava is increasing, total being 276 million MT in 2013 (FAOSTAT). Figure 1 shows an unusual fall in average yield in 2012, however it came back to increasing trend in 2013. The average yield is 13.5MT/Ha in 2013.

Figure 1: World Cassava Production and Yield



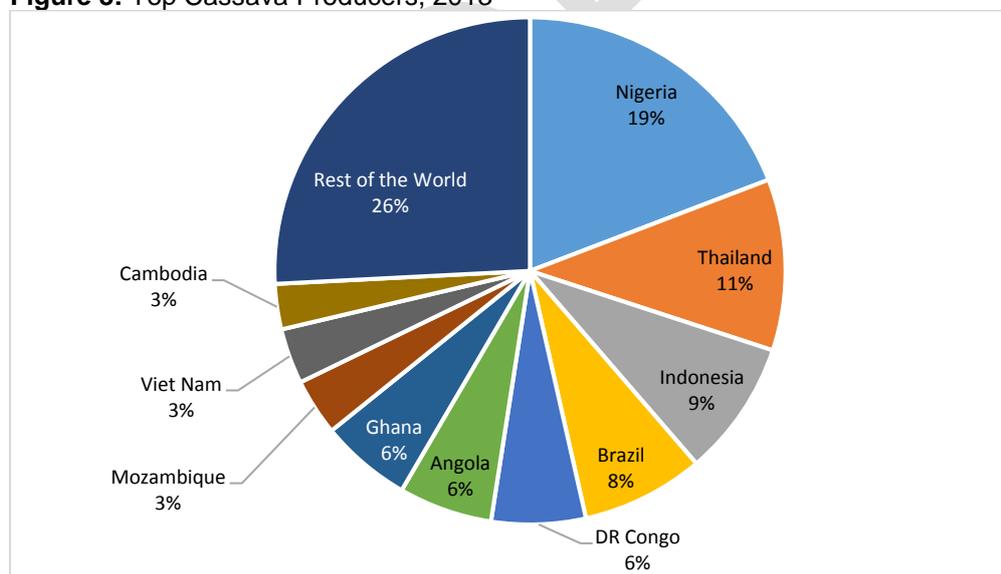
There is a growing demand of cassava and cassava products in the world. The export of cassava products (in the form of cassava, dried cassava and cassava starch) in the world has increased by 75% from 2008 to 2012. A total of 9.6 million MT of cassava products are traded internationally in 2012, which are worth of USD2.7 billion (FAOSTAT¹). Cassava is mainly used for food (53%), feed and seed (24%) with other uses such as bio ethanol, paper, and glue accounting for (23%)².

Figure 2: World Cassava Export



Nigeria, Thailand and Indonesia are the top three cassava producers among 102 cassava producing countries in the world (FAOSTAT). Together they produce around 40% of world's total cassava production of 276 million MT in 2013.

Figure 3: Top Cassava Producers, 2013

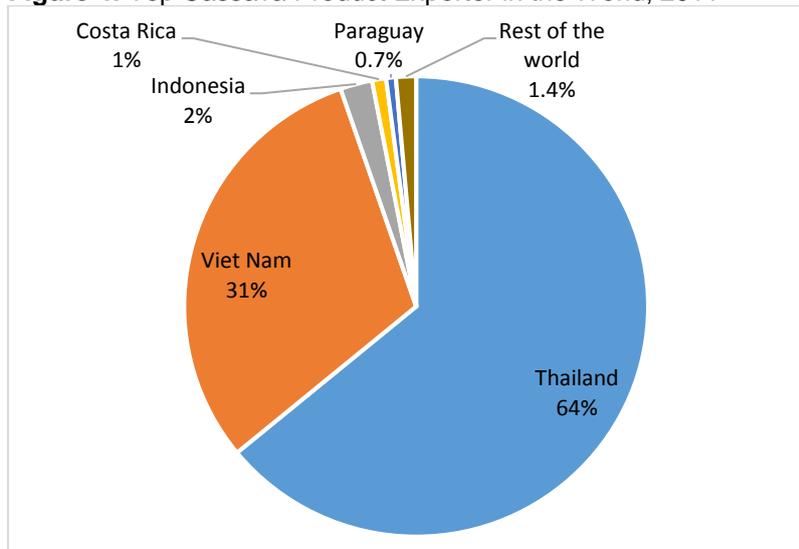


Thailand is the largest exporter of cassava products in the world, exporting 64% of world total export alone. After Thailand, Viet Nam is the 2nd largest exporter. Indonesia exports around 2% of world export in the world (FAOSTAT).

¹ <http://faostat3.fao.org/home/E>

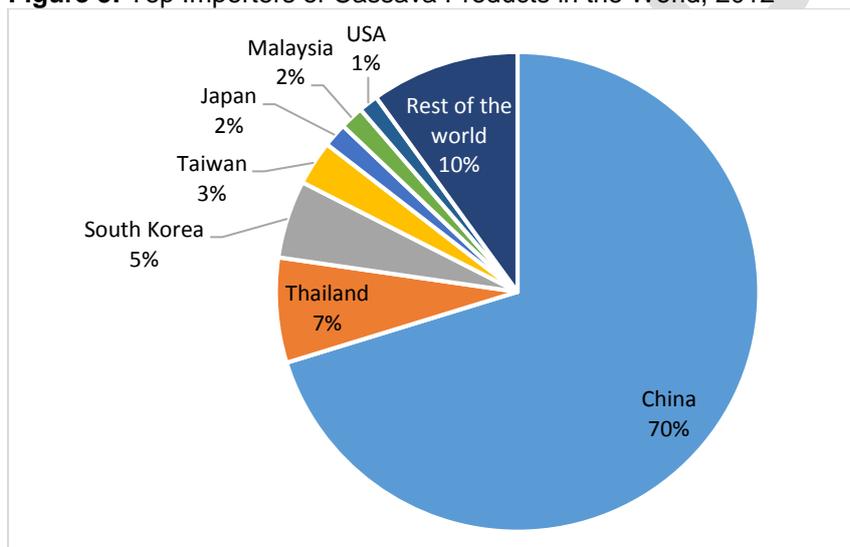
² Leen Kuiper, et al. 2007. Bioethanol from cassava. Ecofys. The Netherlands. www.ecofys.com

Figure 4: Top Cassava Product Exporter in the World, 2011



China alone imports 70% of world’s total import. Top 6 importers of cassava products are from Asia (FAOSTAT).

