AIP-PRISMA
Australia-Indonesia Partnership for
Promoting Rural Income through
Support for Markets in Agriculture

Australian Aid

CASHEW GROWTH STRATEGY DOCUMENT FOR NUSA TENGGARA BARAT

OCTOBER 2015

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Abbreviations

ILAF	Intervention Logic Analysis Framework
GAP	Good Agricultural Practices
Ha	Hectare
NTB	Nusa Tenggara Barat (West Nusa Tenggara)
PRISMA	Promoting Rural Income through Support for Markets in Agriculture

1. Executive Summary

There is robust demand for cashew globally, and Indonesia is a small but growing exporter of unshelled cashew. International demand for cashew has been steadily growing, increasing annually by an average of 5% for shelled cashews and 12% for unshelled cashews since 2002.[1] Global trade is divided into two main channels based on the type of cashew product: processed and raw cashew kernels (shelled cashew) and raw cashew nut (unshelled cashew). Currently, Indonesia accounts for 5% of the supply of unprocessed cashews, mainly flowing to India, but it is an increasingly important export commodity. Indonesian exports of unshelled cashew grew by an average annual rate of 9% between 2008 and 2012, and national earnings from cashew exports increased substantially from US$ 44 million in 2011 to US$ 97 million in 2012.[2] Indonesia's plantation lands, soil conditions and relatively low labour costs provide a competitive advantage for the country to play a bigger role in the global cashew market.[3]

West Nusa Tenggara accounts for 11% of Indonesia's cashew production but experiences lower productivity compared to other provinces and countries. NTB is a significant cashew producing province; however, NTB's average cashew yield is 385 kg/Ha, significantly below that of East Java (725 kg/Ha) and East Nusa Tenggara Timur (450 kg/Ha).[4] This is also significantly below the productivity in other countries. Cashew production in NTB is dominated by smallholder farmers, and while profit margins are lower compared to other commodities, cashew remains important horticultural crop as it is often grown in drier areas with fewer alternative crops and sources of income.

There is a market opportunity to increase smallholder production of cashew in NTB to meet the growing national and international demand for cashews. By increasing yield productivity in NTB to meet minimum international standards through the application of good agricultural practices and effective pest control, the cashew crop in NTB could be almost doubled. Given the scale of growing international demand, increased production of cashew in NTB would result in greater smallholder farmer household income.

Analysis of the cashew sector in NTB shows a number of critical problems that currently constraint the ability of farmers to respond to the growing global cashew demand. First, farmers experience low productivity because they do not apply good agricultural practices in cashew cultivation, using the minimum level of inputs. Farmers generally are not aware of the benefits of using high quality seedlings and fertiliser, and only undertake the basic maintenance of cashew trees. Secondly, outbreak of pests can result in reduction of productivity by 30-50%, and farmers do not have access to information or services to effectively manage pest outbreaks. The incidence of the helopeltis pest in particular has been the highest contributing factor to productivity reduction in NTB in the cashew sector. Thirdly, farmers focus only on supplying the market for unshelled cashews, although prices for

[1] FAOSTAT data for 2012, checked in October 2015.
[2] (FAOSTAT; Bank of Indonesia 2000; The National Agency for Export Development 2003 and Ministry of Agriculture Center for Data and Information System Agricultural, 2012).
[3] Improving The sustainability and Competitiveness of Agricultural Export Commodities in Indonesia, Bustanul Arifin, 2012.
[4] Efficiency of Cashew Marketing in the West Lombok Regency, Brawijaya University, 2009.

processed cashews (i.e. cashew kernels) are significantly higher than those for unshelled cashews.

The vision of change at the sector level is to: (1) increase smallholder productivity and overall production (2) reduce potential losses due to pests and (3) increase farmer cashew processing activities. At the service level, it is envisaged that farmers will have access to: (1) information and extension services (2) high quality inputs (seedlings and fertiliser) (3) pest control services and (3) technologies and financial services to invest in processing. To realise this vision, this reports recommends the following five intervention areas:

- Intervention Area 1: Development of pest control and GAP services
- Intervention Area 2: Development of a nursery centre in partnership with input suppliers
- Intervention Area 3: Development of a financial product for cashew processing
- Intervention Area 4: Establishment and improvement of information services

It is recommended that the first intervention area, focused on introducing pest control services and promoting good agricultural practices to cashew farmers, is prioritised in order to provide the basis for raising productivity levels of farmers and enabling overall production in NTB to increase. Intervention areas 2 and 4, focusing on introducing better planting material to replace existing trees and information services, would be considered as part of a second phase that built upon farmers' awareness of good agricultural practices, as well as private and government interest in further investment in the cashew sector in NTB. The final stage would be focused on opportunities for post-harvest processing at the province, district and local level.

2. Background

Promoting Rural Income through Support for Markets in Agriculture (PRISMA) is a multi-year program which is 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 2018. PRISMA works in East Java, West Nusa Tenggara (NTB), East Nusa Tenggara (NTT), Papua, and West Papua.

