

Introducing Market Development Indonesia (IMDI)

SECTOR REPORT

Cassava in East Java, & NTT



SNV Netherlands Development Organisation
JI Kemang Timur Raya 66

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Table of Contents

1	Executive Summary	3
2	Background	5
3	Sector Profile	6
3.1	International Context	6
3.2	National Context	7
3.3	Timor Timur Utara (TTU), Nusa Tenggara Timur (NTT) Province, and Trenggalek and Sampang, East Java Province	8
4	Sector Dynamics	9
4.1	Market Map	9
4.2	Core Value Chain	12
4.3	Supporting Functions/ Services	12
4.4	Supporting Rules and Regulations (Enabling Environment)	13
5	Analysis	14
5.1	Problems and Underlying Causes	14
5.2	Services, Enabling Environment and Weaknesses Analysis	15
6	Strategy	16
6.1	Market Potential	16
6.2	Vision of Change	17
6.3	Interventions	17

1 Executive Summary

The majority of global demand for Cassava is in Asia. Indonesia is major exporter of Cassava and national production is increasing. It is the third most significant agricultural product in the country after rice and maize and the government is increasingly providing support to the Cassava industry. Cassava is not expected to be adversely affected by climate variability there is strong growth potential for cassava due to growing local and international demand. However, processing industries are under-developed in Indonesia and the country is increasingly importing cassava starch to make up for the shortfall in domestic supply.

Regionally, southern Sumatra and East Java account for over half of Indonesian cassava production. Cassava is the largest production crop in TTU and Trenggalek, and the second largest after rice in Sampang. In Trenggalek, East Java, the Cassava industry is more dynamic in where it is primarily traded as a cash crop and in Sampang, East Java, Cassava is used both in household consumption and traded locally. In East Java farmers are more organised in representing themselves to industry and in accessing higher value markets. In TTU the Cassava industry is less developed and farmers experience very low productivity, here the commodity is primarily consumed as a staple food amongst small-holders. Even in TTU, where Cassava production is focused upon serving local demand, options for value-addition are emerging though remain limited. Service providers are supporting post-harvest industries more dynamically in East Java.

Generally in the Cassava sector farmers can be seen to be accessing value-added industries at the district level. The local government in the target districts is supporting the private sector to create production zones for Cassava. Farmers in cooperatives are better able to access credit and access agronomic information through government, though services are weak, particularly in TTU. Government regulations support the development of non-rice commodity sectors and the government is promoting access to additional land in return for commitments to sustainable forest management. Local academic and research institutions such as Jember University are proactive on research into Cassava. In more traditional areas local social structures and norms impact upon small-holder farm practices as rituals need to be undertaken prior to cultivation.

The **key problems in the Cassava sector in East Java and NTT** include: general low productivity amongst cassava growers; a lack of working capital for cooperatives and other farmer representative organizations; limited land for cassava planting; unreliable fresh supply for processing industries; Cassava starch producers do not receive quality produce for commercial processing and trading; and particularly in TTU farmers find it difficult to sell fresh cassava. In this the **key services which can be strengthened to impact positively on the local market system** include: agro-inputs services, for the promotion and retailing of improved technologies; agronomic extension services, to enable the adoption of GAP; financial services, particularly the provision of products which can be adopted by small-holder Cassava grower and groups; state forestry services, in relation to Cassava growers accessing restricted lands; and business brokering services, to support the development of the industry.

A vision of change is outlined for the sector and service levels for the cassava sector in East Java and NTT. The vision of change at the **sector level** is to increase the productivity, the supply and quality of cassava to meet the growing domestic demand for cassava from processors. At the **service level** the vision is to develop three key services: (1) financial services, through the development of a new financial product; (2) extension services, through the development of processing industries proximate to the target districts; (3) and,

representation services to develop responses to key threats such as biological control services (particularly through government services to tackle the cassava *Mealy Bug*).

It has been calculated that with the increase in production (of over 30%) combined with the increased values realised can **unlock a potential (untapped) market of over AUD 4M in Madura Island, AUD 4.5M in Trenggalek, Malang, and Kediri, and nearly AUD 12M in TTU**. As a strategy to realise this market potential and vision of change this report recommends five inter-related interventions to achieve the vision of change. These comprise:

- 1. Increasing the quantity and quality of fresh cassava supply for starch processing.***
- 2. Increasing the quantity and quality of supply for modified cassava processing***
- 3. Developing a consistent supply of cassava chips.***
- 4. Advocacy policy to Government and stakeholders to improve support for sector including land access and extension services.***
- 5. Establish national forum to address key sector issues.***

2 Background

AusAID has been a key player in supporting development activities in Indonesia. The Australia Indonesia Partnership for Decentralization-Rural aims to increase rural incomes in 5 provinces of Eastern Indonesia. Under this framework it has tendered a new project. The goal of Australia Indonesia Partnership for Promoting Rural Income through Support for Markets in Agriculture AIP - PRISMA is to contribute to a 30%, or more, increase in net incomes for 1,000,000 poor rural female and male farmers, 300,000 of which will be reached by June 2017.

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 – the 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 coconut sector was selected because the sector is the one of the main income source of farmers in Indonesia such as the East Java districts of Tenggalek and Pacitan.

This Sector Report on the Cassava sector in three districts in Indonesia, Tenggalek and Sampang in East Java Province and Timor Tengah Utara and in Nusa Tenggara Timur (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. The report is result of a learning process by which NGOs were mentored by Swisscontact to develop their capacity for engaging in wider market-oriented programming in specific agricultural sectors. Certain interventions identified in this report will be commissioned for implementation under the IMDI initiative.

