Chapter 7. FVC Survey in Madagascar

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7.1. Introduction to the FVC Survey in Madagascar

The Survey Team studied the VCs of beans, vanilla, and cacao in Madagascar. Beans are popularly produced in Madagascar, but the survey focused on scarlet runner beans, which are not commercially cultivated. Both vanilla and cacao are important export crops in Madagascar. In particular, Madagascar dominates the global vanilla market, accounting for more than 50% of globally traded vanilla. This chapter describes the results of the VC study and then presents ideas for VC development projects through PPPs.

7.2. Bean (Scarlet Runner Bean) VC

7.2.1. Overview

Beans are generally rich in protein and have high nutritional value, and various beans, such as kidney beans, lima beans, peanuts, and soybeans, are produced, distributed, and consumed in Madagascar. However, in relation to Japan, this analysis examines scarlet runner beans (SRBs), which are cooked as a boiled dish, as a possible production area. This section assesses the production potential of SRBs for export to Japan and describes the results of a general VC survey of the beans consumed in Madagascar. Figure 7-1 provides an overview of the VC of common beans. In Madagascar, agricultural research institutes, such as Foibem-pirenena momba ny Fikarohana ampiharina amin'ny Fampandrosoana ny eny Ambanivohitra (FOFIFA), are responsible for bean variety development and basic seed production. Private seed producers and agricultural cooperatives propagate seeds that they obtain from research institutes, but many farmers still use recycled seeds. Fertilizers and agro-chemicals are sold by agro-dealers, but the amounts of these products used in the cultivation of beans are not large. Harvested beans are transported to retail markets and bean processing plants through intermediaries (e.g., wholesalers, brokers, etc.). Processed beans are used in products, such as porridge made by milling, canned bread, and cooked beans, and as livestock feed in the case of soybeans. Table 7-1 provides a summary of bean prices at each stage of the VC.

Table 7-1: Bean prices at each stage of the VC in Madagascar

Farm gate price (depends on variety)	1,500–3,000 MGA[1]/kg	44 Yen/kg–87Yen/kg (MGA=0.029 Yen)
Intermediate → Retailer	1,900–4,400 MGA/kg	55 Yen/kg–128 Yen/kg (MGA=0.029 Yen)
Retail price (Black-eyed beans)	2,000–2,500 MGA/kg	58 Yen/kg–73 Yen/kg (MGA=0.029 Yen)
Retail price (Soybeans)	2,100–5,000 MGA/kg	61 Yen/kg–145 Yen/kg (MGA=0.029 Yen)
Retail price (Lima beans)	3,500–5,000 MGA/kg	102 Yen/kg–145 Yen/kg (MGA=0.029 Yen)
Retail price (Kidney beans)	3,000–3,500 MGA/kg	87 Yen/kg–102 Yen/kg (MGA=0.029 Yen)
Retail price (Bambara beans)	4,500–4,700 MGA/kg	131 Yen/kg–136 Yen/kg (MGA=0.029 Yen)
Retail price (Cowpeas)	2,700–4,100 MGA/kg	78 Yen/kg–119 Yen/kg (MGA=0.029 Yen)

Source: The Survey Team

[1] Malagasy Ariary

Figure 7-1: Outline of the bean VC in Madagascar

Source: The Survey Team

7.2.2. Agricultural inputs

(1) Bean varieties

Various native varieties of beans have already been identified, but releases of improved varieties are limited. Legume breeding is handled by FOFIFA, which has also identified varieties that are consistent with Madagascar's natural characteristics. Table 7-2 shows the improved varieties of beans (kidney beans) that have been registered to date and their characteristics.

Table 7-2: Improved varieties of kidney beans in Madagascar

Name	Color	Days to harvest	Yield potential (kg/ha)	Weight of 1,000 seeds (g)	Appropriate areas for planting
Cal98	Red and white	85–90	1,600–2,000	470–490	Southwest, Northwest, East-central, Central Highlands
DRK64	Dark red	80–85	1,400–1,600	470–490	
Ranjonomby	White	80–85	1,000–1,200	470	
RI-5-2	White	75–80	1,200–1,500	450–470	

Source: FOFIFA

Cal98 DRK64 Ranjonomby RI-5-2

Table 7-3 summarizes the characteristics of the varieties of local beans (e.g., kidney beans, lima beans, peanuts, etc.) identified by this survey.

Table 7-3: Indigenous bean varieties in Madagascar

Category	Name	Color	Days to harvest	Yield potential (kg/ha)	Weight in 1,000 seeds (g)
Lablab	Bevoa	White	115–145	500–700	250–290
Lablab	Lohapitse	White	100–120	500–700	150–190
Lablab	Manja	Deep red	150–180	600–800	250–275
Lablab	Ondragne	White green	90–110	400–600	230–260
Lablab	Vorompotsy	White	150–180	600–800	240–270
Mucuna	Garadake	Dark	150–180	500–900	775–805
Lima bean	Atolinkibo	Red white	120–150	500–700	340–380
Lima bean	Mafiry	Purple	120–150	600–800	350–375
Lima bean	Mamy	Light red	120–150	600–800	340–370
Lima bean	Matsaotsaoke	White	120–150	600–800	350–375
Lima bean	Soamaso	Red white	120–150	500–700	350–380
Lima bean	Soramena	Red white	130–150	600–800	1,000–1,100
Lima bean	Tsimeda	White	150–180	600–800	990–1,050
Kidney bean	Mandronono	White	95–100	800–1,000	385–400
Kidney bean	Menangoe	Dark red	90–95	800–1,200	375–410
Cowpea	Baboke	Light brown	80–100	500–800	170–205
Cowpea	Famimaso	White	80–90	600–900	170–210
Cowpea	Malaindrafe	Light brown	110–120	700–1,100	180–210
Cowpea	Maramasake	Green	80–120	200–500	165–195
Pea	Vatopiletse	White	110–150	600–1,000	740–790
Pigeon pea	Malaky	White	Not applicable	600–950	170–200
Pigeon pea	Androy	White	Not applicable	600–1,000	170–190
Groundnut	Boha	Reddish purple	100–130	700–1,800	450–500
Groundnut	Kanety	Reddish purple	90–120	600–1,200	250–300

Source: FOFIFA

SRBs have not been cultivated in Madagascar previously; a cultivation trial by a Japanese company that began in 2017 is the first cultivation. Although this survey did confirm that soybeans are cultivated, no varieties were registered, and this survey did not confirm the characteristics of local varieties.

(2) Seed distribution

FOFIFA carries out pre-basic and basic seed production for beans. The basic seeds produced by FOFIFA are sold to private seed dealers and farmers' associations, who then propagate and sell them. According to FOFIFA officials and farmers' associations engaged in seed propagation, the demand for bean seeds is high, and private companies and donors often place orders for seeds with them. However, because there is no room to store the produced seeds, the seeds are basically produced to order. It can be assumed that Madagascar has the capacity to propagate seeds, but the

projected production cannot be achieved because it is not possible to identify the market for seeds. The cost of obtaining bean seeds varies depending on the type and variety of bean, but for the kidney bean, which is the most produced bean in Madagascar, it is 2,000–2,500 MGA/kg.

(3) Fertilizers and agro-chemicals

Fertilizers and agro-chemicals are distributed and sold by agro-dealers located in various cities. Table 7-4 shows the types and prices of fertilizers and agro-chemicals available for bean cultivation that were identified in this study.

Table 7-4: Fertilizers and agro-chemicals for bean cultivation sold in Madagascar

Category		Product	Price
Fertilizers	DAP	DAP Marron 1 kg	2,650
	NPK (11:22:16)	NPK (11:22:16) 1 kg	2,400
	NPK (12:12:17)	Kintana Manga (12:12:17) 1 kg	2,300
	Ammonium sulfate	Sulfate D'Ammonium 1 kg	1,050
	Urea	Urea AgriVet 1 kg	2,100
	Urea	Urea Granule 1 kg	1,850
	Liquid fertilizers	Engrais Soluble Croissance (15:30:15) SHT DE 1 kg	11,700
Agro-chemicals	Insecticides	Pyrifos 48 EC Flacon 100 mL	5,500
		Tafondro 550 EC FLC 100 mL	5,500
		Mortak FLC 100 mL	5,200
		Legion 44 EC FLC 1 L	40,500
		Gazidim 400 EC FL 1 L	26,500
		Agrimethrine 25 EC FLC 1 L	28,200
	Fungicides	Carbazim 500 SC 1 kg	25,700
		Mancolaxyl 720 WP SHT 1 kg	25,700
		Penncozeb EN Sachet 1 kg	17,700
	Herbicides	Rifor 500 EC EN L (BD 5 L)	30,200

Source: The Survey Team

(4) Others

The inoculant used in soybean production was produced and sold by TICO Co., Ltd., which has a base in Antsirabe but production has stopped.

7.2.3. Production

(1) Current bean production

Figure 7-2 shows trends in annual bean production in Madagascar. Annual production of dry beans (only in the genus Phaseolus) is stable at about 86,000–88,000 tons. Conversely, the annual production of pulses not elsewhere specified (i.e., other legumes) has been around 11,000–12,000 tons. The annual production of peanuts is relatively high, at approximately 58,000 tons. As a result, Madagascar has many small-scale peanut oil producers, particularly in rural areas. Annual production of soybeans is very low, at about 40–50 tons.

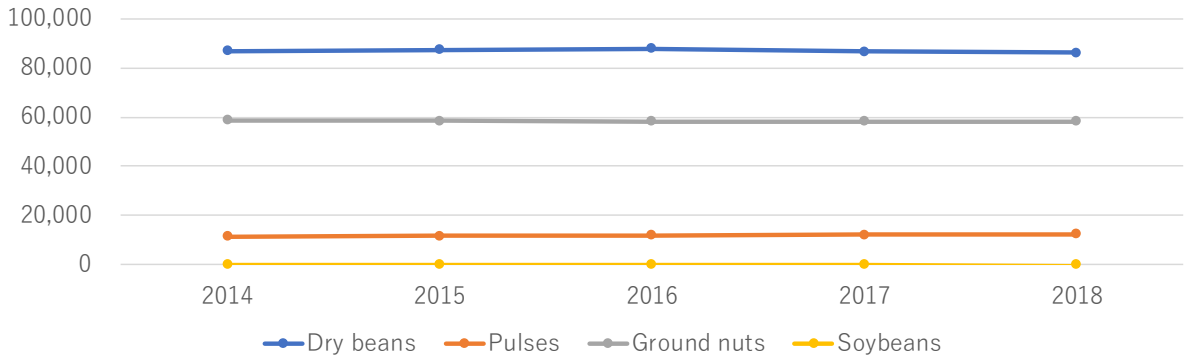


Figure 7-2: Annual production of beans in Madagascar (tons, 2014–2018)
Source: The Survey Team

Figure 7-3 shows the yields of dry beans and pulses in African countries in 2018. Relative to other countries, Madagascar had moderate yields of dry beans but relatively higher yields of pulses.

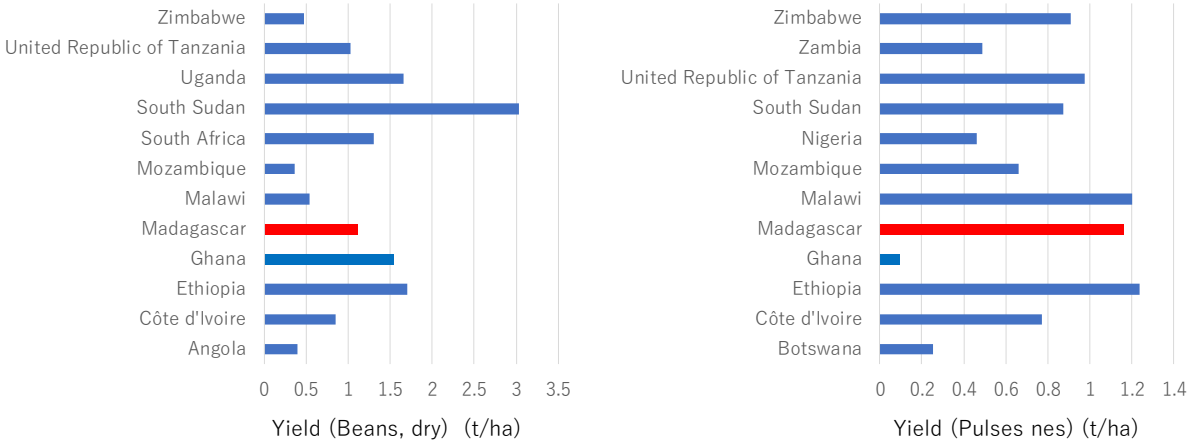


Figure 7-3: Yield of beans in Madagascar relative to other countries (2018)
Source: FAOSTAT

(2) Cropping calendar for beans

Beans are grown throughout Madagascar. Figure 7-4 shows the cultivation calendar for kidney beans observed in Antsirabe. There are two seasons for the cultivation of kidney beans: 1) cultivation in upland fields and 2) cultivation in paddy fields as secondary crops. In the former period, cultivation begins in the rainy season, and the harvest is around February. In the latter period, plowing and seeding work starts around March after the rice harvest, and harvesting is carried out around June or July.

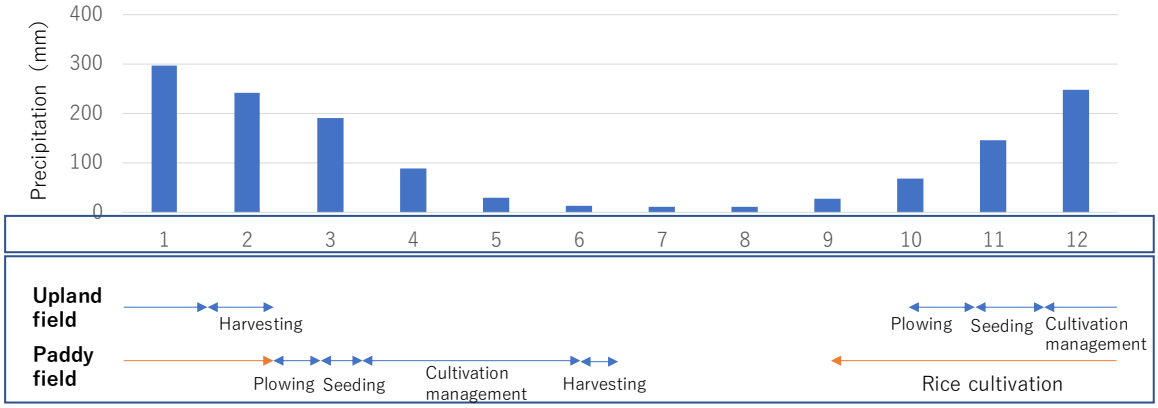


Figure 7-4: Precipitation in Antsirabe and the cropping calendar of kidney beans

Source: Climate.data.org and The Survey Team

(3) Bean cultivation practices

This discussion describes the cultivation practices of kidney bean farmers in Antsirabe. Farmland is prepared before cropping (i.e., plowing and making rows) using animal or human power. For fertilizer application, only compost is used rather than chemical fertilizers. For other cultivation management, seeding and weeding are all done manually, and some farmers spray pesticides during the flowering period. Beans are harvested by hand, dried for about one week, packed in 50–100 kg bags, and sold by brokers and on the market.

Table 7-5 shows the incomes of the kidney bean producers interviewed in this survey. The kidney bean yield of the farmers interviewed was about 600 kg/ha, which is rather low, and the farm gate price of 2,000 MGA/kg sold is a general price. Input costs are kept low, and labor is the highest fraction of total cost. Total revenue is 348,580 MGA/acre (10,457 yen), but actual revenue is slightly higher because family members provide most of the required labor.

Table 7-5: Revenue obtained from kidney bean production in Madagascar (MGA)

1. Income				
Category	Item	Yield(kg/acre)	Unit price (MGA/kg)	Income (MGA)
Sales	Kidney beans	230	2,000	460,000
Total income (MGA/acre)				**460,000**
2. Cost				
Category	Item	Quantity /acre	Unit price (MGA)	Cost
Input	Seeds	1	2,500	2,500
	Compost	0.66	12,000	7,920
	Insecticides	1	5,000	5,000
Production	Land preparation	4	3,000	12,000
	Seeding	4	3,000	12,000
	Weeding	8	3,000	24,000
	Harvesting	8	3,000	24,000
Post-harvest	Drying, Sorting	8	3,000	24,000
Total cost (MGA/acre)				**111,420**
3. Revenue (MGA/acre)				**348,580**

Source: The Survey Team

（4） SRB cultivation

The characteristics of SRBs differ from those of the common beans widely cultivated in Madagascar. SRBs are indigenous to the highlands of Central and South America (approximately 2,000 m above sea level) and prefer a cool climate. The most suitable temperature for growth is 15–22°C, and germination is possible at 10°C or higher. Growth is inhibited at temperatures below 5°C, and pod formation and fruiting are markedly inhibited at temperatures above 25°C. Thus, even in Madagascar, SRBs must be cultivated at high altitudes where a cool climate can be expected.

Thus, SRB cultivation in the Central Highlands region, which has an altitude of 1,500 m or higher, can be inferred to be suitable in Madagascar. For example, Antsirabe's altitude is 1,504 m, and temperatures exceeding 25°C are unlikely to occur throughout the year, suggesting that the environment is suitable for cultivating SRBs. SRBs prefer well-drained soil, but rainfed cultivation requires adequate rainfall. Thus, the period from October, when the rainy season starts, to around June, when the rainy season ends, can be regarded as an appropriate period for cultivating SRBs. The number of days between sowing and harvesting is 120 to 150, suggesting that it is possible to cultivate SRBs as often as twice a year. The suitable region and period are shown in Figure 7-5.

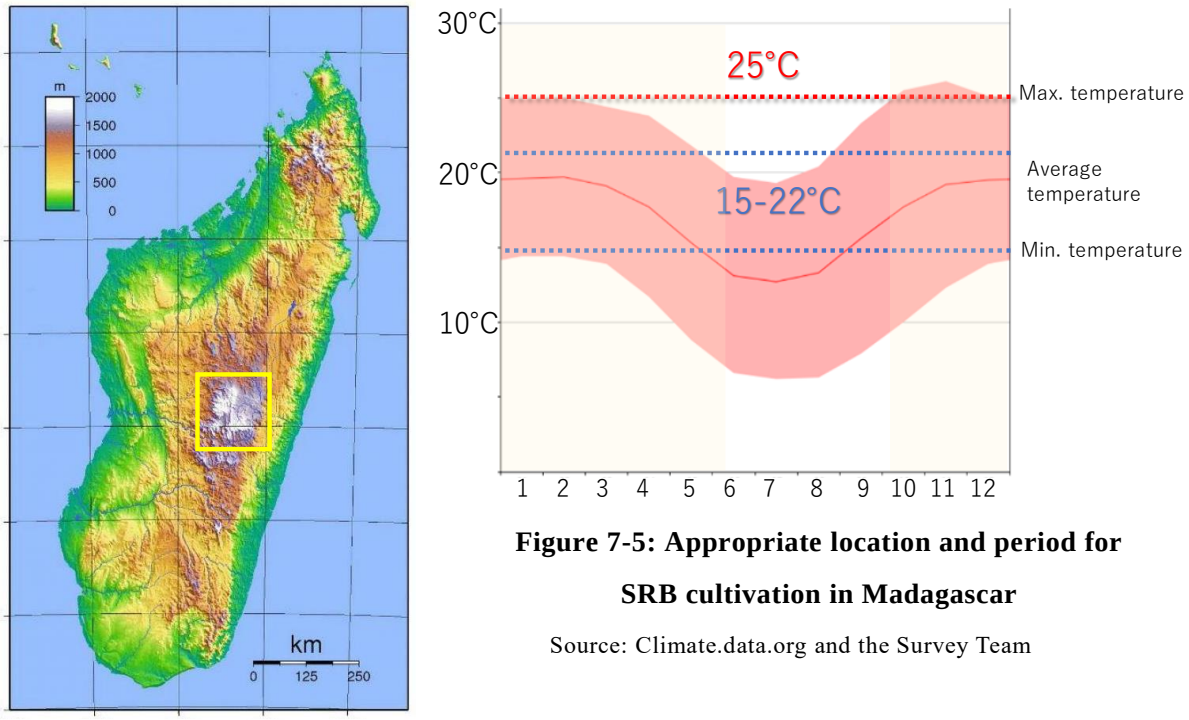


Figure 7-5: Appropriate location and period for SRB cultivation in Madagascar

Source: Climate.data.org and the Survey Team

SRBs are a vine crop. Thus, in addition to basic cultivation management (fertilization and pest management), a support system is required. When FOFIFA was in charge of cultivation guidance, SRBs were cultivated in two ways, as shown in Figure 7-6. However, several problems were

found: 1) the support height was too low; 2) the planting density was too high, and the plants were overgrown; and 3) inducement for the vertical direction was not well prepared[2]. As a result, the growth and pod formation of the SRBs were inhibited, resulting in reduced yields.

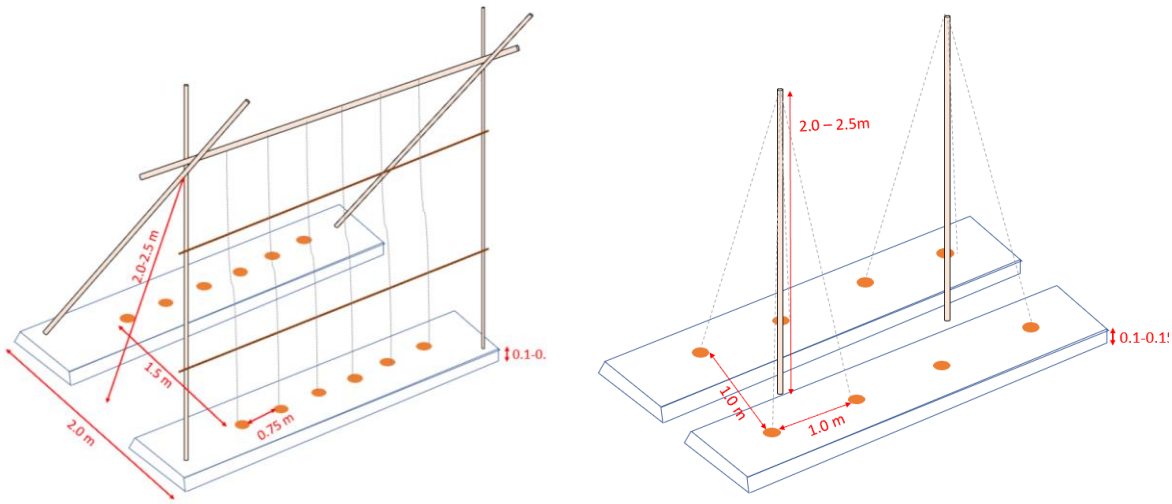
The support is too low, and the plants are overgrown

Inducement for the vertical direction is lacking

Figure 7-6: Current support system of SRB cultivation in Madagascar

Based on these observations, two types of support systems, shown in Figure 7-7 were proposed. The first is a system to install rafter props, and the second is a system to lengthen the props and lower the planting density. In the former, the necessary prop height to grow SRBs is secured, and the air permeability is excellent. However, preparing this system requires more labor and materials. The latter system requires less labor and fewer materials for preparation, but the top of the prop is particularly likely to become overgrown owing to poor ventilation. It is necessary to conduct cultivation trials using these support systems in the future to verify which is superior from a profit perspective.

[2] The cultivation method of SRBs is described in Shinshu University Journal as follows. "Not to overgrow is an important point for the cultivation of SRB. When it is overgrown, insects visiting flowers are active only on the surface of the shoot and leaf group, and they do not enter into the dim back side, and even if it is fruited, they physiologically drop the fruit by the time when the sheath grows to about 2cm. In addition, many diseases occur." Thus, a low support causes the plant to grow thickly at the top of the support. A high cultivation density is also a cause of overgrowth. When the vine is not induced to grow in the vertical direction, the amount of light hitting the plant body is limited, and growth is suppressed.



Rafter prop type **Erect prop type**

Figure 7-7: Proposed support systems for cultivating SRBs in Madagascar

Source: The Survey Team

7.2.4. Processing

Various processed products are made from different types of bean, but the scale of production is not large in Madagascar. The major processed products identified by this survey are as follows.

Flour milling: Dried kidney beans and soybeans are packed in powder form. This powder is generally eaten as porridge and is also sold as food for infants due to its high nutritional value. Soybeans are processed into coffee through several processes, including heating and drying seeds in an oven; by milling and adding sugar; and into pastries made from soybean flour, which are produced and sold at supermarkets.

- Oil extraction: Peanut oil is produced on a small scale in rural areas. The oil is squeezed, and the residue is used as feed for livestock. Owing to the limited production of soybeans, Madagascar has very few soybean oil extractors, and the scale of production is small.
- Canning: Rehydrated beans are cooked and canned. Canned beans are Madagascar's largest processed bean product and are exported.

For soybeans, some enterprises are planning the construction of oil extraction and feed manufacturing plants. The installation of oil extraction and feed production facilities with a capacity of at least 1,000 tons/year is under consideration, with plans to procure the necessary raw materials through contract cultivation. Because financing is a challenge, a low-interest financing system is needed to cover the initial investment costs.

7.2.5. Distribution

(1) Distribution of beans

Madagascar has two distribution channels for beans: 1) distribution via middlemen (i.e., wholesalers and brokers) and 2) distribution by contract cultivation. In the former case, beans collected by brokers or wholesalers are transported to customers, processors, or retailers. In the latter case, the buyer lends the necessary inputs, such as seeds, fertilizers, and agricultural chemicals, as credit and deducts the cost of the inputs from the purchase price of beans when the harvest is traded. Under contract cultivation, the purchase conditions for beans are clearly defined. The exporters of common beans interviewed in this survey use water content (about 12%) and the contamination rate (not more than 2%) as purchase conditions.

(2) Market price

Table 7-6 shows the retail price of each type of bean based on interviews with retailers in Antananarivo. The market prices for all beans fluctuate, but the fluctuation range of soybean prices is particularly large.

Table 7-6: Market price of beans in Madagascar

Type of bean	Retail price (MGA/kg) bottom	Retail price (MGA/kg) ceiling	Purchasing price from middlemen (MGA/kg)	Production area	Remarks
Black-eyed beans	2,000	2,500	1,900	Ambatoboeny	High prices in August and September
Lima beans	3,500	5,000	3,400	Tulear, Morondava, Fianarantsoa	—
Kidney beans (red, white)	3,200	3,500	3,100	No data	They taste good and are commonly consumed
Kidney beans (white)	3,000	3,100	2,900	Bealalana	—
Bambara beans (white)	4,500	4,700	4,400	Tulear, Morondava, Fianarantsoa	Relatively higher retail price owing to a longer cultivation period
Bambara beans (black, white)	4,000	4,500	3,900	Tulear	Relatively higher retail price owing to a longer cultivation period
Soybeans (white)	2,100	5,000	2,000	Antsirabe	High price in May
Cowpeas (red)	4,000	4,100	3,900	Western Madagascar	High price in September
Cowpeas (green)	2,700	3,200	2,600	Ambatoboeny	High price in November

Source: The Survey Team

Box 7.1: Bean platform

Sehatra Fiaraha-Mihary Tsaramaso (SFMT: Legged Platforms) was established in 2013 by FOFIFA staff in Antsirabe, a bean production area. The platform was established to improve the inefficient production and distribution of beans caused by a lack of communication among actors and a lack of access to market information in the bean supply chain. SFMT's organizational goals are as follows.

1. To support producers in growing high-quality beans according to market demand.
2. To create attractive markets through the development of new bean products and unique local products.
3. To contribute to the local community by addressing the malnutrition of women and children.

Currently, 98 organizations (i.e., agricultural cooperatives, agricultural materials suppliers, wholesalers, retailers, and exporters) participate in the platform, which provides opportunities for information exchanges and business collaboration through regular meetings. One option is to revitalize the bean sector by offering technical and financial assistance for such platforms.

Figure 7-8: SFMT logo

7.2.6. Imports, exports, and the domestic market

(1) Imports and exports

Figure 7-9 shows trends in the amount of beans (Harmonized System (HS) code: 0713) exported from Madagascar. Overall, approximately 63,000–83,000 tons of beans are exported annually, mainly to France, Vietnam, and India. Conversely, Madagascar's legume imports are around 1,700–5,200 tons, with the majority of these imports coming from the United States and Ukraine. Thus, beans from Madagascar are not only consumed domestically but also appear to be a major export item.

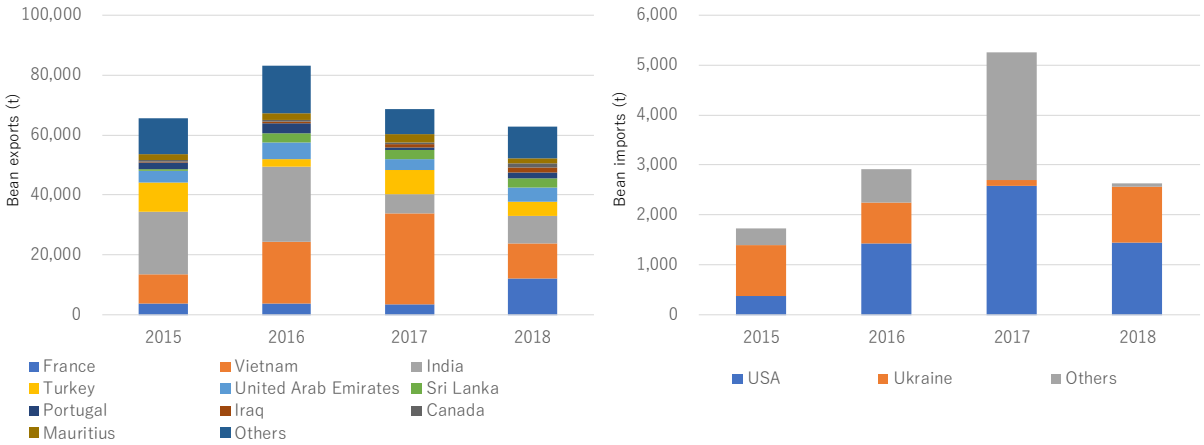


Figure 7-9: Import and export of beans (HS code:0713) in Madagascar (2015-2018)

Source: UN Comtrade

Figure 7-10 compares trends in export volumes by type of bean. The available statistical data

show that most of the exported beans fall into the category “Other.” Additionally, cowpeas and peas are exported in large amounts.

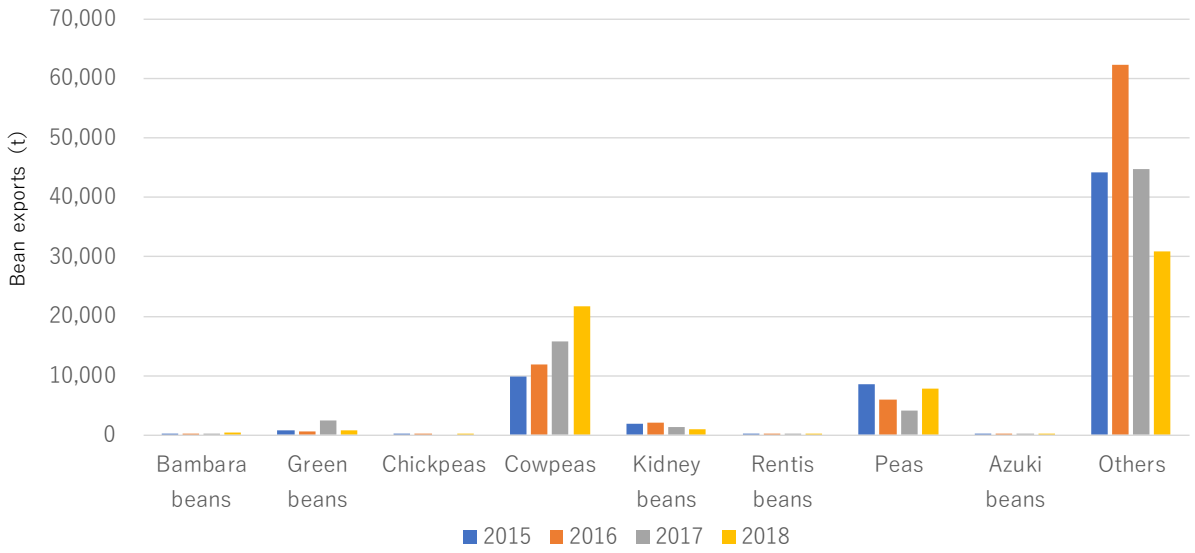


Figure 7-10: Exports of each type of beans in Madagascar (2015–2018)

Source: UN Comtrade

(2) Consumption

The Survey Team conducted a simple survey of bean palatability. The study was conducted in Sahanivotry Fukutany Vohitrarivo and targeted 30 randomly selected Malagasies (18 men and 12 women with an average age of 30 years (5 to 77 years old)). The beans used in the palatability survey were 1) black-eyed beans, 2) soybeans, 3) lima beans, 4) kidney beans (white), 5) kidney beans (black and white), 6) bambara beans (white), 7) bambara beans (brown), 8) cowpeas (red), and 9) cowpeas (green). The results of the investigation are described in detail below.

1) Frequency of eating beans

All of the respondents said that they consumed beans at least one day a week. In particular, the largest number of respondents (57%) ate beans two to three times per week, followed by one day per week (27%) and four to five days per week (13%).

2) Favorite and least favorite beans and the reasons

Table 7-7 shows the results of the palatability survey for the nine kinds of beans presented in this report. Kidney beans (white) were the most liked, followed by bambara beans (brown) and bambara beans (white). Conversely, black-eyed beans, cowpeas (red), and lima beans were the most disliked, in that order. When asked why they preferred to eat beans, many respondents cited the “taste.” Here, “taste” includes the ease of eating, such as the texture and softness of beans. The next most common response was their high nutritional value (i.e., they are rich in vitamins,

energy, and calcium). In addition, the most common reason that people cited for not liking beans was the "smell," and this complaint was particularly relevant for black-eyed beans and soybeans. This reason was followed by allergies and feelings of residual stomach pain, indigestion, and abdominal pain.

Table 7-7: Results of bean palatability survey conducted in Madagascar

Category	Score for favorite beans *	Score for least favorite beans*
Black eyed beans	7	35
Soybeans	10	16
Lima beans	23	20
Kidney beans (White)	102	8
Kidney beans (White and Black)	24	1
Bambara beans (White)	31	11
Bambara beans (Brown)	45	6
Cowpeas (Red)	12	26
Cowpeas (Green)	15	15

* The interviewees were given nine different bean samples and were asked to choose their top three favorite beans and top three least favorite beans. The scores were calculated by assigning five points to a first place pick, three points to a second place pick, and one point to a first place pick and summing the points.
Source: The Survey Team

7.2.7. Policies and the role of the government

In this survey, staff at the Ministry of Agriculture, Livestock, and Fisheries (MAEP) were asked whether there was a policy document on bean promotion, but they responded that there was no such document. However, the MAEP recognizes the importance of promoting beans for (1) soil improvement, (2) improving consumer nutrition (promoting protein intake), and (3) improving farmers' income. Beans also have high potential as a secondary crop of rice. A MAEP official said that there was a plan to distribute seeds and fertilizers for black-eyed and kidney beans to farmers in Antsirabe starting in 2020 as part of an agricultural extension program, but details were not obtained.

7.2.8. Issues and opportunities

(1) Issues

In Madagascar, beans are positioned as both export and domestic consumption crops. At this stage, Madagascar's bean productivity is not significantly inferior to that of other African countries, but it is essential to strengthen market competitiveness to continue to capture a certain share of the international market. From this point of view, the following problems are evident: 1) shortages in the production and distribution of improved seeds and 2) low yields due to a lack of

fertilization technology dissemination. In addition, Madagascar is highly dependent on imports of edible oils and livestock feed from abroad, and the oil extraction industry, which serves as the basis for the import substitution for these products, is underdeveloped. A weakness of SRBs is that their total production cost is high because they have a longer cultivation period and require more materials than other beans do. Consequently, their unit selling price is higher than that of other beans. Moreover, it is not clear whether they are marketable outside of Japan, and further research is required.

(2) Opportunities

Beans have already been established as a major export crop in Madagascar. In addition, the fact that various improved and native varieties have been identified is an advantage. In Madagascar, where rice cultivation is thriving, the cultivation of leguminous plants is thought to have beneficial effects through the improvement of soil fertility. SRBs have potential in that a certain amount of demand has been confirmed in the Japanese market and they are a commercial product with a high dietary fiber content that appeals to health-conscious consumers. Table 7-8 shows the results of the SWOT analysis.

Table 7-8: Results of the SWOT analysis for beans and SRBs in Madagascar

Strengths	**Weaknesses**
Beans ● In addition to the identified local varieties, improved varieties of kidney beans have been developed. ● A supply chain has been established, as beans are a major export crop. ● They can be cultivated as a secondary crop in paddy fields. ● They are high in protein and other nutrients. SRBs ● The Central Highlands region is a suitable environment for the cultivation of purple honeysuckle. ● They are high in dietary fiber and can appeal to health-conscious consumers. ● There are few competitors because the cultivation environment is limited by climatic conditions.	Beans ● The production and distribution of seeds do not meet demand. ● Productivity (yield) must be improved to enhance competitiveness. ● The oil extraction industry (soybean and peanut oil) is small, and most cooking oil is imported. ● Accessing the necessary funds to develop the processing industry is difficult. SRBs ● The cultivation period is longer than that of other beans, and many materials are required. ● The protein content is lower than that of beans. ● The market potential in Madagascar is unknown. ● They take longer to cook because of their large seeds.
Opportunities	**Threats**
Beans ● The demand for beans from the international market is stable. SRBs ● There is potential for export to the Japanese market. ● There is demand from health-conscious consumers.	Beans ● Climate is unstable climate (i.e., climate change). ● The international market price of beans fluctuates. SRBs ● The occurrence of pests and disease is a threat.

Source: The Survey Team

7.3. Vanilla VC

7.3.1. Overview

Figure 7-11 shows an overview of the vanilla VC in Madagascar, and Table 7-9 provides information about vanilla prices. Vanilla is produced for export in Madagascar. The major production sites are located in the tropical rainforest areas in the east of Madagascar, including Sava District. Vanilla seedlings can be purchased at FOFIFA's vanilla station in Antalaha district, but most vanilla farmers plant vanilla trees by obtaining vanilla vines from friends or neighbors. Fertilizers and chemicals are rarely used in vanilla production. Vanilla pollination and curing (processing) require significant amounts of labor, and the vanilla industry is very labor-intensive. Processing (curing) is done by farmers or exporters. The distribution of vanilla in Madagascar usually involves more than two traders and is very complex. The major destinations of vanilla from Madagascar are Europe, North America, and Japan.

Table 7-9: Vanilla prices in Madagascar

Farm gate prices	Green vanilla	2,900–5,800 JPY/kg	(1 MGA = 0.029 JPY)
	Processed vanilla beans	21,750 JPY/kg	(1 MGA = 0.029 JPY)
Exporters' purchasing prices	Green vanilla	7,250 JPY/kg	(1 MGA = 0.029 JPY)
	Processed vanilla beans	23,200 JPY/kg	(1 MGA = 0.029 JPY)
Selling price of exporters (FOB)	Processed vanilla beans	47,171 JPY/kg	(1 USD = 109.7 JPY)
Retail price in a foreign market (Japan)	Processed vanilla beans	230,000 JPY/kg	

Source: The Survey Team

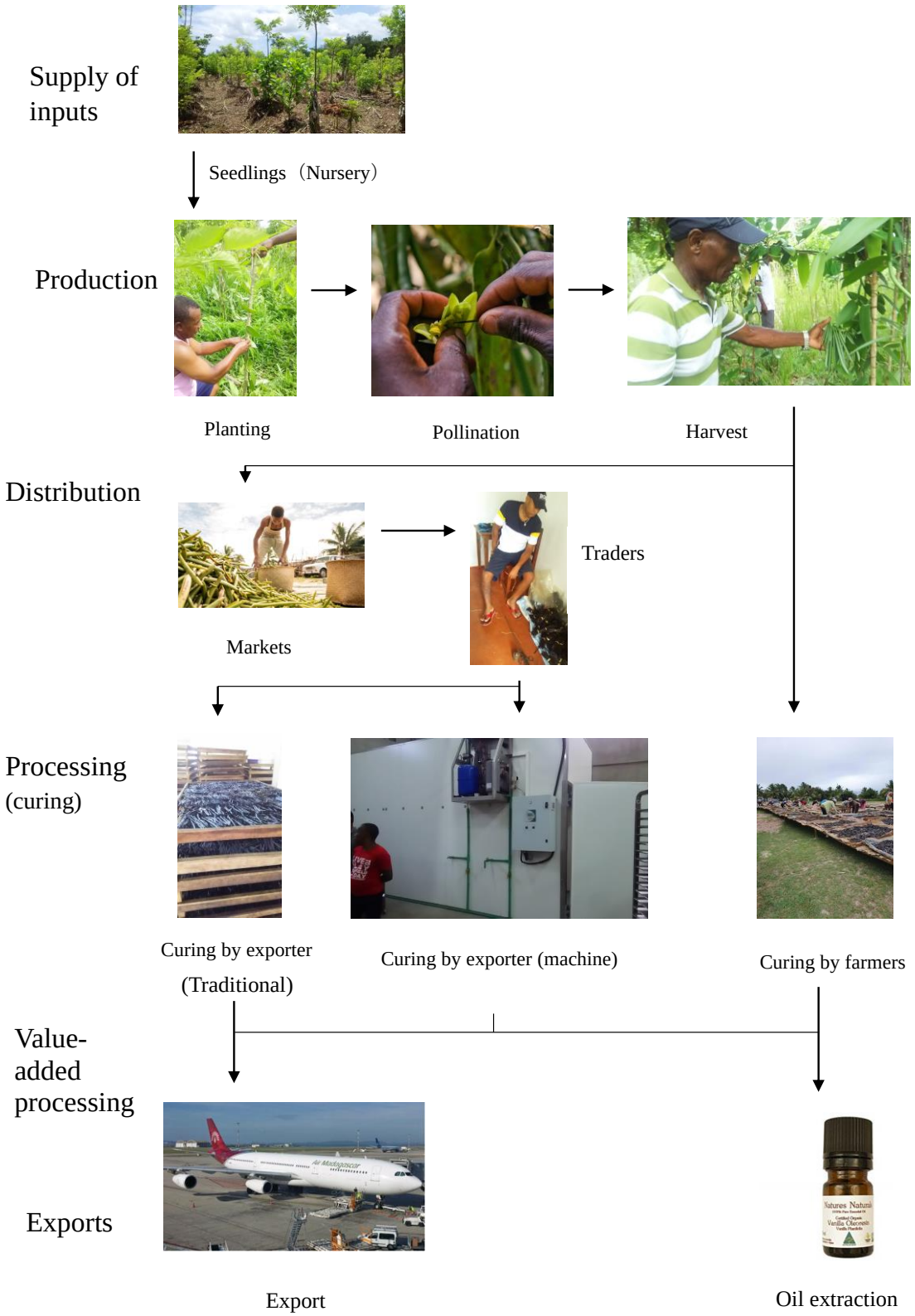


Figure 7-11: Overview of the vanilla VC in Madagascar

Source: The Survey Team

7.3.2. Agricultural inputs

(1) Seedlings

There are three major varieties of vanilla in the world, as shown in the list below. The major varieties that are planted in Madagascar are shown in Table 7-10. The Tsv Taitsa variety is a relatively new variety that is popular among farmers, as it is tolerant to heat and, thus, is easy to grow. The Manitra Anpotonv variety contains a high level of vanillin, which is the major source of vanilla's odor, but it is difficult to grow, as it is not tolerant to heat.

- Fragrance variety (also called the Bourbon variety): Mexican origin
- Pompuna variety: Peruvian origin
- Happape variety. Tahitian origin.

Table 7-10: Major varieties of vanilla in Madagascar

Variety	Crossing	Yield of green vanilla per tree (kg)	Vanillin content in vanilla beans (%)	Characteristics
Fragrance variety	—	0.8–1	1.5–2	—
Tsv Taitsa variety	Cross between Fragrance and Pompuna varieties	3	1.5–2	Introduced in 1995 as a new variety. Tolerant to heat.
Manitra Anpotonv variety	Cross between Fragrance and Happape varieties	1	7	Difficult to grow, as it is intolerant to heat.

Source: Centre FOFIFA, Tamatave.

Vanilla can be planted by imbedding vanilla vines, which does not require grafting or other labor. Most farmers obtain vanilla vines from friends or neighbors. The FOFIFA vanilla station in Antalaha District grows 23 vanilla varieties, including those listed in Table 7-10. Small farmers can obtain seedlings (1.25–1.5 meters of vanilla vines) from the station for a fee. Commercial farmers can buy seedlings for 2,000 MGA each (in the case of the Manitra Anpotonv variety, 3,000 MGA each). In addition, FOFIFA has planted vanilla trees of the Fragrance variety at its farm in Invluika and plans to sell or distribute the seedlings grown there in the future.

(2) Pesticides

Pesticides can be purchased at agricultural input stores, which are located in many rural areas of Madagascar, but they are rarely used for vanilla production. The major reason is that vanilla is grown as part of agro-forestry and is mixed with other fruit trees, and spraying pesticides can damage other fruits. The high price of pesticides and farmers' lack of knowledge on spraying

pesticides are additional reasons[3].

7.3.3. Production

（1） Overview of the production of green vanilla in Madagascar [4]

Madagascar is the largest producer of vanilla in the world and produces 3,227 of the 16,525 tons of global production. Figure 7-13 shows trends in the production of green vanilla in Madagascar. The quantity of production decreased in 2003 owing to cyclone damage. However, the harvest area increased in 2001 owing to an increase in the price of vanilla. In 2005, when the newly planted vanilla could be harvested, production increased significantly, and vanilla production of has increased steadily since then. It decreased in 2015 owing to cyclone damage but recovered in 2017.

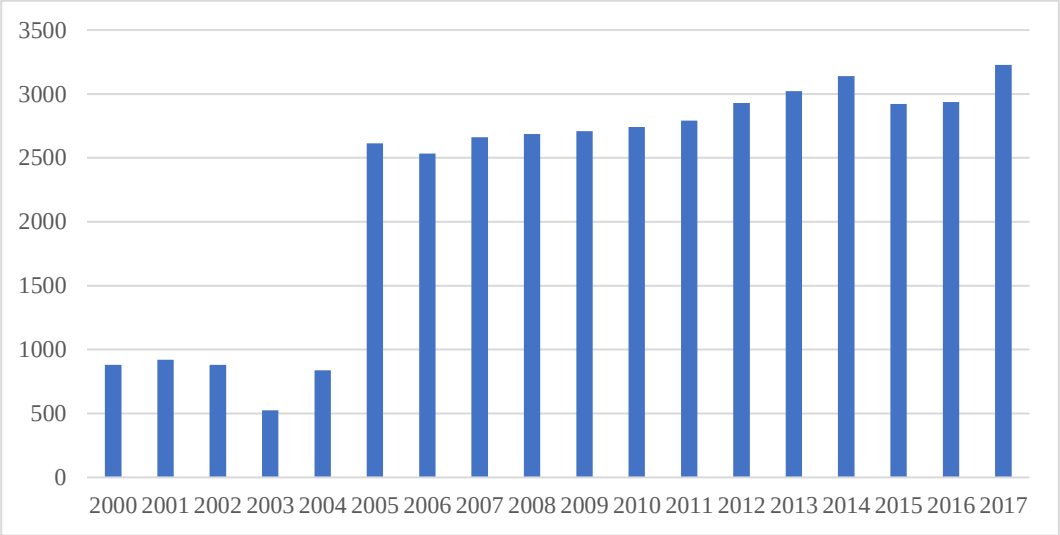


Figure 7-12: Trends in green vanilla production in Madagascar (tons)

Source: FAOSTAT

Growing vanilla trees requires a minimum temperature of 10°C, even in winter, and it is suitable for tropical rain forests with annual precipitation ranging from 2,000 mm to 3,000 mm. In Madagascar, the eastern and north-eastern coastal areas, which have a tropical rain forest climate, are the major vanilla production sites. Table 7-11 shows the quantity of annual vanilla production by district, and Figure 7-13 shows the major vanilla production sites on a map. Clearly, the most important production site is the Sava District, which constitutes 70% of the total production and harvest area of Madagascar.

[3] Based on interviews with Centre FOFIFA, Tamatave, and vanilla farmers in Sava District.
[4] Green vanilla is the fruit of the vanilla tree before it has been dried.

Table 7-11: Quantity of annual vanilla production by district (2010)

District	Quantity of production (tons)	Harvest area (ha)
Sava	2,765	43,680
Analanjirofo	195	14,920
Sofia	860	1,835
Diana	30	1,880
Vatovavy Fitovinany	35	1,000
Atsinanana	10	775
Atsimo Atsinanana	15	550
Total	3,910	64,640

Source: Statistique Agricole, MAEP

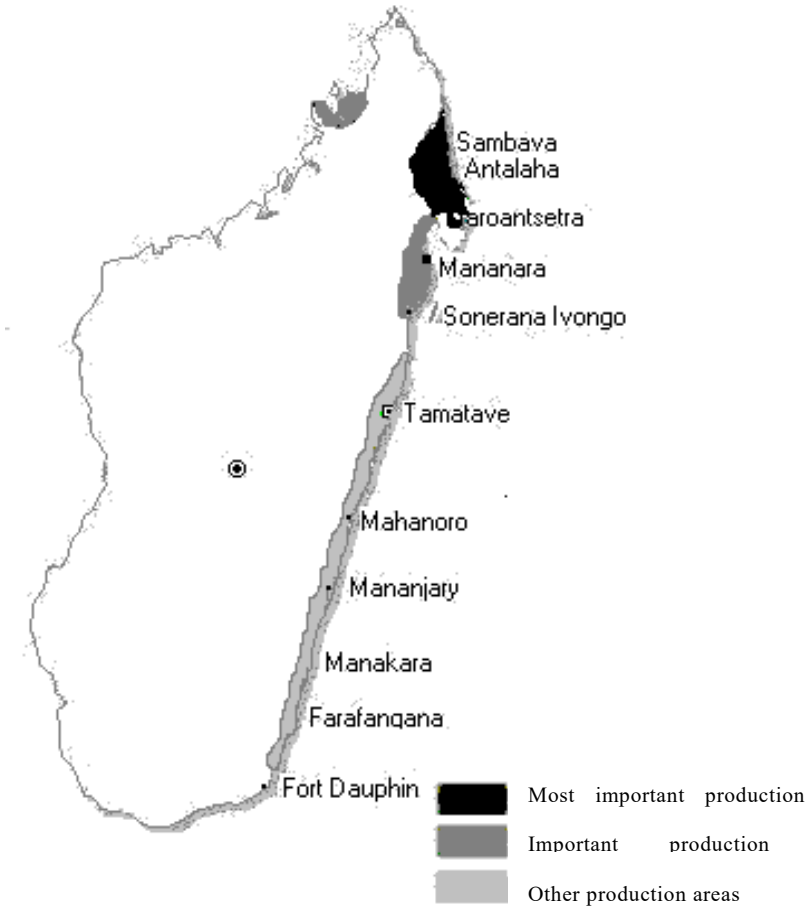


Figure 7-13: Major vanilla production sites

Source: Centre FOFIFA, Tamatave

（2） Methods of cultivation and harvest

Most of the vanilla trees in Madagascar are planted as part of agro-forestry and are intercrops of such products as coffee and bananas. The time from plantation to the first pollination is three years, and that from pollination to harvest is eight months. In Madagascar, pollination usually occurs between July and September, and the harvest is between April and June. Most vanilla farmers use jatropha trees as a splint of vanilla trees. Because pollinating insects do not exist in Madagascar, pollination is performed by hand by farmers. Vanilla farmers check their farms every day when the flowering season approaches, as the flowering period is only one day long. Vanilla flowers can be pollinated individually by hand, but it requires a significant amount of labor. Vanilla farmers also harvest vanilla by hand.

（3） Major issues in production

1） Pests and diseases

Damage by fungal diseases, such as Fusarium, and pests, such as Kakamenaloha, is extensive, and this damage is more serious in the north than in the central and southern areas. As vanilla is grown as part of agro-forestry, pesticides are expensive, and farmers generally lack knowledge on spraying pesticides. Thus, pesticides are rarely used to combat this damage, and farmers instead deal with it by excluding the damaged trees by hand.

Kakamenaloha

Damage by fungus

Source: Centre FOFIFA, Tamatave.

2） Owing to a recent increase in the price of vanilla beans, theft of vanilla fruit before harvest has been rampant. Owing to a lack of vehicles, the local police have not been able to deal with this theft. Many of the vanilla farmers counteract theft by organizing security groups, but it is difficult to properly deal with it, as they lack security and equipment.

3） Because of concerns about vanilla fruit theft, many farmers harvest vanilla before it matures. Since 2018, the Ministry of Agriculture of each district has determined the start date of the harvest and has levied fines to farmers who harvest before that. Cases of

harvesting before maturity have decreased since then.

4) The cultivation skills of vanilla farmers in Sava District, where vanilla has been cultivated for a long time, are generally high. However, the cultivation skills of vanilla farmers in other areas are usually low, and the production yield and quality of vanilla are lower in other areas than in Sava District.

Because vanilla farmers are small-scale farmers, they have little bargaining power. In some cases, however, farmers organize groups and sell their products directly to exporters. In addition, exporters and processors organize farmers as contract farmers in some cases. For example, a vanilla processor in Antalaha District, Symrise, has organized approximately 10,000 vanilla farmers. Symrise hires about 40 extension workers who provide technical support with cultivation and life improvements to contract farmers[5].

7.3.4. Processing

(1) Curing

Green vanilla is transformed into vanilla beans through a series of processes called curing. Most of the vanilla curing in Madagascar is done by exporters, but farmers and groups of farmers do some curing as well. Curing methods and processes differ significantly across different processing agents, and there is no standard for curing.

Figure 7-14 shows an example of how vanilla is cured by a large processing firm.

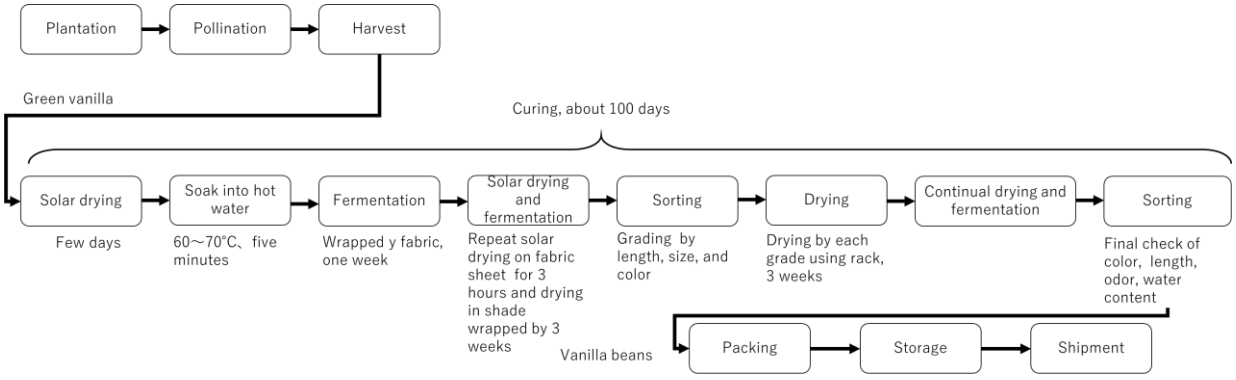


Figure 7-14: Example of vanilla curing by a large processing firm

Source: Overseas Merchandise Inspection Company "Report of the Basic Study on the Coherence in Policies on ODA and Trade of Agricultural Commodities" (2008).

[5] Based on an interview with Symrise.

Drying

Grading

Packing

In addition, an example simple curing method that is carried out by farmers is as follows (the curing process takes about two months)[6].

- Soak green vanilla in hot water for three minutes
- Store vanilla at home for four days
- Carry out solar drying for four hours a day for one month
- Dry the vanilla inside the home for two weeks and keep it with oiled paper

Soak with hot water

Dry beans outside

Packing

Curing involves a large amount of labor and can be highly labor-intensive at times. Some processors, however, try to save labor by introducing machinery, such as dryers and sorters.

Dryer at Vanipromad (Antalaha)

Most vanilla farmers cannot cure vanilla owing to a lack of skills and necessary equipment. It is also difficult for farmers to get loans, and, thus, it is hard for them to start curing businesses.

[6] Overseas Merchandise Inspection Company "Report of the Basic Study on the Coherence in Policies on ODA and Trade of Agricultural Commodities" (2008).

（2） Vanilla essential oils

Major processed vanilla bean products include vanilla essential oils, which are mostly manufactured in places that import vanilla beans, such as Europe and the USA. Madagascar has three vanilla essential oil plants.

- Symrise (Antalaha District)
- Takasago (Sava District)
- Societe Zizi Antsirabe Nord (Antsirabe District)

7.3.5. Distribution

Most vanilla farmers bring green vanilla to the vanilla markets, which are located in most rural areas of Madagascar, and sell it to traders there. Some traders also visit vanilla farmers to procure green vanilla. Traders deliver green vanilla to exporters who have curing facilities and sell it to them.

7.3.6. Imports, exports, and the domestic market

（1） Exports of vanilla beans

Vanilla bean exports from Madagascar constituted 54.1% of the total value of exports in the world in 2018 (FAOSTAT). In addition, the vanillin content of Madagascar vanilla beans is generally high, and Madagascar vanilla beans have a reputation for high quality in international markets.

Figure 7-15 shows the trend in the value of exported vanilla beans from Madagascar. The recent increase in the export value stems mainly from the increase in the price of vanilla beans in international markets.

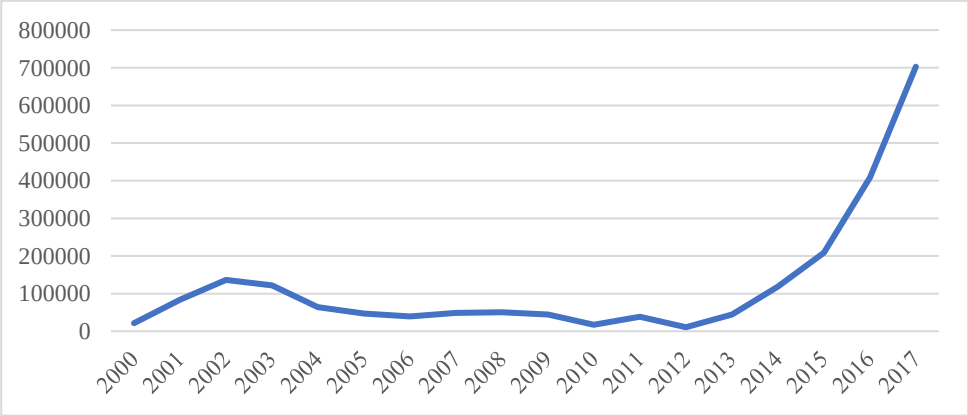


Figure 7-15: Trend in the value of vanilla bean exports from Madagascar (1,000 USD)

Source: FAOSTAT

Figure 7-16 shows the share of the value of exports from Madagascar by commodity. As the figure shows, vanilla has recently become the most important export from Madagascar owing to the increase in its price.

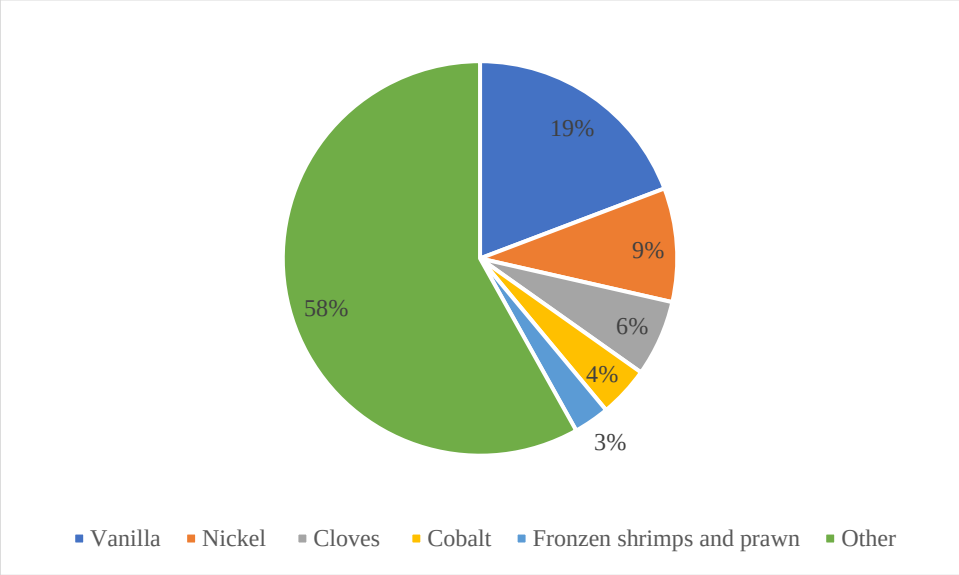


Figure 7-16: Share of the value of exports from Madagascar by commodity (2017)

Source: FAOSTAT

Table 7-12 shows the value, quantity, and unit price of vanilla beans exported from Madagascar. The major destinations of vanilla from Madagascar are Europe, North America, and Japan. In addition, the unit price of vanilla beans to North America is lower than that to Europe and Japan.

