

**2015 UPDATE**  
**PEANUT SUB-SECTOR GROWTH STRATEGY**  
**IN**  
**EAST JAVA**

**June 30, 2015**

## Table of Contents

Summary of key changes from previous GSDs and focus for next year .....	4
1 Executive summary .....	6
2 Background .....	8
3 Sector description .....	8
3.1 Sector profile .....	8
3.1.1 Overall context .....	8
3.1.2 Local context .....	9
3.2 Sector dynamics .....	11
3.2.1 Market overview .....	11
3.2.2 Sector map .....	12
3.2.3 Core value chain .....	13
3.2.4 Supporting functions / services .....	16
3.2.5 Supporting rules and regulations (enabling environment) .....	18
4 Analysis .....	19
4.1 Problems and underlying causes .....	19
4.2 Services, enabling environment, and weaknesses analysis .....	20
5 Strategy for change .....	21
5.1 Market potential .....	21
5.2 Vision of change .....	21
5.3 Intervention areas .....	22
5.4 Sequencing and prioritisation of intervention areas .....	23
5.5 Sector vision of change logic .....	24
Annex 1: Intervention Logic Analysis Framework (ILAF) .....	25
Annex 2: Gender table .....	26

## Tables & Figures

Figure 1: Production vs imports in Indonesia .....	9
Figure 2: Top 10 peanut producing provinces (2013) .....	9
Figure 3: Peanut production in initial intervention districts (2013) .....	10
Table 1: Production calendars for dryland and wetland farming on East Java mainland .....	14
Table 2: Certified nurseries in East Java .....	17
Table 3: Business potential in target area .....	21

## Abbreviations

AIP-PRISMA	Australia-Indonesia Partnership for Promoting Rural Income through Support for Markets in Agriculture
BBI	Balai Benih Induk
BPSB	Badan Pengawas Sertifikasi Benih
BPTP	Balai Pengkajian Teknologi Pertanian
CAGR	Compound annual growth rate
GAP	good agricultural practices
ha	hectares
ILAF	Intervention Logic Analysis Framework
NTB	Nusa Tenggara Barat (West Nusa Tenggara)
NTT	Nusa Tenggara Timur (East Nusa Tenggara)
ppb	parts per billion

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## Summary of key changes from previous GSDs and focus for next year

Year	August 2014 - June 2015
	<p>Over the past year, the team has engaged with more market actors in the peanut sector, as well conducted numerous field investigations. This has improved their understanding of the dynamics, constraints, and opportunities in the sector. The sections on the core value chain and supporting functions/services are now nearly double in length and include more detailed descriptions of related functions and relevant market actors. Aside from this, the main changes to the GSD include:</p> <ul style="list-style-type: none"> <li> <p><b>Revising the problem statement and adding a related intervention area around good agricultural practices, including better pest and disease management:</b> While the intervention area on certified seed mentioned the importance of embedded information to help farmers maximise yields, the initial problem statement only focused on the impact of poor quality seeds on farmer productivity. This has been revised to also include the link between traditional agricultural practices and low productivity. Despite the importance of and potential losses from pest and disease, no mention was made about this in the previous GSD. This has also been revised. The underlying causes now discuss how farmers have limited access and knowledge of good agricultural practices, including pest and disease management. A related intervention area has also been introduced.</p> </li> <li> <p><b>Revising the assessment of the potential for an intervention in Madura:</b> The previous version of the GSD noted that although Sampang was listed as the third largest peanut producer in 2012, figures were likely to be highly inflated and the investigation team was not able to find any evidence of peanut farming. Neither the traders nor farmers interviewed were aware of a potentially vibrant peanut sector in the district. As a result, the team initially recommended that AIP-PRISMA does not target Sampang as a potential intervention district. They have since found more evidence of peanut production in Bangkalan and Sampang, and traders have indicated that they are sourcing large quantities of low quality peanuts from Madura. CV Trubus Gumelar, the current nursery partner for the certified seed intervention, has also indicated interest in expanding to Madura. The team now intends to explore opportunities for a future intervention in Madura.</p> </li> <li> <p><b>Changing the initial target districts:</b> Based on field investigations, the team has found that peanut farmers in Pacitan are increasingly shifting to other crops (such as maize), and traders are also not focusing on Pacitan as a key peanut production zone. Hence, the team is now focusing its initial efforts on other districts and has added two new initial target districts: Magetan and Ponorogo. Magetan is the third largest peanut production zone on the East Java mainland. Peanut production in Ponorogo is much smaller, but the district has the highest productivity in East Java and also the presence of market actors who are interested in promoting certified peanut seeds. This includes our current partner, CV Trubus Gumelar.</p> </li> <li> <p><b>Replacing the potential partner highlighted under the certified seed intervention area with other newly identified market actors:</b> The previous version of the GSD focused on UD Permata Tani as the main potential partner for the commercialisation of certified peanut seeds. This was because the company was already selling a small amount of seeds through private channels. However, UD Permata Tani has not been particularly responsive and has expressed more interest in supplying the government. As a result, over the past year, the team has identified several other market actors who were not previously mentioned in the GSD. This includes the current partner, CV Trubus Gumelar, and other potential partners (UD Sri Niaga Tani and Farmer Budi).</p> </li> <li> <p><b>Refining the strategy under the certified seed intervention area:</b> A more nuanced understanding of the seed supporting function (including the various government actors involved, the different stages of seed production, and processes and requirements for nursery and seed certification) has led the team to improve the design of interventions in this area. This includes recognising the need for additional interventions or activities to help potential partners obtain nursery certification and to work with government seed institutions to increase the stock of breeder and foundation seeds for improved seed varieties.</p> </li> </ul> <p>The market growth potential in the sector has not changed, and there is still significant opportunity to expand East Java's production to fulfil increasing peanut demand from home processing industries.</p>

**The planned focus for July 2015-2016 is on:**

- Continuing the implementation of the certified seed intervention with CV Trubus Gumelar
- Partnering with UD Sri Niaga Tani to adopt a similar business model to promote certified seeds
- Identifying additional potential nursery partners for scale-up
- Exploring further the potential for a GAP intervention with BASF while also identifying other input companies that could be potential partners
- Conducting further assessments (with the assistance of a sector expert) to identify additional opportunities and interventions, including around aflatoxin and improving the availability of breeder and foundation seeds

Year	July 2015 - June 2016

Year	July 2016 - June 2017

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## 1 Executive summary

**Indonesia is among the top ten global producers of peanuts. However, its peanut production has been declining over the past decade, and it relies heavily on imports to satisfy growing domestic demand.** Despite expectations that production will continue declining, national demand for peanuts is high and is expected to grow alongside population growth. Peanut demand is driven by its consumption as food, which accounts for over 90% of peanut uses. Home industry food processors are the main users of peanuts, accounting for 81% of total peanut consumption for food. Large-scale food manufacturers and households each contribute approximately 10% to peanut consumption for food.<sup>1</sup> Imports, which have increased at an annual rate of 9% since 2007, accounts for on average 21% of annual peanut consumption.

**East Java is the single largest peanut producing province in Indonesia, accounting for 30% of national production.** Whilst overall production levels have been falling in Indonesia, East Java has seen a slight increase in peanut production. Peanut farming, which is a secondary crop for farmers, varies significantly by district. But similar to the rest of Indonesia, production in East Java is typically highest in areas where the climate is driest. Relative to other legume crops, peanut farmers and traders enjoy higher margins and have a ready market able to absorb increased levels of production. Unlike other legume crops, there is a strong presence of formal retail outlets and informal outlets at bazaars as the end market for a significant portion of processed peanuts.