3 Sector Profile

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

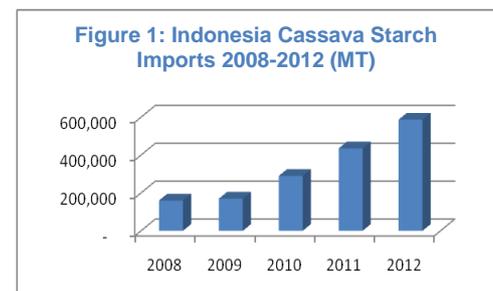
3.1 International Context

3.1.1 The majority of global demand for Cassava is in Asia.

The world demand for cassava imports is estimated at 220MMT per year¹. 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. In tropical areas, cassava is the third most important calorie source after rice and maize³. The largest importers of dried cassava are China followed by the USA and South Korea. The current demand in China for cassava starch is an estimated at 989,000 MT and worth USD 459M and for cassava chips demand is estimated at 5.7MMT per year (USD 120M).⁴In Asia, the demand for cassava chips is increasing, particularly for bio-fuels, with one bioethanol plant requiring approximately 4MT of cassava chips per day. Demand for cassava chips from European countries is largely for animal feed as substitute for grain.

3.1.2 Indonesia is major exporter of Cassava and national production is increasing.

Indonesia is the third largest producer of cassava after Brazil and Nigeria, and is the fourth biggest exporter. Thailand is the world's leading exporter of dried cassava exporting 430 MMT, with Indonesian exporting approximately 145MMT⁵. Between 2007 and 2011, cassava production increased by 17% nationwide. The competitive advantage for cassava production and trading in Indonesia is the lower cost base, large areas of land suitable for cassava production and many high yielding cassava varieties. Trade agreements influence the price of cassava, and a recent decision by the Chinese Government to abolish the 6% import tariff on Thai cassava products has boosted Thai exports to the country.



3.1.3 Indonesia is increasingly importing starch to make up for the shortfall in domestic supply.

Although an exporter of Cassava regionally, Indonesia is increasingly importing Cassava Starch, with imports reaching 600,000 MT in 2012⁶ with around half in East Java (2010).⁷ 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. Starch imports fluctuate due in some part to currency valuations, generally however the price for imports is are typically no more expensive than locally produced starch.

¹Deo Berita. 2012. Perkuat Ketahanan Pangan, Singkong Bisa Diandalkan.

<http://ditiempdn.kemendag.go.id/index.php/public/information/articles-detail/berita/66>

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

³FAO. Cassava: international market profile.

⁴FAO.2006. The World Cassava Economy. <http://www.fao.org/docrep/009/x4007e/x4007e00.htm>

⁵FAOSTAT.2010. Cassava dried export by countries. <http://faostat.fao.org/site/342/default.aspx>

⁶ Table produced from 2008-2011 data from: <http://www.republika.co.id/berita/nasional/umum/12/12/14/mf0ifz-ini-alasan-indonesia-banjir-singkong-impor>; 2012 figure is 587,000 MT for up to September only. Data from:

http://regional.kompas.com/read/2012/12/17/05113818/Impor_Tepung_Singkong_Melonjak_Drastis

⁷Presentation by Rod Lefroy, CIAT, SNV Workshop 23 May 2013, Jakarta Indonesia.

3.1.4 Cassava is not expected to be adversely affected by climate variability.

As cassava is one of the most drought tolerant crops it is likely to be less impacted by rising temperatures 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 increase.⁸

3.2 National Context

3.2.1 Cassava is the third most significant agricultural product in Indonesia after rice and maize.

Cassava is the third most significant agriculture product in Indonesia after rice and maize, with production of 25M MT covering 1.5M hectares in 2012.⁹ 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 2007-2011, Indonesia increased its production of cassava by 17%. The demand for modified cassava flour (Mocaf) is also growing driven by major producers such as *Indofood*.

3.2.2 There is strong growth potential for cassava due to growing local and international demand.

There is strong growth potential for cassava with the demand in East Java estimated at 6.9M MT which is well above the current production level of just over 3 M MT.¹⁰ 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. In addition, 50% of the current volume of Vietnamese export of chips will be required domestically for bio-ethanol plants already under construction.¹¹

3.2.3 Southern Sumatra and East Java account for over half of Indonesian Cassava production.

Indonesia is the world's second largest importer for cassava starch, with estimated demand of 295,000MT (USD 120M) followed by Malaysia and Japan¹². Lampung Province in Sumatra accounted for 38% of all cassava production in 2011, with 9,017,137 MT. East Java contributed 13% to national production and Nusa Tenggara Timur (NTT) an estimated 5%. Cassava production in East Java declined 8% between 2007 and 2011 while production increased by 38% in Nusa Tenggara Timur (NTT), albeit from a much lower base.

3.2.4 The Indonesian Government is increasingly providing support to the Cassava industry.

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. While generally cassava does not have a high level of government support, there are policies and programs that have helped stimulate the sector. For example, the government of Indonesia has introduced a regulation on the acceleration of food diversity based on local resources to achieve food security, (Peraturan Pemerintah (PP)22/2009)¹³. This regulation triggered the growth of modified cassava flour (mocaf) production and composite rice made from mocaf and maize flour. In addition, in the National Roadmap for Biofuel, there is a target to increase bio-ethanol use in fuel from 5%

⁸Presentation by Rod Lefroy, CIAT, SNV Workshop 23 May 2013, Jakarta Indonesia.