Table 7-12: Value, quantity, and unit price of vanilla beans exported from Madagascar (2018)

	Value of exports (1,000 USD)	Quantity of exports (tons)	Unit price (USD/kg)
USA	282,441	1,113	254
France	203,850	458	445
Germany	82,472	167	494
Mauritius	54,846	128	494
Netherlands	28,565	63	453
Canada	20,213	133	152
Japan	15,293	37	413

Source: FAOSTAT

（2） Price of vanilla beans

Figure 7-17 shows the trends in the price of vanilla beans in international markets. As the figure shows, the price of vanilla has fluctuated significantly in the last 20 years. Because of the decrease in Madagascar's vanilla production, which was caused by cyclone damage in 2003, the price of vanilla increased to 490 USD/kg in that year. The increase in the price of vanilla shifted demand from natural to artificial vanilla, and the price of vanilla decreased to 25 USD/kg in 2005. The price of vanilla started to increase in 2012 owing to fears of health risks of artificial vanilla, and it increased significantly in 2017 owing to cyclone damage in Madagascar. It continues to be extremely high through 2019.

Owing to the recent increase in the price of vanilla, new vanilla tree plantations have been extensively established in major vanilla-producing countries, such as Uganda. Thus, some experts believe that vanilla's price will soon decrease[7].

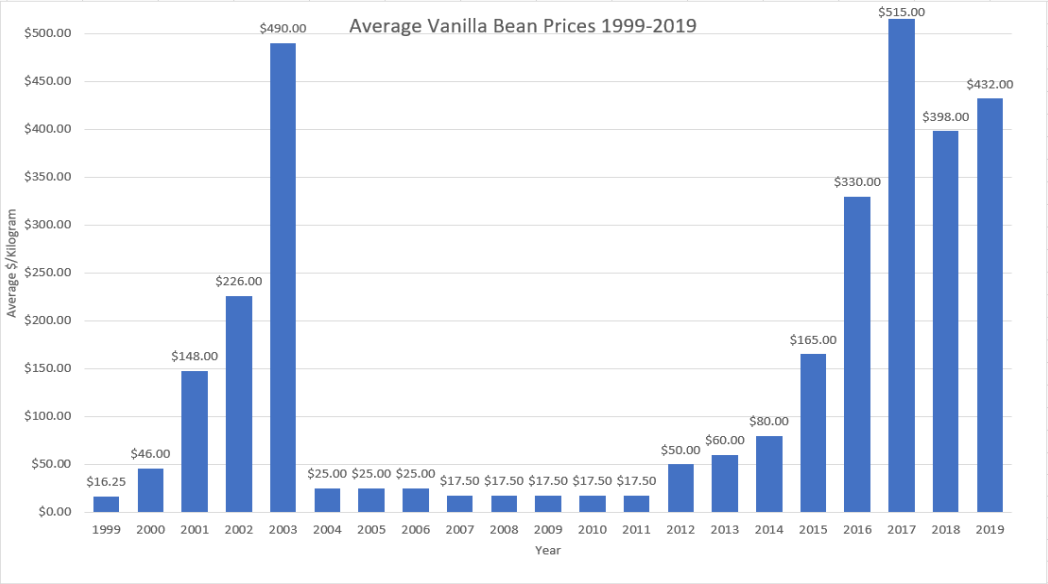


Figure 7-17: Trends in vanilla bean prices in international markets (USD/kg)

Source: Cooksvanilla.com

Figure 7-18 shows the price of vanilla in each stage of the VC as of November 2019. The price of vanilla is much higher than that of other agricultural products in Madagascar, and farmers, traders, and exporters face the risk of robbery. Many traders and exporters hire military personnel (150,000 MGA per day[8]) to secure their businesses.

[7] Based on interviews with Symrise and MEAP.
[8] Based on interviews with traders and processors of vanilla.

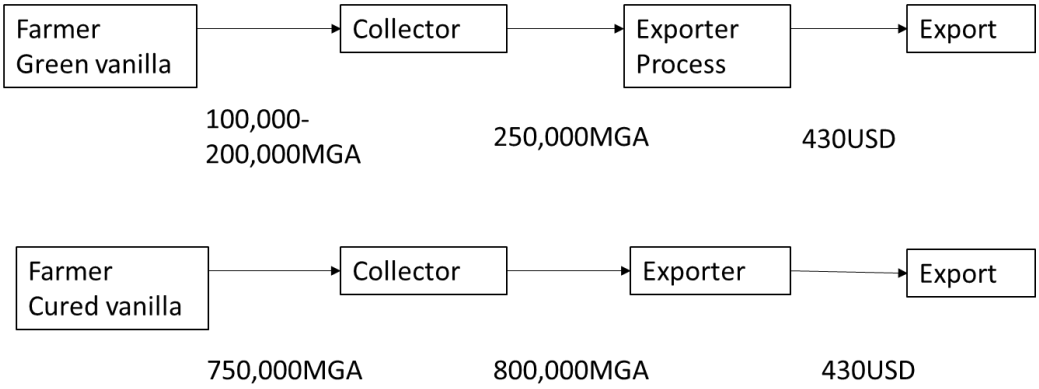


Figure 7-18: Price of vanilla at each stage of the VC (per kg)

Source: The Survey Team

The qualities of green vanilla and vanilla beans vary depending on their size, level of maturity, and the existence of a split, but there is no clear quality standard. Instead, buyers evaluate vanilla quality based on their experience. In addition, no institution can perform all of the tests of vanilla quality, such as water and vanillin contents, and pesticide residue in Madagascar is one of the major issues in Madagascar's overall VC[9].

Table 7-13 shows the selling prices of vanilla beans to exporters by type as of November 2019. Black vanilla is for retail purposes, and red vanilla is for processing, as red vanilla has less water content than black has. The prices differ among vanilla types because it takes more time to dry vanilla to red vanilla.

Table 7-13: Selling price of vanilla beans to exporters by type

Type	Water content	Days for processing (relative to black kitchen)	Selling price to exporters per kg
Gourmet black	35%	—	370 USD
Black kitchen	28-32%	—	380 USD
Red Europe	25%	4–5 days	420 USD
Red US	20%	6.5 days	430 USD

Source: The Survey Team

(3) Exporters

Since 2016, only firms that have been certified by the Ministry of Commerce can export vanilla. Certificates can be obtained after ministry staff visit a firm to check the hygiene management of the plant and the water and the vanilla quality in terms of its water and vanillin contents. There are 120 certified exporters in Madagascar as of November 2019.

One of the major issues for exporters is the difficulty in making investments because the interest

[9] Most exporters can test the water content of vanilla, and some of them can test the vanillin content of vanilla by themselves.

rates of loans from financial institutions are high. In addition, many of them are willing to explore new markets, such as Japan and China, but do not have opportunities to do so.

(4) Domestic market

The vanilla beans produced in Madagascar are not consumed in Madagascar except for small amounts sold to tourists.

7.3.7. Policies and the role of the government

There is no comprehensive policy related to the vanilla industry as of 2019. The support provided by the MAEP to the vanilla sector is as follows.

- Improvement of farmers' productive capacities by introducing good agricultural practices (GAP). The MAEP introduced GAP in Diana District in 201 and plans to extend them to other areas and distribute GAP manuals to farmers for free.
- Promotion of farmers groups.
- Development of traceability. A traceability development project that is planned to launch in January 2020 will try to mark each vanilla bean to avoid robbery. The project area will be Diana District.

The MAEP in Sava District, which is a major vanilla production site, employs seven agricultural experts, and three of them are experts in vanilla. They provide technical assistance to the farmers, but only a limited fraction of the large number of vanilla farmers in the area can receive training.

The East District office of the MAEP monitors the maturity of vanilla fruit within the district and determines the start date of the harvest (see section 7.3.3.(3)3)).

Currently, no research is being conducted on the cultivation, diseases, pests, and processing of vanilla. Many players in the vanilla VC claim that research on these items is required to further develop the vanilla VC in Madagascar[10].

7.3.8. Issues and opportunities

Table 7-14 shows the SWOT analysis of the vanilla VC in Madagascar.

(1) Issues

Major issues in the vanilla VC in Madagascar include unstable production volumes and prices, which make stable procurement difficult; the lack of clear quality standards; and limited research

[10] Based on exporters and chambers of commerce.

on breeding, farm management, pests and diseases, and processing.

Issues in the production of vanilla include frequent cyclone strikes, rampant theft of vanilla fruits and trees, farmers' tendency to harvest vanilla too early to avoid theft, rampant pests and diseases, and limited access to technical services for production. The complex distribution system is also an issue. Issues in processing include the difficulty faced by famers in curing owing to the lack of skills and equipment, the limited production of high value-added vanilla products (e.g., essential oils), and the difficulty in making investments owing to high interest rates.

(2) 2. Opportunities

Opportunities in the vanilla VC include a suitable climate and soil for producing high-quality vanilla, the existence of many farmers with years of experience in vanilla plantation, and a number of exporters that have links to foreign customers. There is also potential to expand to new markets, such as Japan and China, and to develop high value-added products, such as essential oils.

Table 7-14: SWOT analysis of the vanilla VC in Madagascar

Strengths ● Suitable climate and soil to produce high-quality vanilla ● Existence of a large number of farmers who have years of experience in vanilla planting (especially in Sava District) ● Existence of a large number of exporters with links to foreign customers	Weaknesses ● Unstable production volumes and prices that make stable procurement difficult ● Lack of clear quality standards ● Very limited research activity in breeding, farm management, pests and diseases, and processing Production ● Frequent cyclones ● Rampant theft of vanilla fruits and trees ● Tendency of farmers to harvest vanilla too early, fearing theft ● Pests and diseases ● Limited access to technical services for production ● Limited access to quality vanilla trees (in some regions) Distribution ● Highly complex supply chain with little vertical integration ● Poor road conditions in rural areas Processing ● Many farmers do not cure vanilla owing to a lack of skills, equipment, and access to funds ● Vanilla curing is mostly done with traditional methods ● Very limited production of high value-added vanilla products (e.g., essential oils) ● Difficult to make investments owing to high interest rates
Opportunities ● Stable demand in international markets ● Potential to expand to new markets ● Potential to add value by processing to oils or essences	Threats ● Increasing competition in international markets

Source: The Survey Team

7.4. Cacao VC

7.4.1. Overview

Table 7-15 shows an overview of the cacao VC in Madagascar. Cacao is produced for export, and it is one of Madagascar's major cash crops. It is cultivated mainly in Ambanja District, and seedlings are produced by FOFIFA Ambanja in the same district. Fertilizers and agro-chemicals are seldom used. There is little opportunity for mechanization, and cultivation, harvest, fermentation, and drying are all conducted manually. Flavor bean[11] varieties are cultivated, but the quality control of dried beans has room for improvement. Rainy season road conditions between Ambanja city and the upstream area of the Sambirano River, which is the major cacao production area in Madagascar, are a major challenge. Dried cacao is exported to European countries, the USA, Japan, and so forth. Table 7-15 shows cacao prices at each stage of the VC.

Table 7-15: Cacao prices in Madagascar

Farm gate prices	2,200 MGA/kg of standard wet cacao (Farmers in Ambanja)	66 JPY/kg	(1 MGA＝ 0.03 JPY)
	1,600 MGA/kg of standard wet cacao (Symrise)	48 JPY/kg	(1 MGA＝ 0.03 JPY)
	6,000 MGA/kg of standard dried cacao (RAMA-EX and FOFIFA)	180 JPY/kg	(1 MGA＝ 0.03 JPY)
	9,000 MGA/kg of premium dried cacao (FOFIFA)	270 JPY/kg	(1 MGA＝ 0.03 JPY)
	11,460 MGA/kg of premium dried cacao for EU (Union de Cooperatives Lazan`ny Sambirano (UCLS))	344 JPY/kg	(1 MGA＝ 0.03 JPY)
	8,000 MGA/kg of premium dried cacao for EU but sold to middlemen(UCLS)	240 JPY/kg	(1 MGA＝ 0.03 JPY)
Export prices	2.0 EUR/kg of standard dried cacao (from RAMA-EX to EU)	244 JPY/kg	(1 EUR＝ 122.2 JPY)
	4.0 EUR/kg of premium dried cacao for EU (from UCLS to Ethiquable in France)	489 JPY/kg	(1 EUR＝ 122.2 JPY)
International price	2,646.61 USD/ton(ICCO, 16th January 2020)	291 JPY/kg	(1 USD＝ 110.1 JPY)

Source: The Survey Team

[11] Flavor beans are quality cacao beans with less bitterness that are rich in flavor. The Criollo and Trinitario varieties are regarded as flavor beans.

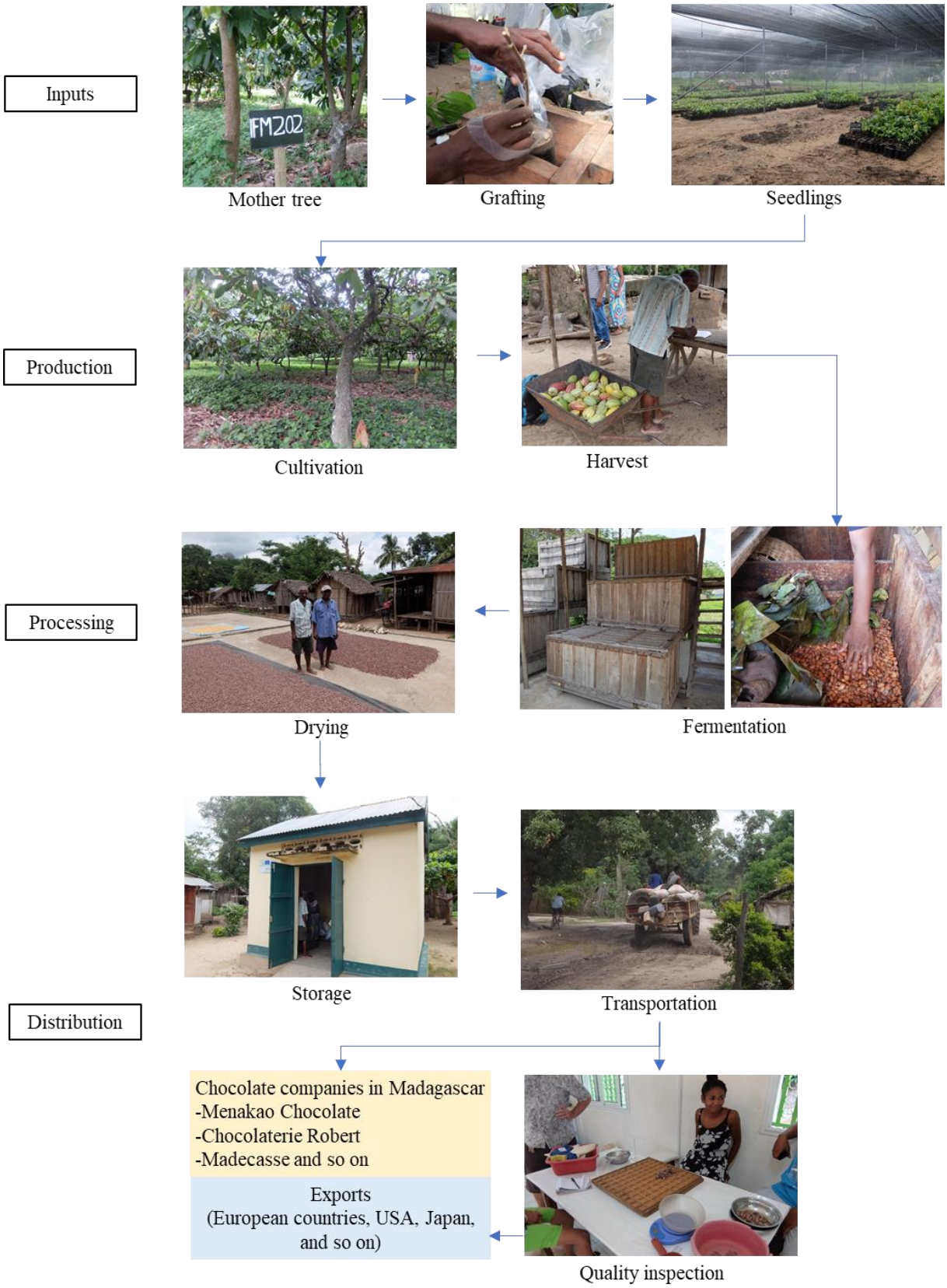


Figure 7-19: Overview of the cacao VC in Madagascar

Source: The Survey Team

7.4.2. Agricultural inputs

(1) Seedlings

Most cacao seedlings are cultivated in FOFIFA Ambanja. Its cacao mother tree orchard preserves five Criollo varieties and 30 Trinitario varieties. FOFIFA Ambanja produces seedlings of all five Criollo varieties and 12 out of the 30 Trinitario varieties. These superior varieties are selected according to i) yield, ii) disease tolerance, iii) drought tolerance, iv) flood tolerance, and v) flavor. The upstream area of the Sambirano River is flooded every rainy season, and, thus, a flood tolerant variety is chosen as root stock. The price of one seedling is 1,500 MGA for Criollo varieties and 600 MGA for Trinitario varieties.

The demand for cacao seedlings in Ambanja District is around 10,000 seedlings per year, but FOFIFA Ambanja produced 6,000 seedlings in 2019, which is far below demand. FOFIFA Ambanja produces seedlings according to its budget. In other words, it cannot produce seedlings beyond the budgeted amount. FOFIFA Ambanja returns the revenue from selling seedlings to the national account, and, thus, its revenue cannot be used to produce new seedlings. Of the produced seedlings, 90% are Trinitario varieties, and the remaining 10% are Criollo varieties. Criollo varieties bear flavor cacao beans, but Trinitario varieties have much higher yields and better disease tolerance. Thus, ordinary farmers buy seedlings of Trinitario varieties, and only a few large plantations use seedlings of Criollo varieties. Ordinary farmers do not select specific Trinitario varieties when they buy seedlings; instead, FOFIFA Ambanja chooses appropriate varieties through discussions with farmers.

Transportation between the upstream area of the Sambirano River, where the major cacao production area and FOFIFA Ambanja in Ambanja city are located, is a major challenge. The road is only passable by tractors during the rainy season. To expand its seedling production and dissemination capacity, FOFIFA established four nurseries, listed below, and allowed farmers to manage the nurseries. Each nursery produced 3,000 seedlings in 2019.

- Ambodimanga Ramena
- Amjiabory (commune Maevatana)
- Migiko (commune Ambohimarina)
- Antsamala (commune Bemaneviika)

(2) Fertilizers and agro-chemicals

Fertilizers and agro-chemicals are not generally used for cacao cultivation in Madagascar except for the application of organic fertilizer when transplanting seedlings. The Survey Team was informed that some cacao farmers traditionally apply gasoline to control pests, although this practice is not appropriate.

7.4.3. Production

（1） Production volumes and areas

Figure 7-20 shows the volume of cacao production in Madagascar. This volume is around 11,000 tons per year, but it has been decreasing. Aging cacao trees and climate change are assumed to be affecting the yields of cacao trees in Madagascar.

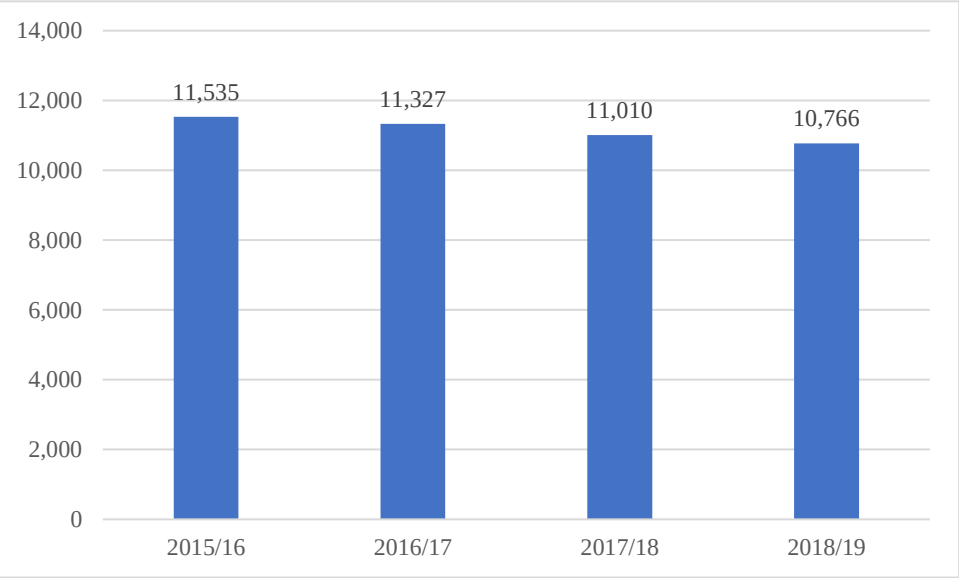


Figure 7-20: Cacao production volume in Madagascar (tons)

Source: MAEP

＊The 2018/2019 value is projected.

The cacao production volume in Ambanja District was about 9,200 tons in 2015 [12], accounting for 80% of Madagascar's total cacao production. In addition, 65% of Ambanja cacao is produced in the upstream area of the Sambirano River. However, cacao production recently began on Madagascar's east side, as shown in Figure 7-21 . This change is partly attributable to the fact that the suitable cacao cultivation area is very limited in Ambanfja District, as cacao is traditionally cultivated over time.

Cacao is cultivated using almost no

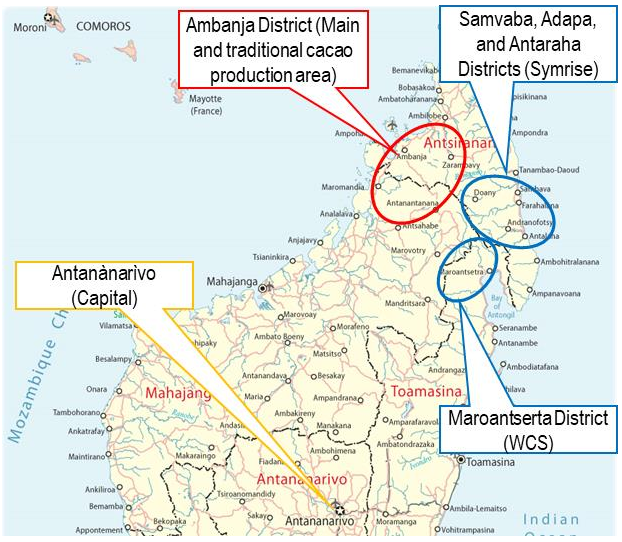


Figure 7-21: Cacao production areas in Madagascar

Source: The Survey Team

[12] FOFIFA Baseline Survey (2016)

fertilizer or agro-chemicals in the agro-forestry system. However, the cacao yield in Madagascar is 862.9 kg/ha, which is the fifth highest among the 60 countries with available FAOSTAT data for 2017. FOFIFA's report indicates that the cacao yield is 400 kg/ha, which is still higher than the median (388.5 kg/ha) in the same FAOSTAT data for 2017.

(2) Farmers

Most cacao farmers in Madagascar are small-scale farmers who cultivate cacao on 0.5–1.25 ha of land. Moreover, 80% of them do not own their land, and only 10% of them are organized in groups. If a farmer belongs to a cacao producer cooperative, such as Union de Cooperatives Lazan' ny Sambirano (UCLS), his cacao will be purchased, processed, and exported to a good customer who buys cacao at a premium price. An individual farmer who does not belong to a farmers' organization sells his wet cacao at a low price to middlemen or large-scale farmers with fermentation boxes. As shown in Table 7-15, the price of wet cacao beans is much lower than that of fermented and dried beans. An individual farmer can ferment a small volume of cacao in a plastic container or bag and sell the fermented cacao to middlemen or large-scale farmers; however, the price of cacao beans is lower than that of properly processed cacao beans.

Large-scale cacao plantations are established and operated by several cacao export companies, such as Millot, Mava, Ramanandraibe group, and SCIM. Quality cacao beans are produced, fermented, and dried at the plantations.

(3) GLOBALG.A.P. and the MRLs of European countries

Most of the cacao produced in Madagascar is exported to European countries. Many exporters and cacao cooperatives have BIO certification[13], which is an organic certificate of the Ecocert Organic Standard. BIO certification is harmonized with EU standards. The survey team did not identify any companies with GLOBALG.A.P. or HACCP certification.

Agricultural products to be exported from Madagascar must be certified by the plant protection department (MAEP). The department inspects products to verify that they comply with the phytosanitary regulations of their destination countries. Madagascar does not check whether products conform to the MRLs of European countries because it lacks the necessary analytical equipment; instead, the department refers to the analyses of accredited institutions overseas, such as those in South Africa and Mauritius. In some cases, companies importing Malagasy products specify the overseas institutions at which a phytosanitary certificate can be obtained. Cacao exported from Madagascar to European countries has not been rejected owing to a failure to conform with phytosanitary regulations, as cacao is produced organically in Madagascar.

[13] BIO certification (BIO mark) is a common symbol of organic products among AOC (Appellation d'Origine Contrôlée) EU member countries.

（4） Quality inspections in Madagascar

The National Cacao Council (Le Conseil National du Cacao, or CNC) established a cacao analysis center with the assistance of the Integrated Growth Poles and Corridors Project (Le Projet Pôles Intégrés de Croissance et Corridors, or PIC2) of the WB. The center conducts sample inspections of all the cacao to be exported. One sample is taken from every 12.5 tons of cacao, and export companies are charged 15 euros; these charges are the major source of revenue for the CNC. The inspected characteristics, such as the moisture content and the number of beans per 100 g, are shown in Table 7-16. The 2018 inspection results show that 98% of the exported cacao is superior, and 2% is of standard quality. A certificate is issued by the CNC based on the results of its analysis and analysis by domestic analytical laboratories[14].

Table 7-16: Cacao quality standards in Madagascar

Quality by FCC standard	Good fermented	Fairly fermented	Fair average quality
% Moldy + moth eaten beans	≤5%	>5% and ≤ 10%	>10% and ≤12%
% Slated beans	≤5%	>5% and ≤ 10%	>10% and ≤12%

FCC: The Federation of Cocoa Commerce

Quality according to Malagasy Standard	Out of grade	Standard	Superior
Humidity	≥8%		
Graining/size		≤105 beans	≤95 beans
Foreign materials		≤0.1%	≤0.1%
Broken beans		≤3%	≤1%
Flat beans		≤3%	≤1%
Purple beans		≤18%	≤10%
Slated beans		≤6%	≤2%
Sprouted beans		≤4%	≤1%
Moldy beans		≤3%	≤1%
Moth-eaten beans		≤0.1%	≤0.1%

Source: CNC

7.4.4. Processing

As shown in Table 7-17, almost all of the cacao exported from Madagascar takes the form of dried beans rather than that of processed cacao products. The procedure and facility for fermentation and drying are the determining factors of cacao quality. The three-tier fermentation

[14] JLB expertise and Centre Technique Horticole de Tamatave

box shown in Figure 7-19 is the standard fermentation facility, and the standard fermentation method involves shifting cacao beans from the top to the bottom of the box by rotating the top and bottom sides of the beans for six days. Even when using the proper facility and applying the standard fermentation method, the fermentation conditions in each box may vary depending on the temperature, humidity, and microorganisms in each box. Small farmers cannot harvest a sufficient amount of cacao at one time to fill a standard fermentation box. Thus, they either sell wet cacao to middlemen or larger cacao farmers who have fermentation boxes or ferment cacao improperly in a plastic container or bag. Large cacao plantations[15] operate multiple fermentation boxes at each plantation.

Table 7-17: Exports of cacao and cacao products from Madagascar in 2017

State of Cacao	Amount (ton)	Ratio (%)
Cocoa by beans and chips of beans, raw or roasted	12,554.70	99.25%
Shells: skins (skins) and other waste	0.05	0.00%
Paste of cocoa completely or partially defatted	0.03	0.00%
Butters, fats, and oil of cocoa	1.40	0.01%
Powder of cocoa, without addition of sugar or other sweeteners	1.15	0.01%
Other powders of cocoa	3.25	0.03%
Other tablets, bars, rods, or sticks of chocolate filled	0.93	0.01%
other tablets, bars, rods, or sticks of chocolate not filled	86.94	0.69%
Other chocolates presented in tablets, bars, or sticks	1.11	0.01%
TOTAL	12,649.56	100.00%

Source: Plan National Cacao (2018–2015), CNC

After fermentation, cacao beans are dried. Larger-scale farmers, cooperatives, and large plantations use concrete slabs for drying cacao beans, as shown in Figure 7-19. Farmers who do not have concrete slabs use tarpaulin sheets on the ground. Cacao cannot be exported if its moisture content is greater than 8%.

After fermentation and drying, cacao beans are shelled, roasted, and crushed to obtain a cacao mass. The cacao mass is divided into cocoa butter and cocoa cake. Cocoa cake is dried and powdered to obtain cocoa powder, which is the main material for chocolate bars. Very small amounts of cacao butter and cacao mass are produced in Madagascar. Because Madagascar mainly exports dried cacao, most of the value (93.4% of the value, according to Figure 7-22) generated through the process of making chocolate is added overseas, after cacao beans are exported.

[15] Operated by Millot, Mava, Ramanandraibe Group, SCIM, and so forth.

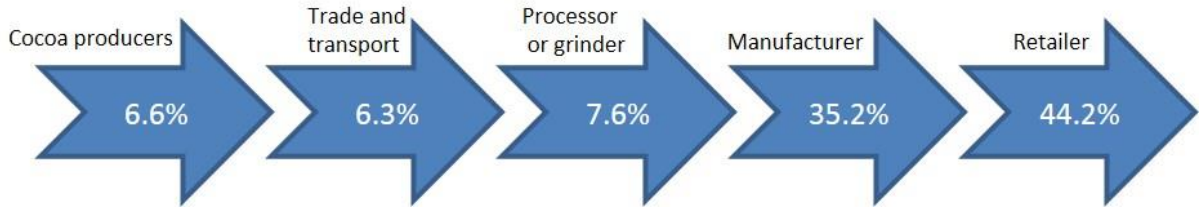


Figure 7-22: Price breakdown for chocolate

Source: Cocoa Bolometer, 2015

Although the volume is small, some cacao beans are processed in Madagascar. The German-affiliated company Symrise processes cacao that is produced in Samvaba, Adapa, and Antaraha cities on the east side of Madagascar, produces cocoa butter and cocoa mass, and exports them to Taiwan. Table 7-18 provides an overview of the companies that produce chocolate in Madagascar.

Table 7-18: Chocolate manufacturers in Madagascar

Company	Overview
Menakao Chocolate	Founded by Indo-Malagasy in 2006.
Chocolaterie Robert	Founded in 1940. It owns a cocoa plantation and produces 400 tons of chocolate. It sells 80% of it locally and exports the remaining 20% to the UK, France, Japan, and Korea. It plans to increase its chocolate production to 1,000 tons/year.
Madecasse	A former Peace Corps volunteer founded the company in 2008. It produces 225 tons of chocolate bars (3 million bars) and exports them all to the USA.

Source: The Survey Team

7.4.5. Distribution

(1) Logistics

A cold chain is not used for the transportation and storage of cacao in Madagascar. For example, UCLS collects cacao beans from the storehouse at each member cooperative every three weeks, stores the collected cacao at the central warehouse, and exports it every two to three months. The moisture content of the exported cacao is controlled to be below 8%. This low moisture content preserves the quality of the cacao even without a cold chain. Cacao is shipped overseas in ventilated containers. Almost all of the cacao beans are exported from Antsiranana port, but container ships come Antsiranana port only twice a week, which is one of the constraints on cacao exports.

7.4.6. Imports, exports, and the domestic market

(1) Cacao exports from Madagascar

Most of the cacao produced in Madagascar is exported. Figure 7-23 and Figure 7-24 show that the production volume is around 11,000 tons per year, but the export volume has increased beyond

12,000 tons per year, and exported cacao as a fraction of total production increased from around 80% to beyond 100%[16]. The cacao that is not exported is assumed to be processed into chocolate by the companies listed in Table 7-18. There is no dietary culture around consuming cacao as it is., Powdered cocoa drinks are not produced and sold in Madagascar, and a very limited volume of cocoa cake is produced[17].

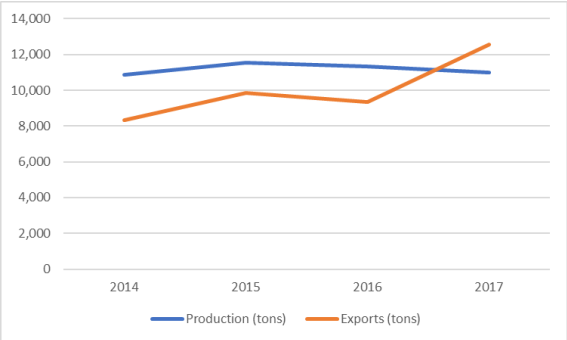


Figure 7-23: Cacao production and export volumes in Madagascar (tons)

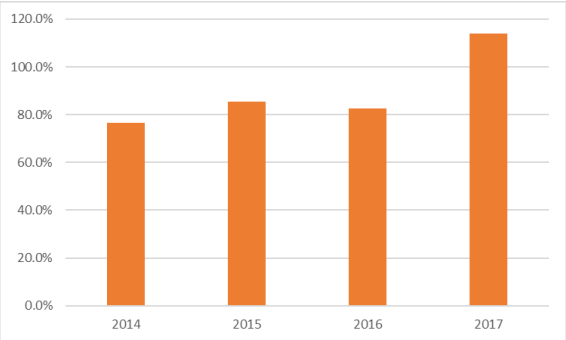


Figure 7-24: Ratio of cacao exports to production in Madagascar (%)

Source: FAOSTAT

(2) Madagascar cacao in the global market

Figure 7-25 shows the total global volume of cacao production between 2000 and 2017. It increased from three million tons to more than five million tons. Table 7-19 shows the volume of cacao production in the top ten countries and Madagascar. Madagascar is the 22nd largest producer of cacao and accounts for 0.2% of world cacao production.

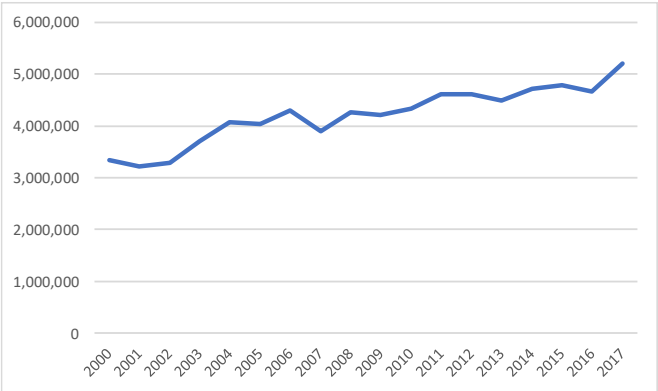


Figure 7-25: Global cacao production (tons)

Source: FAOSTAT

Table 7-19: Top ten cacao-producing countries and Madagascar in the 2016-2017 season

No.	Country	Cacao production (tons)
1	Côte d'Ivoire	2,020
2	Ghana	970
3	Indonesia	290
4	Ecuador	270
5	Cameroon	246
6	Nigeria	245
7	Brazil	174
8	Peru	115
9	Dominican Republic	57
10	Colombia	55
22	Madagascar	10

Source: International Cocoa Organization (ICCO)

[16] One reason that the exported volume may be greater than the production volume is that cacao stored in the previous year may have been exported in 2017.

[17] Cocoa powder is produced from cocoa cake.

It is widely known that Madagascar produces high-quality flavor cacao beans. The ICCO evaluates the ratio of flavor beans to total exported cacao beans, and only ten countries, including Madagascar, export 100% flavor beans, as shown in Table 7-20. Countries that produce large overall volumes of cacao comprise a sizable portion of the volume of exported flavor beans in the global market. Madagascar is the ninth-largest flavor bean-producing country, but it accounts for only 2% of total flavor bean production, as shown in Figure 7-26. These statistics reveal that the share of Madagascar cacao in the global market is very small not only in terms of total export volume but also in terms of the export volume of flavor beans. The CNC has emphasized the necessity of branding Madagascar cacao as featuring high-quality flavor beans.

Table 7-20: Ten countries that export only flavor cacao beans

Country	Fine or flavor cocoa as a percent of total exports	
	Council decision March 2011	Panel recommendation September 2015
Mexico	100%	100%
Venezuela	95%	100%
Madagascar	100%	100%
Nicaragua	*b/*	100%
Bolivia	100%	100%
Grenada	100%	100%
Costa Rica	100%	100%
Trinidad and Tobago	100%	100%
Dominica	100%	100%
Saint Lucia	100%	100%

＊The ratio of flavor beans to total exports is sourced from the ICCO Ad Hoc Panel on Fine or Flavor Cocoa in September 2015
Source: ICCO (both Table 7-20 and Figure 7-26)

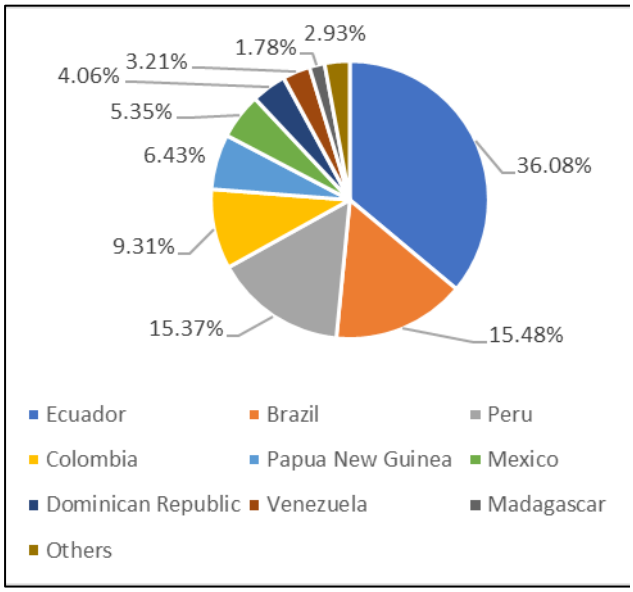


Figure 7-26: Share of flavor bean exports among the top nine countries (%)

Figure 7-27 shows fluctuations in international cacao prices from 1990 to 2013. The nominal price of cacao increased during this period. However, the inflation-adjusted cacao price increased to around 2,500 USD in 1990, but, after fluctuating, remains around 2,500 USD. In short, inflation-adjusted cacao prices did not change significantly from 1990 to 2013, meaning that the value of cacao did not change during the period. This result may be attributable to global cacao production steadily increasing to meet the increasing demand, as shown in Figure 7-25. It can also be said that the intention of global cacao production was to increase quantity rather than improve quality. This analysis implies that Madagascar cacao should aim to add value rather than competing on price by, for example, branding Madagascar cacao.

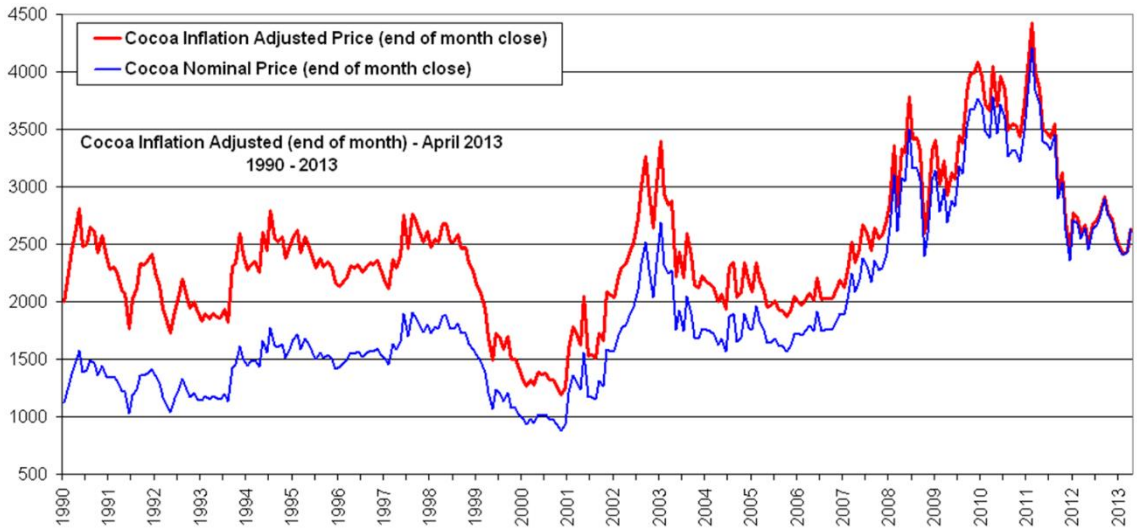


Figure 7-27: Price of cacao (nominal and inflation-adjusted prices, USD)

Source: http://www.aboutinflation.com/cocoa-vs-inflation.

7.4.7. Policies and the role of the government

As a national cacao promotion policy, the Plan National Cacao 2018–2025 (PNC) was compiled by the CNC in 2018. The outline of the PNC is summarized in Table 7-21.

Table 7-21: Outline of Madagascar's PNC (2018–2025)

Vision: Double the production of 100% fine and 100% sustainable cocoa between 2018 and 2025
Strategic Axis 1: Double cocoa production on the market
Strategic Axis 2: Strengthen producer structuring to better regulate the sector
Strategic Axis 3: Increase product quality
Strategic Axis 4: Increase locally added value
Strategic Axis 5: Improve access to domestic markets and exports

Source: PNC (2018–2025), Madagascar

The PNC is harmonized with the promotion of agricultural product exports according to Emergence Madagascar (2017–2030), which is the Malagasy national policy.

7.4.8. Issues and opportunities

(1) Issues

Table 7-22 shows the results of the SWOT analysis of the cocoa VC in Madagascar. Several weaknesses are identified, as follows. In research and development, high-potential Criollo and Trinitario varieties have been identified, but their performance has not yet been well researched. Moreover, research on cacao cultivation on the east side of Madagascar has not been conducted. As for inputs, an insufficient supply of seedlings is an issue. In the post-harvest process, several varieties of cacao beans are harvested, fermented, and dried in a mixed form, and fermentation

processes are not uniform. As a result, the flavor of dried cacao beans is not consistent. In marketing, no common quality standard is adopted by all stakeholders, and, thus, quality differences are not fairly reflected in prices. A system for facilitating market transactions, such as a market information-sharing system or a matching platform between farmers and buyers, does not exist. The serious transportation challenges between the upstream area of the Sambirano River and Ambanja city is a major logistics issue.

(2) Opportunities

The strength of the Malagasy cacao VC is its high-quality flavor beans. Malagasy cacao is unique in terms of its varieties, as Madagascar has pure Criollo varieties and naturally crossbred Trinitario varieties. Madagascar's climatic conditions are suitable for growing the cacao trees of these varieties, and quality flavor beans are produced.

The expansion of the flavor bean market is an opportunity for the Malagasy cacao VC.

Table 7-22: Results of the SWOT analysis of the cacao VC in Madagascar

Strengths ● Existence of pure Criollo varieties ● Naturally hybrid Trinitario varieties ● Suitable climate conditions ● Long history of cacao production ● 100% certified flavor beans by ICCO	**Weaknesses** ● Characteristics of each variety are not well identified. ● Limited availability and accessibility to quality seedlings outside Ambanja ● Decreased productivity due to aging trees ● Limited space for planting trees in Sambirano ● Limited research and production experiences in the east side of Madagascar ● Mixed varieties are grown, harvested, and processed together. ● Small-scale farmers cannot afford fermentation boxes and drying slabs. ● Quality is not uniform owing to different fermentation methods among small-scale farmers. ● Insufficient capacity of farmers to be united in working groups from the production to sale of cacao ● Drying beans during the rainy season is difficult. ● No laboratory to inspect residual pesticide ● Insufficient storage space for dried cacao ● Road is not passable during the rainy season between the high Sambirano and Ambanja. ● Quality is not necessarily reflected in farm gate prices. ● Quality is not standardized among farmers, traders, and exporters. ● Market information sharing system does not exist. ● Matching system for producers and buyers does not exist.
Opportunities ● Growing international demand for quality cacao	**Threats** ● Strict market requirement (condition, size, etc.) ● Many competitors in Africa, Asia, and Latin America

Source: The Survey Team

7.5. Large-scale Agricultural Investments in Madagascar

Among large-scale agricultural developments in Madagascar, the Korean company Daewoo and the Indian company Balun tried to acquire 1.3 million ha and 200,000 ha, respectively, of cultivated land with 99-year leases in 2008[18]. Both companies promised significant investments in infrastructure development and job creation, and the Government of Madagascar at the time also indicated its support. However, none of the projects was implemented owing to protests from local communities and NGOs and the economic crisis that began in 2009.[19]

Tsilavo (2015)[20], who is researching large-scale agricultural investments in Madagascar, reported that, as of 2014, Madagascar has eleven large-scale agricultural development projects spanning thousands to tens of thousands of hectares, with a total land area of 217,000 ha, but the total cultivated area is only 2% (about 4,500 ha). He speculates that none of the investors (companies) has obtained the legal rights to the land, and, thus, they are hesitating to invest at full scale.

Today, various international and local stakeholders pay close attention to large-scale agricultural investments involving land acquisitions in Madagascar, and new implementations of such projects are presumed to be difficult. Under these circumstances, this field survey had an opportunity to interview local companies that produce and export agricultural products through contract farming with local farmers instead of acquiring their lands on a large scale. Some of these companies' initiatives are presented in this section as a case study.

■ Case Study: Société Trading de l'Océan Indien[21]

Société Trading de l'Océan Indien (STOI) is an agricultural production and exporting company established in 1997 in Madagascar that focuses on vanilla, lychee, beans, and organic fertilizer (brand name: Taroka). STOI is known as the first company in Madagascar to obtain an organic certificate from Ecocert International (organic fertilizer and lychee in 2006), and it also acquired GLOBALG.A.P. certification for lychee in 2007. Its organic fertilizer is produced and blended in a factory with a production capacity of 30 tons per day and 10,000 tons per year by 100 employees in rotating shifts.

Its contract farming of haricot beans began eight years ago. This model is the oldest contract farming model in the company and has been running with 1,300 contracted households in the Miandrivazo Commune in Menabe Province, located in the western part of Madagascar. Under

[18] An area of 1.3 million ha is equivalent to more than one-third of the current total area of cultivated land in Madagascar, and 200,000 ha is almost equivalent to the area of Tokyo, Japan.
[19] For example, Takahata (2011) and the Japan Society for Madagascar Studies describe this history on their websites in detail.
[20] Tsilavo Ralandison (2015) Land Grabbing in Africa - Case Study of Madagascar, Asia Research World Trend Vol. 239 (September 2015)
[21] STOI homepage (https://www.vanille-naturelle.com/qui-sommes-nous/notre-histoire/) and an interview with STOI CEO Mr. Rabetsitonta Tovonanahary in 2019

STOI's contract farming scheme, the company provides input materials (i.e., fertilizers and improved seeds from FOFIFA) and agricultural equipment rentals to farmers, and the farmers sell (reimburse) haricot beans to STOI at the market price after the harvest. After collecting the reimbursements, STOI fumigates the haricot beans against weevils in storage and exports it, mainly to France and Mauritius. As a result of contract farming, the farmers' yield has increased from 750 kg/ha to 1.2 tons/ha, and household income has increased by 90%. However, contract faming was not smooth sailing from the beginning, and the reimbursement rate in the first year was only 50%. Since then, the STOI involved Chief Fokontany in the entire contract farming process and utilized witnesses when both parties signed contracts. Furthermore, the company implemented thorough measures to avoid renting agricultural machinery to farmers who failed to adhere to the contract in the previous season. Conversely, the company responded flexibly by delaying the reimbursements in the following year in response to a petition from farmers in a year with insufficient rain. Through these activities, the company successfully built a relationship of trust with the community over time, and the reimbursement rate is now 95%.

STOI recently applied its learnings from haricot beans to paddy rice production. With technical support from a Chinese private company called Yuan's Madagascar Agricultural Development Company Ltd., a verification trial of improved varieties conducted on 30 hectares of land in Menabe, Bongolava, Itasy, and Valinankaratra Provinces achieved an average yield of 8 tons/ha (the average yield of the local variety is 2.5 tons/ha). The company targets production of 5,000 tons of rice by 2020[22].

The company also provides meal support as part of its corporate social responsibility activities. The company provides meal assistance to Betania Center Ankasia, which is the only available educational facility in Ankasina District (this district has no public school), one of the project areas. In this district, many households do not have the capacity to pay 3,000 MGA/month (approximately 90 JPY) for their children's tuition, and many families cannot eat three meals a day. Thus, this meal assistance program plays a vital role in improving children's nutrition.

To further expand its business in the future, STOI is planning to build a warehouse, mainly for rice, legumes, and vanilla, with an estimated cost of 3–5 million USD. However, the annual interest rate from the local bank is very high at 18%, and, hence, the company is looking for alternative financial institutions to borrow at a lower interest rate. Figure 7-28 illustrates some of the company's activities.

[22] Xinhua News Agency "Malagasy press review" dated August 13, 2019. http://french.xinhuanet.com/2019-08/13/c_138306240.htm

[Upper left] Aerial photo of paddy rice demonstration plots
[Upper right] A signboard established at the demonstration plot implemented by Yuan's Madagascar Agricultural Development Company Ltd. and the MAEP.
Variety: Weichu 902-3, Growth period: 110 to 150 days, Yield: 8 to 12 tons/ha
Source: YouTube "Publi Reportage Riz Hybride"
[Lower left]】 School meal service. Students are eating "Koba," which is made from bananas and is rich in vitamins, calcium, and iron.
Source: STOI homepage

Figure 7-28: STOI's activities in Madagascar

7.6. Assistance by DPs for the VCs of Beans, Cacao, and Vanilla

The following are the assistance programs and projects for the VCs of beans, cacao, and vanilla implemented by DPs.

（1） AfDB (bean VC)

The AfDB aims to increase the production of rice and beans ("pois de cap") based on commerce, は from 2013 to 2022, through an irrigation development program for 22,000 ha of land in Toliara District in Atsimo-Andrefana Prefecture. The amount of bean production has failed to increase owing to insufficient technological assistance to farmers and the lack of agricultural machines. The project produces these crops on 4,000 ha at present.

The AfDB is planning the Project de Zone de Transformation Agro-industriel, through which it will support the Malagasy government in supplying agricultural water and electricity and maintaining warehouses in the irrigated part of the project area starting in June 2020. The AfDB is expecting public-private cooperation in the project in terms of production, processing, and market reclamation, including exports. Based on this assumption, the AfDB plans to transport beans ("pois du cap") and cultured fish to Toliara, a port city, for export. In addition to this project, the AfDB will support a project of the Malagasy government that targets vanilla, rice, nuts, livestock, vegetable oil, and aquaculture.

(2) IFAD (bean and vanilla VCs)

IFAD is implementing the following five projects for poor smallholder farmers (total loan amount: 482,000,000 USD).

1) Inclusive Agricultural Value Chains Development Programme
2) Project to Support Development in the Menabe and Melaky Regions Phase II (AD2M2)
3) Vocational Training and Agricultural Productivity Improvement Programme
4) Projet d'Appui au Renforcement des Organisations Professionnelles et aux Services Agricoles
5) Support Program for Rural Microenterprise Poles and Regional Economies (PROSPERER)

Among these five projects, AD2M2 and PROSPERER include beans (white beans) as a target crop. AD2M2 (2016 to 2022, loan amount: 34,400,000 USD) aims to support 57,000 farmers in 44 communes in Menabe Prefecture by increasing irrigation agriculture production and marketing. The project assures landholding rights and serves to improve the management skills of farmers' groups and access to agricultural finance.

PROSPERER (2008 to 2021, loan amount: 17,700,000 USD) established the value chain approach (VCA) in 2008 to realize PPPs. Under the VCA, producers formulate a rural medium enterprise (RME), which is similar to a farmer's cooperative. An RME builds networks from production to sales with processing factories and exporters (called market operators (MOs)). In the PROSPERER program, the VCA takes the following steps.

① Identify the needs of the MO
② Based on the needs of the MO, look for an RME that can produce and supply the demanded crops
③ Make an upgrading plan, which indicates the kinds and amounts of agricultural inputs and techniques for crop production required by the MO. PROSPERER invites FOFIFA officers and companies to provide instructions on farming techniques.
④ The RME and MO exchange a memorandum of understanding and formulate a "couple." The contract indicates the agricultural inputs and machinery to be provided by the MO and the cost-sharing between the producers and the MO. The contract period for any crop lasts for one year, and it is extended as needed.

The process of selecting a producer based on the MO's needs described by ① and ② is a characteristic of PROSPERER. For example, when the MO needs to buy 10,000 tons of beans, the project calculates the area and the number of farmers necessary to harvest that amount. Then, the project identifies a group that can secure that number of farmers in the area. It may be said

that PROSPERER is promoting market-oriented agriculture by choosing producers based on market demand.

PROSPERER has established vanilla plantations across 1,000 ha in nine regions. In that area, 3,000 RMEs were empowered, and 300 to 500 tons of vanilla are produced every year. The farmers in the RME form a vigilance committee to prevent vanilla theft in the community and maintain local security. Farmers selling to other buyers at higher prices is an issue, but the project enhances couples' reliability when they make an upgrading plan. The project does not intervene in unstable vanilla pricing, but it always obtains pricing information from the Investigation Section of the Malagasy Chamber of Commerce. There is a major risk that the MO will demand a higher or lower production amount if the international price changes. In addition to vanilla, 5,000 RMEs produce white beans.

(3) Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) (vanilla VC)

GIZ supports 4,000 small farms in Sava Prefecture that produce vanilla through the Vanilla Strategic Alliance (VSA) (2011–2021). The VSA is a framework for promoting vanilla producers' economic independence through contracts between GIZ and McCormick & Co., Inc. (USA), a spice handler; Unilever (the Netherlands)[23], which owns an ice cream brand; and Symrise[24], a supplier of vanilla (Germany). The implementing organization is Save the Children.

Target farmers of VSA project
Source: VSA Fact Sheet (GIZ)

The VSA project improves farmers' knowledge of and access to agricultural inputs and improves production techniques through its Farm Business School. It is also developing a life insurance program for farmers to prevent a decrease in the workforce. In addition, the project plans to support young producers, improve security measures in the process of vanilla production, diversify crop cultivation to reduce the production risk of only cultivating vanilla, and promote financial education to help farmers learn how to use their earnings from seasonal vanilla cultivation.

(4) Helvetas (Cacao and vanilla VCs)

1) Outline of the project

[23] Unilever Co. is the parent company of Ben & Jerry's Ice Cream (https://www.unilever.co.jp/brands/our-brands/ben-and-jerrys.html, accessed on December 24, 2019).
[24] Symrise is a chemical maker that handles fragrance-aroma compositions. It is a world-class player in this field (https://www.symrise.com/, accessed on December 24, 2019).

Helvetas, a Swiss NGO, is implementing Revenus Pour la Nature (RPN, Income Improvement Program for Nature in English) to reduce deforestation by increasing farmers' incomes and facilitating forest preservation. RPM is carrying out 1) two projects in Ambanja District in Diana Prefecture with financial support from the Swiss Lindt Cacao Foundation[25], a chocolate manufacturing company and 2) one project implemented by ALBA Swiss Chocolate in Maroantsetra District in Analanjifofo Prefecture. The target of these projects is small-scale farmers who own farmland in the local forest and produce cacao. The private companies associated with these projects not only provide funds to implement the RPN programs but also purchase cacao from the target farmers. Thus, the farmers can stably produce cacao. However, although there are many cacao producers in Ambanja, only a portion of them can meet the processing criteria for cacao beans set by the Lindt Foundation. To tackle this problem, Helvetas supports FOFIFA in the production of high-quality cacao seedlings to facilitate the production of high-quality cacao.

2) Assistance model for forestry conservation and vanilla VC

Ramanandraibe Export (a Malagasy export trader of vanilla beans) and other private companies expect Helvetas, which assists in the RPN program, to provide quality assurance, traceability, and a grouping of farmers to ensure stable crop production. These private companies fund the water supply for processing vanilla beans. Helvetas supports farmers in soil management, the provision of materials for seedling production, and high-quality processing during the harvest.

The Community Based Organization for Forest Protection (COBA) is responsible for forestry conservation in the target community. When a private company purchases vanilla from farmers, it offers the vanilla from one pod per one kilogram of purchased vanilla to COBA. COBA ensures the safety of the forest with the funds obtained from the sale of the provided vanilla. Similarly, the private company offers one pod of vanilla per kilogram to the target area's municipality.

A pod containing vanilla beans

The municipality maintains peace and order in neighboring vanilla production areas with the funds obtained from the sale of this vanilla (see **Figure 7-29**).

[25] The Lindt Cocoa Foundation was established in 2013 for the sustainable development of society and environment to help produce and process cacao, a necessary ingredient for chocolate production. The foundation supports farmers' life and agriculture (http://lindtcocoafoundation.org/, accessed on December 25, 2019).

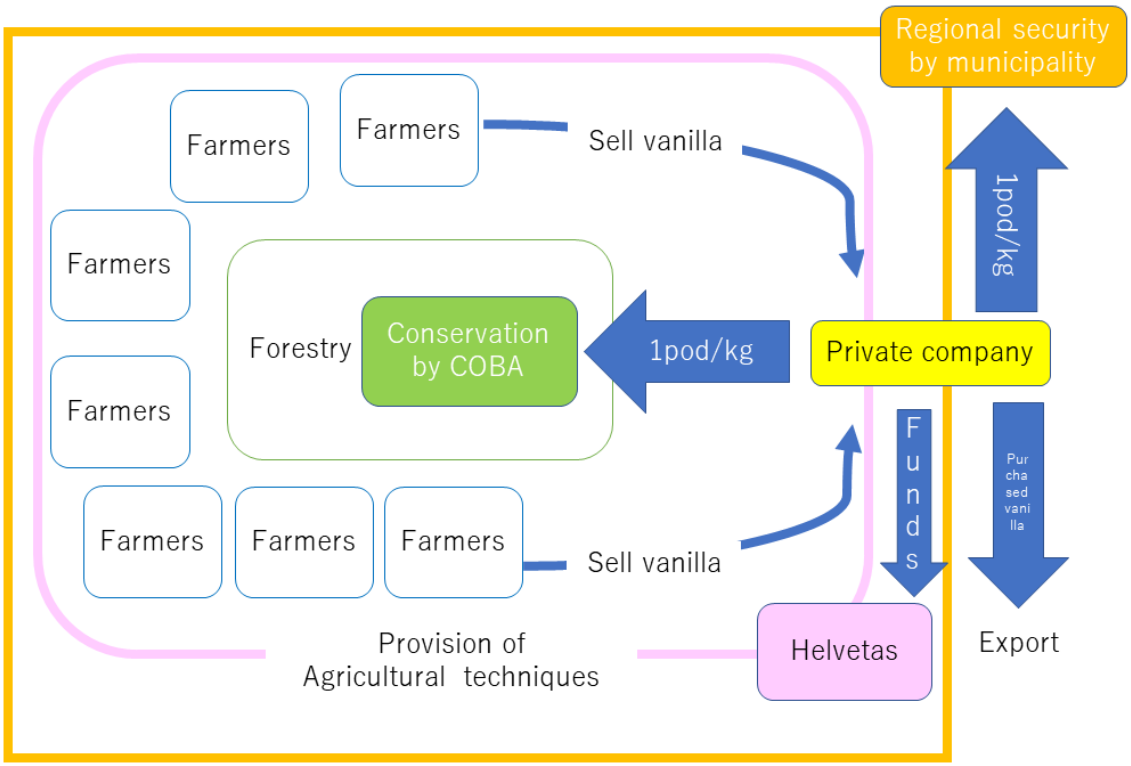


Figure 7-29: Support for the vanilla VC by PPPs

Source: The Survey Team, based on an interview with Helvetas

In this model, farmers contract with a private company, which is a buyer. The role of Helvetas is to maintain quality control and a fair price. To date, the vanilla farmers have produced good-quality vanilla and increased profits[26]. However, the forest preservation activity is limited during vanilla production, and preservation work is not done throughout the year because the municipality lacks the budget for it. In addition, Helvetas is going to carry out a large-scale vanilla project in collaboration with the WB and the MAEP in 2020. The primary purpose of the new project is forest conservation. To achieve this goal, Helvetas will increase the production of high-quality vanilla.

In addition to the projects mentioned above, the WFP carried out a project to promote farmers' independence by improving the production, processing, and market access of small-scale farmers and transferring post-harvesting technology. The project targets maize, rice, and beans and offers market information about these crops to farmers.

7.7. Workshop Results

(1) Outline of the workshop

Date: December 6, 2019 (Fri.), 9:30 to 13:00

[26] As this project is funded by private companies, detailed information on, for example, production and prices is not available.

Venue: Sunny Garden Hotel (Antananarivo)

Participants: 37 (government-related entities: 22, companies/cooperatives: 15)

Program: The Survey Team conducted the workshop on the following schedule.

Time	Activities	Responsibility
9:00–9:30	● Admission	● The Survey Team
9:30–9:35	● Opening remarks	● MAEP
9:35–9:50	● Introduction of participants ● Explanation of objectives, expected outputs, and workshop program	● The Survey Team
9:50–10:10	● Presentation of the survey results and FVC development project concepts	● The Survey Team (Dr. Kotegawa) Beans
10:10–10:30		● The Survey Team (Dr. Ikeda) Vanilla
10:30–10:50		● The Survey Team (Mr. Machida) Cacao
10:50–12:00	● Group discussion (three groups are formed by participants with interest in the same target crop)	● The Survey Team
12:00–12:15	● Sharing of the results of each group's discussion, Q&A	● The Survey Team (Beans)
12:15–12:30		● The Survey Team (Vanilla)
12:30–12:45		● The Survey Team (Cacao)
12:45–12:50	● Closing remarks	● JICA Madagascar Office
13:00–14:00	● Lunch and networking (end of the workshop)	

(2) Workshop activities

Presentation of the survey results by The Survey Team

Participants sample Japanese beans processed in Japan

Presentation of the analysis results

7.8. Environmental and Social Legislative Framework for Agricultural Investments in Madagascar

7.8.1. Main policies, laws, and regulations related to EIAs

Table 7-23 shows the main policies, laws, and regulations related to EIAs in Madagascar.

