

2016 UPDATE SOYBEAN SUB-SECTOR GROWTH STRATEGY IN West Nusa Tenggara - NTB

March 29, 2016



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Summary of key changes from previous GSDs and focus for next year **Error! Bookmark not defined.**

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1. Executive Summary

Indonesia is a rising consumer of soybeans, but it currently only produces one third of the soybeans it consumes. Demand is driven by the food processing industry, particularly tempeh and tofu processing. Soybean is one of the most important source of protein for Indonesians in both rural and urban areas. Indonesia relies on a sizable amount of soybean imports to fulfil domestic demand, with imports having increased on average by 10% each year between 2005 and 2015.

NTB is the third largest soybean producer in Indonesia, accounting for 15% of national production. Soybean production in NTB is focused in three districts namely Central Lombok, Bima and Dompu. Compare with the other main soybean provinces in Indonesia, NTB has the lowest productivity and even lower than national productivity. In some area in NTB, soybean farming is the main crop unlike soybean farming in East Java, which is a secondary crop for farmers, complements the intensive cultivation of more highly valued primary crops and provides an additional income stream to farmers in the post-rice or maize harvest seasons.

There is a market opportunity to expand NTB's soybean production in order to meet the growing demand for soybean from the food processing industry especially in Java Island. Tofu and tempeh consumption are on the rise as local populations have developed a preference for these sources of protein. Processors have reported robust production and sales growth over the past five years and expect to continue expanding their operations. As a result, there is an existing and growing market that is able to absorb increases in local soybean production.

Analysis of the market reveals a number of problems that currently constrain the ability of soybean farmers to take advantage of this market opportunity. Farmer productivity is low because they use poor quality seeds and poor agricultural practices, including around pest and disease control. Limited access to good quality certified seeds and improved soybean seed varieties means that farmers continue to use degenerated seeds with low and declining yields. Furthermore, they are unable to maximise yields because they have limited access to information on good agricultural practices (including on pest and disease control strategies) and are reluctant to invest in better practices and/or pesticides and insecticides because of the perceived low returns from soybean farming

These problems are associated with weaknesses in seed and information/extension services. Although there are a few established nurseries that can produce certified seeds, most of them do not have commercial distribution channels. In general, nurseries face large obstacles when trying to obtain seed certification, and there are high barriers to entry into the soybean nursery business. While government research institutions have developed improved, higher-yielding soybean varieties, they have low capacity to promote these new varieties. At the same time, private seed companies have not considered soybean seeds as a potential market. Finally, public provision of information and extension services is poor, and there is a lack of private alternatives.

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

Promote good quality seeds

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Promote better information services, including on pest and disease control strategies

Information services can be provided through some of these same actors, as well as through chemical input companies and lead farmers.

The intervention areas in the NTB soybean sector be implemented in two phases. In the first phase, the focus is on *promoting better information services*, *including effective pest and disease control strategies and then followed by promoting good quality seeds*.





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 Australian, 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 Reports aims to provide a logic and rationale for market-based interventions which can support the soybean sector to benefit of smallholder farmers in NTB.

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 soybean sector.

3.1.1 Overall context

Global demand for soybean is strong and rising, with China being the biggest driver of demand and prices for soybeans. World production of soybeans has rapidly increased, with a compound annual growth rate (CGAR) of 3% over the past decade. In 2013, 276 million tonnes of soybean were produced globally. The United Stated and a group of South American countries are the main producers, and the US and Brazil accounted for 32% and 30% of global production respectively in 2013.

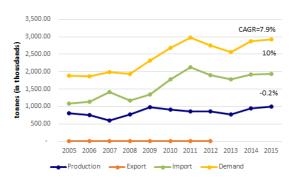
China alone imported 59.9 million tonnes in 2012, accounting for over 62.4% of world soybean imports. This was on top of an estimated 12 million tonnes of domestic production. Chinese soybean demand is expected to continue growing alongside increases in population, incomes, urbanization, and meat consumption. As demand in China grows, this has put upward pressure on international soybean prices, and world soybean prices have generally trended upwards.