**There is market opportunity to expand East Java's peanut production in order to meet the growing demand for peanuts by home industry food processors.** Since demand from large scale food processors has been flat and they are not currently interested in expanding production, increased production of processed peanuts will mainly be from home industries. With peanut consumption per capita expected to remain stable, growth of national peanut consumption will be determined primarily by population growth. In addition to fulfilling growing demand from home industries, there may also be opportunities for substituting imports.

**Analysis of the market reveals a number of problems that currently constrain the ability of peanut farmers to take advantage of this market opportunity.** Despite high-levels of processing and commercial trading, there is limited commercialised seed development on the input end. Most farmers are still using low-yielding retained seeds and have limited knowledge and access to newer improved peanut varieties such as Tuban, Hypoma, and Takar. Furthermore, the use of traditional agricultural practices also constrains farmer productivity. Farmers tend to have limited access and knowledge of good agricultural practices, including pest and disease management. Since peanut is a secondary crop, neither government nor input suppliers are targeting their programs, information services, or products at peanut farmers.

**The vision of change at the sector level is to:** is to increase smallholder productivity and production. At the **service level**, it is envisaged that farmers will have access to (1) seed and (2) information and extension services. To realise this vision, this report recommends the following two intervention areas:

- Promote certified seeds of improved varieties for peanut production along with embedded information

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<sup>1</sup> USDA Gain Report, Indonesia Oilseeds and Products Annual Report 2014

- Introduce good agricultural practices, including effective pest & disease management

Although productivity gains in peanuts have largely ignored the food safety aspect in the peanut food chain and the risk of aflatoxin contamination does not adversely impact farm gate prices and farmers' profitability, it is, nonetheless, important from a development and public health perspective to address the issue of aflatoxin. As a result, we will also seek to integrate aflatoxin risk management practices and solutions where possible, especially when working with collectors or other downstream actors.

We envision that seed services will be provided through seed companies, collectors, and seed related government institutions. Information and extension services will be provided through input companies (particularly chemical companies).

**It is recommended that the intervention areas in the East Java peanut sector be implemented in two phases.** In the first phase, the focus is on *promoting certified seeds of improved varieties for peanut production along with embedded information* since we already have a partner and a number of other potential partners. This will be followed in the second phase by *introducing good agricultural practices, including effective pest and disease management*, which is a new intervention area introduced in the 2015 update of the GSD.

## 2 Background

The Australia-Indonesia Partnership for Promoting Rural Income through Support for Markets in Agriculture (AIP-PRISMA) is a multi-year program that is a part of the Government of Indonesia's midterm development strategy to accelerate poverty reduction through inclusive economic growth. With the support of the Government of Australia, the program aims to achieve a 30% increase in the net incomes of 300,000 male and female smallholder farmers in eastern Indonesia by June 2017. PRISMA works in East Java, West Nusa Tenggara (NTB), East Nusa Tenggara (NTT), Papua, and West Papua.

This Sector Report aims to provide a logic and rationale for market-based interventions which can support the peanut sector to the benefit of smallholder farmers in East Java.

## 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 peanut sector.

#### 3.1.1 Overall context

**World production of peanuts has been increasing at an annual rate of 2.4% over the past decade, with 95% of production being consumed within the country of origin.** Globally, 45.2 million tonnes of in-shell peanuts were produced in 2013 on 25.4 million hectares (ha), with an average global yield of 1.78 tonnes/ha. China is the world's top producer, accounting for nearly 40% of global production. India is the second largest producer at 21% of global production. The price of peanuts on the world market has shown little movement over the past decade, except in those years when the USA has had a crop shortage.

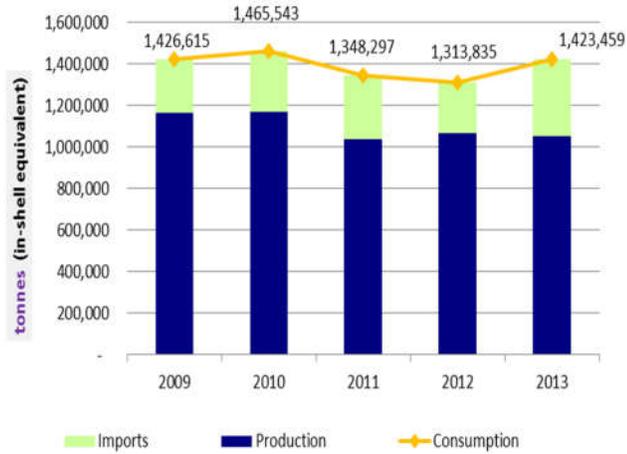
**Indonesia is among the top ten global producers of peanuts, but its peanut production and harvested area has been declining over the past decade.** According to FAO estimates, Indonesia produced approximately 1.15 million tonnes of peanuts in-shell (or 2.6% of global production) in 2013, making it the 8th largest world producer. Based on BPS data, this was equivalent to 786,868 tonnes of peanut kernels. Peanut production growth has trended downwards at an annual rate of approximately 2% since 2007 while harvested area has declined by 4% annually over the same period (from 660 thousand ha in 2007 to 520 thousand ha in 2009). With harvested area falling faster than production, yields have improved by an annual rate of 2% during this period.

**Despite expectations that production will continue declining, national demand for peanuts is high and is expected to grow alongside population growth.** Peanuts, which are an important staple food for most Indonesians, feature prominently in local cuisine. It is a rich and cheap source of vegetable protein. In 2013, peanut consumption was estimated at 1.42 million tonnes of peanut in-shell equivalent. Peanut consumption for food accounts for over 90% of peanut uses while the use of peanuts for animal feed has ranged between 75,000 and 125,000 tonnes per year. Peanut consumption per capita is expected to be static, remaining at approximately 5.5 kg per year. Therefore, population growth will be the key determinant of food

use growth of peanuts in Indonesia.<sup>2</sup> Home industry food processors are the main users of peanuts, accounting for 81% of total peanut consumption for food. Large-scale food manufacturers and households each contribute approximately 10% to peanut consumption for food.<sup>3</sup>

**With demand consistently outstripping supply, Indonesia is heavily reliant on imports to satisfy growing domestic demand.**

Imports have increased at an annual rate of 9% since 2007 and account for on average 21% of annual peanut consumption. In 2011, Indonesia was the world’s second largest importer of peanuts in-shell with 120 thousand tonnes. Indonesia’s import of peanut kernels is even higher than peanuts in-shell and accounts for on average 70% of total imports. In 2013, 177 thousand tonnes of peanut kernels were imported, which is approximately 265 thousand tonnes of peanut in-shell equivalent. Peanuts are mainly imported from India, and the peak import months are typically from February to March and from May to July. Export volumes (582 tonnes of shelled peanuts in 2011) are negligible in comparison to imports.