Table 7-23: Main policies, laws, and regulations related to EIAs in Madagascar

Policies, Laws, and Regulations
Act No. 90-033 of 21 December 1990 Environment Charter, as amended by Laws No. 97-012 of 6 June 1997 and No. 2004-015 of 19 August 2004 (Art. 10)

Decree No. 99-954 of 15 December 1999 as amended by Decree No. 2004-167 of 3 February 2004 on rendering investment compatible with the environment (the "MECIE Decree")
Interministerial Order No. 4355/97 of 13 May 1997 on the definition and delineation of sensitive areas (Art. 2 and 3)
Act No. 99-021 of 19 August 1999 on the policy management and control of industrial pollution
Law No. 2001-005 of 11 February 2003 on the Code of Management of Protected Areas

Source: The Survey Team

7.8.2. EIA system in Madagascar

The EIA system in Madagascar is implemented based on the MECIE Decree mentioned in Table 7-23. Depending on the nature, location, size, and so forth of the planned project, the project proponents are required to submit either an environmental impact assessment (Etude d' Impact Environmental) or an environmental management plan (Programme d' Engagement Environmental) to the Environmental Bureau (Office National pour l'Environnement, NOE). Articles 4 and 5 of the Cabinet Order specify the projects to be covered by the Act, and the "EIA Guidelines" have been formulated as the implementation guidelines.

Figure 7-30 shows the process and the estimated number of days required for an EIA in Madagascar. However, according to the NOE and the Environmental Services Division of the Ministry of Agriculture, there is a shortage of manpower during the busy season, and the process is delayed relative to the standard schedule shown in Figure 7-30. The current staffing for handling EIAs at the NOE includes four people who review the submitted EIAs for decision making (Service de l'Environnement) and four people who follow up with the environmental monitoring and audit after approval (Follow-up Unit) to manage the EIA. The department handles about 50 EIA cases per year.

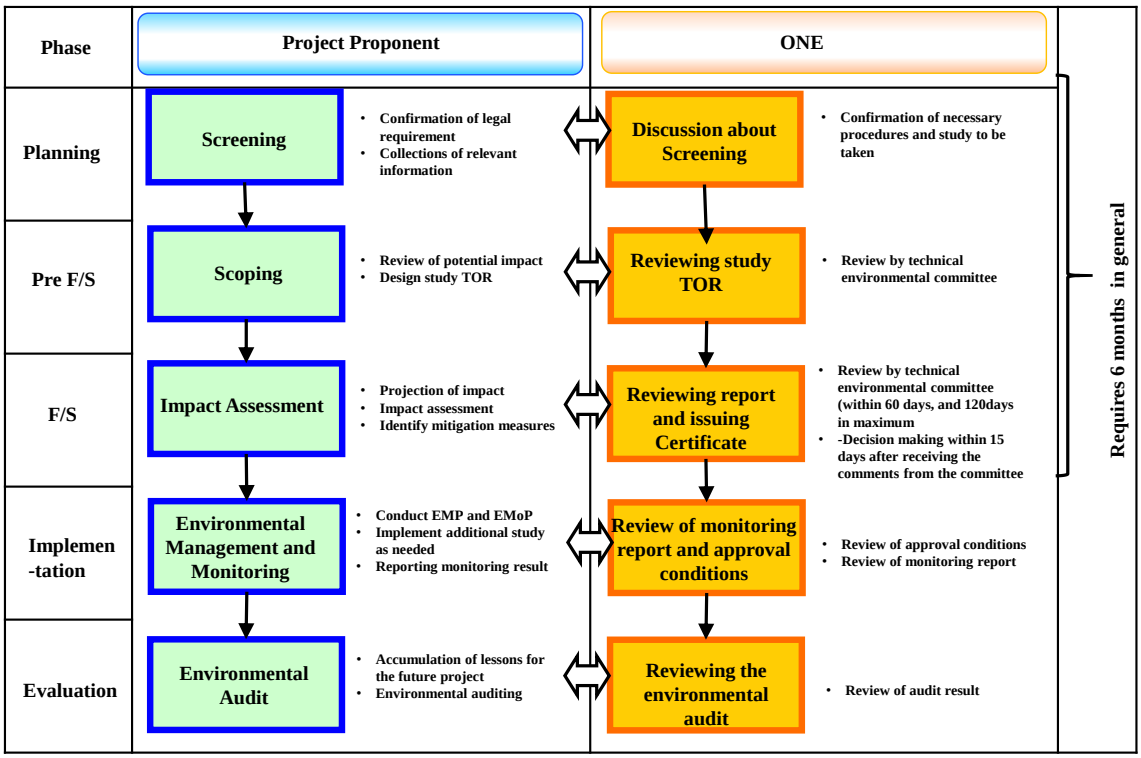


Figure 7-30: EIA flow in Madagascar

Note: F/S: Feasibility Study, EMP: Environmental Management Plan, EMoP: Environmental Monitoring Plan, TOR: Terms of Reference

Source: JICA (2009).

As shown in Table 7-24, the EIA review cost is determined based on the project cost, and the necessary amount can be estimated in advance to some extent[27]. Thus, the project proponent is encouraged to secure the planned budget well in advance.

Table 7-24: EIA review fees in Madagascar[28]

Investment amount (project)	Contribution to monitoring and evaluation costs
< 2 billion MGA	0.5% of the total equipment investment
Between 2 billion and 5 billion MGA	2 million MGA plus 0.4% of the total equipment investment
Between 5 billion and 25 billion MGA	7 million MGA plus 0.3% of the total equipment investment
Between 25 billion and 50 billion MGA	32 million MGA plus 0.2% of the total equipment investment
> 50 billion MGA	82 million MGA plus 0.1% of the total equipment investment

Note: MGA 1 is equivalent to JPY 0.03 (as of February 2020)

Source: Economic Development Bureau of Madagascar (EDBM)

[27] In Nigeria, for example, the EIA fee is not calculated according to only the project cost, and the amount is not known until an invoice is received from the environmental authority. As a result, budget appropriations may be delayed by the project proponent, which may hinder the schedule of the main project (based on interviews conducted by the Survey Team).

[28] http://edbm.mg/one-stop-shop/environmental-permits/

7.8.3. Main policies, laws, and regulations related to land acquisition and resettlement

（1） General

The Constitution of Malagasy and Land Law is the main legal framework that is referred to when a project proponent or investor plans to acquire land or resettle people in Madagascar because no framework specifically for land acquisition and resettlement has been developed in Madagascar.

From a practical point of view, it is desirable to refer to the Resettlement Action Plan (Cadre de Politique de Reinstallation) formulated in 2006 by the irrigation and watershed management project (i.e., the Irrigation and Watershed Management Project) in the northwestern part of Lake Alaotra supported by the WB or to the Abbreviated Resettlement Action Plan prepared by the Grant Aid for the Project for Rehabilitation of Irrigation and Watershed Management in Southwest of Lake Alaotra supported by JICA. These reports were prepared in accordance with the Operational Policy (Current Environmental and Social Framework) of the WB. Because no particular social and environmental issues were identified at the time of this field survey, it is assumed that the appropriate processes were followed.

（2） Land Policy Reform (2005)

The enactment of the Land Policy Reform in 2005 marked a turning point in Madagascar's land policy. Since then, land has been classified into the following three categories.

① Public land: Public land is land owned by the Malagasy government. There are two types of public land: land that cannot be bought or sold (public domain) and land that can be bought or sold but is used by government agencies (state private domain). Within the state private domain, unused or vacant land[29] is sold to investors.

② Private land: An individual must obtain one of three certificates to own private land: (a) a cadastral certificate, (b) a title, or (c) a land policy certificate. (a) and (b) are issued by the Land Service under the Ministry of Land. The acquisition of (a) requires one million MGA/parcel, and the registration process takes over a year. (c) can be issued by a commune to residents by justifying that they have lived in the area for a long time, and this certificate is the centerpiece of the Land Policy Reform. It is said that a consultant (advisor) to the commune decides the cost of the certificate according to the status of the land, but the typical cost of 40 to 3,000 MGA/parcel is reasonable. If there is no problem, a land policy certificate is issued in about one month. A person who does not possess any of these

[29] The more appropriate expression is land that has been inhabited since ancient times but has been deemed unused or vacant by the government because it does not retain official documentation of land ownership rather than just unused or vacant land.

certificates is considered a squatter under the law. However, it is said that only 15% of the population holds a certificate, and more than 20 million people hold no land ownership certificates.

③ Lands with specific status: This category includes national parks, investment zones, and development zones.

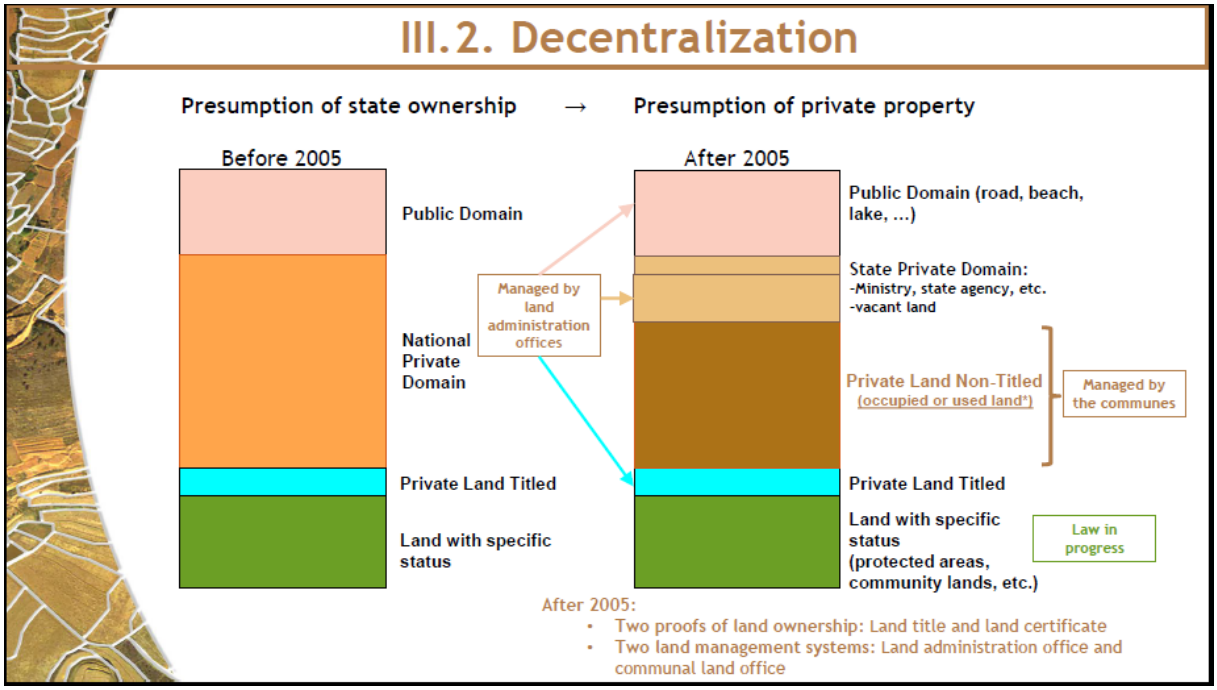


Figure 7-31: Change in Madagascar's land tenure system by Land Policy Reform 2005

Source: Fanomezantsoa (2017), Land Administration Reform in Madagascar: The Theory, The Practice, and The Lessons Learned

（3） Current issues regarding land policy and shifts toward improvement

Current issues related to land policy and shifts toward improvement in Madagascar are summarized below based on interviews with the BiMTT (Birao Ifandraisan'ny Mpampiofana eo amin'ny Tontolon'ny Tantsaha in local language; meaning Liaison office of the rural trainer in English), a local NGO that has rich experience with Madagascar's land system; the residents of Farihitsara Village near the city of Antilabe, where a private investment project involving land acquisition is currently planned; and the fukutan Chief[30] about the problems related to Madagascar's land system.

[30] A fukutan is the smallest administrative unit in Madagascar (fukutan < commune < district < province)

- Land occupied by a person who does not possess a land title and land policy certificate is not registered in the Malagasy government's land database. In other words, if people live on the land but are not represented in the data, the land is treated as public land (state private domain). Thus, when investors ask the Malagasy government for land or resources, this land is offered as an investment destination, which later causes problems for the residents.

- It is said that many investors conduct direct negotiations (including bribes) with influential people in local communities, local government officials, politicians, and so forth without going through official channels (e.g., the EDBM). This problem is also a source of land-based conflict, as described above.

- Although the Land Policy Reform has been decentralized and the Land Service Office, a subordinate organization to the Land Ministry, has been established at the commune level, corruption has also reached the commune level, affecting asset assessment and valuation, among others.

- Since 2016, the WB has implemented a project called the Madagascar Agricultural Rural Growth and Land Management Project, which includes activities to promote the obtaining of land policy certificates and which has benefited 228,000 farmers to date. In addition, the WB announced an additional 52 million USD in International Development Association grants in 2019, with the goal of issuing another 2.5 million land policy certificates by 2023[31]. Although the project has achieved significant results for many people who were not able to obtain official land certificates, the Malagasy government's has little financial involvement in this project, and farmers fear that the project will cease if financial assistance from the WB stops.

- Land issues are said to be the most common reason for civil court cases in Madagascar[32]. Box 7.2 describes traditional reburial rituals, but this ritual is only one example, and it is assumed that there are various other traditional rituals in Madagascar. Thus, when planning a development project involving the acquisition of land in any region, due consideration should be given to the history, cultural traditions, and customs of the land and ethnic groups.

[31] World Bank (2019) https://www.worldbank.org/en/news/press-release/2019/03/01/world-bank-supports-the-national-land-certification-program-in-madagascar

[32] Fanomezantsoa et al. (2017) Land Administration Reform in Madagascar: The Theory, the Practice, and the Lessons Learned

Box. 7.2: Traditional Reburial in Madagascar（*Famidihana*）

Famadiana is a traditional reburial ritual in Madagascar. More specifically, relatives are gathered three to five years after the death of the deceased, and the body is removed from the grave of the deceased, covered with a new silk cloth, and carried around the house where the deceased lived seven times. After that, the family plays music or has a conversation about their ancestors and buries them before sunset. There are various theories about the use of bandages, such as that they warm the body when it is cold under the soil. This ritual is still practiced in many parts of Madagascar and is an important traditional ritual for the people of Madagascar.

For example, the reason that local residents and NGOs are strongly opposed to the construction of a hydroelectric reservoir currently planned by the Ministry of Electricity and an Italian company called Tozzi Green in the Sahanivotry commune in central Madagascar is that residents will not only be forced to leave but also will no longer have access to their precious graves. Malagasy graves are often scattered on mountains and hills by families rather than gathered in one location. Thus, when planning development projects, it is necessary to not only plan each grave without hindrance but also to ensure that they have access to the route.

Incidentally, graves are just one example, and the same kind of consideration should be given to churches and so on.

(Source: The Survey Team)

7.8.4. Good practices

The "Ambatovy Project" is introduced as a good practice of environmental and social considerations in Madagascar. This project is one of the world's largest nickel production projects, and although nickel production is very different from agriculture, the resettlement plan for the affected people and the environmental protection plan for the affected ecosystem associated with the large-scale land acquisition should be taken into account in the agriculture sector as well. In addition, the project has been highly evaluated by the safeguards of the Madagascar Office of the WB as one of the best examples of environmental and social considerations in the country. Thus, their efforts are introduced as a good example in Figure 7-32[33].

Good Practice: Ambatovy Project

The photographs from left to right show the refined nickel plant, Ambatovy's website, and the "EIA report" and the "Sustainability report" of the Ambatovy project on the website.

[Project Outline]

This type of project, in which mining and refining are carried out consistently in the same country, is one of the rarest project types in the world. Sumitomo Corporation is involved in this project in cooperation with a private resource company in Canada and a Korean mineral resources company. The actual annual performance in 2019 was 34,000 tons of refined nickel and 3,000 tons of refined cobalt, and 92,000 tons of ammonium sulfate were a by-product.

[33] Survey Team's interview with the WB Madagascar Office in 2019

【Environmental Compliance and Commitment (extracted)】

International Finance Corporation Performance Standards, WB Group Guidelines, Equator Principles, Business and Biodiversity Offset Program, MECIE decree, and compliance under financial agreements (other than those already mentioned, JBIC Environment Guidelines, AfDB Environmental Guidelines, etc.)

【Major Socioeconomic Impacts】

- ✧ Increase in export revenue: +USD 1.5 billion p.a. (after production)
- ✧ Increase in government revenue: ＋USD 4.5 billion (approx. 30 years in total)
- ✧ Job opportunities: 3,500 direct employment (85% are Malagasy) + 5,500 temporary

【Key Activities for Environmental and Social Considerations】

- ✧ A relocation plan for PAPs was developed over a 14-year period, during which more than 200 public hearings were conducted to grant alternative lands with titles, housing, and social infrastructure (e.g., healthcare centers, wells, schools, and roads) to 300 affected households (approx. 1,200 people). In addition, training on farming techniques was provided as part of an income restoration program.
- ✧ Achieving No Net Loss on Biodiversity as a project, which is beyond compliance with the relevant laws and regulations (offsetting 14,384 ha, with an affected area of 2,854 ha).
- ✧ A tree-cutting method was devised to enable lemurs, an endemic species, to escape to the surrounding conservation areas, and several aerial bridges for lemurs were installed at the site. Invasive alien species were removed from 11 ha, and indigenous species were transplanted to 3 ha.
- ✧ An alternative route for pipeline construction was selected to circumvent an environmentally vulnerable area identified after construction started. Some sections are buried underground.
- ✧ Measures against invasive alien species were taken after the operation started. Regardless of whether there is a direct causal relationship between the project and the Asian toad, from the viewpoint of regional ecosystem conservation, the project plans to procure experts on invasive alien species based on comments from experts. The project is also organizing a Joint Fact Finding team with experts to implement the measures.

[Key Lessons]

The following points can be especially helpful in planning future development projects.

- ✧ RAP preparation for large numbers of PAPs without legal certificates of land ownership.
- ✧ Flexibility and perseverance to respond to issues that become apparent after construction or operation begins and change the project design.
- ✧ Strategic approach in which even those who have critical views on the project are actively involved as stakeholders and work together to resolve problems.
- ✧ High ethical standards that go beyond compliance with laws and regulations.

Figure 7-32: Example good practice of environmental and social considerations in Madagascar

Source: Survey Team based on the results of an interview with Ambatovy and a review of other relevant documents

7.9. Legislative framework for agricultural investments in Madagascar

7.9.1. Main laws and regulations

In Madagascar, with the establishment of the Investment Law (Law 2007-36, 2008), the investment environment was improved to protect foreign and domestic investors from expropriation and nationalization, except for purposes of public interest established by regulations. The Government of Madagascar undertakes public works, the establishment of nature reserves, the construction of military sites, and so forth, which require the expropriation of investors' private property. The Government of Madagascar shall require an official declaration of their public interest, and investors shall be granted fair and advance remuneration in accordance with the market value of the expropriated profits. In addition, free zones and enterprises in Madagascar (Law 2007 - 037, 2008) have been implemented for economic growth through export promotion.

7.9.2. Tax incentives for investment in the agricultural sector

The following are general incentives for investment in the agricultural sector[34]. Consulting with the EDBM is recommended on a case-by-case basis if an investor needs details about the incentives applied to specifically planned projects.

(1) 100% of share ownership allowed for non-nationals (as an exception, the telecommunications sector is capped at 66% ownership by foreigners)

(2) Incentives in the Free Zone (Free Zone and Companies Law, Law 2007-037, 2008)

■ Condition: At least 95% of production is exported

■ Tax incentives

① Five years of exemptions for industrial firms engaged in processing and intensive production, then 10% is exempted

② Two years of exemptions for service sector companies, then 10% is exempted

③ Fifteen years of exemptions for all other types of free zone companies, then 10% is exempted

④ Exemptions from custom and value-added taxes on imports of all inputs (e.g., equipment, raw materials, construction materials, etc.)

■ Applicable industries:

① Manufacturing industry (entreprises industrielles de transformation)

② Service companies (entreprises de services)

③ Companies engaged in intensive production (entreprises de production intensive basique)

④ Free zones (zones franches)

7.9.3. Other related information

The website of the Madagascar Development Agency (EDBM) lists standard costs for personnel, water, electricity, transportation, warehouse and office rent, and other aspects of business in Madagascar. The link is https://www.theiguides.org/public-docs/guides/madagascar/databases.

7.10. Concepts of PPP projects in Madagascar

7.10.1. Bean (SRB) VC development projects

Figure 7-33 shows the proposed PPPs for beans (SRBs). For beans as a whole, it is necessary to 1) propagate and distribute improved beans and 2) disseminate fertilization management techniques to maintain and strengthen the competitiveness of beans as an export crop. For this

[34] https://www.theiguides.org/public-docs/guides/madagascar

reason, it is necessary to promote seed production and sales by private seed companies engaged in the contract farming of beans, and these companies are expected to receive support for accessing funds to expand the scale of their businesses through investments, loans, and two-step loans from the private sector. This approach is also effective for promoting the growth of the oil extraction industry and the import substitution of edible oils. In the bean sector, communication between actors in the supply chain has been poor, and the distribution of inputs and bean-related products has remained inefficient. As the private sector has established a platform for beans in recent years and communication between actors is improving, effective measures include providing technical support for the operation of this platform, including the use of information and communication technology, and capital investment support (establishment of storage facilities, etc.) to promote efficient seed distribution. For SRBs, it would be effective to continue supporting the establishment of cultivation techniques by private companies and to support a trial of exports to the Japanese market using the Sustainable Development Goals business scheme.

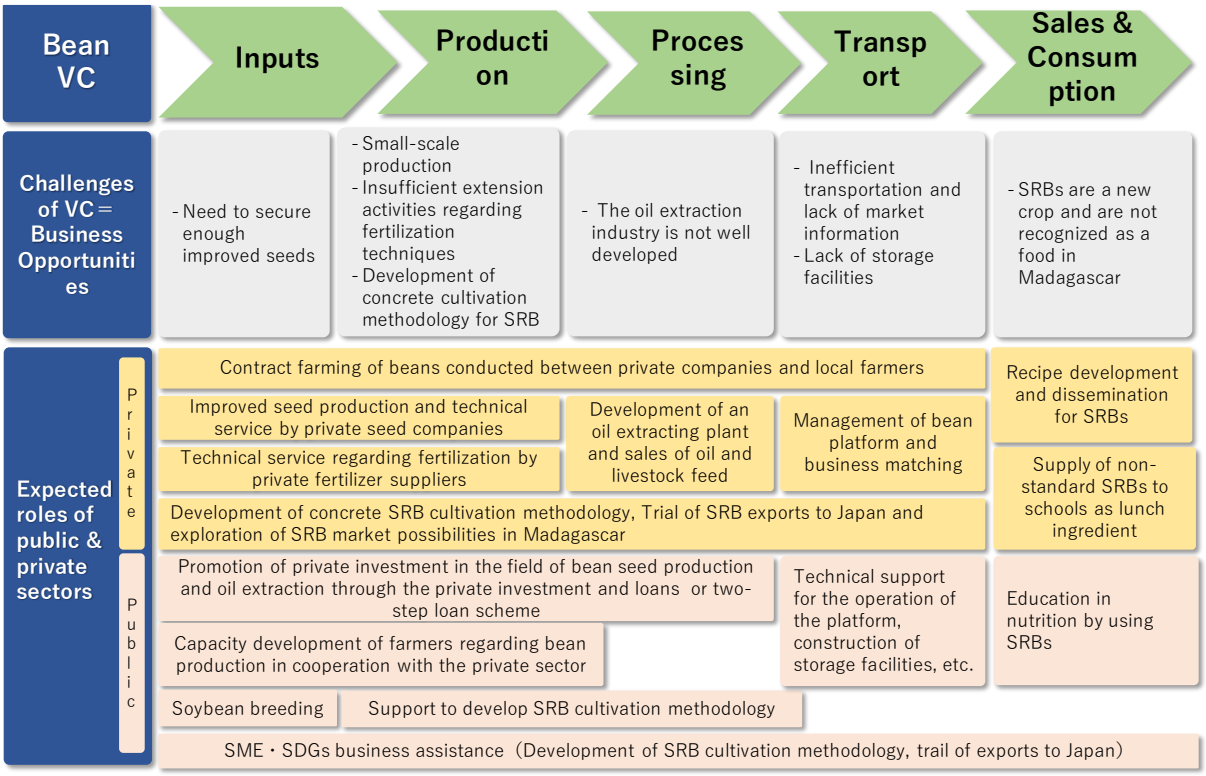


Figure 7-33: VC development sheet for beans (SRBs) in Madagascar

Source: The Survey Team

7.10.2. Vanilla VC development projects

Figure 7-34 shows some ideas for PPP projects for vanilla VC development in Madagascar. As a countermeasure to the quality management issues throughout the vanilla VC, the development of quality standards, the establishment of institutions that can conduct various quality tests, and the promotion of research activities on farm management, pests and disease, and

vanilla processing would be effective. To address the complex distribution system, the promotion of direct sales by farmers to exporters is desired.

To utilize the potential to explore new markets, activities such as study tours to potential markets and matching events for exporters and foreign buyers would be effective in strengthening relationships with foreign buyers and promoting vanilla exports.

As for the roles of donors, promoting investments by processors and exporters by providing them with loans and investments is recommended. In addition, the provision of technical assistance in farm management and curing would be an effective countermeasure to the issue of limited access to technical support.

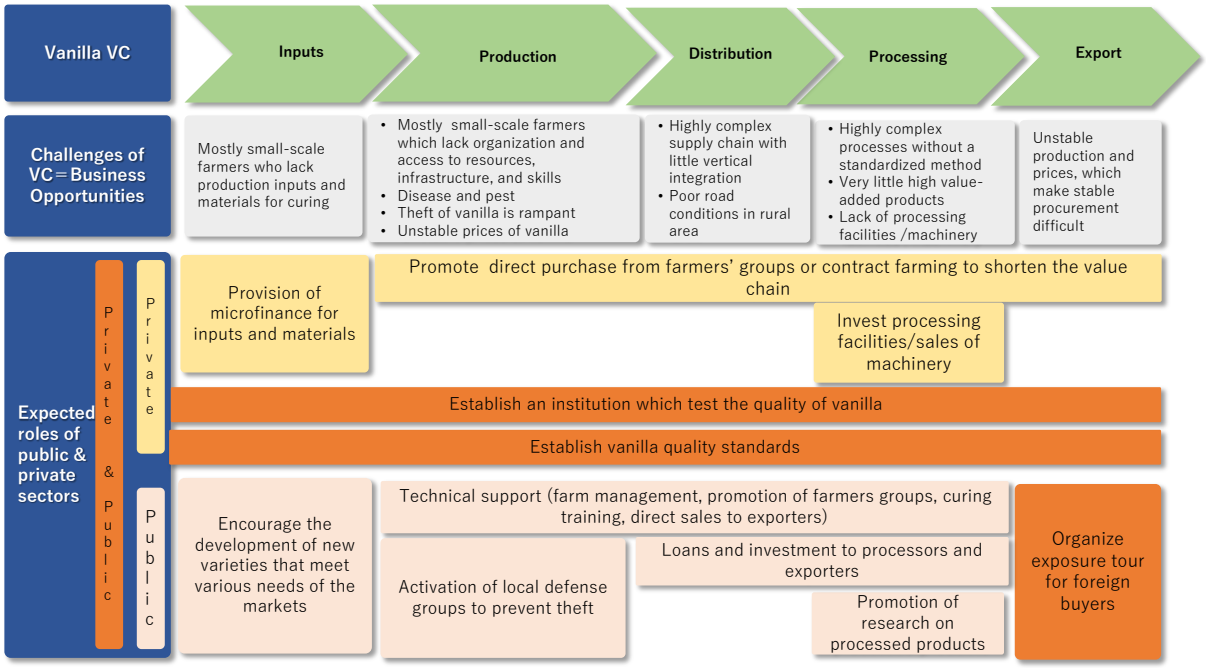


Figure 7-34: VC development sheet for vanilla in Madagascar

Source: The Survey Team

7.10.3. Cacao VC development projects

Figure 7-35 shows concepts for cacao VC development projects through PPPs. The issues with inputs are insufficient research on cacao varieties and seedling production. These challenges should be addressed by government agencies implementing research and establishing several mother tree orchards to produce quality scions and rootstocks and by private nurseries propagating seedlings. Some issues identified in production are the low yields of aging cacao trees and limitations to the suitable area for cacao cultivation in the Sambirano River basin. These issues can be addressed by establishing a new cacao plantation on the east side of Madagascar. Private sector development loan schemes provided by development partners may be tapped for this project. When establishing a new farm, it is possible to plant different varieties and process them separately so as to separately produce beans with different flavors. In post-harvest processing, the

equipment and methodology should be standardized to improve the quality of cacao. The creation of a credit scheme for cacao farmers is expected to facilitate the introduction of standardized fermentation boxes and the organization of farmers into cooperatives for collective fermentation. This credit scheme can be used by cacao cooperatives to build raised beds for drying cacao and storehouses for dried cacao beans. The processes and equipment for fermentation and drying cacao can be improved, and research and development should be conducted by the public sector to find the best method.

In logistics, it is very important to upgrade the road between the upstream area of the Sambirano River and Antsilanana, where cacao is shipped. For marketing, a common quality standard for cacao should be set and adopted by all stakeholders through a collaboration between the public and private sectors so that the price can accurately reflect quality. This process will encourage farmers to produce quality cacao. The public and private sectors can jointly establish a platform for matching farmers and buyers.

Some technical cooperation projects are expected to be conducted through a collaboration between DPs and the Malagasy government to strengthen the whole cacao VC, to promote forest preservation by promoting cacao production, and to facilitate private companies' business activities in Madagascar.

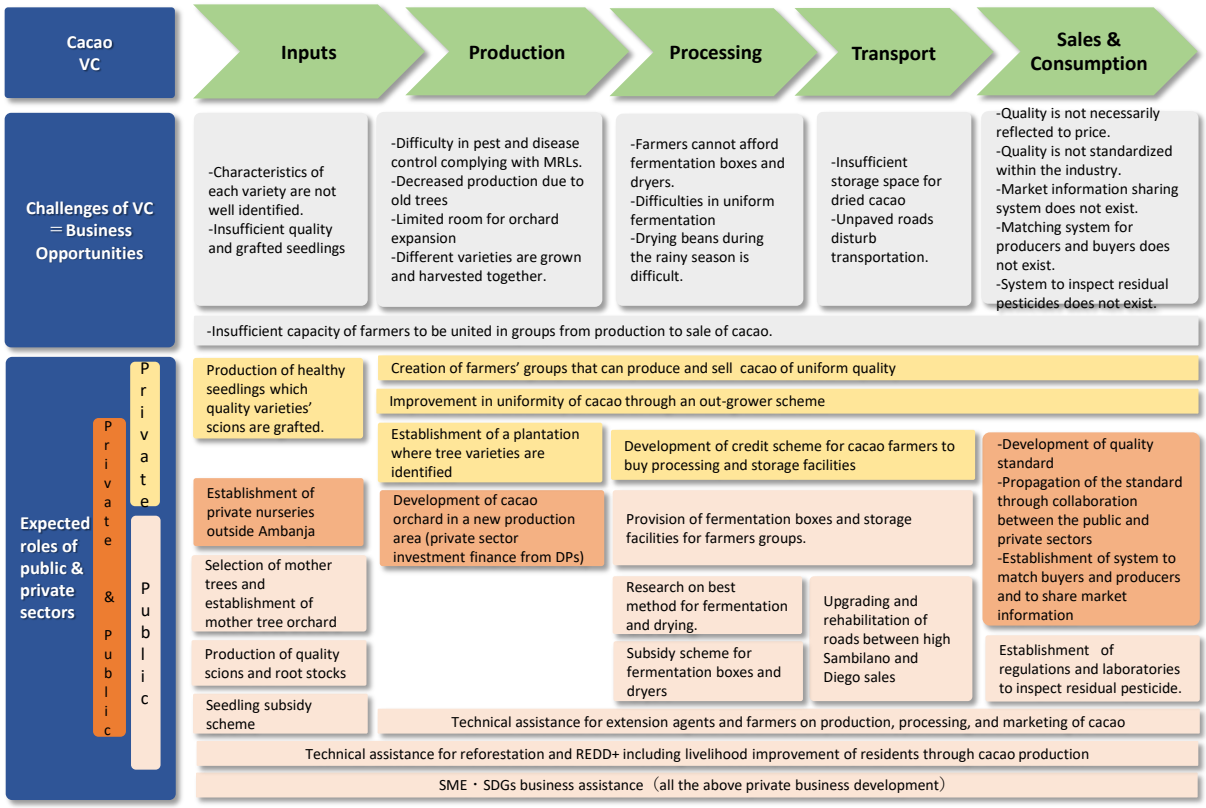


Figure 7-35: Cacao VC development sheet in Madagascar

Source: The Survey Team

Chapter 8. FVC Survey in Nigeria

Chapter 8. FVC Survey in Nigeria

8.1. Introduction to the FVC Survey in Nigeria

The Survey Team studied the VCs of sesame, tomatoes, and cacao in Nigeria. Sesame is one of Nigeria's major export crops, and Japan imports most of its sesame from Nigeria. Tomato production and consumption are both high in Nigeria, but production faces challenges, such as low yields and high wastage rates. Cacao is one of Nigeria's major export crops, and Nigeria has a large export volume, mainly to European countries. In this chapter, the results of the VC study are described, followed by concepts for VC development projects through PPPs.

8.2. Sesame VC

8.2.1. Overview

Figure 8-1 provides an overview of the sesame VC in Nigeria. The main inputs are seeds, fertilizers, and agro-chemicals. Fertilizers and agro-chemicals can be purchased at agricultural material stores, but seeds are rarely distributed. Most sesame producers are small- or medium-scale farmers. Generally, they plow the land using rented tractors and then make rows and sow, but some farmers sow seeds using the broadcasting method, which does not require making rows. In many cases, harvested sesame seeds are dried and sorted before being collected by agricultural cooperatives or middlemen at the sesame collection point. In the case of contract farming with sesame buyers, such as export companies, sesame seeds are collected at sesame collection points established by the enterprises and are shipped to their respective demanders. At the sesame collection points, sesame wholesalers ship sesame seeds in response to customer orders, whereas wholesalers who own storehouses keep sesame seeds there and sell them when the sesame market price rises around May to July. Most sesame is delivered to sesame exporters, who carefully select and pack it before exporting it; sesame consumption within Nigeria is quite limited. Table 8-1 shows sesame prices in each stage of the sesame VC.

Table 8-1: Sesame prices in each stage of the VC in Nigeria

Farm gate price	300–400 NGN[1]/kg	90 Yen/kg–120 Yen/kg	(NGN = 0.3 Yen)
Wholesale price	350–500 NGN/kg	105 Yen/kg–150 Yen/kg	(NGN = 0.3 Yen)
Retail price	350–600 NGN/kg	105 Yen/kg–180 Yen/kg	(NGN = 0.3 Yen)

Source: The Survey Team

[1] Nigerian Naira

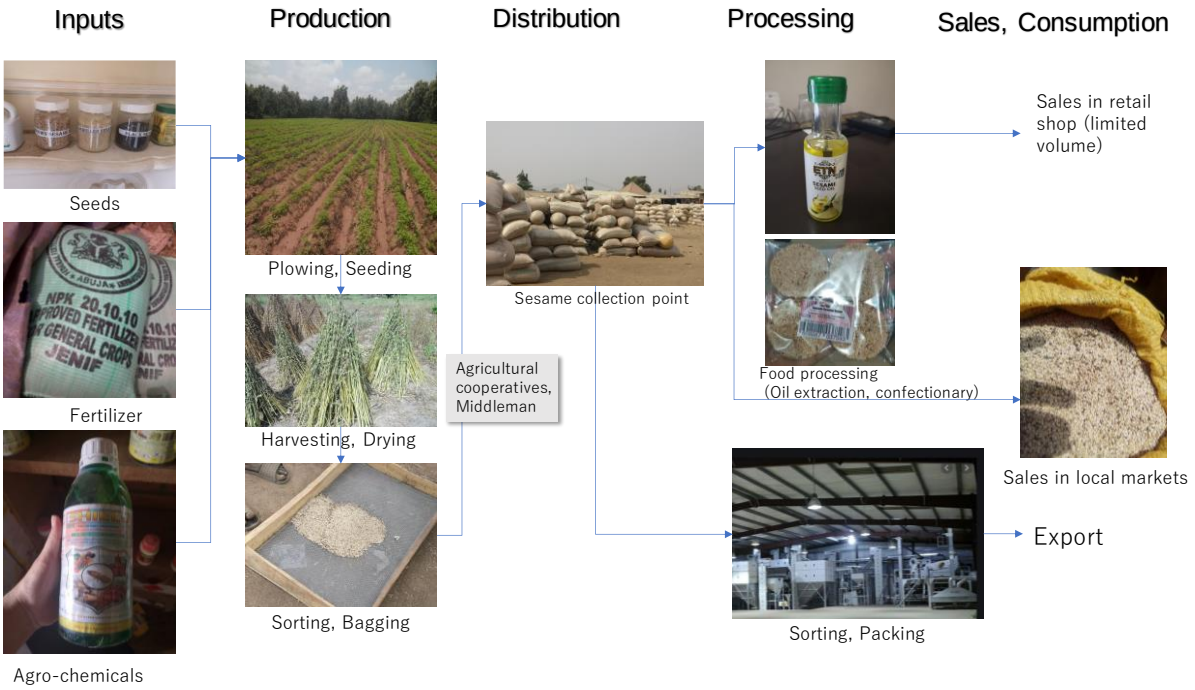


Figure 8-1: Outline of the sesame VC in Nigeria

Source: The Survey Team

8.2.2. Agricultural inputs

(1) Seeds

1) Breeding of sesame varieties

The National Cereal Research Institute (NCRI) is responsible for developing and disseminating sesame seeds in Nigeria. The seven varieties shown in Table 8-2 have been released to date, and NCRIBEN 04E is the most popular because of its high yield and oil content. In general, oil-extracting companies are the largest consumers of sesame, but the oil content of the released sesame varieties is as low as 50% or even less. To strengthen the international competitiveness of sesame-related products, the government should concentrate on developing new sesame varieties that attract international sesame demand. The NCRI also stores black sesame seeds produced in China. In recent years, some Chinese traders are said to be seeking black sesame seeds.

Table 8-2: Sesame varieties released in Nigeria

Name	Days to harvest	Seed color	Yield potential (kg/ha)	Oil content (%)
NCRIBEN 01M	102–105	White	600–700	45
NCRIBEN 02M	102–115	Light brown	550–600	45
NCRIBEN 03L	125–140	White	500–550	45
NCRIBEN 04E	90–95	White	1,300	50
NCRIBEN 05E	90–100	White	1,200	44
E8	90	Light brown	1,000	50
YANDEV 55	125	Light brown	600	45

Source: NCRI

The variety registration procedure is described in detail in “Guidelines for Registration and Release of New Crop Variations in Nigeria,” published in 2016. The required tests for variety registration described in this document are as follows.

Distinctness, uniformity, and stability: At least two years (seasons) of trials in the field are required. Various characteristics (e.g., yield, days to harvest, seed color, and disease resistance) are evaluated through comparative tests, with registered varieties showing similar characteristics to newly developed varieties.

Value for culture and use (VCU): This test assesses whether the variety is beneficial for farmers. Cultivation tests should be conducted in at least ten experimental fields to evaluate the variety’s performance (yield and disease resistance) in fields with different environments. Data must be obtained through this test for at least two years or two cropping seasons.

On-farm trials: In addition to the VCU trials, at least ten farmers must conduct the same tests as the VCU using their farmland as experimental fields. Testing for at least one year or one cropping season is required, and supervision by the appropriate agricultural extension organization of the government is necessary to manage the trial cultivation.

After all the data required for seed registration have been collected, the test results and an application for variety registration must be submitted to the Technical Sub-Committee (TSC). The members of the TSC are appointed by ministers from research institutions under the jurisdiction of the Federal Ministry of Agriculture and Rural Development (FMARD) and the Federal Ministry of Science and Technology. If the TSC examination determines that the variety meets the required criteria, it is granted a variety registration permit upon approval by the National Committee, which consists of the relevant bodies, including the director of the FMARD.

2） Seed production and distribution

The NCRI and private enterprises are mainly responsible for the production and distribution of sesame seeds. The former obtains improved seeds through seed multiplication from basic seeds and distributes them to farmers through private input suppliers, but the amount of seeds is limited. In the latter case, sesame exporters provide seeds to farmers as part of a contract farming agreement. The seeds themselves are procured separately from the contracted farmers. From an exporter's point of view, the exporter offers sesame varieties of different sizes depending on the region to meet their customers’ demands for various sesame seed sizes. Farmers who cannot obtain sesame seeds by the means listed above procure seeds by (1) using recycled seeds, (2) purchasing seeds from neighboring farmers, and (3) purchasing seeds from the market. However, the quality of seeds from these sources is poor, resulting in low yields.

（2） Fertilizers

According to “Recommended Practices For Beniseed Production” issued by the NCRI, fertilizer application in sesame cultivation depends on soil fertility, and fertilizer does not need to be applied to fertile farmland. However, fertilization is encouraged for infertile land (particularly farmland that is deficient in nitrogen and available phosphate). The standard fertilizer application rates are 60 kg of nitrogen, 30 kg of phosphorus tetroxide, and 20 kg of potassium oxide per hectare. According to the NCRI, although fertilizer can be procured from agro-dealers, many farmers find it difficult to apply the proper amount of fertilizer because they lack the funds to procure it.

（3） Agro-chemicals

As in the case of fertilizers, agro-chemicals can be procured from agro-dealers. According to NCRI officials, pesticides were used infrequently in sesame cultivation in the past, but their use has increased in recent years owing to serious damage by pests (i.e., gall flies (Asphondylia sesami Felt) and silver-leaf whiteflies (Bemisa tabaci)). According to an agro-dealer, insecticides containing deltamethrin, chlorpyrifos, and imidacloprid are particularly used in sesame cultivation.

8.2.3. Production

（1） Current state of sesame production

Figure 8-2 shows trends in sesame production and yield over the past ten years (i.e., 2009–2018) based on FAOSTAT statistics. Nigeria's sesame production increased rapidly in 2012 but has remained around 400,000 to 600,000 tons per year since then, making Nigeria the fourth or fifth largest producer in the world. The sesame yield has been around 1 ton/ha except in 2011–2013, when the yield greatly increased, and it is higher than that of Burkina Faso, a major sesame producer, and is equal to or slightly higher than that of Tanzania. However, a policy document on sesame seeds to be described later estimates Nigeria’s average sesame yield to be 424 kg/ha, which is significantly different from FAOSTAT’s statistical data. Based on interviews with local sesame farmers and extension workers, it is unlikely that the average sesame yield reached around 1 ton/ha, and 424 kg/ha seems to reflect the actual situation more accurately. By this premise, Nigeria’s sesame yield is low, and there is a need for technical guidance concerning the dissemination of improved varieties and appropriate cultivation management.

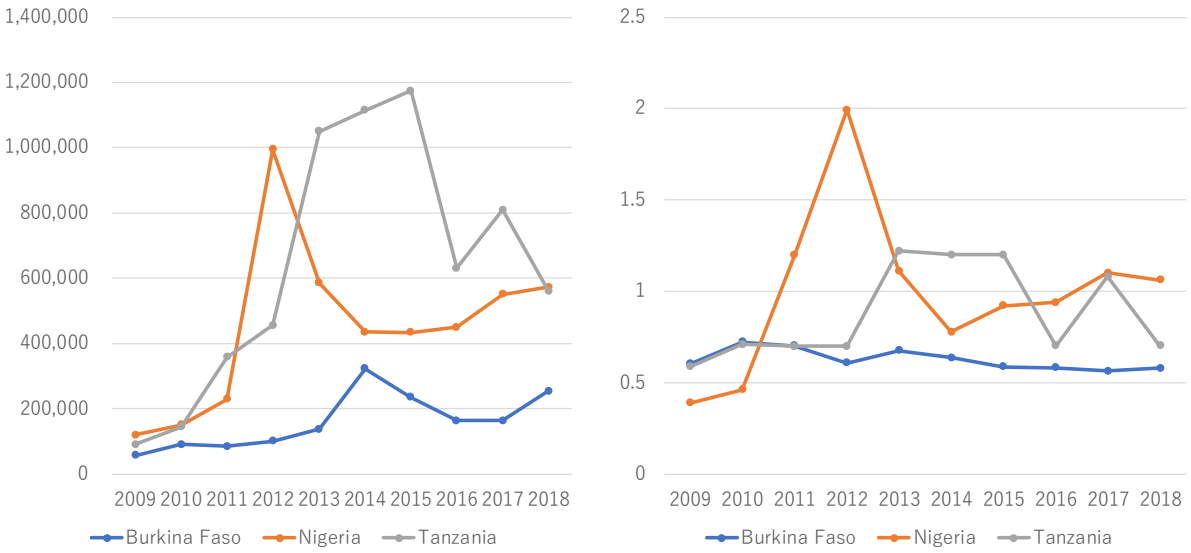


Figure 8-2: Sesame production (tons; left graph) and yield (tons/ha; right graph)

Sourc: FAOSTAT

Within Nigeria, sesame production is concentrated in the north. In particular, the Guiana Savanna, Sudan Savanna, and Sahel Savanna regions shown in Figure 8-3 are suitable places for sesame cultivation. Because the zones have different precipitation patterns, the cultivation periods, including sowing times, are different. By state, the major sesame-producing regions are Nassarawa, Jigawa, and Benue, which produce 20,000–40,000 tons (actual figures for 2011) of sesame per year.

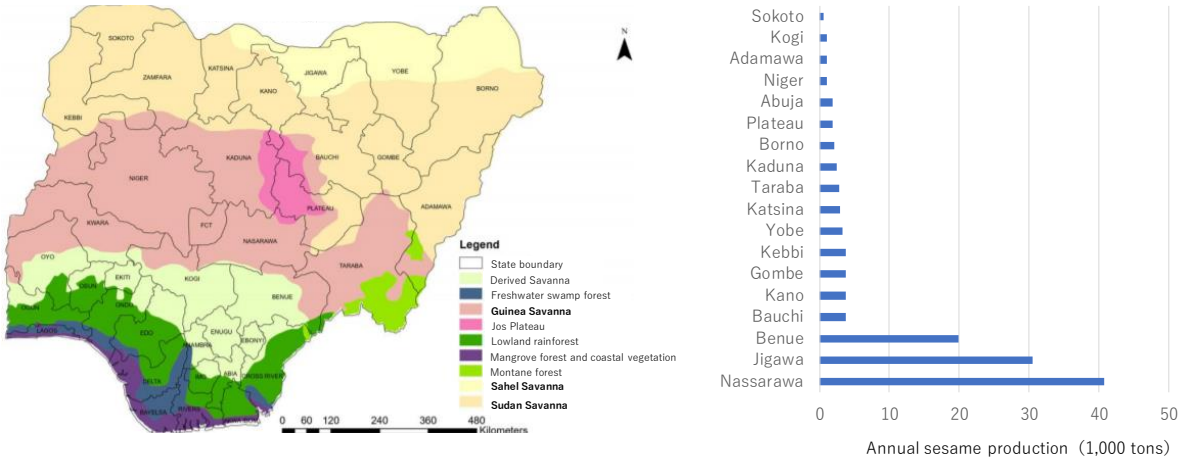


Figure 8-3: Agro-ecological zones in Nigeria (left)
and annual sesame production by region (right)

Source: Federal Department of Forestry, Nigeria (left), National Bureau of Statistics, Nigeria (right)

(2) Sesame cropping calendar

Figure 8-4 shows the sesame cropping calendar for the Guiana Savanna zone. In the Sudan Savanna region, sowing is generally performed from late June to early July. In Sahel Savanna,

sowing begins at the start of the rainy season (around May) because of the region's low rainfall. The harvesting time depends on the variety, but it is around 90 to 120 days after sowing, and in the Guiana Savanna area, harvesting is done from November to December.

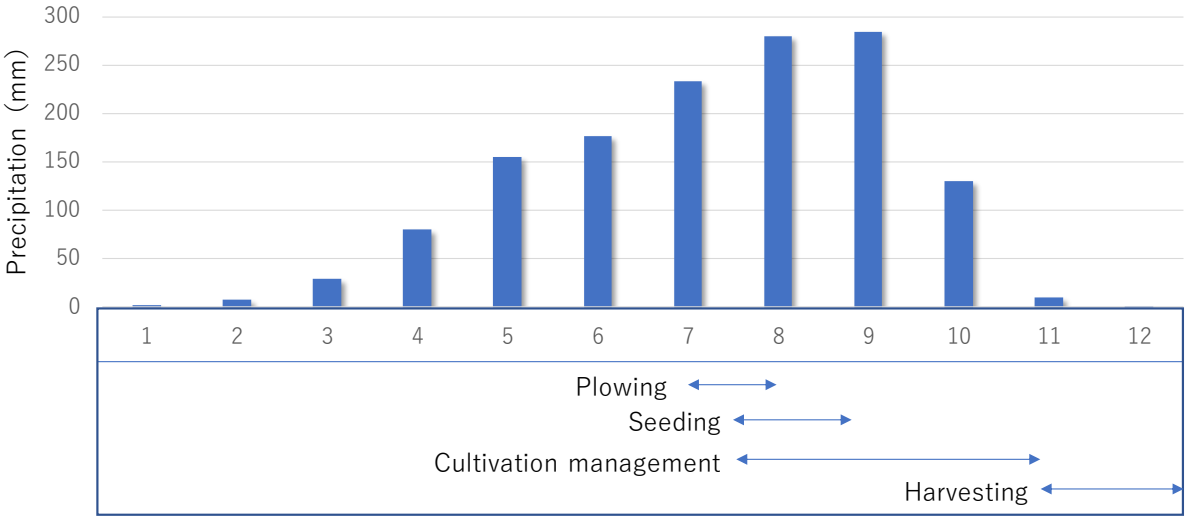


Figure 8-4: Sesame cropping calendar in Guiana Savanna

Source: ClimateData.org and the Survey Team

(3) Conventional sesame production practices

The sesame cultivation practices in Gwagwalada (about 60 minutes by car from Abuja) examined in this study are as follows. From around July, plowing work is carried out using manpower or a rented tractor, and seeding is carried out after plowing. In regions with low soil fertility, chemical fertilizers are applied before sowing. Although the state government extension staff teaches stripe seeding as a better practice for sesame production, farmers with less family labor tend to use broadcasting methods that do not require the effort of raising rows. Cultivation management includes weeding twice throughout the cropping season and pesticide application in the flowering and fruiting stages. Because farmers have a shortage of manpower for sesame harvesting, they may hire workers or cooperate with neighboring farmers. After harvesting, sesame seeds are bundled, tied upright, and dried for approximately one to two weeks before threshing, wind sorting, or sieving. Sesame is sold in two different ways; an agricultural cooperative (or farmer group) may collect all of the sesame seeds and transport them to a sesame collection point established by a sesame wholesaler, or sesame seeds may be sold to middlemen who come to the farm to buy them.

Table 8-3 shows the revenue from sesame production and sales based on an interview with a small-scale farmer (i.e., a production scale of around 2 ha) in Gwagwalada. The yield of this farmer is as low as 350 kg/ha, which is lower than the average yield for Nigeria mentioned above,

but the local extension staff confirmed that this yield level is common in Gwagwalada. The unit price of sesame is 350 NGN/kg, and the income earned from selling the entire crop is 122,500 NGN/ha. However, the cost of production is 90,000 NGN/ha when seeding, threshing, and sorting, which are provided through family labor, are not included as costs, and it is 114,000 NGN/ha when the cost of family labor is included. The difference is 32,250 NGN/ha (8,500 NGN/ha when the cost of family labor is included), meaning that the farmer earns a profit, but the previous year's yield was around 200 kg/ha, putting severe pressure on the household economy. The reason for the decrease in yield was a delay in sowing seeds; this delay could be attributed to a variety of factors, but the main cause was a lack of access to funds. The need to improve access to funds so that farmers can properly profit from sesame cultivation has been pointed out because, in many cases, the planting period is delayed owing to a lack of funds for renting a tractor and procuring inputs, which must be done before starting sesame cultivation. However, local extension workers also pointed out that there are few tractor rental service providers, which also causes delays in cultivation, as farmers must wait to rent tractors.

Table 8-3: Revenue obtained through sesame production and sales in Nigeria

1. Income				
Category	Item	Yield (kg/ha)	Unit price (NGN/kg)	Income (NGN)
Sales	Sesame	350	350	122,500
Total income (NGN/ha)				**122,500**
2. Cost				
Category	Item	Quantity/ha	Unit price (NGN)	Cost (NGN)
Inputs	Seeds (procured from the market)	25 kg	400	10,000
	Fertilizer	5 bag (50 kg)	6,500	32,500
	Insecticide	1 bottle	2,500	2,500
Production	Land preparation (tractor rental)	1	20,000	20,000
	Seeding	0 (4 person-day)	1,000	0(4,000)
	Weeding ×2 times	0 (12 person-day)	1,000	0 (12,000)
	Harvesting, Drying	25 person-day	1,000	25,000
Post-harvest	Threshing, Sorting	0 (8 person-day)	1,000	0 (8,000)
Total cost (NGN/ha)				90,000 (114,000)
3. Revenue (NGN/ha)				**32,250 (8,500)**

Source: The Survey Team

8.2.4. Processing

As mentioned above, most sesame produced in Nigeria is exported to other countries. In Nigeria, many exporters with facilities for the pre-export cleaning and packing of sesame seeds use rotary shifters, stone extraction machines, gravity sorters, and, if necessary, color sorters to perform cleaning work to meet their customers' needs. Some sesame exporters have set up their

own laboratories to analyze the residual agro-chemicals in sesame. In addition to exporters sampling and conducting the necessary tests before shipment, the same samples are sent to other countries (mainly Europe) to conduct the same tests to collect accurate data regarding sesame quality. Companies usually extract one sample for every 30 tons of sesame collected.

In addition, although the scale is limited, sesame oil processors produce and sell a small amount of sesame oil, and, in rural areas, confections made from sesame are produced and sold. Officials at the FMARD and the NCRI have pointed out the need to foster the sesame processing industry to stimulate domestic demand for sesame. Local extension workers have also pointed out the need to disseminate and raise awareness about sesame use in rural areas.

8.2.5. Distribution

（1） Sesame procurement route

Sesame produced by farmers is transported by either agricultural cooperatives or middlemen to sesame collection points established by sesame wholesalers. These sesame collection points are located in major sesame production areas, and most sesame transactions take place at these locations. The purchase price is set based on the assumption that the moisture content of the sesame seeds is 8% or less and based on the mixing ratio of impurities. Sesame is sold by wholesalers to sesame demanders (mainly sesame exporters), but wholesalers store some sesame in their own warehouses and sell it when the market price rises (generally from May to July). These efforts to store sesame seeds are entirely undertaken by wholesalers; there are no cases of such efforts being undertaken by agricultural cooperatives.

Some sesame exporters procure sesame through contract farming. In contract farming, the cost of inputs is loaned to farmers upfront and is then deducted when the farmers sell their crops. However, these contracts do not force farmers to sell sesame to the contracted companies, and farmers who receive loans may sell sesame to other buyers, although they are required to repay their loans. The targets of contract farming span six states, including Nasarawa and Benue, in partnership with the DFID, which provides technical assistance and monitoring to farmers[2]. Thus far, the loan repayment rate is around 90%, which is not bad for the participating companies.

（2） Sesame distribution

A pressing issue for sesame exporters is congestion on the road leading to the port and

[2] The name of the DFID project is the Rural and Agricultural Markets Development Programme for Northern Nigeria (2013–2021), which targets rural areas in northern Nigeria to improve employment and productivity. With the goal of increasing the incomes of approximately 710,000 poor people in northern Nigeria by 15–50% by 2021, various activities, such as strengthening collaboration among VCs and promoting investment by private companies to provide input sales and agro-related services, are being implemented. See https://devtracker.dfid.gov.uk/projects/GB-1-202098 for details.

inefficient container loading within the port, which causes shipment delays. The exporters interviewed in this survey said that it takes at least two weeks for sesame-loaded containers to arrive at Apapa Port after being shipped from the sesame cleaning plant in Lagos. As a result, the cost of transportation has risen rapidly, from 150–200 USD for a 15-foot container three years ago to 800–850 USD for a 15-foot container today. The following underlying problems were pointed out.

First, the roads to the port are not properly maintained, causing congestion. Many traffic accidents occur, which makes congestion more serious. According to one exporter, an accident happens once a day.

Second, loading delays can arise at the port. Apapa Port has only three cranes, meaning that the loading speed is very slow. In addition, these cranes are frequently broken, causing further shipment delays. In particular, Apapa Port has not been renovated for about 25 years, and its facilities are aging and operate inefficiently.

8.2.6. Imports, exports, and the domestic market

Figure 8-5 shows the annual export volumes of sesame from Nigeria (2014–2017), which fall in the range of about 143,000-173,000 tons/year. Turkey is the largest export market, followed by Japan, and together they account for 64%–75% of Nigerian sesame exports. The annual amount exported to Japan is around 53,000 tons, but it decreased to around 30,000 tons in 2017. According to sesame exporters, sesame exports to Japan apparently decreased in 2017 owing to a delay in sesame shipments to Japan, especially during the fourth quarter (October–December).

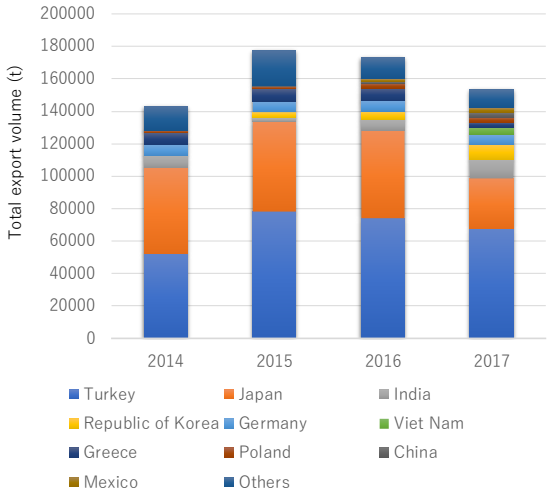


Figure 8-5: Annual sesame exports from Nigeria (2014–2017)

Source: FAOSTAT

8.2.7. Policies and the role of the government

According to "Nigeria Food and Agricultural Policy and Strategy: From Agriculture as Development to Agriculture as Business" published by the FMARD in 2015, several measures were taken to develop the sesame VC, as shown in Table 8-4.

Table 8-4: Development policy for the sesame VC in Nigeria

	Contents
Objective	✓ Increase the current average sesame yield of 424 kg/t by at least 50% through the production and dissemination of improved seeds. To this end, the government will promote the spread of improved seeds in Nasarawa, Jigawa, Benue, Yobe, Kano, Katsina. Gombe, and Plateau States and will develop the

	sesame oil industry and create jobs.
Strategy	✓ Improve farmers' access to agricultural inputs through the Growth Enhancement Support e-Wallet system. ✓ Provide support to research institutions that develop sesame varieties. ✓ Train at least 1,000 farmers in sesame seed cultivation. ✓ Hold workshops on sesame quality standards to strengthen the competitiveness of sesame producers and processors. ✓ Establish small sesame processing facilities in Nassarawa, Jigawa, Benue, Yobe, Kano, Katsina, Gombe, and Plateau States. ✓ Support research and development related to the development of improved varieties through tissue culture.

Source: Nigeria Food and Agricultural Policy and Strategy: From Agriculture as Development to Agriculture as Business

8.2.8. Issues and opportunities

（1） Issues

Nigeria is a major global sesame exporter. It is essential to maintain and strengthen market competitiveness as a supplier of raw sesame material. From this perspective, the issues facing the sesame VC are as follows.

- ✓ Production and dissemination of improved seeds: The sesame varieties developed and released in Nigeria are greatly inferior to the sesame varieties released in other countries (e.g., Tanzania) in terms of yield and oil content. In addition, activities related to the production and dissemination of improved seeds are limited, and local sesame producers have difficulty accessing improved seeds.
- ✓ Low yield and poor financial access: Nigeria's sesame yield is very low at 424 kg/ha. There are various reasons for this low yield, but a critical issue is that small-scale farmers sometimes miss the appropriate cropping season owing to difficulties procuring inputs and accessing farming services, such as tractor rentals, owing to a lack of access to financing.
- ✓ Delayed sesame delivery: Congestion, especially around ports, is a major issue in sesame exporters' operations, causing significant economic losses.

（2） Opportunities

Nigeria’s sesame industry has potential because, in addition to the vast land available for sesame production, much of the land is flat, making it suitable for mechanized work. Nigeria has also established itself as a major supplier of sesame to Japan since the 1990s, and the fact that a sesame supply chain has already been developed is considered to be an advantage. The international demand for sesame is expected to continue to increase in the future, as evidenced by the recent trend of increasing sesame purchases from China, which is also an opportunity for industries related to the sesame VC (e.g., agricultural machinery sales, etc.). Table 8-5 shows the results of the SWOT analysis for sesame in Nigeria.