¹⁰ AIPD Rural Tier 2 Commodity Briefs, Collins Higgins Consulting Group, December 2012, p. 32

¹⁰Presented by Cargill at SNV workshop, 22 May 2013 and sourced from East Java Province Agricultural Department and PerumPerhutani.

¹¹Presentation by Rod Lefroy, CIAT, SNV Workshop 23 May 2013, Jakarta Indonesia.

¹²FAOSTAT.2010.Meta data for cassava import.<http://faostat.fao.org/site/342/default.aspx>

¹³DeoBerita. 2012. PerkuatKetahananPangan, SingkongBisaDiandalkan.

<http://ditjenpdn.kemendag.go.id/index.php/public/information/articles-detail/berita/66>

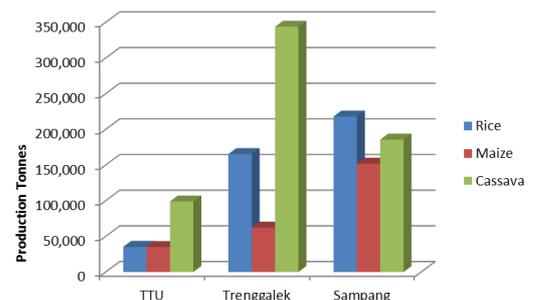
to 15% between 2005 and 2025(Presidential Instruction no 1/2006)¹⁴. This regulation has helped support bio-ethanol industries using sugar cane, jatopra, coconut and cassava for fuel production.

3.3 Timor Timur Utara (TTU), Nusa Tenggara Timur (NTT) Province, and Trenggalek and Sampang, East Java Province

3.3.1 Cassava is the largest production crop in TTU and Trenggalek, and the second largest after rice in Sampang.¹⁵

Almost all cassava production in the three target districts is undertaken by smallholders. Cassava is generally intercropped¹⁶ 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, it is generally considered the third most important crop in terms of government priority. This is because the price of cassava (approximately IDR 800/kg) is significantly lower than both maize (IDR 3500) and rice (IDR 7000/kg). In addition, cassava is not the primary staple food in any of the three districts¹⁷.

Figure 2: Cassava production across the target districts in East Java and NTT (MT) against other staples



3.3.2 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 11,600 farmers from low-income households. Cassava is planted with crops such as coconut, durian, cocoa and coffee, total production in 2011 was 350,463 MT. Productivity in Trenggalek is the highest of the three districts with an average 23.2 MT/ ha¹⁸.

3.3.3 In Sampang, East Java, Cassava is used both in household consumption and traded locally.

Sampang district covers 23% of Madura Island near to Surabaya. The district has an estimated 55,000 farmers growing cassava with most of these considered to be poor with an average plot ranges from 0.2 to 0.25 ha. Commonly small farmers only plant cassava on the border of rice fields. In 2010, cassava production was 185,688 MT from 14,030 ha with productivity of 13.2 MT per 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 markets¹⁹.

3.3.4 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 Timor Tengah Utara (TTU) grow cassava. It accounts for an estimated 30% of household income, in a district with small average plot sizes (0.5ha). The total production is 98,841 MT from 10,095 ha with an average productivity is 9.8MT per ha, which is almost half of the national average (around 20 MT per 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 where cassava is intercropped

¹⁴Anasia Silvati.2008. Indonesia Biofuel development. US Commercial Service. Department of Commerce. USA

¹⁵ See Figure 1: reproduced from Collins Higgins, 2012

¹⁶IFC.2007. Value chain Analysis for Commercial Cassava Growing in NTT. Nimmo Bell Company LTD

¹⁷Data from interviews conducted during field research, March, 2013

¹⁸AIPD Rural Tier 2 Commodity Briefs, Collins Higgins Consulting Group, December 2012, p. 32

¹⁹AIPD Rural Tier 2 Commodity Briefs, Collins Higgins Consulting Group, December 2012, p. 32

mainly maize and groundnut. Cassava functions very much as a staple food in TTU where it is eaten a *sLakuTobe*, a local staple meal made from mixing dried cassava flour with beans. It is also used to feed livestock such as pigs²⁰.