Although a rising consumer of soybeans, Indonesia is a not a major producer on a global scale, and its soybean production has in fact been declining. Along with peanuts, soybean is the third most important source of protein after cereals and fish for Indonesian in both rural and urban areas. Soybean has deep historical roots in Indonesian culture, with tempeh having originated in Java and having been a food staple since at least the 16th century. Tofu was introduced subsequently into the Indonesian diet by the Chinese. Tempeh, tofu, and soy sauce are respectively consumed by nearly 70%, 65%, and 45% if households in Indonesia.



Nonetheless, both production and area harvested of soybean in Indonesia have been trending downwards for the past 20 years. In the past decade, Indonesian production of soybeans was just less than one million tonnes and accounts for less than 1% of global production. National demand, on the other hand, has been growing at a CAGR of 7.9% between 2005 and 2015.

Figure 1: Indonesian Soybean Market



Indonesia currently only produces one third of the soybeans it consumes and relies on a

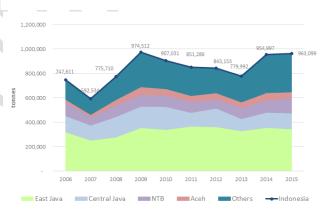
sizable amount of soybean imports to fulfil domestic demand. Indonesia has been a net importer of soybeans since 1975. Imports, which have increase on average by 10% each year between 2005 and 2015, reached 2.1 million tonnes in 2011. Most of the soybeans imported into Indonesia are sourced from the US, which contributed approximately 85% of imports in 2012. Indonesia does export some soybeans, but the volumes are negligible when compared to imports.

3.1.2 Local Context

NTB is one of main soybean production provinces in Indonesia, accounting of 15% of national production. Four provinces, namely NTB, East Java, Central Java and Aceh contribute 75% of national soybean production.

Soybean production in NTB is supported by a large harvested area, with NTB accounting for 10% of Indonesia's soybean harvested area in

Figure 2: Soybean Production in Indonesia



2012. Similar to national trends, between 2009 to 2012, there as a downward trend in the soybean harvested area in NTB. In NTB, this resulted in a 28% reduction in harvested area from 95.3 thousand hectares (ha) in 2009) to 62.9 thousand ha in 2012. Nationally, the soybean harvested area fell by 21% during the same period.

Yields in NTB is the lowest compare to national and international benchmark. In 2015, national yields reached 1.5 tonnes/ ha while NTB registered 1.3 tonnes/ ha. Central Java has the highest productivity in Indonesia but when compared with US and South America, yields in Indonesia are only half of what is being achieved by the leading global producers.



Figure 3: Soybean Harvested Area in Indonesia

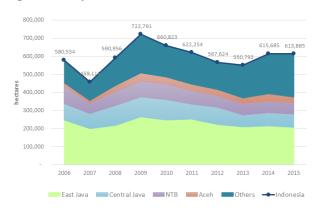


Figure 4: Soybean Productivity in Indonesia



Soybean farming is estimated to involve approximately 251,000 farming households in NTB and is an important source of additional income for poor farmers. While soybean is not the primary source of income for most Indonesian farmers, it usually complements the intensive cultivation of more highly valued primary crops and provides an additional income stream to farmers in the post-rice or maize harvest seasons. Most of soybean farmers can be described as poor, as are the many thousands of people employed in the tempeh and tofu processing industry. The urban and rural poor are also among the highest consumers of tempeh and tofu. This underscores the importance of soybean as a pro-poor commodity.

In addition to pro-poor economic benefits from soybean farming, legumes have the unique ability to fix atmosphere nitrogen to support their own growth and provide residual nitrogen for use by subsequent cereal grain and folder crops. They also provide significant crop rotation benefits by reducing pests, soil-borne and foliar disease, and weed pressure.

At the district level, the 2 districts (Bima and Central Lombok) in which AIP-PRISMA is proposing to start its soybean intervention account for 67% of soybean production in

NTB (around 164 thousand farming households). Bima and Central Lombok is the top districts in NTB for soybean production. The main soybean cultivation areas in NTB located in flat lowlands, and both Bima and Central Lombok consist mainly of lowland areas. According to central statistics data, Bima and Central Lombok produced approximately 24 thousand tonnes soybean in 2012.

