

SECTOR REPORT

Pigs in East Nusa Tenggara (NTT)



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swisscontact

Under AusAID's Introducing Market Development Indonesia (IMDI)

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1 Executive Summary

The global pork market is dominated by established exporters in the developed world. Countries like Canada, the United States and Brazil large producers increasing their exports to meet rising demand of around 6% annually. Competition and rising production costs are putting pressure on global producers. Indonesia is a small player in the global pork market with an under-developed industry. Domestic demand for pork is uneven though increasing in certain regions, with demand from hotels, restaurants and supermarkets for a steady supply of higher quality pork getting stronger. Pigs are often imported between islands, especially from the district Manggarai in Flores, which has the largest pig population in Indonesia. East Nusa Tenggara (NTT) Province is the largest pork consuming area in Indonesia. Demand for pig meat is growing in NTT.

In NTT, pigs are valuable assets for small-holders as rearing is relatively straightforward and returns can be realised quickly. However, pigs are generally reared in an informal way using traditional practices at a small scale. Services are quite under-developed, with poor inspection practices and hygiene in informal slaughterhouses. In Sumba Barat Daya and Ngada in NTT pig rearing is commonplace though investments in the practice are limited. The traditional character of pig farming, the underdeveloped transport facilities and the limited local market deters entrepreneurs from investing. Generally the market in NTT can be characterised through a number of related features: producers spend little on improved inputs for pigs and traditional pig breeding and growing practices are common; the majority of pigs are sold locally through local collectors into the trading system; and, processing is undertaken at home slaughterhouses. Mortality rates are high and proper veterinary services are limited, although Government support services have been established for improved fodder; in general there are poor facilities for pig export and storage.

The **key problems in the pigs sector in NTT** include that: pig productivity is low; farmers cannot process pig meat locally; and, the market for pigs is under-developed in rural areas. The key services **identified which can be strengthened to impact positively upon the local market system** include: inputs/ breeding services; financial services; extension and production support services; processing services, particularly slaughtering and packing services; and, business brokering services to support to the development of the sector.

A vision of change is outlined for the sector and service levels. **The vision of change at the sector level** grow a local market for daily consumption (in addition to ceremonies etc.) and export opportunities to enhance market-based up-scaling of pig breeding and growing. **At the service level** the development of formal slaughtering, wholesale and retail and export in Ngada and SBD will support the production of higher quality meat. There is scope to meet the demand for pork by enabling small scale farmers, to scale up their activities and to support them with improved inputs (better piglets and affordable fodder) and access to services which will lead to a larger supply of higher quality pigs. It is calculated that it is possible to increase the production of pig meat in the sector by around eight times, **unlocking a potential market of over AUD 400M in the target areas**. The current production value is only a small fraction of this potential, comprising only around 1% of the total market potential.

The report recommends four inter-related interventions to achieve the vision of change. These comprise:

- 1. Introduction of improved pig breeds and promotion of commercial pig rearing in Ngada and SBD**
- 2. Establish processing facilities in SBD (slaughterhouse, cool storage)**
- 3. Develop trade between existing processing operations and higher value markets**
- 4. Establish commercial aggregation services and link to processing facilities**

2 Background

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

To enable a quicker start for the new project by identifying potential partners, building up their capacity to take on the role of market facilitators AIP-Rural commissioned Swisscontact – the Swiss Foundation for Technical Cooperation – to implement a small project called IMDI (Introducing Market Development in Indonesia) from October 2012 till 31 March 2014. The pigs sector was selected because the sector is one of the main income sources of farmers in the target locality in Indonesia.

This Sector Report on the pigs sector in East Nusa Tenggara (NTT) has been produced by HivosRegional Office Southeast Asia (ROSEA) through IMDI. The document is not intended as a comprehensive sector report; rather it is to provide a logic and rationale for market-based interventions which can support the pigs sector to the benefit of small-holder producers. The report is the result of a learning process by which NGOs were mentored by Swisscontact to develop their capacity for engaging in wider market-oriented programming in specific agricultural sectors. Certain interventions identified in this report will be commissioned for implementation under the IMDI initiative.