4 Sector Dynamics

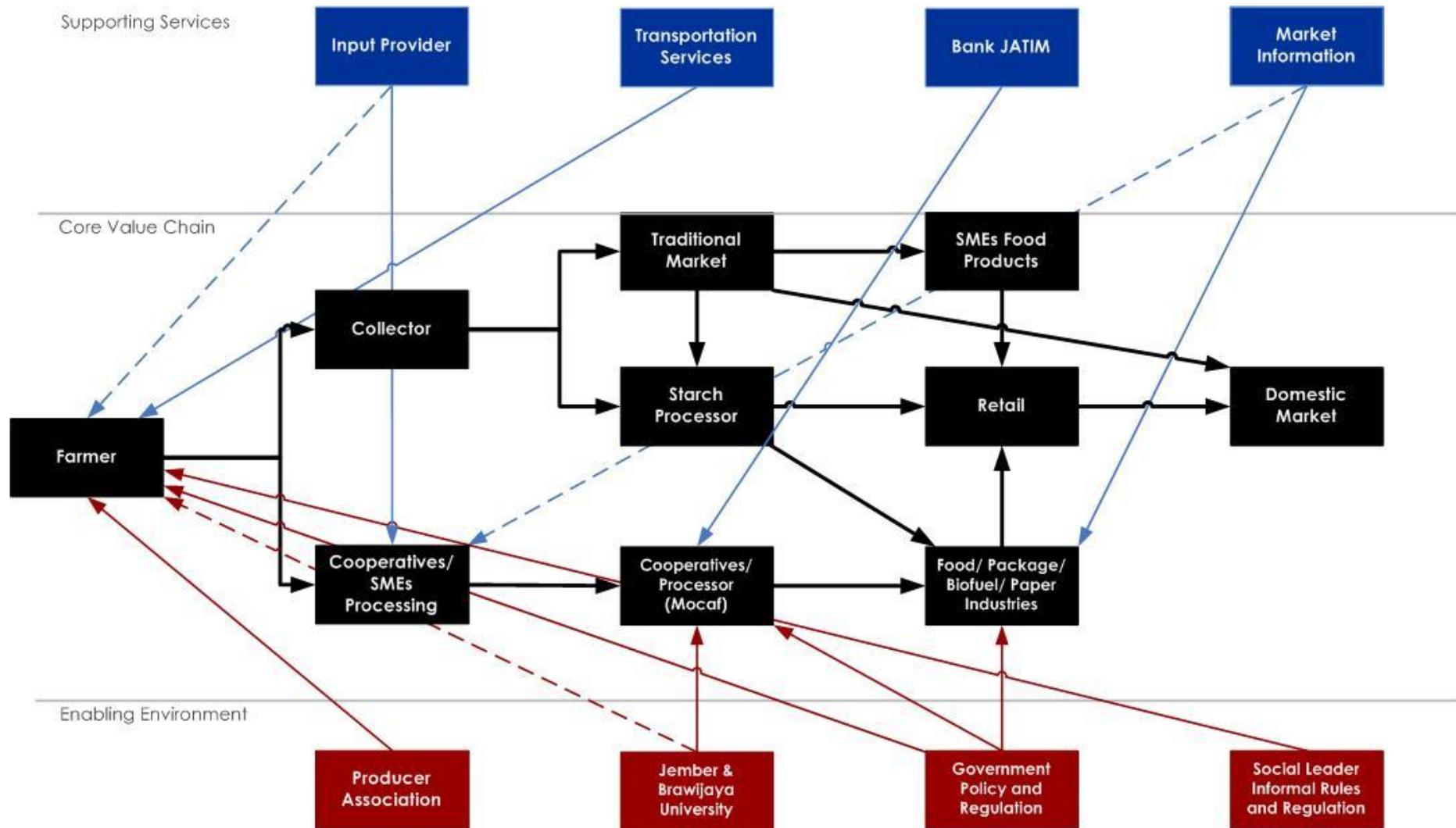
The sector dynamics provide information on how the sector functions and operates; this information has been derived from both literature and engagement with market actors relevant to the sector.

4.1 Market Map

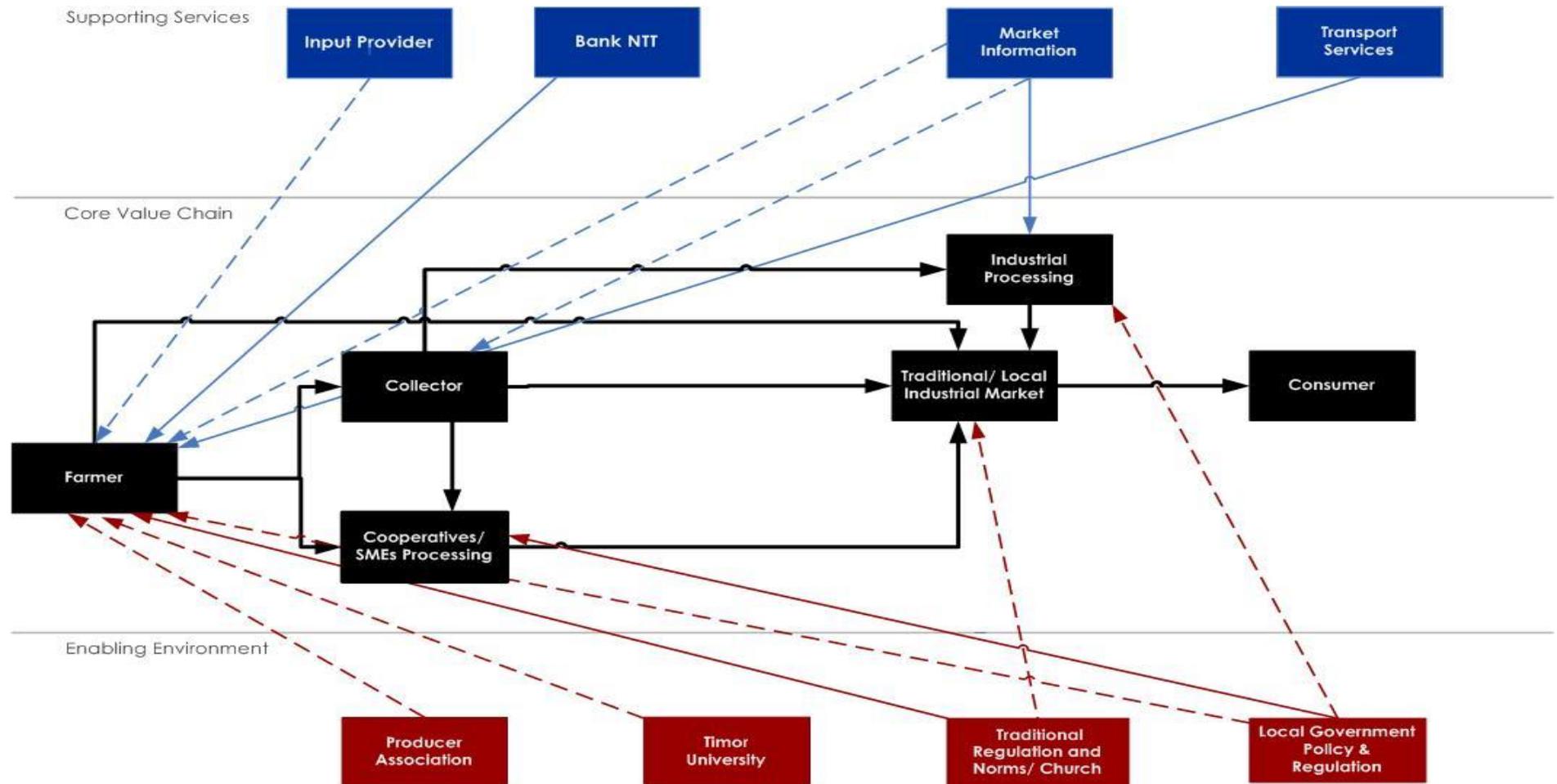
As TTU and East Java are markedly distinct in their profile and dynamics, **separate sector maps have been developed for East Java and TTU**. The most dynamic market for cassava out of the three target districts is **East Java**, particularly Trenggalek where starch and mocaf processing exist. *Cargil* in Ponorogo district supplies as much as 30% of starch demand for the sweetener industry in Indonesia while *Cargil* in Surabaya and *Gemah Ripah Loh Jinawi* Cooperative in Trenggalek. 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 neighbouring Pamekasan District. In **TTU**, cassava is mostly sold fresh and largely used for home consumption with only a few farmers selling cassava chips. There is some larger commercial activities beginning with *PT Singkong Timor Jaya* recently starting up operations and planning to develop a cassava chip plant in the neighbouring district of Belu district.