This report aims to provide a logic and rationale for market-based interventions which can support the cashew sector for the benefit of male and female smallholder famers in Nusa Tenggara Barat (NTB). This is an updated version of the Sector Report, produced by MercyCorps in 2013 under the AusAID-funded IMDI program, a preparatory program preceding PRISMA.

3. Sector description

3.1 Sector profile

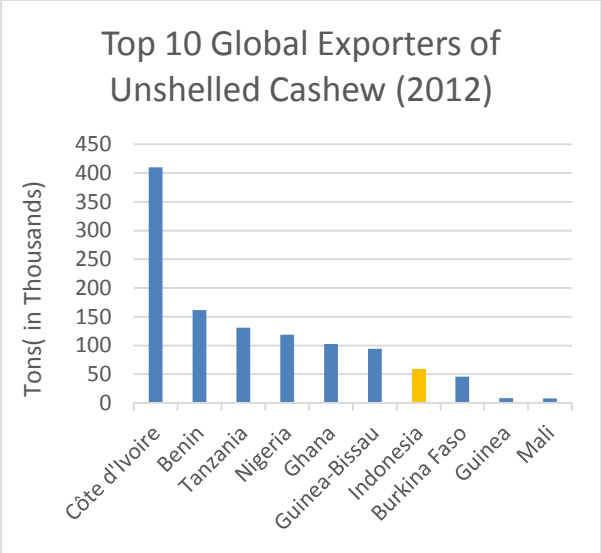
3.1.1 Overall context

There is robust demand for cashew globally, with demand increasing in North America, India and other Asian countries. International demand for cashew has been steadily growing, increasing annually by an average of 5% for shelled cashews and 12% for unshelled cashews since 2002.[5] Despite a recent slight decrease in exports to European markets in 2012, global demand is expected to continue to increase due to rising demands in India, the Middle East, China and other Asian countries. In 2010, India consumed 30% of the world cashew kernels, followed by North America (25%), Europe (17%) and the Middle East (6%). Trends in demand and supply show an increasing Asian bias; consumption in India has increased at an annual rate of 11% for the past decade, whereas China's imports from Vietnam increased 39% from 2009 to 2010.

Global trade is divided into two main channels based on the type of cashew product: processed and raw cashew kernels (shelled cashew) and raw cashew nut (unshelled cashew). The top producers of processed and shelled cashews – Viet Nam (accounting for 53% of global exports); India (24%); the Netherlands (7%) and Brazil (6%) – mainly export to the US and countries in the EU, as well as other countries with smaller demand. A second channel for unprocessed cashews flows largely to India, which captures 91% of global imports to process for domestic and global trade. The largest producers of unshelled cashews are in West Africa (82%), followed by Tanzania (11%) and Indonesia (5%).

[5] FAOSTAT data for 2012, checked in October 2015.

Figure 1: Top Exporters of Unshelled Cashew



Indonesia is a small but growing exporter of unshelled cashew, and has the potential to capitalize on the shift toward Asian consumer markets. Currently Indonesia accounts for only 5% of the global raw cashew nut market and is ninth in terms of global production, yet it is an increasingly important export commodity for Indonesia. Exports of unshelled cashew grew by an average annual rate of 9% between 2008 and 2012, and national earnings from cashew exports increased substantially from US$ 44 million in 2011 to US$ 97 million in 2012.[6] Indonesia's plantation lands, soil conditions and relatively low labour costs provide a competitive advantage for the country to play a bigger role in the global cashew market.[7] In addition, Indonesia's peak harvest season occurs from September to December, which follows the harvest season in West Africa and India (February to June) and only overlaps with Tanzania's harvest season. Therefore, global buyer and export trader focus is relatively concentrated on Indonesia during its harvest season. Prices for cashew in Indonesia are largely driven by: 1) global demand, 2) levels of production in India and from the major producers of unshelled cashew in West Africa and 3) quality of the cashew nut. Prices generally range from IDR8,000/kg to IDR18,000/kg depending on the above factors.

Within Indonesia East Nusa Tenggara is the largest producer of cashew, with significant production in four other provinces; the focus remains on unshelled cashew production. Following the introduction of cashew more than 20 years ago through government programs, East Nusa Tenggara produces 35% of cashews in Indonesia, with South Sulawesi (14%), South-East Sulawesi (13%), West Nusa Tenggara (11%) and East Java (115) forming the other main cashew producing provinces. The climates in these provinces areas are characterized by lower levels of rainfall and a long dry season, which is considered ideal for growing cashew. There is a low number of processed and value-added products in Indonesia, with the sector largely focused on production of unshelled cashew for export markets.