Figure 5: Top Importers of Cassava Products in the World, 2012



3.1.2 Local context

Indonesian domestic consumption of cassava and cassava product has also had a significant increase. This has helped the increased production find its way to the local markets. Cassava is the third most significant agriculture product in Indonesia after rice and maize, with production of 24 million MT covering 1 million hectares in 2013 (FAOSTAT). Domestic demand for cassava is strong as it is consumed as a staple food particularly in Eastern Indonesia, used in Indonesian snacks as well as in food processing and for other industrial uses. Over the five year period from 2009-2013, Indonesia increased its production of cassava by 9%. The demand for modified cassava flour (Mocaf) is also growing driven by major producers such as *Indofood* and *Tiga Pilar Groups*.

Cassava production in Indonesia has continued to go up, however the export has gone down over the last decade. The Indonesian cassava export has gone down by more than 800%

from 2004 to 2012 (Figure 7). The yield in Indonesia (22.4MT/Ha in 2013) is higher than the world average, however the best yield is recorded in India as 34.8MT/Ha in 2012 (FAOSTAT).

Figure 6: Cassava Production in Indonesia

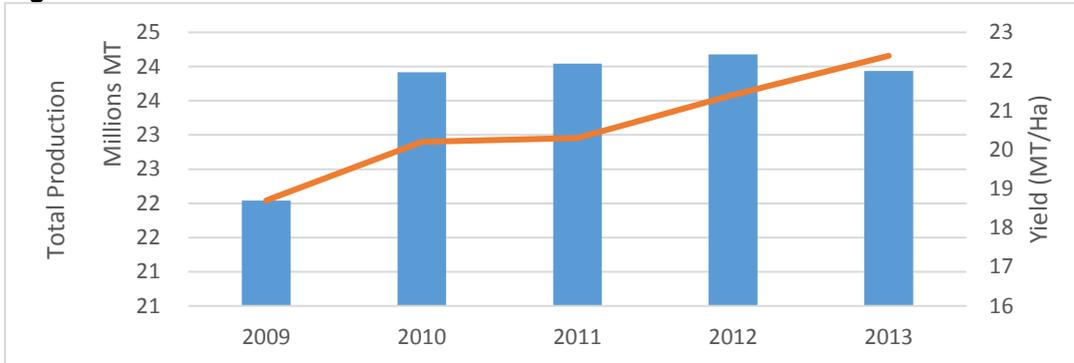
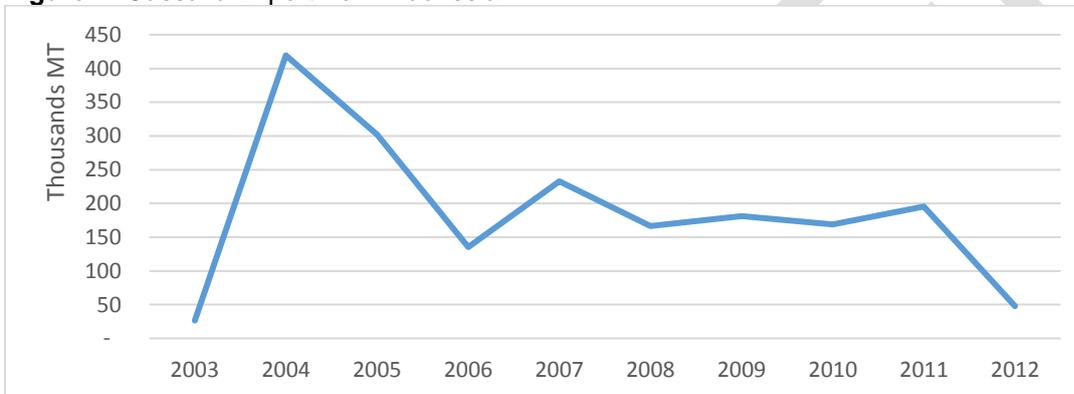
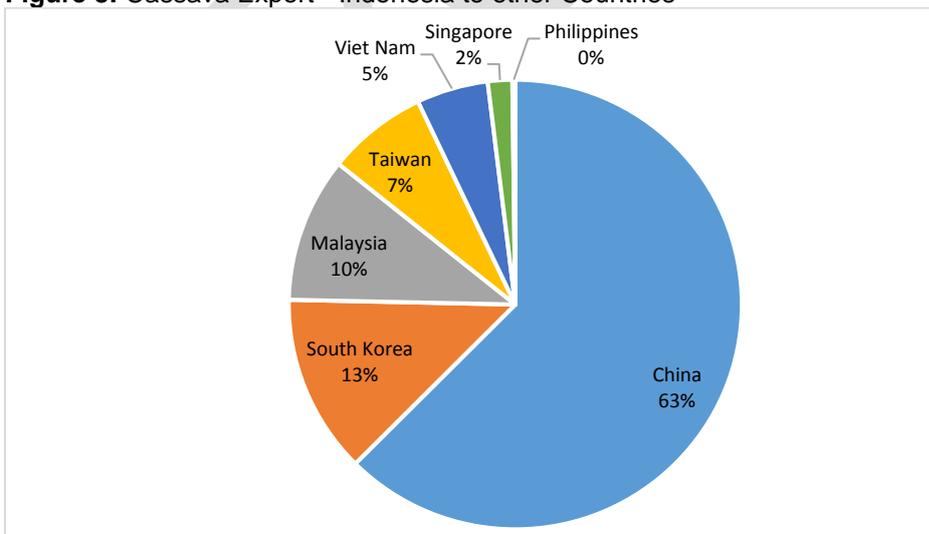


Figure 7: Cassava Export from Indonesia



China, South Korea and Malaysia are the largest importers of Indonesian cassava products. China alone imports more than 60% of Indonesia’s total export.