Figure 5: Soybean production by district (2015)

With an average yield of 1.2 tonnes/ ha in 2012, Bima and Central Lombok was among the top five districts with the highest soybean yields. This was higher than NTB average of 1.16 tonnes/ ha.

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3.2. Sector dynamics

3.2.1 Market Overview

Soybean farming in Bima and Central Lombok is priority crops. In Bima, soybean is grown in three seasons during the year, and Central Lombok in one seasons during the year. In NTB farmers are willing to invest on chemical to reduce pest and diseases attack but still facing with low productivity because majority of farmers has limited knowledge on pest and diseases management. There are very limited information about chemical product information and the application from both public and private extension services. Some farmers are contract farmers of nurseries in both districts. The farmers sell to nurseries and nurseries will sell as soybean seeds. However, if the quality of soybean doesn't meet the requirement for seeds, then farmers will sell for soybean consumption.

3.2.2 Core Value Chain

Inputs

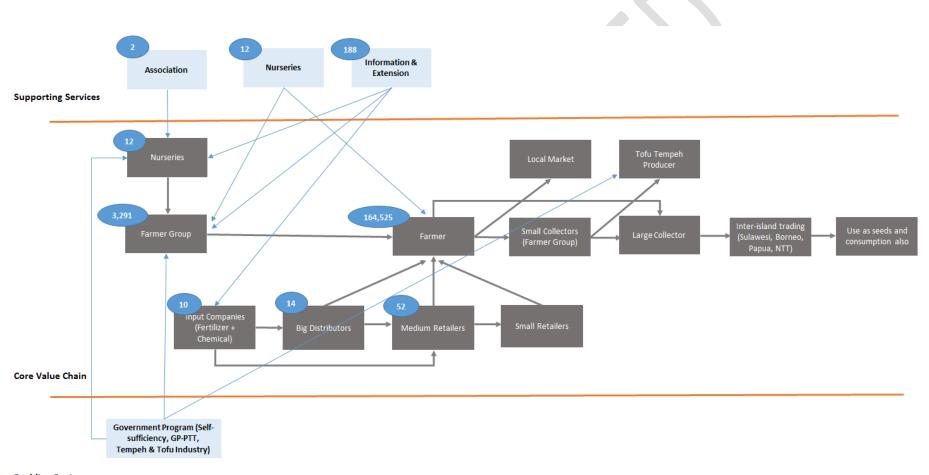
Mostly farmers are planting two varieties of soybean seeds namely burangrang and anjasmoro. The anjasmoro and burangrang varieties has a potential productivity approximately 1 tonnes/ ha to 1.5 tonnes/ ha. There are small number of farmers who are planting other varieties named wills but this variety has lower yield compare to anjasmoro and burangrang.

Soybean farmers in Bima and Central Lombok overly use pesticides to prevent their crops from pest attack. Farmers buy chemical from retailers which close with their location. Only small farmers in Central Lombok who do not use pesticide and do early harvesting to avoid pest attack.

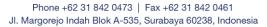
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3.2.3 Market Map



Enabling Environment



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Most of farmers used fertilizer to increase their yields however there are limited private company who sell fertilizer for farmers. In Bima, there is scarcity of subsidy fertilizer and farmers must buy from retailers with higher price.

Farmers buy chemical from small retailers, medium retailers and/ or direct buy to big distributors in the city. In Bima, majority farmers buy chemical from small retailers which located in the sub-village. Both of small retailers, medium retailers and big distributor do not give technical assistance to farmers to use the chemical. However, the chemical company will invite the big distributor to attend the workshop and/ or gathering event if they will promote new chemical product.