3.1.2 Local context

West Nusa Tenggara accounts for 11% of Indonesia's cashew production but experiences lower productivity compared to other provinces and countries. NTB is a significant cashew producing province, with Bima and Dompu forming the two major cashew producing districts with over 30,000 Ha of land under cultivation (2012), and significant

[6] (FAOSTAT; Bank of Indonesia 2000; The National Agency for Export Development 2003 and Ministry of Agriculture Center for Data and Information System Agricultural, 2012).
[7] Improving The sustainability and Competitiveness of Agricultural Export Commodities in Indonesia, Bustanul Arifin, 2012

potential productive plantation area (with approximately 7,500 Ha of young cashew nut plantation ready to produce their first yields in three years). However, NTB's average cashew yield is 385 kg/Ha, significantly below that of East Java (725 kg/Ha) and East Nusa Tenggara Timur (450 kg/Ha).[8] This is also significantly below the productivity in other countries; for example, productivity in Vietnam reached 672 kg/Ha, while in parts of Africa and Asia it has reached as high as 1000 kg/Ha.[9]

Cashew is primarily grown by smallholder farmers in NTB for export, with responsibilities shared between men and women, and is an important horticultural crop. Cashew production in NTB is dominated by smallholder farmers, and while profit margins are lower compared to other commodities, cashew remains important horticultural crop for export to other regions of Indonesia and the export market. As a drought resistant crop, cashew is grown in poorer, drier areas of NTB (and other provinces), which have fewer alternative crop options and a high risk of crop failure[10], thus having significant economic importance. Within farming households, women and men generally work together on cultivation (including planting, fertilising, weeding, and maintenance). Women are mainly responsible for harvesting and marketing of cashews, and in some areas, for seed selection and watering; while men undertake land clearing for planting and making beds.

Cashew is particularly susceptible to pests and disease, particularly Helopeltis, which significantly impacts yields in NTB. Cashews are particularly susceptible to a number of pests and diseases at flowering, which significantly reduces productivity. This includes Helopeltis (affecting cashew production globally), caterpillars eating leaves and flowers, and fungal diseases, especially anthracnose and powdery mildew (though less common in Indonesia).[11] Pests attack young succulent shoots causing the trees to stop flowering" and significantly lowering total production. Losses from pests in NTB are considered to be substantial, causing up to an estimated 30%-50% reduction in productivity.

Smallholder farmers do not apply good agricultural practices and lack knowledge on good pest control and site selection, which are key determinants of their low productivity. Smallholder farmers in NTB have lower productivity than in other areas of Indonesia, primarily due to lack of knowledge and application of good agricultural practices and pest control. There are a number of critical areas where GAP is not currently applied: weeding; pruning and canopy management; thinning out; maintenance; and fertiliser application. In addition, farmers lack knowledge on effective methods of pest control and site selection.

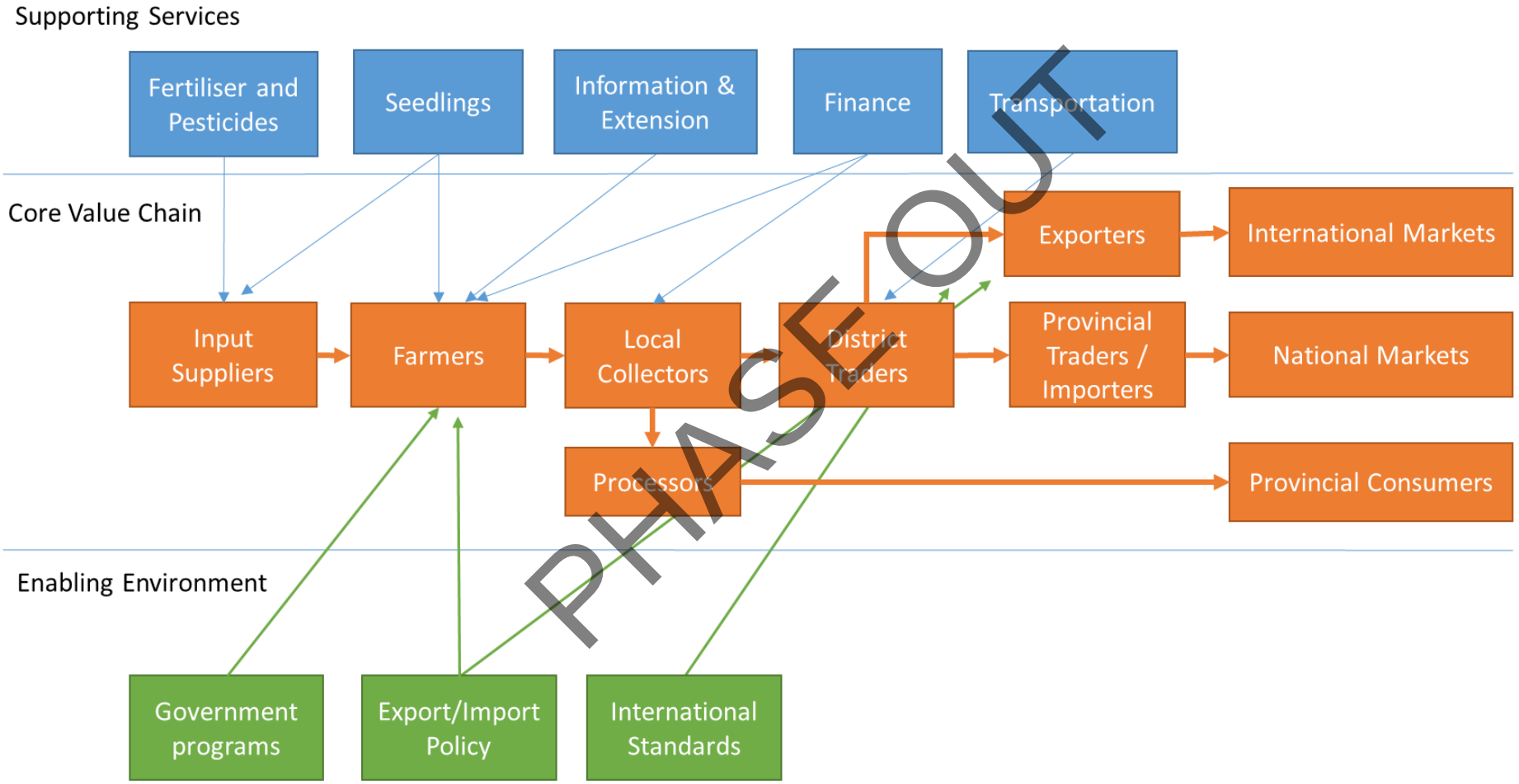
[8] Efficiency of Cashew Marketing in the West Lombok Regency, Brawijaya University, 2009
[9] Widiatmaka, Atang Sutandi, Anas Iswandi, Usman Daras, Muhammad Hikmat, and Ari Krisnohadi, "Establishing Land Suitability Criteria for Cashew (Anacardium occidentale L.) in Indonesia," Applied and Environmental Soil Science, vol. 2014, Article ID 743194, 14 pages, 2014. doi:10.1155/2014/743194
[10] Baker, Ian. SADI-ACIAR Research Report. The potential for cashews in eastern Indonesia. April 2008.
[11] Ibid.