Table 8-5: Results of the SWOT analysis for sesame in Nigeria

Strengths	Weaknesses
● A large area of flat land is available. ● A supply chain to major sesame export destinations has already been established. ● Sesame exporters have the necessary facilities for sesame cleaning and packing and have thorough quality control.	● Most sesame producers are small farmers with low production efficiency. ● Because the necessary budget and facilities are not allocated, the ability to develop sesame varieties is low. ● Activities to propagate and spread improved sesame varieties are limited. ● Production costs are high, and yields are low. ● Accessing funds is difficult. ● The sesame processing industry is not developed. ● Transportation costs are rising owing to the lack of transportation infrastructure.
Opportunities	**Threats**
● International sesame market prices may rise. ● Demand for sesame from Asian countries is particularly strong.	● International sesame market prices may fluctuate strongly.

Source: The Survey Team

8.3. Tomato VC

8.3.1. Overview

Figure 8-6 shows an overview of the tomato VC in Nigeria. The major inputs for tomato production, such as seeds, pesticides, and fertilizers, are available at agricultural input shops, which are located in many rural areas of Nigeria. The main improved tomato varieties planted in Nigeria include the Roma, UC, and Beefsteak varieties, but local varieties are also planted extensively. Nigeria's tomato production has increased significantly in the last 20 years, but the productivity of its tomato farming is extremely low compared to that of other major tomato producers. The major tomato production sites in Nigeria are Bauchi, Taraba, Gombe, Kano, Zamfara, Jigawa, Sokoto, Katsina, and Kaduna provinces, many of which are located in the northern region of the country. Tuta absoluta and Ralstonia solanacearum are major diseases affecting tomato farming in Nigeria. Tomato distribution is mostly carried out by traders and small retailers, and the high wastage of tomatoes during transportation because of the lack of a cold chain is a key issue. Nigeria has many tomato processors, but they face difficulty obtaining fresh tomatoes because their purchasing price is often lower than the cost of producing fresh tomatoes.

Table 8-6 shows the prices of tomatoes at each stage of the VC.

Table 8-6: Prices of Nigerian tomatoes

Farm gate price (small farm)	For eating fresh	15–20 JPY/kg	(1 NGN = 0.3 JPY)
	For processing	12.4–14 JPY/kg	(1 NGN = 0.3 JPY)
Farm gate price (commercial farm)	For eating fresh (high quality toma toes)	65–93 JPY/kg	(1 NGN = 0.3 JPY)
Wholesale price	For eating fresh	25–28 JPY/kg	(1 NGN = 0.3 JPY)
Domestic retail price (open market; Baligin market in Lagos)	For eating fresh	43–56 JPY/kg	(1 NGN = 0.3 JPY)
Domestic retail price (supermarket; Shoprite in Lagos)	For eating fresh (high quality tomatoes)	180–190 JPY/kg	(1 NGN = 0.3 JPY)

Source: The Survey Team

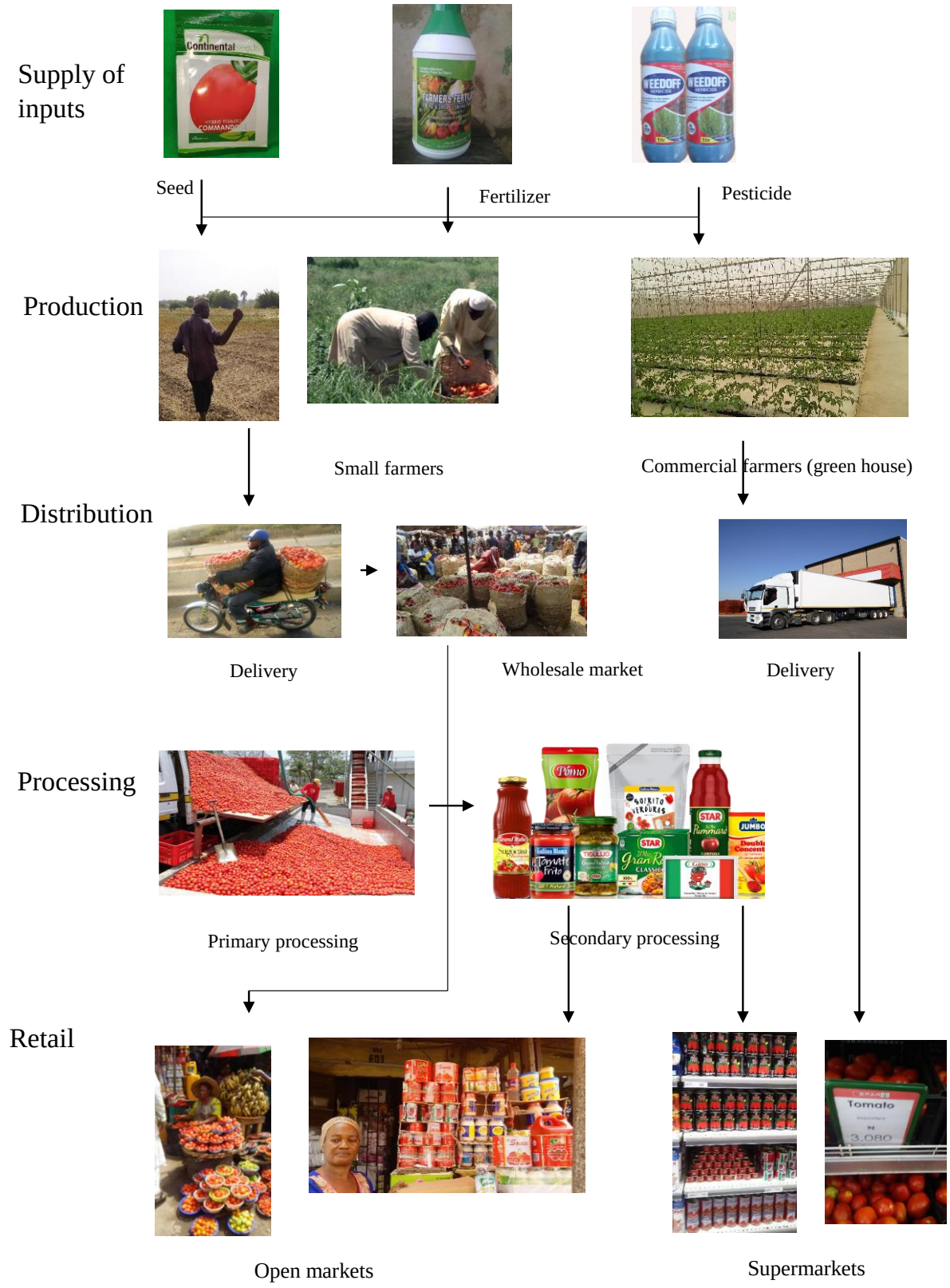


Figure 8-6: Overview of the tomato VC in Nigeria

Source: The Survey Team

8.3.2. Agricultural inputs

The major inputs for tomato production, such as seeds, pesticides, and fertilizers, are available at agricultural input shops, which are located in many rural areas in Nigeria. The main improved tomato varieties planted in Nigeria are the Roma, UC, and Beefsteak varieties, which are imported, and the seeds of these varieties are quite expensive.

Table 8-7 shows the cost structure of tomato production in Nigeria. Seed costs are approximately 20% of the total cost in the case of irrigated cultivation and are 30% of the total cost in the case of rain-fed cultivation, which is quite high.

Table 8-7: Cost and revenue structure for tomato production in Nigeria (per hectare)

	Item	Service life (years)	Irrigated (NGN)	Rain-fed (NGN)
Fixed costs			**24,750**	**5,950**
	Blade for plowing	2	2,500	1,500
	Plow	2	12,500	
	Irrigation equipment	2	5,000	
	Land (rent)		4,000	4,000
	Hoe	6	750	450
Variable costs			**86,500**	**58,000**
	Labor		20,000	10,000
	Pesticides		5,000	2,500[3]
	Herbicides		6,000	6,000
	Fertilizer		18,000	9,000
	Seeds		22,500	22,500
	Transportation		15,000	8,000
Total costs			**111,250**	**63,950**
Harvest (tons)			10.0	5.5
Total revenue			**300,000**	**160,000**
Profit			**188,750**	**96,050**

Source: Costs and Returns Analysis for Small-Scale Irrigated Crop Production in Kaduna State, Nigeria (2015)

8.3.3. Production

（1） Overview of tomato production in Nigeria.

Figure 8-7 shows trends in annual tomato production in Nigeria. Clearly, tomato production has increased significantly in the last 20 years.

[3] The yield of tomatoes in the case of rain-fed farming is lower than that in the case of irrigated farming, and the labor and pesticide costs are calculated to be lower.

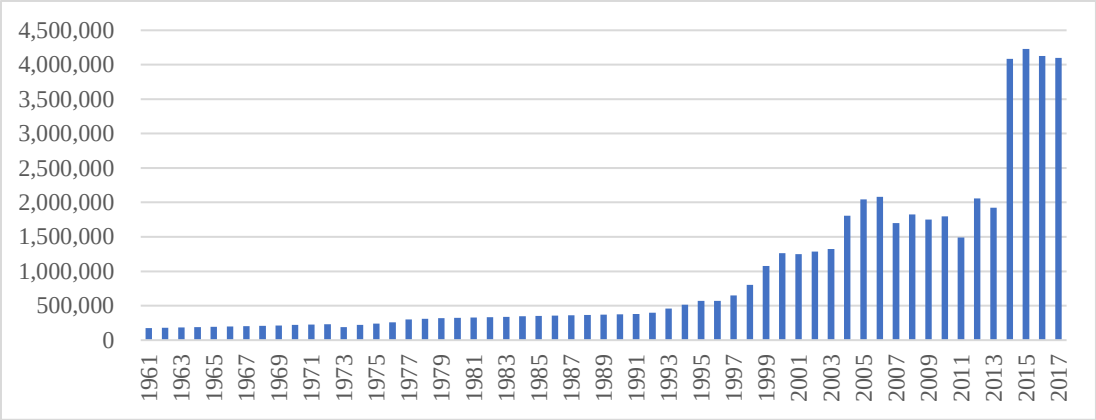


Figure 8-7: Trends in annual tomato production in Nigeria (tons)

Source: FAOSTAT

Table 8-8 shows the tomato production volumes, harvest areas, and yields of major tomato-producing countries. Nigeria ranked eleventh in the world in terms of annual tomato production in 2017. However, the tomato production yield is extremely low compared to other major tomato producers. The reasons for this low yield include the low penetration rate of improved varieties, inadequate irrigation infrastructure, the spread of diseases, and farmers' poor cultivation skills.

Table 8-8: Tomato production volume, harvest area, and yield by country (2017)）

Country	Production volume (tons)	Harvest area（ha)	Yield （tons/ha)
China	59,626,900	1,033,276	57.71
India	20,708,000	797,000	25.98
Turkey	12,750,000	187,070	68.16
USA	10,910,990	126,070	86.55
Egypt	7,297,108	182,444	40.00
Iran	6,177,290	153,735	40.18
Italy	6,015,868	99,750	60.31
Spain	5,163,466	60,852	84.85
Mexico	3,782,314	91,989	41.12
Brazil	4,187,729	63,572	65.87
Nigeria	4,100,000	589,254	6.96

Source: FAOSTAT

（2） Major production sites

The major tomato production sites in Nigeria are Bauchi, Taraba, Gombe, Kano, Zamfara, Jigawa, Sokoto, Katsina, and Kaduna provinces, many of which are located in the northern region[4,5] (see Figure 8-8).

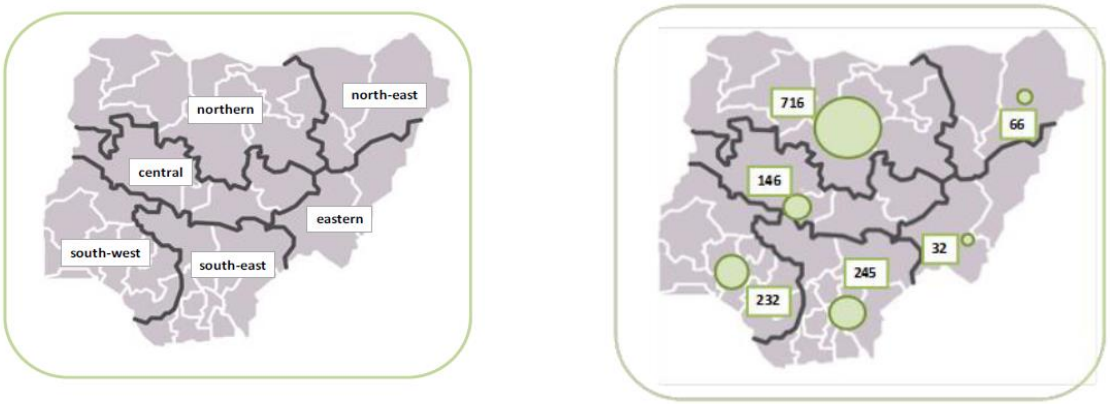


Figure 8-8: The six regions of Nigeria (left) and annual tomato production volume by region (estimated, 1,000 tons, 2009) (right)

Source: "Tomato Production and Marketing Value Chain Analysis" GEMS4 Wholesale and Retail, coffey.

The climates of these provinces are suitable for tomato production, as their average temperatures are between 24ºC and 34ºC, and these provinces are located in the savanna climate zone, where pests and diseases are not rampant. The tomato yields in Kano and Jigawa provinces are much higher than the average for Nigeria, as many tomato farms in these provinces are irrigated[6].

（3） Major varieties

Table 8-9 shows the major improved tomato varieties grown in Nigeria.

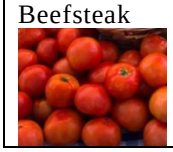
Table 8-9: Major improved tomato varieties in Nigeria

Variety	Characteristics
Roma 	Improved version of an Italian variety. As its skin is thick, it is suitable for processing but is also popularly eaten fresh. Days of cultivation: 100–120.
UC	Originated in the USA. As its water content is low, it is suitable for processing. Its

[4] Based on an interview with the FMARD

[5] Data on annual tomato production and harvest area by regions are not currently collected. The lack of such basic data is one of the issues for the development of the tomato VC (based on an interview with the FMARD).

[6] According to a tomato processor, the tomato yield for a medium-sized farmer is 50 tons/ha in Kano province and 30-40 tons/ha in Jigwa province.

	yield is relatively high. Days of cultivation: 75–80.
Beefsteak 	Originated in Great Britain. Its yield is high. As its water content is high, it is popularly eaten fresh. Days of cultivation: 90–100.

Source: http://www.tomatogrowers.com

In addition to these improved varieties, a number of local tomato varieties are planted extensively throughout Nigeria. The seeds of these local varieties are propagated through in-house seed production and the provision of seeds to relatives or neighbors. It is less costly for tomato farmers to plant local tomato varieties, but their yields are much lower than those of the improved varieties.

(4) Cultivation periods and price fluctuations

The time from seeding to harvesting tomatoes is usually 2.5–4 months, and tomatoes can be cultivated two or three times a year. However, most farmers in Nigeria grow tomatoes during the dry season (November to May), when the risks of pests and diseases are low. As it is difficult to store fresh tomatoes for a long time, the price of tomatoes decreases significantly during the harvest season (Figure 8-9).

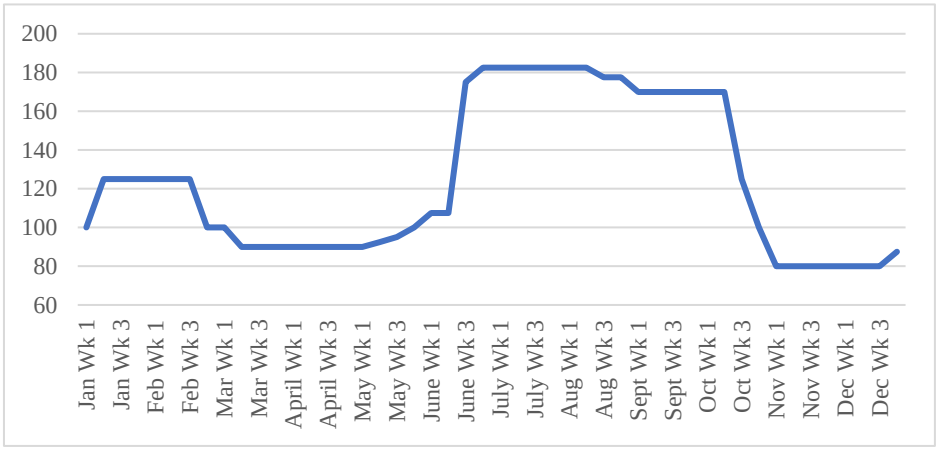


Figure 8-9: Wholesale tomato prices at a market in Lagos (NGN/kg, 2019)

Source: Lagos State Agricultural Development Authority

(5) Major issues in tomato production

1) Diseases

Damage from Tuta absoluta and Ralstonia solanacearu to tomatoes can be seen extensively in

most parts of Nigeria (Figure 8-10). Research on these diseases is not conducted in Nigeria,[7] and, thus, tomato farmers do not have any countermeasures to these diseases.

Tuta absoluta

Ralstonia solanacearu

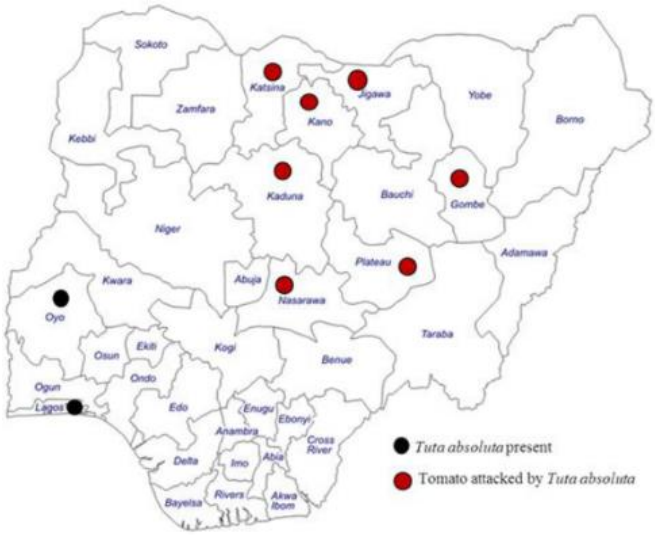


Figure 8-10: Areas damaged by Ralstonia solanacearu

Source: Borisade et al. (2017) "The tomato leafminer attack in Nigeria" Journal of Agricultural Extension and Rural Development

2) Inadequate irrigation facilities

Irrigation facilities are inadequate in most parts of Nigeria except for some areas in Kano and Jigwa provinces, and most tomato farmers grow tomatoes using rain-fed farming. As shown in Table 8-7, the tomato yield in the case of rain-fed farming is low, and farmers have limited incentives to use improved varieties whose seeds are expensive but whose yields are higher[8].

3) Farmers' cultivation skills

The cultivation skills of the small-scale farmers who produce most of the tomatoes in Nigeria

[7] The National Horticultural Research Institute plans to start researching Ralstonia solanacearu soon.
[8] Based on an interview with the FMARD.

are generally poor, which is a major factor in the low productivity of tomato farming in Nigeria. The ADP is responsible for providing agricultural extension services to farmers, but most ADP offices have a limited number of tomato farming experts, with the exception of some areas, like Kano province[9].

4） Inadequate cold-chain facilities

Rural areas of Nigeria have very few refrigerators that are accessible to farmers, and tomato wasting in fields is quite high[10]. When tomato prices are so low that the farm gate tomato price is lower than cost of producing tomatoes, many farmers dispose of tomatoes rather than harvesting them[11].

8.3.4. Processing

（1） Primary processing

Primary tomato processing involves transforming fresh tomatoes into tomato paste, and secondary processing involves producing tomato products, such as tomato sauce and seasoning, from tomato paste. Before 2017, Nigeria had only a few primary processors, and most secondary processors imported tomato paste from China and other countries to produce tomato products. However, the government of Nigeria banned imports of fresh tomatoes in May 2017, and several large-scale primary processors have been set up since then (see Table 8-11).

Some of these plants, however, are not currently operating at full capacity or do not operate at all because of the unstable supply of raw materials (fresh tomatoes). The major reason for this unstable supply is the gap between the prices at which processors are willing to purchase fresh tomatoes and the prices that farmers desire. Processors are willing to pay 40–45 NGN for tomatoes, but the cultivation costs of tomatoes are higher when the yield is 7–8 tons. In addition, farmers can sell their tomatoes to be eaten fresh at higher prices[12], meaning that few farmers are willing to sell their tomatoes to processers[13]. Many primary processors have organized contract farming to procure tomatoes, but they face many cases of tomato side-selling, and most of them are unsuccessful in processing tomatoes from contract farmers[14].

[9] Based on interviews with the FMARD and ADP Lagos.
[10] According to an FMARD estimate and hearing to JIRCAS, tomato wastage is about 40% of total production.
[11] Based on interviews with the FMARD and ADP Lagos.
[12] However, when the tomato supply increases, the price of tomatoes to be eaten fresh sometimes decreases to the level of the price of tomatoes for processing.
[13] Based on interviews with some processors, such as GB Foods and Olam.
[14] Erisco has a long-standing relationship with farmers in Kebbi province and does not have issues procuring fresh tomatoes for processing (based on an interview with Erisco).

Table 8-10: Major primary processing plants for tomatoes in Nigeria

Primary processor	Plant location	Processing capacity (tons/day)	Notes
Dangote	Kano province	1,200	Not operating as of January 2020.
Savare Integrated	Not known	Not known	
Ikara	Kaduna province	Not known	
Perfect integrated	Not know	70	Not operating as of January 2020.
RAU	Taraba province	Not known	
GB Foods	Kebbi province	4	
Sonia Foods	Lagos city	Not known	
Erisco	Kebbi province	Not known	
Aldusa	Katsina province	4	

Source: The Survey Team

（2） Secondary processing

The primary processors listed in Table 8-10 also conduct secondary processing, in which tomato products, such as tomato sauce and seasoning, are produced from tomato paste[15]. Many of the secondary tomato processing plants are located in the southern region, where the population is large and demand for these products is high.

8.3.5. Distribution

Most tomato distribution in Nigeria is carried out by middlemen, who are called traders. Traders visit tomato farms to collect and pack tomatoes. They then deliver the packed tomatoes to wholesale markets in non-refrigerated trucks. The tomatoes are sold to retailers in the wholesale markets and are delivered via the retailers' trucks or motorbikes. As the road conditions are usually bad and the packing material is usually paper or wood, many tomatoes are crushed during delivery[16].

[15] In addition to these firms, Olam is engaged in secondary tomato processing.
[16] Based on interviews with retailers and wholesalers at the Benin wholesale market.

Packing of tomatoes

Tomato delivery via small truck

A small number of large-scale commercial tomato farmers have their own reefer trucks and use them to deliver their tomatoes to large-scale buyers, such as Shoprite. A major issue for commercial tomato farmers and large-scale retailers is that very few transportation firms have cold chains.

(Left) Greenhouse at Wells Hosa Greenhouse Farms in Benin city (Right) The farm's truck

Most fresh tomatoes and tomato products (such as tomato sauce and seasoning) are sold to consumers through open markets or small retail shops. Although some big cities, such as Lagos, have many supermarkets, the volumes of fresh tomatoes and tomato products sold in supermarkets comprise only a small portion of all tomatoes and tomato products distributed in Nigeria[17].

8.3.6. Imports, exports, and the domestic market

（1） Imports and exports

Table 8-11 shows the values of exports and imports of fresh tomatoes and tomato paste for Nigeria. Before imports of fresh tomatoes and tomato paste were banned in May 2017, Nigeria imported a large volume of tomato paste. However, exports of fresh tomatoes and tomato paste are very small. Most of the fresh tomatoes and tomato products produced in Nigeria are consumed

[17] The tomatoes and tomato products sold at supermarkets are estimated to be about 5% of the total volume of tomato distribution (based on interviews with the FMARD and processors).

domestically.

Table 8-11: Values of exports and imports of fresh tomatoes and tomato paste in Nigeria (1,000 USD)

Year	Fresh tomatoes		Tomato paste	
	Value of exports	Value of imports	Value of exports	Value of imports
2011	13	71		162,279
2012	18	111		186,677
2013	2	194		223,713
2014	9	301	250	191,484
2015	3	385	70	94,163
2016	14	489	94	59,631
2017	0	986	18	65,541

Source: FAOSTAT

（2） Domestic market

The demand for fresh tomatoes and tomato products is quite high in Nigeria and is expected to continue to increase in the future as Nigeria's population increases.

8.3.7. Policies and the role of the government

Nigeria has no comprehensive policy related to tomato farming and processing as of January in 2020. Basic statistics, such as tomato production levels and harvest areas by province, do not exist, which is an issue facing the promotion of the tomato VC.

The government services offered to tomato farmers include extension services provided by the ADP. However, because the number of extension officers is small compared to the number of farmers and the number of tomato experts at the ADP offices is also small, only a limited number of tomato farmers can receive extension services from the ADP[18].

The headquarters of the National Horticultural Research Institute in Ibadan and its office in Kano province both have tomato experts, and they provide farmers with training on how to process tomato products, such as tomato puree.

8.3.8. Issues and opportunities

Table 8-12 shows the SWOT analysis for the tomato VC in Nigeria.

[18] For example, Abuja FCT has 300 extension officers, but only one of them is an expert on tomatoes. These officers are responsible for providing extension services to 170,000 farming households.

（1） Issues

One of the major issues facing the tomato VC in Nigeria is the low production yield owing to the small cultivation scale, the high prices of seeds of improved varieties, the low tomato cultivation skills of farmers, and inadequate irrigation facilities. In addition, the unstable supply of fresh tomatoes to primary processors is another major issue, as many farmers are unwilling to supply tomatoes to processors. The difficulty that processors face in organizing contract farming is one of the factors driving this unstable supply. The high wastage rate due to the unavailability of a cold chain and poor road conditions is another major issue.

（2） Opportunities

The tomato VC has potential because of a suitable climate for tomato production, the availability of vast lands that can be used to expand tomato plantations, the existence of several primary processors and a number of secondary processors, and the large and increasing demand for tomatoes and tomato products in the domestic market.

Table 8-12: SWOT analysis of the tomato VC in Nigeria

Strengths ● Suitable climate for tomato production ● Existence of vast lands that can be used for tomato plantation ● Existence of several primary processors and a number of secondary processors	Weaknesses Overall ● Very low production yields ● Limited research on pests and diseases ● Some diseases cannot be prevented For small farmers ● The scale of production is mostly very small ● Limited access to and knowledge of quality seeds for farmers ● Cross-pollination ● Farmers usually do not keep records ● No access to a cold chain, a lack of proper packaging material, bad road conditions, and price fluctuations, which lead to high wastage ● Limited access to processing facilities ● Lack of irrigation facilities (in some areas) For processors ● High transportation costs ● Lack of cold-chain services ● Difficulty of stable procurement ● Difficulty of organizing contract farmers, as side-selling is rampant
Opportunities ● Increasing demand in the domestic market	Threats ● Diseases and pests (especially in humid areas) ● Desertification

Source: The Survey Team

8.4. Cacao VC

8.4.1. Overview

Figure 8-11 shows an overview of the cacao VC in Nigeria. Small-scale farmers in Nigeria mainly produce cacao . Farmers use cacao seedlings and seeds that they prepare for themselves or that are produced by the Cocoa Research Institute of Nigeria (CRIN). Cultivation management is mainly labor intensive, and the main activity is fungicide application. Most of the produced cacao is sold to European counties by exporters through cacao cooperatives or licensed buying agents (LBAs), and the rest of the cacao is processed in Nigeria. Table 8-13 shows the prices of cacao at each stage of the VC.

Table 8-13: Cacao prices in Nigeria

Farm gate prices	800 NGN/kg of standard dried cacao (Ondo state ADP, CAN)	240 JPY/kg - 255 JPY/kg	(1 NGN＝ 0.3 JPY)
Wholesale prices	800-1,000 NGN/kg of standard dried cacao (Cocoa products (Ile-Oluji) Limited, Akure Cooperative Multipurpose Union)	255 JPY/kg - 300 JPY/kg	(1 NGN＝ 0.3 JPY)
Export prices	2 USD/kg of standard dried cacao (Cocoa Farmers Association of Nigeria (CFAN))	217 JPY/kg	(1 USD＝ 108.3 JPY)
	3 USD/kg of premium dried cacao (CFAN)	325 JPY/kg	
	1.6 USD/kg of substandard dried cacao (CFAN)	173 JPY/kg	(1 USD＝ 108.3 JPY)
International price	2727.70 USD/ton of standard dried cacao(ICCO, 30th January 2020)	296 JPY/kg	(1 USD＝ 108.3 JPY)

Source: The Survey Team

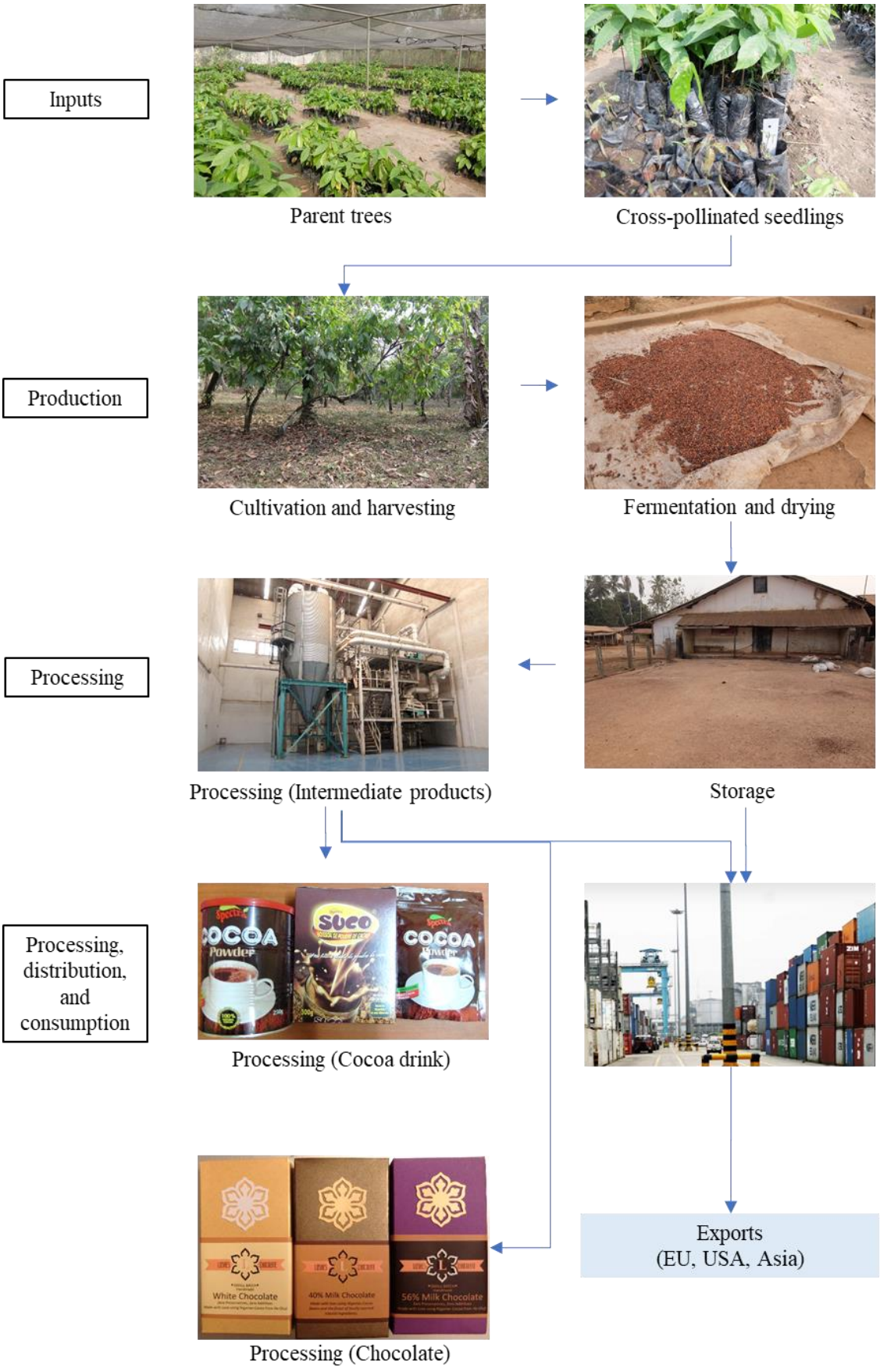


Figure 8-11: Overview of the cacao VC in Nigeria

Source: The Survey Team

8.4.2. Agricultural inputs

（1） Seeds and seedlings

The materials for planting cacao trees in Nigeria are seeds or un-grafted seedlings. CRIN produces and sells both cross-pollinated cacao pods and seedlings that are grown from cross-pollinated cacao seeds. Table 8-14 shows that about 30,000 seedings and 60,000 cacao pods were produced and provided by CRIN in 2019. These pods and seedlings were cross-pollinated[19], and CRIN has parent trees to produce them. The prices of cacao pods and seedlings are 200-300 NGN and 150-200 NGN, respectively. A cacao pod contains approximately 40 seeds, implying that pods are more economical for planting than seedlings are. Thus, the demand for cacao pods is higher than that for seedlings. Neither government organizations[20] nor farmers know the proper grafting technique. Tissue culture is conducted in CRIN at the experimental scale. Thus, even if seeds and seedlings are categorized as the same variety, their planting materials are genetically different from each other. CRIN has developed eight cacao varieties, as shown in Table 8-15, and propagates and disseminates them, but proper performance cannot be expected because the seeds or seedlings are genetically non-uniform. Farmers generally use seeds that they obtain from their farms when they plant cacao trees, but they cannot expect the planted trees to perform similarly to their mother trees for the same reason.

Table 8-14: Numbers of cross-pollinated cacao pods and seedlings produced and provided by CRIN in 2019

CRIN station	Location	Number of cacao pods	Number of seedlings
1. CRIN Headquarters	Ibadan, Oyo State	45,000	63,750
2. Ajassor Substation	Cross River State	15,000	20,000
3. Ibeku Substation	Abia State	870	240
4. Uhomonra Substation	Edo State	125	8,000
5. Owena Substation	Ondo State	2,350	1,700
	Total	63,345	29,940

Source: CRIN

Table 8-15: Characteristics of eight cross-pollinated varieties of cacao provided by CRIN

Variety	Adaptation	Disease Tolerance	Yield Potential (tons/ha, dry beans)
TC-1	-Moist savanna -Humid forest	Moderately resistant to Phytophthora pod rot	1.9–2.2 (Mean: 2.04)

[19] Specifically, these seedlings are cross-pollinated between the Forastero and Trinitario varieties. The Criollo varieties are not available in CRIN.

[20] FMARD, CRIN, and state ADPs

TC-2	-Moist savanna -Humid forest	Moderately resistant to Phytophthora pod rot	1.94–2.3 (Mean: 2.12)
TC-3	-Moist savanna -Humid forest	Highly resistant to Phytophthora pod rot and mirids	1.7–2.0 (Mean: 1.85)
TC-4	-Moist savanna -Drier areas	Highly resistant to Phytophthora pod rot and mirids	1.5–1.8 (Mean: 1.6)
TC-5	-Moist savanna -Drier areas	Resistant to mirids and the “witches broom” disease of the Americas	1.5–1.85 (Mean: 1.7)
TC-6	-Moist savanna -Humid forest	Highly resistant to Phytophthora pod rot	1.4–1.65 (Mean: 1.5)
TC-7	-Moist savanna -Humid forest	Moderately resistant to Phytophthora pod rot and highly resistant to mirids	1.6–1.9 (Mean: 1.73)
TC-8	-Moist savanna -Humid forest	Resistant to Phytophthora pod rot and mirids	1.2–1.5 (Mean: 1.34)

Source: CRIN

（2） Fertilizer

In Nigeria, fertilizer is applied only when a seedling is transplanted from a nursery to a farm and is not used after transplantation. Some farmers heap empty cacao pods around the bases of old cacao trees with lower yields to serve as fertilizer.

（3） Pesticides

The major diseases of cacao trees in Nigeria are Phytophthora pod rot and Cacao swollen shoot virus, which is transmitted by mealybugs. Some pests, such as mirids and young worms, damage stems and cacao pods. Farmers use a fungicide to control Phytophthora pod rot but do not use pesticides, as cacao has insect-pollinated flowers and blooms and is pollinated throughout the year.

According to CRIN, several kinds of fungicides and pesticides are allowed to be used for cacao trees[21]. However, CRIN, the Ondo State ADP, and the Cacao Association of Nigeria mentioned that many imitation or adulterated agricultural chemicals are sold on the market.

8.4.3. Production

（1） Production and production areas

Figure 8-12 and Figure 8-13 show the area under cultivation and the production volume of cacao, respectively, by state in Nigeria. The two figures indicate that the Ondo, Osun, and Cross River States are major producers of cacao in Nigeria. Figure 8-14 and Figure 8-15 show the same data on a map of Nigeria. These figures indicate that cacao is popularly cultivated in the southern part of Nigeria, specifically in the South West, South South, and South East zones. The suitable

[21] These kinds are Actara, Ultimax Plus, Kocide 101, Ridomil Gold, Funguran OH, Champ DP, and Copper Nordox.

environment for cacao cultivation is a rainforest where the temperature does not fluctuate much throughout the year, with an average above 20°C, and where the annual rainfall is greater than 1,500 mm. The southern part of Nigeria satisfies these conditions well. However, the two figures reveal that cacao production is not very popular in some states in the southern part of Nigeria. There is still room to expand cacao cultivation in these states.

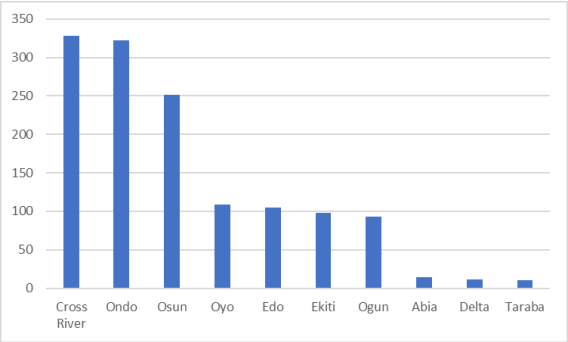


Figure 8-12: Area of cacao under cultivation in the top ten states in Nigeria in 2011 (ha)

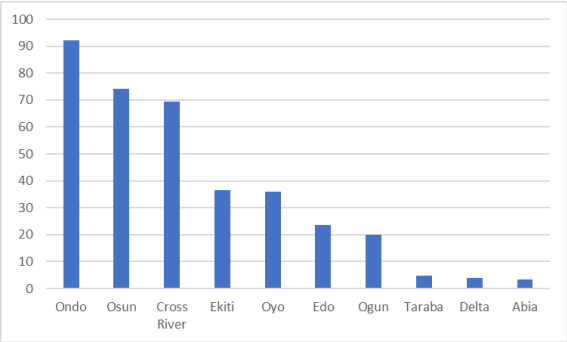


Figure 8-13: Volume of cacao production in the top ten states in Nigeria in 2011 (tons)

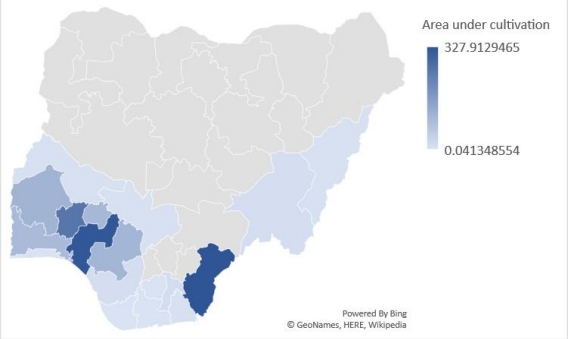


Figure 8-14: Area of cacao under cultivation by state in Nigeria in 2011 (ha)

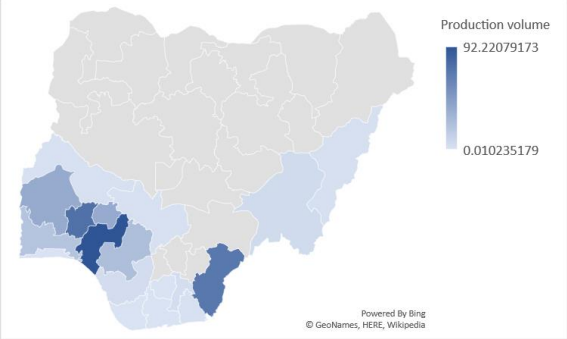


Figure 8-15: Volume of cacao production by state in Nigeria in 2011 (tons)

Source: National Bureau of Statistics, Nigeria.

(2) Production of Nigeria

Figure 8-16, Figure Figure 8-17, and Figure 8-18 show the production volume, area harvested, and yield of cacao in Nigeria, and Figure 8-19 shows yields by variety. These figures indicate that cacao has not been widely produced in Nigeria in recent years. The peak years for the production volume, harvested area, and yield are 2006, 2009, and 1998, respectively. The assumed reasons for this trend are i) reduced yield due to aging cacao trees, ii) the shrinking of cacao farms as cacao farmers age, and iii) lower yields and areas of cacao farms due to disease. Cacao trees can bear fruit until they reach 60 to 80 years of age, but their yield peaks at six to seven years and drops sharply 18 years after planting. Ideally, a cacao tree should be replaced when it reaches 20 years of age. The cacao cultivation area drastically increased from 1999 to 2008 according to Figure 8-17, large-scale rehabilitation of cacao farms will be necessary starting in 2019. CRIN

and the state ADPs recommend that cacao farmers replace aging cacao trees in stages, but farmers are reluctant to replace old, low-yield cacao trees because doing so lowers production for several years. Planting new trees by expanding the farm area and keeping old cacao trees is another option, but this process is also difficult because cacao farmers are aging and youth are migrating from rural to urban areas.

Figure 8-20 shows that farmers who are older than 41 years old account for more than 70% of all cacao farmers in 2007. It was easy to see that cacao farmers were aging in 2007, and this tendency has become more serious now. One reason for the migration of youth from rural to urban areas is the difference in the living standards of the two areas. Cacao stakeholders in Nigeria mentioned that cacao production does not attract youth in rural areas.

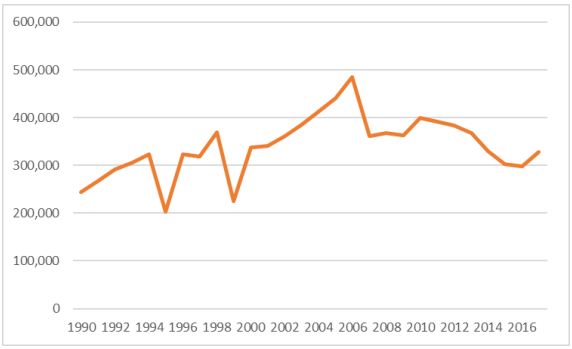


Figure 8-16: Production volume of cacao in Nigeria (tons)

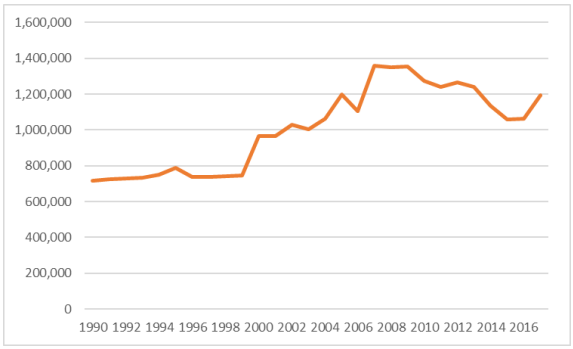


Figure 8-17: Area of cacao harvested in Nigeria (ha)

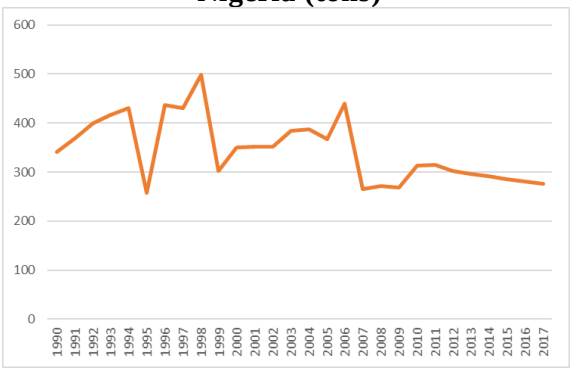


Figure 8-18: Cacao yield in Nigeria (kg/ha)

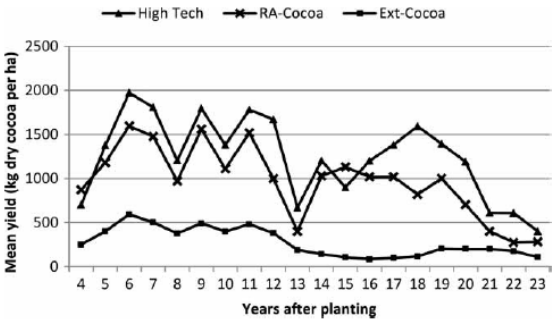


Figure 8-19: Average yields of the three varieties of cacao

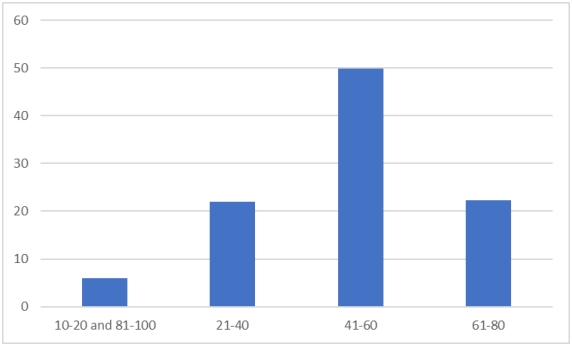


Figure 8-20: Ages of cacao farmers in Nigeria in 2007

Source: Ahenkorah et al. (1987)
Source: FAOSTAT (Figure 8-16, Figure 8-17, and Figure 8-18)
Source: Cocoa production survey 2007, CRIN (Figure 8-20)

(3) Cultivation

The cultivation management of cacao is conducted manually in Nigeria. After a seedling has been transplanted to a farm, the main form of cultivation management is disease control, specifically, removing pods affected by Phytophthora pod rot, applying fungicide to control the disease, and cutting down the trees infected with Cacao swollen shoot virus. Cacao is harvested throughout the year in Nigeria. The main season is from September to March, and the light season is from June to August. Mature cacao is immediately harvested for proper fermentation and to prevent theft. Farmers harvest cacao every 15 days during the main season. Disease control and harvesting are the major activities on cacao farms.

(4) GLOBALG.A.P. and MRLs of European countries

Most of the cacao produced in Nigeria is exported to European countries. Cacao produced in Nigeria is rarely rejected owing to a lack of conformity to the MRLs. It is estimated[22] that fewer than 5% of cacao farmers and cacao cooperatives have GLOBALG.A.P. certification, whereas around 80% of cacao exporters have the certificate. The Produce and Inspectorate Department of each State Ministry of Agriculture conducts sample inspections of cacao at LBAs, but out-graded cacao is seldom found.

8.4.4. Processing

Harvested cacao is fermented and dried. The global standard method of fermenting is to sift cacao beans from the top to the bottom of stepped fermentation boxes, which takes six to seven days. In Nigeria, cacao beans are wrapped in banana leaves for fermentation without using boxes. Farmers or middlemen generally collect a certain amount of cacao beans for fermentation, meaning that the first cacao beans collected start fermenting before others arrive. As a result, the degree of fermentation differs among the collected beans. Moreover, using banana leaves rather than standardized fermentation boxes makes the quality control of fermented cacao beans more difficult.

Fermented cacao beans are sun-dried on concrete slabs or tarpaulin sheets on the ground. Foreign material, such as stones and sand, is naturally mixed in with the cacao beans, and dried cacao beans are rarely cleaned. As a result, the rate of foreign matter in cacao from Nigeria is 5%, which is higher than 0–1% and 3% for cacao produced in Ghana and Côte d'Ivoire, respectively.

Almost all of the dried cacao produced in Nigeria is exported. A small amount of dried cacao is processed[23] to make cacao butter and cacao mass for export and cocoa powder for the domestic

[22] From a meeting with the Cocoa Association of Nigeria
[23] Cocoa Products (Ile-Oluji) Limited, FTN Cocoa processors Plc., and so forth

market. Figure 8-21 shows that the volume of ground cacao for processing has decreased in recent years. Figure 8-22 indicates that the volume of ground cacao in Nigeria is much smaller than that in other cacao-producing countries. The volumes of ground cacao in Côte d'Ivoire, Ghana, and Indonesia are increasing. As shown in Figure 8-11, cocoa powder[24] and chocolate[25] are produced in Nigeria for the domestic market, as is further described in section 8.4.6.

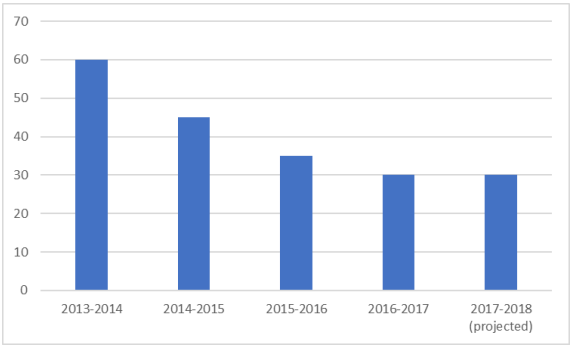


Figure 8-21: Volume of ground cocoa in Nigeria (tons)

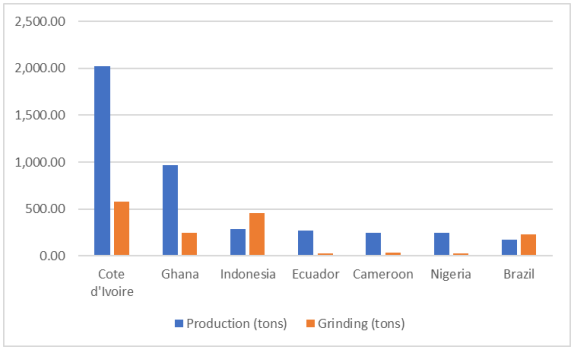


Figure 8-22: Cocoa production and grinding in major cacao-producing countries in 2016–2017 (tons)

Source: International Cocoa Organization (ICCO)

8.4.5. Distribution

(1) Transportation

Dried cacao beans are transported without a cold chain, and the means of transportation are diverse and include pick-up trucks and marine containers. Access between farms and fermentation and drying sites is the biggest transportation challenge. It is common that motrable roads are not available or difficult to pass during the rainy season even they are available, which is one of the constraints to expanding cacao farms. Congestion at the Lagos ports is also a serious problem. As a result, it takes 20 days from dispatching cargo at a warehouse in Lagos to shipping it at a Lagos port, greatly increasing the time and cost of exports and squeezing export companies' profits. Cacao exporters are located in Lagos[26] and Ondo States,[27] which are the major cacao-producing states.

8.4.6. Imports, exports, and the domestic market

(1) Exports of cacao from Nigeria

Most of the cacao produced in Nigeria is exported. However, Figure 8-24 shows that a sizable gap exists between the production and export volumes. Stakeholders in the cacao VC mentioned that a meaningful portion of produced cacao is exported through improper processes or smuggled

[24] Cocoa Products (Ile-Oluji) Limited, Spectra Food Industry, and so forth.
[25] Loshes Chocolate, Pod Chocolate, and so forth.
[26] Olam, for example.
[27] Nivik, for example.

abroad to the Benin Republic and Cameroon. They also mentioned that the congestion at the Lagos ports induces improper or illegal exports. In fact, the volume of cacao exported from Nigeria has decreased in recent years, as shown in Figure 8-23.

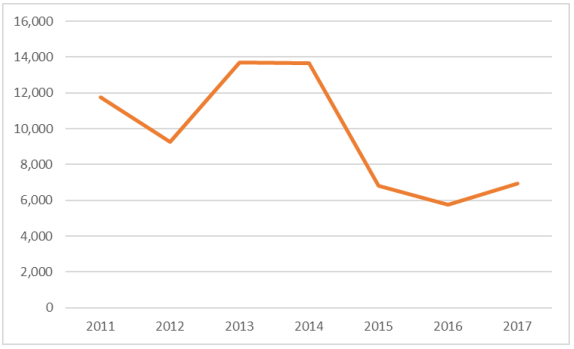


Figure 8-23: Volume of cacao exports from Nigeria (tons)

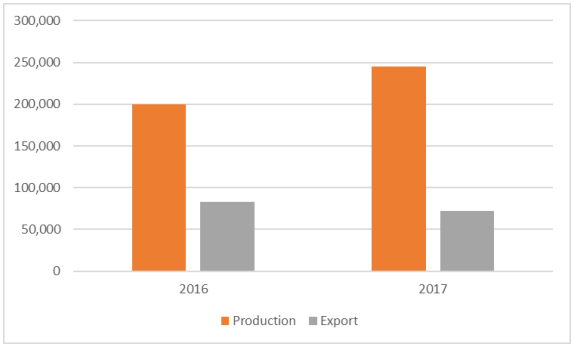


Figure 8-24: Production and export volumes of Nigerian cacao (tons)

Source: UN Comtrade (export), ICCO (production).

（2） Domestic market

As described in section 8.4.4, cocoa powder and chocolate are produced in Nigeria for the domestic market. The price of a chocolate bar is around 2,000 NGN, but the quality does not match the price, as chocolate bars are made from non-flavor beans[28] (flavor beans are not produced in Nigeria.). The price of cocoa powder for making a cocoa drink is not high, as shown in Table 8-16. The domestic market for cocoa powder is large enough to allow several companies to produce similar products. Considering the large market for cocoa-flavored products, such as Milo, there is room to expand cocoa powder sales if the companies develop attractive new products. Cocoa powder is rich in nutrition, and several cocoa powder makers are lobbying the Nigerian government to introduce cocoa powder into school feeding programs.

Table 8-16: Prices of cocoa-flavored drinks and their competitors in Nigeria

Company	Product name	Price (NGN)	Unit price (NGN/g)
Spectra Food Industry	Suco Cocoa Powder Drink (packet) 300 g	420	1.4
	Pure Cocoa Powder Drink (packet) 300 g	450	1.5
Amel International Services Limited	Susan Pure Cocoa Powder (packet) Drink 300 g	750	2.5
Nestle	Milo 500 g (can) x 2	2,400	2.4
	Milo 500 g (packet) x 2	2,200	2.2
Cocoa Products (Ile-Oluji) Limited	Oluji Pure Cocoa Powder (packet) 250 g	500	2.0

Source: Nestle (Jumia), Spectra Food Industry (Yahoota), Oluji (Aivon.ng), Susan (Exclusive supermarket)

[28] Flavor beans are quality cacao beans with less bitterness that are rich in flavor. Cacao beans of the Criollo and Trinitario varieties are regarded as flavor beans.

8.4.7. Policies and the role of the government

The policy to promote the cacao industry was the Cocoa Transformation Agenda (2011–2015), but it has not been updated as of now. The Agricultural Promotion Policy 2016–2020 is the current policy for the agricultural sector. Cacao is listed as one of the prioritized crops for export, and the following actions are planned to promote cacao.

- Development of high-yield varieties
- Distribution of seedlings of varieties that can mature faster
- Strengthening of relationships with the ICCO and the World Cocoa Federation
- Considering re-establishing the cocoa marketing board

Currently, the Federal Ministry of Industry, Trade, and Investment (FMITI) has initiated a task force with several stakeholders, including the FMARD, to address the formulation of the National Cocoa Plan of Nigeria (2019–2028). The plan involves making investments in the cacao sector with a loan of as much as 600 million USD from Afreximbank in Egypt. As Afreximbank asked the FMITI to formalize the plan as part of government policy, the plan was submitted to a cabinet meeting, and approval is expected to be granted soon (as of January 2020).

8.4.8. Issues and opportunities

（1） Issues

Table 8-17 shows the results of the SWOT analysis for the cacao VC in Nigeria. The VC has several weaknesses. Although CRIN has developed cross-pollinated varieties, the planting materials for the varieties are grown from seeds. They are not genetically uniform, and they may not perform as expected. Cacao trees and farmers are aging simultaneously, and the youth in rural areas are losing interest in cacao farming. As a result, aging trees are not being replaced by young trees, and the cacao farming and production areas are decreasing. Improper facilities and methods for fermenting and drying cacao beans lead to lower quality beans and higher rates of foreign matter, resulting in lower export prices. Sharecroppers are responsible for a portion of cacao production, but they may not engage in cacao production for a long period, leading to low levels of investment in cacao production and insufficient skills. The quality does not affect the farm gate price, making farmers less motivated to improve quality. Cocoa powder is relatively less expensive, but its nutritional value is not well known among the general public.

The threats of the VC are high international standards in the cacao global market, such as a lower rate of foreign matter, and intense competition with other countries.

（2） Opportunities

The cacao VC in Nigeria has several strengths. Nigeria has vast land that is suitable for cacao

cultivation and a large rural population. Thus, there is great potential to increase the production volume of cacao. CRIN has technical capabilities in terms of breeding and pest and disease control. Importers of Nigerian cacao may appreciate that ship backs of the cacao rarely occur. Cacao production and trading are not controlled by any authority, as cacao board previously did.

Several opportunities for the VC are also observed. Newly emerging economies have rapidly increased their demand for cacao. These are prospective markets for Nigeria, as they prefer the less expensive cacao that Nigeria produces. Ghana and Côte d'Ivoire, strong competitors to Nigeria, have levied a fixed living income differential as much as 400USD/ton on exported cacao since 2019. This additional charge on cacao has improved the price competitiveness of Nigerian cacao. The prohibition of imported cacao products provides domestic cocoa powder makers with a market for cocoa drinks.

Table 8-17: Results of the SWOT analysis of the cacao VC in Nigeria

Strengths	Weaknesses
● Vast suitable land for cultivation in 22 states ● Locally developed hybrid varieties ● CRIN knows methods for rehabilitating old farms ● CRIN knows methods for pest and disease control ● Liberalized cocoa trade in Nigeria and overseas ● Developed cocoa value chain that links stakeholders ● Existence of two IITA tissue culture laboratories ● Few ship backs due to residual pesticides ● Government's Favorable treatment of micro, small, and medium enterprises	● Seedlings of the same variety are not genetically uniform ● Flavor bean varieties are unavailable. ● Decreased productivity due to aging trees and less rehabilitation. ● Aging farmers and less interest of youth in the rural areas ● Grafting techniques are not known by extension officers and farmers ● Lowered production by black pod disease, CSSV, and so on ● Fake and/or adulterated agricultural chemicals are used. ● Fermentation box is not frequently promoted. ● Raised bed is not much promoted for drying. ● Low compliance of farmers and LBAs with international standards ● Ratio of foreign mattes is 5%, whereas those of Ghana and Cote d'Ivoire are 0-1% and 3%, respectively. ● The rainy season affects the drying process and quality of cacao. ● Low retention of share-croppers leading to low skills and low investment in cocoa farming ● Underdeveloped roads and electricity affect logistics and processing. ● Quality is not necessarily reflected in farm gate prices ● Access to credit is difficult and interest rates are high. ● Nutrition value of cocoa is not widely known. ● Risk of theft increases security costs.
Opportunities	**Threats**
● Growing demand of cacao in emerging nations ● Growing domestic market for cocoa & cocoa-like drinks ● Importation of cocoa is banned. ● Côte d'Ivoire & Ghana set a fixed living income differential	● High market requirement (foreign matte, size, and so on) ● Many competitors in Africa, Asia, and Latin America

Source: The Survey Team

8.5. Logistics

8.5.1. Background and purpose of the logistics survey

In Nigeria, which has a vast land area, logistics are an important indicator of the business environment. Through interviews with Japanese companies, this survey confirmed a high interest in logistics, such as the development of logistics infrastructure, the presence or absence of reliable logistics companies, physical distribution costs, and the ease of importing and exporting. Thus, a logistics survey was conducted to collect information about the current situation and logistics problems and to present possible solutions. The survey focused on (1) roads (domestic transport) and (2) ports (imports and exports), which are highly relevant to the transportation of sesame, cacao, and tomatoes, to conduct a focused survey over a limited period.

8.5.2. Current status and issues of logistics

（1） Transportation policies

The transportation sector is under the control of the Federal Ministry of Transport. The main national development strategy is the Master Plan for Integrated Transportation Infrastructure (MPITI), developed by the Ministry of Budget and National Planning in 2002. The MPITI describes strategies for developing passenger and cargo transportation systems. The National Integrated Infrastructure Master Plan (NIIMP), formulated in 2015, describes strategies for prioritized transportation sector projects, such as the rehabilitation and expansion of highway and regional road networks, the enhancement of connectivity to non-road public transportation, and the facilitation of private investment.

（2） Current status of major logistics infrastructure

Roads account for 90% of Nigeria's domestic and cross-border passenger transportation and freight shipments. Nigeria has the second largest road network in Africa, with a total distance of 200,000 km. However, its road pavement rate is only 18%. The maintenance and rehabilitation of the vast road network across the country has become a major issue. The total weight of the cargo handled by the six domestic ports[29] is 72 million tons (2017), of which 18.9 million tons (about 26%) are transported via Apapa Port in Lagos. By air, five international airports[30] and 20 domestic airports are operating[31]. Nigeria’s railways include 3,505 km of narrow track lines and 512 km of regular track lines, and there are 304 stations nationwide[32].