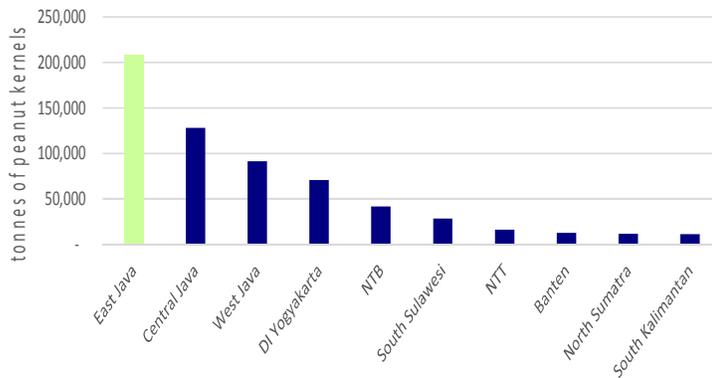


**Figure 1: Production vs imports in Indonesia**

**3.1.2 Local context**

**East Java is the single largest peanut producing province in Indonesia. Whilst overall production levels have been falling in Indonesia, East Java has seen a slight increase in peanut production.** The top producers of peanuts are all on Java Island and together they contribute 61% of production. East Java alone accounted for 30% of national production on 29%

**Figure 2: Top 10 peanut producing provinces (2013)**



of the total area cultivated nationwide in 2013. Production was 208 thousand tonnes of peanut kernels in 2013 and has been growing at a compound annual growth rate (CAGR) of 0.9% since 2007. Concurrently, harvest area has declined by 1.8% annually from 167 thousand ha in 2007 to 150 thousand ha in 2013. This has resulted in improved yields, and East

Java has consistently surpassed average national yields since 2011. Productivity in 2013 was

<sup>2</sup> USDA Gain Report, Indonesia Oilseeds and Products Annual Report 2013

<sup>3</sup> USDA Gain Report, Indonesia Oilseeds and Products Annual Report 2014

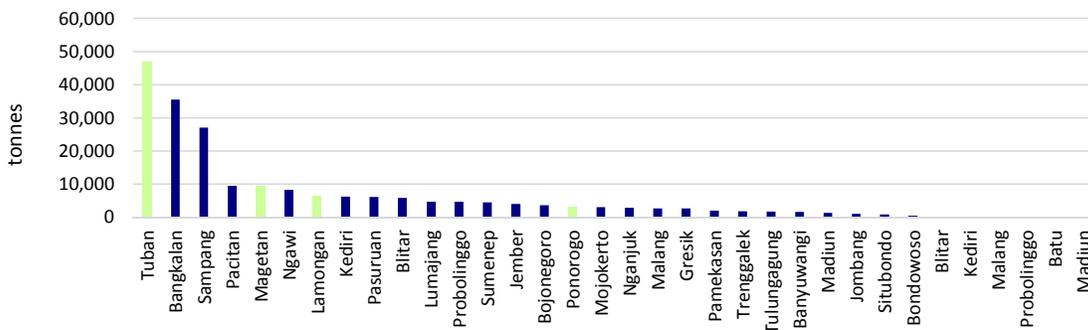
1.52 tonnes of kernels/ha, slightly higher than the national productivity of 1.35 tonnes of kernels/ha.

**Within East Java, peanut production varies significantly by district depending on proximity to important trading centres as well as soil and climatic factors.** Since peanuts are typically a dryland crop, production in East Java is highest in areas where the climate is driest. However, similar to the rest of Indonesia where approximately 30% of peanut production is concentrated in irrigated paddy fields, there is also some peanut farming in more fertile and humid areas of the province. In these areas, farmers grow a wider variety of crops, and there tends to be more processing activities nearby.

**Relative to other legume crops, peanut farmers and traders enjoy higher margins and have a ready market able to absorb production.** As a secondary crop, peanut farming can be an important source of additional income for poor farmers. In addition to playing an important economic role, peanuts, along with other legumes, have the unique ability to fix atmospheric nitrogen to support their own growth and provide residual nitrogen for use by subsequent cereal grain and fodder crops. They also provide significant crop rotation benefits by reducing pests, soil-borne and foliar disease, and weed pressure.

**At the district level, the 4 districts in which AIP-PRISMA is starting its peanut sector interventions accounted for 32% of peanut production in East Java in 2013 (over 100,000 farmers).** Initial districts are selected based on the availability of entry points and potential for high growth and outreach. This includes Tuban, Magetan, Lamongan, and Ponorogo. Tuban is the strongest centre of production in East Java and is known for the quality of its kernels, as well as the presence of the region’s most important traders. Top processors source significant amounts of peanuts from Tuban, and buyers have strong links with these companies. Since Lamongan borders Tuban, many of the traders from Tuban also source peanuts from this district. Magetan peanuts are also well-known in East, Central, and West Java. These three districts all have sandy soils which are ideal for peanut farming, and farmers from Tuban and Magetan are often considered to have better knowledge about peanut production. Yields in Tuban and Magetan (1.57 and 1.93 tonnes of kernels/ha respectively) are well above the provincial average of 1.39 tonnes of kernels/ha.

**Figure 3: Peanut production in initial intervention districts (2013)**



Although peanut production is smaller in Ponorogo, there is a peanut seed producer in the district who is willing to serve farmers in Ponorogo, as well as neighbouring Magetan. Productivity in Ponorogo has been consistently high and has been the highest in East Java since 2012 (2.35 tonnes of kernel/ha in 2012 and 1.94 tonnes of kernels/ha in 2013). Finally, given

high peanut production in Madura (with Bangkalan and Sampang alone accounting for another 30% of peanut production), AIP-PRISMA will be exploring opportunities to expand to Madura in the future. Districts in Madura are among the districts with the lowest productivity in East Java.