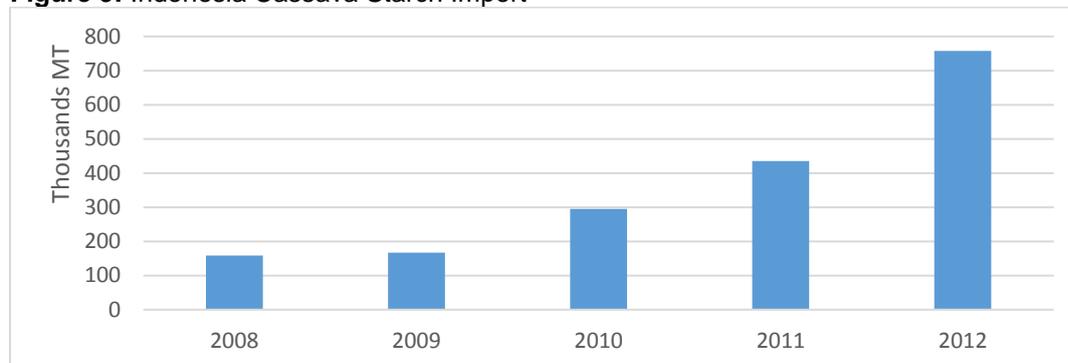
Figure 8: Cassava Export - Indonesia to other Countries



Despite the growth in production, Indonesia imports large quantities of cassava starch, estimated around 720,000 MT in 2012, which has increased by 370% from 2008 to 2012 (FAOSTAT). The shortfall in Indonesia stems from a comparatively under-developed processing industry compared to regional competitors such as Thailand, where the majority of the imported

starch originates. There is strong growth potential for cassava with the demand in East Java estimated at 7 million MT which is well above the current production level of just over 3 million MT³. Currently some of this demand is being met by importing starch, which indicates there is an opportunity for import replacement. There is also international demand for cassava chips with China expecting to double consumption over the next five years.

Figure 9: Indonesia Cassava Starch Import



Lampung Province in Sumatra accounted for 38% (around 9 million MT) of all cassava production in Indonesia in 2011. East Java contributed 13% to national production and East Nusa Tenggara (NTT) an estimated 3.3%. Cassava production in East Java declined 8% between 2007 and 2011 while production increased by 38% in NTT, albeit from a much lower base⁴.

The Indonesian Ministry of Agriculture has targeted to increase cassava production by 5.5% annually and increase the land available for cassava cultivation by 1.6% through bringing under-utilised land into productive use. There are policies and programs that have helped stimulate the sector. For example, the regulation on the acceleration of food diversity based on local resources to achieve food security, (Peraturan Pemerintah (PP) 22/2009)⁵ has triggered the growth of modified cassava flour (mocaf) production and composite rice made from mocaf and maize flour. National Roadmap for Biofuel has a target to increase bio-ethanol use in fuel from 5% to 15% between 2005 and 2025 (Presidential Instruction no 1/2006), which has helped support bio-ethanol industries using sugar cane, jatropha, coconut and cassava for fuel production.

Cassava is the largest production crop in TTU and Trenggalek, and the second largest after rice in Sampang⁶. Almost all cassava production in the three target districts is undertaken by smallholders. Cassava is generally intercropped with other commodities like maize, ground nut, green bean, coconut, coffee, and sometimes durian. Most farmers plant local varieties such as *Menthik* in Trenggalek and *Laku Muti* in TTU. Despite Cassava being the most significant crop in terms of production volume of staples, it is generally considered the third most important crop in terms of government priority. This is because cassava is not the primary staple food in any of the three districts⁷.

³ AIPD Rural Tier 2 Commodity Briefs, Collins Higgins Consulting Group, December 2012, p. 32

⁴ Presented by Cargill at SNV workshop, 22 May 2013 and East Java Province Agricultural Department and Perum Perhutani.

⁵ www.ditjenpdn.kemendag.go.id/index.php/public/information/articles-detail/berita/66

⁶ AIPD Rural Tier 2 Commodity Briefs, Collins Higgins Consulting Group, December 2012

⁷ Data from interviews conducted during field research, March, 2013

The Cassava industry is more dynamic in Trenggalek, East Java, where it is primarily traded as a cash crop. There are 23,200 farmers who grow cassava in Trenggalek with an estimated 11,500 farmers from low-income households. Total production in 2011 was 350,000 MT. Productivity in Trenggalek is the highest of the three districts with an average 23.2 MT/ Ha⁸.

In Sampang, East Java, Cassava is used both in household consumption and traded locally. The district has an estimated 55,000 farmers growing cassava, most of them are poor with an average plot of 0.25 ha. Commonly small farmers only plant cassava on the border of rice fields. In 2010, cassava production was 185,000 MT from 14,000Ha with productivity of 13.2 MT/Ha. Cassava is used both as a staple dish in *Sela* (small chopped and dried cassava mixed with rice) and as a cash crop with cassava traded at *Sri Mangun* and *Torjunan* traditional markets⁹.

In TTU the Cassava industry is less developed with very low productivity, and it is primarily consumed as a staple food amongst small-holders. An estimated 75% (some 37,500 approx.) of farmers in TTU grow cassava with average plot of 0.5Ha. About half of these farmers are female. Cassava accounts for an estimated 30% of household income. The total production is 98,000 MT from 10,000 Ha with an average productivity is 9.8MT per ha, which is almost half of the national average (around 22.4 MT/Ha). Cassava accounts for an estimated 54% of total food production in the district, and is planted across 24 sub-districts. The three largest producing sub districts in TTU are Miomaffo Timur, Biboki Feotelu and Insana Barat. Cassava is also used to feed livestock such as pigs.

As cassava is one of the most drought tolerant crops it is likely to be less impacted by rising temperatures and climatic variabilities, than other crops. This is particularly relevant for the drier conditions of Eastern Indonesia. In fact, the bioclimatic crop suitability is likely to increase in Indonesia. However, the threat of pests and diseases is also likely to increase¹⁰.