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3 Sector Profile

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

3.1 International

3.1.1 The global pork market is dominated by established exporters in the developed world.

In Indonesia and worldwide there is a demand for more and higher quality meat cuts. Countries like Canada, the United States and Brazil as large producers increasing their exports to meet rising demand of around 6% annually. China is by far the largest producer of pork, with output forecast to total 52M MT in 2013¹. However, production in this country is lower than consumption, compelling the country to import large quantities of pork every year. In many areas of the world, high quality pigs have already been introduced, with a number of countries increasing exports to major importers like Japan, Russia, USA, Mexico and Hong Kong. The European Union, the US and Canada remain the largest pork exporters at global level, with global pork sales totalling 91.5M MT in 2012.²

3.1.2 Competition and rising production costs are putting pressure on global producers.

Lower profit margins worldwide have pushed many producers out of the pig sector. Availability of fodder is under pressure due to the trend to use grains for human consumption and biofuels (ethanol), rather than for animal food. A number of countries have forbidden swill feeding to pigs, including uncooked feed scraps containing meat or meat products in order to prevent outbreaks of exotic diseases, especially foot and mouth disease. Feeding is seen as the most costly component of raising pigs (55 to 60% of the cost). High quality fodder may consist of wheat, barley, sorghum and oats. Feed costs tend to be volatile. At the international level, quality meat can be exported for prices starting at around USD 5.00 per kilo. On average 40% of pigs slaughtered is used for fresh meat cuts, while the other 60% is processed further.

3.2 National Context

3.2.1 Indonesia is a small player in the global pork market with an under-developed industry.

Indonesia currently plays a very minor role in the international market for pigs or pork meat. Indonesia has very limited policies on pig raising which are strongly tied to Muslim regulations and inspections towards halal food products. The government is not restricting production of pigs, except in areas where local groups oppose pig rearing for religious reasons. There are few national regulations which restrict the production of pigs, but there are also limited stimuli undertaken by the government. The government programmes which exist to increase the number of pigs are not applied consistently and usually very small compared to for example the cattle programmes. Services for pig breeding and growing are very limited and skills of extension workers are insufficient, as they are normally generalists in the field of agriculture and husbandry. International requirements for export are strict, not only because of the spread of diseases but also because of meat quality and hygiene regulations. Restrictions are also valid within Indonesia though recently the regulations have been eased due to a reduction in detected cases of pig diseases.

¹ Latest US Department of Agriculture (USDA) projections

² <http://www.euromonitor.com/passport-fresh-food-global/passport-subscription>

3.2.2 Domestic demand for pork is uneven though this is increasing in certain regions.

Demand from hotels, restaurants and supermarkets for a steady supply of higher quality pork is getting stronger. At the regional level pig rearing is an important contributor to people's incomes. In 2011 the pig population was highest in East Nusa Tenggara (NTT) province with approximately 1.8M pigs, but not equally dispersed over the islands. The island Flores has the largest population (45%), followed by (West-)Timor (43%), while the island Sumba only makes out 6.5 % of the total pig population in the province. Since the demand for pork is quite high on the island, pigs are imported from other islands, especially from the district Manggarai in Flores. Therefore, there is scope for pig business development, both in Ngada and in SBD.

3.3 East Nusa Tenggara (NTT) Province

3.3.1 NTT is the largest pork consuming area in Indonesia.

The population of NTT are the biggest pork consumers of Indonesia. It is served at almost every religious ceremony and traditional events and has become an important commodity. The pig population is highest in NTT province with 1.8M pigs³, which is almost twice the amount of Bali as having the second largest pig population. The pig population is not equally dispersed over the islands. The supply of pigs is not equally dispersed in the regions and across the islands as well as during specific periods of the year, which causes that supply is not always meeting demand. Therefore, the price of pigs is volatile and has the tendency to increase in periods and areas of high demand. In Papua one pig can yield many millions of IDR (up to 25M/ 2,500 USD) in times of scarcity, but in general a grown pig sells for around Rp. 3M (around 40,000 Rp./kg), while the meat sells for around Rp. 65,000.

3.3.2 Demand for pig meat is growing in NTT.

The demand for pigs and pig meat is growing significantly in NTT province, especially from the cities and restaurants.⁴ The enhancement of the inland and inter-island transportation in NTT has contributed to the marketing potential of the produce. This gives small farmers opportunities to be involved in the pig market chain, expectedly resulting in the improvement of their welfare. The price of pigs is divers among the various islands, though the average estimate of price range per (adult) pig (age 1.5 - 2 years) is between two and three million IDR (200 to 300 USD) and between Rp. 300,000 and 500,000 for piglets (age 1.5 – 3 months). The fact that pigs need only a fairly short time to become suitable for sale, it is very appealing for small farmers to raise pigs, for in a short time they are able to increase their household income.