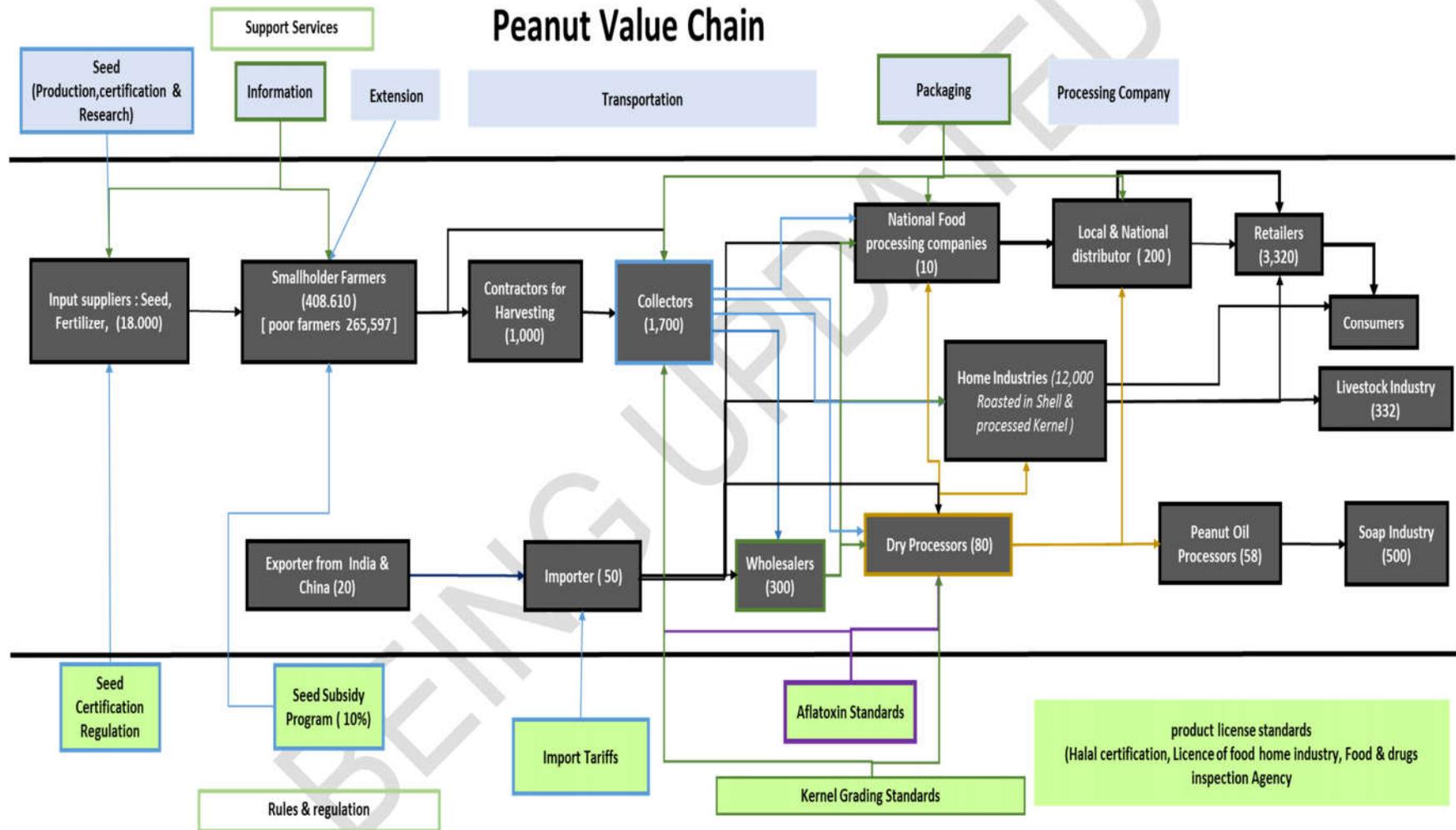
## 3.2 Sector dynamics

### 3.2.1 Market overview

The peanut sector, which is a secondary crop for farmers, involves production mainly for home processing industries of both roasted in-shell peanuts and kernel products. Unlike other legume crops, there is a strong presence of formal retail outlets and informal outlets at bazaars as the end market for a significant portion of processed peanuts. Despite the high-levels of processing and commercial trading in the sector, there continues to be an absence of significant commercialised seed development on the input end. Overall, few farmers are using certified or improved varieties of seeds. Limited availability of good quality, higher yielding planting materials has led some farmers to shift towards other more profitable crops.

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3.2.2 Sector map



### 3.2.3 Core value chain

#### Inputs

**Most farmers retain seeds from previous harvests or purchase seeds from collectors.**

Approximately 20% (81,722) of peanut farmers in east java (408,610) will buy seeds from collectors (1,700) during the planting season. Farmers may sort and select what they consider to be seed-quality pods from collectors. In some cases, collectors will also perform the selection and bagging of seed themselves prior to selling back to farmers from whom they source their peanuts. There is also a trading system whereby dry season peanut farmers will sort seed from their harvest and sell to wet season peanut farmers. Likewise, wet season peanut farmers will circulate their seed to dry season farmers. By using retained seeds, new genetic material is not being introduced into the seed supply chain, thus resulting in decreased yields over time.

**Few farmers are using certified seeds or improved varieties of peanut seed.** Farmers tend not to know what varieties of seeds they are buying or producing, but the most commonly used variety in East Java is Kancil. The Kancil variety was developed in 2001 by Balitkabi, a government agricultural research centre in Malang. There are some farmers who have even used imported kernels as seed, which are poorly adapted to local conditions and have low germination capacity. Improved varieties exist, and in fact, Balitkabi has registered 9 other improved varieties since it introduced Kancil. This includes the Tuban variety in 2003 and newer varieties such as Hypoma and Takar in 2012. All of these varieties can obtain average yields above 2.5 tonnes of kernel/ha, which is over double the yields of retained seeds.

In East Java, the Tuban variety is only available through UD Permata Tani in 8 of 20 sub-districts of Tuban. Foundation or extension seeds of Hypoma or Takar varieties are not currently being produced. As a result, neither seed multipliers nor farmers are growing Hypoma or Takar in Indonesia. The only exception was one farmer in Tuban, Farmer Budi, who received left over breeder seeds from Balitkabi's research trials. Under ideal conditions, this farmer claimed to achieve 5.5 tonnes of kernels/ha with Hypoma & Takar, and he was able to sell approximately 7 tonnes as uncertified seed to other farmers. Aside from the improved varieties developed by Balitkabi, Garuda Foods also has its own variety of peanut seed, but this is only available to farmers in its contract farming model in Central Java.

**The other main input for peanut farming involves chemical inputs, particularly fertilisers and chemicals for pest and disease control.**

Peanut farmers can access chemical inputs using the same network of private input suppliers as other crops. Chemicals are mostly applied on the basis of local experience and norms, often with poor understanding of impacts on crop yield and quality. The use of fertiliser is more common among wetland peanut farmers, but overall, input use efficiency (yield realised per unit input cost) tends to be low among peanut farmers in East Java.

In terms of pest and disease, early and late leaf spot and rust are the most prevalent diseases in Indonesia. They occur in all peanut production zones and often result in substantial losses. For example, leaf spot can result in a reduction of the number of pods, as well as empty pods. Losses due to these diseases vary from season to season and between regions. According to sector experts at Balitkabi, pest and disease can reduce yields by up to 75%. Previous Balitkabi

studies also indicated high losses of up to 50 to 60%.<sup>4</sup> Suitable pest and disease management products are available through chemical companies such as BASF, Syngenta, Bayer, Dupont and PT NASA but are not commonly used by peanut farmers. Also, not all of these chemical companies (e.g. BASF) have registered these products in Indonesia for peanut farming.

## Production

**Peanuts are grown in both dryland and irrigated areas. In both areas, women are actively involved in peanut cultivation.** Average landholdings for peanut farming are 0.25ha, and the peanut varieties that are available in Indonesia take between 90-95 days to grow. Most of the peanut production in Tuban and Lamongan are on drylands while more peanut farmers in Ponorogo and Magetan are growing peanuts on irrigated lands. The more advanced farmers in Tuban have peanut farms on irrigated lands. Men are responsible for land preparation, fertilisation, and watering but not all peanut farmers will perform these activities. Women are the main actors involved in planting and weeding.

**There is one main season of peanut farming in each of these areas, and the production calendar and practices vary depending on whether the farmer is doing dryland or wetland peanut farming.** In dryland peanut farming areas on East Java mainland, the main cropping pattern is maize – peanut – fallow. Dryland peanut farming is dependent on rainfall and begins in February, with the harvest in May. Dryland peanut farmers tend not to clear the land before farming and will start planting maize in between the dried maize plants even before they harvest the maize. It is uncommon for these farmers to use fertiliser since the prevailing belief is that there is sufficient residual fertiliser from the maize season. Peanut farming in Madura also tends to be during the rainy season, with farmers broadcasting seeds in uncleared maize fields.

**Table 1: Production calendars for dryland and wetland farming on East Java mainland**

<b>Dryland Farming</b>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Climate					dry season					rainy season		
Peanuts		peanut			harvest							
Other crops		harvest				fallow				maize or chili		

<b>Wetland Farming</b>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Climate					dry season					rainy season		
Crops	harvest	maize or paddy			harvest	peanut		harvest	paddy			

In irrigated peanut farming areas, the main cropping pattern is paddy – paddy/maize – peanuts. Peanuts are mainly grown from June to August during the dry season because farmers are able to use water from the irrigation system. However, farmers tend only to water their peanut farms once or twice during the production cycle whereas good agricultural practices (GAP) require that peanut plants are watered four times (after 15, 25, 50, and 75 days). Unlike dryland farmers, these peanut farmers tend to engage in land preparation, using the same hand tractors they use to prepare the land for paddy. They are also more likely to use fertiliser and will prepare a seed bed before planting. In both dryland and irrigated areas, peanut farmers tend to only conduct weeding once near the beginning of the planting cycle. GAP recommends weeding at least two times (before flowering and after the flower drops towards the ground).