3.2 Sector dynamics

3.2.1 Market overview

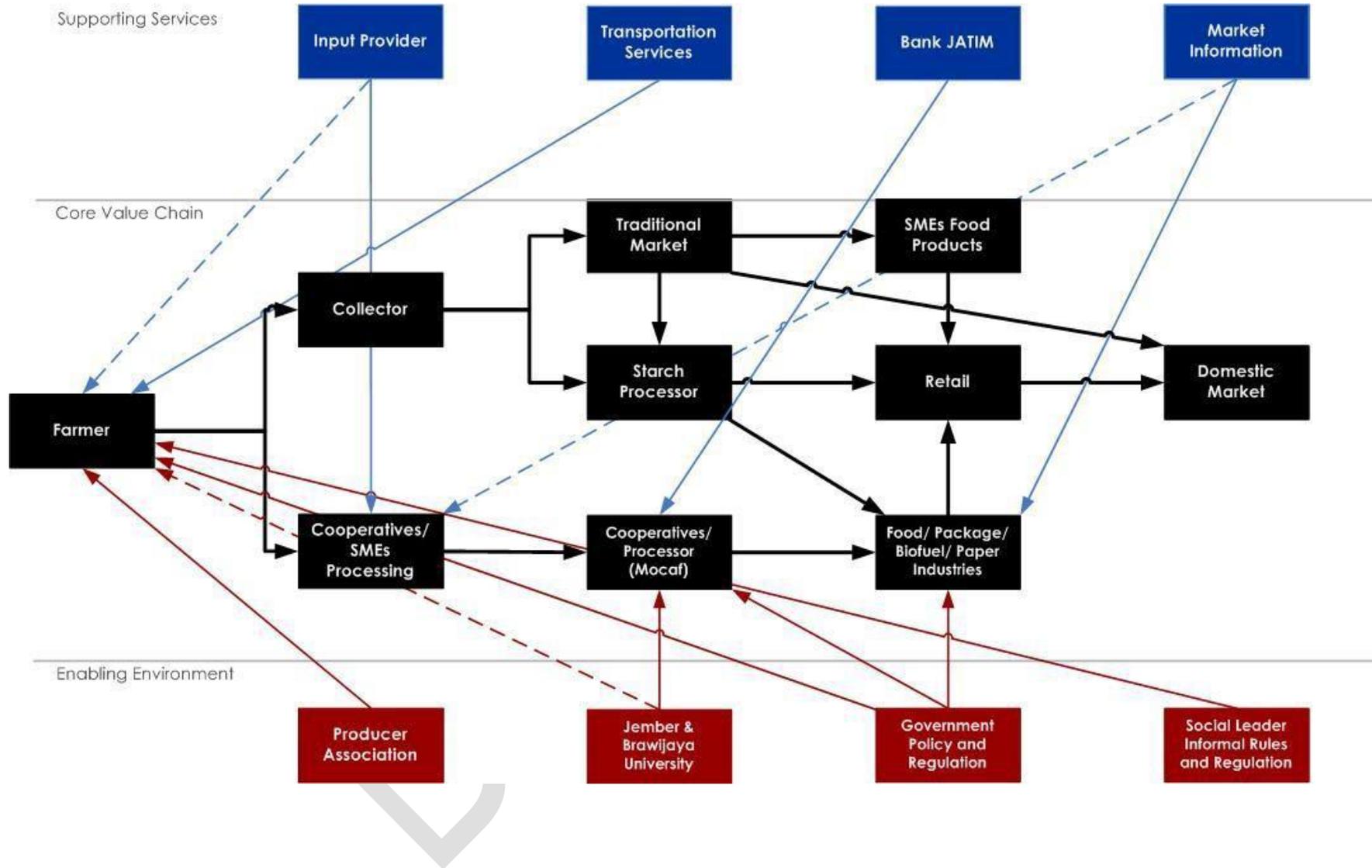
TTU and East Java are markedly distinct in their profile and dynamics. The most dynamic market for cassava out of the three target districts is East Java, particularly Trenggalek where starch and moca processing exist. In Sampang, farmers tend to harvest gradually based on cash needs. There are few farmers/home industry processors as almost all raw cassava crackers are from the neighboring Pamekasan District. In TTU, cassava is mostly sold fresh and largely used for home consumption with only a few farmers selling cassava chips.

⁸ AIPD Rural Tier 2 Commodity Briefs, Collins Higgins Consulting Group, December 2012

⁹ AIPD Rural Tier 2 Commodity Briefs, Collins Higgins Consulting Group, December 2012

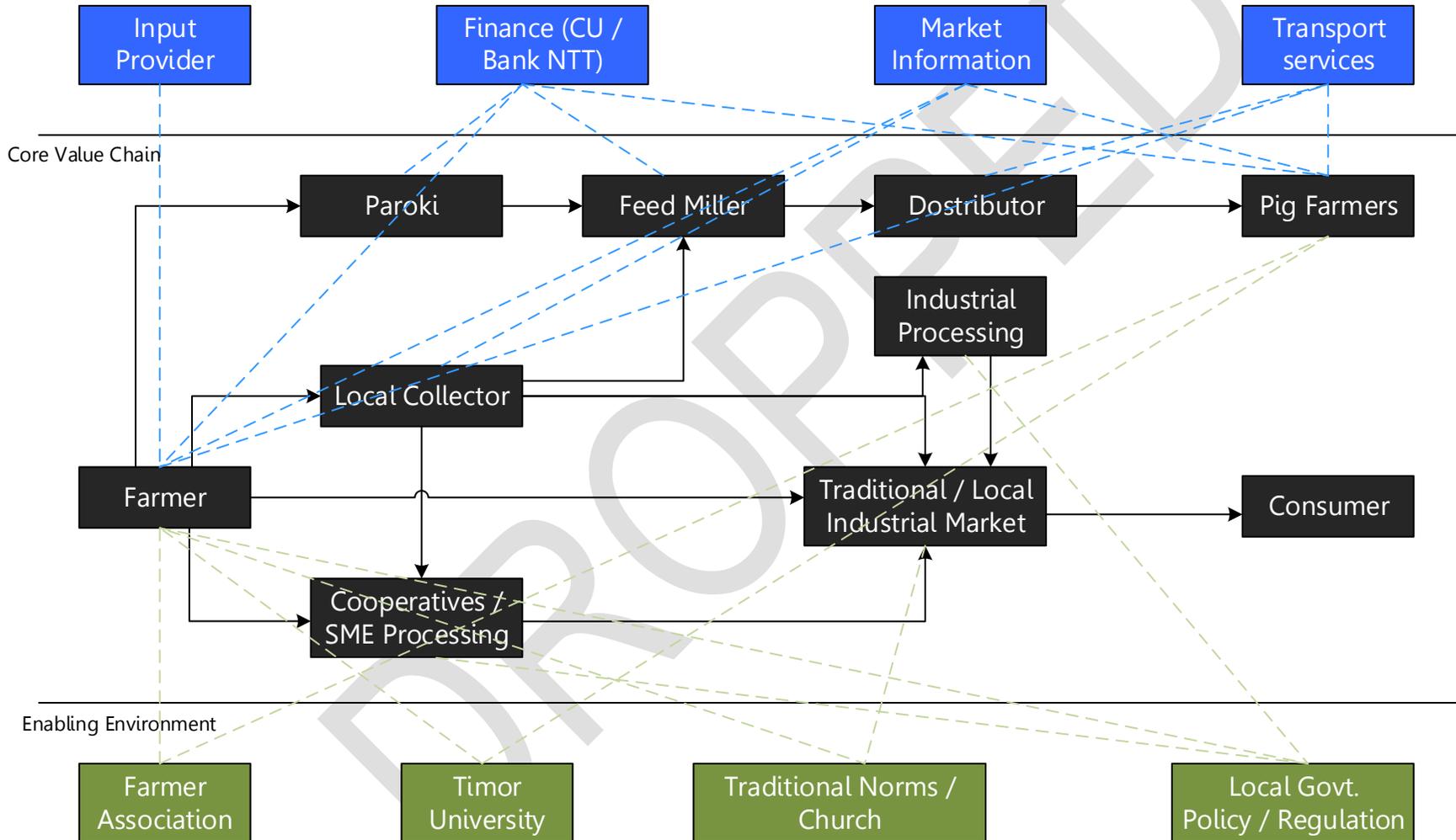
¹⁰ Presentation by Rod Lefroy, CIAT, SNV Workshop 23 May 2013, Jakarta Indonesia.