²⁰AIPD Rural Tier 2 Commodity Briefs, Collins Higgins Consulting Group, December 2012, p. 45-46

4.2 Sector Map: East Java



4.3 Sector Map TTU



4.4 Core Value Chain

4.4.1 In East Java farmers are more organised in representing themselves to industry and in accessing higher value markets.

In Trenggalek, there are producer organisations which support value-add industries such as mocaf. Farmers join clusters under cooperatives supply cluster leaders with fresh cassava, this supply is consolidated and with value addition through producing fermented dried cassava to the Gemah Ripah Loh Jinawi cooperative to produce mocaf. The mocaf then supplied to the food industry through contracted suppliers.

4.4.2 Farmers are accessing value-added industries at the district level.

Farmers also supply cassava for the starch home industry centre in Pogalan District or to other districts like Ponorogs. Its product goes to contracted supplier 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.

4.4.3 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 with seedlings with production 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 Ponorogo 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.

4.4.4 Cassava production in TTU is focused upon serving local demand.

In TTU, cassava supply serves local markets. Generally a collector buys fresh cassava from the farmer and brings it to the retailer in the traditional market. Some farmers sell directly to traditional markets using minibuses or pick-ups which cost on average IDR 15,000 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.

4.4.5 Options for value-addition are emerging though remain limited in TTU.

There is a limited but developing processing industry in TTU with 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.

4.5 Supporting Functions/ Services

4.5.1 Service providers are supporting post-harvest industries in East Java.

In **Trenggalek**, there are local machinery providers who previously have worked with the *GemahRipah* 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, though 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 start up period. The government supported through approximately USD500-700 for machine cost, while the cooperative provides smaller working capital: in the region of IDR 100,000- 200,000.

4.5.2 Farmers in cooperatives are better able to access credit.

Credit is quite difficult for farmers to access in this district however the Nurullman Cooperative can access credit fairly easily. In general, farmers find it difficult to access finance as the majority of farmer plant cassava on rented land from the PERHUTANI (Perusahaan HutanInti) which means they are unable to provide collateral. Credit for farmers is available from Bank NTT and Bank Jatim under the scheme KKPE (Kredit untuk Ketahanan Pangan dan Energi). However, there are few farmers who can provide collateral and borrow credit through the formal bank schemes. Also there is no monitoring system to ensure credit is invested in production-related activities rather than on consumer products or domestic spending priorities such as school fees, health care etc.

4.5.3 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. The GemahRipah Cooperative does have extension workers but they focus on post-harvest processing. There is one farmer group who supply high yielding varieties with an oculation technique – this model could potentially be replicated elsewhere. In Sampang, Cargill Surabaya through the Department of Agriculture distributes seeds to farmer clusters clusters and farmers. Seeds are often provided free of charge to poor farmers via the Catholic Church. 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.

4.6 Supporting Rules and Regulations (Enabling Environment)

4.6.1 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 Trengalek, the cassava competes with other food stuffs (such as wheat) and cassava is increasingly becoming more viable. Indonesia consumes a lot 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, Peraturan Pemerintah (PP) 22/ 2009²¹.