Production

Soybean farming in Bima and Central Lombok is priority crops. Most of farmers are using certified seeds and chemical inputs. The majority of soybean farmers in Central Lombok located in Praya sub-district and they cultivate soybean in lowlands after rice harvest. Farmers will plant soybean in the same areas where they grow rice, and farmers grow crops in monoculture. These farmers also tend to use pesticide due to highest pest and diseases attack. Since planting begins after the rainy season and soybean mature within 3 months, the peak harvest in Central Lombok occurs in September. The typical cropping pattern for these farmers is rice-rice-soybean. In some area in Central Lombok, farmers conduct early harvest of soybean to reduce production cost for pesticide and they sell it to local markets as vegetable (without drying). For this product they could get IDR 10,000/ 3 bundles.

Different with Central Lombok, in Bima majority of farmers located in lowlands and highland where soybean is planted twice annually after the rice harvest. The typical cropping pattern for these farmers is rice-soybean-soybean-soybean where the peak harvest in Bima Occurs on July, October and January. Same with soybean farmers in Central Lombok, soybean farmers in Bima grow crops in monoculture. Soybean farmers use fertilizers and chemical input.

For seeds, Bima is one of central for soybean seeds production. The nurseries in Bima produce soybean seed to meet the demand from Eastern Indonesia provinces such as Borneo, Sulawesi, Papua and even to East Java.

Farmers typically have an average soybean harvested area of 0.1 ha in Central Lombok and Bima. The average yields in Bima and Central Lombok approximately between 1 tonnes/ ha to 1.5 tonnes/ ha. In several area in Bima especially in Bolo sub-district, there are easy access to water in dry season from irrigation station to watering the land in dry season.

Trading and Processing

Most of farmers in Bima and Central Lombok already have market to sell their production both of for soybean seed and soybean consumption. Some farmers sell the soybean production to nurseries for seeds. However, if the farmers see the soybean quality unable to meet the requirement for seeds, the nurseries will help farmers to sell to local collector.

The nurseries sell the soybean seeds to outside NTB like Surabaya, Borneo, Sulawesi, and Papua to meet the demand of government program.

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The soybean consumption from farmers, small collector and nurseries sell to big local collector in the sub-district level and the collector will sell to outside NTB. In Bima there are five big collector who sell soybean consumption to outside NTB like Surabaya, Sulawesi, NTT, Papua and Borneo. The average soybean consumption which sell by collector is 30 tonnes per harvest. Majority the collector have storage to save the soybean consumption before their sell.

The farmers and small collectors who sell to big collector usually come from three sub-district in Bima like Donggol Sub-district, Disila Sub-district, and Calabaini Sub-District. Besides that, the soybean farmers also come from Dompu District. Usually farmers sell directly to collector in storage, the collector will buy from farmers with variation prices between IDR 5,500 per kg to IDR 6,000 per kg depends on soybean consumption quality and the big collector will sell with price IDR 6,500 per kg.

In Central Lombok and Bima, there are no significant issues about soybean import to meet the demand of tofu and tempeh home industry. Usually the supply soybean for tofu and tempeh comes from farmers who directly sell soybean to tofu and tempeh industry. The tofu and tempeh home industry only sell their production to local market. Same like in East Java Province (Trenggalek District and Sampang District), retailing of tofu and tempeh is carried out by micro retailers, most of whom are women, who buy directly from the processors. Marketing and outreach keep tofu and tempeh as household staples for poorer urban and rural populations. As widely consumed processed commodities, tofu and tempeh are highly sensitive to the price fluctuations experienced in the trade of soybeans. However, due to the sensitivity of low-income consumers to price increases, tofu and tempeh processors respond to price fluctuations by reducing the size of their products (which are not sold by weight) rather than increasing the nominal price to consumers

3.2.4 Supporting Functions / Services

Nurseries services are important for stimulating the adoption of certified seeds by farmers especially to support GP-PTT Government program in NTB. From the latest information, there are 12 soybean nurseries active to support GP-PTT program. Nurseries will produce certified soybean seeds through contract farming model, and will give direct advices to farmers to implement GAP soybean. The soybean nurseries will support by PPL to monitor the soybean seeds cultivation. In Central Lombok and Bima, The Certification Bodies (BPSB) also support nurseries to give technical assistance directly to farmers who members of contract farmers. After harvest and sell certified soybean seeds, usually the nurseries also conduct monitoring to know about yields from their certified seeds production in the next level.