3.2.2 Sector map: East Java



3.2.3 Sector map: TTU

Supporting Functions



3.2.4 Core value chain

In East Java farmers are more organized in representing themselves to industry and in accessing higher value markets. In Trenggalek, there are producer organizations which support value-add industries such as mocaf production. Farmers join clusters under cooperatives to supply cluster leaders with fresh cassava. These are consolidated to produce fermented dried cassava and supplied to the Gemah Ripah Loh Jinawi cooperative to produce mocaf. The mocaf is then supplied to the food industry through contracted suppliers. This cooperative was not active in the long run, however, the clusters continued to supply the fermented chip to the mocaf factory - PT Tiga Pilar Group in Solo, Central Java – directly. The factory has capacity of 1000 MT/month.

Farmers are accessing value-added industries at the district level. Farmers also supply fresh cassava for the starch home industry center in Pogalan district or to other districts like Ponorogo. Its product goes to contract suppliers in the food and paper industry. There is a more dynamic industry in Trenggalek due to the presence of farmer groups, home industry and lead firms processing starch and mocaf. There are almost 200 home businesses producing tapioca for the local market. There are some limited home industries which produce crackers.

The local government is supporting the private sector to create production zones for Cassava. The local agricultural department has supported the establishment of mono-crop cassava clusters in Angsoka and Sogian villages with support from private companies such as Cargill who supplied seedlings. The production is going to Cargill's operations in Ponorogo. The pilot project has shown positive signs with local farmers supplying around 40 MT of fresh cassava to Cargill with three successful deliveries, and there are plans to scale up by distributing seedlings from the pilot to other villages. Such government driven initiatives have not led to large scale success in the past however.

Cassava production in TTU is focused upon serving local demand. Generally a collector buys fresh cassava from the farmer and brings them to retailers in the traditional market. Some farmers sell directly to traditional markets using minibuses or pick-ups which cost on average IDR 15,000 (\$1-\$2 AUS) return. In TTU both men and women spend time in the field for cultivation including land preparation, planting, weeding, and harvesting. In traditional markets, it is primarily women who sell fresh cassava.

Options for value-addition are emerging though remain limited in TTU. There is a limited but developing processing industry in TTU. There are very few farmers who process cassava into dried chips or other products as there is no ready market. In TTU starch, raw crackers and fried chips are generally imported from Java. However, farmer organization – Gapoktan Tani Jaya – is processing cassava into dried cassava flour as an input to their processing of corn chips (tortilla). The company also has a pilot project in TTU for cassava mono-crop cultivation.

3.2.5 Supporting Functions / Services

Service providers are supporting post-harvest industries in East Java. In Trenggalek, there are local machinery providers who previously have worked with the Gemah Ripah Cooperative to provide cassava slicers for clusters and equipment for the home starch industry. The cooperative ended the relationship with the machine service provider due to capital limitations since the end of the government scheme. The machinery service provider now serves the farmers (through lead farmers) directly. The cooperative used to get soft loans from the government and this financial support has stopped as they have reached the end of their startup period. The

government supported through approximately USD500-700 for machine cost, while the cooperative provides smaller working capital of around IDR 100,000- 200,000.

Agronomic information is being transferred to farmers through government though services are weak. Government extension workers do not generally provide services to cassava farmers as it is not seen as a priority crop. The Gemah Ripah Cooperative does have extension workers but they focus on post-harvest processing. In Sampang, Cargill Surabaya, through the Department of Agriculture, distributes seedlings to farmer clusters. Seedlings are often provided free of charge to poor farmers via the Catholic Churches in TTU. High yielding varieties must be imported from Java and there are no local machinery providers. PT Singkong Timor Jaya distributes seeds and fertilizer to farmers directly and via the Catholic Church.

The exchange of market information among the actors are limited. The actors who are involved in the international cassava market are aware of the growing demand of cassava product, however that information do not pass down to the farmers' level. The actors who are involved in secondary processing and conversion industry can reap the benefit of growing domestic and international demand if they have more knowledge of that growing demand. However limited knowledge on the market and limited appreciation of the value of processed cassava products in the international market limit their access to the high value markets.