<sup>4</sup> Balitkabi. (2010) Optimalisasi Pengendalian Terpadu Penyakit Bercak Daun Dan Karat Pada Kacang Tanah.

## Harvesting, Trading, and Processing

**Harvesting and initial drying is either done by the farmer or collector depending on how and when the farmer chooses to sell the peanut crop. In Magetan and Ponorogo, the common practice is for farmers to harvest their own crop.** When farmers harvest their own peanut farms, they will do this manually with family labour or hired labour. Both men and women are involved in harvesting. If the price is good, they will sell directly to collectors while the peanut is still wet. Otherwise, farmers will proceed with sun-drying the peanuts, which can take 4-7 days. This is typically done outside on concrete floors. If there are rains during this period, the peanuts are placed in plastics sacks or simply scattered on the ground inside the house. Since the peanuts will still be partially wet, farmers will place them outside again to dry when the rains have finished. Storing is also done with sacks or uncovered on the ground. In Magetan and Ponorogo, farmers may store peanuts for up to 2 months before selling them. At the farmer level, farmers will always sell peanuts dry or wet in-shell.

**Unlike farmers in Magetan and Ponorogo, Tuban and Lamongan farmers are more likely to sell their entire crop while the peanuts are still in the ground.** Contractors, either independent contractors or agents of collectors, will visit peanut farms before the harvest to do a random sampling of the quality and quantity of peanuts. This is used to estimate a price for farmers, who are paid one month in advance of the harvest. While there is no price adjustment after the harvest, farmers are content with this arrangement since it provides savings in terms of effort and cost of harvest labour and results in faster payment.

**Contractual relations between large food processing companies and farmers have expanded over the last five years. But overall, few peanut farmers in East Java are supplying these companies directly.** At the same time, peanut demand from these large processors has remained flat. Dua Kelinci, one of two large snack processors, has even noted a slight decrease in its demand and has recently downsized this part of the business. Both Garuda Foods and Dua Kelinci have strict requirements that peanuts must be delivered wet-in shell within 48 hours of harvesting. These companies will then dry the product themselves in order to better control the quality of the peanuts. They have a preference for varieties with 2 kernels per pod although Garuda Foods also procures a small amount of 3-kerneled pods. These peanuts are roasted in their shells and sold to local markets.

**Whether food processors require wet in-shell peanuts, dry-in shell peanuts, or peanut kernels depends on whether they are a large food processor, dry processor, home industry for roasted in-shell peanuts, or home industry for other peanut products.** Any rejects or wet-in shell peanuts that cannot be absorbed by Dua Kelinci or Garuda Foods are sold by collectors to either home industries that make roasted in-shell peanuts or dry processors who make dry peanut kernels. When selling to dry processors, collectors will often dry these peanuts again and sell them dry-in shell. Dry-in shell peanuts can be stored for about 6-8 months before shelling them. Although some drying occurs at the collector level, dry processors will further dry the peanuts to ensure the right moisture content. Dry processors have equipment to check the moisture level of peanuts and will calculate the buying price depending on the moisture content. Similar to large food processors, they tend to prefer 2-kerneled pods because of the size and roundness of these kernels. In addition to drying, dry processors will also shell and sort peanuts and will supplement their production with imported peanut kernels, mainly from India. The Indian variety is preferred as it is similar in size and shape to Indonesian varieties. Imported kernels also have a longer shelf life.

Dry processors have established relationships with large food processors and will sell a small amount of dried kernels which meet specific size and quality requirements to these processors. The rest of the dried kernels is sold to local markets and home industries that make peanut snacks (roasted or fried peanut kernels, peanut sauce, coated peanuts, etc.), with a small amount also going to peanut oil processors. Cake residues from peanut oil processing is used by the animal feed industry. Women play a significant role in home processing and the retailing of peanuts snacks.

**Whereas peanut demand from large processors has been flat, peanut home processing industries are growing rapidly, particularly in Ponorogo, Magetan, and Madiun. Traders are looking for additional sources of peanuts to meet the demands of home industries.**

To fulfil the peanut demand from the home processing industry, traders in Tuban are also sourcing peanuts from NTB and West Java. When buying from other regions, Tuban traders prefer to purchase peanuts in half dry condition as this prevents them from getting crushed during the delivery process. After getting peanuts from other provinces, they will continue the drying process for at least two days. Magetan traders prefer to source within East Java since they consider half-dry peanuts to be of poor quality (both in terms of taste and colour). Some traders in Pasar Pabean, the main commodity market in Surabaya, have indicated that they are sourcing large quantities of peanuts from Madura since there is insufficient production in Tuban and Magetan. The quality of these peanuts tend to be lower than those sourced from the East Java mainland.

#### 3.2.4 Supporting functions / services

**Seed services are important for stimulating the adoption of higher quality seeds by farmers. The seed supply chain from breeder to extension seeds involves a number of government agencies in Indonesia.** Balitkabi is responsible for research and producing breeder seeds, which is certified with a yellow label in Indonesia. White label seeds are then multiplied by Balai Benih Indonesia (BBI), another government institution, to produce white label seeds which are otherwise known as foundation seed. White label seeds are then distributed to certified seed producers who further multiply the seeds to become purple label seeds and eventually blue label seeds. Blue label seeds, which are extension seeds, are the certified seed type that are most commonly used at the farm-level.

**The production of newer improved peanut varieties is constrained by the limited supply of breeder and foundation seeds.** Balitkabi has limited supplies of breeder seeds for Hypoma and Takar varieties. Although Balitkabi has produced some yellow label seeds, this has mainly been for research purposes. None of the other government agencies have experience producing these varieties. BBI, which is responsible for producing foundation seeds, has only produced the Kancil variety. Its annual production volume is based on requests from government projects. According to the Head of BBI, farmers are not familiar with other varieties. As a result, it is easier for the BBI to meet its targets for the PAD (local revenue generation policy) by promoting varieties that are known by farmers. It is unclear which agency in the government is responsible for promoting new varieties to farmers.

**Furthermore, there are only a few certified nurseries that are producing peanut seeds, and they are mainly producing seeds for the government.** There are 8 certified seed producers in East Java, but only two currently produce peanut seeds. UD Permata Tani in Tuban

and Pak Arifin in Malang are the only certified seed producers who are currently involved in peanut seeds. UD Permata Tani produces 500 tonnes of seeds annually of the Tuban variety. Most of this is sold to the government for seed distribution programs in Kalimantan, NTT, and Aceh, with the remainder being sold through private channels in 8 sub-districts of Tuban. Pak Arifin has noted that he does not see the business opportunity in multiplying and certifying seeds himself. Instead, he prefers to order seeds from UD Permata Tani and sell them to the government. As a result, only limited quantities of certified peanut seeds are available commercially.

There are two other nurseries who have previously produced certified peanut seeds. This includes CV Trubus Gumelar, which produced certified peanut seeds for government projects in 2010. CV Trubus Gumelar stopped producing peanut seeds when the government stopped its subsidised peanut seed distribution program in East Java. It now focuses on producing certified soybean seeds for the government. Overall, private distribution channels are largely underdeveloped and seed producers do not have sufficient knowledge on how to distribute and market certified seeds through commercial channels.