The main projects under development for each type of infrastructure are as follows.

[29] Apapa, Onne, Port Harcourt, Delta, Calabar, and Tin Can Ports
[30] Lagos, Abuja, Kano, Enugu, and Port Harcourt airports
[31] Nigeria Investment Guide (Jan. 2020)
[32] NIIMP (2015)

- ✓ Roads: The 1.6 km "Second Niger Bridge[33]" over the Niger River between the southern Delta province and Anambra province is under construction (scheduled to be completed in 2022), along with dozens of other rehabilitation and expansion projects.
- ✓ Ports: The first deep sea port in Nigeria, "Lekki Deep Sea Port," is under construction by the China Development Bank in the Lagos Free Trade Zone (scheduled to be completed in 2022).
- ✓ Airports: Remodeling of the five major international airports is under way.
- ✓ Railways: A new 1,402 km line connecting the coastlines of Lagos and Calabar is under construction by the China Civil Engineering Construction Corporation[34] (no projected completion date). Other new lines are under construction between Abuja, Nyanya, and Kubwa and between Lagos and Ibadan.

（3） Roads

As described above, the poor pavement of the roads is a problem. The Federal Road (Route A2) spans more than 1,000 km from the northern Kano province[35], the main production area of tomatoes and sesame seeds, to the southern Lagos province. Small-scale farmers generally load tomatoes into baskets made from bamboo-like materials and transport them via bus or motorbike. However, owing to the poor pavement conditions, deterioration in quality and tomato losses are caused by vibration during transportation. Nigeria's post-harvest loss is worth ten billion dollars[36] a year, with 40-50% of fruits and vegetables losing their economic value.

The transportation time from Kano to Lagos via road is two days one way, and that from Abuja to Lagos is 1.5 days[37]. However, roads are frequently blocked by traffic accidents and construction, which increases transportation costs and risks[38].

[33] The Onicha metropolitan area of Ananbra province is the economic center of commerce, industry, and education, and the completion of the bridge is expected to improve logistics efficiency by reducing congestion on existing roads.
[34] A subsidiary of China's leading international construction company China Railway Group Limited
[35] Kano province is a trading hub with the second largest population in Nigeria (more than four million people). It is one of the main agricultural production areas as well as a large market for agricultural products. Buyers from Niger, Chad, Central African Republic, Benin, Togo, and elsewhere come to buy crops.
[36] Report (2019) from the Organization for Technology Advancement of Cold Chain in West Africa (OTACCWA)
[37] Based on an interview with Kobo360
[38] Based on an interview with J.O.F. (Nigeria) Limited

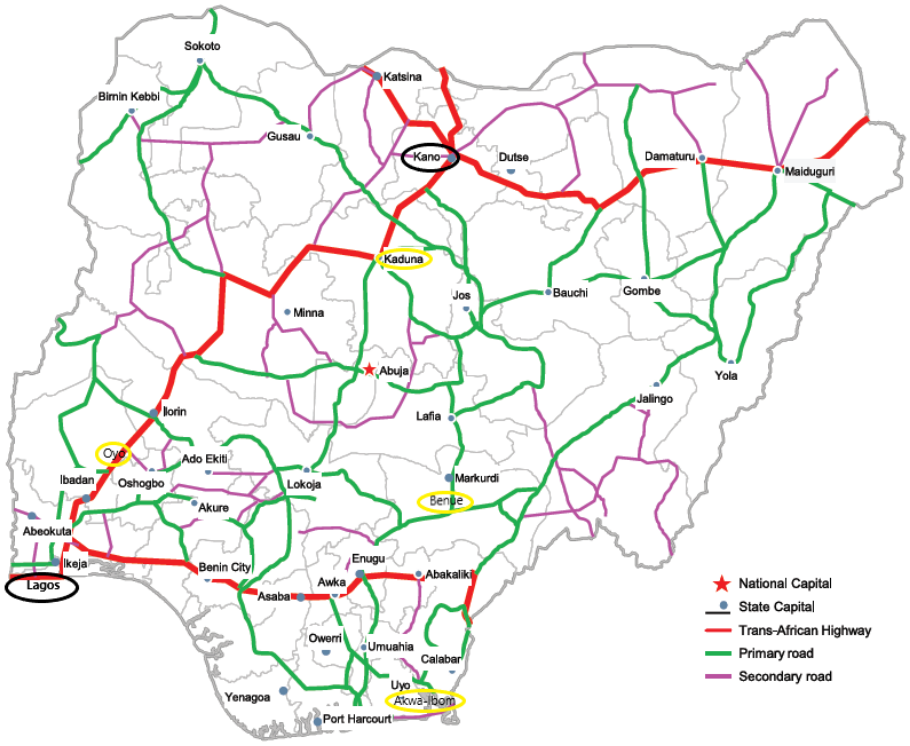


Figure 8-25: Road network in Nigeria

Source: The Survey Team, based on the NIIMP (National Planning Commission, 2015)

Table 8-18 shows the cost of transporting 20/40 feet containers via road from Nigeria's major agricultural production areas to Lagos.

Table 8-18: Transport costs from major agricultural production areas to Lagos via road

USD	Akwa-Ibom	Benue	Kaduna	Kano	Oyo
Lagos (20 ft)	1,222–1,477	1,373–1,633	1,402–1,696	1,758–2,131	670–1,010
Lagos (40 ft)	1,830–2,216	1,865–2,265	1,876–2,271	2,346–2,840	1,314–1,588

Source: Nigeria Investment Guide (Nigerian Investment Promotion Commission, Jan. 2020)

Box 8.1: Kobo360

Kobo360 is a startup operating an online platform that connects truck drivers and companies who need logistics services. The company was founded in 2017. As of January 2020, it has operations in Nigeria, Kenya, Togo, Ghana, and Uganda. It employs approximately 200 staff and approximately 6,000 registered drivers. About 20 sub-centers throughout Nigeria, including in the Northern (Kano province, etc.) and Eastern regions (Otoko province, etc.), provide resting places and other support, such as vehicle maintenance, to registered drivers. The load capacity of a registered truck is 2–60 tons. Registered drivers can purchase trucks, tires, gasoline, and so forth from partner companies at a discounted price. Agricultural products, such as flowers and cereals, are 65–70% of the total products handled. The company does not handle the transportation of fresh products that require temperature control. It plans to expand its business to Tanzania, Egypt, and South Africa by 2020.

Current status of the cold chain

Sesame and cacao are export crops, but tomatoes cannot meet domestic demand and they are sold in the domestic market.

As Figure 8-26 shows, Nigeria's cold storage capacity[39] in 2014 was 100,000 m^3, which is less than that of South Africa (300,000 m^3). There is a large gap between Nigeria and other countries, such as China (76 million m^3), the USA (115 million m^3), and India (131 million m^3). However, according to a study conducted by The Global Alliance for Improved Nutrition in 2018, the cold storage capacity in Lagos province was estimated to be 200,000 m^3 (217 refrigerated rooms and warehouses and 27 refrigerated vehicles), which is twice the estimated amount for the whole of Nigeria in 2014. It is assumed that there is more room for Japanese companies to enter the Nigerian market with frozen and refrigerated products, as the demand for the cold chain is expected to continue to grow steadily.

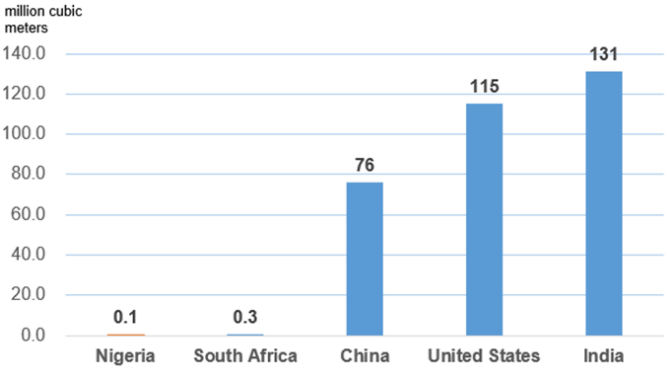


Figure 8-26: Comparison of cold storage capacity in Nigeria and other countries (2014)

Source: Study Team, based on the Global Cold Storage Capacity Report (International Association of Refrigerated Warehouse, 2014)

Box 8.2: Organization for Technology Advancement of Cold Chain in West Africa (OTACCWA)

OTACCWA was established in June 2018 as a cross-sectoral organization involving various companies, organizations, and experts from Nigeria and ECOWAS[40] member states. The organization aims to reduce post-harvest loss by establishing a cold chain through various activities, such as providing training to farmers and advice to investors. Some points made by OTACCWA regarding the current status and challenges of the cold chain are as follows.

- Farmers do not generally have refrigerators.
- Some exporters own frozen cars to transport some products, such as mangoes.
- Reefer containers are used to import fish, chicken, and tomatoes. However, none of Nigeria's export products requires temperature control, and, thus, the reefer containers are empty on the return route.
- Goods can be transported by plane with refrigeration equipment from the north to the south. However, the transportation costs are high.

Box 8.3: Kennie-O Cold Chain Logistics (KCCL)

KCCL is a startup founded in 2014 that provides refrigerated transport services. The founder, Mr. Ope, was a poultry farmer, but he founded the company because of his experience with the mass disposal of frozen chicken owing to temperature control problems during transportation. As of January 2020, the

[39] This measurement indicates the capacity of existing refrigeration facilities (including refrigerators, refrigerated vehicles, and so forth) in space (m^3).
[40] Economic Community of West African States

company owns four refrigerated vehicles and provides services to customers that include major supermarkets (e.g., Shoprite, etc.). The main products handled are fresh vegetables, such as tomatoes, carrots, and cucumbers. The company has its own farm (8 ha).
Two main issues with cold-chain development were raised.

- Long transportation times owing to poor road infrastructure

Expensive electricity costs owing to poor electrical infrastructure

（4） Ports

Nigeria is ranked 179th in Trading Across Borders[41] (2019), one of the WB's Doing Business indicators, which is lower than the rankings of South Africa (145th) and Ghana (158th). The times and costs to export goods (excluding tariffs) are shown in Table 8-19. In Nigeria, exports take 128 hours (about five days), which is roughly one day more than the average of 97.1 hours (about four days) in sub-Saharan Africa.

Table 8-19: Comparison of the time and cost of exporting cargo

Country	Trading Across Borders rank	Time to export—Border compliance[42] (hours)	Cost to export—Border compliance[43] (USD)	Time to export—Documentary compliance[44] (hours)	Cost to export—Documentary compliance[45] (USD)
Sub-Saharan Africa	NA	97.1	603.1	71.9	172.5
Nigeria	179	128	786	74	250
South Africa	145	92	1,257	68	55
Ghana	158	108	490	89	155

Source: Trading Across Borders (WB)

The times and costs to import goods (excluding tariffs) are shown in Table 8-20. Cargo imports take 242 hours (about ten days) in Nigeria, which is twice as long as the sub-Saharan African average of 126.2 hours. The time required for the document procedure is also longer than that in other countries.

[41] The time and cost of importing and exporting cargo (https://www.doingbusiness.org/en/data/exploretopics/trading-across-borders)
[42] The time to comply with laws and regulations related to customs clearance and inspection
[43] The cost to comply with laws and regulations related to customs clearance and inspection
[44] The time to comply with laws and regulations related to the acquisition, preparation, and submission of documents
[45] The cost to comply with laws and regulations related to the acquisition, preparation, and submission of documents

Table 8-20: Comparison of the time and cost of importing cargo

Country	Trading Across Borders rank	Time to import-Border compliance (hours)	Cost to import-Border compliance (USD)	Time to import-Documentary compliance (hours)	Cost to import-Documentary compliance (USD)
Sub-Saharan Africa	NA	126.2	690.6	96.1	287.2
Nigeria	179	242	1077	120	564
South Africa	145	87	676	36	73
Ghana	158	80	553	36	474

Source: Trading Across Borders (WB)

As mentioned above, cargo imports and exports in Nigeria face problems in terms of the time and cost of documentation and customs clearance.

One of the main reasons for the long transport time is congestion at Apapa and Tin Can Ports in Lagos. The two ports account for approximately 57% (Apapa 1,154 vessels, Tin Can 1,307 vessels) of all vessels that visited the six main ports[46] (4,292 vessels) in Nigeria in 2017[47]. According to an announcement[48] by the Nigerian Ports Authority in January 2020, the congestion at Apapa Port has worsened, and it can take three weeks to anchor a ship and unload its cargo. The World Food Programme (WFP) used Tin Can Port prior to 2018, but it has been using Port Harcourt in the southeast since 2018 owing to the congestion at Tin Can Port[49].

The capacities of the six existing ports and Lekki Deep Sea Port (under construction) are shown in Table 8-21. The completion of Lekki Deep Sea Port construction is urgent because the gap in cargo handling capacity is expected to reach 5.5 million TEUs[50] by 2025[51], whereas it was 0.8 million TEUs in 2016.

Table 8-21: Capacity of the existing six ports and Lekki Deep Sea Port

	Apapa Port	Tin Can Port	Rivers Port	Onne Port	Calabar Port	Delta Port	Lekki Deep Sea Port
Cargo handling capacity (million TEUs/year)	3.9	3.8	0.2	0.8	0.15	0.33	2.5
Quay (meters)	2,537	3,396	704	-	174	572	1,200
Number of berths	21	13	8	16	7	20	3
Depth (meters)	13.5	13.5	9.5	11	6.4	5.9	16.5

Source: The Survey Team, based on Handbook 2018/19 (Nigerian Ports Authority) and Lekkiport.com

[46] Apapa, Tin Can, Delta, Rivers, Onne, and Calabar Ports
[47] Nigerian Ports Authority, Handbook 2018/19
[48] Vanguard News (accessed February 2020) https://www.vanguardngr.com/2020/01/port-congestion-npa-declares-emergency-on-lagos-ports/
[49] Based on an interview with the WFP.
[50] Twenty-foot Equivalent Unit
[51] Lekki Port website (accessed February 2020) https://lekkiport.com/about-lekki-port-lftz-enterprise/the-port/

Figure 8-27 shows a picture of the road near Tin Can Port from Google Maps. Dozens of container trucks are lined up on the road.

Figure 8-27: Congestion at Tin Can Port in Nigeria

Source: Screenshot from Google Maps (accessed January 2020)

Based on interviews with logistics companies, government agencies, and the JETRO Nigeria Office, the causes of congestion at Apapa and Tin Can Ports can be organized into three main issues.

1) Access to the ports

The most important issue is traffic congestion near the ports. The following factors in this problem were mentioned.

- Poor road conditions[52]
- Poor driving and parking methods
- Lack of regulatory control and corruption
- Overloading of trucks
- Frequent traffic accidents[53] for these reasons

Figure 8-28: Congestion at Apapa Port in Nigeria

Source: Vanguard News (accessed February 2020)

https://www.vanguardngr.com/2018/07/apapa-congestion-lagos-sympathises-with-residents-commuters/

[52] Two roads enter Apapa Port, but one of them is unusable (from an interview with the WFP).

[53] Vehicles are old, and engine failure is likely to occur. Traffic jams are worsened when broken down cars are repaired because some vehicles roll over owing to a lack of necessary equipment, such as jacks (based on an interview with Kobo360).

2） Capacity of the ports

- Inefficient operation of existing facilities and equipment
- Lack of cargo handling capacity at container terminals
- Port inspection takes a long time owing to a lack of X-ray screening machines[54]

3） Other external factors

Nigeria's land border has been blocked since August 2019, and cargo that would be imported and exported by land has been concentrated at the ports.

The increase in the urban population of Lagos also contributes to worsening traffic congestion. Trucks, cars, buses, taxis, motorbikes, and school buses are mixed on roads, causing traffic jams.

In addition to the above issues, the NIIMP (2015) lists other challenges, such as frequently changing policies, the presence of a number of government agencies, improved electricity supply to ports, inefficient customs clearance operations and systems, and a lack of human resources.

8.5.3. Constraints of this survey and proposal

The congestion at Apapa and Tin Can Ports is a serious issue, and if it continues, it will be a major barrier to the economic activity of local and multinational companies and Japanese companies in Nigeria. Although this survey presents an overall picture of the problem, it is not possible to identify priority issues or examine concrete solutions due to the limited survey period. The Nigerian Ports Authority seeks to address the congestion by moving cargo from Apapa and Tin Can Ports to other ports in response to the current situation. However, this solution will not work in the medium to long term. It is necessary for a third party to conduct a detailed survey of the situation targeting key stakeholders, such as the Nigerian Ports Authority, the terminal management company[55], the Lagos state government, and other related organizations and companies.

8.6. A Large-scale Agricultural Development Project in Nigeria

This chapter introduces Special Industrial Processing Zones (SAPZs), which are supported by the AfDB, as an example of a large-scale agricultural development project in Nigeria.

This project has studied a development plan utilizing the lessons learned from a large-scale commercial-agricultural development project based on a PPP. Thus, this project seems to be a great reference for Japan in planning a PPP project on the FVC. The details are shown below.[56]

[54] Based on an interview with the JETRO Nigeria Office
[55] Apapa Port has been operated by APM Terminals since 2006.
[56] Determined by the Survey Team based on an interview with the AfDB Nigeria office (January 2020) and press

（1） Background

The AfDB is promoting an initiative to develop agricultural processing zones, called “Staple Crops Processing Zones (SCPZs),” in African countries, including Nigeria. This initiative is consistent with one of the AfDB’s top priorities, “Feed Africa,” and it is expected to reduce poverty, improve agricultural productivity, and strengthen human resources by building a foundation for Africa’s agricultural processing industry. A similar initiative was launched in Nigeria about a decade ago, but the model was government-led. Thus, there was a lack of infrastructure development and poor coordination among stakeholders due to bureaucracy, and it was vulnerable to the impacts of policy change[57]. In conclusion, it is difficult to say that the project worked well.

Given these lessons, the AfDB consulted with the relevant ministries, agencies, and the private sector in April 2019 to develop “A Roadmap for the Development of SAPZs in Nigeria,” which set a new direction for private-sector-led agricultural development. This plan is expected to actively attract foreign capital; contribute to the reduction of food imports, a major issue in Nigeria; and create youth employment opportunities through contract farming with private companies, jobs at processing plants to be constructed, and so forth. Eventually, the original name, “SCPZs,” was changed to “SAPZs” based on a discussion with the Nigerian government.

（2） Outline of and future plans for SAPZs

The outline of and future plans for the SAPZs are summarized below.

- ✧ **Project Components:** Commercial farming with a PPP model, contract farming, export promotion, and value addition by agro-processing along with the necessary technical and financial support to promote these activities.
- ✧ **Partnership with the Private Sector:** Including large-scale agribusiness companies, such as Olam International, Elephant Group, and financial agencies, with a focus on collaboration with companies that have the capacity to carry out core business without government involvement (e.g., Olam has already started producing and processing sesame in Nigeria)
- ✧ **Budget:** AfDB: USD 200 million
- ✧ **Project Sites:** A total of six states were selected as project sites based on selection criteria, including market accessibility, agricultural productivity, and the state of existing

materials (Blueprint, World Stage etc.)

[57] According to AfDB personnel interviewed by the Survey Team, Cargill was previously interested in agricultural development in Nigeria, but it disappeared owing to a policy change following a change in the state government.

infrastructure, such as roads, water, and electricity grid lines. Areas that are already equipped with infrastructure and do not require significant new infrastructure investments were selected. Of these, four states are included in phase 1, and the remaining two states are included in phase 2.

- ✧ **Target Agricultural Products:** Rice, sorghum, horticulture crops (including tomatoes), cassava, livestock, and others. The specific crops differ in different areas (e.g., cacao, cassava, and chicken farming may be selected in Ogum State).

- ✧ **Benefits to Smallholders:** The AfDB will support private companies to ensure that contracts are not disadvantageous to smallholder farmers, and it also plans to instruct farmers to comply with the contracts.

- ✧ **Infrastructure Development:** Infrastructure development by private companies with support from the Nigeria Investment Promotion Council is also under consideration (e.g., companies can recoup investment costs by charging road tollgate and electricity fees, etc.).

- ✧ **Feasibility Study (F/S)[58]:** The services include the preparation of four site-specific feasibility reports that will guide the design of appropriate SAPZ project interventions and will involve VC analysis, infrastructure assessment and evaluation, technical design for the processing hub and the accompanying Rural Transformation Centers, the design of common use structures, a social and environmental safeguards analysis, and the identification of existing and new anchor investor companies capable of managing the SAPZs. The F/S consulting service is expected to start in February 2020 and continue for 12 weeks (This information is based on interviews conducted prior to the spread of the COVID-19, which may have affected the schedule due to the subsequent spread.).

8.7. Development Partner (DP) Assistance to the VCs of Sesame, Cacao, and Tomatoes

The following are the assistance programs and projects implemented by DPs for the VCs of sesame, cacao, and tomatoes.

（1） WB（cacao and tomatoes）

The Agro-Processing, Productivity Enhancement, and Livelihood Improvement Support Project (APPEALS) of the WB is a successor to the Nigeria Commercial Agriculture

[58] AfDB (February 2020) Request for Expressions of Interest (REOI) Consultancy for the Provision of Transaction Advisory Support to the Nigerian Federal Ministry of Agriculture And Rural Development's Staple Crop Processing (SCPZ) Initiative
https://www.afdb.org/en/documents/eoi-nigeria-feasibility-studies-special-agro-industrial-processing-zones-sapzs-nigeria

Development Project (2009–2017), which supported training and business plan making and developed roads, electricity, and aggregation facilities. APPEALS aims to assist farmers in applying agricultural modernization techniques. It was implemented in June 2018 and targeted six provinces (Cross River, Enugu, Lagos, Kogi, Kaduna, and Kano). In each province, the project supports the entire VCs of the three crops. Among these crops, cacao is included in Cross River province, and tomatoes are included in Kano province.

Three steps are included in APPEALS support for a VC: 1) production (i.e., identification of needs and selection of necessary techniques and extensions), 2) processing, and 3) marketing (i.e., assistance to farmers in making business plans and supporting the linkage between farmers and markets). Especially in marketing, there are a variety of Service Providers, such as seed traders and transportation companies, between the benefitting farmers and the project. For example, when a farmer asks a transportation company for a truck to deliver his or her crops, the farmer pays 40% of the fees to the SP before the SP will provide the service. At the same time, the project pays 60% of the cost to the bank account of the SP after the services are provided. Thus far, 60,000 groups have been formed, and 360,000 farmers have benefitted. Of these farmers, 35% (21,000) are women.

(2) GIZ (tomatoes)

1) Outline of the Nigeria Competitiveness Project (NiCOP, 2018 to 2022)

NiCOP has received financial support from the EU and has been implemented with the aim of commercializing target crops, including tomatoes, for 25,000 farmers (2–10 ha). The major project activities in the target areas are 1) identifying the present situation in the private sector (i.e., traders of agricultural inputs and materials, processing plants, and buyers), 2) identifying the current status of production, processing, and marketing and conducting a gap analysis, and 3) developing training to mitigate the gaps found in 1) and 2). To date, 2,000 farmers have participated in training. This training has an original curriculum based on the Farmer Business School and G.A.P. (i.e., the management of farmland, pesticides, and fertilizers). The project develops a training curriculum for each VC[59], and the training package includes knowledge and information on specific techniques and marketing and the enhancement of organizational capacity. The project intends to target existing farmers' groups rather than establishing new groups. Nigeria has a variety of farmers' organizations, such as formally certified agricultural cooperatives and informal farmers' groups.

[59] The content of curriculum and the materials are not publicly available.

2） Assistance for the tomato VC

The GIZ has found that the demand for domestic tomatoes has been increasing since tomato imports were restricted by the Nigerian government from February 2019 to 2021. NiCOP targets tomatoes in Kaduna, Kano, Plato, Oyo, and Ogun provinces. The PPP approach of the project is characterized as building a linkage of offering agricultural materials and providing individual contract farming through one-on-one communications with a private company. The project implements tomato contract farming with Dangote in Kano. Dangote has extension staff who instruct the contracted farmers about cultivating the specific tomato variety that they require. The contract farmers have already produced 40 MT/ha/farmer. The project intends to mitigate the risk of climate change by decreasing production by 15 MT/ha/farmer. The establishment of a linkage between the project and GB Foods is also in progress as of January 2020.

（3） WFP (tomatoes)

The WFP focuses its aid to Nigeria on providing emergency assistance with grains in the Northeast area. The WFP also has experience with VC assistance targeting tomatoes, including cultivation technology transfers, the development of cooling facilities, and rural electrification in Kano province. In that project, the WFP applied the Three-Pronged Approach (3PA) to improve crop productivity in the following three steps[60].

1） Integrated context analysis (ICA) (national level)

The government and development partners establish an appropriate strategy based on analyses of food security, natural disasters, and soil degradation in a particular area.

2） Seasonal livelihood programming (SLP) (regional level)

Based on the ICA, seasonality, and gender perspectives, the community, the government, and development partners make a plan consisting of multiple sectors.

3） Community-based participatory planning (field level)

Based on the SLP, the project plans to tackle prioritized issues raised by the community. The plan covers multiple sectors.

To provide emergency assistance with grain transport, the WFP started to use Port Harcourt in 2019 because it has cold facilities and to avoid the time required for loading and customs at the Lagos ports.

[60] The 3PA is applied not only in Nigeria but also in South Sudan and Zimbabwe (source: WFP).

（4） DFID (tomatoes and sesame)

DFID's assistance with the tomato VC includes growth and employment in the wholesale and retail sectors (GEMS-4) and LINKS-Powering Economic Growth in Northern Nigeria (LINKS).

1） GEMS-4 (2012 to 2017) (tomatoes)

The harvest loss rate (45%) and the low selling price for farmers are serious issues in Nigeria. Through GEMS-4, DFID applied Good Handling Practices (GHPs) and introduced 25,000 plastic crates and the renting model. The project also established a linkage between tomato producers and processing plants, made a tomato cluster map[61], promoted transportation by train, and improved the packaging system. Through improvements in the handling and shipping of tomatoes, the loss rate decreased, which contributed to a price increase. GHPs are used by off-takers, wholesale traders, farmers, and processing plants. DFID is now encouraging the government to regulate the introduction of crates and GHPs, and the crate rental business is expanding.

2） LINKS (May 2018 to March 2026) (tomato)

LINKS is the roll-out of the Market Development in the Niger Delta II project (2018-2020). It increases the employment and income of women and youth and the production, processing, and consumption of crops for overall economic growth. Kaduna and Kano provinces are the primary target area, and tomatoes are the focus in Kaduna and Jigawa provinces.

3） Propcom Mai-karfi Project (sesame)

Together with Olam, DFID implements a VC project for small-scale farmers in the northeastern area of Nigeria, targeting sesame. The NGO conducts project activities in low-security areas, and small and medium enterprises, such as fertilizer and seed traders, provide high-quality business support to farmers using media and telecommunications (e-Extension).

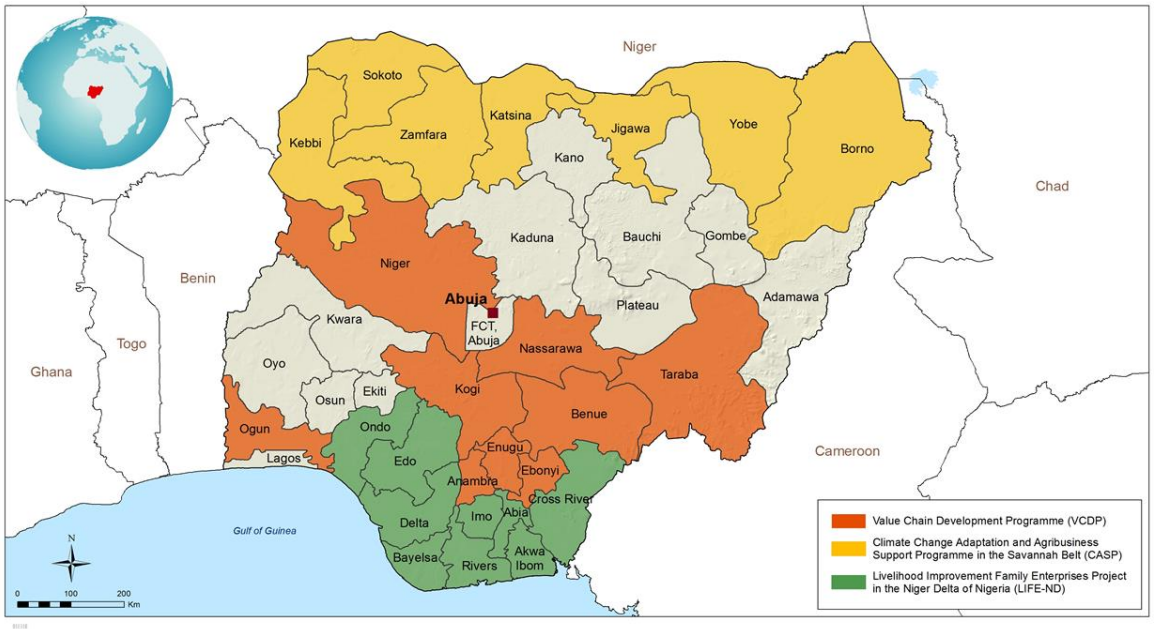
（5） IFAD (VC assistance)

1) Outline

IFAD divides Nigeria into three areas, as shown in Figure 8-29, based on their agricultural and economic environments. IFAD implements one VC-related project in each locality. None of these three projects targets sesame, tomatoes, or cacao.

[61] Tomato Production and Marketing Value Chain Analysis (GEMS4 Wholesale and Retail, April 2014, DFID)

Figure 8-29: IFAD program areas



Source: IFAD

Table 8-22 provides outlines of the three projects.

Table 8-22: IFAD's portfolio in the agricultural sector

Name of the project or program	Objectives	Target crops
Value Chain and Development Programme (VCDP)	To improve the incomes and food security of small-scale farmers through support for the VCs of rice and cassava. The program promotes the required quality and establishes a linkage between producers and processing companies.	Rice, cassava
Climate Change Adaptation and Agribusiness Support Program in the Savanna Belt	To involve 727,000 poor farmers in commercial agriculture and secure nutrition.	Millet, sorghum, cowpeas, vegetables, onions, groundnuts, rice
Livelihood Improvement Family Enterprises Project in the Niger Delta of Nigeria	To foster 250,000 entrepreneurs among women and young people by supporting start-up needs, production, and marketing.	All crops

Source: The Survey Team, based on interviews with IFAD.

Among these three projects, the project scale of the VCDP (2015 to 2024) is significant, at 329 million USD[62]. The VCDP comprehensively supports the entire VC, from capacity and technology development to infrastructure, such as roads, warehouses, processing plants, and machinery (including an IFAD fund of 214 million USD). The project aims to benefit 130,000 farmers and processors (men and women) and had reached 80,000 farmers by January 2020.

[62] The fund includes financial inputs from private sector actors, such as Olam.

2） Commodity Alliance Forum

The most remarkable aspect of the VCDP is the establishment of the Commodity Alliance Forum, where stakeholders, such as private sector organizations, government organizations, and farmers can communicate and exchange knowledge and information (Figure 8-30: Structure of the Community Alliance Forum). In the forum, these stakeholders share their demands and VC issues from their own perspectives. The primary role of the Parent Apex Forum at the provincial government level is to provide information to the Primary Forum for each crop cluster and monitor their activities. Each Primary Forum consists of public and private sector organizations and farmers. The chairman of the Primary Forum represents the farmers, and market operators take the overall initiative for governing the forum. The Primary Forum holds an annual meeting and is called every month to discuss progress and take action to solve a variety of issues. Through these activities, innovative ideas, such as the paddy tracking system, are suggested by farmers. IFAD believes that this PPP model can be applied to any crop.

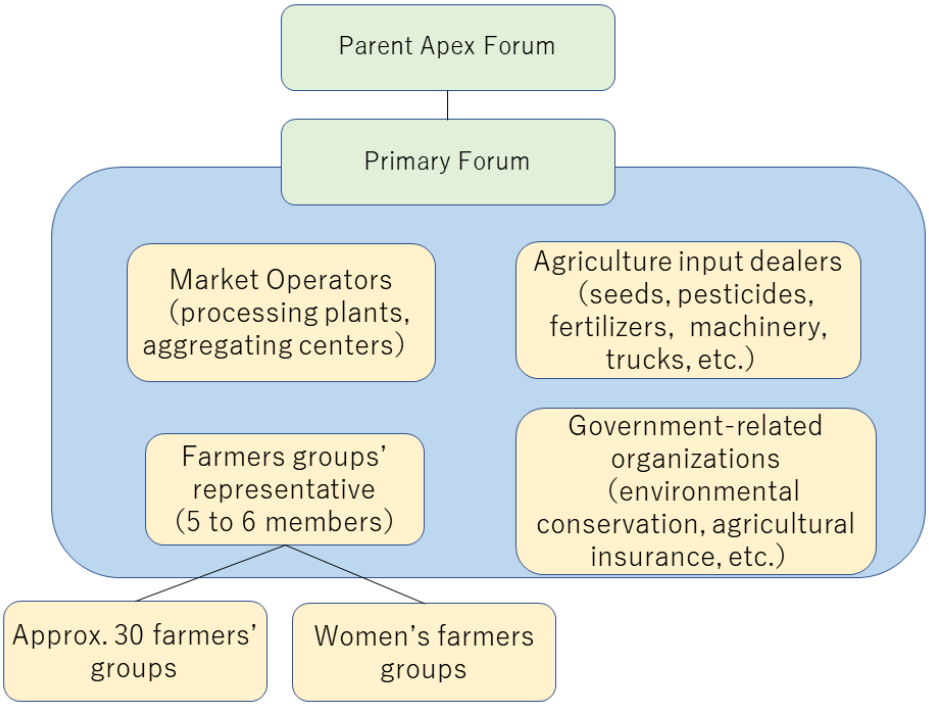


Figure 8-30: Structure of the Community Alliance Forum

Source: The Survey Team, based on interviews with IFAD.

(6) FAO (VC assistance)

The FAO does not target the sesame, tomato, or cacao VCs in its assistance programs. Under its assistance policy for sustainable production and VC development in Africa, the FAO implemented the Strengthening Capacities to Implement the Youth Employment in Agriculture Programme (YEAP) from 2014 to 2016, targeting female and young entrepreneurs in the agricultural sector. As part of the YEAP, the FAO implemented a technical cooperation project

(TCP) that aimed to improve the implementation capacity of government officers in six provinces (Baunchi, Imo, Katsina, Lagos, Niger, and Rivers provinces). Through the TCP, the FAO encouraged the youth to participate in agriculture as a business and helped them earn profits. The project successfully improved the image of agriculture held by young farmers at the junior high school level by utilizing the Junior Farmer Field Life School[63].

(7) Issues

Some development partners pointed out the following issues related to facilitating projects in the agriculture sector:

1) Changes in the implementation environment due to changes in government policy

Project sustainability is not always secured over the course of administrative changes in the government. DPs are required to have close and constant communication under those circumstances.

2) Measures to ensure safety in the northern area (Kano and Bauchi provinces)

・Cooperating with a local NGO is indispensable for implementing projects in the northern region. The project conducted an assessment survey through an NGO.

・Entering low security areas without permission is prohibited. The project uses the training system whenever possible. Remote control of the project is also necessary.

8.8. Workshop Results

(1) Outline of the workshop

Date: January 31, 2020 (Fri.) 9:30 to 13:00

Venue: Bolton White Hotel (Abuja)

Participants: 56 (government and public institutions: 36; private sector and related organizations: 20)

Program: The Survey Team conducted the workshop according to the following schedule.

Time	Activities	Responsibility
09:30–10:00	● Admission	● The Survey Team
10:00–10:05	● Opening remarks	● JICA Nigeria Office
10:05–10:15	● Introduction of participants ● Explanation of objectives, expected outputs, and workshop program	● The Survey Team
10:15–10:30	● Presentation of the survey results and concepts for FVC development projects	● The Survey Team (Dr. Kotegawa) Sesame
10:30–10:45		● The Survey Team (Dr. Ikeda) Tomatoes

[63] http://www.fao.org/3/a-ak595e.pdf

10:45–11:00		● The Survey Team (Mr. Machida) Cacao
11:00–11:50	● Group discussion (Three groups are formed by participants with interest in the same target crop.)	● The Survey Team
11:50–12:10	● Sharing the discussion results of each group, Q&A	● The Survey Team (Sesame)
12:10–12:30		● The Survey Team (Tomatoes)
12:30–12:50		● The Survey Team (Cacao)
12:50–12:55	● Closing remarks	● FMARD
12:55–13:00		● JICA Nigeria Office
13:00–14:00	● Lunch and networking (end of the workshop)	● The Survey Team

(2) Workshop activities


Participants listening to the Survey Team presentation


Participant presenting the discussion results


Active discussion in the WS

8.9. Environmental and Social Legislative Framework Related to Agricultural Investments in Nigeria

8.9.1. Main policies, laws, and regulations related to EIAs

The main policies, laws, and regulations related to EIAs in Nigeria are summarized in Table 8-23.

Table 8-23: Main policies, laws, and regulations related to EIAs in Nigeria

Policy, Law, or Regulation	Outline
Federal Environmental Protection Agency (Now FMEnv) Act No. 58, 1988	Enacted in 1992 and amended in 1998, this law establishes the Federal Ministry of Environment (FMEnv), which aims to achieve environmental protection, the sustainable use of the natural environment, EIAs, and so forth in Nigeria.
EIA Act CAP E12 LFN 2004	This act was established based on the abovementioned Federal Environmental Protection Agency Act. This act stipulates the types and sizes of projects that require EIAs in Nigeria as well as the roles and responsibilities of the stakeholders in EIAs. In addition, this law establishes several sectoral guidelines for EIAs. The sectoral guidelines that seem related to the agricultural and food processing sectors are as follows: ・ National Environmental Guideline for Agriculture and Rural Management ・ EIA National Guidelines for the Decommissioning of

	Facilities in Nigeria ・ Guidelines and Procedures for Biophysical Environmental Impact Assessment ・ EIA Guidelines for Pesticides ・ EIA Guidelines for Food and Beverages ・ Social Impact Assessment Guideline and Standard ・ EIA Guidelines for Fertilizers, Phosphates, and Urea Plants ・ Health Impact Assessment Procedural Guideline
Forestry Law CAP 51, 1994	This law, enacted in 1958 and amended in 1994, stipulates forbidden activities that lead to forest degradation and provides an administrative framework for the sustainable use of forest resources for the purpose of forest protection in Nigeria.
Endangered Species (Control of International Trade and Traffic) Act 11 of 1985	This act stipulates endangered species in Nigeria. The hunting, capture of, or trade in animal species listed in the First Schedule to this Act is absolutely prohibited. Furthermore, no person shall hunt, capture, trade in, or otherwise deal with an animal species specified in the Second Schedule to this Act unless that person possesses a license issued under this Act.

Source: The Survey Team

8.9.2. EIA system in Nigeria

The EIA system in Nigeria complies with EIA Act No. 86 of 1992. Nigeria's EIA has two distinctive features relative to those in Eastern and Southeast African countries.

First, the cost of obtaining a certificate for EIA approval (excluding the cost of an EIA study conducted by registered consultants) is not clearly stated in the act or guidelines. For example, in other countries, obtaining an EIA certificate either is free of charge or the required fee can be determined by progressive calculations according to the project cost. Nigeria is unique because of the strong involvement of the FMEnv in all stages of the EIA process (i.e., it not only screens and reviews EIA reports but also, for example, confirms the sampling and analysis methodologies for water quality tests). The transportation allowances, per diem costs, and accommodation costs required by the FMEnv staff at the project target site vary depending on the planned implementation location of the project and the project proponent (an applicant) should bear those costs[64]. Table 8-24 and Table 8-25 show the number of EIA approvals by sector in 2018 and the revenue generated from EIA registrations and reviews by the EIA division of the FMEnv in 2018, respectively.

Based on these references, EIA costs (excluding EIA study costs) are estimated to be an average of 910,000 NGN per project (approximately 300,000 JPY). Thus, when conducting an F/S for highly urgent Loan or Grant Aid projects within a limited time frame (e.g., fixed E/N or cabinet schedules), it is necessary to clarify which of the donors or government agencies is

[64] The EIA division of the FMEnv interviewed by the Study Team in 2020

expected to bear this cost in the project formulation stage and to ensure that the necessary budget is available for project approval.

Table 8-24: Number of EIA approvals by sector in 2018

2018 EIA APPROVALS (SUMMARY)													
	First Quarter			Second Quarter			Third Quarter			Fourth Quarter			TOTAL
SECTORS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	
Infrastructure	0	0	0	0	1	1	1	2	0	4	0	2	11
Waste Mgt	0	0	0	0	0	2	0	0	0	0	0	0	2
Power	1	1	1	3	4	1	1	1	0	3	1	0	17
Telecoms	0	1	0	1	3	6	15	0	0	2	0	0	28
Mining	1	4	0	3	1	1	0	0	0	2	0	1	13
Manufacturing	1	3	2	2	0	2	0	1	0	1	0	0	12
Oil & Gas	0	0	2	1	2	2	1	1	1	0	1	1	12
Agriculture	1	1	0	0	0	0	0	0	0	0	0	0	2
Renewable Energy	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**4**	**10**	**5**	**10**	**11**	**15**	**18**	**5**	**1**	**12**	**2**	**4**	**97**

Source: Environmental Assessment Department 2018 Annual Report

Table 8-25: Revenue generated from EIA registrations and reviews by the EIA division of the FMEnv in 2018

2018 REVENUE GENERATED FOR THE MONTHS OF JANUARY-SEPTEMBER FOR EIA DIVISION													
S/N	Activities	Jan (₦)	Feb (₦)	Mar (₦)	Apr (₦)	May (₦)	Jun (₦)	Jul (₦)	Aug (₦)	Sept (₦)	Oct (₦)	Nov (₦)	Dec (₦)
1	*EIA Registration*	1,350,000	1,750,000	1,600,000	3,250,000	3,150,000	800,000	1,750,000	850,000	850,000	1,100,000	1,650,000	850,000
2	*Final Assessment Charge*	2,145,000	4,950,000	7,733,250	15,878,250	4,860,000	5,737,500	9,418,750	995,000	3,625,000	6,250,000	3,225,157	4,931,880
Monthly Total		*3,495,000*	*6,700,000*	*9,333,250*	19,128,250	8,010,000	6,537,500	11,168,750	1,845,000	*4,475,000*	*7,350,000*	*4,875,157*	*5,781,880*
Grand Total		₦88,699,787											

Source: Environmental Assessment Department 2018 Annual Report

The second distinctive characteristic of Nigeria's EIA system is the establishment of a considerable number of sectoral EIA guidelines between 2017 and 2019. As of February 2020, all sectoral guidelines except for "National Environmental Guideline for Agriculture and Rural

Management" are available on the FMEnv website[65]. A project proponent is required to carry out an EIA in compliance with the sectoral guidelines shown below according to the characteristic features of the planned project.

- EIA Procedural Guidelines
- National Environmental Guideline for Agriculture and Rural Management
- EIA National Guidelines for the Decommissioning of Facilities in Nigeria
- EIA Guidelines for Renewable Energy
- EIA Guidelines for Oil and Gas
- EIA Guidelines for Urban Development
- Guidelines for Biophysical Environmental Impact Assessment
- EIA Guidelines for Pesticides
- EIA Guidelines for Food and Beverages
- Social Impact Assessment Guideline and Standard
- EIA Guidelines for Fertilizers, Phosphates, and Urea Plants
- Health Impact Assessment Procedural Guidelines
- Procedural Guideline for Lab Accreditation
- Strategic Environmental Assessment (SEA) Guidelines
- Manufacturing Industry Guidelines

Other important details related to EIAs in Nigeria that were confirmed by the EIA division of the FMEnv are as follows.

- The SEA Act in Nigeria is expected to be enacted in 2020.
- In the agricultural sector, one of the threshold values to determine whether a project is subject to an EIA is "whether the development area is bigger than 500 ha" or whether the number of PAPs subjected to land acquisition and resettlement is greater than 100 households. In addition, an EIA study report must also be submitted in the case of the construction of a food processing plant.
- The number of days required for the EIA procedures described in the EIA guidelines is the minimum number of days if all procedures move forward without any delay. For example, if the documents submitted by the project proponent to the FMEnv are inadequate and the FMEnv asks the project proponent to respond, the response will be delayed or the number of days required will not be as specified in the guidelines.
- In Nigeria, if any land acquisition and resettlement of people is anticipated due to the

[65] https://ead.gov.ng/environmental-guidelines-revision/

planned project, the project proponent submits an RAP together with the EIA report to the FMEnv for approval.

8.9.3. Main policies and laws related to land acquisition and resettlement in Nigeria

（1） Main policies and laws related to land acquisition and resettlement in Nigeria

Table 8-26 shows the main laws related to land acquisition and resettlement in Nigeria. According to the director of the Land Resources and Climate Change Department in the Federal Ministry of Agriculture, who was a former member of the Land Reform Committee, the Nigerian Land Use Act was meant to be amended in 1990 to meet the needs and challenges of that era, but the amendments are not completed because it was extremely difficult to make democratic revisions taking all perspectives (i.e., many different opinions from the large population[66] and people of different ethnicities and religions) into account. Thus, the Land Use Act of 1978 is still referenced.

Table 8-26: Main laws related to land acquisition and resettlement in Nigeria

Act and Law	Outline
Nigerian Land Use Act 1978	The Land Use Act, which is the fundamental law regarding land acquisition and resettlement in Nigeria, was enacted in 1978 and amended in 1990. It provides ownership, management, and control of land in each state of the federation to the Governor, as shown below. *"all lands comprised in the territory of each state of the federation are hereby vested in the Governor of that state and such lands shall be held in trust and administered for the use and common benefit of all Nigerians in accordance with the provisions of this act."*
Urban and Regional Planning Law 1992	This law aims at overseeing the realistic, purposeful planning of the country to avoid overcrowding and poor environmental conditions. In this regard, the law stipulates the roles and responsibilities of the administrative body for development planning. Part IV Acquisition of Land and Compensation stipulates time limits for payments, dispute management, and so forth.

Source: The Survey Team

（2） RAPs

As of now, RAP guidelines have not been developed in Nigeria, but, according to the EIA division of the FMEnv, they will be developed within a few years with support from the WB. As mentioned previously, a project proponent must submit both an EIA and an RAP to the FMEnv for approval if project implementation requires the acquisition of lands and the resettlement of people.

[66] Nigeria is currently the seventh most populous country in the world, but, according to the United Nations "World Population Prospects: The 2017 Revision," its population is expected to reach approximately 390 million by 2050. It will overtake the United States to become the third most populous country in the world.

（3） Current issues

The current issues related to environmental and social considerations in Nigeria are as follows.

- Several environmental regulations for pollution control (e.g., air pollution, noise, water pollution, etc.) set maximum allowable emission limits. However, there are very few examples of EIA study reports that were conducted in Nigeria's agriculture sector in which future impact forecasts were quantitatively forecasted and compared with standard values[67]. The necessary forecasting methods (models) to quantitatively calculate future impacts have not been established in Nigeria.

- The starts of projects have been delayed, sometimes because the project proponent (executing agency) did not secure the budget for the EIA or RAP in advance.

- Because Nigeria is a federation, state governments can independently enforce laws and regulations. However, investors are not always aware of this characteristic, and differences in perceptions can sometimes lead to trouble.

- The development of a legal framework for land acquisition and resettlement can simplify the land registration process and provide appropriate compensation to affected persons (e.g., the amendment of the land act, the establishment of RAP Guidelines and a Land Acquisition and Resettlement Policy Framework for agricultural investment, etc.). The current land administration issues are clearly reflected in Nigeria being ranked 179th in the WB's "Ease of Doing Business" rankings. According to the report, the land registration process in Nigeria entails 11 steps that take 69 days. Moreover, the ratio of administrative costs to land value is as high as 10%, and the quality of land administration is low (see Table 8-27).

Table 8-27: Ease of registering land in Nigeria compared with other countries

SN	Country	Property registration (DTF)*	Property registration index **	Procedures (number)	Time (days)	Cost (% of property value)	Quality of land administration index (0–30)
1	New Zealand	94.97	1	2.0	1.0	0.1	26.0
2	United States	76.80	37	4.4	15.2	2.5	17.6
3	China	76.15	41	4.0	19.5	3.4	18.3
4	United Kingdom	74.51	47	6.0	21.5	4.8	24.5
5	Botswana	65.45	81	4.0	27.0	5.1	10.0
6	Morocco	64.35	86	6.0	22.0	6.4	15.5
7	South Africa	58.43	107	7.0	23.0	7.6	13.5
8	Cote	57.56	113	6.0	30.0	7.4	10.5

[67] Based on a Study Team interview with the EIA division of the FMEnv and local consultants in 2020

	d'Ivoire						
9	Ghana	55.50	119	6.0	52.0	6.7	8.0
10	Burkina Faso	50.44	140	4.0	67.0	12.0	11.5
11	Algeria	43.83	163	10.0	5.5	7.1	7.0
12	Nigeria	34.08	179	11.3	68.9	10.5	7.4

Remarks: * The higher the score, the easier it is to register land. ** This index indicates the ease of land registration by ranking; smaller numbers imply higher rankings.

Source: Survey Team, partially edited based on the WB Doing Business and License Intech Open (2019) Land Acquisition and Use in Nigeria

8.10. Legislative Framework for Agricultural Investments in Nigeria

In Nigeria, the governing law for an investor's tax incentives is determined in accordance with the provisions of the Industrial Development (Income Tax Relief) Act. In addition, the Nigeria Investment Promotion Act of 1995 established the Nigeria Investment Promotion Commission (NIPC) for the promotion, coordination, and supervision of foreign investments in Nigeria. The law stipulates relatively liberal investment rules and allows companies to be 100% foreign-owned. The only exceptions to this rule are the oil and gas industries, which only allow operating companies to be established through joint ventures with local capital or production-sharing contracts[68]. The Nigeria Investment Promotion Act provides tax incentives for recognized industries and businesses that meet the qualifications. The following discussion mainly describes preferential measures related to the agricultural sector[69].

8.10.1. Incentives common to all industries

Companies that register with the NIPC and are successfully registered in a "pioneer industry" based on their economic effects, such as job creation, can receive preferential treatment, such as preferential taxes (commonly known as "pioneer status"). Among the 69 pioneer industries, agriculture, including food processing, is a priority industry. The major incentives are as follows[70].

■ Incentives to companies that qualify for pioneer status

- The company can enjoy a tax holiday for an initial period of three years that is renewable for an additional two years.

[68] JETRO (2017) Investment Guide in Nigeria (Japanese version)
[69] Nigerian Investment Promotion Commission and Federal Inland Revenue Service (2017) Compendium of Investment Incentives in Nigeria
[70] http://www.nigeriaembassyusa.org/
The Embassy of the Federal Republic of Nigeria to the United States

■ Investments in economically disadvantaged areas

- The company receives a 100% tax holiday for seven years and an additional 5% of depreciation above and beyond the initial capital depreciation.

■ Local raw material utilization

- Companies that attain a minimum local raw material utilization (80% for the agro-industry and 70% for agro-allied industries) receive a 30% tax concession for five years.

■ In-plant training

- The cost of training facilities receives a 2% tax concession for five years.

8.10.2. Sector-specific incentives

Sector-specific incentives are set for the agriculture and agro-allied, solid minerals, manufacturing, tourism and hospitality, and oil and gas sectors. This section explains the specific incentives for the agriculture and agro-allied sectors.

■ Agriculture and agro-allied sectors (Companies Income Tax Act (CITA) CAP C.21 LFN 2004, as amended in 2007)

- A 95% capital allowance is enjoyed in the year that a qualifying expenditure is incurred, pursuant to Paragraph 24 Table 1 and 2 Second Schedule of CITA.
- Companies that are wholly engaged in agricultural activities are entitled to unrestricted capital allowances, pursuant to Paragraph 24 (7) of CITA.
- Companies that are wholly engaged in agricultural activities are entitled to carry forward unutilized capital allowances indefinitely.
- The agricultural credit guarantee scheme fund provides a loan guarantee of up to 75%.
- Exemptions from the minimum corporate income tax are provided.
- Indefinite forwarding of losses is provided.

8.10.3. Tariff-based incentives (TBIs)

■ General requirements for access to TBIs

- Evidence of registration with the Corporate Affairs Commission[71]
- Tax compliance by means of the tax identification number

[71] https://www.cac.gov.ng/ Upon the establishment of a company or project in Nigeria, it must register with the Corporate Affairs Commission.

- Certification by the relevant ministry (where applicable): agriculture, automotive, greenhouses, and power.

■ Agricultural sector (extracted)
- Import duty on agricultural equipment and machinery of 0% (HS Headings 84, 85, and 90)
- The 0% import duty rate on greenhouse equipment is classified as agricultural equipment (HS Headings 94.06)
- Import duty of 10% and a 20% levy on husked brown rice (HS 1006.20.00.00)

In addition, there are incentives for infrastructure development, research, employment, and value addition, especially in the engineering industry, such as export processing zones and special economic zones. A duty drawback system is also available from the Nigeria Export Promotion Commission (NEPC). The latest detailed information about investment incentives is available at the One Stop Investment Centre: OSIP[72] under the NIPC, which is the entry point for investors.

However, there have been reports of past agricultural investment projects for which these tax incentives were not paid as prescribed. Figure 8-31 shows an example summary of criticisms from environmental and social NGOs in a large-scale rice development project (30,000 ha) planned by Dominion Farm, a US company, in eastern Nigeria and the company's counterarguments[73].

[72] https://slideplayer.com/slide/3027309/

[73] In January 2020, the Survey Team was shown Dominion Farm's counterstatement titled "(Not) Doing Business in Nigeria" and made inquiries with Environmental Right Action and Friends of the Earth Nigeria, who criticized Dominion Farm for grabbing land from local people, in written form to understand if any allegations were untrue, but the Study Team received no answer from the NGOs as of February 2020. The full text of "(Not) Doing Business in Nigeria" is available at this link: https://www.farmlandgrab.org/post/view/24612-not-doing-business-in-nigeria

Case Study: Dominion Farm (part of the G8's New Alliance for Food Security and Nutrition in Africa NA Project)

- **History**: In 2012, Dominion Farm **signed an MOU** with FMARD and the Taraba State Governor to develop **a fully irrigated 30,000 ha rice project in Taraba with $40M.**
- **Target:** 300,000 tons of rice, 15,000 workers, and 15% of Nigeria's 2.1M annual rice imports in ten years.
- **Land**: 90% of the land is operated by contract farmers and remaining 10% is a nuclear rice farm. [1)]

Critical Articles by NGOs etc.[2)]:

- Farmers are being forced off lands "*We were not involved at any level*" (farmer)
- Farmers considered it a forced eviction without proper consultation & compensation.

Counterstatement against these critical articles by the investor (Dominion Farm)[3) 4)] :

- Failed promises:
  - The state government did not pay compensation to the farmers though it was promised in the MOU.
  - An all-weather road was not constructed by the state.
  - Federal and state governments provided no money and substituted funding from a wealthy private sector called TY.
  - A waiver of all duties on imported agricultural equipment (tractor, rice mills, etc.) was ignored by the clearing agent but he asked for a bribe. Dominion paid a massive duty and not one bribe.
  - Land was not owned by the state but others and made things complicated and destructive.
- As a result, preparation work took more than 3.5 years even though the original plan was only six months. All these brought unbudgeted expenses to Dominion.

Source
1) US Embassy to Nigeria (2012), 2) ERA / FoEN / CEED / GJN / GRAIN (2015), 3) Blue Paper News Ltd (2018), 4) The Boss Paper Ltd(2018)

Figure 8-31: An example agricultural investment in Nigeria

Note: ERA: Environmental Right Action, FoEN: Friends of the Earth Nigeria, CEED: Center for Environmental Education and Development, GJN: Global Justice

Source: Survey Team based on the above references

8.11. Concepts for PPP projects in Nigeria

8.11.1. Sesame VC development projects

Figure 8-32 shows the proposed PPP projects for sesame in Nigeria. To maintain and strengthen Nigeria's market competitiveness as a major supplier, it is particularly important to 1) undertake breed development and seed propagation, 2) improve farmers' access to funds and yields, and 3) improve port and transportation infrastructure.

✓ Variety development, seed propagation, and dissemination: To strengthen market competitiveness, the government must focus on developing sesame varieties with high yields and oil contents. Seed propagation and dissemination are expected to be addressed through sesame production by contract farming (i.e., seeds are provided by the contracted company) or seed propagation and sales businesses developed by encouraging private seed companies. In response to this demand for funds, support through private investment and loans is expected to contribute to improved access to sesame seeds.

✓ Yield improvements and improved access to funds: The low yields and instability in sesame

production need to be improved to increase national sesame productivity and strengthen international market competitiveness. The government must improve the sesame production environment for small-scale farmers by promoting subsidy policies for inputs and cultivation via contracts with private companies.

✓ Improving port and transport infrastructure: In particular, exporting companies suffer significant economic losses owing to inefficient operations at ports and delays caused by congestion around ports. Various infrastructure improvements (i.e., the improvement of port facilities and access roads to ports) are strongly required.

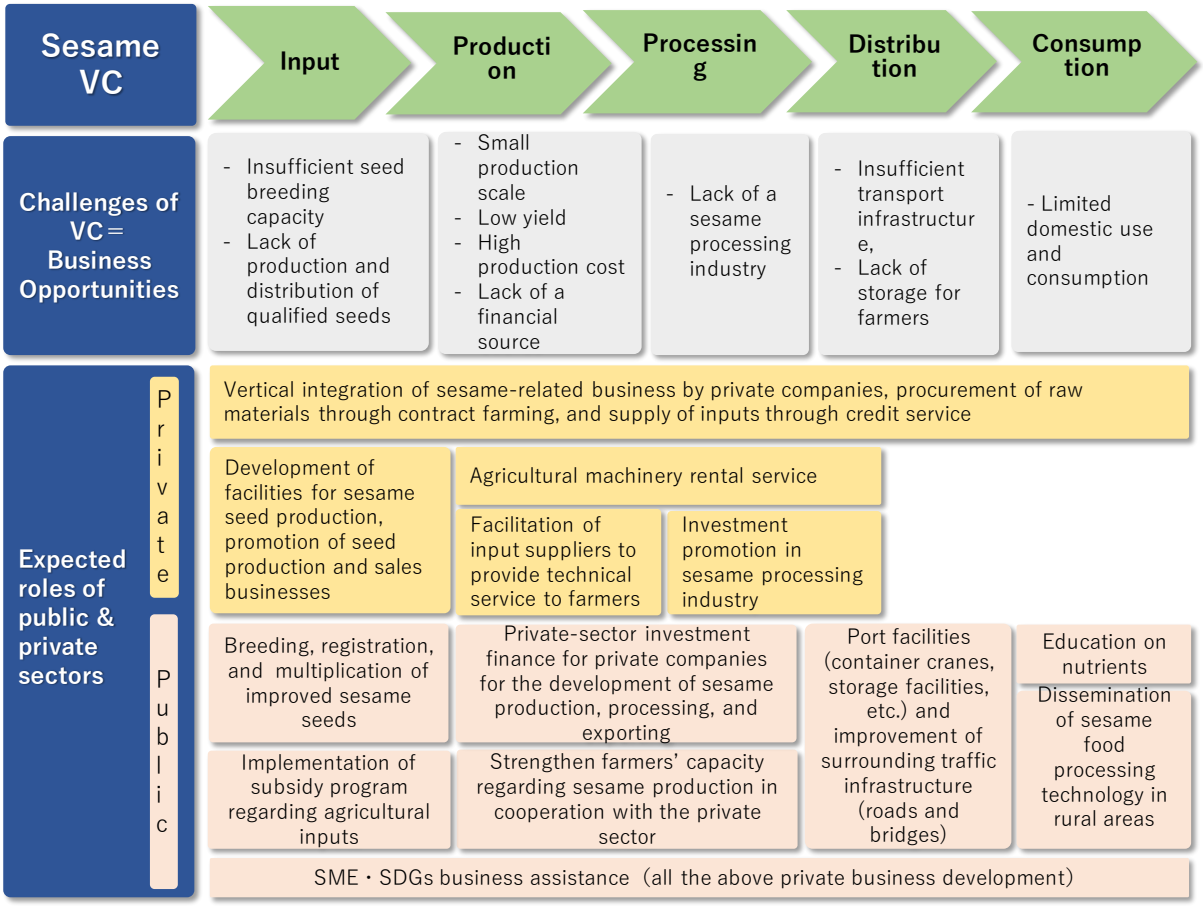


Figure 8-32: Sesame VC development sheet for Nigeria

Source: The Survey Team

8.11.2. Tomato VC development projects

Figure 8-33 shows some ideas for PPP projects for tomato VC development in Nigeria. To address the issue of the spread of disease, research activities on disease prevention should be promoted by, for example, developing the capacity of the National Horticultural Research Institute for disease prevention research.

To address the high costs of seeds, nurturing seed breeders in Nigeria is thought to be effective,

but it is likely to require financial and technical support from the government or donors. To tackle the problem of the low productivity of tomato farming, the provision of technical support to farmers; financial and technical support for greenhouse farming; and sales of quality chemicals, fertilizers, and cold-chain equipment by private firms are thought to be effective. For the issue of the unstable supply of tomatoes for processors, support to increase productivity at the farm level, which is described above, can be a countermeasure. In addition, promoting contract farming and enhancing the relations between farmers and processors by setting up a coordination body of various players in the tomato VC can also be useful.