4.6.2 The government is promoting access to additional land in return for commitments to sustainable forest management.

In Indonesia around 48.8M people or 12% of the population are living inside or surrounding forests, and the government wants to encourage farmers to take better care of these forests. Cassava can be grown sustainably in the forests – and the *Lembaga Masyarakat Di Dalam Hutan* (Forest Community Association)(LMDH) is encouraging usage for non-timber forest products in the forest. They are working with local farmer organisations to help them grow crops in the forest in exchange for care of the land. There are over 500,000²² farmers in Trenggalek, of which cassava farmers number under 25,000²³. The government scheme has currently engaged around one fifth of these farmers, with around 100,000 farmers engaged in 122 LMDHs²⁴ in Trenggalek. The integration of the farmers into LMDH has not been successful so far however. Also, the access to land *Inpress* (Presidential instruction)

²¹DeoBerita. 2012. PerkuatKetahananPangan, SingkongBisaDiandalkan.

<http://ditjenpdn.kemendag.go.id/index.php/public/information/articles-detail/berita/66>

²²Collins Higgins.2012. AIPD Tier 2. P. 40

²³Collins Higgins.2012. AIPD Tier 2. P. 40

²⁴http://petakhutan.files.wordpress.com/2012/09/september_2012.pdf

No 5 tahun 2011 to the Forestry Ministry is intended to provide forest land for the development of food production through intercrop activities or in form of developing conversion policy²⁵. One factor which has limited the appeal of the scheme is that farmers are unable to use the rented land as collateral for accessing formal finance.

4.6.3 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.

4.6.4 Local social structures and norms impact upon small-holder farm practices in more traditional areas.

Social structures have been seen to affect agricultural practices amongst small-holder farmers in traditional areas. In TTU the cultural practices and beliefs of social leaders has had an adverse impact in terms of timing for cassava plantation in that Generally government support is limited although have an in TTU in that cultural leaders will not allow planting until the completion of rituals ceremonies (from which the leaders receive informal taxes in form of goods). Often these are not in keeping with the GAP practices as espoused by the government.

5 Analysis

5.1 Problems and Underlying Causes

5.1.1 Low productivity amongst cassava growers.

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. Also, extension services are weak – particularly in TTU – leading to low adoption and practice of good farming practices for cassava. In some cases a lack of reliable water supplies for irrigation contributes to lower harvests.

5.1.2 Lack of working capital for cooperatives.

Across the three districts one of the key problems for farmers is access to working capital for investment in their farm businesses. Typically one source of loans is local cooperatives, which many of the farmers in the three districts are attached to, though many cooperatives lack credit to provide to farmers. Even when cooperatives are able to access loans they are often insufficient, for example the coop Gemah Ripah Loh Jinawi accessed a loan from Bank Muamalat which supported current production though the coop still operated under capacity.

5.1.3 Limited land for cassava planting.

Farmers lack land for cassava planting which hinders the volume of production which can be realized. The main causes of this land limitation are that often privately owned lands are prioritized for other crops, particularly maize and groundnuts (which are often more profitable), with which cassava cannot be inter-cropped. Lands owned by the government are often underutilized, despite recent efforts to bring forests (where cassava can be cultivated sustainably) into productive use the outreach of this has been limited so far. Lack of organization on the farmers' side limits their ability to represent themselves effectively to

²⁵<http://pse.litbang.deptan.go.id/ind/pdf/files/FAE29-2b.pdf>

government, the private sector, and other interest groups. In Trenggalek particularly, a key issue is less than optimal land preparation as there are many weeds which increase pests and impact negatively on productivity.

5.1.4 Lack of fresh supply for cassava processing.

The processing industry suffers from periodic shortages of fresh cassava supply, this hinders the development of the industry by deterring investment and confidence in reliable supply. The causes of this lack of fresh supply include that farmers lack access to by reliable market information to inform production plans (cassava production is highly seasonal and while fresh cassava is widely available in dry season it is limited in the wet season). Although farmers generally plant cassava once a year during the wet season and this leads to a lack of production in the dry season and yield decreases in the wet season (as cassava becomes rotten). On the production side, there is limited agricultural and processing machinery used locally, particularly in TTU where processing is most limited. The lack of working capital available to processors, which often operate under slim margins, also can limit the purchase of cassava from producers and traders.

5.1.5 Starch producers do not receive quality produce for commercial trading.

Locally operating starch producers are not receiving reliable supplies of quality produce for commercial trading, this reduces the competitiveness of the local sector against domestic and international competitors. The causes of the lack of quality supply include that due to local cultivation practices the quality of dried fermented chip used for mocaf production is worse in wet season, also the quality of mocaf and crackers are not uniform. Often cassava is too low quality to make starch and mocaf because the water content is too high and the root is too young²⁶. As the mocaf price is similar to wheat, there is competition from producers over which crops to cultivate. As a result, SMEs find it difficult to market products and starch price under pressure of imported starch from overseas, particularly Thailand.

5.1.6 Farmers in TTU find it difficult to sell fresh cassava.

TTU farmers suffer disproportionately in their difficulty in selling fresh cassava as generally the market is largely constrained to local consumption with value-added processors looking to trade outside the local area only beginning to emerge. This under-development of the market is caused by the general lack of information on the national and international market demand for cassava and a lack of awareness on the potential economic value for cassava on the farmers' side. The lack of market linkages for cassava snacks from TTU (due to the lack of processing industries) means fresh cassava from TTU does not go to industrial processors and products cannot enter mainstream markets. The low level of integration with outside markets, and the generally uncoordinated nature of cassava selling in TTU, means that local cassava often does not meet market demands in terms of quality and volume for commercial operations to thrive.