3.2 Sector dynamics

3.2.1 Market overview

The cashew market in NTB relies on traditional methods of cultivation, with farmers using a very minimum level of inputs. The majority of seedlings are provided through government agencies, while other available inputs (i.e. fertiliser and pesticides) are available in but not promoted by agri-input suppliers. There are currently no service providers offering information, extension or pest control services for cashew farmers; as a result, farmers tend to obtain information only from peers and do not apply good agricultural practices to cashew cultivation. A collection system for unshelled cashews is established in NTB, which primarily serves destination markets in other provinces and countries (i.e. India).

3.2.2 Sector map



3.2.3 Core value chain

Inputs

The majority of seedlings are provided by the government, with few independent seedling distributors or private nurseries operating. The introduction of cashew was initiated by the government as part of an reforestation program in Sulawesi in the 1970s, and today the majority of seedlings are still available only through government distributors. For example, in Bima, there is one individual appointed by the government to distribute cashew seeds/seedlings to farmers for free; however, this distribution mechanism is yet to reach all farmers in need of new seedlings. In other areas, such as Dompu, farmers generally report obtaining seedlings provided by government, though some farmers buy seedlings from outside of the area (i.e. from Lombok). At present there are no private nurseries operating in the area.

Good planting material is critical to determining the upper limits of productivity. In Indonesia and in NTB, the gene pool for cashew trees– whether for government provided seedlings, private sales, or farmer propagated planting material – is fairly narrow, and productivity from even better yielding clonal varieties developed in Indonesia is below international standards (i.e. 10 kg per tree for Indonesian varieties versus 50 kg per tree in Australia).[12] In addition, as the initial government provided seedlings began distribution in the 1970s, many trees are nearing or past the peak productive age (10-30 years) and the need for good quality planting material for replanting is important.

The use of relevant inputs (fertiliser and pesticides) for cashew in NTB is very low, although they are available in agro-input stores. Farmers in NTB generally do not use any inputs for cashew farming, aside from planting material. Although chemical and organic fertiliser, as well as appropriate pesticides are available in agro-input stores across the province and relatively accessible for rural farmers at the district level, they are infrequently used. Men and women jointly make decisions on buying inputs (including seeds, pesticide and fertilizer) related to cashew production.

Pests, particularly Helopeltis (White Butterfly), have been a major factor in reducing crop yields amongst farmers in recent years. The incidence of the helopeltis pest has been the highest contributing factor to productivity reduction in NTB. Although relatively easily controlled with chemical sprays, farmers generally lack sufficient information and services to effectively tackle any outbreak of this pest. Work in Australia indicates that Helopeltis causes very large yield losses if uncontrolled, even at low populations.[13] Fungal diseases, such as anthracnose, frequently occur if rain falls during flowering or harvest and can attach either the flowers or the fruit. Leaf eating insects also effect cashew trees in NTB.