3.2.6 Supporting Rules and Regulations (Enabling Environment)

Government regulations support the development of non-rice commodity sectors. In Trenggalek, the impact of government support for the development of the mocaf industry and composite rice from cassava and maize flour is evident. There is a higher density of farmers and more processors located in Trenggalek. The cassava competes with other food crops (such as wheat) and cassava is increasingly becoming more viable. Indonesia consumes large amount of rice so the government is trying to encourage a more diversified diet. The regulation on food diversity is based on supporting local resources to achieve food security.

Jember University is proactive on research into Cassava. The Food Faculty at Jember University (JU) is striving to be the leader in cassava research in Indonesia. Mocaf is introduced and developed by this faculty. They have already developed one diversified product using mocaf - composite rice - which consists of mocaf, and maize flour.

4. Analysis

4.1 Problems and underlying causes

The problems and underlying causes are specific to the poor target groups that AIP-PRISMA seeks to support through interventions in the cassava market system in EJ and NTT. These problems have been identified through the Sector Dynamics section above and are also presented in the Intervention Logic Analysis Framework (ILAF) table. The 3 key problems faced by farmers can be summarised as:

- Low productivity results in low income for farmers.
- Low quality processed cassava fetches low income for farmers.
- Limited access to high value market results in low income for farmers.

Low productivity results in low income for farmers. Cassava growers suffer from low productivity, particularly in TTU and Sampang where productivity is around half the national average. In Trenggalek the productivity is comparable but could be higher to take advantage of the more dynamic market conditions which exist there. The causes of this low productivity include poor access to appropriate agro-inputs, particularly high-yielding varieties of plants, lack of application of good fertilizers, and the failure to protect against pest-attacks. Extension services are weak – particularly in TTU – leading to low adoption and practice of good farming practices for cassava. Also, better practices require additional income, however the farmers are reluctant to invest that due to perceived low return from the crop.

Low quality processed cassava fetches low income for farmers. Weak extension services also leads to farmers' lack of knowledge on appropriate primary processing. Farmers also do not have access to sufficient secondary processing services like slicing, drying, etc. Both these effects the quality of processed cassava which fails to get access to high value market.

Limited access to high value market results in low income for farmers. The inferior quality of processed cassava effects its access to market. On top it, the exchange of market information is very underdeveloped. Because of that producers do not focus on international market which restricts their access. As a result of this they all perceive cassava as a low return crop for local market, which discourages them to make additional investment required to access the high value commercial market.

4.2 weaknesses in services and rules / regulations

There are a number of services and enabling environment factors which affect the underlying causes of the problems highlighted above. In order to strengthen the market system, it is crucial that identified weaknesses in these services and enabling environment factors are the target of interventions. The key services weaknesses are detailed in the ILAF table and include:

- Agro-input services
- Agronomic extension services
- Processing services
- Business brokering services

Agro-input services. Due to the weakness of the market, particularly in Sampang and TTU, there are few service providers retailing improved agricultural inputs, particularly improved varieties of cassava stem and fertilizer. The lack of competition means that often retailers are not proactive in reaching small-farmers. Also, as the government generally does not see cassava as a priority crop it does not support farmers with improved or relevant agricultural inputs. There is no fertilizer subsidy for cassava production.

Agronomic extension services. Government, local cooperatives and other agronomic extension services are generally weak. Government extension services suffer from a lack of extension outreach, and as input providers are not active locally, there is a lack of transfer of knowledge about good pre-harvest techniques. As government does not prioritize cassava, extension staff tend to focus on other commodities and post-harvest processing.

Processing Services. Govt. provided some limited scale support to some registered cooperatives to acquire equipment/machineries to provide mechanization and processing

services to the members. However, once the start-up phase ended, the activities did not continue. Now there are insufficient mechanization and processing service providers. Also, due to limited information on market potential and service market opportunity, very few entrepreneurs have interested to invest in commercial mechanization and processing services to the farmers.

Business brokering services. There are few business brokering services operating to develop the industry whether at farmer/ producer level or in local processing services. There is a general lack of support from government for SMEs on food processing and marketing issues. Particularly in TTU, there is lack of support to investors to actively operate businesses locally. Community leadership services are not sufficiently commercially oriented. Farmer organizations in the local cassava industry are more focused on social issues than on business development.

5. Strategy for Change

The strategy is designed to strengthen the weaknesses in the current service provision and enabling environment in the market system. This takes the form of (1) identifying the market potential, through calculations to show the potential of the sector; (2) a vision of change, to envisage how the value chain or market system would operate if identified problems are resolved; and (3) a set of interventions which can be targeted at specific market actors or groups of market actors which can be engaged to drive change in the system.

5.1 Market Potential

The sector analysis has provided significant opportunities to impact positively the lives of poor cassava farmers by increasing their awareness of the value of cassava and derived products, strengthening linkages between farmers and processors and working together to increase the volume and quality of cassava production.

The major opportunity is around improving farming practices and introducing new and higher yielding varieties of cassava. This will improve the position of farmers within the cassava market system in East Java, and integrate farmers in TTU into growing market for value-added cassava products. Trenggalek has the highest immediate potential given the existing processing base. However, there are also opportunities to help grow the market in TTU by working with the emerging processors based in the area. There is an opportunity to link the private sector actors with the extension workers to improve farmer production practices.

It has been calculated that with the increase in production (of over 30%) combined with the increased values realized can unlock a potential (untapped) market of over IDR 42 billion in Sampang and Sumenep, IDR 45 billion in Trenggalek, and nearly IDR 112 billion in TTU. See table below.

Table 1: Cassava Market Potential

	Market/Production Value		
	Sampang / Sumenep	Trenggalek	TTU
Average Selling price (IDR/kg)	600	600	2,100
Current Production (MT)	182,390	294,690	106,869
Potential Production (MT)	252,540	372,240	163,575
Current Value of Production (million IDR)	109,434	176,814	224,425
Total value of potential production (million IDR)	151,524	223,344	343,508

Total potential value of increased production (million)	42,090	46,530	119,083
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5.2 Vision of change

The vision of change is that by 2018, farmers in Trenggalek, Sampang, Sumenep and TTU will improve their productivity, quality and supply of cassava to meet the demands of processing companies. Its market value will have increased, attracting more farmers to go into cassava production, which will increase national production to meet local and international demands. At the service level the vision is to develop three key services: (1) Agro input services – through established input companies; (2) agronomic extension services - through the development of processing industries proximate to the target districts; and (3) business brokering services – through linkages with large traders and agro-processing industries.