Countermeasures to the issue of cold-chain inadequacy include the sales of products, such as refrigerators, reefer vehicles, and solar equipment for refrigeration; overseas investments and loans or two-step loans to cold-chain service providers; and setting up community-based processing plants with refrigerators. In addition, to decrease tomato wasting during transportation, technical support for packing is required.

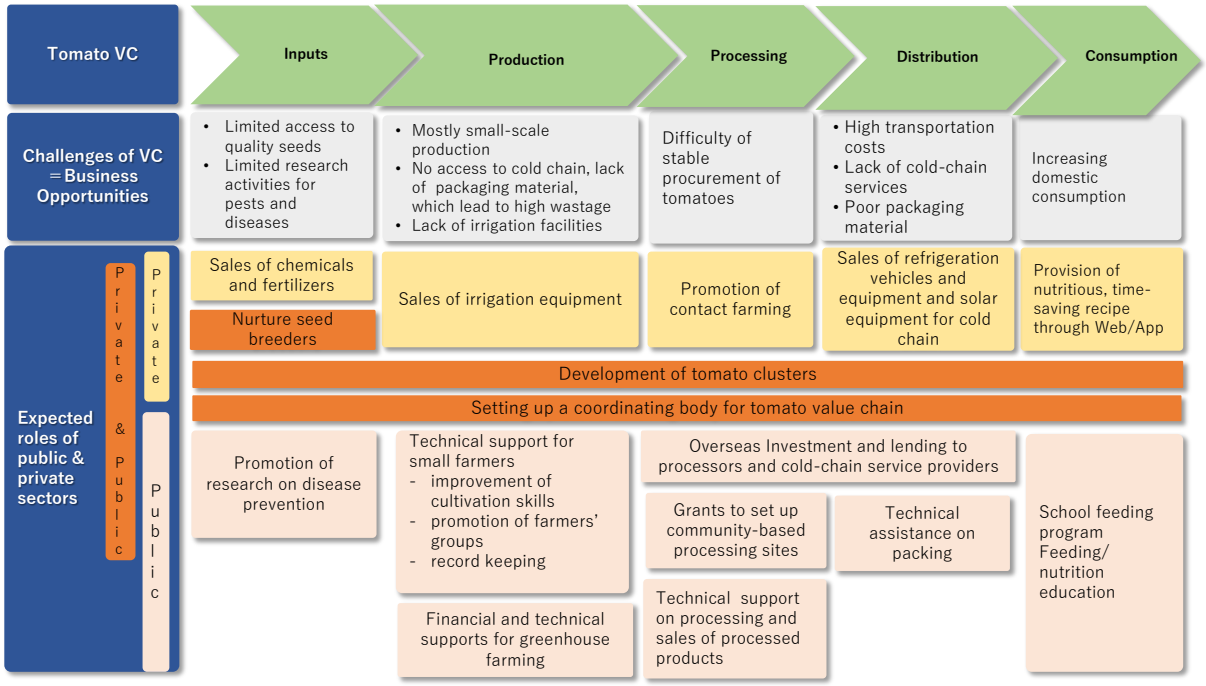


Figure 8-33: Tomato VC development sheet for Nigeria

Source: The Survey Team

8.11.3. Cacao VC development projects

Figure 8-34 shows concepts for cacao VC development projects in Nigeria through PPPs. For inputs, grafted seedlings can be produced and supplied in collaboration with the public and private sectors. Regulations are prepared to enable the distribution of proper agro-chemicals, and a system to make the regulations functional should be addressed by the public and private sectors.

As for cultivation, private service providers may be able to meet the needs of spraying agro-chemicals, grafting, and top working. Agricultural companies can tap private sector development loans financed by DPs for the development of large-scale cacao farms. For processing, the dissemination and extension of appropriate fermentation facilities and methods by the public sector are necessary. DP development finance may facilitate investors in establishing processing plants to produce cacao butter and cacao mass. To improve logistics, rural road construction and the upgrading of the Lagos ports should be addressed by the public sector. In consumption, local cocoa powder makers are expected to develop a new cocoa drink that can capture a portion of the market for cocoa, coffee, and tea. Cocoa, which is locally produced and rich in nutrition, is a suitable food for a school meal program.

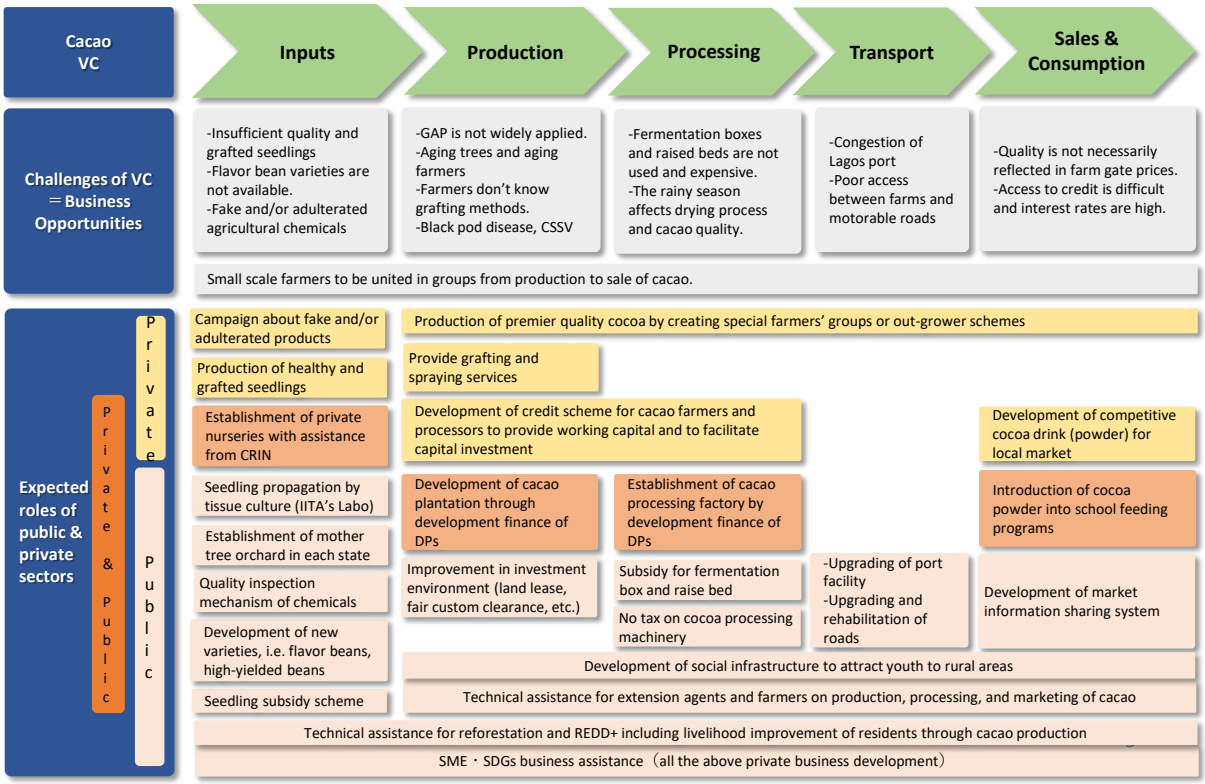


Figure 8-34: Cacao VC development sheet for Nigeria

Source: The Survey Team

Chapter 9. Farm Block Survey

Chapter 9. Farm Block Survey

9.1. Overview of Farm Block Survey

A farm block (FB) is a large-scale agricultural development scheme that is planned by Zambia's Ministry of Agriculture (MOA). One FB in each state of Zambia is chosen for the survey, for a total of ten FBs. The Survey Team studied all ten FBs to collect basic information so that players in the public and private sectors can consider FBs as a target for development investment in the future. This chapter describes the FB study methodology, outlines of the FBs, progress and risks of development in each FB, development partners' (DPs') perspectives on the FBs, the results of the FB study, and evaluations of the FBs.

9.2. Objectives of the FB Survey

The objectives of the FB survey are to identify current development progress and challenges in each FB and to compile key lessons that can be utilized for formulating regional agricultural development projects using private funds.

9.3. Methodology of the FB Survey

(1) First field survey

Table 9-1 provides a short description of the survey period, targets, and methodology of the first FB field survey. After a pre-discussion with JICA, five of the ten FBs, Nansanga, Luena, Luswishi, Solwezi, and Chikumbiro FBs, were chosen as the targeted FBs for the first phase of the survey, which was conducted by Japanese consultants with local survey assistants, and the remaining five sites were chosen for the second phase and surveyed only by local survey assistants. The survey methodology involved field visits; interviews with and questionnaire surveys of local stakeholders, including governmental organizations, private companies, traditional leaders[1], farmers, and so forth; and a literature review of the relevant documents.

Table 9-1: Short summary of the first FB field survey

Phase	Survey Period	Targeted FBs	Surveyors	Survey Method
Phase 1	June 4–15, 2019	Nansanga, Luena, Luswishi, Solwezi, and Chikumbiro	Three teams consisting of Japanese and local survey assistants	Field visits, interviews, literature review, etc.
Phase 2	June 17–28, 2019	Kalumwange, Manshya, Kalungwishi, Shikabeta, and Musokotwane	Three teams consisting of local survey assistants	

Source: The Survey Team

[1] Traditional leaders in this Chapter include chiefs and village heads.

(2) Second field survey

The second field survey was conducted to collect more detailed information for selecting potential sites for public and private sector projects and planning the potential projects. Based on information collected in the first field survey, Luswishi, Solwezi, Nansanga, Manshya, Kalumwange, and Musokotwane FBs were selected as the targets for the second survey. The selection of these six FBs is summarized in Annex 2. The main survey items include a stakeholder analysis of the FBs; plans for and progress on infrastructure development; investor activities; analyses of potential crops; environmental and social considerations, including resettlement; DPs' activities; and related laws and regulations. A short description of the second survey is provided in Table 9-2.

Table 9-2: Short summary of the second FB field survey

Survey Period	Targeted FBs	Surveyors	Survey Method
October 1–11, 2019	Luswishi, Solwezi Kalumwange, and Nansanga	Three teams consisting of Japanese and local survey assistants	Field visits, interviews, literature review, etc.
December 9–13, 2019	Manshya and Musokotwane	Two teams consisting of Japanese and local survey assistants	

Source: The Survey Team

9.4. Limitations of the FB Survey

As mentioned above, the FB Survey was carried out in a short period of time to obtain an overview of the actual situations of ten FBs throughout Zambia and the issues to be considered when formulating future development projects. In developing the questionnaire survey of the residents (farmers) of the FBs, the Survey Team conducted preliminary discussions with JICA, and the basic policy of the survey was to conduct several interviews as a case study rather than conducting a rigorous, time-consuming survey with large enough samples for statistical analysis. Thus, the survey results for farmers may not necessarily be representative of the survey area.

9.5. Outline of FBs

（1） Background on FB establishment and site selection

In 2002, following the Presidential Directive that Zambia can no longer depend on copper receipts because of their unreliability, the government of Zambia began developing and commercializing agricultural land through the Farm Block Development Program (FBDP), which aimed at economic diversification and growth. In 2005, the Ministry of Finance and National Planning formulated the Farm Block Development Plan (2005–2007) and laid out the

general concept of the FBDP, as follows.

- To establish one FB in each province, as shown in Table 9-3, and to develop FBs with areas of not less than 100,000 ha per block to achieve economies of scale.
- To comprise a core venture of large-, medium-, and small-scale farms operating through an out-grower arrangement, similar to Nakambala Sugar Estates in Mazabuka.[2]
- To promote adding value to products, thereby creating a link between agriculture and related industries.

Table 9-3: List of FBs selected by the Farm Block Development Plan (2005)

	FARM BLOCK	AREA APPROX (HA)	DISTRICT	PROVINCE
01	Nasanga	155 000	Serenje	Central
02	Kalumwange	100 000	Kaoma	Western
03	Luena	100 000	Kawambwa	Luapula
04	Manshya	147 750	Mpika	Northern
05	Solwezi	100 000	Solwezi	N/Western
06	Simango	100 000	Kazungula	Southern
07	*SADA plus Machiya*	100 000	Mufulira Mpongwe	C/belt
08	Mungu	100 000	Kafue	Lusaka
09	Mwase-Mphange	100 000	Lundazi	Eastern

Source: Ministry of Finance and National Planning (2005), Farm Block Development Plan (2005–2007)

Owing to limited financial resources, the government of Zambia selected three FBs to prioritize for development by allocating them with limited resources. These FBs, called phase 1 FBs, were Nansanga, Kalumwange, and Luena.

In addition, to further promote FB development, the MOA formulated the "Revised Guidelines on Allocation of Farms in the Farm Blocks identified by the Farm Block Development Committee" and determined the roles and composition of the FB Development Technical Committee (TCFBDP) (see Figure 9-8 for details), which plays a central role in FB development, the application fees paid by investors, the basic guidelines for FB development, and so forth.

Later, the creation of Muchinga Province and the delay in FB development, among other issues, led to the re-selection of about half of the FBs. As of June 2019, the MOA selected ten FBs, as

[2] Nakambala Sugar Estate, the predecessor to Zambia Sugar, was established in 1964. In the period from April to August 2017, the company recorded 2 million tons of sugar cane production, with sugar production of about 250 thousand tons and refined sugar production of 50 thousand tons. Furthermore, the company is a significant provider of employment, with 5,646 employees, including 2,038 permanent employees and a seasonal workforce. The company also contributes to social development by, for example, rehabilitating a rural health center and constructing schools, among other projects.
Zambia Sugar (2017) *Annual Report for the Period Ended 21 August 2017*

shown in Table 9-4 and Figure 9-1. Notably, this FB Survey updated the areas of Nansanga, Kalumwange, Shikabeta, Musokotwane, and Chikumbiro FBs to the latest status based on interviews with the Provincial Agricultural and Coordination Office (PACO) and the District Agricultural and Coordination Office (DACO) in each province and district.

Table 9-4: List of FBs as of June 2019

Serial Number	FB Name	District	Province	Area (ha)
1	Nansanga	Serenje	Central	133,000
2	Luena	Kawambwa	Luapula	100,000
3	Kalumwange	Kaoma	Western	140,000
4	Luswishi	Lufwanyama	Copperbelt	100,000
5	Manshya	Shiwang'andu	Muchinga	147,000
6	Kalungwishi	Lunte/Mporokoso	Northern	200,000
7	Solwezi	Mushindano	North-Western	100,000
8	Shikabeta	Rufunsa	Lusaka	74,000
9	Musokotwane	Kazungula	Southern	117,000
10	Chikumbiro	Lundazi	Eastern	100,000

Source: The Survey Team based on MOA (2018)

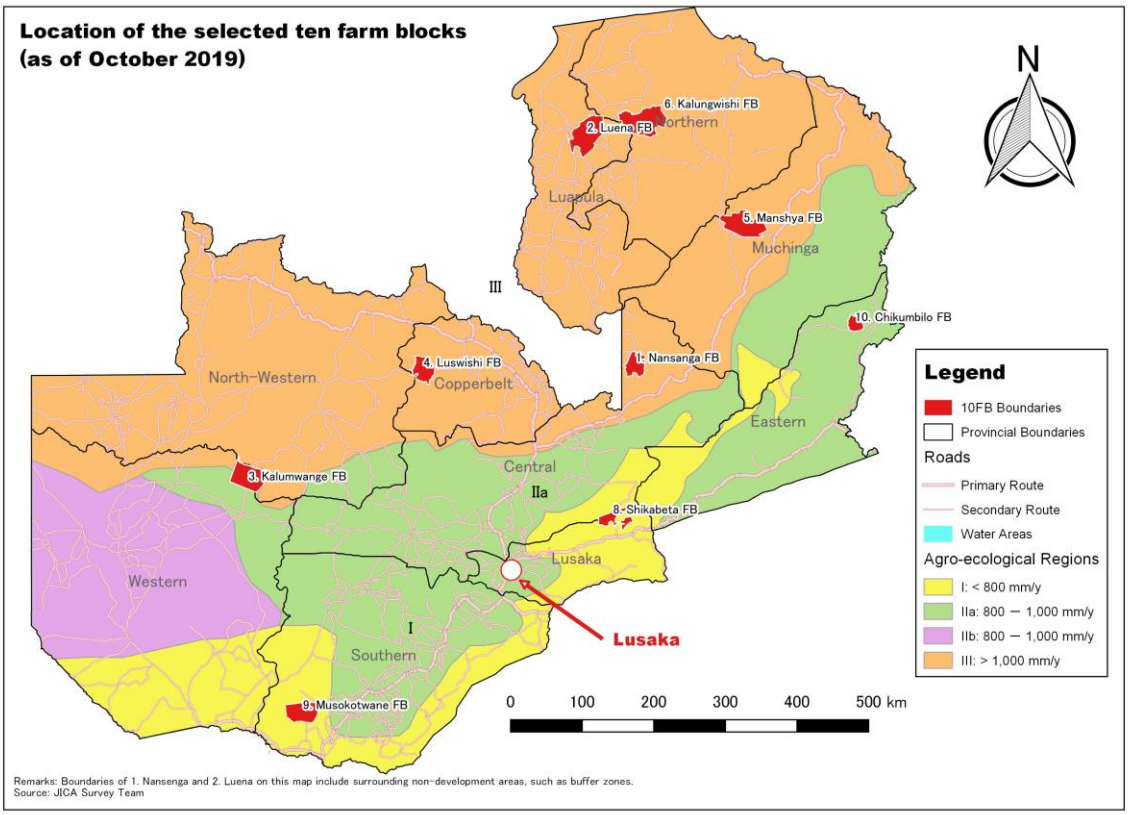


Figure 9-1: Locations of the ten selected FBs as of October 2019

Note: The boundaries of 1. Nansanga and 2. Luena on this map include buffer zones.

Source: The Survey Team

（2） Objectives of FB development

The government's main objectives for the creation of FBs include the following:

- To commercialize agricultural land and, thus, exploit its full potential to attain economic diversification and growth.
- To enhance food and nutrition security through the production of adequate food for the nation and for export.
- To open up undeveloped rural areas, reduce poverty through job creation, and minimize rural-to-urban migration.

（3） Process and stakeholders of FB development

The process and stakeholders of FB development are outlined in this section.

1） Land alienation for FBs

First, land must be secured for FB development. The MOA[3] identifies appropriate land in each province and then requests through the Ministry of Chiefs and Traditional Affairs that the chief[4] of the land alienate the land from customary to state land. Once the chief has granted consent, the Ministry of Land and Natural Resources (MoLNR) registers the transformation.

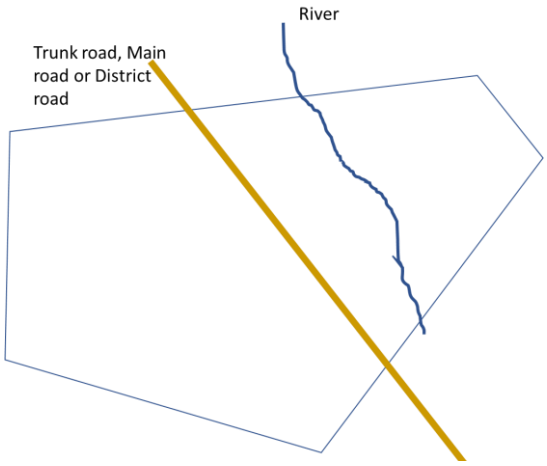


Figure 9-2: Land alienation for FB development

Source: The Survey Team

[3] The Ministry of Agriculture and Cooperatives managed FBs until 2010, and then the Ministry of Agriculture and Livestock managed FBs until 2015.

[4] Consent from the chief who directly owns the land, the senior chief, and the paramount chief is required.

2） Plotting for FB development

After FB land is transformed into state land, the MOA plots the FB for different purposes. The major purposes of the plotted areas are summarized in Table 9-5. The plotting results are registered by the MoLNR. However, commercial farmers may obtain land in an FB before plotting the FB, as occurred in Solwezi FB. Figure 9-3 shows a schematic diagram of a plotted FB.

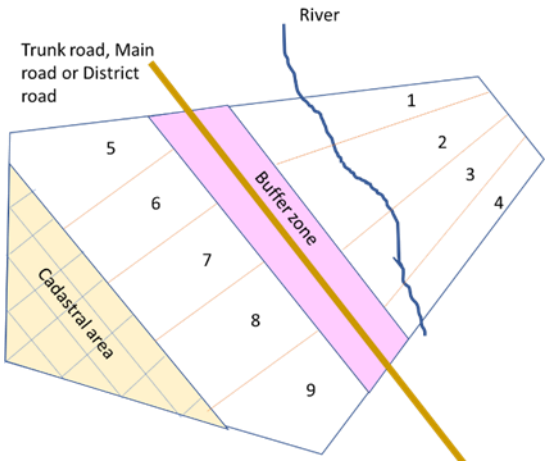


Figure 9-3: Plotting for FB development

Source: The Survey Team

Table 9-5: Main types of plots in FBs

Plot	Purpose
① Plots for core ventures and commercial farmers	Areas of 5–10,000 ha of land are plotted for agricultural development
② Buffer zone	Commercial areas along main roads and residential areas are excluded from development
③ Cadastral area	Areas where existing farmers are populated so that land registration can be performed for the population and vacant plots can be given to immigrants and resettled people from other parts of the FB.

Source: The Survey Team

3） Development planning of FBs and the implementation of plans

Next, the MOA, in collaboration with local governments, plans the development of FBs. The key players in planning FBs are the Department of Development Planning and the Department of Physical Planning in the Provincial Administration. The FB development plan must be endorsed by the council of the municipality, town, or city where the FB is located. Figure 9-4 lists the main components of FB development plans and summarizes the

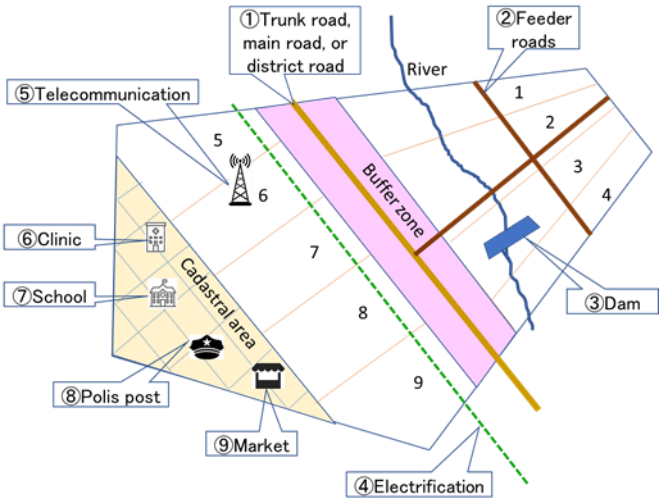


Figure 9-4: Development planning of FBs

Source: The Survey Team

responsible government bodies for these components.

Table 9-6: Responsible government bodies for FB development planning

Infrastructure	Responsible government body and remarks
① Planning and construction of the trunk road, main road, or district road inside an FB	The Road Development Authority (RDA) has responsibility. Budget allocations for constructing or upgrading roads have been delayed, and existing roads are often used with minor maintenance.
② Planning and construction of feeder roads inside an FB	The city, town, or municipal council should have responsibility. However, they have fewer financial and human resources, so they are often supported by the RDA. In some cases, Zambia National Services plans and constructs community roads.
③ Dams	If the height of a dam is 5 m or more, the Ministry of Water Development, Sanitation, and Environmental Protection (MoWDSEP) designs, constructs, and hands over the dam to a client, specifically the MOA or commercial farmers in the case of dam development in an FB. If the height of a dam is less than 5 m, no proper permission is necessary, and any authority can construct a dam. However, a stakeholder meeting that includes MoWDSEP should be held to design and construct the dam.
④ Electricity	The Rural Electrification Authority (REA) under the Ministry of Energy is the public sector authority responsible for rural electrification. However, only Luswishi and Kalumwange FBs have been partly electrified by the public sector. Several large commercial farmers[5] have ordered Zambia Electricity Supply Corporation (ZESCO)[6] electrification at their own expense.
⑤ Telecommunications	The Zambia Information and Communication Technology Authority (ZICTA) has financed Zamtel to establish a telecommunications network that covers 93% of the total population. Private carriers, such as MTN and Airtel, are expanding their networks according to their plan. The construction of telecommunications towers must comply with aviation laws and environmental conservation regulations, but an application to the Ministry of Communication is not required.
⑥ Hospitals	The Ministry of Health plans and constructs hospitals in collaboration with local governments.
⑦ Schools	The Ministry of Education plans and constructs schools in collaboration with local governments.
⑧ Police stations	The Ministry of Home Affairs plans and constructs police stations in collaboration with local governments.
⑨ Markets	Local governments plan and construct markets.

Source: The Survey Team

[5] Global Industry in Luswishi FB

[6] Vin Energy Solution, a wholesaler of electricity, is planning the electrification of Luswishi and Solwezi FBs by raising funds from commercial farmers in the two FBs.

4) Resettlement

Resettlement may be unavoidable when core ventures or commercial farmers launch their projects in their FBs. Resettlement in relation to FB development may be categorized into three cases depending on the relocation site, as follows.

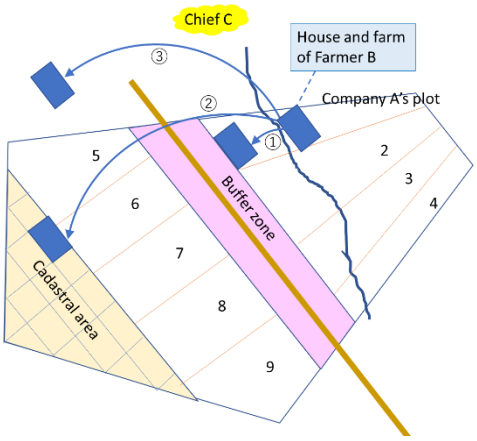


Figure 9-5: Resettlement related to FB development

Source: The Survey Team

① Resettlement within the same plot

Figure 9-5 illustrates the case of resettlement within the same plot, which is owned by company A. The stakeholders and their responsibilities are as follows.

- Company A: According to the resettlement plan specified in the EIA for Company A's development in the FB, it must provide land and other compensation appropriately.
- MOA: The MOA coordinates stakeholder meetings and the whole process of resettlement. The MOA also collects the baseline, that is, the livelihood conditions of the resident before resettlement, for the assessment of compensation
- Zambia Environmental Management Agency (ZEMA): ZEMA is the certification authority of the EIA conducted by company A, and the EIA includes the resettlement plan.
- Department of Resettlement (DOR) in the Office of the Vice President: ZEMA requests comments from the DOR if an EIA includes a resettlement plan.
- MoLNR and local governments: These groups register the land after resettlement.

② Resettlement to the cadastral area within the same FB (see ② in Table 9-5)

Figure 9-5 also illustrates the case of resettlement to the cadastral area within the same FB. The stakeholders and their responsibilities are as follows.

- Company A: According to the resettlement plan specified in the EIA, the company provides necessary compensation.
- MOA: In addition to the responsibilities described in ①, the MOA coordinates the selection of a plot in the cadastral area for Resident B, the displaced resident.
- ZEMA, DOR, MoLNR, and local governments: Same as in ①.

③ Resettlement outside the FB

The case of resettlement from inside the FB to outside the FB is also shown in Figure 9-5. The stakeholders and their responsibilities are as follows.

- Company A: Same as in ②.
- MOA: In addition to the responsibilities described in ①, the MOA facilitates communication between Resident B and Chief C in collaboration with the Ministry of Chiefs and Traditional Affairs.
- Chief C: The Chief chooses and alienates appropriate land for Resident B according to his request.
- ZEMA, DOR, MoLNR, and local governments: Same as in ①.

5) Payment for utilities in FBs

Once core ventures or commercial farmers launch their businesses in an FB, they generally need to pay the cost of the following utilities, as shown in Figure 9-6.

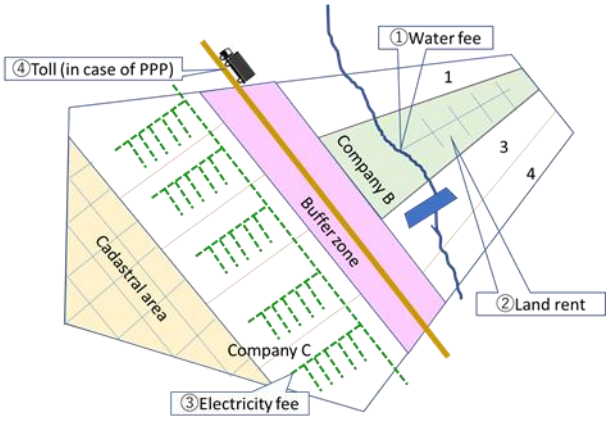


Figure 9-6: Payment for utilities in FBs

Source: The Survey Team

① Water fee: When water is used, water fees must be paid to the Water Resources Management Authority (WARMA) in MoWDSEP regardless of the source of the water (i.e., groundwater or surface water). If WARMA does not exist in a location, the Department of Water Resources Development in MoWDSEP bears the responsibility for WARMA.

② Land rent: core ventures and commercial farmers must pay land rent to MoLNR every year.

③ Electricity fee: An electricity fee must be paid to ZESCO. If core ventures or commercial farmers extend power feeder lines at their own expense to connect to an existing grid, the lines are constructed by ZESCO or another business entity, such as Vin Energy. The electricity users pay a construction fee back to ZESCO or the other entity on top of the electricity fee.

④ Road fee: If a road inside an FB is constructed by a PPP, a toll fee must be paid by the users of the road.

6) Contract farming

One of the businesses to be conducted in FBs is the production and processing of agricultural products. The basic model is to produce and process agricultural products within the same FB. If the production capacity of a factory in an FB is not fully utilized, materials can be procured from farmers both inside and outside the FB. The farmers operate at a small scale and are occasionally organized. The factory may provide the farmers with agricultural inputs, such as fertilizer and seeds, and may buy their products on a contract basis (① and ② in Figure 9-7). This contract farming facilitates agricultural development in the area and also helps to maintain a good relationship between company B and the nearby farmers. Once company B's factory is operating at full capacity, another factory owned by company B outside the FB[7] can accept products from inside or outside the FB (③ in Figure 9-7).

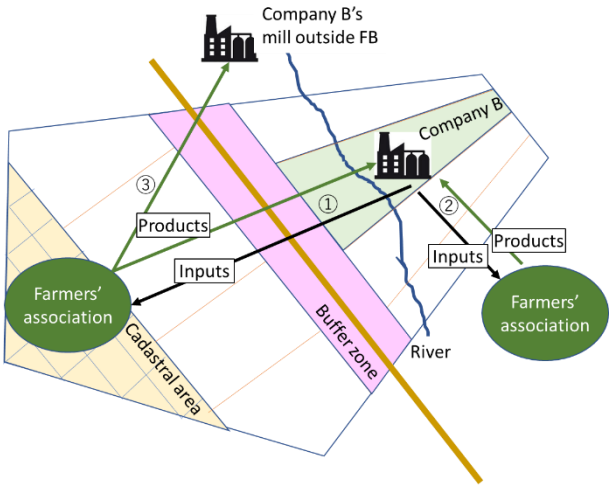


Figure 9-7: Contract farming in relation to FBs

Source: The Survey Team

(4) Implementation structure of FB development

1) Implementation structure

Figure 9-8 illustrates the implementation structure of FB development. The main engine is the TCFBDP, which consists of the MOA as the chair, followed by the MoLNR; the Ministry of Livestock and Fisheries; the Ministry of Local Government and Housing; the Ministry of Mines, Energy, and Water Development; the

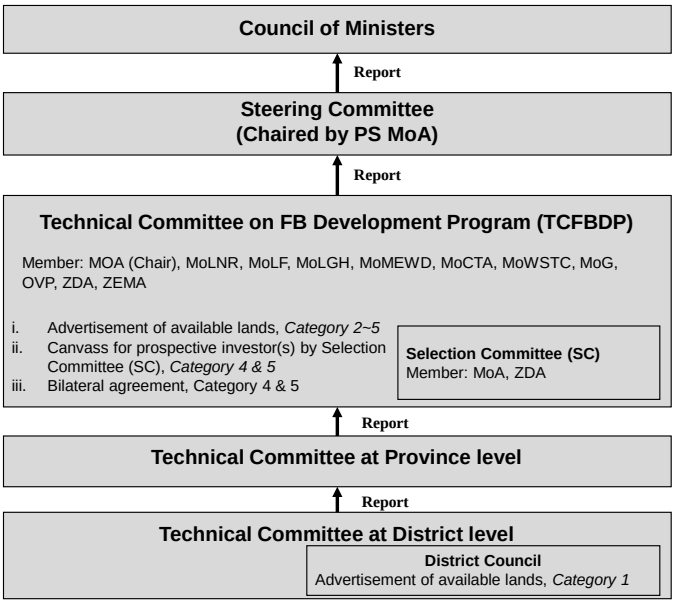


Figure 9-8: Implementation structure of FB development

Source: The Survey Team based on MOA (2018)

[7] Global Industry in Luswishi FB does not have a factory inside the FB but rather sends soybeans to its factory in Ndola to extract oil.

Ministry of Chiefs and Traditional Affairs; the Ministry of Works Supply, Transport, and Communication; the Ministry of Gender; the Office of the Vice President; the Zambia Development Agency; and ZEMA.

One of the essential roles of this structure is attracting investors and allocating farms in FBs. The TCFBDP acts as an agent for the Commissioner of Lands in identifying would-be developers for farms in categories 2 to 5 (medium, large, commercial, and core venture farms) among five categories classified based on the land size. In addition, ZDA, in collaboration with the MOA, constitutes a non-standing committee called the Select Committee that is tasked with canvassing suitable private investors with traceable references. The TCFBDP may enter into bilateral agreements with respect to core venture and commercial farms. According to the aforementioned guidelines, similar technical committees at the province and district levels were intended to be established, but specific committees for the FBDP were not established owing to a lack of funds. As an alternative, some districts, such as Luena, use existing organizations, such as the District Development Coordination Committee and the Provincial Development Coordination Committee. The District Council in which the farm block is located acts as an agent for the Commissioner of Lands in identifying developers for farms in category 1 (small-scale farms). To this effect, the Committee has several land allocation alternatives.

The progress and issues concerning FB development in each district are reported to higher-level organizations through this implementation structure. FB development progress reports have been compiled by some districts, such as Luena and Luswishi.

As a specific example, the preparation, allocation, and application process for small-scale farmers' plots (assuming the plot size is about 5 ha) to be functionalized in a future out-grower scheme is summarized in Table 9-7. Furthermore, those who wish to obtain a land title deed from MoLNR can follow the process explained in Table 9-8.

Table 9-7: Example preparation process for an out-grower's land in Luena FB and the application steps

Activity	Responsibility	Time Frame
1) Carrying out an agricultural survey in the intended area and fiscally opening the boundaries with temporary beacons. This is a kind of temporary demarcation of the FB[*1] from the Buffer Zone.	Technical Service Branch (TSB) of the MoA in the district	Depends on the size of the plot
2) Handing responsibility over from DACO to the Planning Authority under the District Council to set concrete beacons for each corner of the plot.	Planning Authority under the District Council accompanied by the TSB	As above
3) Numbering each farm plot for identification.	Planning Authority, DACO, and TSB	As above
4) Advertising available lands for investment or settlement by TV, radio, and posters on trees or community boards.	District Council	1 to 2 weeks

5) Receiving an application form from the District Council and submitting all necessary documents to the same, as follows. - A copy of the National Registration Card - A reference letter from an affiliate - A farm plan, including a business plan and the applicant's desired amount of land - An endorsement (this can be part the of application form) - The application fee (20 to 50 Kwa/applicant) - A copy of a bank statement	Applicant	Depends on the applicant
6) Receiving the application and registering to the short list.	District Council	Once the application is received
7) Calling applicants by phone for interviews with the District Council.	District Council	N/A
8) Examining the applicant's business plan and capacity in the interview.	Evaluation Committee to be established*2.	N/A
9) Providing results of the examination by phone and radio; hanging posters on trees, community boards, and so forth; and calling the successful applicants to provide an "offer letter" that contains the following documents. - Confirmation letter from the District Council - Location map of the land to be allocated - Minutes from the interview of the applicant	District Council	N/A
10) Forwarding a list of applicants who successfully obtained land to MoLNR and MoLGH.	District Council	N/A
11) Conducting site visits and marking the corners or boundaries of the plots by paint, axe, and so on to avoid encroachment from others.	Applicant	N/A
12) Starting development. * If the applicant wants to obtain a land title deed from the MoLNR, the applicant follows another process, shown in Table 9-8.	Applicant	N/A

Note:

*1: In this table, "FB" does not refer to the entire FB but rather an aggregation of several designated areas (plots) to be developed by core ventures, commercial farmers, or smallholder farmers or to be allocated for the construction of social and agricultural infrastructure, such as schools, clinics, agricultural training centers, depots, and so forth.

*2: The expected committee members are all of the ministry departments at the district level (such as the MOA, Ministry of Education, and Ministry of Health), Water Affairs, the Forestry Department, Chief Affairs, District Commissioner (if needed), a Representative from the District Council, and Chiefs. The committee is not expected to include a Member of Parliament.

Source: The Survey Team

Table 9-8: Example process for obtaining a land title deed from MoLNR in Luena FB

Activity	Responsibility	Time Frame
13) Submitting an application form for a land title deed with the following attachments to the District Council. - A location map of the land to be allocated - Minutes of the interview with to the applicant - Approval letter from the Council (this letter proves that the Council has allowed the applicant to obtain the title and that the title	Applicant	Usually takes 3 to 6 months

can be issued after application)		
14) Forwarding the series of abovementioned documents to the MoLNR Ndola office*3.	District Council	
15) Examining the application based on the information written on the submitted documents.	MoLNR Ndola office	
16) Calling the applicant to collect the "offer letter" and noting that the applicant must pay a processing fee (1,600 Kwa/ applicant) within 90 days of receiving the offer letter.	MoLNR Ndola office	
17) Collecting the offer letter from the MoLNR Ndola office and paying the processing fee (payment in cash or by bank transfer are acceptable)	Applicant	
18) Issuing the land title deed after receiving the processing fee from the applicant.	MoLNR Ndola office	
19) Notably, it is the land title deed holder's obligation to pay the annual ground rate (10 Kwa/ha/year). In case of Kawambwa district, where Luena FB is located, the applicant can pay this annual fee to the MoLNR through the Forestry Department in the District Agriculture Office.	Title holder	Once a year

Note:
*3: The MoLNR Ndola office handles applications from five Northern provinces in Zambia: Northern, Northwestern, Copperbelt, Muchinga, and Luapula Provinces. Likewise, applications from the remaining five provinces are handled by the MoLNR Southern office.

Source: The Survey Team

2) Major stakeholders and their responsibilities

FB development is a comprehensive regional agricultural development program, and its activities include not only agricultural development but also social infrastructure development, commercialization, and industrialization, and the related organizations are diverse. The ministry in charge of the FB development program is the MOA, and, according to the aforementioned revised guidelines, the main activities and responsible organizations are as follows.

Table 9-9: List of activities and responsible organizations for FB development

Activity	Responsible Organization
Financing and coordination	Ministry of Finance and Ministry of National Development Planning
Agricultural land alienation / identification and consolidation	MOA, Ministry of Lands and Natural Resources, Ministry of Local Government, Farm Block Committees
Advocacy	MOA, Ministry of Lands and Natural Resources, Ministry of Local Government
Agricultural land baseline data	MOA
Layout plans	MOA, Ministry of Lands and Natural Resources, Ministry of Local Government
EIA	Ministry of Water Development, Sanitation, and Environmental

Activity	Responsible Organization
	Protection, ZEMA
Demarcation and survey	MOA, Ministry of Lands and Natural Resources, Ministry of Local Government
Land allocation	Ministry of Lands and Natural Resources, Ministry of Local Government
Road infrastructure	Ministry of Housing and Infrastructure Development
Dams and boreholes	Ministry of Water Development, Sanitation, and Environmental Protection, MOA
Electrification	Ministry of Energy, ZESCO
Schools	Ministry of General Education
Health facilities	Ministry of Health
Security	Home Affairs
Investor identification and investment certificates	Ministry of Commerce, Trade, and Industry, Zambia Development Agency
Land-use plans	MOA, Ministry of Lands and Natural Resources, Ministry of Local Government
Conservation works	Ministry of Lands and Natural Resources, Ministry of Local Government, Ministry of Water Development, Sanitation, and Environmental Protection, ZEMA
Commercialization and industry	Ministry of Finance, Ministry of Commerce, Trade, and Industry, Zambia Development Agency, Industrial Development Corporation (IDC), Zambia Chamber of Commerce and Industry, Zambia Business Forum

Source: Ministry of Finance and National Planning (2005), Farm Block Development Plan (2005-2007)

(5) Lessons learned from previous FB development experiences

A feasibility study report for Kalunwishi FB[8] reviewed the development progress of the FB and identified some of the important factors for ensuring success, as summarized below.

■ Impacts of delays in the implementation of FB development

These delays led traditional leaders to reclaim the land to hand it over to the local people.

■ Factors that contributed to the delays in the implementation of FB development

- Lack of funding to the FBs.
- Lack of collaboration among government ministries.
- Unclear policy on land tenure for foreign investors.

[8] China Railways Engineering Cooperation (CREC) China Railway Seventh Group (2017), *Final Report, Feasibility Study for the Proposed Kalungwishi Farm Block,* (Prepared by RANKIN Engineering Consultants)

- Alleged lack of transparency in land allocation.
- Foreign investors needed bigger pieces of land than thousands of hectares, discouraging investors.
- Lack of investor capacity in terms of large-scale farm operation and management.
- Lack of reliable basic agricultural information, such as soil types, meteorological data, and suitability of crops.
- Limited to crop farming only, although the government eventually allowed livestock and fish farming to be incorporated.
- Lack of capacity of the government running the FB development program to install necessary infrastructure in most cases.

■ The lessons learned include the following:

- The private sector should spearhead development and identification of FBs.
- Title deeds for farms should be held by three parties, that is, the Chiefs, the council, and the investors. If the investor fails to develop the land, the other parties can hand over the land to other investors.
- A clear policy on land tenure for FBs should be formulated by the MOA.
- The criteria for land allocation in FBs should be strict, and all farmers' allocated land should have a proven success record.

9.6. Current Status and Challenges of each FB

The following sections present the current status and challenges of each FB as of June 2019.

9.6.1. Nansanga FB

（1） Geographical information

Nansanga FB, with a total area of 133,000 ha, is located in the northeast of the Serenje District in Central Province. The route from Lusaka to Serenje town is 430 km long, and that from Serenje town to Nansanga FB is another 60 km northward. The general layout of the Nansanga FB and its location is shown in Figure 9-9.

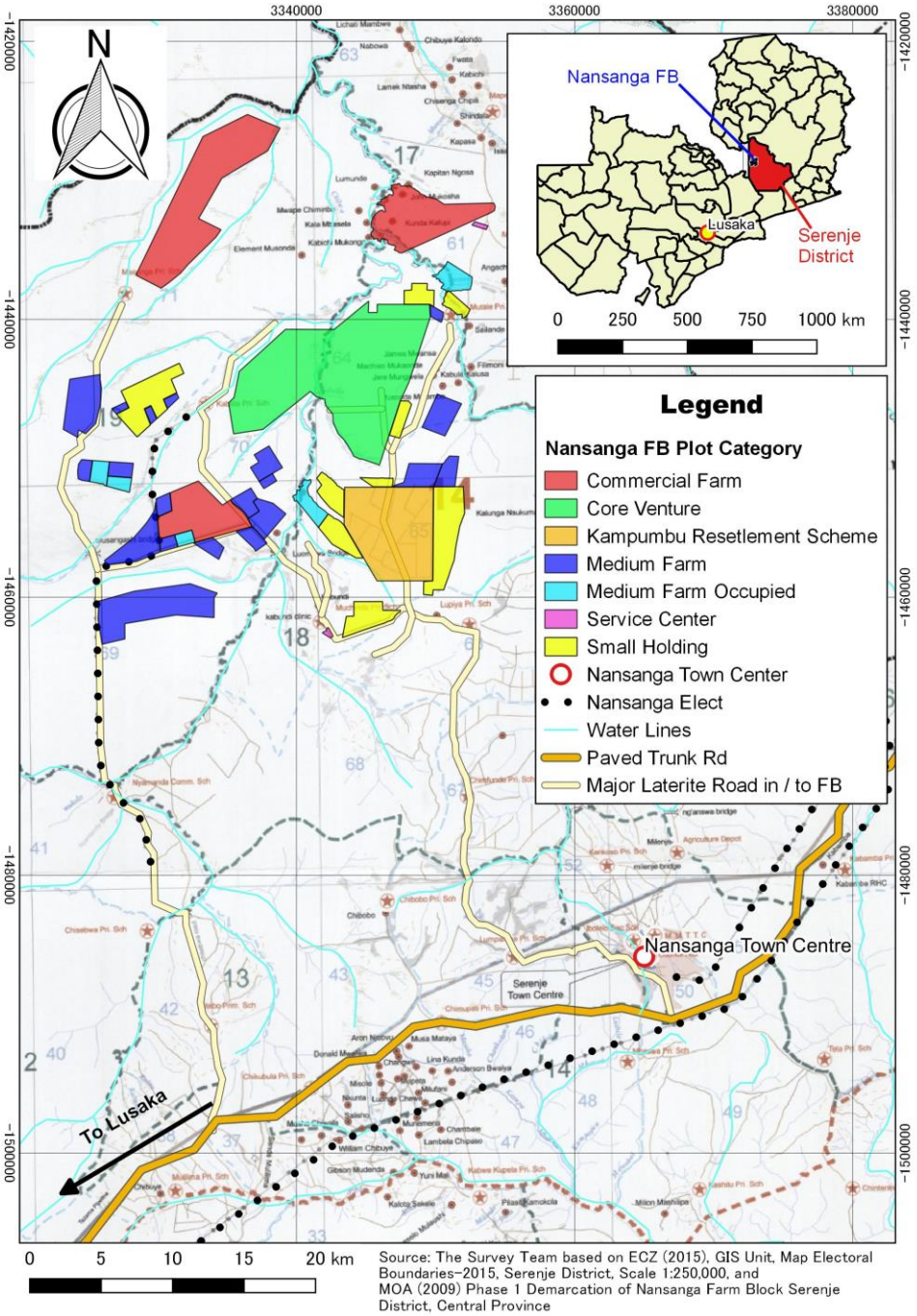


Figure 9-9: General layout of Nansanga FB

Source: The Survey Team

（2） Background

Nansanga FB is one of the phase 1 blocks selected by the FB Development Program in 2005, and the Government of Zambia carried out promotional activities to attract foreign investors and preferentially construct infrastructure. However, as of now, no core ventures that are expected to play a central role in the FB development program have been established, and eventually the development of the core venture plot (CVP) was handed over to IDC. Since January 2019, a local consulting firm hired by IDC has implemented a RAP study in the CVP.

The observation of the Assistant Technical Officer (ATO) in Serenje District is that the location of Nansanga FB is less attractive than those of the other surrounding FBs, that is, Luwombwa FB (established by the Farm Development Program in the 1990s and not included among the MOA's ten selected FBs) and Munte FB (established by the Resettlement Scheme in the 1970s and not included in the MOA's ten selected FBs), among others. These FBs are advanced in terms of their market accessibility and communication and electricity network coverage.

（3） Investment progress

As of June 2019, only Zambia Correctional Services has started its business. It aims to develop the capacity of prisoners, especially in terms of farming and farm management, so that they can start private businesses or be hired by agricultural firms after completing their rehabilitation. Their farm plan is to cultivate maize, soybeans, wheat, and so forth on 700 ha of land irrigated by nine center pivots (the irrigable land area per center pivot is about 80 ha), and 63 prisoners are expected to serve in its operation, maintenance, and other farming activities. Electric facilities were installed in May 2019 and are currently undergoing a final operation check, and land clearing is in progress. Once a full-scale production system is in place, products, such as maize, will be available for purchase from the Food Reserve Agency (FRA). The selection of crops to be cultivated and the market are decided by the provincial office (Kabwe HQ). The settlement of medium-scale farmers is almost complete, but no contract farming is taking place owing to the absence of a core venture farm. Table 9-10 outlines business development progress in the FB.

Table 9-10: Progress of investors' and farmers' business development in Nansanga FB

Category	Existing number	Names of actors who currently conduct business	Planned number	Names of actors who plan to conduct business
Core investors (10,000 ha)	0	N/A	0	N/A
Commercial farmers (1,000–5,000 ha)	1	Zambia Correctional Services (maize, soybeans, and wheat)	2	Copperbelt Forest (timber)

Medium-scale farmers (100–1,000 ha)	47		N/A	
Small farmers (0–100 ha)	300		N/A	

Source: The Survey Team

（4） Progress of infrastructure development

The upper left photo in Figure 9-10 shows the conditions on T2 Road, which is a trunk road leading to Tanzania from Lusaka via Mpika and Isoka, around Serenje District. The road has two lanes with local potholes, but no drainage has been constructed. Another trunk road from the center of Serenje District to Nansanga FB is a laterite paved road constructed by the RDA and funded by the National Road Fund Agency.

During the field visit, weeding on the roadside and the cleaning of pipes in the box culvert were both relatively well managed, but, according to the DACO, several sections of the road become hard to pass in the rainy season. Concerning the irrigation facilities, three bridges (about 10 m in length) cross the Luwombwa River, which is the main water source of Nansanga FB, but they have deteriorated significantly. Three irrigation dams[9] and four kilometers of irrigation canals were constructed, but it is hard to argue that they are functioning well. According to the aforementioned Revised Guidelines, the Government of Zambia reports that 85% of the infrastructure needed for Nansanga FB was completed, but it is unclear how much of that infrastructure is still usable. Additionally, with the exception of a few areas, internet and mobile phone networks are unavailable, which hampers various activities in this area.

Trunk Road (T2 Road around Serenje District)

Access Road in the FB

[9] In Zambia, all structures with concrete bodies are called “dams” regardless of the embankment height. Although this report also uses that expression, this terminology includes structures that do not meet the definition of a dam in Japan (height > 15 m).

Damaged Luombwa Bridge crossing Luombwa River

Damaged Spillway of Sasa Dam

Figure 9-10: Current conditions of major infrastructure developed in and around Nansanga FB

（5） Expected impact of FB development

1） Land acquisition and resettlement

The Serenje district ATO noted that no farmers had been displaced by Nansanga FB development through June 2019, but the influx of both naturally settled farmers and professional squatters to the CVP is increasing. For instance, the number of Project Affected Households (PAHs) was only 49 households when the Nansanga FB program was initially planned, but it is now 91 households with 556 persons. None of these households has a land title deed issued by the MoLNR, and only three households have a consent letter for the lands issued by Chief Muchinda. Thus, large-scale involuntary resettlements are extremely likely to occur when the CVP is developed.

A local consulting firm called Green Line Solutions hired by IDC last year has been implementing an RAP study for the existing residents (farmers) within the CVP area. Only the results of a reconnaissance survey are available as of now, but, eventually, specific compensation measures, implementation structures, and so on will be described in the RAP report. The socioeconomic profiles of the existing CVP residents are shown in Table 9-11.

Table 9-11: Socioeconomic profiles of the existing CVP residents in Nansanga FB

Total number of households (PAHs)	91 households
Total number of farmers within the households (PAPs)	556 persons
Total area under cultivation*	239 ha
General description of structures	Temporary (mud and pole) and semi-permanent (mud with concrete plastering and iron sheets)
Total number of burial sites	6 sites
Water source	Well and streams

Primary and secondary occupations	Primary occupation is farming, and secondary occupation is livestock rearing
General types of crops and fruit trees planted	Maize, beans, soybeans, groundnuts, cassava, sorghum, millet, tobacco, sweet potatoes, Irish potatoes, peas, cowpeas, mangos, bananas, mulberries, guava, pawpaw, curry trees, avocados, sweet apples, lemons, chili, bamboo, and Jatropha
Total average monthly income per household	About ZMK 259,000 per month
Total number of fruit trees	725 trees
Total average value of fruit trees	About ZMK 682,000 per month

* This result is wildly different from the results of interviews with farmers conducted by the Survey Team.
Source: Extracted from the MOA Department of Field Services Sereneje (2019), Nansanga Core Venture Farm Resettlement: Reconnaissance Survey Inventory

According to the ATO, Nansanga has not had any court cases, but there have been three court cases in the surrounding areas, namely, one in each of Kasanka, Nansanga, and Luonbwa. These cases were caused by large-scale agricultural development projects. Farmers who cannot prove that they originally lived on land or who did not develop their farmland properly within a certain period of time after obtaining a land lease certificate have filed lawsuits against the current landowner[10]. The ATO also mentioned that with the help of Human Rights Watch (HRW), a South African lawyer has been hired, but the case has not been settled in more than five years.[11] HRW's views are published on its website[12]. The ATO also shared the district's experience with cases in which in-cash compensation was paid in past development projects, but the cash was used for entertainment, such as alcohol, leading to various problems. Above all, the farmers themselves prefer land-based compensation rather than money. Consequently, land-based compensation for the loss of land has become the basic compensation policy in Serenje District.

2) Impact on the usage of land and other natural resources

According to interviews of the existing residents by the Survey Team, about 100 to 200 ha of land per household are allocated by the chief, and the traditional slash-and-burn farming method, called the *citemene system*[13], is carried out. Some farmers combine improved technology, such

[10] This term may refer to the land title deed holder.
[11] The draft National Land Policy (under review) mentions that civil society land advocacy records indicate a growing number of land disputes before the formal court system owing to a wave of illegal land allocations involving non-Zambians and between nationals as a result of large-scale investments, including the agricultural sector. In addition, a decision in a land-related conflict may take up to two years or more in 90% of cases.
[12] Human Right Watch, "Forced to Leave" Commercial Farming and Displacement in Zambia, October 25, 2017, https://www.hrw.org/report/2017/10/25/forced-leave/commercial-farming-and-displacement-zambia (accessed on June 8, 2019)
[13] The *citemene system* is one of traditional slash-and-burn systems in northern Zambia. It generally consists of logging land and cultivation land. Farmers first bring in the branches of trees cut at the logging site and pile them in a circular shape with a diameter of 60–70 meters. The area where the collected branches are piled up is called a *citemene* in the Bemba language. Before the rainy season, people set fire to the area to be cultivated later (usually 0.2–0.7 ha). In addition, there are two ways of cutting branches; one is on the trees and the other is at waist height. In the former, the trunk is not cut down in the case of trees with large diameters, so sprouting regeneration and ecosystem recovery occur rapidly. The purpose of waist-high cutting is to cut down the trunk at a height around that of the waist of an adult man. When the productivity of cultivated land decreases, the cultivated land is abandoned and another *citemene* is carried out.

as feeding fertilizer, with the *citemene system*. Although the cultivated area per household is less than 10 ha at any given time, farmers use local resources by rotating cultivated and fallow land every few years. Farmers mentioned the following four advantages of the *citemene system*: (1) pH correction of acidic soil with ash, (2) pest and disease control, (3) savings on fertilizer costs, and (4) the restoration of soil fertility.

Farmers also said that they harvest firewood, timber, wild fruits, mushrooms, caterpillars, and so forth from fallow lands for sale and self-consumption. Dried caterpillars can be sold at ZMK 50 per 5 kg, but the same amount is traded at a price of about ZMK 400 (about eight times greater) in Lusaka. Farmers also catch fish from nearby rivers and consume it at home.

Referring to the results of the reconnaissance survey shown in Table 9-11, the average amount of cultivated land per household is calculated to be about 2 to 3 ha. This result suggests a possible lack of consideration for the fallow land and the local resources obtained by the existing farmers. In addition, the ATO expressed concern that the existing farmers did not receive any information on relocation sites, and, according to his understanding, there was no more vacant land around the CVP. In other words, if access to resettlement sites and natural resources is not properly secured, the negative impact on the existing residents is a concern.

3) Impact on the local economy, such as employment and livelihood

If the relocation site of the PAPs is far from the CVP, it will be difficult for them to benefit from employment and livelihood improvements, and, thus, alternative means of livelihood must be sought. However, because the existing residents in the area have only primary education on average, it will not be easy for them to obtain jobs outside of agriculture. However, farmers living outside the CVP expressed the view that they expect a positive impact of FB development (see Box 9.1).

Box 9.1: Expected impact of FB development (the words of farmer living outside the CVP)

1) Creation of employment opportunities: Daily labor, cooking, cleaning and extraction work, routine weeding management, etc. are expected. Previously, I was hired by the DACO Serenje office to engage in the plot boundary creation work of the CVP. At that time, a wage of ZMK 20 per day person X 90 days was paid, which was a valuable cash income opportunity for me.
2) Improving lifestyles: I'm expecting life to become more convenient through the income improvement.
3) Securing a market to sell: I heard an out-grower scheme was to be introduced together with the core venture and am expecting that this will secure our market to sell. Moreover, the market will be closer than now. I'm selling maize to Food Reserve Agency Satellite Depots in Nansanga town for ZMK 120 per 50 kg, but the transport cost is ZMK 250 per 60 bags (one bag is equivalent to approximately 50 kg). On the other hands, soybeans are grown and sold under the loan scheme of COMACO. COMACO is very helpful because it comes to pick up soybeans from my fields.

4） Impact on existing social infrastructure and services

A benefit for the farmers who live on the CVP is that water for domestic use can be secured within ten minutes on foot from their residences, but the distance to health facilities, schools, agricultural training centers, and so forth is 10 to 30 km one way. If the displacement of existing residents is unavoidable, social infrastructure and services that are at least as good as or better than the pre-project level need to be provided at alternative sites.

5） Impact on local conflicts of interest

Not surprisingly, the responses to the FB development program are very different across farmers currently living on the CVP and those living outside of it. The former told the Survey Team that they would oppose FB development unless suitable alternative sites and houses were provided in kind. Failure to provide adequate support for these PAPs could lead to widening disparities and potential conflicts of interest in the area.

9.6.2. Luena FB

（1） Geographical information

Luena FB, with a total area of 100,000 ha, is located about 15 to 70 km east of the center of Kawambwa District in Luapula Province. The distance from Lusaka to Luena FB is about 950 km.

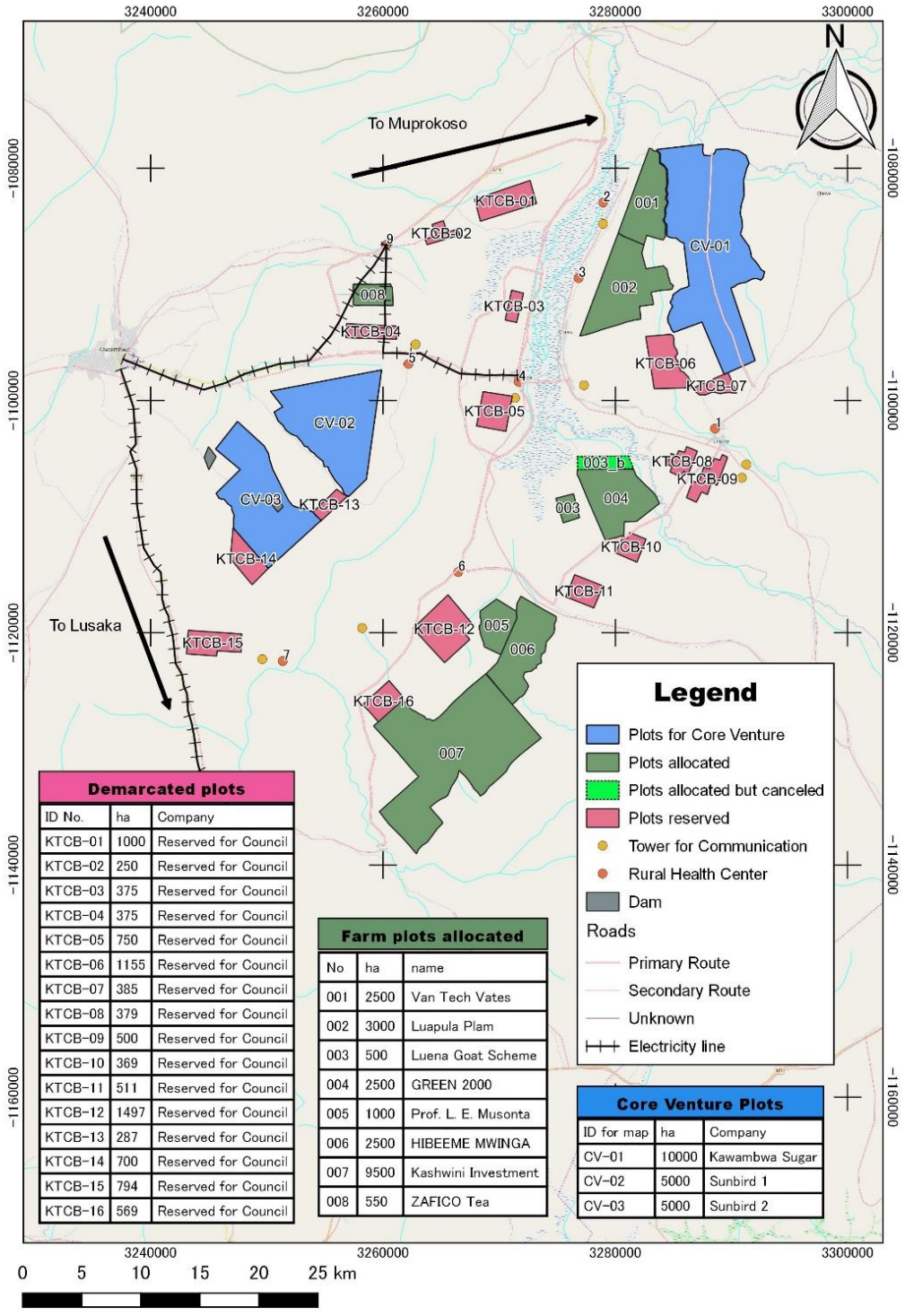


Figure 9-11: General layout of Luena FB

Source: The Survey Team, based on the Kawambwa DACO's map and personal interviews

(2) Uniqueness of Luena FB

The basic policy of Luena FB is to prevent involuntary resettlements due to FB development. Thus, the most important feature of this FB is that the development areas for core investors and commercial farmers, called demarcated plots, are placed in a worm-like manner to avoid disturbing existing settlements. Figure 9-12 shows an enlargement of part of Luena FB. The red and yellow outlined areas are the development areas known as demarcated plots. The non-development area established to protect the residential areas along the swamp/river is called the buffer zone (the green filled area in Figure 9-12), and its width is about 1 to 1.5 km. This model is sometimes called the "Luena Model."