One of the biggest soybean nurseries in NTB is UD Pemuda Kreatif in Bolo Sub-district in Bima, established by FEATI World Bank Program in 2005. It is harvesting soybean seed on 470 ha and has the capacity to expand to 1,000 ha by working with more farmer groups.

Different with other provinces in Indonesia, Information and government extension services (PPL) in NTB not significant issues related to soybean cultivation. The PPL in Central Lombok and Bima very active to support sustainability soybean sector. They give advices and technical assistance directly to farmers. In Bima, there are 188 PPL for 18 subdistrict where per sub-district there are 9 PPL. The PPL not focus only for soybean, but

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because soybean is main commodity in Bima, the PPL can give more effort to manage soybean production compared with other crops.

The PPL bodies (BPPPK) have three focus namely quality, quantity, and sustainability. In 2015, they have plan to develop Visual Audio House with capacity 40 farmers. This house will use to farmer meeting and socialization about agriculture information. This house can rent by private company to promote their new product. Different with PPL, the private extension service very limited involvement on technical assistance directly to farmers. Usually in NTB, the private extension services only sell their product through retailers and conduct demo plot. There are limited information from private extension services to PPL about product information.

In NTB there are two the biggest soybean association, one located in Central Lombok (Soybean Nurseries Association) and the second one located in Bima (Soybean Farmer Association). The Soybean Nurseries Association have 6 nurseries members. The members is the biggest soybean nurseries in Central Lombok. This association focus on nurseries empowerment, sharing information about soybean market and run business like saving and loan between the association members. On the other side, The Soybean Farmer Association in Bima more active to farmer empowerment through one nurseries (UD Pemuda Kreatif) to increase capacity of farmers and increase soybean productivity.

3.2.5 Supporting Rules and Regulations (Enabling Environment)

Self-sufficiency is the biggest Indonesia National Government program on agriculture sector with five main commodities namely rice, maize, soybean, sugar and beef. There are 12 provinces including NTB which have been targeted to help meet the national objective for self-sufficiency in soybeans. In 2014, there was a national production target of 2.7 million tonnes but only 953,956 tonnes were produced domestically. To achieve the 2015 target, the government has continued to provide farmers through one of programs namely GP-PTT.

In NTB province, the agriculture institution provides 49,000 ha for GP-PTT program to achieve NTB target production in 2015 (123.126 tonnes) where Central Lombok and Bima is the districts which received the widest GP-PTT areas (Bima: 38,640 ha and Central Lombok 37,956 ha).

Related to tofu and tempeh home industry, the NTB agriculture institution has one project to promote soybean business with main objective of the project is to empower local tofu and tempeh home industry. The empowerment is related to capacity building in both competitiveness as well as productivity, with hope that the increased productivity may also increase demand on local beans.

4. Analysis

4.1. Problems and underlying

The problems and underlying causes are specific to the poor target groups that AIP-PRISMA seeks to support through interventions in the soybean market system in NTB. There problems have been identified through the Sector Dynamic section above and are also presented in the

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Intervention Logic Analysis Framework (ILAF) table. The two key problems can be summarized as:

Farmer productivity is low because they employ poor pest and diseases control

Farmer productivity is low because they employ poor pest and diseases management.

Farmers mainly use chemical and purchase from small retailers, middle retailers and/ or directly to big distributor. Farmers, especially in Bima, overuse pesticide due to they do not know about the appropriate doses to reduce pest attack. Impact of pest and diseases attack in NTB can decrease the productivity until more than 50%.

On the other side, poor pest and disease management related to poor good agriculture practices. As a results, farmer continue to use ineffective of out dated practices which have negative impacts on productivity and quality. According to ACIAR trials, the adoption of improved agronomic practices can lead to improvement in soybean yields of 170%.

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:

- Existing retailers cannot give enough product information
- Limited extension services number. Existing extension services have limited capacity on chemical product information and its application, and lack of private alternatives.

Existing retailers cannot give enough product information. The majority of soybean farmers buy chemical from retailers if they already seeing pest and diseases symptom. However, when the farmers buy product from retailers they not received enough product information especially related to product application. This condition occurred due to distributor (as a first point when private company sell their product) or retailer's only focus on sales although they not have knowledge about chemical company. On the other hand, there are no body give them information and person who in-charge in the shop have less capacity.