5.3 Intervention Areas

It is crucial that interventions are designed which are ‘systemic’ so that outcomes are not dependent upon the project or development partner for sustainability. This means that AIP-PRISMA should not seek to provide services (or at least only temporarily) but rather enter the market system in a catalytic manner to tackle the service weaknesses in existing market actors. Based on our analysis, two key intervention areas will be necessary to transform the cassava sector in EJ and NTT:

- **Intervention Area 1:** Increasing access to good agricultural practice and fertilizer provision.
- **Intervention Area 2:** Promoting rewarding system and GAP to increase quality and regularity of cassava supply.
- **Intervention Area 3:** Developing a consistent supply of cassava chips for local animal feed industry.

Intervention Area 1: Increasing access to good agricultural practice and fertilizer provision.

This intervention specifically addresses adoption of **appropriate agricultural inputs and good farm practices** amongst cassava farmers, which is a fundamental issue contributing to increasing average yields. The intervention is based on private sector partner (Organic fertilizer company) expanding their market and their distribution network of organic fertilizer in Trenggalek. In addition, agents will provide information on good agricultural practices (GAP) through trainings to the farmers as embedded service with fertilizer provision. The GAP trainings will include planting distance, drainage, cleaning and weeding, pest control, fertilizing and planting schedule. These embedded service has the potential to increase year round productivity. The agent (farmer groups and women cooperative) will be engaged as the trainers who will deliver GAP training to farmers and establish demonstration plots to support trainings. The company will support demonstration plots and technical assistance as well as provide promotional support to the agents.

Intervention Area 2: Promoting rewarding system and GAP to increase quality and regularity of cassava supply.

The intervention is based on large traders providing extension services to local collectors, which in turn will improve the collectors’ capacity to disseminate these information to farmers. The traders will also buy fresh cassava from the farmers and as they will buy over a period of time, it will have the potential to stabilize the price for the farmers. The traders will supply input and

training of Good Agriculture Practices (GAP). Both of Taman Organic and Mr. Amir (a major local trader) will provide cassava seed stem for farmers, provide experts to organise: a) Training for local collectors, and b) organize demonstration plots. The trained collectors will afterward deliver this technical advice to their farmers.

Intervention Area 3: Developing a consistent supply of cassava chips for local animal feed industry.

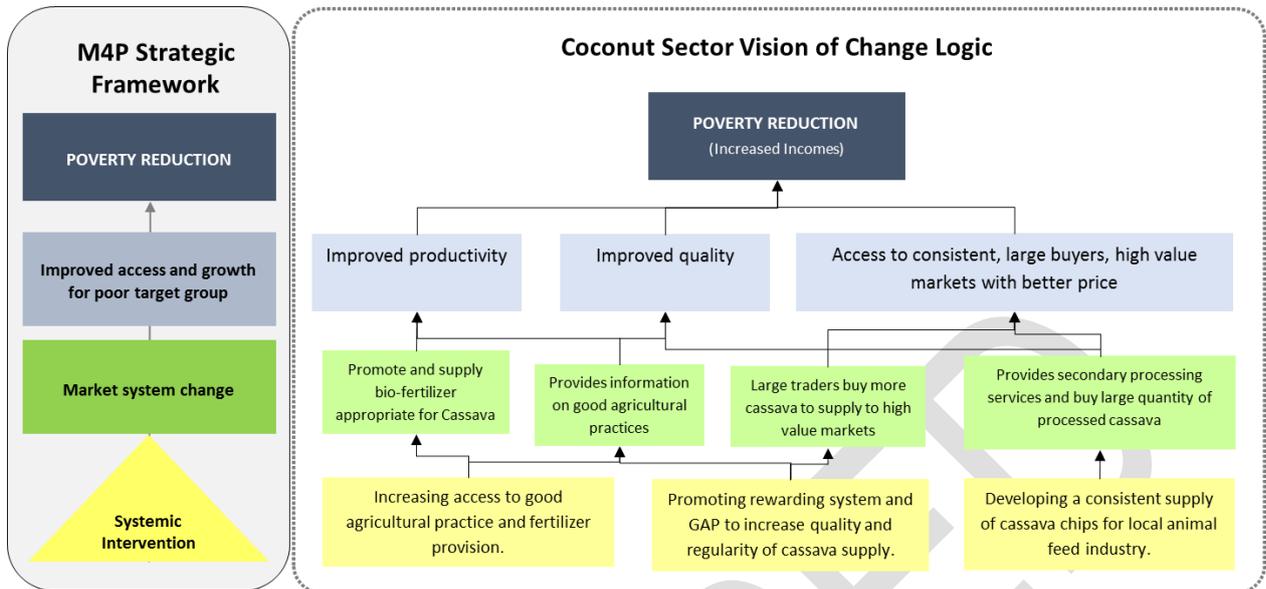
The intervention in NTT is based on the commercial buyer providing extension services to the Parokis (local representative body of the Catholic Church) that will act as chip collectors. In turn they will train farmers operating under a contract system. The commercial buyer will deliver the training on GAP and processing techniques to the church bodies at the district level. The buyer will invest in machinery, production building, warehouse, a computer and labor. Church bodies will arrange the demonstration plots. The Church will also rent a mobile slicer so that they can process cassava chip faster, in a thinner and uniform shape that will reduce the drying period. Through this intervention farmers can get access to knowledge, processing services and regular cassava chip market.

Chips can in turn be used as a major ingredient for the production of animal feed. With no local feed production available in TTU there is a significant market opportunity for local production. There is especially the potential for pig feed production TTU is a Christian dominant area and every household has at least some pigs and there are many small and medium scale pig farmers. Large national feed companies do not have a large presence on the Island and the feed that is available is expensive. Therefore, the establishment of local feed industries has a natural growth potential.