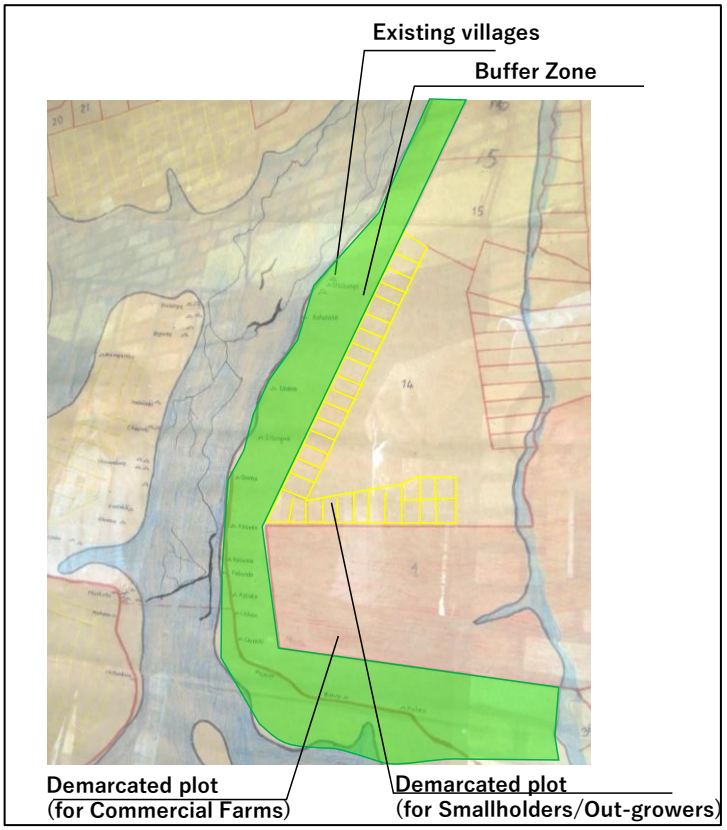


Figure 9-12: Schematic figure of the development concept of Luena FB (enlarged)

Source: The Survey Team, based on a handwritten map created by the Kawambwa DACO

According to Kawambwa DACO, the "FB" in Luena FB refers to the 100,000 ha of demarcated development areas (demarcated plots) in aggregate and does not include the buffer zone. However, the buffer zone includes existing residents who can participate in the FB program's out-grower scheme as well as users of infrastructure facilities, such as roads, transmission lines, schools, and health centers, and, thus, in a broad sense, the buffer zone where people live and infrastructure facilities are located may also be referred to as part of the FB. Thus, it should be noted that the definition of "FB" differs depending on the context.

(3) Investment progress

Luena FB, one of the phase 1 FBs selected together with Nansanga and Kalumwange, was established in 2007 and begin allotting land in 2012. The current status of investors' and farmers' business development in Luena FB is shown Table 9-12.

Table 9-12: Progress of investors' and farmers' business development in Luena FB

Category	Existing number	Names of actors who currently conduct business activities	Planned number	Names of actors who plan to conduct business activities
Core investors (10,000 ha)	2	Kawambwa Sugar (sugarcane), Sunbird Bioenergy (cassava)	0	N/A
Commercial farmers (1,000–5,000ha)	2	Green 2000 (soybeans, onions, and potatoes), ZAFFICO Tea (tea)	6	Luapula Palm, Luena Goat Scheme, Vantec, and so forth
Medium-scale farmers (100–1,000ha)	N/A		N/A	
Other small farmers (0–100 ha)	0		1,200 or more	N/A

Source: The Survey Team

An outline and progress of the ten companies (including individuals) that have been allocated farmland in Luena FB are summarized in Table 9-13.

Table 9-13: Outline and progress of ten companies that have been allocated farmland in Luena FB

Plot No.*	Company/investor name	Short summary and progress of the business
CV-01	Kawambwa Sugar	The company was allocated 10,000 ha of land in 2016. Sugarcane seedlings were first produced on 1 ha of land in 2017, and the second multiplication is currently ongoing on 10.2 ha of land. A procedure to extend ZESCO's transmission line by about 9 km to Kawambwa Sugar's field is currently underway and will be completed by the end of 2019. Currently, land consolidation and the construction of field offices are underway. The business plan extracts sucrose from sugarcane and exports it to the DRC. In the future, the byproducts (bagasse) will be used as a source of organic fertilizer and biomass power generation, and the generated electricity will be sold to ZESCO.
CV-02 & CV-03	Sunbird	The company was allocated 10,000 ha of land for cassava production in 2015. Thus far, 130 ha of farmland has been consolidated. The company plans to distill purified ethanol from cassava.
001	Van Tech Vates	The company was allocated 2,500 ha of land in 2018. Its business outline is not known.
002	Luapula Palm	The company was allocated 3,000 ha of land in 2018 for oil palm production, but no activity has started yet.
003	Luena Goat Scheme	Land was allocated in 2018, but no activity has started yet. The plan is to provide goat breeding services.
004	Green 2000	The company was allocated 2,500 ha of land in 2018. Thus far, 300 ha of land have been consolidated. Without waiting for the installation of transmission lines by ZESCO, Green 2000 has started its business with its own generator. It plans to cultivate Irish potatoes, wheat, onions, soybeans, and so on with 16 center pivots. The company has also constructed access roads with a total length of 14.6 km on the farm and other roads with a length of 6.9 km on the farm boundaries. One center pivot can irrigate about 64 ha with a radius of 450 m in length.

005	Prof. L.E. Musonta	This private investor was allocated 1,000 ha of land in 2018, but the business plan is not known.
006	Hibeeme Mwinga	This private investor was allocated 2,500 ha of land in 2018. He is planning to start a livestock-related business.
007	Kashiwini Investment	This company was allocated 9,500 ha of land in 2018. It plans to produce maize, wheat, fruit, and spices.
008	ZAFFICO Tea	ZAFFICO Tea, a parastatal organization, acquired an original company that had gone out of business since its establishment in 1976. Of its 1,500 ha of allocated land, 550 ha will be used for tea plantation. Currently, seedling production on 50 ha of land is underway. In the future, ZAFFICO Tea plans to work on contract farming with an out-grower scheme. Additionally, ZAFFICO has started a large-scale pine tree plantation (called ZAFFICO Plantation).

* See the plot numbers described in the general layout map of Luena FB.

Source: The Survey Team

(4) Progress of infrastructure development

As shown in Figure 9-11, some infrastructure, such as transmission lines, roads, eight communication towers, and seven rural health centers have been installed in Luena FB. In addition, sixteen more plots are reserved for the future construction of social facilities, such as schools, health centers, churches, depots, graves, agricultural training centers, and so forth, although detailed construction locations, times, and budgets have not yet been determined (see the pink demarcated plots in Figure 9-11). Figure 9-13 illustrates some of this infrastructure.

Communication towers along an access road in Luena FB. The ZAFFICO Tea plantation can be seen on both sides of the road.

An electric substation along the Trunk Road in the northern part of Luena FB.

Road surface conditions of the two-lane trunk road north of Luena FB (from Kawambwa town to Muporokoso)

Surface conditions of an access road in Luena. The road width is approximately three to four meters, and it is not paved.

Figure 9-13: Progress of infrastructure development in and around Luena FB

A remarkable infrastructure development project related to Luena FB is upgrading 182 km of Kasomeno–Mwenda road. The project is coordinated by the RDA and Groupe Europeén de Development Africa. The 475 million USD road project will offer an alternative, shorter route for cargo traffic from Lubumbashi, the mineral-rich province in the DRC's Katanga region, to Dar es Salaam port. The Kasomeno–Mwenda road is part of this upgrade project, which covers 85 km of road upgrades, 2 km of new road construction, and a 350 m cable-stayed bridge and two on-stop border points in the DRC and Zambia at an estimated cost of 180 million USD.[14] According to the RDA, F/S has been completed, and the detailed design and EIA are underway. Construction is supposed to commence by 2020, but the project completion schedule has not been provided in detail.

With the opening of this route, Kawambwa's accessibility to the DRC will be significantly improved. In anticipation, Kawambwa Sugar, which promotes sugarcane development in Luena FB, plans to export sugar to the DRC.

[14] RDA, 2017, The Kasomeno Mwenda Road Project Brief

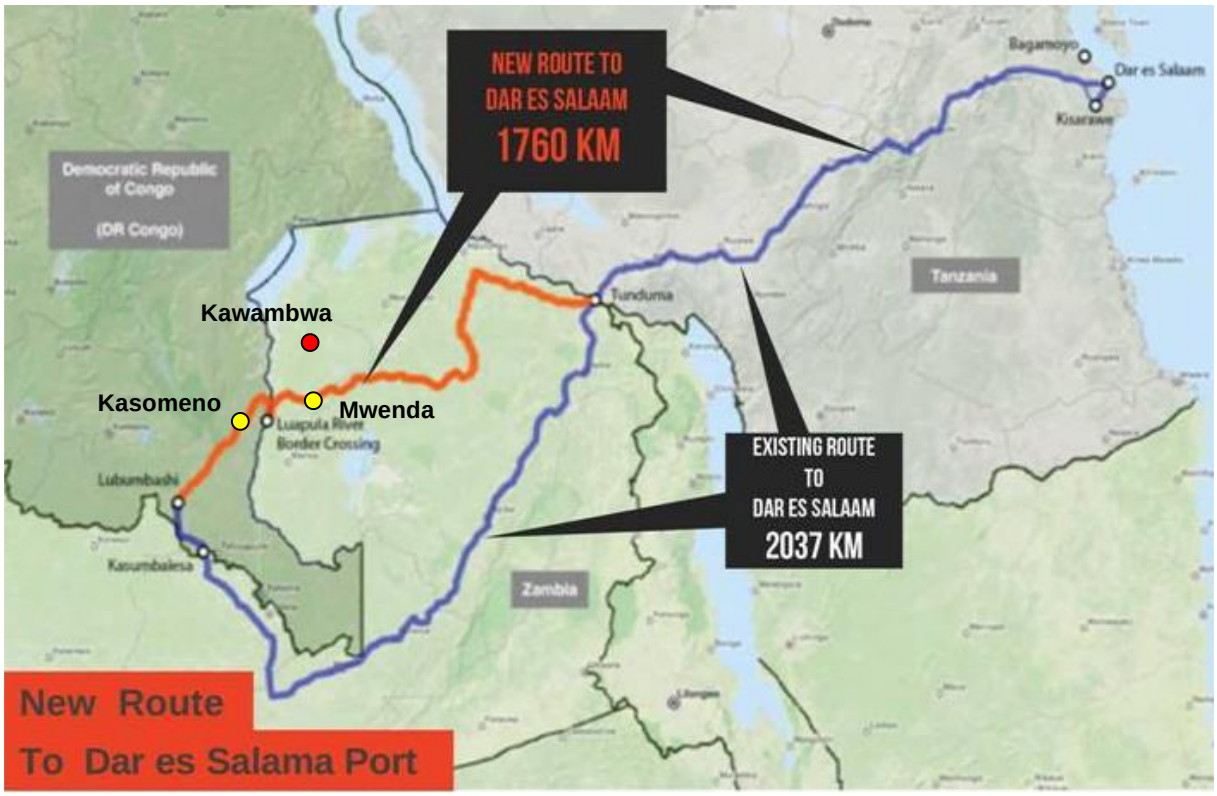


Figure 9-14: Route of the Kasomeno–Mwenda road

Source: The Survey Team, revised based on https://dailynews.co.tz/news/2018-07-175b4da743cec2e.aspx

（5） Expected impacts of FB development

1） Land acquisition and resettlement

A census survey conducted by the Kawambwa district agricultural office in 2017 as a part of an EIA study[15] for the entire Luena FB revealed that the existing villages in and around Luena FB consist of four blocks, called Chibote, Pambashe, Luena, and Central Muyembe. A total population of 45,424 persons lives in a total of 211 villages. In terms of chiefdoms, Luena FB is divided into three areas by streams and dambos that flow from south to north. The chiefs of these areas, in order from east to west, are Chief Mukanta, Senior Chief Mushota, and Chief Chama. Senior Chief Mushota is also the head of the Chisinga tribe.

According to the land husbandry officer (LHO) of the Kawambwa district agriculture office, the Senior Chief and the Chiefs have already provided written agreement to the FB development program. The LHO also mentioned that when conducting the field survey for land allotment plans, the district office hired existing residents as casual workers to create awareness of the FB development program.

However, the LHO estimates that 80% of households in the FB area support the FB

[15] DACO called it as EIA, but seems like it is SEA or Framework.

development program and 20% do not. The reason that some do not support it is the prospect of total or partial loss of cultivation lands. Based on the above-mentioned census, if the total population of 45,424 is multiplied by the population growth rate of 2.5%, the total population in 2019 is estimated to be 47,724. Dividing this total by the LHO estimate of six people per household on average brings the total number of households to about 8,000. Assuming that 20% of those affected are dissatisfied with the FB development, the number of dissatisfied households is approximately 1,600, which is equivalent to approximately 9,600 people (the number of households is multiplied by the average of six members). The planned number of settlements for smallholder farmers is 1,200 households, which is 400 households short.

Furthermore, a mechanism that allows the affected farmers to settle first into the small plots has not been established, and, thus, the number of households who lose lands be may far greater than 100. According to the Luapula Province PACO Planner, if PAPs want to settle, they can apply for small-scale plots, but preferential treatment, such as preferential allocations, is still under consideration. In addition, the application fee is expected to be around ZMK 1,000/ha so that even poor households can apply. Regarding the application costs, the ATO of the Kawambwa District DACO expressed the same idea, whereas one of the existing residents expressed that his preference is for smaller and more inexpensive lands. The ATO added that he is considering living in the settlement area as one of the settlement conditions to effectively utilize the social infrastructure planned to be developed in the FB.

According to the three village headmen and women interviewed in the field survey, with the allocation of development areas to core investors, 175 of the 200 households in Shikalaba Village and all 650 households in Chitondo Village will suffer entire or partial losses of their cultivation land. In contrast, among the 26 households in Katonka Village, which is far from the investors' development area, no farmers are expected to lose cultivation lands.

2) Impact on the usage of land and natural resources

The existing residents in Luena FB, like those in Nansanga, engage in the traditional slash-and-burn farming method called *citemene* or farming that combines this method with modern technologies using chemical fertilizers. The main crops cultivated in this area are finger millet, maize, cassava, and sweet potatoes. As described in the previous section, the impact on cultivation land depends on the distance from the development area, but, according to the head of Shikalaba Village, the cultivation lands are set at some distance from the residences. Although some residents have land near their homes, this land is considered infertile and unsuitable for agriculture. If no alternative lands are provided to the affected farmers who will lose their cultivation land owing to the FB development program, there is a concern that the buffer zone will house large numbers of landless farmers.

In addition, the existing Luena residents also harvest mushrooms (mainly in December when the rainy season starts), honey (harvested around June when the rainy season ends), charcoal, timber, and a small amount of caterpillars from fallow lands for sale or home consumption. In Koapa village, fish caught in the nearby river are eaten on a daily basis. Men go fishing from January to June, and women go fishing from July to December. The fish species are tilapia, catfish, and small fish called *lusembe* in the local language. At the village headwomen's house, caught fish are on the table almost every day, and fish is eaten twice a week even in the low season.

If FB development restricts the use of land and local resources by existing residents, the residents will need to obtain alternative resources. A forest officer in Kawambwa District reported to the Survey Team that illegal logging is increasing in the local forest adjacent to Luena FB, with some farmers already having restricted access to fallow and cultivated land.

3) Impact on the local economy, such as employment and livelihood

Because agriculture is the main means of livelihood for the existing residents, the impacts on cultivated land are likely to have significant impacts on residents' livelihood. The interviews with existing residents indicate that the project proponent has not confirmed a plan to provide alternative sites and compensation to the affected farmers. To confirm its adequacy, the Survey Team asked ZEMA about the approval statuses of the EIA and RAP for the companies that were allocated land in Luena FB, but no answer was obtained.

However, according to DACO, one of the priority issues in Luena FB is the development of roads and bridges that cross Pambasi Swamp (dambo) in the east-west direction. At present, the only option is to use a detour, and if roads are developed, access to east-west traffic, especially to Kawambwa Sugar, will be dramatically improved. According to Kawambwa Sugar's contract farming model, the shipping cost from the sugar cane field to the factory is the farmer's responsibility, and, thus, significantly shortening the travel distance is expected to improve small farmers' net income. In addition, a shortened travel time to schools and health facilities is expected, leading to a positive impact on local residents.

Additionally, Luapula Province has the second highest poverty rate among Zambia's ten provinces (that of Western Province is the highest), and its unemployment rate of 24.2% is the highest in Zambia (the national average is 12.6%). Active employment of local residents through the implementation of development projects is expected to reduce poverty in the region[16].

[16] Central Statistical Office (2018), *Zambia in Figures 2018*

4） Impact on local society, such as the local decision-making body

In Luena FB, the Ad-Hoc Committee was established as a forum for coordinating the various stakeholders involved in FB development and is chaired by the District Commissioner and a secretary appointed by the DACO. The other members are the District Officer, Chiefs, ZESCO, the Ministry of Health, and Ministry of Education. However, both the PACO and the DACO testify that this committee is no longer functioning.

The main reason that it is no longer functioning is that its budget is insufficient; even the transportation expenses of the committee meeting attendees cannot be paid. As a countermeasure, the Development Coordinating Committee, which is established at the district, province, and country levels and is budgeted by the government, is used. The stakeholders discuss issues concerning FB development on a quarterly basis and report the results to the higher organizations (see Figure 9-15).

However, it is unclear whether the appropriate budget can be managed at its current scale and implementation system and whether the appropriate operation and management of FB development can be performed with the current implementation structure even if the activities within the FB become active in the future.

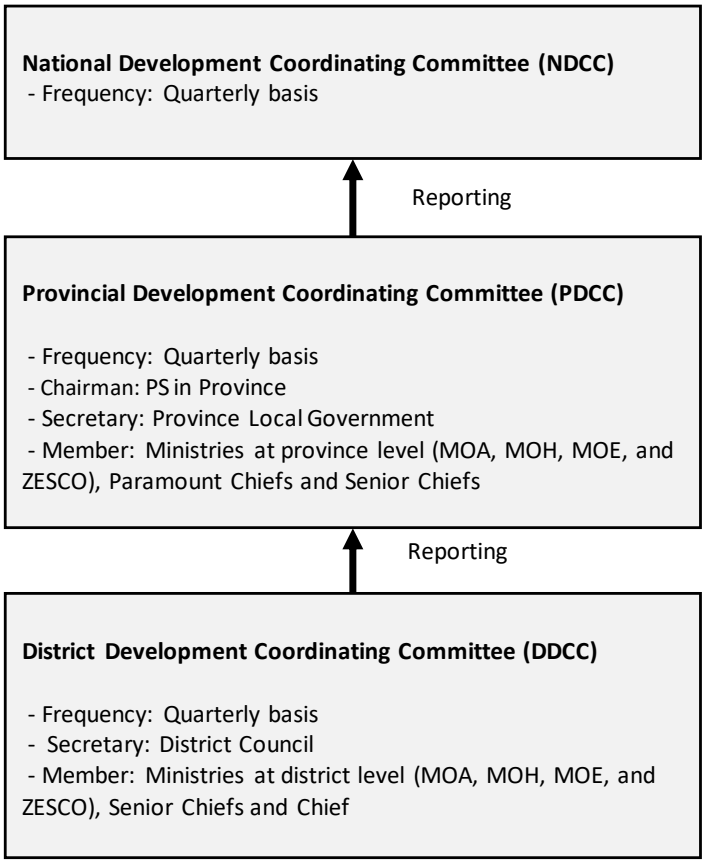


Figure 9-15: Periodic meeting and reporting mechanism in Luena FB

Note: PS: Permanent Secretary, MOH: Ministry of Health, MOE: Ministry of Education

Source: The Survey Team

5） Local conflicts of interest

As mentioned above, a conflict of interest may arise between the 80% of residents in favor of FB development and the 20% of residents in opposition. However, according to the DACO, the cultivated land area varies considerably across households, which seems to cause trouble owing to itching and invasions by farmers who have borrowed large-scale land. Given this situation, distributing 5 ha of land evenly to the farmers who are currently cultivating unequal land areas could contribute to the elimination of such dissatisfaction and troubles. The DACO also shared that the average cultivated area per household is about 2 ha. Thus, he believes that the planned 5 ha of land per household are more than adequate for small-scale farmers in this area.

6） Occupational health and safety

Failure to ensure an appropriate working environment may lead to accidents, injuries, and illnesses of the existing residents employed as workers. Box 9.2 describes the hearing record of a farmer engaged in logging and harvesting trees as a casual worker on a pine plantation project implemented by a parastatal enterprise.

Box 9.2: The voice of a local resident engaged as a seasonal worker in a plantation project operated by a parastatal enterprise (male age 29)

I was working at Plantation Company for a month in April this year. The reason I decided to work was that, for a maize farmer in April, the farming work is not so busy. I engaged in logging, root extraction, and weeding work by machete and ax. The work continued from 4:00 am to 4:00 pm without a lunch break. As it was dark in the early morning, I was working with a head light on my head, but I was not provided with proper work clothes and protective equipment. Some workers were injured during the work. There was no weekend. Wages are not on a daily basis but on a norm basis. We worked for 21 days under the condition of ZMK 46 per task per person, but the paid amount was ZMK 300-600 on average which is ZMK 15-30 per day in daily conversion. After I left, I recently heard that it has improved to five working days a week from Monday to Friday, but I do not want to work there anymore. I will look for another job next April.

9.6.3. Kalumwange FB

（1） Geographical information

Kalumwange FB is located in Kaoma District in Western Province. The FB can be reached within six hours by car from Lusaka via Route M9 and Route D301, as shown in Figure 9-16. The red polygon indicates the boundaries of the FB. The reported total area of the FB is 144,000 ha.

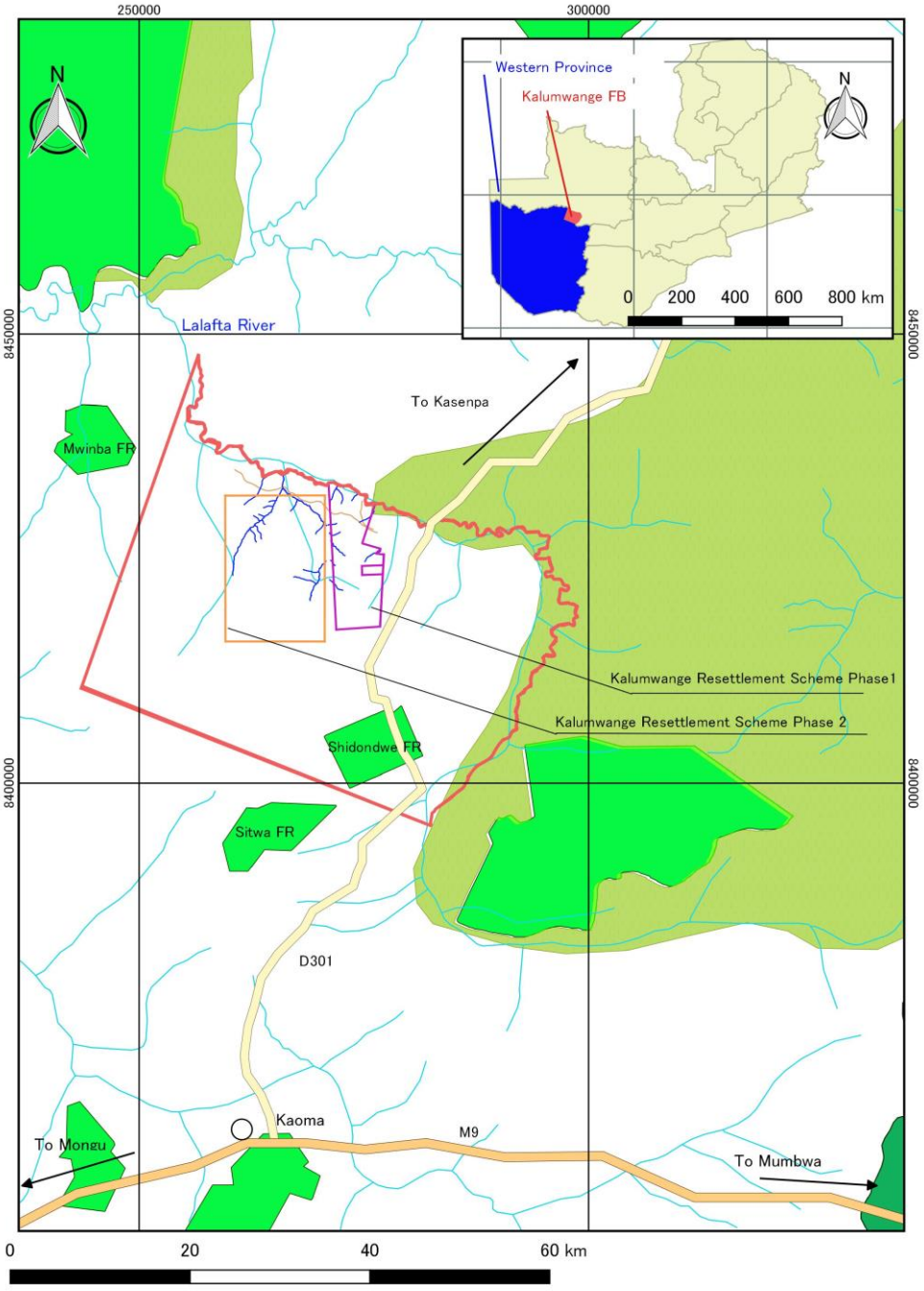


Figure 9-16: General layout of Kalumwange FB

Source: The Survey Team

（2） Background

Kaoma district was selected as an FB targeted district in Western Province in 2012, and the selection of candidate sites soon began, but the negotiation for land alienation from the Local Chief was difficult. Negotiations with traditional authorities (Local Chief Mwene Kasimba) continued after 2013, and a written agreement with the MOA to alienate the land shown in Figure 9-16 to Kalumwange FB was reached in 2018. However, the consent of Senior Chief Nalille, a senior authority to Chief Kasimba, was not obtained as of October 2019, when this field survey was conducted. Because the consent of the Senior Chief was not obtained, the consent of the Paramount Chief, who is the highest traditional authority, was not obtained. Senior Chief Nalille is very concerned about the rapid development of FB for the following reasons[17]:

- ✓ The four resettlement schemes already established for Zambians in Kaoma District do not seem to be functioning well enough to take advantage of the lessons learned. For example:
  - For the Tobacco Board of Zambia, a 75,000 ha parcel of land sold to Zambians went to Zimbabwean investors without any information being shared.
  - In the Mushota area, the residents at that time were relocated based on a land allocation request, but no project was carried out.
  - All resettlement projects have insufficient infrastructure and have not achieved the expected results.
- ✓ Given these circumstances, discussions on Kalumwange FB have not yet reached the stage of consultation with donor agencies, and much remains to be done by the Government of Zambia.

According to Local Chief Kashimba, applications for new allotments of land on the FB development site have been unending in recent years, but because the land has already been transferred to the MOA, it is impossible to allocate it to those who want to use it effectively. He argues that the Zambian government should reveal its future plans for Kalumwange FB.

（3） Basic agricultural information in Kaoma District

Because agricultural data for Kalumwange FB are unavailable, the area planted, production, yield, and number of households for the major products in Kaoma District were obtained from the Central Statistical Office of Zambia as alternative data, and the average values from 2013 to 2015 are summarized in Table 9-14. The top five products in terms of area planted are maize, cassava, groundnuts, Virginia tobacco, and rice (soybeans are ranked 13th). Except for cassava, the yields is very low (e.g., 1.6 tons/ha for maize and 0.6 tons/ha for rice).

[17] Study Team's interview to the Senior Chief on October 2019

Table 9-14: Short summary of agricultural production in Kaoma District

	Products	Area planted (ha)	Production (ton)	Yield (t/ha)	Nos. HHs planted (hhs)
1	Maize	24,328	39,922	1.6	29,219
2	Cassava*	18,989	138,238	11.7	NA
3	Groundnuts	3,241	1,643	0.5	11,221
4	Virginia Tobacco	1,448	1,879	1.3	2,073
5	Rice	1,330	758	0.6	1,123
6	Sweet Potatoes	919	3,086	3.3	3,420
7	Sorghum	568	314	0.6	1,421
8	Millet	393	180	0.5	1,083
9	Cowpeas	360	207	0.6	1,358
10	Mixed beans	259	113	0.4	698
11	Bambara nuts	220	152	0.7	755
12	Seed cotton	215	287	1.1	294
13	Soybeans	157	126	0.8	362
14	Burley Tobacco	133	164	1.2	242
15	Popcorn	66	121	1.8	22
16	Sunflower	7	2	0.3	52
17	Paprika	2	1	0.5	20
18	Finger Millet	NA	NA	NA	NA
19	Irish potatoes	NA	NA	NA	NA

* Cassava yield: 11.7 ton /ha is applied for estimation

* Data above is average of recent three years data from 2013 to 2015

Download URL:http://zambia.opendataforafrica.org/ZMCRFCSD2016/crop-forecast-survey-data-of-zambia-2015

Source: JICA Survey Team based on Central Statistical Office of Zambia

Recently, maize and the Solanacea family were affected by tomato leaf miners (Tuta absoluta), stalk borers, and fall armyworms (Spodoptera frugiperda), and DACO, in cooperation with the Zambia Agricultural Research Institute, distributed brochures and pesticides to farmers.

（4） Progress of infrastructure development

1） Roads

Route D301, which connects Kaoma and Kasempa, is the road that connects Kalumwange FB to Kaoma and Kasempa. The Link Zambia 8000 program (Phase 2) includes a plan to upgrade Route D301 to double bituminous surface treatment (DBST) and is scheduled to be completed in 2018, but the road remains unpaved as of 2019 owing to a lack of budget. The improvement rate of the access road in the FB is about 40% of its target value.

2） Electricity

Although power is supplied to Kaoma city, the power infrastructure in Kalumwange FB has not been developed, and the area remains unelectrified.

3） Irrigation

Lalafuta River and its tributaries in Kalumwange FB are the main sources of water, and access to water is good. In addition, two water storage dams, which mainly function as water reservoirs for livestock, have been constructed in the FB.

4） Communication infrastructure

Within Kalumwange FB, Zamtel and MTN have their own communication towers, and telephone communication is possible in some areas of the FB.

（5） Progress of other work

No F/S, EIA, census, or socio-economic survey has been carried out for Kalumwange FB development. Additionally, no plan to implement these outstanding activities is mentioned in the annual report of Kaoma District[18]. The PACO in Western Province established a task-force for Kalumwange FB development that comprises a provincial team from the Department of Physical Planning and the Provincial Planning Unit. However, the PACO faces serious staff shortages, especially among marketing and farming technical staff, and the staff are quite busy. Under these circumstances, it seems that they cannot afford to tackle the activities necessary for Kalumwange FB development because the central government has not provided a clear development policy for this FB.

（6） Investment progress

No investors exist in Kalumwange FB as of now. Some farmers carry out contract farming with Japan Tobacco International.

（7） Agricultural potential

Kaoma County, where Kalumwange FB is located, has annual precipitation of about 900 to 1,000 mm and is on the border between Regions IIa and III in the Agroecological Zones published by Zambia's MOA (see Figure 9-1). Its altitude is about 1,150–1,250 m, and it is characterized by comparatively large temperature differences between day and night. The soil is classified as ferralsol and acrisol. Both soil classes are characterized by strongly acidic soils and generally low fertility, but the latter is more clayey. From the perspective of crop markets, access to Lusaka, where Zambia's major processing plants are located, is relatively good. According to a ZDA report, crops with high investment potential in the Western region include cashew nuts, cassava, millet, sorghum, rice, and maize. Although the area is not clearly superior to other FBs, it is

[18] DACO, Kaoma District (2016), *Annual Report -2016*

considered to be suitable for fruit trees, such as citrus, and soybean cultivation.

(8) Expected impact of FB development

1) Land acquisition and resettlement

The current population of the Kalumwange FB site is estimated to be about 9,000 people across 1,700 households. According to the DACO, in Kalumwange FB, the majority of the population is concentrated in the Kalumwange Central[19] and the Kalumwange Resettlement areas. Among them, because the resettlement area is basically excluded from the relocation and acquisition of land even if FB development is carried out, the potential impact of development in Kalumwange FB is about 3,700 persons (600 households) who live in Kalumwange Central, as shown in Table 9-15.

Table 9-15: Estimated population in Kalumwange FB

		Population	Household	Village
Kalumwange Central*	-	3,697	616	56
Kalumwange Resettlement Scheme**	Phase 1	2,925	585	-
	Phase 2	2,255	451	-
Total		8,877	1,652	

Source:

* JICA Study Team estimated based on the Census data (2010) and population growth ratio (1.4)

**Kalumwange Resettlement Committee (2019)

However, according to the Local Chief, many farmers are calling for the allocation of land in the areas to be developed. If development does not progress as planned, there is a concern that farmers will be allowed to enter, creating the risk that the number of residents to be resettled owing to FB development will increase.

2) Impact on land and natural resource use

According to the results of interviews with existing residents of the FB, the average amount of land owned per household is 20 ha, 5 to 6 ha of which are currently cultivated. The land is dominated by maize, and farmers cultivate other crops, such as tobacco, sunflowers, soybeans, groundnuts, and so forth on 0.25 ha[20] to 0.50 ha of the remaining plots. In response to a DACO questionnaire survey, no traditional farming methods, such as *citemene* farming, are carried out in Kaoma District, unlike in Northern, Luapla, and Central Provinces. Additionally, according to interviews with farmers, the farmers harvest mushrooms, honey, worms, building materials, and so on from nearby forests or woodlands, mainly for their own consumption. The land-use and

[19] This village faces Route D301 and has schools, kiosks, and so forth.

[20] An area of 0.25 ha is equivalent to one lima, which is a local unit of measurement in Zambia.

land allocation plans of Kalumwange FB are unknown at this stage, but, depending on the plan, there is a concern that it may affect the local people's usage of land and local resources.

3) Impact on the local economy, such as employment and livelihood

The Zambia National Farmers Union (ZNFU) Kaoma reported that of the 23,000 farmers in Kaoma District, 1,500 are members of ZNFU Kaoma. Among them, small-scale farmers who want cash immediately are forced to sell maize to middlemen, even at low prices. Another option is selling maize to the FRA, but the payments take time. If a middleman sets a higher price than the FRA, some farmers ignore their contracts with the FRA and sell maize to that middleman. Maize farmers completely rely on government distribution for chemical fertilizers, but the distribution is often late and fertilizers cannot be applied at the appropriate time. If road infrastructure is developed as part of the FB development program, access from farms to the market will be improved, and farmers will be able to choose multiple sales destinations, reducing the risk of being beaten by specific buyers or middlemen and delays in fertilizer distribution.

4) Impact on local society, such as traditional leaders

Chief Mwene Kashimba hopes that the livelihoods of the local people will be enriched and that they can earn enough income to send their children to school. The chief mentioned that he is always ready to support FB development. However, he is dissatisfied with the current situation, in which he receives no clear communication from the MOA regarding future development plans in Kalumwange FB. There is a concern that the relationship will worsen if this situation continues.

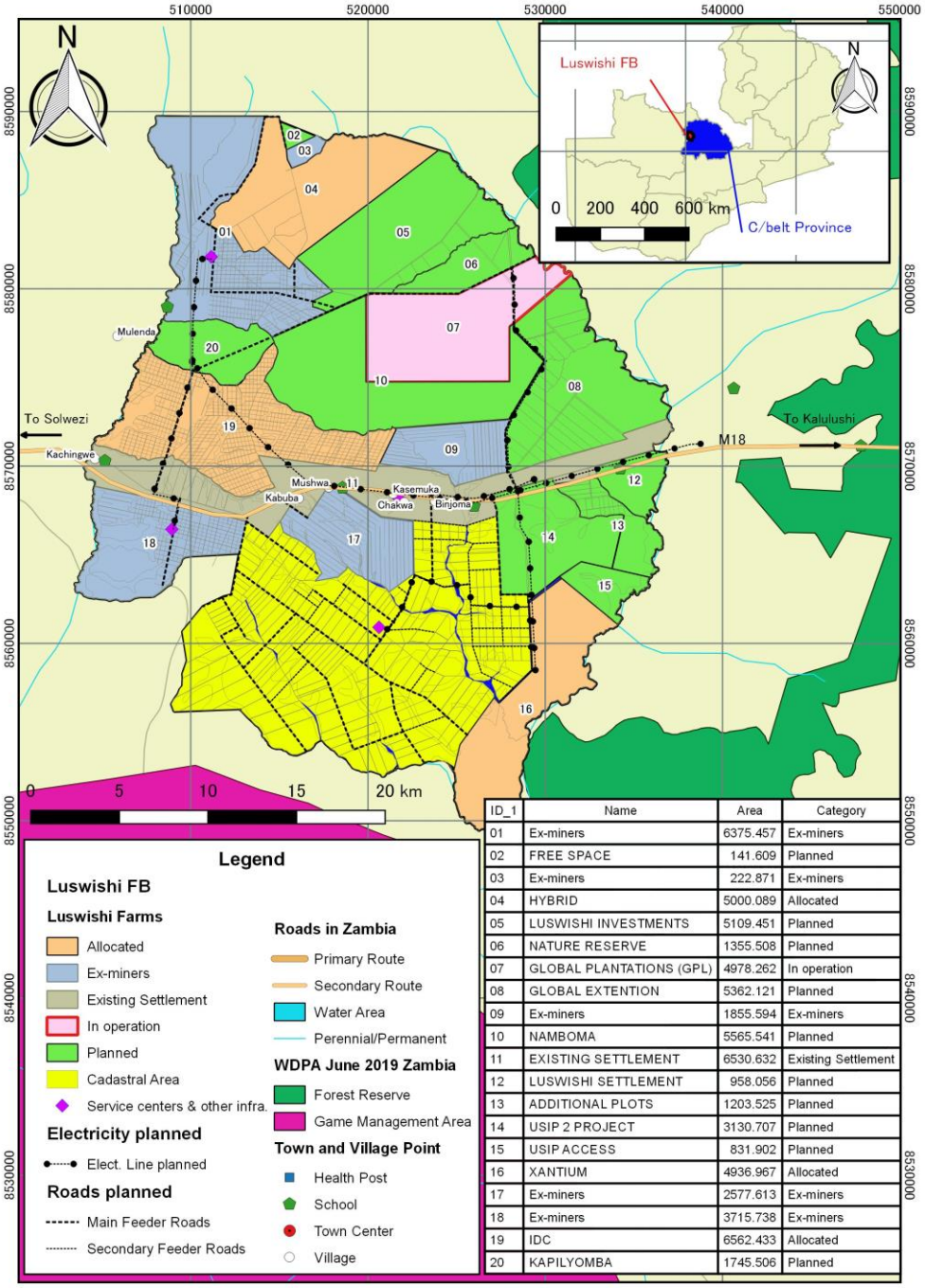
5) Impact on existing social infrastructure and services

The residents of the Kalumwange Resettlement Scheme have an average walking distance to social infrastructure of 1.5–2 hours for primary schools, clinics, and collecting points, with no electrification. In addition, because the access road in the FB is unpaved, the road conditions greatly deteriorate in the rainy season. Electrification and road improvements in the FB are expected to improve the quality of services and accessibility to social infrastructure.

9.6.4. Luswishi FB

（1） Geographical information

Luswishi FB is located in the eastern part of the Lufwanyama District of Copperbelt Province. It is about 150 km from Ndola, a commercial city in the province, and its total area is 100,000 ha. Route M18, commonly known as Kalengwa Road, extends from east to west, and the FB touches the western border of the Kambilombilo Resettlement Scheme.



ID_1	Name	Area	Category
01	Ex-miners	6375.457	Ex-miners
02	FREE SPACE	141.609	Planned
03	Ex-miners	222.871	Ex-miners
04	HYBRID	5000.089	Allocated
05	LUSWISHI INVESTMENTS	5109.451	Planned
06	NATURE RESERVE	1355.508	Planned
07	GLOBAL PLANTATIONS (GPL)	4978.262	In operation
08	GLOBAL EXTENTION	5362.121	Planned
09	Ex-miners	1855.594	Ex-miners
10	NAMBOMA	5565.541	Planned
11	EXISTING SETTLEMENT	6530.632	Existing Settlement
12	LUSWISHI SETTLEMENT	958.056	Planned
13	ADDITIONAL PLOTS	1203.525	Planned
14	USIP 2 PROJECT	3130.707	Planned
15	USIP ACCESS	831.902	Planned
16	XANTIUM	4936.967	Allocated
17	Ex-miners	2577.613	Ex-miners
18	Ex-miners	3715.738	Ex-miners
19	IDC	6562.433	Allocated
20	KAPILYOMBA	1745.506	Planned

Figure 9-17: General Layout of Luswishi FB

Source: The Survey Team, based on data shared by the AfDB and other data collected during the survey

（2） Background

Luswishi FB was established in 2008. Because of its fertile land and abundant water resources, such as rivers, its agricultural production potential is high. In addition, some commercial cities, such as Ndola, the provincial city, and Kitwe, have developed based on copper production in the province, and the main trunk road leads to Lusaka, Zambia's capital, and some cities in the DRC. Thus, the location is advantageous for marketing agricultural products.

Since the establishment of the FB in 2008, the Demographic Surveys (the same year), the Land Capability Surveys and Strategic Environmental and Social Impact Assessments (2010), the demarcation and allocation of large commercial farms (2013–2018), the demarcation of small and medium size farms (2016–2017), and stakeholder sensitization and feasibility studies for AfDB financing (2017) have been conducted. Although these initial activities have been conducted, according to the provincial LHO, Luena, Kalwange, and Nansanga FBs have been prioritized by the Zambian government, and, thus, funding to Luswishi FB stopped as of 2016. For this reason, it has been impossible to carry out substantial activities other than surveys.

（3） Basic agricultural information of Luswishi FB

The main crops of Lufwanyama District, where Luswishi FB is located in Copperbelt Province, are said to be maize, soybeans, and vegetables (cabbage). According to district statistics, Lufwanyama District has higher production of maize, sorghum, sunflowers, groundnuts, common beans, bambara nuts, and sweet potatoes compared to other districts in the province.

Since the mass destruction in 2016, crops have been damaged by fall armyworms (Spodoptera Frugiperda) and tomato leaf miners (Tuta Absoluta) in recent years. The damage of maize by fall armyworms was reduced in 2018 through the distribution of insecticides in cooperation with the Disaster Management and Mitigation Unit, but effective measures against tomato leaf miners have not been taken.

（4） Investment progress

Of the total 100,000 ha of land in Luswishi FB, 87,669 ha are currently allocated. Only Global Plantation has started farming in its plot, which is now outsourced to Olympic Milling for field management. Olympic Milling owns seventeen tractors, combine harvesters, five planters, and thirteen pivots, and it plans to cultivate 5,000 ha. This area currently includes 3,500 ha of soybeans grown by rainfed cultivation (in the rainy season) and 500 ha turned to wheat cultivation with center pivot irrigation (in the dry season). There are plans to cultivate 2,000 ha, but some pivots are not working owing to a lack of electricity.

The soybeans produced by Olympic Milling are sold to a refinery plant run by Global Industry (a group company of Global Plantation) in Ndola for oil extraction. They are also sold to Zambeef

and Olympic Milling's sister company Olympic Stock Feeds for animal feed materials as well as to a Chinese company in Lusaka and another sister company, SSS.

The contracting farms have not been developed, as core investors, who were expected to form the core of FB development, have not been allocated. However, approximately 310 small-scale farmers have received technical training through the IDC/TAHAL project, which may lead to contract sales.

Table 9-16: Progress of investors' and farmers' business development in Luswishi FB

Category	Existing number	Names of actors who currently conduct business activities	Planned number	Names of actors who plan to conduct business activities
Core investors (10,000 ha)	0		1	Global Plantation with an additional 5,000 ha
Commercial farmers (1,000–5,000ha)	4	Global Plantation, with an additional 5,000 ha run by Olympic Milling (irrigated and rainfed soybeans and irrigated wheat) IDC/TAHAL - Luswishi Agro-project (irrigated vegetables (in greenhouses), citrus, and wheat, with 300 small-scale farmers) Xantium Dairies Zambia Ltd. (dairy) Hybrid Poultry Farm Ltd. (currently, maize for feed)	2	Namboma Holdings (beef) Luswishi Investment Ltd. (irrigated soybeans and wheat)
Medium-scale farmers (100–1,000ha)	300	Cadastral area with 300 medium-sized farms	N/A	N/A
Small farmers (0–100 ha)	1,020	Ex-miners' area with 1,020 farms of 5 ha	310 N/A	IDC/TAHAL - Luswishi Agro-project (irrigated vegetables (in greenhouses) and fruits) Upscaling Smallholder Irrigation Project (irrigated soybeans and wheat)

Source: The Survey Team, based on Status of the Luswishi Farm Block Development (June 2019) and an interview with the provincial LHO

(5) Progress of infrastructure development

1) Roads

Route M18, commonly known as Kalengwa Road, extends from east to west in the FB, but it is unpaved, and the road network in the FB is undeveloped. The Link Zambia 8000 program (Phase 2) includes plans to upgrade 185 km of road (including Route M18 and Route D181) between Kalulushi and Kasempa to DBST. According to the plan, the construction of Phase 2

routes was supposed to start in 2013 or 2014 and was scheduled to be completed from 2016 to 2018, but construction has not begun owing to a lack of funds. The road network inside the FB is under the jurisdiction of Lufwanyama County, but the county has only used graders, which is not sufficient for road maintenance and management in the FB. For this reason, large vehicles cannot enter the fields in the FB, as shown in Figure 9-19, and the mass transport of agricultural products and livestock is difficult. Companies are planning to produce dairy products and eggs in the FB, but if the road is not well developed and transport vehicles shake strongly, milk fat will be transformed into butter, and eggs will be broken. According to companies in the FB and MOA officials, it will be difficult to make further investments unless the roads are improved. The AfDB plans to work with PPPs to improve the roads connecting Luswishi FB to the outside. The contents of the investment package, including the road sector, will be finalized by the end of October 2019, although detailed information regarding the road improvements included in the investment package has not been obtained.

2） Electricity

The electricity network in Luswishi FB is only extended by Global Plantation from a substation that distributes power to a school in the area, and its voltage is only 11 kV. For this reason, companies developing farmlands generate their own power (by solar light and fuel), but this power is insufficient to manage some activities, such as center-pivot irrigation, the operation of processing equipment, and the refrigeration and freezing of agricultural and livestock products, and the lack of power is the main restriction on the operations. At present, the Permanent Secretary of Copperbelt is discussing with ZESCO an extension of the 35 kV network to the FB via the Rural Electrification Authority. However, this network is mainly set up to supply electricity to local residents near the FB, and it is not a fundamental solution for securing the amount of electricity needed by core ventures and commercial farmers. To supply electricity to core ventures and commercial farmers in the FB, the AfDB plans to build new transmission lines and distribution networks through PPPs. Vin Energy is one of the companies proposing a PPP project for the power supply in the FB, and it has made the following proposals, as shown in Figure 9-18.

- ✓ In addition to upgrading the substation located in Luano, 85 km of 220 kV transmission lines will be installed and connected to the newly installed substation in Luswhishi FB. In addition, a 33 kV distribution network will be installed from the newly installed substation to each power user.
- ✓ Additionally, 75 km of 33 kV transmission lines will be installed from the newly installed substation in Luswhishi FB to connect to Mikelenge FB (the southern portion of Solwezi FB).

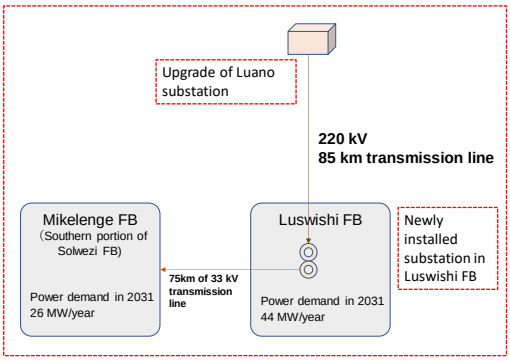


Figure 9-18: Outline of the PPP project proposed by Vin Energy

Source: Documents provided by Vin Energy, modified by the survey team

Vin Energy forecasts that the electricity demand of Luswishi FB's core investors and commercial farmers will increase to about 44 MW/year by 2031. Similarly, the power demand of Mikelenge FB is estimated to increase to about 26 MW/year, and the total power demand of these FBs is expected to be 70 MW/year. It is estimated that about 80 MW/year of power supply can be achieved if this plan is realized, and the cost of this project is about 40 million USD.

3) Irrigation

Olympic Milling Co., Ltd. has developed a water storage dam by itself, and it plans to construct another water storage dam. In addition, the Upscaling Smallholder Irrigation Project operated by the AfDB plans to build a water dam and irrigation facilities that cover 1,000 ha of farmland.

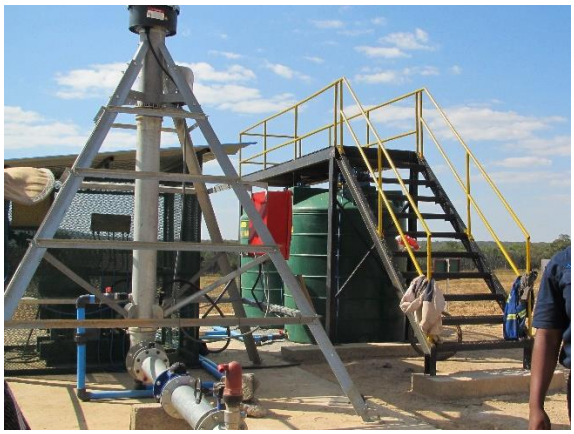
4) Communication infrastructure

At present, there is no communication infrastructure in the FB, and investors and commercial farmers have their own communication facilities. Zamtel, a subsidiary of the Ministry of Transport, Works, Supply, And Communications, plans to install 1,009 new towers nationwide, but the interior of Luswishi FB is not covered by this plan. Plans by other private carriers to install telecommunications facilities have not been confirmed.

Road in Luswishi FB: Too narrow for large vehicles to pass through

Reservoir constructed by Olympic Milling on its farmland

Model plot to sell to new settlers through the IDC/TAHAL pilot project: Fruit trees are planted on the front land and vegetables are cultivated in the rear house. The planned sales price is ZMK 30,000 to 40,000 per house, including 1 ha of cultivation land



Core part of center pivot irrigation: The power shortage is a challenge

Figure 9-19: Current status of major infrastructure in Luswishi FB

（6） Agricultural potential

Lufwanyama District, in which Luswishi FB is located, has annual precipitation of about 1,200 mm and falls into Region III of the Agroecological Zones published by the MOA of Zambia (see Figure 9-1). Its altitude is about 1,150–1,300 m, and it is characterized by a comparatively large temperature difference between day and night. The soil is classified as ferrasol and is characterized as slightly more clayey and generally less fertile than strongly weathered or loamy soils. The soil is strongly acidic, with a pH of 3.8–4.4. From the perspective of crop markets, the FB has the advantage of being relatively close to Ndola and Lusaka, which have large populations and many maize and soybean processing plants. Another advantage of Luswishi FB is that it is

close to Lubumbashi in the DRC, which has a population of about 12 million and high potential for selling a variety of agricultural products.

According to a ZDA report, maize, horticultural crops, coffee, and soybeans are among the crops with high investment potential in Copperbelt Province. Additionally, considering the local climate conditions, the province is considered to be suitable for the cultivation of fruit trees, such as bananas, avocados, cashew nuts, and citrus fruits, as well as wheat.

（7） Expected impacts of FB development

1） Land acquisition and resettlement

According to an RAP report in January 2018, 345 households (PAHs) live in the cadastral area of Luswishi FB. Of these, 78 households use their land with farm permits from the government, and the remaining 167 are considered to be subject to relocation and resettlement. According to the provincial LHO, each investment company (core investor) has established an individual compensation scheme, as follows.

- Hybrid Chicken:
  - Received a letter from the MOA informing it about PAHs using farmland in its plot. Because there were four households on the plot, they were paid compensation under the presence of the Chief, who provided land for resettlement.

- Xantium Dairies Zambia:
  - Received a letter from the MOA notifying it about PAHs using farmland in its plot and instructions about compensation based on the survey. It discussed the RAP with the District Commissioner Office and provided compensation based on the land evaluation. Twenty-one households were resettled on land provided by the Chief, but it is said that the procedure was unclear because there were no government guidelines[21].
  - Conversely, at a meeting with residents held by the Study Team in October 2019, as shown in Table 9-17, many residents complained about the impact of the relocation caused by the company's land acquisition and the resulting compensation policy. From the residents' perspective, over 100 households were affected by the project.
  - According to local consultants who conducted the RAP for the Agro-Luswishi Farm Project of IDC/TAHAL described later, the reason for the complaint was that Xantium did not update its census survey and cut-off date conducted more than ten years ago, and it proceeded with the land acquisition without properly consulting the residents.

[21] It seems that the project proponent did not recognize the National Resettlement Policy (2015), which was established before the commencement of the project in 2018.

According to a census taken immediately after the FB was established (around 2008 to 2009), approximately 20 households were living on the planned site of Xantium, but the company began physical development in 2018, and the number of residents had increased.

Table 9-17: Total households and project-affected households in Luswishi FB

S/N	Village Name	Nos. Households	Nos. PAHs	Project Name
1	Minembo	44	44	Xantium
2	Nsambantenga	20	10	Xantium
3	Milumbe	48	14	Xantium
4	Kamabwe	20	20	Xantium
5	Lumwana	40	40	GPL, Namboma, and Xantium
6	Kamandanga	15	15	Xantium
7	Kankonshi	44	44	GPL
8	Nkwale	62	0	-
9	Kasalamakanga	50	50	Namboma
10	Mulilanama	49	0	-
11	Kebumba	48	0	-
12	Kabunene	314	0	-
13	Kasoka	39	0	-
14	Kasho	39	0	-
15	Cananda	108	0	-
Total		940	237	

Source: The Survey Team, based on estimations by the affected residents who participated in a meeting in 2019

- Pilot project run by IDC/TAHAL: "Agro-Luswishi Farm Project"
  - RAP consultants were hired and a weekly Resettlement Working Group Meeting is being held to discuss compensation for inhabitants who own land in the FB.
  - The Resettlement Working Group includes 12 representatives (men and women) chosen by the village, a chairperson (presently female), the Chief, a project manager (from TAHAL), RAP consultants, the District Commission, and the municipality. ZEMA also attends for environmental monitoring, and Save the Children is in charge of social considerations.
  - The project will affect 176 households. Farmers who are forced to relocate and who wish to receive alternative sites and housing have agreed to resettle on the project sites. The project will provide new housing and access to infrastructure, such as irrigation and training centers.
  - According to the RAP consultants, the involuntary resettlement provisions of International Finance Corporation Code #5 are applied for the resettlement plan in addition to domestic laws.

- The resettled residents have made no complaints at present.
- See Table 9-18 and Table 9-19 for a list of requirements for eligible recipients, which specifies compensation and support measures for the affected households.

Table 9-18: Entitlement matrix in Agro Luswishi Farm Project (1/2)

#	Type of Loss	Affected PAHs	Entitlements
1	Land for Built permanent structures	Each of the 57 PAHs with Permanent structures	1) Though the Project Affected Households do not have land Title for their Built permanent structures, Agro Luswishi will provided 1ha Farm replacement land for eligible PAH whose lose built permanent structure 2) These Farms will be registered with the Department of Lands and Title transferred to respective PAH by IDC/TAHAL 3) 1 borehole/10 PAHs to be sunk in the Resettlement site to supply domestic water
2	Built dwelling permanent structures	Each of the 57 PAHs with Permanent structures	Two compensation options: 1) 01 complete replacement Main dwelling house and 01 Ventilated Improved Pit latrine, contractor-built on the allocated 1ha farm (no cash) 2) If PAH desires self-relocation in an area of PAH's choice but outside Farm Project boundary, Cash Compensation for existing Main dwelling structures at GVD valuation rate
3	Built permanent non-residential structures	Each of the 57 PAHs with permanent non-residential structures	Cash compensation at GVD rates for permanent non-residential structures (kitchens, pit latrines/bathrooms, animal and chicken shelters, wells) within the boundary of a homestead)
4	Built seasonal structures	All 22 affected PAHs with seasonal structures	Cash compensation for PAHs with built seasonal structures include dwellings, kitchens and granaries
5	Fruit trees	Each of the affected 29 and 5 PAHs with permanent and seasonal structures respectively	1) Cash compensation for full productive life of mature trees based on GVD valuation rates 2) Two replacement saplings for immature (unproductive) trees
6		Each PAH owning less	1ha for PAHs owning less than 1ha cultivated field

Source: RAP for Agro Luswishi Project

Table 9-19: Entitlement matrix in Agro Luswishi Farm Project (2/2)

#	Type of Loss	Affected PAHs	Entitlements
	Land for Cultivation Fields	than 1ha cultivated field	
		Each PAH owning more than 1ha cultivated field	Minimum of the same farm size as the one previously owned, within the Farm Project boundary, These farms will be registered with the Department of Lands and Title transferred with to respective PAH.
		154 PAHs owning previously cultivated/cleared area without standing crop	K2,000 (US$153) Flat rate compensation per Project Affected Household for the previously cultivated/cleared fields without standing crop.
7	Additional cultivation assistance	All PAHs with affected cultivated fields	To the extent possible, Agro Luswishi will provide support such as training and technical advice to ensure livelihood restoration and smooth crop restoration process for PAHs.
8	Standing Crops in cultivated fields	All PAHs with standing crops	All standing crops harvested at the time of relocation.
9	Clinic, School, Church, and Market	All the 57 PAHs that will be displaced	Contractor-built complete structures in Resettlement site (no cash)
10	Difficulty for some households coping with transition caused by physical displacement	Affected Vulnerable Groups (e.g. female headed PAHs, persons with chronic illnesses and disabled PAPs	Transitional hardship assistance as appropriate to specific cases, e.g. cash consideration and transport to assist during transition and other assistance deemed appropriate under specific circumstances
		All the 57 PAHs that will be displaced	-To encourage PAHs to develop of vegetable gardens at the allocated farms, Agro Luswishi provide seed and fertiliser during the first month of relocation. -Food assistance for no more than 3 months of (max 2 x 25kg bags of mealie meal) to supplement PAHs from date of relocation will be provided to ensure food security (subject to computation of monetary value of food assistance) and allow PAHs to purchase food with available cash to supplement home-grown food items

Source: RAP for Agro Luswishi Project

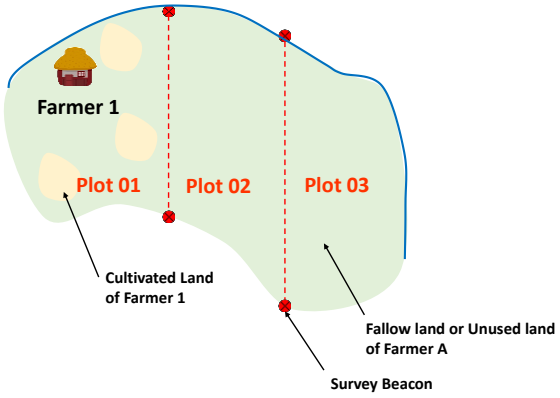
- Cadastral area
  - The cadastral area is a plot planned by the MOA in southern Luswishi FB with the main purpose of attracting out-growers and small investors in FB development (see the yellow area in Figure 9-17). The area is 20,700 ha, and the main targets are (1) existing landowners in the cadastral area, (2) persons residing outside the cadastral area who own land in the cadastral area, and (3) new settlers through publication (including residents living outside of the FB area).[22]
  - When the Study Team visited the western part of the cadastral area in October 2019, there were no settlements based on public announcements by the district, but a worker (a neighborhood farmer engaged in the survey conducted in January 2018) was interviewed, and the survey beacons set on the ground were confirmed (see top photo in Figure 9-20).
  - A survey was conducted in January 2018 under the direction of the district LHO. Eight local employees cut down trees on the border (referred to as cutting or clearing), a contractor was hired to install concrete survey beacons, and the LHO registered the coordinates of all beacons with a portable GPS.
  - The cases showing the effects of the new plot design on existing farmers were confirmed as follows.
    - In Case 1 in the same figure, although the existing cultivated and residential lands (Plot 01) are given priority for continued use by the farmers who are the current occupants, the LHO asks them to provide fallow and unused land (Plots 02 and 03) to other farmers free of charge for the development of the region, and the farmers accepted accordingly.
    - In Case 2 in the same figure, an area where eight households reside was set up as one big parcel with four beacons at each corner for future settlers (investors). Farmers A to H received an notification from the LHO that they should take care not to relocate their residences, as in Case 1, and that the land area would be smaller than before, but that it was also for the development of the region. In other words, Farmer A's land area will decrease from 35 ha to 15 ha. The farmers say that they have no choice but to accept the government's decision. In Case 2, existing housing facilities, which are scattered around the area, are basically not relocated. However, if infrastructure can be efficiently installed by the collective housing, relocation may become unavoidable. Kaonde and Lamba, the main ethnic groups in the region, are relatively less resistant to congregation, whereas

[22] Based on the Survey Team's interview with a senior sociologist who carried out the F/S for Luswishi FB development supported by AfDB (July 2019)

the Tonga ethnic group, which comes from the South, is generally known for its pastoral nature, which favors sparse populations. In the case of a relocation owing to collective housing, coordinating the relocation will be challenging.