**Table 2: Certified nurseries in East Java**

#	Name	Location	Description
1	UD Permata Tani (Pak Gaguk)	Tuban	Run by a government officer. Produces certified peanut seed but only for government programs in other provinces.
2	Pak Arifin	Malang	Run by a government officer. Produces certified peanut seed but only for government programs in other provinces.
3	Pak Swarji	Gresik	Previously produced peanut seed for government programs but now is focused only on paddy.
4	Pak Agung	Trenggalek	Government officer with license to produce certified seeds but not currently producing any certified seeds.
5	CV Trubus Gumelar (Pak Eryanto)	Ponorogo	Produced peanut seeds for government program in 2010 but stopped since government ended after that.
6	UD Sri Niaga Tani (Pak Fathoni)	Tuban	Agro-input dealer and collector for peanuts who received his license in 2015. He has Hypoma seed
7	Pak Kasman	Tuban	Not currently producing any certified seeds.
8	Pak Heru (CV.Anugrah Catur Wijaya)		Produced for red rice and on process registered for legume seed. He has Takar 2 seed.

**Both the nursery and seed certification processes continue to be major challenges for existing and new seed producers.** Badan Pengawas Sertifikasi Benih (BPSB) is responsible for certifying nurseries and has offices at the district and provincial level. Although there is a policy which clearly outlines the process and requirements for becoming a certified nursery, applicants are receiving conflicting information from different levels of BPSB. There appears to be a lack of understanding, especially at the district level, of the division of roles between the district and provincial levels with respect to the certification of nurseries. This makes it difficult to navigate the nursery certification process and for new nurseries to enter the market.

Once nurseries are certified to produce seeds, there are also challenges with getting the seed certification each year. For each season of seed production, nurseries have to register with BPSB (Badan Pengawas Sertifikasi Benih) the amount of certified seed they intend to produce

and details around the land area, variety, and schedule for planting and harvest. BPSB will conduct field assessments during the cultivation and harvest periods to check that planting and post-harvest procedures are being observed and to assess the quality of the seed produced. A laboratory assessment is also done on a sample of seeds. Bureaucratic delays can result in farmers receiving the seed certification after the peanut planting season. This serves as a deterrent for both existing seed producers and potential new entrants, especially since certified seeds have a short lifespan of 3 months.

**Information and extension services are another important support function for peanut farmers. Unfortunately, farmers have limited channels for obtaining information on peanut farming.** Farmers mainly get their information through peer farmers. However, the knowledge base sustaining such interactions is generally poor as peers often have similarly low levels of knowledge or awareness. Input companies do not regard peanut farmers as an important potential market and have therefore focused their extension efforts on other crops. At the same time, government advisory services are prioritising other crops (such as paddy and maize) and are poorly equipped to transfer know-how in peanut farming. There are also few extension agents relative to the number of farmers.

### 3.2.5 Supporting rules and regulations (enabling environment)

**Government priorities favouring maize and rice planting has encouraged farmers to plant these primary crops instead of secondary crops such as peanuts.** Peanuts are not among the main commodities (namely rice, maize, soybean, sugar, and beef) that are being targeted by the government as part of the Swasembada Pangan Program. Although there is minimal evidence of any concerted effort by the national government to promote peanut production and marketing, several provincial and district level governments (e.g. in Kalimantan, South Sumatra, Aceh, and NTT) are providing subsidised certified peanut seeds to their farmers. In East Java, the government previously provided seed subsidies for peanuts. This ended in 2011, and no other support exists for peanut farming in East Java.

**The main form of government support to the sector is through import tariffs.** In December 2010, the Indonesian Ministry of Trade announced a 5% tariff on imports of peanut-based products including unrefined oil, flour/meal, and peanut cake. The government rescinded this tariff in January 2011 for products targeted to the animal feed industry due to protests by feed millers but then reinstated these measures in 2012. Recently, the government has issued a regulation for a 10% tariff on imports of peanut kernel.

**The only official 'standard' involved in the peanut value chain is related to aflatoxin controls, but these are rarely enforced for the domestic production of peanuts.** Officially, the Indonesian government allows 20 parts per billion (ppb) in nuts/foodstuffs for human consumption (compared with 15 ppb for Australia or the EU). Except for imported peanuts at customs, the official limits do not appear to be enforced at any level of the value chain from farm through to wholesale trade or processing. This is despite studies showing highly elevated aflatoxin levels in many cases. A number of independent studies conducted in Indonesia revealed that aflatoxin can reach up to 1,000 ppb in peanut and maize products, which is well beyond acceptable levels.

There are supposedly laws being considered and agencies working to spread awareness on acceptable levels and best practices to avoid aflatoxin contamination. But few market actors

from farmers, traders to processors are aware of any active campaigns to ensure that Indonesian peanuts comply with both domestic and international limits on aflatoxin contamination. Knowledge of aflatoxins and the associated risks continue to be low across the entire value chain.

**With minimal government enforcement of quality standards, market actors are, for the most part, left to their own standards of quality control.** Peanut roasters (SME processors) indicated that they are subject to some health inspections and certification, but there is no specific mention of aflatoxin in these inspections. Garuda Foods implements its own safety system, along with HACCP controls, at their processing centre. While most value chain actors are unaware of aflatoxin and the dangers of contamination, they will take measures to control moisture, the presence of which can facilitate growth of *Aspergillus flavus* and *Aspergillus parasiticus*, the main aflatoxin-producing fungal pathogens. Despite the lack of government enforcement, a number of peanut roasters and processors have expressed interest in upgrading their quality management and food safety systems in order to meet established quality standards.

**A loose grading system exists that is based on visual and tactile inspection of kernels by wholesalers.** Wholesalers will look at size, moisture content, discolouration, and presence of foreign materials. Kernels are often sorted into several categories based on size. Approximately 50% of domestic kernels are between 6-7mm, and these kernels are the most popular among food processors. 6mm and 8mm kernels account for 10% and 40% respectively of domestic kernels. Even low grade “rejected” peanuts are being sold, mainly to peanut tempeh, sauce, and oil processors. Oil extractors tend to use only inferior grade, rejected peanuts, which they can source from wholesalers at a significantly lower price (as little as 10% of the wholesale price for peanut kernel). This is cause for concern, as kernels with very high levels of aflatoxin contamination can still make their way back into the food chain.

## 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 peanut market system in East Java. These problems have been identified through the Sector Dynamics section above and are also presented in the Intervention Logic Analysis Framework (ILAF) table. The key problem can be summarised as:

- Farmer productivity is low as evident through general productivity of 1.3 Mt/ha where as potential productivity is 2.5 Mt/ha

**Farmer productivity is low as evident through general productivity of 1.3 Mt/ha where as potential productivity is 2.5 Mt/ha.** Farmers lack access to good quality certified seeds and mainly use seeds from their own or other farmers’ seed banks. They may also purchase seeds from collectors who sort seeds from the harvest or allow farmers to do the sorting. Neither farmers nor collectors have effective seed selection methods. There is no guarantee of the productivity and quality of these seeds, which tend to be old, degenerated varieties characterised by low and declining yields. Despite the existence of newer high-yielding varieties (e.g. Tuban, Hypoma, and Takar), farmers still lack knowledge and access to these varieties.

Farmers also have limited access and knowledge of good agricultural practices, including pest and disease management. Proper land clearing, seed treatment, watering, fertilisation and weeding can improve productivity. Pest and disease management strategies are also important for reducing losses from peanut leaf spot and rust, which are widespread in Indonesia and can reduce yields by up to 50-75%. Improved varieties and good agricultural practices (GAP) can result in yields of over 2.5 tonnes/ha. In contrast, current yields in East Java are general productivity of 1.3 Mt/ha where as potential productivity is 2.5 Mt/ha.