Limited extension services number. Existing extension services have limited capacity on chemical product information and its application, and lack of private alternatives. Information and extension services are important to ensure farmers have better access to information on GAP, including pest and diseases management in soybean farming, and are educated on the benefits of investing in soybean production. The government extension services tend to have limited capacity on chemical product information, technical knowledge and also skills on chemical application. On the other side, there are chemical companies only focus on sales and no embedded information is available through retailers, soybean nurseries, or traders.



4.3. Gender Issues

Men are the principal farmers of soybean, but women also play a role in some activities, usually when start cultivation, and when harvest. In the family, man are the decision maker related to purchasing of input production. There are no significant issues about women in soybean sector.

5. Strategy for Change

The strategy is designed to strengthen weaknesses in the current service provision and enabling environment in the market system. This take 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 intervention 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

5.2. Vision of Change

Focusing on achieving the potential outlines above for the soybean sector in NTB, a vision of change can outlines for both the sector and service level. The vision of change at the **sector level** is to increase smallholder farmer productivity through better pest and diseases control and make soybean farming more profitable due to increase production. This will finally attract more farmers to the sector. At the **service level**, it is envisaged that farmers will have improved access to information and extension services.

We envision that information/ extension services will be provided through collaboration among nurseries, retailers, BPSB, and the local government.

5.3. Interventions

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, one key intervention will be necessary to transform the soybean sector in NTB:

Intervention 1: Promote increase productivity by applying better pest and diseases control



Intervention 1: Promote increase productivity by applying better pest and diseases control.

The key objective is to provide information about pest and diseases control through chemical product information and its application, and ensure the GAP applied in soybean farming. There is potential to work with existing chemical company to ensure increase productivity of soybean and that chemical company are providing embedded information to farmers (either directly or through retailers). This may involve (1) establishing central of product information through key farmer's empowerment; and (2) improving the ability of retailers to share the chemical product information and its application to farmers;

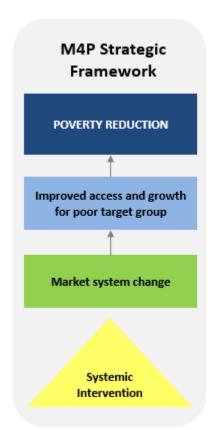
5.4. Sequencing and prioritization of interventions

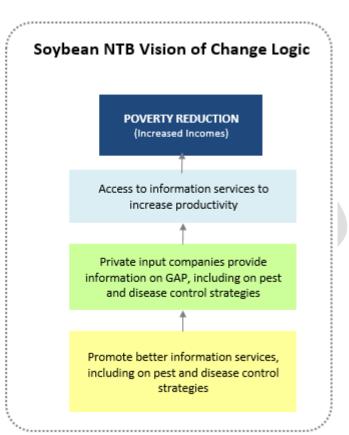
As there is only one proposed intervention for NTB soybean sector, there is no need to sequence or priorities interventions in this sector.





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) Interventions	Service Provider/Partner
Farmer productivity is low because they employ poor pest and diseases control	Farmers lack of knowledge on the chemical application Farmer lack of access to information form extension services	Information/ Extension Services	Existing retailers cannot give enough product information Limited extension services number. Existing extension services have limited capacity on chemical product information and its application, and lack of private alternatives	Intervention 1: Promote increase productivity by applying better pest and diseases control	 BASF Nurseries/ lead farmers Agri-input retailers

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Annex 2: Identified Market Actors

Institution	Contact Person	Address	Phone Number
Trader/ Input Suppliers			
UD Yogi Tani	Saipul	Pinggarate Sub-district, Central Lombok	087864466 889

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Annex 3. People Interviewed

Institution	Contact Person	Address	Phone Number
Local Government			
BPSB Bima District	Ir. Abdul Latief	Bima	
Pest and Diseases Unit, Central	H. Chaerudin	Pringgarata, Central Lombok	082339801866
Lombok Agriculture Institution			