3.3.3 Pig rearing practices remain largely traditional in NTT.

Pigs are generally kept in a traditional and informal way and the care of pigs is usually assigned to housewives at small scale. Pigs are found tied or untied in the yard around the house or kept in a simple pig-sty. The pigs are fed household leftovers, kitchen waste, roots and/or paddy waste. Due to a combination of poor diet and in-breeding, local pigs in NTT are often sick, small and less flavorful. Breeding practices are not based on in-depth knowledge and experience and therefore production has not been maximized. This has constrained farmers' ability to adequately fulfill the constant increase in demand for pork meat. Pig breeding is undertaken by both men and women, however since pig farming is mostly very traditional around the house (99% of the households in Ngada and 95% in SBD raise pigs on a non-commercial, traditional basis), women – and to a lesser extend children – play an important role in raising the pigs.

³ Farming statistics of 2011

⁴ Pigs production in Indonesia, Joni Liano and Pollung H. Siagian, in: CIAR working paper no. 5, March 2002, Priorities for Pig Research in Southeast Asia and the Pacific until 2010., page 28 - 30.

3.3.4 Pigs are valuable assets for small-holders in rural areas as rearing is relatively straightforward and returns can be realised quickly.

In many areas pig raising has an important role as a 'coping' mechanism (that is, pigs are sold to meet temporary financial demands in times of need, such as sickness, schooling of children, etc.) and the consumption is mainly for traditional events (wedding ceremonies, funerals, etc.). Small profit margins worldwide have pushed many producers out of the pig sector, which until now has not led to improvement of the prices. Availability of fodder is under pressure due to the trend to use grains for human consumption and bio-fuels (ethanol) rather than for animal food. Hence, feed costs tend to be volatile. Pig farming is seen as a reliable source of income that is easy and not capital intensive; yet profitability is low.

3.3.5 In Sumba Barat Daya and Ngada in NTT pig rearing is commonplace though investments in the practice are limited.

In Sumba Barat Daya and Ngada/ Nagekeo⁵ around 80% of the population in the target areas has a habit of breeding and growing pigs, having an average of around 5 pigs roaming around the house. Investments done for pigs are almost zero, since people tend to obtain pigs for free from relatives or neighbours in change for services or other items. In NTT it is common for pigs to be slaughtered in informal slaughterhouses as a preparation for traditional events. Inspection practices and hygiene are poor in these informal slaughterhouses. Even though the demand for pork is going up, investors have not shown interest in establishing and operating professional slaughterhouses. The traditional character of pig farming, the underdeveloped transport facilities and the limited local market have prevented entrepreneurs from investing. Efforts of the government to set up a slaughterhouse in Ngada district resulted in a slaughterhouse which is only incidentally used.