Production

Cashew production in NTB is primarily carried out by smallholder farmers, who apply few (if any) inputs and generally do not apply good agricultural practices. Smallholder farmers with 1-2 hectares are the primary producers of cashews in NTB, and cashew forms an

[12] Baker, Ian. Final Report: The potential for cashews in eastern Indonesia. SADI-ACIAR research report, April 2008.
[13] Baker, Ian.

important source of income. The primary input for cashew farmers is planting material, and few (if any) additional inputs are used. There are a number of areas where farmers lack appropriate knowledge on cultivation and therefore do not apply good agricultural practices, which in turns significantly lower productivity of their cashew trees. This includes: thinning out and pruning young trees, particularly during the first 3-4 years; continually pruning more mature trees to prevent their canopies from growing into each other and to maximise fruit bearing surfaces; application of fertiliser; and regular weeding. Responsibility for cultivation is generally shared between men and women.

Processing and Trading

The majority of farmers sell raw cashew nuts to local collectors and do not undertake further processing activities. Harvesting and drying of cashews is carried out during the dry season (mainly August/September to November), with women generally having responsibility for harvesting and marketing activities (including deciding when to sell cashews). Women reported having a high workload during the harvest period (with men focusing on other crops, such as maize) and do not consider shelling cashews as a viable option because of the more intense labour and time required to shell the nuts and limited technology available to do so.

There is an established collection system for unshelled cashew for export to other provinces and international markets. At the village level, local collectors purchase raw cashew nuts by kilogram directly from farmers at their homes. Local collectors may provide cash down payments to farmers in June-July for cashews, which can be used for farming inputs or general household expenditure; this down payment or advance is then offset against the agreed price for the cashews at harvest time. Local collectors sell the raw cashew to district collectors, who in turn work for or sell unshelled cashews to traders and/or exporters who sell the cashews to final destination markets in other provinces or in international markets (mainly India) via Surabaya, Lombok and Bali. For example, in Dompu there is a representative of an Indian company who buys cashew from village and district collectors (up to 80% of production in Dompu) and send the cashews for processing in India. Very limited stocks of cashew are sold for processing within the province.

Prices agreed with local collectors are generally considered fair and competitive. Given the growing demand for cashews, traders generally will buy as many cashews as can be produced, with higher quality cashews destined for international markets and lower quality cashews sold in the domestic markets. Depending on international market demand and quality, prices for cashews can be between IDR 8-18,000 per kilogram.

There are no large cashew processing industries operating locally in Sumbawa but some micro-processing exist. The closest industrial processing facilities for cashew are in Mataram in Lombok, but this remains an unfeasible option for cashew farmers in Sumbawa (companies generally prefer to source within two hours of processing facilities). Following government support through the Office of Plantation, which provided training on processing, micro-enterprise management, linkages and also provided tools, there are three successful micro-processing facilities operating in Sumbawa. These facilities process raw cashew nut into edible cashew kernels and other value added products. Their products are mainly sold to the

local markets (i.e. stores in Dompu and Bima), and do not currently constitute a major destination market for raw cashews in the area.

3.2.4 Supporting Functions / Services

There are very limited sources of information and extension services for cashew farmers in NTB. Through the government, the Office of Plantation provides some training and tools to farmers on cashew farming; however, this is sporadic, subject to the availability of budget and insufficient to reach the numbers of cashew farmers in the province. In addition, there are no private sector providers of information that currently provide these services. Farmers typically rely therefore on word of mouth amongst local communities.

Storage, aggregation and transportation services are provided by local collectors. The majority of smallholder farmers do not have their own storage and transportation facilities. Sales of cashew therefore are generally made at the farm at the time of harvest; local collectors provide the transportation services to collect raw cashews and transport to district collectors. Local and district collectors also offer the only aggregation of cashew supply, as this is not undertaken at farmer level.

There are no commercial pest control services offered for the cashew sector in NTB and government resources are too limited to effectively support pest control. There are currently no pest control services (such as insecticide spraying, soil applied insecticide) in NTB in the cashew sector that could support farmers in combating pests, particularly when cashew trees are flowering. The *Dinas Perkebunan* has acknowledged the importance of the issue and has employed some extension agents to provide information to farmers on pest control; however, due to limited resources, this is an insufficient sources of information and services for cashew farmers.

3.2.5 Supporting Rules and Regulations (Enabling Environment)

The current formal rules and regulations governing the cashew sector are not a barrier to increased production and export. There are virtually no trade rules set by the government, particularly relating to the export of raw cashew to other provinces and to international markets. While the government has not highlighted cashew as a major commodity overall for the province, some district governments (i.e. Dompu) have stated its importance in their investment and development plans. There are a number of companies operating in NTB that directly source cashews for export markets; therefore, government rules and regulations do not form a barrier to greater production of cashews for the export market.

4. Analysis

4.1 Problems in the Core Function and Underlying Causes

The problems and underlying causes are specific to the poor target groups that PRISMA seeks to support through interventions in the cashew market system in NTB. These problems have been identified through the Sector Dynamics section above and are also presented in the Intervention Logic Analysis Framework (ILAF) table.

4.1.1 Problems and their underlying causes faced by Farmers

The two key problems faced by farmers can be summarised as:

- Farmers experience low productivity because they do not apply good agricultural practices in cashew farming.
- Farmers lack access to technology, services and financing that would enable them to undertake processing of cashews.