#### 4.2 Services, enabling environment, and weaknesses analysis

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:

- Few nurseries are producing certified seeds for peanuts (in particular improved, newer varieties)
- Poor public provision of extension services and lack of private alternatives

##### **Few nurseries are producing certified seeds for peanuts (in particular improved, newer varieties)**

The introduction of certified seeds of improved varieties can result in significant yield improvements for farmers. Unfortunately, there is an absence of an efficiently functioning seed supply chain to supply certified seeds of improved varieties to peanut farmers. Aside from Balitkabi, which produces a small supply of breeder and foundation seeds for Hypoma and Takar varieties, none of the other government seed institutions have produced these varieties. The focus has been on the Kancil variety, which was developed in 2001, and there is reluctance from other government institutions to produce and promote varieties that are not already familiar to farmers.

At the same time, there are only a handful of certified nurseries, of which only two are currently producing certified peanut seeds. The nursery and seed certification processes are deterrents for both existing seed producers and potential new entrants. Moreover, the main focus of existing nurseries has been on producing certified seeds for government seed subsidy programs. As a result, for the most part, nurseries have yet to develop commercial distribution channels, and few have the marketing and distribution capacity to sell certified seeds through private channels.

##### **Poor public provision of extension services and lack of private alternatives**

Information and extension services are important to ensure farmers have better access to information on GAP in peanut farming, including effective pest and disease management practices. There are, however, few reliable sources of information for peanut farmers. Government has relatively few extension agents and is not equipped to satisfy the need for technical information and training. Since peanut is a secondary crop, existing extension agents tend to have limited technical knowledge and skills on peanut farming. Private input suppliers

also tend not to focus on peanut farming, and their products and informational materials are more geared towards maize, rice, and other priority crops.

## 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

**There is market opportunity to expand East Java’s peanut production in order to meet the growing demand for peanuts by home industry food processors.** Peanut consumption is driven by food consumption of peanuts. Since demand from large scale food processors has been flat and they are not currently interested in expanding production, increased production of processed peanuts will mainly be from home industries. With peanut consumption per capita expected to remain stable, growth of national peanut consumption will be determined primarily by population growth. There may also be opportunities for substituting imports, which on average account for 21% of annual peanut consumption.

Based on our calculations, there is potential to unlock at least an additional AUD 10.9 M in production.

**Table 3: Business potential in target area**

Description/Years	Total Business in the target area (s)
Existing Production (MT)	74,843
<b>Potential New Production in Existing Areas (MT)</b>	<b>29,937</b>
Total Potential Production (MT)	104,780
<b>Average Selling Price Peanuts per kg (IDR)</b>	<b>4,000</b>
<b>Current Value of Production (million IDR)</b>	<b>299,370.0</b>
<b>Total value of potential production (million IDR)</b>	<b>419,118</b>
<b>Total value of potential production (AUD)</b>	<b>38,101,636</b>
<b>Total potential value of increased production (million IDR)</b>	<b>119,748</b>
<b>Total potential value of increased production (AUD)</b>	<b>10,886,182</b>

### 5.2 Vision of change

Focusing on achieving the potential outlined above for the peanut sector in East Java, 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 smallholder productivity and production. At the **service level**, it is envisaged that farmers will have access to (1) seed and (2) information and extension services.

We envision that seed services will be provided through seed companies, collectors, and seed related government institutions. Information and extension services will be provided through input companies (particularly chemical companies).

### 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 peanut sector in East Java. The following table shows the key intervention areas along with approved, on-going, or completed interventions and intervention concepts:

Intervention Areas	Approved, on-going, or completed interventions and intervention concepts
<b>Intervention Area 1:</b> Promote certified seeds of improved varieties for peanut production along with embedded information	<ul style="list-style-type: none"> <li>Promote certified seeds of improved varieties (CV Trubus Gumelar in Ponorogo, Magetan, and Tuban)</li> </ul>
<b>Intervention Area 2:</b> Introduce good agricultural practices, including effective pest & disease management	-

Although productivity gains in peanuts have largely ignored the food safety aspect in the peanut food chain and the risk of aflatoxin contamination does not adversely impact farm gate prices and farmers’ profitability, it is, nonetheless, important from a development and public health perspective to address the issue of aflatoxin. As a result, AIP-PRISMA will also seek to integrate aflatoxin risk management practices and solutions where possible, especially when working with collectors or other downstream actors in the intervention areas below.

#### **Intervention Area 1: Promote certified seeds of improved varieties for peanut production along with embedded information**

The key objective is to ensure the availability and use of certified peanut seeds of improved varieties. This is essential for improving farmer productivity and profitability from peanut farming. This may involve supporting new or existing nurseries to (1) produce sufficient amounts of certified seeds of improved varieties; (2) establish private distribution channels that also provide embedded information; and (3) stimulate demand by increasing awareness among farmers of the benefits of investing in certified seeds.

On the seed production side, this may include linkages with Balitkabi and other government seed institutions to source the required foundation seeds, as well as additional interventions or activities to increase the supply of breeder and foundation seeds or improve the nursery and seed certification processes. With respect to distribution, there is potential to work closely with collectors and explore models where the collectors provide seeds and information as embedded services to farmers. Embedded information will be important to help farmers maximise yields from planting better quality, higher yielding seeds. Since women are responsible for planting, it will be important to ensure that exposure to the benefits of certified seeds and information on better practices are accessible to women and tailored to their needs. There is also significant potential for the participation of women as seed growers.



In order to promote certified peanut seeds of improved varieties, AIP-PRISMA has been working with CV Trubus Gumelar, a certified nursery which is interested in developing a commercial market for certified peanut seeds in Ponorogo, Magetan, Tuban, and potentially also Madura. Support has been provided to CV Trubus Gumelar on establishing the peanut nurseries, sourcing Takar 2 white label seeds from Balitkabi, and designing promotional materials and activities. The nursery has produced purple label seeds during the last planting season and is working with seed growers to multiply the seeds again before selling them to peanut farmers. Potential candidates for scale-up include UD Sri Niaga Tani and Farmer Budi in Tuban.

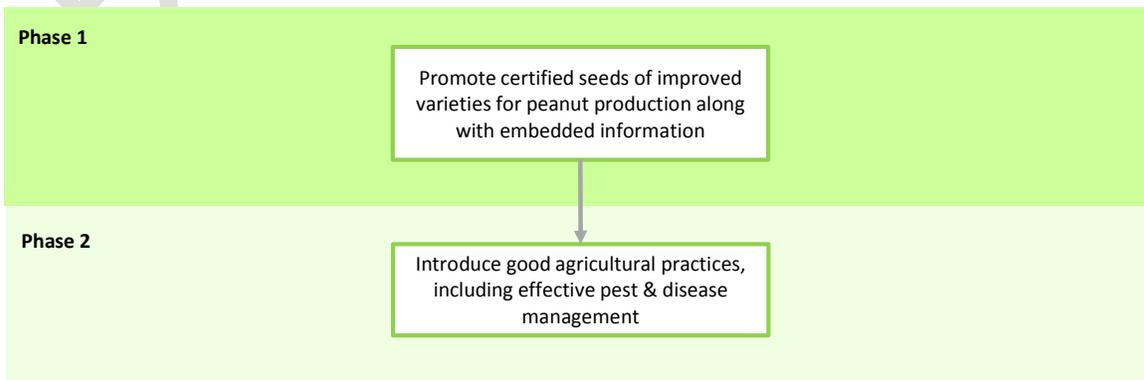
**Intervention Area 2: Introduce good agricultural practices, including effective pest & disease management**

The main objective is to ensure better access and use of information on GAP by peanut farmers. This will allow farmers to maximise yields, including through reduced losses from pest and diseases. Similar to the previous intervention, it will be important that information on better practices are accessible to women and tailored to their needs.