4 Sector Dynamics

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

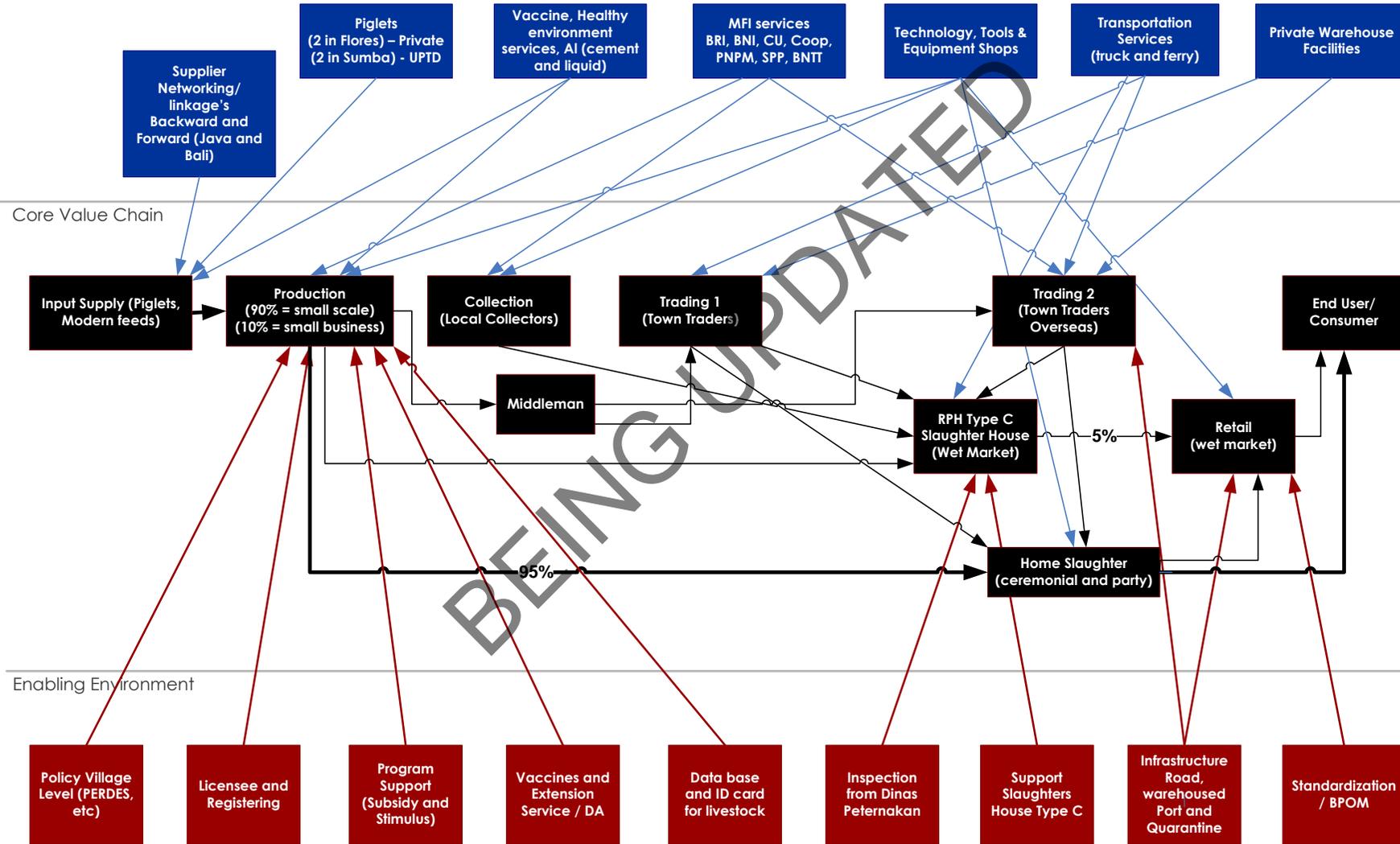
4.1 Market Map

Around 85% of all households in the province are involved in pig farming, mainly in a traditional way and the produce reach only traditional markets or is sold directly to consumers in the villages. Despite such high levels of pig rearing and the demand for pork meat being quite high, the sale of pigs to slaughterhouses and sales between islands remains rare. The market for pigs has become more demanding, not only in terms of quantity, but also in terms of quality (excessive fat, the cuts). Supermarkets and five star hotels are keen on getting prime quality meat. Over the years, GOI has supported the pig sector, not only in terms of production, but also: through prevention of epidemic diseases, supply of improved breeding stock to smallholders and provision of extension services at various administrative levels. Private industries have provided support in the supply of feedstuffs and veterinary medicines and here and there goods and services to pig producers. However, in the target districts the pig sector is still poorly developed, especially for small-holders as most support is provided to large scale pig breeders.

⁵ Nagekeo is a split-off of Ngada district and is now a separate district. When Ngada is mentioned, part of the activities may take place in Nagekeo. Partner YMTM is also based in Nagekeo.

Market Map Pigs

Supporting Services



4.2 Core Value Chain

4.2.1 Producers spend little on improved inputs for pigs.

Inbreeding is common due to traditional practices. People tend to spend as little as possible for inputs, including pigs, fodder and farming equipment. It is common that people exchange their pigs to avoid having to buy these on the market at a relatively high price. Fodder is less of an issue in Ngada where the production of cassava and other local crops helps to meet demand for pig food. 99% of the producers are traditional, informal pig producers; only 1% of the producers are commercial producers. Breeders supply piglets for pig farmers. The pig farmer grows the pig to be sold and consumed (mostly in a traditional way).