Farmers experience low productivity because they do not apply good agricultural practices in cashew farming. Average annual yield for cashew production in NTB was 367 kg/ha in 2012 based on official data. This productivity level is significantly below other cashew producing regions in Indonesia and other international producers of raw cashew[14]. Current yields in NTB are constrained primarily by farmers not applying good agricultural practices that would support higher productivity. In NTB farmers provide minimum level of inputs and care to cashew production (planting material, some pruning in the first years); to reach the maximum potential of their cashew trees, farmers would need to undertake pruning of more mature trees to prevent their canopies from growing into each other and to maximise fruit bearing surfaces, regularly apply fertiliser at the correct times during the year, conduct regular weeding and address the potential for outbreak of pests, particularly helopeltis, and fungi.

Farmers lack access to technology, services and financing that would enable them to undertake processing of cashews. Farmers in NTB almost exclusively sell raw, unshelled cashew nut to suppliers. There is a potential for farmers to receive a higher price for cashews, if they were able to sell shelled cashews. However, this would require significantly more labour, particularly from women who are responsible for harvesting and any processing of cashews. Currently, women farmers are not able to consider selling shelled cashew because of labour constraints and being unaware of technologies that would enable them to shell the cashews more quickly. In addition, cashew farmers lack options for financing or accessing shelling services that would enable them to process raw cashew nut prior to sales. Financial institutions have not seen the commercial potential in cashew farmers and there are few products available to support cashew farmers to invest in production tools and technical assistance services.

4.2 Weaknesses in services and rules / regulations

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

- There are no suppliers of pest control services and information in NTB to effectively address pests that impact farmers' cashew production.

[14] Ministry of Agriculture, Agriculture Statistic Database, 2012.

- There is limited provision of information and extension services because of weak public provision and lack of private alternatives.

There are no suppliers of pest control services and information in NTB to effectively address pests that impact farmers' cashew production. Pests (particularly helopeltis) have been a major factor in reducing cashew yields among cashew farmers in NTB, with the potential to cut productivity by up to 50% for any given harvest. There are no supplier of pest control services and information in NTB, and farmers do not have access to the knowledge or services required to effectively address any outbreak of pests. While chemical insecticides are available, farmers are unaware of the potential use of these chemicals and suppliers of the insecticides do not promote them for use on cashew trees.

There is limited provision of information and extension services because of weak public provision and lack of private alternatives. Currently farmers do not have access to the knowledge required to information and extension services in the cashew sector. Support provided by the provincial *Dinas Perkebunan* and Office of Plantation does not effectively supply the need for technical information. Furthermore, private input suppliers and traders do not provide embedded information on cashew cultivation. As a result, farmers mainly obtain information through their peers and have limited exposure to good agricultural practices and application of inputs that could improve their productivity.

5. Strategy for Change

5.1 Market Potential

There is a market opportunity to increase smallholder production of cashew in NTB to meet the growing national and international demand for cashews. By increasing yield productivity in NTB to meet minimum international standards through the application of good agricultural practices and effective pest control, the cashew crop in NTB could be almost doubled. Given the scale of growing international demand, increased production of cashew in NTB would result in greater smallholder farmer household income. The districts of Bima and Dompu, with over 30,000 hectares of land under cultivation, would be the main target areas.

Table 1: Business Calculation for Cashew Sector Development in Target Areas

Description/Years	Total
Average Selling Price/kg (IDR)	8,000
Current Production (MT)	9,118
Current Value of Production (million IDR)	72,945
Potential Additional Production (MT)	2,735
Total value of potential production (million IDR)	202,655
Total value of potential production (AUD)	20,265,523
Total potential value of increased production (million IDR)	129,711
Total potential value of increased production (AUD)	12,971,059

5.2 Vision of change

Focusing on achieving the potential outlined above for the cashew sector in NTB, a vision of change can be outlined for both the sector and service levels. The vision of change **at the sector level** is to: (1) increase smallholder productivity and overall production (2) reduce potential losses due to pests and (3) increase farmer cashew processing activities. At the **service level**, it is envisaged that farmers will have access to: (1) information and extension services (2) high quality inputs (seedlings and fertiliser) (3) pest control services and (3) technologies and financial services to invest in processing.

5.3 Interventions

- **Intervention Area 1**: Development of pest control and GAP services
- **Intervention Area 2**: Development of a nursery centre in partnership with input suppliers
- **Intervention Area 3**: Development of a financial product for cashew processing
- **Intervention Area 4**: Establishment and improvement of information services

Intervention Area 1: Development of Pest Control and GAP Services

Cashew farmers' productivity is primarily lowered by lack of application of good agricultural practices and inability to combat pests. To address this, farmers need information services, as well as pest control services and supplies. PRISMA is facilitating service providers to offer three main services to cashew farmers: (1) supplies for effective pest control products (tools and technology) and GAP; (2) pest control services; and, (3) knowledge and skills on good agriculture practices, including trimming, effective planting distance, and fertilization.