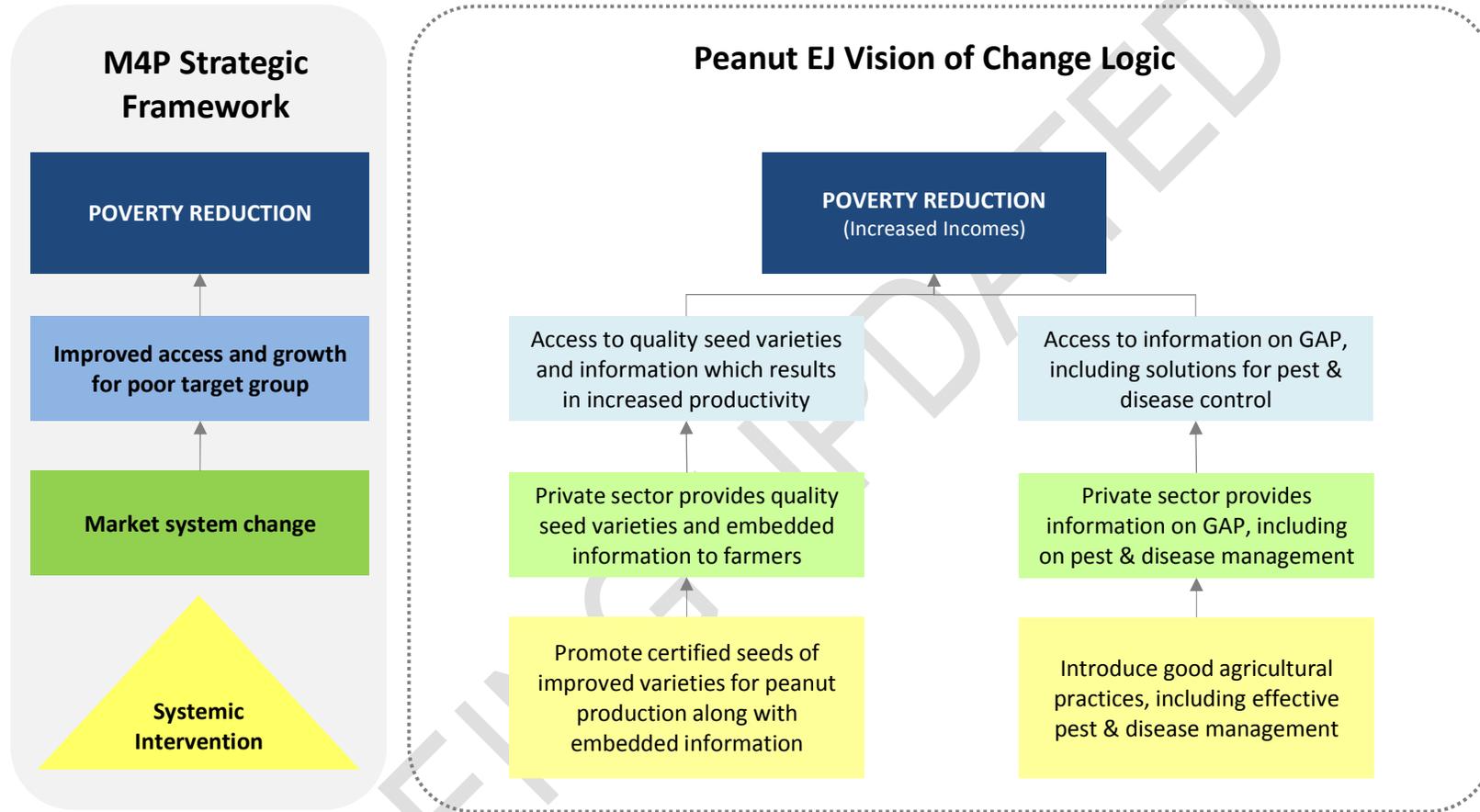
There is potential to partner with input suppliers to develop effective distribution channels and marketing and promotional strategies which target smallholder farmers and provide them with embedded information on GAP. In particular, there are opportunities to work with chemical companies (such as BASF, Syngenta, Dupont and PT NASA) that already have suitable pest and disease management products that can be used for peanut farming. Several years ago, BASF conducted trials in Indonesia which found that their products can bring about a substantial reduction in losses from key peanut diseases. They are interested in promoting these solutions, as well as providing embedded information to peanut farmers, and are currently trying to register their products so that they can be used for peanut farming in Indonesia

**5.4 Sequencing and prioritisation of intervention areas**

**It is recommended that the intervention areas in the East Java peanut sector be implemented in two phases.** In the first phase, the focus is on *promoting certified seeds of improved varieties for peanut production along with embedded information* since we already have a partner and a number of other potential partners. This will be followed in the second phase by *introducing good agricultural practices, including effective pest and disease management*, which is a new intervention area introduced in the 2015 update of the GSD.



5.5 Sector vision of change logic



## Annex 1: 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
Farmer productivity is low as evident through general productivity of 1.3 Mt/ha where as potential productivity is 2.5 Mt/ha.	Farmers use retained seeds or buy poor quality seed as they do not have access to improved quality seed.	Seed services	Limited access to good quality seeds for farmers resulting from limited outreach of traditional channels	<b>Intervention Area 1:</b> Promote certified seeds of improved varieties for peanut production along with embedded information	<ul style="list-style-type: none"> <li>Nurseries (CV. Trubus Gumelar, UD Sri Niaga Tani)</li> <li>Collectors</li> <li>Government seed institutions</li> </ul>
	Farmers use traditional agricultural practices that are not up to date on modern good agricultural practice	Information and extension services	Limited supply as few nurseries are producing certified seeds for peanuts (in particular improved newer varieties)		
	Farmers have limited knowledge of good quality seed, good agricultural practices, including pest and disease management		Poor public provision of extension services and lack of private alternatives	<b>Intervention Area 2:</b> Introduce good agricultural practices, including effective pest & disease management	<ul style="list-style-type: none"> <li>Input companies (BASF, PT Nasa, etc.)</li> </ul>

## Annex 2: Gender table

No.	Activity in production	Task		Explanation
		Male	Female	
1	Decision on the commodity to be planted	v	v	Discussed between male and female. Decision made by women based on economic reason
2	Buying peanut seed		v	Women buy peanut to collector, wet market or neighbours
3	Preparation of seed		v	Repealing the sheell (unshelling peanut)
4	Land preparation	v		Mostly conducted by men
5	Planting	v	v	Decision on time and application made by men and women
6	Weeding	v	v	Decision on time and application made by men and women
7	Fertilizing	v	v	Mostly dominated by men, women only assist
8	Pest control	v		Mostly conducted by men
9	Harvesting	v	v	Decision on time and application made by men and women
10	Drying		v	Mostly dominated by women, men only assist
11	Packaging and Storing	v	v	Mostly dominated by men, women only assist
12	Transporting	v		Mostly conducted by men
13	Selling peanut	v	v	Decision on time and application made by men and women