4.2.2 Traditional pig breeding and growing practices are common.

Whilst these traditional breeding and growing practices prevail, the opportunities to develop the pig sector are considerable: big pig market, export possibilities, high demand of pigs for traditional events, no pig import prohibition from Timor and Alor, strong interest in developing pig business, limited breeding competition, capital from banks and cooperatives available. Pig growers have almost similar constraints as well as opportunities as pig breeders. Farmers find the price of pigs at Mata Loko market too high; they tend to obtain their pigs from neighbors or family members. It is difficult for farmers to get veterinary services and often pigs have worms. Most farmers have no or very rarely information or advice on proper pig rearing.

4.2.3 Most pigs are sold locally through local collectors into the trading system.

In general the growers sell their pigs at the village level, mostly at traditional events. Most pigs are of the age of four months to two years. Collectors collect pigs from the pig farmers and sell to traders. Breeding constraints include: home based, informal husbandry, limited capital, simple fodder (banana tree trunk and various leaves), in-breeding practices, limited health care, small piglets and low production of piglets per sow, limited rearing skills. There is one big market called *pasar mata loco*, but there is also a lot of trading through Aimere Harbour to Sumba. Pigs are usually sold to collectors, who sell the pig to traders. Traders export the pigs to Sumba, where Sumba traders channel the pigs to the home slaughters, after which the meat goes to the end users. Generally traders buy their pigs from Flores, Bima, Sumbawa, East Sumba, Kupang and Sabu. They also buy from local markets (there are 6 local markets in SBD). Transportation from other islands is done with the Ferry. The pigs sold at the market have the age of between one to two years with a price between 2 to 5 million IDR. The pigs sold at *Radamata* market are between 1-1.5 years old, with a price between 1.5 and 2 million IDR.

4.2.4 Processing is undertaken at home slaughterhouses.

The processing of pigs is generally done at home slaughterhouses. The pigs, which are slaughtered from the market, are usually tainted. The average pork meat is sold for between 40.000 and 50.000 IDR per kilogram. The intestines are not sold. The pig owner usually commissions the pork meat traders, for between 200.000 and 300.000 IDR per pig. The sale of pork meat is done according to the *Leis* system, which is from door to door. The constraints in processing pork meat is the lack of capital, the pork consumption is generally done at ceremonies and special events. There is no formal slaughterhouse for pigs in SBD and people tend to do the slaughtering at home. The pigs that are sold to Nagekeo go directly from the traders to the home slaughters, and then to the end users.

4.3 Supporting Functions / Services

4.3.1 Mortality rates are high and proper veterinary services are limited.

Mortality rate of pigs is very high, caused by hog cholera. Vaccination occurs rarely to none at all. The hog cholera emerges usually during the change of season from rainy to dry season (between the month July and September). Knowledge and management of pig farming are still very traditional and limited (earthen floor, tied to a tree, not paying attention to hygiene, and nutrition). Generally the farmers get their seeds/piglets from the *tau ng'a* system, a traditional asset sharing system and PUAP (village agri-business program). Women are responsible for the maintenance of the pigs. In general sick pigs are traditionally medicated using leaves, forest flowers garlic and roots. To call for an animal health care staff is for most farmers too expensive. They have to pay 25.000 IDR for each pig. Furthermore, an animal health Clinic has been established in 11 sub-districts with a special staff for health control, vaccination and other extension services.

4.3.2 Government support services have been established for improved fodder.

The district government pig farm uses local fodder made of corn, salted fish and parser. The corn is usually bought from a number of markets in the villages in SBD and the bran and 'brem' are bought in a number of shops in Waitabula (Eka Putra and Matahari). There are limited extension services from the Animal husbandry department in SBD, due to a shortage of staff. Extension services are focused on target villages with 1 extension service staff, which means that there are in total 131 extension services staffs in SBD.

4.3.3 There are poor facilities for pig export and storage.

The quarantine office in Ende is responsible for eight harbours, including Nagakeo and Ngada. There is no pig storage place in Ende. There are a very limited number of quarantine officials. There is no pig import from Timor, Lembata or Alor in order to anticipate the spread of hog cholera in Flores. Pig export through Aimere harbour is important. There is regular export from this harbour.

4.3.4 Fodder

Fodder production is not well-developed in Nagekeo and Ende and almost non-existent in SBD. Important food components such as nutrients and dedak (nutrient version of rice husk) are regularly transported between production areas (nutrients from Surabaya to all pig areas and dedak from various areas to pig areas). The need for importing these food items causes high cost of pig fattening on a commercial basis in remote areas.