The intervention will look to partner with the agribusiness unit of PT Gerband NTB Emas, a state-owned enterprise, to provide support to service providers as well as working with PT Nasa on the provision of organic pest control and fertiliser inputs. It is envisaged that the service providers will be independent business entities, cooperatives and potentially traders, and that their businesses/organisations can grow by offering information services to cashew farmers embedded into sales of relevant supplies and services or tied to the collection of cashew supplies.

This intervention area would focus on organic based pest control and other agricultural inputs, the overall environmental risk is considered to be low, with some implicit benefits in terms of improving the productive use of marginal and degraded lands. Cashews are generally considered a drought resistant crop, and as such increasing its productivity will help small holder farmers better withstand environmental and economic shocks.

Intervention Area 2: Development of a nursery centre in partnership with input suppliers

As cashew trees age past the peak of their productivity, replanting will be required. A nursery centre with a demonstration plot would increase farmer awareness of the impact of starting with high quality planting material and be a source of improved seedlings. The nursery centre could be managed by a partnership of government (i.e. *Dinas Perkebunan*) and private sector,

as seedlings are mainly now provided by government agencies though their outreach is insufficient.

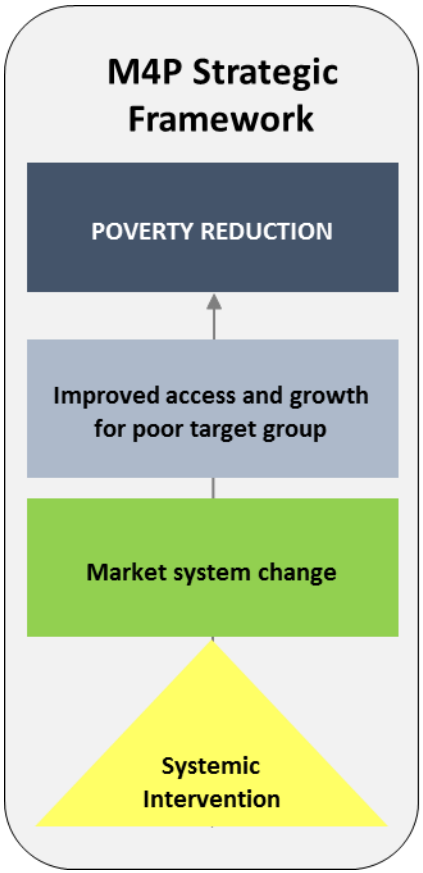
Intervention Area 3: Development of a financial product for cashew processing
Any further value-adding activities or expansion of production in the cashew sector are likely to require that market actors have increased access to financial products to invest in tools, technologies and other facilities. This could include financial products that covered storage and warehousing, transportation or post-harvest processing. It could also include financial products to expand production, including finance to cover the costs of seedlings, re-plantation, inputs, etc. In Bima and Dompu, there are opportunities that have been offered by several micro finance institutions to develop specific financial products. At least BRI and BPR PasirBima, had offered to develop partnership with Mercy Corps to develop financial product. BRI has raised the possibility to replicate successful warehouse receipt program, while BPR Pasir has offered special loan cashew market players in Bima and Dompu.