5.4 Sequencing and prioritization of interventions

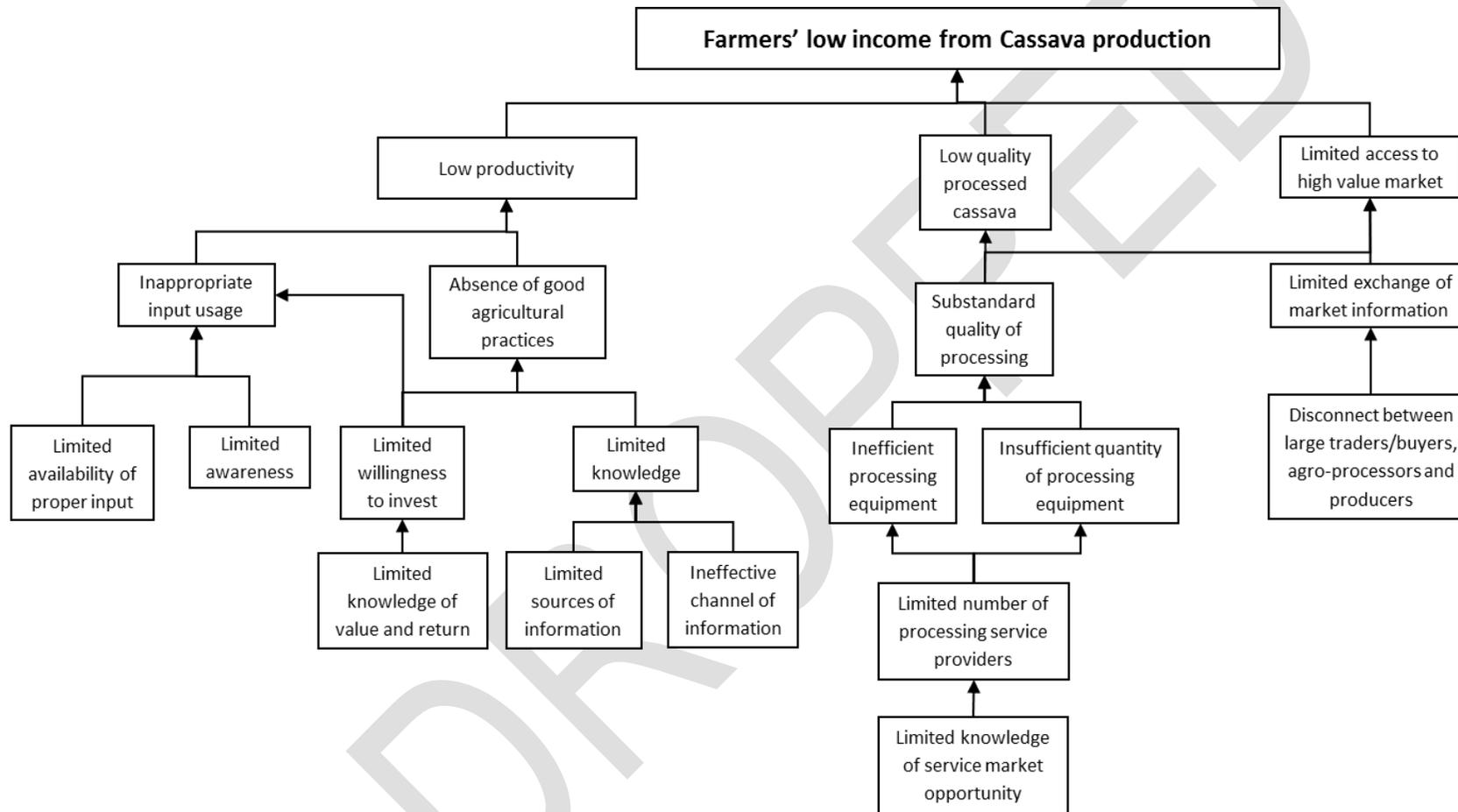
As the proposed interventions are focusing different geographic locations, all three can start at the same time. For intervention 1 and 2, once the pilot phase is successful it can be scaled up to neighboring cassava producing districts. Also these districts are already inclined to produce cassava, so productivity increase will attract large number farmers very soon. For intervention 3 once the pilot phase is successful it can be scaled up all over TTU, Timor Island) and Flores Island..

5.5 Sector Vision of Change Logic



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Annex 1. Constraint Tree



Annex 2. Intervention Logic Analysis Framework (ILAF)

(1) Problem/ Symptom	(2) Underlying cause	(3) (4) Services and Enabling Environment	(5) Service weaknesses/ underlying causes	(6) Intervention Areas	Service Provider/Partner
Low productivity results in low income for farmers	I. Farmers do not use right input (good varieties) II. Farmers do not apply fertilizer III. Farmers do not apply good agricultural practices IV. Certain pest attacks significantly reduce productivity V. Farmers' limited willingness to invest due to low return	Agronomic extension services Pest control services Market promotional services	I. Limited availability of proper input/fertilizer II. Farmers are unaware of appropriate usage of inputs III. Limited alternative sources for agriculture information IV. Available Extension services are insufficient and ineffective	Intervention 1: Increasing access to good agricultural practice and fertilizer provision. Intervention 2: Promoting rewarding system and GAP to increase quality and regularity of cassava supply.	<ul style="list-style-type: none"> • Input company • Large industrial traders/buyers
Low quality processed cassava fetches low income for farmers	I. Primary and secondary processing methods are substandard	Agronomic extension services Processing services	I. Farmers are unaware of good primary processing practices II. Processing equipment are inefficient III. Limited number of processing equipment and service providers IV. Service providers are unaware of service market opportunity	Intervention 2: Promoting rewarding system and GAP to increase quality and regularity of cassava supply. Intervention 3: Developing a consistent supply of cassava chips for local animal feed industry	<ul style="list-style-type: none"> • Medium size local animal feed producers • Large animal feed producers • Local level traders
Limited access to high value market results in low income for farmers	I. Primary and secondary processing methods are substandard II. Limited exchange of market information III. SMEs find it difficult to market cassava products IV. Market is largely constrained to local market with processors only beginning to emerge	Processing services Business brokering services Market promotion services	I. Insufficient and ineffective processing equipment and service providers II. Disconnect between large trader/buyer, agro-processors and producers	Intervention 3: Developing a consistent supply of cassava chips for local animal feed industry	<ul style="list-style-type: none"> • Medium size local animal feed producers • Large animal feed producers • Local level traders