5.2 Services, Enabling Environment and Weaknesses Analysis

5.2.1 Agro-inputs services.

Due to the weakness of the market, particularly in Sampang and TTU, there are few **service providers retailing improved inputs** particularly stem and fertilizer inputs locally. The lack of competition means that often retailers which are operating, for example in Trenggalek, are not proactive in reaching particularly small-farmers. Also as the government generally does not see cassava as a priority crop it does not support farmers with improved inputs or support with key services such as irrigation.

5.2.2 Agronomic extension services.

Whether from government, local cooperatives, or from extension processing staff **agronomic extension services to facilitate the adoption of good farm practices** are

²⁶Interview result with Cahyo from Cooperative Gemah Ripah and Nur the owner of home industry for starch processing

generally weak. Government extension services suffer from a lack of extension outreach, and as machinery 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.

5.2.3 Financial services.

Cassava farmers and processors' businesses are hampered by the **lack of an effective financial services offer** in the local market. There are limited credit products available and no specific agricultural products available which are flexible enough to suit the needs of cassava processors. Formal financial products are generally not available to farmers who procure credit services from cooperatives which are themselves suffering from poor access to credit.

5.2.4 State forestry services.

Generally state forestry services are not prioritizing cassava for inter-cropping in protected forest areas. Although land is limited and cassava can be cultivated sustainably in forested areas, there is limited understanding of the economic value of cassava in government and cassava is not being prioritized. **Government lobbying services** available to promote the cassava industry and raise its profile in government are few and the sector is not sufficiently organized locally to provide these services.

5.2.5 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, and, particularly in TTU, lack of support to investors to actively operate businesses locally. **Community leadership services** are not sufficiently commercially oriented as farmer organizations in the local cassava industry and largely social rather than business focused.

6 Strategy

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.

6.1 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, 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 use the extension workers to also improve farmer production practices. It has been calculated that with the increase in production (of over 30%) combined with the increased values realised can **unlock a potential (untapped) market of over AUD 4M in Madura Island, AUD 4.5M in Trenggalek, Malang, and Kediri, and nearly AUD 12M in TTU.** See table below.

Table 1: Business Calculation for Cassava Sector Development

Market/Production Value			
	Madura Island and Ponorogo	Trenggalek/Malang/ Kediri	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 value of potential production (AUD)	15,152,400	22,334,400	34,350,750
Total potential value of increased production (million IDR)	42,090	46,530	119,083
Total potential value of increased production (AUD)	4,209,000	4,653,000	11,908,260

6.2 Vision of Change

Focusing on achieving the potential outlined above for the cassava sector in East Java and TTU, a vision of change can be outlined for both the sector and service levels. The vision of change at the **sector level** is to increase the productivity, the supply and quality of cassava to meet the growing domestic demand for cassava from processors. At the **service level** the vision is to develop three key services: (1) financial services, through the development of a new financial product; (2) extension services, through the development of processing industries proximate to the target districts; (3) and, representation services to develop responses to key threats such as biological control services (particularly through government services to tackle the cassava *Mealy Bug*).

6.3 Interventions

To achieve the vision of change, there are five proposed interventions

6.3.1 INTERVENTION 1: Increasing the quantity and quality of fresh cassava supply for starch processing.

This intervention specifically addresses the low adoption of **good farm practices** amongst cassava farmers which is a fundamental issue contributing to lower than average production yields. Educating and training for farmers through extension staff, and improving plant varieties will result in better quality and more resilient crops. Seasonality should also be addressed by working with farmer groups to stagger planting and harvesting. It is envisaged that the private sector will be incentivised to lead the extension training as they will benefit through greater access to good quality cassava for starch processing. The intervention could be targeted at the East Java districts of Sampang, Ponorogo, Bangkalan, Pamekasan and Sumenep.

6.3.2 INTERVENTION 2: Increasing the quantity and quality of supply for modified cassava processing.

The proposed intervention seeks to increase the year round supply of fresh cassava root to local half processors, which supply dried fermented cassava chips to modified cassava (mocaf) processors. This intervention also specifically addresses **good farm practices** which is a fundamental issue contributing to lower than average production yields. The intervention could focus on the East Java districts of Trenggalek and Kediri where there is greater chance for success given the more active and dynamic mocaf industry which is located there.

6.3.3 INTERVENTION 3: Developing a consistent supply of cassava chips.

One of the principal barriers which has been identified as hindering the industry in TTU is the lack of a consistent supply of cassava chips to serve emerging local processing

industries. This intervention therefore specifically addresses **good farm practices** which is a fundamental issue contributing to lower than average production yields. Educating and training farmers in good agricultural practice and supply of inputs such as fertilizer and suitable varieties will result in increased productivity and quality of chips produced by farmers. The intervention is recommended to be targeted at the local cassava producers and service providers operating in TTU.

6.3.4 INTERVENTION 4: Advocacy policy to Government and stakeholders to improve support for sector including land access and extension services.

The low priority ascribed to cassava in the eyes of government hinders the development of the sector in reducing investment and the provision of support services. Land access is a major issue which is not being capitalized upon for the benefit of cassava growers. There for advocacy to provincial and district governments to improve support for sector including land access and extension services could raise the profile of the sector and improve the current level of government investment and support, and improve farmers' access to rented land and protected forests. This intervention addresses the **weak representation and government lobbying services** which characterize the cassava sector.