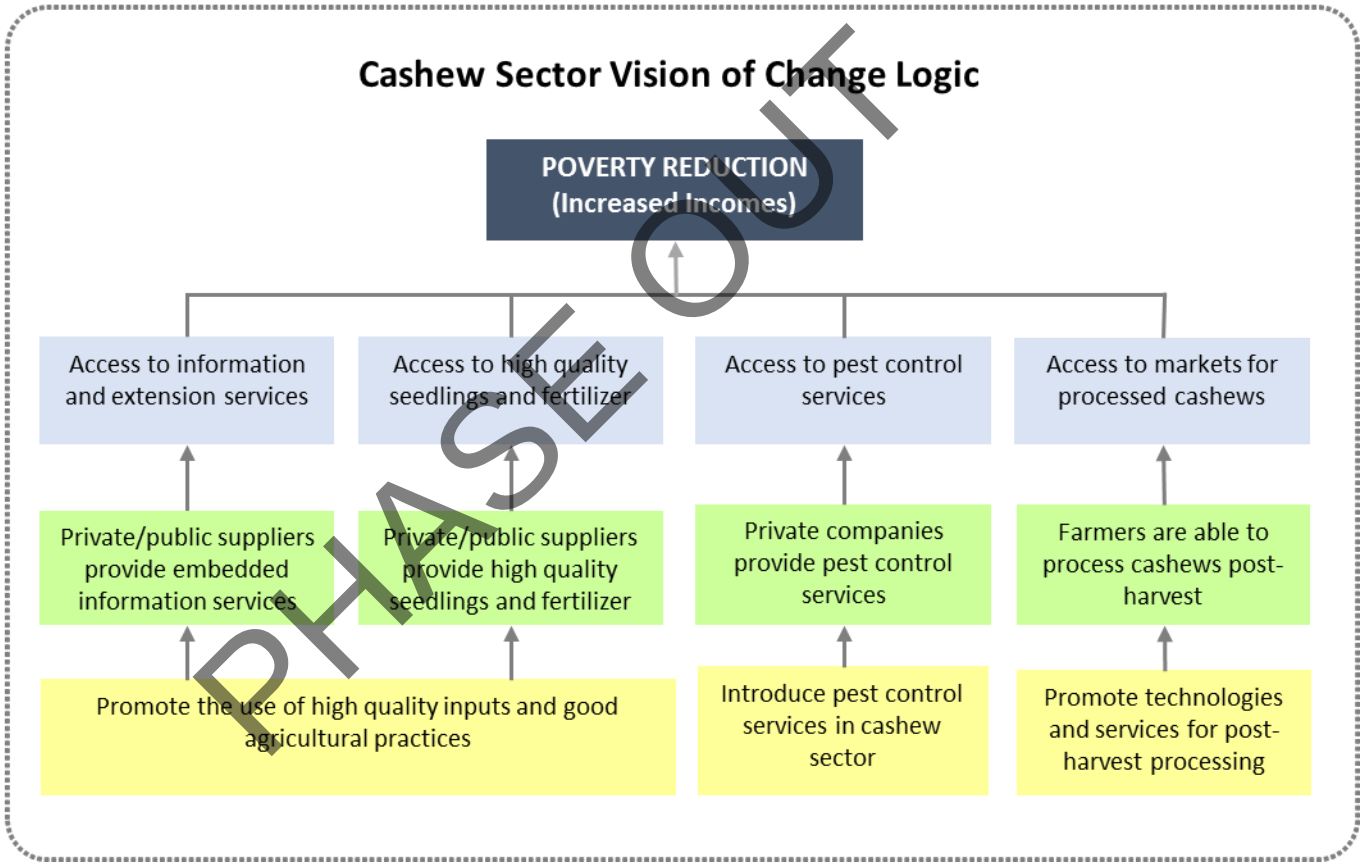
Intervention Area 4: Establishment and improvement of information system
Flow of information has become one of the major underlying causes in the sector stagnancy in NTB. For example, information on pest control mechanisms, wider market price, new technologies and market opportunities for processing are limited. This intervention area could consider the potential for the design and establishment of an information system, building on interest from the local government and private sector. The information system should consider a range of media channels, including: internet-based, cellular/smart phone based applications and commercial talk shows in the local media.

5.4 Sequencing and prioritization of interventions

It is recommended that the first intervention area, focused on introducing pest control services and promoting good agricultural practices to cashew farmers, is prioritised and implemented first. This provides the basis for raising productivity levels of farmers and enabling overall production in NTB to increase. Intervention areas 2 and 4, focusing on introducing better planting material to replace existing trees and information services, would be considered as part of a second phase that built upon farmers' awareness of good agricultural practices as well as private and government interest in further investment in the cashew sector in NTB. The final stage would be focused on opportunities for processing, which would require the greatest amount of investment and also the largest change in current farmer practices of selling unshelled cashew nut.

5.5 Sector Vision of Change Logic





Annex 1. Intervention Logic Analysis Framework (ILAF)[15]

(1) Problem/ Symptom	(2) Underlying cause	(3) (4) Services and Enabling Environment	(5) Service weaknesses/ underlying causes	(6) Intervention Areas	Service Provider/Partner
Farmers experience low productivity because they employ poor agricultural practices and do not use high quality inputs.	Farmers use minimal inputs and have limited knowledge on good agricultural practices and the benefits of using high quality inputs.	Seedling services Fertiliser services Information and extension services	Insufficient provision of seedlings from government; limited private suppliers. Limited promotion of inputs to cashew farmers by private input suppliers. Weak public provision of extension services and lack of private alternatives.	**Intervention Area 1:** Development of pest control and GAP services	• Fertiliser companies • PT. Gerbang NTB Emas • Agri-input suppliers, cooperatives, traders
				Intervention Area 2: Development of a nursery centre	• *Dinas Perkebunan* • Seedling distributor
				Intervention Area 4: Establishment and improvement of information services	• Local government • Private provider (agri-input company, traders, etc.)
Farmers experience high losses as a result of pests.	Farmers have limited access to knowledge, services and tools to control pest outbreaks.	Pest control services	No suppliers exist providing pest control services in the cashew sector.	**Intervention Area 1:** Development of pest control and GAP services	• As above
Farmers and local traders do not produce processed cashews.	Farmers/local traders lack access to technology, services and financing that would enable them to undertake processing of cashews.	Financial services Technology services Market promotion services	Financial institutions do not see the commercial potential for processing in the cashew sector. There are no existing private suppliers providing post-harvest processing services.	**Intervention Area 3:** Development of a financial product for cashew processing	• Financial institutions • Service providers and/or farmers investing in post-harvest technologies

[15] Adapted from Toolkit for Market System Analysis, International Development Enterprises (iDE), 2012