4.4 Supporting Rules and Regulations (Enabling Environment)

4.4.1 There are no current government restrictions on imports from Sumba.

At the west side of Ngada we see imports of pigs from Manggarai Timur, while on the east side, district Ende, there are pig movements between the market in Ngada and the locations Raja, Mbai, Nagakeo and Boa Wae. From the Harbour of Aimere in district Ngada, there is export of pigs to Sumba, while previous import of pigs from Timor has been stopped due to a government policy to prevent the spreading of pig disease.

5 Analysis

5.1 Problems and Underlying Causes

The problems and underlying causes are specific to the target groups the initiative seeks to support through interventions in the market system. This analysis is informed by the profile and dynamics above and generated through the Intervention Logic Analysis (ILA) tool.

5.1.1 Pig productivity is low.

Local pigs are often unhealthy and small and generate suboptimal returns to farmers. 6 to 12 pigs per year for a period of 5 years and growing to around 60-70 kg within 1 to 2 years (healthy, well-fed high value sows can produce 14 to 20 pigs per year for a period of at least 6 years, growing to around 100kg within 6 months). The reasons for this low productivity include that farmers use traditional methods and lack adequate skills and experience to breed and grow pigs commercially. There is little guidance for pig farmers to improve their pig breeding and growing practices and farmers have few breeding and growing skills, copying traditional practices from their parents.

There is a lack of access to quality high-nutrient fodder locally which limits pig growth. According to the traditional methods, pigs tend to roam around the house, eating what is available in the neighbourhood or from household garbage. The low nutrient value and limited amount of food significantly limits the growth and health of the pigs. Using (local) cassava as fodder leads to intoxication due to high cyanide contents, contributing to widespread diarrhea and aggravated low-protein levels⁶ among pigs. Local fodder is not available at affordable prices and producing high nutrient fodder is currently not commercially feasible. Another underlying cause is that the private sector is reluctant to invest in pig growing activities, while government interventions have not been successful. Most government interventions are aimed at the production of pigs, but interventions have been inconsistent, not value chain oriented and not accompanied by proper extension support, causing unsustainable interventions. Government programs to increase the number of pigs exist, but these are not applied consistently and are usually very small and without sufficient support extension services.

5.1.2 Farmers cannot process pig meat locally.

One of the key problems around meat processing is that there are no meat processing services available to farmers in the local area. The cause of this problem lies in the lack of investment in the sector from the private sector, which has not recognized the profitability of investing in meat processing and poor targeting of government support. The private sector has not recognized the profitability since traditional production methods prevent farmers from selling high-value pigs for slaughter. Government undertakes no efforts to push people to make use of the formal slaughterhouse in Ngada, and in SBD there is no slaughterhouse available. The unstable local market and the limited overview over the potential market prevents entrepreneurs from investing in pig processing. Current efforts of the government to efficiently control informal slaughterhouses and the establishment of a formal slaughterhouse in Ngada have not been successful as efforts were not combined with introducing new breeds and practices in an efficient and consistent way.

5.1.3 The market for pigs is under-developed in rural areas.

There is not yet a well-developed pig market in the target districts, despite rising demand for higher quality pig meat. Most pigs are traded or bartered among local communities and end up for consumption during weddings or traditional ceremonies. Trading for wholesale or retail meat is still very limited and incidental, although demand is on the rise. There are a

⁶ <http://www.fao.org/wairdocs/ilri/x5458e/x5458e08.htm>

lack of service providers operating in the local area in the key services of fodder, services for the extension good practices and others. The reasons for the underdevelopment of the market include that there is not sufficient critical mass to require a commercial service at present, as although some 65,000 pigs⁷ find their way to local slaughterhouses annually more than half of these pigs are not sold but simply slaughtered for consumption by the owner. Also farmers generally do not perceive pig rearing as a commercial opportunity as the cultural significance of pig farming entails that having pigs is rather a cultural trait than a commercial consideration.

5.2 Services, Enabling Environment and Weaknesses Analysis

The supporting functions (also known as the services, or supporting services) and rules and regulations (also known as the enabling environment), and weaknesses are developed through analysis of the information derived from above and comprise the next steps of the ILA tool. These identify the key areas in which the initiative can target interventions.