6.3.5 INTERVENTION 5: Establish national forum to address key sector issues.

Although government is a major player in the cassava industry, it is important that cross-sector representation is developed to deal with ongoing issues which affect the industry nationally. Therefore this intervention seeks to establish a national forum to address key sector issues such as introducing biological controls for the cassava *Mealy Bug*. This has the potential to benefit the broader industry as can address sector wide issues. The national forum would include major industry players such as *PT Cargill, Cooperative, Indofood, PT Singkong Timor Jaya*, relevant universities such as *Jember University*, government, and existing associations. This platform will bring key stakeholders to discuss and find solution for challenges.

Annex 1 Intervention Logic Analysis Table

(1) Problems	(2) Underlying Causes	(3) Services/ (4) Enabling Environment	(5) Weaknesses	(6) Interventions
Low productivity amongst cassava growers	<ul style="list-style-type: none"> - Most farmer do not plant high yielding varieties - Farmers do not apply fertilizer - Pest attack impacts harvest due to the cassava mealy bug which could reduce productivity by potentially 30% - Lack of access to extension services <ul style="list-style-type: none"> o Good farming practices for cassava are low - Lack of water supply - 	<p>Agronomic extension services to facilitate the adoption of good farm practices(through government/ cooperative/ processor extension staff)</p> <p>Biological control services(government services)</p>	<ul style="list-style-type: none"> - Lack of transfer of knowledge about good pre-harvest techniques from - Government does not support farmers with irrigation as cassava not a priority - Irrigation is not highlighted as an issue by extension staff as cassava not a priority - Finance products not available for farmers - Lack of transfer knowledge of good pre harvest technique - Extension staff focus on other commodities and or post-harvest processing - Government is not currently addressing the issue through biological control initiatives 	<p>INTERVENTION 1: Increasing the quantity and quality of fresh cassava supply for starch processing</p> <p>INTERVENTION 2. Increasing the quantity and quality of supply for modified cassava processing</p>
Lack of working capital for cooperatives	<ul style="list-style-type: none"> - Limited or no credit available for famer and processor(farmers need collateral for loan) - Lack of access to finance 	Financial services	<ul style="list-style-type: none"> - Limited or no specific agricultural credit product - Companies are not willing to invest due to a lack of interest in the market. 	INTERVENTION 6. Establishment of a financial product an accessible to cooperatives
Limited land for cassava planting	<ul style="list-style-type: none"> - Private land is often prioritized for maize and ground nuts - Unused lands belonging to government is not utilized - Difficult for cassava farmers to access land because they are not well organized - Compete for land use against more profitable crops 	<p>State Forest Company services</p> <p>Land rental services</p>	<ul style="list-style-type: none"> - Limited understanding of the economic value of cassava - 	INTERVENTION 4. Advocacy to Government and stakeholders to improve support for sector including biological control initiatives to tackle the mealy bug,land access, and improved extension services
Lack of fresh supply for cassava processing	<ul style="list-style-type: none"> - Lack of access to market information <ul style="list-style-type: none"> o Cassava production depends on seasons as it is widely available in dry season and limited in wet season o Farmers plant cassava once a year during the wet season o Harvest decreases in wet season (no cassava planting 	<p>Financial services</p> <p>Agronomic extension services to facilitate the adoption of good farm practices</p>	<ul style="list-style-type: none"> - Lack of transfer knowledge of good pre harvest technique - Extension staff focus on other commodities and or post-harvest processing - Lack of information on pre harvest techniques - Finance not flexible to suit processer needs - Machinery provider not active in target districts 	<p>INTERVENTION 3. Developing a consistent supply ofcassava chips</p> <p>INTERVENTION 4.Advocacy to Government and stakeholders to improve support for sector including biological control</p>

	<p>in dry season and cassava becomes rotten during wet season)</p> <ul style="list-style-type: none"> - Limited agricultural and processing machinery used in TTU - Limited working capital of processor sometimes limits purchase of cassava 			<p>initiatives to tackle the mealy bug, land access, and improved extension services</p>
<p>Starch producers do not receive quality produce for commercial trading</p>	<ul style="list-style-type: none"> - Quality of dried fermented chip used for mocaf production is worse in wet season - Quality of mocaf and cracker not uniform - Mocaf price is similar to wheat - Starch price under pressure of imported starch from Thailand - SMEs find it difficult to market products 	<p>Financial services</p> <p>Agronomic extension services to facilitate the adoption of good farm practices</p>	<ul style="list-style-type: none"> - Lack of transfer knowledge of good pre harvest technique - Extension staff focus on other commodities and or post-harvest processing# - Lack of information on pre harvest techniques - Equipment not readily available - Finance not flexible to suit processor needs 	<p>INTERVENTION 3. Developing a consistent supply of cassava chips</p> <p>INTERVENTION 1: Increasing the quantity and quality of fresh cassava supply for starch processing</p>
<p>Farmers in TTU find it difficult to sell fresh cassava</p>	<ul style="list-style-type: none"> - Market is largely constrained to local market with processors only beginning to emerge - Lack of information on national and international market demand for cassava - Lack of awareness on the potential economic value for cassava - Cassava snacks in TTU cannot enter mainstream market - None of cassava in TTU goes to industrial processors - Uncoordinated selling of cassava - Cassava does not meet market demands 	<p>Agronomic extension services to facilitate the adoption of good farm practices</p> <p>Business brokering services</p> <p>Community leadership services</p> <p>Government lobbying services</p>	<ul style="list-style-type: none"> - Lack of support to SMEs on food processing and marketing issues - Lack of support to investors to actively operate in TTU - Farmer organization largely social rather than business focused 	<p>INTERVENTION 5: Establish national forum to address key sector issues</p> <p>INTERVENTION 3. Developing a consistent supply of cassava chips</p>