5.2.1 Inputs/ breeding services.

Sources of quality inputs and services, particularly for breeding, are unreliable in NTT and reflect the generally under-developed nature of the local market. There are a limited number of outlets for vaccines and fodder, which are rarely purchased due to the high prices and the current low risk-low reward model adopted by pig rearers. Local fodder is a problem, more in SBD than in Ngada, where cassava and other crops are easier to grow. Imports of new breeds are made difficult by movement regulation and protocols to tackle pig diseases – generally government pig programmes to support breeding and growing have not been sustainable.

5.2.2 Finance services.

Financial services invested in pig production would enable farmers to invest in quality rearing inputs which would support greater productivity and a higher quality product. Such financial services are available in Ngada, but not in SBD where the bank sector is not sufficiently developed to offer loans for the pig sector. However, even where loans are available there are very limited products developed bespoke to pig rearing.

5.2.3 Extension services.

Extension services support the adoption of good rearing practices by small-holders. However in the target districts there are few service providers offering these services. Commercial service provision is practically non-existent as the majority of pig rearing remains traditional and there is little incentive for proactive marketing of products or services for local business interests. The government provides limited, low quality extension services to support pig rearing, but there are no intensive pig programmes, and support is generally technocratic (the PPLs are generalists).

5.2.4 Processing services.

Processing services exist though are weak in the NTT. As there is an under-developed wholesale and retail distribution system locally (due to the low production volumes) this limits the viability of processing operations as there is no clear route to higher value markets. In Ngada the government is not focusing on developing the wholesale and retail system for pork meat, or encouraging people to make use of the formal slaughterhouse. In SBD professional processing services are not even available.

⁷ Calculation by author: eighty percent of farming household have an average of 4 pigs, and farming households make up 80% of 50,000. That is $50,000 \times 0.8 \times 0.8 \times 4$ or roughly 130,000 pigs held for around 2 years.

5.2.5 Business brokering services.

Business brokering services can support the sector through aggregating supply and acting as a route to market and improved inputs for small-holder producers. In NTT the business brokering services are weak or non-existent. Commercial buyers operating contract farming arrangements, or local commission-based agents such as aggregators, are non-existent locally. Government efforts have not seeking to develop entrepreneurship; rearers are generally not incorporated in an agro business environment, government has no programmes or skills to reach that goal. Business brokering can generate demand for quality inputs, for example, Ngada has sufficient fodder locally available at an affordable price, but this is not currently demanded.

6 Strategy

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

6.1 Market Opportunity

Indonesia has a large volume of pigs which are raised on a very traditional basis, while demand for pork meat is increasing. Therefore there is scope to meet the demand for pork by enabling small scale farmers to scale up their activities through supporting them with improved inputs (better piglets and affordable fodder) and access to services. Traders will benefit from financial services which will increase the dynamics in life pigs flows to other areas with high demand, increasing market opportunities. By providing access to processing technology slaughterhouses can increase the quality of the meat, hence meeting demand for more and higher quality pork. It is calculated that it is possible to increase the production of pig meat in the sector by around eight times, **unlocking a potential market of over AUD 400M in the target areas**. The current production value is only a small fraction of this potential, comprising only around 1% of the total market potential.

Table 1: Business Calculation for Pigs Sector Development

Market/Production Value*	
Average Selling Price per kg	35,000
Current Production (MT)	16,590
Potential Production (MT)	132,718
Current Value of Production (million IDR)	580,643
Total value of production capacity (million IDR)	4,645,144
Total value of production capacity (AUD)	464,514,400
Total value of increased production (million IDR)	4,064,501
Total value of increased production (AUD)	406,450,100

6.2 Vision of Change

The vision of change at the sector level grow a local market for daily consumption (in addition to ceremonies etc.) and export opportunities to enhance market-based up-scaling of pig breeding and growing. Demand for regular high quality meat will stimulate pig breeders and growers to invest in new breeds and production, and better pig rearing practices making them more competitive, a process facilitated through support interventions, including

awareness raising, training, and introduction of inspection, rules and regulations and service providers development, leading to improved welfare of pig breeders and growers. **At the service level** the development of formal slaughtering, wholesale and retail and export in Ngada and SBD will support the production of higher quality meat. Farmers will access new piglet varieties, extension services aimed at improved production practices, and transport and export facilities, and business brokering services which are more responsive to small-holders' needs and support entrepreneurialism in the sector.

6.3 Interventions

6.3.1 INTERVENTION 1: Introduction of improved pig breeds and promotion of commercial pig rearing in Ngada and SBD.

Improved pig breeds can be introduced alongside the promotion of commercial pig rearing in NTT. The improved pig breeds alongside improved inputs, the provision of micro-credit and enhanced management practices under a joint operation scheme of professional pig breeders, financial services institutes and local entrepreneurs or cooperatives will lead to improved productivity and higher quality pigs.

Local interest in having regular access to higher quality meat is growing among private sector entities (restaurants, hotels) as well as individual consumers. Development of local meat outlets will enhance interest of these consumers to purchase pig meat more routinely.

6.3.2 INTERVENTION 2: Establish processing facilities in SBD (slaughterhouse, cool storage).

Local processing is inadequate to support a commercial meat industry. Therefore **formal slaughtering facilities can be developed in SBD and Ngada** which are commercially driven and serve higher value markets (see Intervention 3). Such processing facilities can be developed to ensure proper slaughtering practices, cooling, hygiene, and inspection and transportation services. In Ngada existing processing operations can be upgraded or new ones established, in SBD it is necessary to establish a small slaughterhouse. Local government interested in investing in professional slaughterhouse, and willing to make land available for a farm (1 ha for each pig).

6.3.3 INTERVENTION 3: Develop trade between existing processing operations and higher value markets.

In order for the processing operations to be viable it is necessary to **develop trade with higher value markets**. Currently only the local market at selected locations in NTT is seen as potential market though there are opportunities to export some of the meat to other parts of NTT but also to Bali and Surabaya where we can find professional pig meat processing plants. Many areas currently importing pigs have high prices for pigs and pig meat, justifying the development of local pig rearing in spite of higher local costs for fodder, operations and transport of piglets and full-grown pigs. With facilitation entrepreneurs will be more willing to take the step to invest in new potential high pig-meat consumption areas, not only in terms of breeding and fattening, but also in terms of fodder production and distribution.

6.3.4 INTERVENTION 4: Establish commercial aggregation services and link to processing facilities.

Develop the wholesale and retail of meat in SBD and Ngada and scan export possibilities. Large scale buying of meat not expected, government is open to developing of the sector for the local market and supports pork meat retail development. Entrepreneurs will buy pig meat from the slaughterhouse for local and export market.

Annex1: Intervention Logic Analysis (ILA)

(1) Problems	(2) Underlying Causes	(3) Services/ (4) Enabling Environment	(5) Weaknesses	(6) Interventions
1. Pig productivity is low	<p>Farmers use traditional methods and lack adequate skills and experience to breed and grow pigs commercially</p> <p>Lack of local fodder production and limited use of high-nutrient fodder limits pig growth</p> <p>The private sector is reluctant to invest in pig growing activities, while government interventions have not been successful.</p>	<p>Inputs/ breeding services</p> <p>Finance services</p> <p>Extension services</p>	<p>Quality inputs are not demanded by small-holders</p> <p>Finance products are not accessible by small-holders</p> <p>Extension services are weak by government. Commercial actors not providing services locally.</p>	INTERVENTION 1: Introduction of improved pig breeds and promotion of commercial pig rearing in Ngada and SBD
2. Farmers cannot process meat locally	<p>The private sector has not recognized the profitability of investing in meat processing</p>	<p>Business brokering services</p> <p>Finance services</p> <p>Processing services</p>	<p>No commercial incentives for business brokering locally</p> <p>Finance products are not accessible by small-holders</p> <p>Processing facilities in Ngada are not linked to higher value markets. Facilities are non-existent in SBD</p>	<p>INTERVENTION 2: Establish processing facilities in SBD (slaughterhouse, cool storage)</p> <p>INTERVENTION 3: Develop trade between existing processing operations and higher value markets.</p>
3. Market for pigs is under-developed in rural areas	<p>There is not sufficient critical mass to require a commercial service at present</p> <p>Farmers do not perceive pig rearing as a commercial opportunity</p>	<p>Business brokering services</p> <p>Finance services</p>	<p>No commercial incentives for business brokering locally</p> <p>Finance products are not accessible by small-holders</p>	INTERVENTION 4: Establish commercial aggregation services and link to processing facilities