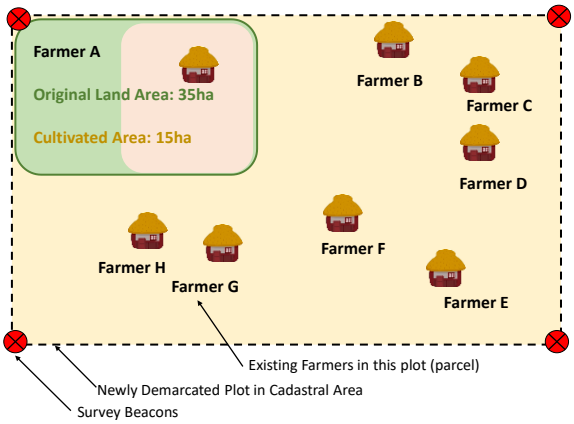
Enlarged photo of the survey beacon set in the cadastral area. It is made from concrete with a diameter of approximately 20 cm without survey nails

Long-distance view of the survey beacon shown in the left photo. The beacon is located in the red circle



Example 1: Example plot design in the cadastral area

In this case, the allocation of Plot 02 and Plot 03 to future settlers is planned



Example 2: Example plot design in the cadastral area

The current and future land-use conditions of Farmers B through H are unknown

Land to be used as cultivation land that has just been reclaimed; smoke still remains. The characteristics of the Kaonde and Lanba

Cattle pastured by Tonga in the cadastral area

systems are that the stumps remain. Unlike the *chitemene* system[23], which distinguishes between logging land and burning and cultivation land, in the system, logging land is burned as cultivated land

Figure 9-20: Current status of the cadastral area in Luswishi FB

2） Impact on land and natural resource use

An example farmer living on the pilot project site of IDC/TAHAL cultivates sweet potatoes and maize on 2 ha of his 8-ha farmland. In this area, the main livestock are chickens (20-40 local chickens), and some households keep cattle for cultivation and transportation. Goats, pigs, and sheep are kept by some households. In addition, they collect mushrooms and fruits from the forest and capture wild animals for food[24]. The members of the Resettlement Working Group believe that the use of woodlands for food will not be restricted because a forest is not far from the relocation area.

However, as shown in Table 9-17, farmers' land and local resource use have already been impacted for some projects other than IDC/TAHAL. Additionally, although it is not apparent at this time, it is expected that further settlement in the cadastral area will impact the land and local resource use of existing residents, as shown in Figure 9-20.

3） Impact on the local economy, such as employment and livelihood

Olympic Milling, which operates Global Plantation's farm, employs approximately 100 local residents for working in the field and buys soybeans from smallholder farmers in the surrounding area (if it hires workers from other provinces, its relationship with the Chief will worsen). However, neighboring residents complain that the available jobs are limited to those that require skills, such as machine or vehicle operation; the wages for day labor during the harvest period are low; and the cultivation technology for soybeans, a new crop in the area, is low, and, thus, their profits are low. Another company that intends to employ approximately 70 local residents in the future is also concerned that, in practice, few people will have the skills to satisfy the employment requirements.

Farmers can improve their production techniques through training for small-scale farmers living in and around the site (e.g., in the case of the IDC/TAHAL agricultural project) run by the investing companies in the FB. For example, a farmer in the project area cultivates sweet potatoes and maize on 2 ha of his 8-ha farmland. Maize is sold to a government-affiliated collection

[23] See footnote 13 for details.

[24] According to the results of interviews conducted in October 2019, about 10% of the income of the existing residents of Luswishi FB comes from non-wood forest resources. Example products include honey, mushrooms, and fruits (Itungu, Masuku). Charcoal is not included in this calculation because the respondents did not provide sales volumes to the Study Team.

agency, and sweet potatoes are sold at the market in Kitwe city. The project provides information on soybean production and horticulture (vegetables and fruits) in addition to maize and sweet potatoes, which have conventionally been produced by small-scale farmers that provide crop options to farmers.

By selling the agricultural products produced in this way to the company (e.g., IDC/TAHAL), smallholder farmers can gain access to the market. According to a project manager from TAHAL, few farmers have direct access to the market in Kitwe, and, thus, they sell their crops to middlemen. Even if they do go to the market, they need to pay transportation costs. By purchasing their crops, the IDC/TAHAL agricultural project can eliminate middlemen and transportation costs, thereby reducing farmers' marketing costs. In addition, technology can be improved by utilizing infrastructure, thereby improving productivity and creating a win-win relationship for the project and the farmers.

In the IDC/TAHAL agricultural project, contract sales to the company are not an obligation to cultivate within the FB. However, almost all farmers are expected to sell their products to the company because it is possible for them to sell crops at pre-determined prices without the above-mentioned costs. Olympic Milling does not have contract farmers, but it is planning a soybean out-grower scheme for local farmers starting in 2020. The Study Team heard from Olympic Milling in June 2019 that it was planning to select contract farmers, provide fertilizer to the farmers free of charge, and purchase their harvest at market price. However, in October 2019, the Survey Team heard about a completely different policy of not purchasing soybeans from the farmers. That is, when they set soybean cultivation contracts with out-grower farmers, the farmers stole soybeans from Olympic Milling and tried to sell them.

4) Impact on existing social infrastructure and services

The IDC/TAHAL agricultural project, as well as Olympic Milling, plans to develop social infrastructure, such as schools, clinics, and sales offices. Some residents expect that they will be able to introduce new crops (in horticulture) besides maize and sweet potatoes and sell them to the company, and doing so will make it easier for them to send their children to school if they can find a market and improve their incomes. Conversely, residents also said that if the roads are not developed, it will be difficult to transport products to the market, which will hinder income improvements and the use of social services.

5) Local conflicts of interest

When compensation was provided for the land that Global Plantation originally developed, some dissatisfaction with the compensation amount provided after the resettlement was raised. However, it is said that this dissatisfaction is resolved now. According to Olympic Milling, which

took over the field management, most of the land was bush, and, thus, it is believed that there were no problems with the residents.

9.6.5. Manshya FB

（1） Geographical information

Manshya FB was established in Muchinga province in 2012. The FB spans three districts, the Shiwang'andu, Mpika, and Nkachibiya Districts. Of these, Shiwang'andu District administers Manshya FB. The total area of Manshya FB is 147,000 ha. Lusaka is 730 km (about 9.5 hours by car) from the center of Shiwang'andu District, and it is another 70 km (about two hours by car) from the district center to the center of Manshya FB via Route D53. The general layout of Manshya FB is shown in Figure 9-21.

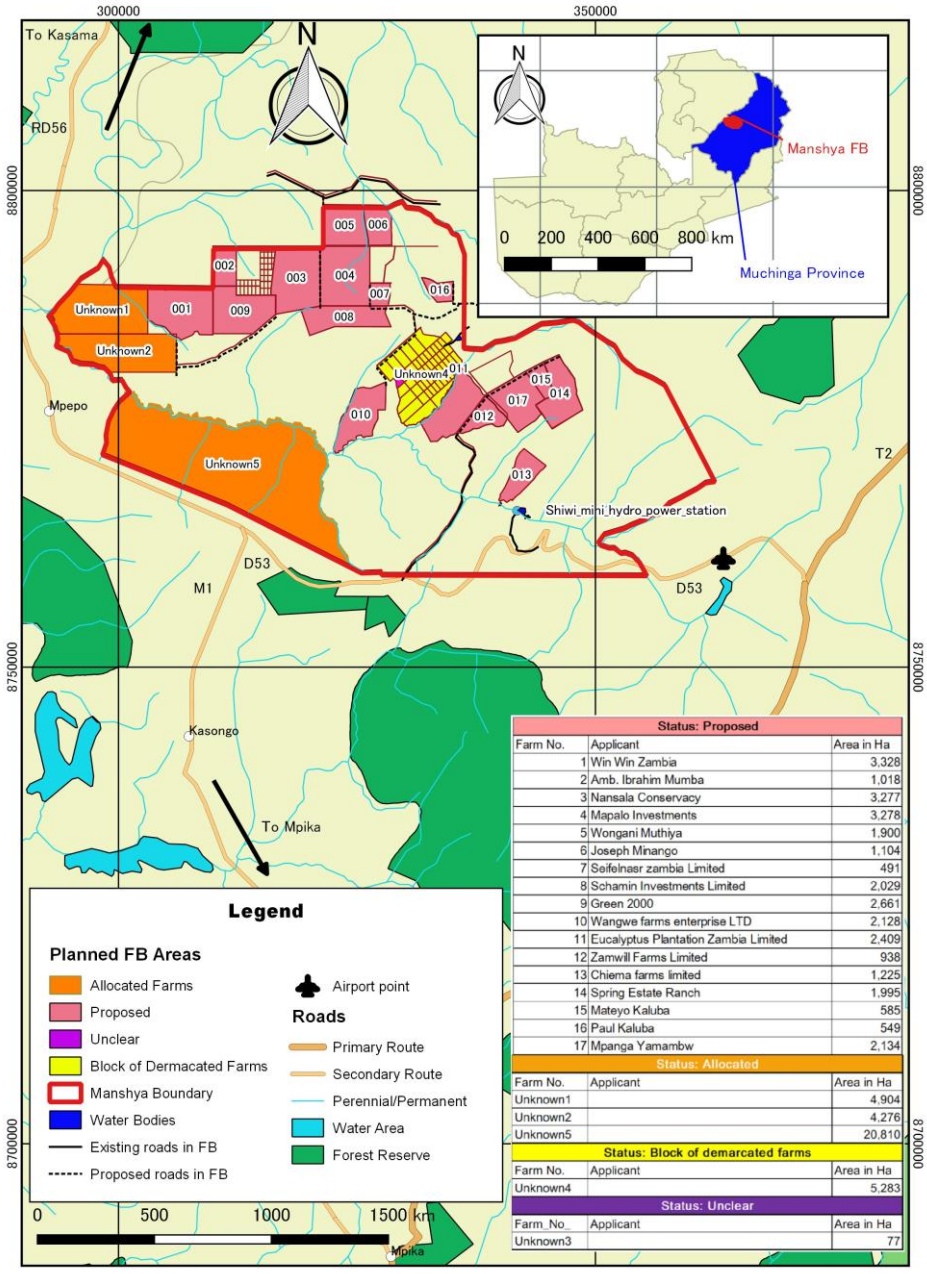


Figure 9-21: General layout of Manshya FB

Source: The Survey Team

（2） Investment progress

Since the block was established in 2012, the major activity that has taken place has been setting the boundaries and designing a layout plan. However, only three quarters of the land has been demarcated and allocated to potential investors.

According to the DACO, a candidate core investor, Champrimo Zambia, plans to use 10,370 ha for cultivation and livestock grazing, but the specific crop and livestock species are unknown. Among commercial farmers, only Mr. Wongani Muthiya has been carrying out any specific activity since 2018. One of his targets is horticultural crops, and he is currently growing tomatoes on 5 ha of land. He also implements goat ranching (100 heads), and his markets are Kasama, Mpika, and Chinsali, which are local cities in the vicinity. However, his total allocation of land is unknown. In addition, the annual report of Shiwang'andu District indicates that 5,000 ha of land are allocated to Mushe Milling for sugarcane cultivation, but the details are unknown. The DACO added that 23 companies or individuals have shown interest in the land as commercial or middle-scale farmers. Some of them has completed their land registration, and some have not yet applied, but none of them has started business activities (see Table 9-21)[25]. Regarding small-scale farmers' plots in Manshya FB, the Shiwang'andu district council, in collaboration with the Muchinga PACO and the Shiwang'andu DACO, has proposed that the MOA advertise 15-ha plots for small-scale farmers and is currently waiting for an answer.

Table 9-20: Progress of investors' and farmers' business development in Manshya FB

Category	Existing number	Names of actors who currently conduct business activities	Planned number	Names of actors who plan to conduct business activities
Core investors (10,000 ha)	0	N/A	1	Champrimo Zambia (farming and ranching)
Commercial farmers (1,000–5,000 ha)	1	Mr. Wongani Muthiya (horticulture and livestock)	20	See the Table below
Medium-scale farmers (100–1,000 ha)	0		3	See the Table below
Small farmers (0–100 ha)	0		N/A	

Source: The Survey Team

Table 9-21: List of medium-scale and commercial farmers allocated lands in Manshya FB

Company or investor's name	Plot number	Area (ha)
Farm Ltd. Win Win	SHIWA/LN_71275/3_25	2,500
Amb. Ibrahim Mumba	SHIWA/LN_71275/4_25	1,000
Nsansala Conservancy	SHIWA/LN_71275/21_25	3,000
Mapalo Enterprise	SHIWA/LN_71275/25_25	3,000

[25] The Survey Team, based on a questionnaire survey of the Shiwang'andu DACO and the Muchinga PACO.

Wongani Muthiya	SHIWA/LN_71275/8_25	2,000
Joseph Minango	SHIWA/LN_71275/11_25	1,000
Seifelnasr Zambia Ltd.	SHIWA/LN_71275/7_25	500
Schamin Investments Ltd.	SHIWA/LN_71275/10_25	2,000
Green 2000	SHIWA/LN_71275/5_25	2,500
Wangwe Farms Enterprise Ltd.	SHIWA/LN_71275/12_25	2,000
Eucalyptus Plantation Ltd.	SHIWA/LN_71275/18_25	2,500
Zamwill Farms Ltd.	SHIWA/LN_71275/16_25	1,000
Chiema Farm Ltd.	SHIWA/LN_71275/23_25	1,200
Spring Estate Ranch	SHIWA/LN_71275/13_25	2,000
Mateyo C. Kaluba	SHIWA/LN_71275/1_25	500
Paul Kaluba	SHIWA/LN_71275/2_25	500
Mpanga Yamambwe	SHIWA/LN_71275/14_25	2,000
Champrimo (Z) Pty Ltd.	SHIWA/LN_71275/6_25	10,000
Mikango Farms	SHIWA/LN_71275/9_25	2,000
Mpika Diocese	SHIWA/LN_71275/15_25	1,000
Tresfor Mwiche	SHIWA/LN_71275/17_25	1,000
Dr. Farncis Kasosolo	SHIWA/LN_71275/19_25	1,000
Njolwe Farms	SHIWA/LN_71275/20_25	1,000
Ahmad Al-Khatib	SHIWA/LN_71275/22_25	5,000
MILA Farms	SHIWA/LN_71275/24_25	1,000

Source: The Survey Team

(3) Basic agricultural information for Shiwang'andu District

Basic agricultural statistics for Shiwang'andu District are shown in Table 9-22. The major products harvested in the district are maize, sweet potatoes, bambara beans, ground nuts, and so forth. In terms of gender, female farmers plant more mixed beans and groundnuts. In addition, vegetables, such as kale, cabbages, and tomatoes, are grown on average plots of 0.1 to 0.2 ha per household, and fruit trees, such as mangos, bananas, and oranges, are grown at an average of two to five trees per household on small-scale farms.

Table 9-22: Number of farmers and production of cereals, beans, and potatoes in Shiwang'andu District

Products	Number of Farmers			Production		
	Male	Female	Total	Area planted (ha)	Expected yield (tons/ha)	Harvested amount (tons)
Maize	21,090	16,140	37,230	20,270	2.5	50,048
Finger millet	765	240	1,005	402	1.5	600
Sorghum	52	-	52	42	1.0	29
Paddy rice	176	144	320	50	1.5	68
Mixed beans	2,762	27,463	30,225	2,244	1.5	278
Bambara nuts	960	423	1,383	32	1.5	33
Sweet potatoes	13,062	3,736	16,798	11,203	2.5	23,140
Cassava			56,428	15,680	1.5	18,620
Sunflowers	41	16	57	45	1.5	36

Ground nuts	1,800	9,830	11,630	1,718	1.5	890
Soybeans	269	56	355	175	1.5	120
Cowpeas	1,000	730	1,730	17	1.0	9
Total	**41,977**	**58,778**	**157,213**	**51,878**		

Note: The harvested amount calculated from the area planted and expected yield may not match in some cells, but this is referred to as the original data.

Source: The Survey Team based on the Shiwang'andu DACO (2018) *Annual Report, Shiwa Ngandu district, 2018*

（4） Progress of infrastructure development

1） Roads

The M1 and T2 roads running east and west of Manshya FB are in good condition. The D56 road, which runs on the north side of Manshya FB and connects the M1 and T2 roads, is being widened and improved to DBST. However, there are no plans to renovate the D53 road, which runs on the south side of Manshya FB, and its current conditions do not meet district road standards. The access road inside the FB is not well developed, and the width of one vehicle is barely accessible because of the ruts of past vehicles. The Manshya River forms the northern and southern boundaries of Manshya FB, but such structures as culvert bridges are not developed, making access to Manshya FB difficult.

2） Electricity

An 11 kV transmission line runs along the D56 road from Chinsali in the northern part of Manshya FB, but the line is not supposed to be used inside the FB. In Lake Shiwang'andu, close to Manshya FB, the REA has built a small hydropower plant (1 MW), as shown in Figure 9-22, but it is only for local use. Further downstream in the FB, off-grid electrification is planned for power transmission to nearby schools, health facilities, and households[26].

3） Irrigation

The inland wetland spreads inside the FB, and irrigation water is abundant. Although it depends on investor activity in FB, water is unlikely to be a limiting factor in promoting irrigated agriculture. Instead, it may be necessary to consider how to treat wastewater.

4） Communication infrastructure

Communication towers, such as those of Zamtel, Airtel, and MTN, are installed along the D56 road, but many areas inside the FB are not covered.

[26] Power Sector in Zambia – Opportunities for Private Companies, Presentation of the Information Workshop on Decentralized Energy Supply and Load Management in Zambia, 2017

5） Social infrastructure

A clinic and elementary school have been constructed along the D56 road.

Crossing point to Manshya FB from the northern boundary (the boundary of the FB is the Manshya River)

Simple slash and burn access roads in Manshya FB

Access road to Manshya FB from Route T2

Photo of the southern border of Manshya FB taken from the left bank of the Manshya River

Hydropower station and power lines outside the FB (1MW)

A pontoon with wires for crossing the Manshya River

Figure 9-22: Progress of infrastructure development in Manshya FB

（5） Expected impact of FB development

1） Land acquisition and resettlement

Although a land allocation plan for Manshya FB has been developed, the current population and its land tenure conditions are unknown because a census of the existing community has not been conducted. After realizing this fact, the Survey Team visited Chief Kabamba, one of the four chiefs who surrendered their land for Manshya FB, namely, Chief Nkula, Chief Kabamba, Chief Mukwikile, and Chief Mpepo. Chief Kabamba explained to the Survey Team that there were four villages in the FB with an average of ten to fifteen households each. Furthermore, the conditions attached to the letters of offer of land to the MOA written in 2012 included (i) that there would be no displacement of the local communities in the FB and (b) that the land with established beacons was surrendered land and belonged to the MOA.

To verify this claim, it is necessary to overlay the positions of existing villages on the general layout of Manshya FB or the land allocation plan (see Figure 9-21). If the conditions attached to the offer letter are respected, the risk of large-scale involuntary resettlement in Manshya FB seems low. Assuming that a household has five people and considering the number of villages and households mentioned by the Chief, the 2012 FB population of 300 people (4 villages × 15 households × 5 people) can be multiplied by the population growth rate of 2.1% from 2011 to 2020 in Chinsali County given by the Central Bureau of Statistics, and the FB population in 2019 can be estimated to be around 347 persons[27].

In any case, as mentioned in the previous section, the population may be increasing both naturally and unnaturally (e.g., by professional squatters seeking compensation) because of recent advances in investment. Thus, census and socio-economic surveys should be conducted to formulate appropriate plans to minimize the negative impact of FB development on the community.

However, according to information that the Survey Team obtained from the Senior Agricultural Officer of Chinsali County in October 2019, the population of the FB is about 21,000 (4,600 households). The information obtained from the District is therefore very different from the information obtained from the Chief, and it is inferred that accurate information cannot be obtained even at the site. Thus, to examine the impact of land acquisition and resettlement owing to FB project implementation, it is necessary to conduct a census survey to ascertain the correct population and number of households.

[27] CSO (2013), *2010 Census of Population and Housing, Population and Demographic Projections 2011–2035*

2） Land and natural resource use

The DACO explained that Bemba comprise 80% of the area, with Bisa comprising the rest. They practice traditional farming methods known as *citemene* and *fundikila*[30] and hybrids of those methods with modern technologies. However, it is unclear to what extent the farmers originally participated in the planning process of the Manshya FB development program and what arguments were made regarding the future of such traditional farming methods.

Local snack known as chikanda[28]

Flower and rhizome of Orchis masculla[29]

Figure 9-23: Chikanda – a popular savory snack in Zambia

Source: See footnotes.

According to the DACO's annual situation analysis report for Shiwang'andu District in 2018, the forest plays an important role for people who harvest non-wood forest products, such as caterpillars, mushrooms, orchids, wild fruits, chikanda, and herbal medicines. It is again unclear whether the Manshya FB development plan considers the people who use these local resources.

Chikanda, also known as "kinaki" or "kikanda," is a popular savory snack in Zambia made from orchid tubers, groundnuts, and chilis. The BBC (2016)[31] reported that "it is estimated that each year over 4.4 million orchid tubers are traded to Zambia from Tanzania, Angola, the Democratic Republic of Congo and Malawi, all to make chikanda."

In recent years, from the perspective of regional resource conservation, Shiwang'andu District has eight newly established regional forests (total area 1,350 ha) in the district, which are separate from the national forest. There is a concern that, when FB development starts, the number of forests that residents can use will decrease further. In Kawambwa District, where Luena FB is located, a forest engineer reported that farmers who could not use conventional natural resources owing to FB development carried out illegal harvesting and logging. Similar cases may occur in and around Manshya FB.

Thus, it is desirable to create sustainable natural resource management plans when formulating

[28] Zambian Kitchen, Chikanta Recipe, https://zambiankitchen.com/chikanda-recipe/ (accessed on July 26, 2019)
[29] BBC (2016), http://www.bbc.com/earth/story/20161123-there-is-a-snack-food-that-is-mostly-made-out-of-orchid (accessed on July 26, 2019), (Photo: Tim Shepherd/naturepl.com)
[30] Fundinka is a "grass-mound" system of cultivation. Briefly, the process involves the formation of mounds of grass covered by earth on a previously fallowed site toward the end of the rainy season. The grass rots within the mound during the dry season, and when the next rains start, the mounds are levelled, and crops and beans are planted in rotation. Fundinka is believed to have a beneficial effect on soil conservation.
[31] BBC (2016), http://www.bbc.com/earth/story/20161123-there-is-a-snack-food-that-is-mostly-made-out-of-orchid (accessed on July 26, 2019).

FB development plans in this area because the potential impact of a large-scale development project like an FB does not remain within the site but rather can spread directly or indirectly to the FB's surrounding area.

3) Impact on the local economy, such as employment and livelihood

The WB (2008) created a detailed report about the usage and value of forest products, as mentioned in an earlier chapter.[32] Briefly, this household survey shows the variability in sources of livelihood across the study sites, but, on average, agriculture production is the main source of income, accounting for 45% of total household income, followed by forest income (20%), trading (20%), and formal and informal income (10%). The four villages surveyed in Northern Province are located in Kasama and Mpika Districts, and 15–40% of their average household income comes from forests. As Manshya FB is located close to Kasama and Mpika Districts, the household incomes of people living in Manshya FB may be similar (see Figure 9-24).

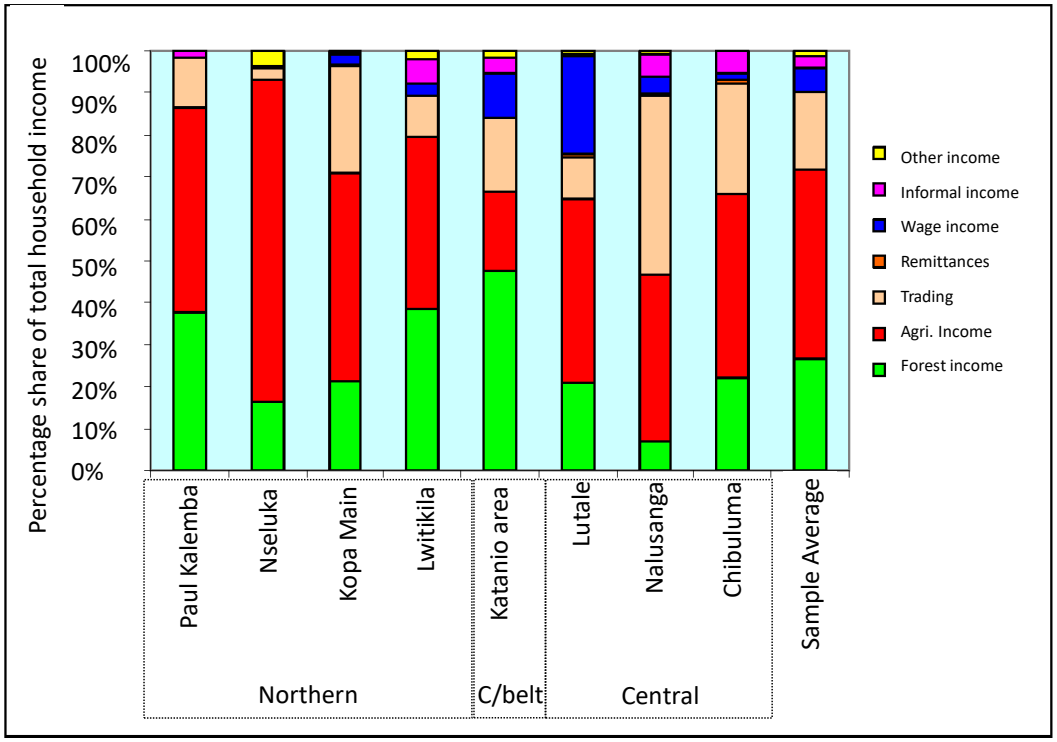


Figure 9-24: Sources of total household income for eight sites in three provinces in Zambia

Source: The Survey Team, based on WB (2008)

A breakdown of forest-derived income is shown in Table 9-23 below. The numbers in the table indicate average household incomes, and the values in brackets are the percentages of all

[32] WB (2008), Technical Annexes, Policies, Incentives and Options for the Rural Poor, Managing the Miombo Woodlands of Southern Africa

households trading each product. For instance, in Lwitikila Village, 62% of the surveyed farmers earned an average of ZMK 300,000 from the caterpillars known as chipumi caterpillars[33].

Table 9-23: Average value of sales of forest products for user households and user households as a percentage of the total population in eight villages in Zambia

Forest product	Paul Kalemba (Kasama)	Nseluka (Kasama)	Kopa (Mpika)	Lwitikila (Mpika)	Katanino (Ndola)	Lutale (Mumbwa)	Nalusanga (Mumbwa)	Chibuluma (Mumbwa)
Timber	4,500,000 (1%)	1,432,500 (3%)	105,000 (3%)	0	0	606,250 (16%)	600,000 (9%)	300,000 (3%)
Poles	0	0	69,000 (3%)	0	0	61,875 (11%)	237,000 (4%)	52,000 (8%)
Charcoal	1,889,250 (10%)	62,400 (7%)	293,850 (7%)	18,000 (3%)	743,921 (46%)	103,750 (11%)	806,667 (5%)	30,000 (3%)
Grass	80,000 (1%)	20,000 (1%)	66,000 (5%)	40,000 (3%)	60,000 (5%)	32,500 (8%)	85,125 (7%)	16,500 (5%)
Mushroom	166,320 (4%)	38,640 (6%)	47,568 (7%)	19,080 (8%)	300,000 (7%)	3,600 (3%)	0	14,400 (3%)
Firewood	0	0	360,000 (1%)	12,000 (3%)	92,000 (5%)	10,000 (3%)	0	25,000 (3%)
Tubers	54,852 (6%)	33,600 (4%)	99,840 (10%)	51,660 (11%)	168,000 (5%)	79,360 (8%)	7,200 (4%)	14,880 (5%)
Mumpa caterpillars	No data	0	119,040 (21%)	170,400 (8%)	0	0	0	0
Chipumi caterpillars	103,875 (5%)	0	328,429 (58%)	309,522 (62%)	0	0	0	0
Other caterpillars	27,216 (6%)	0	0	42,000 (3%)	78,960 (2%)	0	0	0
Fruits	55,800 (5%)	108,000 (1%)	40,000 (8%)	67,520 (8%)	74,480 (7%)	0	0	0
Woodcarving	0	150,000 (1%)	0	30,000 (3%)	0	41,400 (13%)		105,000 (3%)
Reed	0	18,000 (1%)	450,000 (1%)	22,500 (3%)	0	0	913,500 (4%)	0
Honey	63,333 (4%)	200,000 (1%)	77,917 (8%)	31,250 (5%)	356,000 (12%)	438,462 (34%)	324,750 (18%)	334,889 (23%)

Source: Extracted from WB (2008)

This analysis clearly shows that woodlands are a valuable source of livelihood for local farmers even though those who do not live there may consider them worthless at first glance. Non-forest products are also valuable sources of protein and vitamins in rural areas. Thus, it is important to formulate an FB development plan only after carefully confirming the use of natural resources by existing residents.

[33] The exchange rate in 2005 was USD 1.00 = ZMK 4,200. Accordingly, ZMK 300,000 is equivalent to approximately USD 71.4. Assuming that USD 1.00 = JPY 110, ZMK 300,000 is equivalent to approximately JPY 8,000.

9.6.6. Kalungwishi FB

（1） Geographical information

Kalungwishi FB is located in the Mporokoso and Lunte Districts, which are part of Northern Province. The closest entry point to the FB is within 20–30 km of the two urban centers, but the total distance from Lusaka to Kalungwishi FB is 1,035 km (14 hours by car). Kalungwishi FB is a more recent initiative, having been formally established in 2017. It is the largest FB, with an area of about 200,000 hectares.

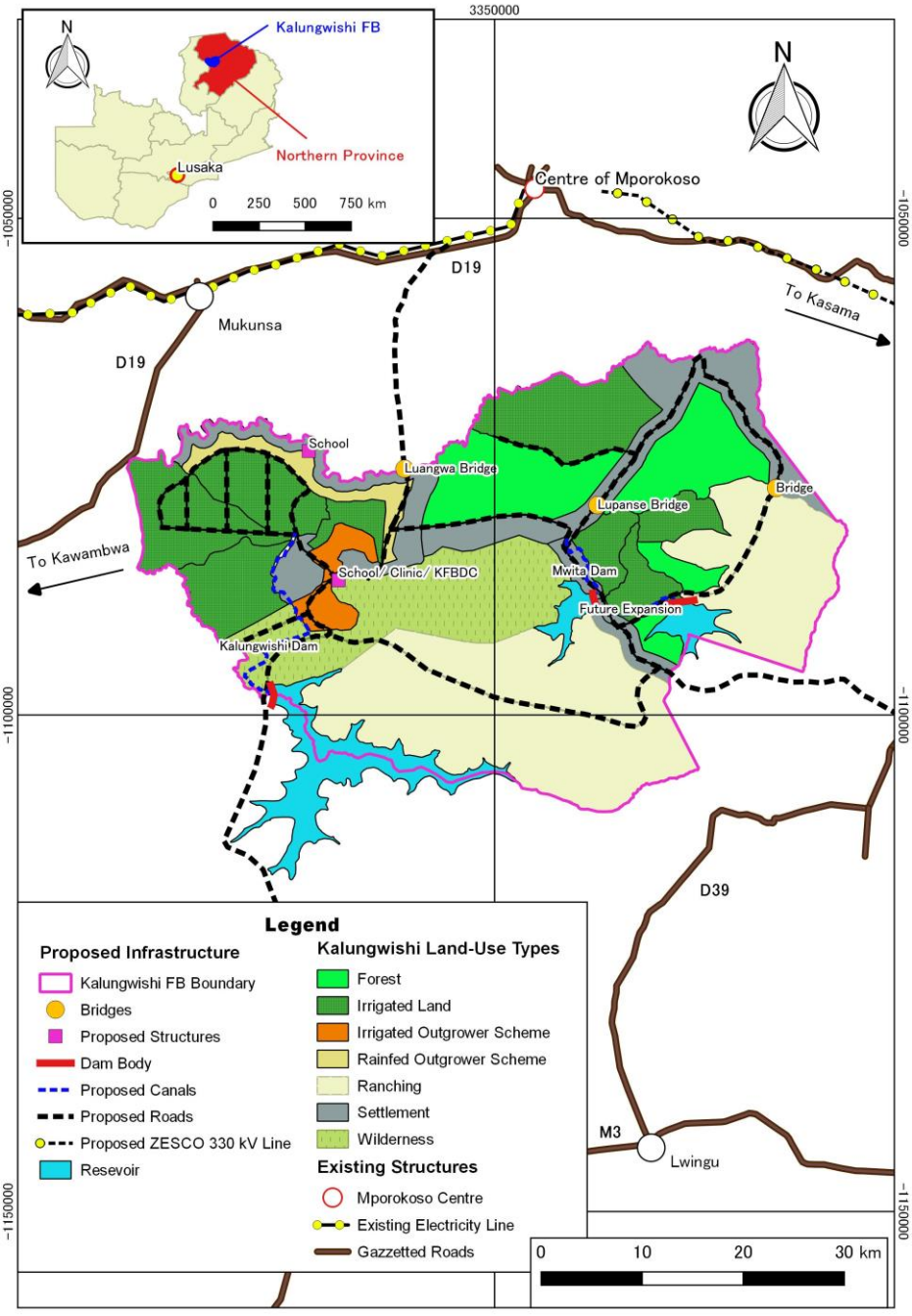


Figure 9-25: General layout of Kalungwishi FB

Source: The Survey Team

（2） Investment progress

Two years after the establishment of Kalungwishi FB, only two potential companies have shown interest in operations on the FB. Two applicants have each been awarded about 10,000 ha of land. One is Consolidated Farming Limited, which is a private sugar refiner[34] with an office in Lusaka, and the capacity of its refinery plant has been expanded from 1,500 tons a day to 2,500 tons a day with a loan from the Southeast African Trade and Development Bank. The company received eight loans from 2001 to 2015, for a total amount of 36 million USD[35]. In Kalungwishi FB, the company intends to process wheat and soy and participate in the out-grower modality that was recommended in the F/S report of the Kalungwishi FB development program compiled by China Railways Seventh Group in 2017.

The other applicant is SeedCo Zambia, which is part of SeedCo International. This company researches, produces, and distributes certified seeds in 15 African countries, and it deals with sorghum, sugar beans, groundnuts, and soybeans in Zambia. SeedCo Zambia currently has two research centers in Mpongwe District in Copperbelt Province, which has high rainfall and frequent spreading of pests and diseases, and in Lusaka, which has the highest agricultural productivity in the country[36]. In Kalungwishi FB, SeedCo Zambia plans to engage in seed breeding and establish a laboratory in the area.

Table 9-24: Progress of investors' and farmers' business development in Kalungwishi FB

Category	Existing number	Names of actors who currently conduct business activities	Planned number	Names of actors who plan to conduct business activities
Core investors (10,000 ha)	0		2	Consolidated Farming Limited (wheat and soy processing and out-growing) and SeedCo (seed breeding and laboratory testing)
Commercial farmers (1,000–5,000ha)	0		N/A	N/A
Medium-scale farmers (100–1,000ha)	0		N/A	N/A
Small farmers (0–100 ha)	0		N/A	N/A

Source: The Survey Team

（3） Progress of infrastructure development

No particular infrastructure has been developed for Kalungwishi FB. Roads, bridges,

[34] Zambia Yellow Pages, https://www.yellowpages.co.zm/zambia-business/5689923/S0880E/sugar-manufacturers/sugar-manufacturers/consolidated-farming-ltd (accessed on July 17, 2019)
[35] Trade and Development Bank, Consolidated Farming Limited、https://www.tdbgroup.org/portfolio/consolidated-farming-limited/ (Accessed on July 17, 2019)
[36] SeedCo Zambia Overview, http://www.seedcogroup.com/zm/about-us/overview (Accessed on July 17, 2019)

electricity, and internet infrastructure either do not exist or exist at very low levels (see Figure 9-26).

Crossing point of the Lwangwa River from the northern boundary of Kalungwishi FB

Access roads in Kalungwishi FB

Access roads to Kalungwishi FB from the eastern boundary

Access roads to Kalungwishi FB from the northern boundary.

Figure 9-26: Current status of infrastructure development in Kalungwishi FB

The CRSG conducted an FS survey of Kalungwishi FB development in 2017, and the rapid development of infrastructure is regarded as the top priority. A series of prioritized infrastructure developments is planned for phase 1 (construction period: 2017–2021), as shown in Table 9-25.

According to the PACO, the current status of development is that the group has already signed an memorandum of understanding with the MOA and is in the process of borrowing 394 million USD from the China Export-Import Bank. JICA confirmed that the FB had made the same progress as of January 2018, and, thus, it is clear that progress has not been made. Comparing the actual progress with the planned schedule in the F/S report, construction is about two years behind the original plan (see Figure 9-27).

As for other infrastructure development, nine communication towers are planned in the Zambian government budget. Currently, a section of the FB that is relatively close to an existing communication tower in Mporokoso town is barely connected to the network, but this section is

about one-fifth of the total FB area, and the rest of the FB has no network coverage. According to the PACO, ZICTA has recently approved the construction of a new communication tower, and, if it is completed, almost half of the FB area will be covered by the network.

Table 9-25: List of proposed infrastructure to be installed in the first phase of Kalungwishi FB

Item	Description
Road network	(1) Paved road network 132 km long, with carriageways 6.4 m wide with 1.5 m shoulders on either side, with double seal bituminous surfacing and a cement-stabilized base (2) Gravel road network 210 km long, with carriageways 6.0 m wide with a natural grave base
Bridges	(1) Luangwa Bridge over the Luangwa River connecting Mporokoso Boma to the FB; about 60 m long. (2) Lupanse Bridge over the Lupanse River connecting the eastern side of the FB to the western side
Dam	Kalunwishi Dam (earth dam, 30 m tall, with a beneficial area of 10,000 ha)
Weirs	For the out-grower scheme, 5 m tall and 30 m wide
Irrigation canal	Concrete-lined trapezoidal canal, with a total length of about 28 km
Landing strip	1,800 m long and gravel surfaced
Power lines	33 and 11 kV power lines, with a total length of about 150 km
Other social infrastructure	One clinic, two schools, and one farm training center with housing (concrete block walls and iron sheet roofs)

Source: The Survey Team based on the CRSG (2017) Final Report, Feasibility Study for Kalungwishi Farm Block Development

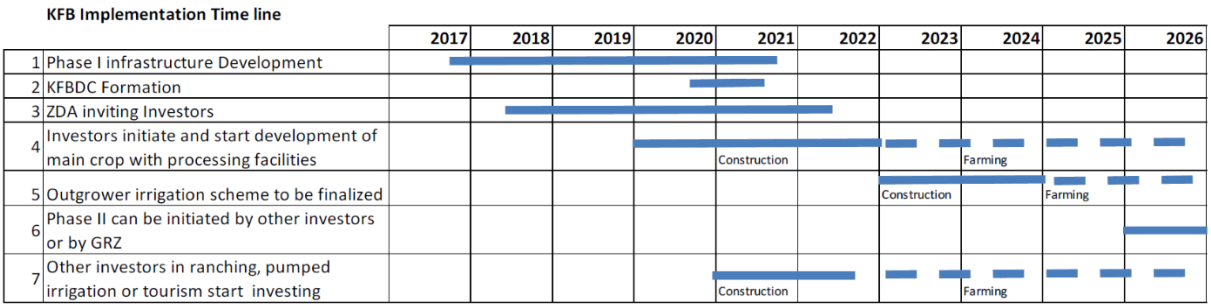


Figure 9-27: Implementation schedule of the Kalungwishi FB development program

Note: KFBDC: Kalungwishi FB Development Company, ZDA: Zambia Development Agency, GRZ: The Government of Republic of Zambia

Source: Extracted from the CRSG (2017) Final Report, Feasibility Study for Kalungwishi Farm Block Development

(4) Expected impacts of FB development

1) Land acquisition and resettlement

The Kalungwishi FB development site includes 67 villages inhabited by 4,268 small-scale farmers. The main crops cultivated are legumes, cassava, finger millet, maize, and groundnuts. Referring to the development plan of Kalungwishi FB, many of the existing settlements are in the designated "Resettlement Area," where resettlements are to be made. In other words, the plan

is considered to minimize the amount of resettlement due to development.

However, as in Nansanga and Luena FBs, farmers in Kalungwishi FB conduct a traditional type of slash-and-burn farming called *citemene*, as shown in Figure 9-28. Because the farmers' cultivation lands are not located near their dwellings and the farming method shifts over a several-year cycle, it is very likely that their cultivation lands will be affected by the FB development.

In an interview with a local farmer regarding resettlement, he said that he would accept resettlement if the government provided (1) advance notice of the resettlement schedule, (2) assistance with re-clearing land and house construction, (3) assistance with restoring his livelihood, and (4) alternative land suitable for agriculture. In addition to these small-scale farmers, the FB development plan area currently includes two large-scale farms, called Lupiya Farm with approximately 1,100 ha and Ichilelea Abalanda Estates, with approximately 6,000 ha. Although the latter land was assigned to the Sisters of the Child Jesus[37] prior to the FB development plan, the MOA is considering alternative sites outside of the FB, as the FB development plan does not conform to the concept of an orphanage project.

2) Impact on of land and natural resource use

According to an interview with a local farmer, the reason that farmers prefer the *citemene* method is that they have no money to buy chemical fertilizers and they know that the *citemene* method can empirically restore soil fertility; hence, they recognize that it is the most suitable farming method. The area of farmland that can be cultivated at one time is about five to six limas, and farmers often cultivate four to five kinds of crops. In an interview, a household with four family members reported currently owning 30 hectares of land and needing at least 30 hectares to continue conducting *citemene* in the future. The results of previous research[38] indicate that the area required for a family of four to continue *citemene* depends on the condition of the trees and the frequency at which cultivated land is renewed, among other factors, and the required area is calculated as 20 to 50 ha. The farmer's response is therefore within this range. Assuming that 30 ha is the average size required to carry out traditional farming methods in this area, the total area required is calculated to be 128,040 ha by simply multiplying the 4,268 households residing in the Kalungwishi FB development area by the required area per household. However, the land-use classification (Table 9-26) in the Kalungwishi FB Development Plan shows that this area has not been secured.

In addition, farmers use natural resources, such as wild fruits, medicinal herbs, building materials and firewood, and annual plants as roofing materials, but the forest area proposed in

[37] This is a monastic order founded in France in 1976 that presently serves in various parts of the world.
[38] Oyama (2013)

the Kalungwishi FB plan was determined from the perspective of water resource conservation rather than from the perspective of the users. Thus, farmers will need to change the way that they use land and natural resources when the current FB development plan is carried out. Alternatively, farmers who do not want change, such as those in Luena FB, or who cannot cope with change for some reason may intrude into forest and nature reserve areas and try to continue with their conventional land and natural resource use.

Typical farming plots opened by *citemene*

Smoke from burning sites (see the tops of the trees)

Figure 9-28: Farming plots using a traditional slash-and-burn practice, namely, *citemene*

Table 9-26: Land-use plan and its distribution in Kalungwishi FB

Land-use Plan	Area (ha)
Forest	24,347
Irrigated Land	44,583
Irrigated Out-grower Scheme	3,693
Rainfed Out-grower Scheme	4,123
Ranching	65,211
Settlement	27,938
Wilderness	23,683
Total	193,579

Source: The Survey Team

3) Impact on the local economy, such as employment and livelihood

Although some farmers responded that they do not need chemical fertilizers and pesticides because they practice *citemene*, some farmers also cited income loss due to the following three problems: 1) unstable rainfall patterns of both drought and heavy rainfall in recent years; 2) a lack of agricultural inputs, such as chemical fertilizers, for maize; and 3) an expansion of pest damage, especially from armyworms (Spodoptera frugiperda). From this response, it seems that there is a certain need for the development of drought-tolerant seeds (early mature variety) by SeedCo, which is planning to invest in Kalungwishi FB. In addition, contract farming with Consolidated Farming Limited is expected to make it easier to secure agricultural inputs.

Furthermore, the development of the road connecting the center of the FB and Mporokoso District will facilitate access to agricultural depots and stores that sell insecticides, enabling farmers to apply fertilizer at the appropriate time. However, because plots that are monocultured through an out-grower scheme create an environment in which pests are more likely to spread, appropriate pest and disease control management is required.

With regard to employment, the basic policy of the Kalungwishi FB Development Company (KFBDC) introduced in the next section assumes that existing or future residents of Lunte, Mporokoso, and Luwingu Districts will be designated as the target users of the FB, and many of the existing residents will be regular employees.

4) Impact on local society, including traditional authorities

A notable aspect of the Kalungwishi FB development plan is its unique management structure and principles, including a strict land tenure process and user cost principles for sustainability. The KFBDC board will comprise the Ministry of Finance, the MOA, the Ministry of Livestock and Fisheries, traditional leaders, WARMA, and farm owners, and it is expected to carry out the monitoring and evaluation of investments; the measurement of water use; billing and collections; awarding performance-based contracts for the routine maintenance of roads, bridges, canals, and the dam; regular consultative meetings between users; and so forth. The KFBDC will also be responsible for distributing company income as part of an agreed mandate of the Government of Zambia to service its debt, traditional leaders, and WARMA.

Regarding land tenure, a title deed in the landowner’s name will be issued only after fourteen years and after the fulfillment of all development commitments and the payment of all fees and user charges. In this manner, only committed farmers and developers will be attracted to and remain on the FB on a long-term basis. At the same time, this rule prevents the allocation of land to farmers and investors who do not have the will or ability to take agricultural development seriously. For this purpose, land- and water-use fees are to be collected according to farmers' solvency, the land-use area, and the degree to which the service is used (see Table 9-27 and Table 9-28).

The KFBDC seems to be a well-considered mechanism for sustainable and effective development and utilizing lessons from other FB developments, but because it involves establishing a completely new organization, it is necessary to fully discuss the plan with relevant local stakeholders, including farmers.

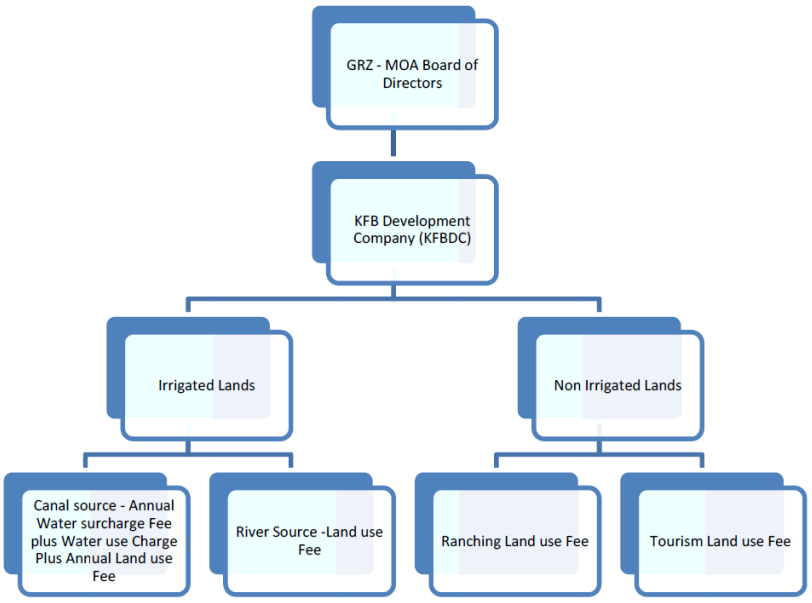


Figure 9-29: Proposed structure of KFBDC

Source: Extracted from CRSG (2017) Final Report, Feasibility Study for Kalungwishi Farm Block Development

Table 9-27: Proposed water charges payable to KFBDC

Category of land	Type of charge	Rate (USD)	Duration of applicability
Irrigation area (by irrigation canal)	Water delivery charge (water distribution fee)	60/ha	Years 1 to 14
	Water-use charge (water-use fee)	0.01/m^3	Per m^3
		50/ha	Minimum charge per ha after year 3

Source: Extracted from CRSG (2017) Final Report, Feasibility Study for Kalungwishi Farm Block Development

Table 9-28: Proposed land-use charges payable to KFBDC

Duration of applicability	Rate (USD/ha)		
	Canal irrigated	Pumped river irrigated	Cattle ranching and rainfed cropping
Year 1	100	40	40
Year 2	10	10	10
Year 3	10	10	10
Year 4	10	10	10
Year 5	10	10	10
Years 6 to 14	20	20	10
Years 14 to 25	4	4	2

Source: The Survey Team, revised based on CRSG (2017) Final Report, Feasibility Study for Kalungwishi Farm Block Development

5) Impact on existing social infrastructure and services

The development of the social infrastructure listed in Table 9-25 is expected to improve social services in this area. It is worth noting that the Ministry of Education guidelines state that it plans to "build a school within a 5 km radius from the student's house." In addition, because many farmers rely on the market in Mporokoso city to purchase agricultural products and inputs, the

construction of roads and bridges connecting the market and the FB can dramatically improve the distribution of various goods and services.

6） Local conflicts of interest

In interviews with existing residents, no clear responses were obtained regarding FB development plans, schedules, site boundaries, compensation policies, and so forth. In other words, farmers do not have sufficient information about the upcoming development program. In the future, it will be necessary to explain FB development carefully through resident consultations and locally available tools, such as radios. In addition, the complaint and grievance redress mechanism (CGRM) is not described in the F/S stage, and a system should be put in place to quickly deal with conflicts of interest if they occur in the future. The traditional CGRM flow is shown in Figure 9-30.

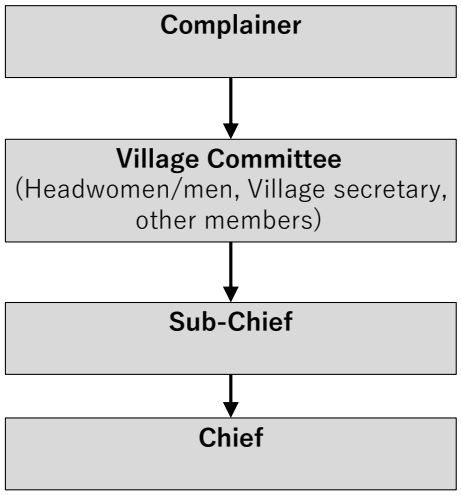


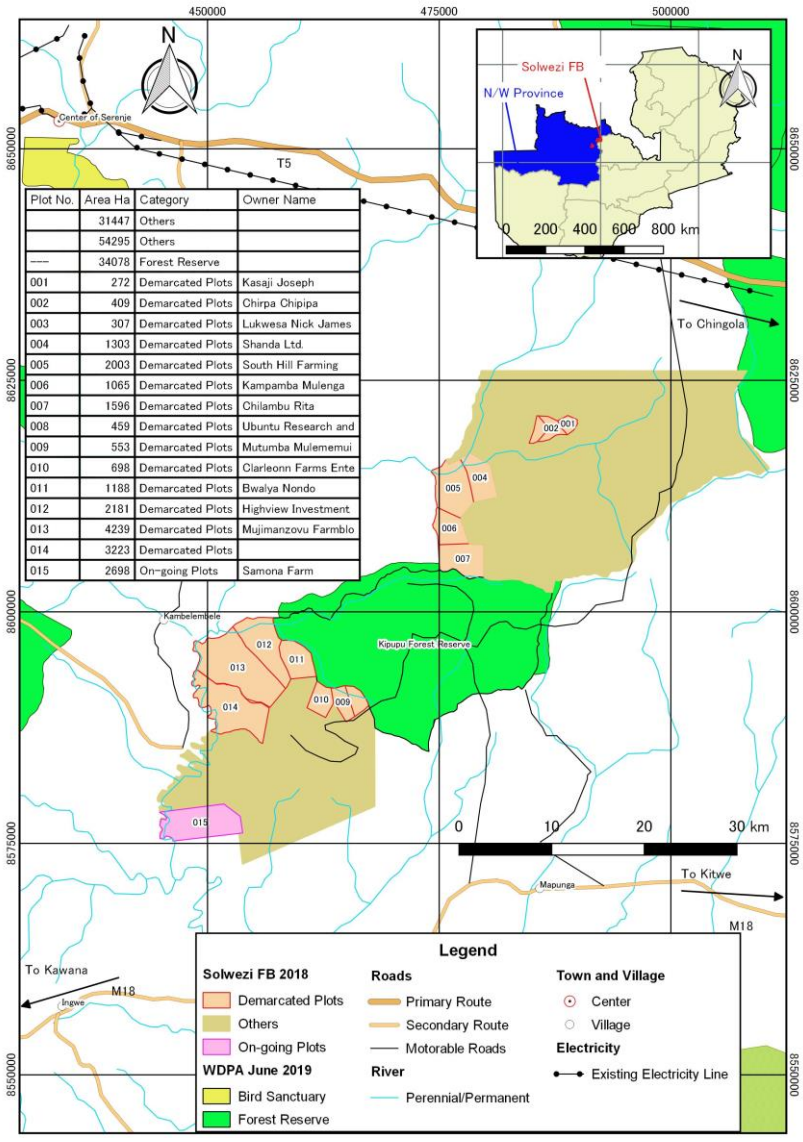
Figure 9-30: Traditional CGRM in Kalungwishi FB

Source: The Survey Team

9.6.7. Solwezi FB

（1） Geographical information

Solwezi FB initially belonged to Solwezi District, where Solwezi, the provincial capital, is located, when it was originally established in North Western Province. Recently, however, the area where the FB is located was separated to form the newly founded Mushindamo District, but the name of the FB is still Solwezi. The FB comprises 100,000 ha of land close to the Lunga River and is divided into 40,000 ha in the south and 60,000 ha in the north, with a protected forest between them. Solwezi city borders the DRC and has access to the DRC's cities as well as the copper and commercial cities (e.g., Kitwe, Ndola, etc.) in the neighboring Copperbelt province. In addition, a main road runs through the south of the FB, and it is possible to reach Kalulushi in Copperbelt Province without passing through Solwezi city.



Plot No.	Area Ha	Category	Owner Name
	31447	Others	
	54295	Others	
----	34078	Forest Reserve	
001	272	Demarcated Plots	Kasaji Joseph
002	409	Demarcated Plots	Chirpa Chipipa
003	307	Demarcated Plots	Lukwesa Nick James
004	1303	Demarcated Plots	Shanda Ltd.
005	2003	Demarcated Plots	South Hill Farming
006	1065	Demarcated Plots	Kampamba Mulenga
007	1596	Demarcated Plots	Chilambu Rita
008	459	Demarcated Plots	Ubuntu Research and
009	553	Demarcated Plots	Mutumba Mulememui
010	698	Demarcated Plots	Clarleonn Farms Ente
011	1188	Demarcated Plots	Bwalya Nondo
012	2181	Demarcated Plots	Highview Investment
013	4239	Demarcated Plots	Mujimanzovu Farmblo
014	3223	Demarcated Plots	
015	2698	On-going Plots	Samona Farm

Figure 9-31: General layout of Solwezi FB

Source: The Survey Team, based on drawings and other data obtained from the DACO

（2） Background

Solwezi FB was established in 2008, and the Farm Block Technical Committee was formed in the same year based on MOA guidelines for FB development, with the relevant ministries and agencies as members. The total land area is 100,000 ha, as 40,000 ha in the south and 60,000 ha in the north were alienated from Chief Mujimanzovu of Kaonde and Chief Kalilili of Lamba, respectively. The north is further divided into sections A and B. Section A, called Mikilingi FB, refers to the northern area near Solwezi town that borders the village head's house located along the Kansombo River, and Section B, called Kipoposhi FB, refers to the protected forest side of Kipupu Forest Reserve. No such designations are identified in the Mujimanzovu area, south of the Kipupu Forest Reserve.

As of June 2019, the FB layout map shows 15 investors (company and individual names) and a planned transport road. Investors have submitted the necessary documents for the implementation of the project, but since the establishment of the FB, no government budget has been allocated to the MOA, and farmland baseline and census/socio-economic surveys have not yet been conducted.

（3） General agricultural information for Mushindano District of North Western Province

Mushindamo District, to which Solwezi FB currently belongs, is a newly established county, and, thus, not enough information is available yet. When the FB belonged to Solwezi District, the crops with relatively high production were maize, rice, millet, soybeans, Irish potatoes, common beans, sweet potatoes, and sugar cane.

In North Western province, maize and tomatoes were damaged due to fall armyworms (Spodoptera Frugiperda) and tomato leaf miners (Tuta Absoluta), respectively, in recent years. However, it was reported that in 2017, when neither crop experienced catastrophic damage, cassava mosaic disease occurred in large numbers in some areas, severely affecting the food security of farming households.

（4） Progress of investment

There are 13 investors (company and personal names) on the FB layout map with allocated land. However, because no initial survey was conducted and roads and electric power infrastructure have not been developed, no companies or individual farmers have started production activities. Table 9-27 shows the progress of business development.

Table 9-29: Progress of investors' and farmers' business development in Solwezi FB

Category	Existing number	Names of actors currently conducting business activities	Planned number	Names of actors who plan to conduct business activities
Core investors (10,000 ha)	0		0	
Commercial farmers (1,000–5,000 ha)	2	Samona Farm (maize, wheat, stevia, avocados, macadamia nuts, etc.) Integrity Farm (soybeans and bananas) Africa Garden (fruit orchard (bananas and mangos), soybeans, maize, cattle, pigs, goats, tomatoes, cabbage, and onions)	8	Shanda Limited South Hill Farming Kampamba Mulenga Chlambu Rita Bwalya Nondo High View Investments Mujimanzovu Farmblo
Medium-scale farmers (100–1,000 ha)	0		6	Kasaji Joseph Chirpa Chipita Lukwesa Nick James Ubuntu Research Mutumba Mulememui Clarleonn Farm Ent.
Small farmers (0–100 ha)	0		0	

Note: Since mid-October 2019, the Survey Team has made inquiries to the MOA about the latest list of companies in the FB and their plot boundaries but no answer was obtained.

Source: The Survey Team, based on the FB plan and interviews with individual investors

(5) Progress of infrastructure development

1) Roads

At present, the feeder roads connecting Solwezi FB to the main roads (i.e., T5, M18, and M8) and the road network inside the FB are not well developed, and passage is especially difficult in the rainy season. According to the RDA, plans have been made to upgrade two feeder roads that connect to the main roads to gravel roads, and construction companies have already been selected. According to the plan, the renovation work will be carried out from 2019 to 2020, but the implementation prospects depend on budgetary measures. Figure 9-32 shows the current progress.

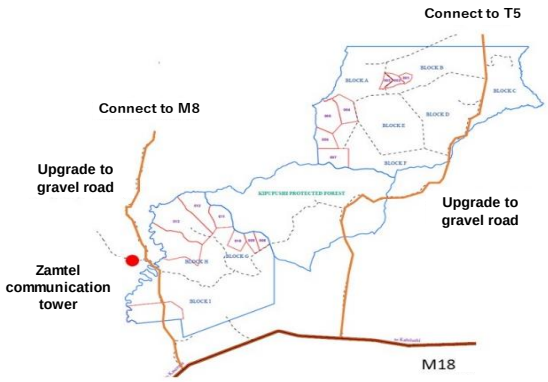


Figure 9-32: Road development progress in Solwezi FB

Source: The Survey Team

2) Electricity

Currently, a 11 kV transmission line connects to Mujimanzovu Palace on the west side of Solwezi FB. However, when this distribution network was installed, the demand for power in the

FB was not considered, and, thus, it is difficult to meet the FB's demand for power with the existing distribution network. According to ZESCO, the 66 kV transmission line between Luano and Kasempa could be connected to the existing 11 kV line to supply around 5–7 MW/year to meet the demand for power, mainly in the southern part of Solwezi FB, but no specific plan to do so is in place at present. On the southern side of Solwezi FB, Vin Energy is planning to install transmission line facilities through a PPP (see Luswishi FB for details.).

3) Irrigation

The Lunga River on the west side of Solwezi FB and its tributaries are the main sources of irrigation, as shown in Figure 9-33. The following water resource facilities have been established in the FB by the Ministry of Water Development, Sanitation, and Environmental Protection.

- ✓ Deep wells with hand pumps: In the past three years, 20 have been established in the northern area, and 150 have been established in the southern area.
- ✓ Hand-dug wells: These are changing from the crane type to hand pumps. In the past three years, 15–20 have been established in the northern area, and 80 have been established in the southern area.
- ✓ Scoop hales: Wetlands are dug near dambos or rivers to draw water. Their purpose is water supply and irrigation.
- ✓ Springs: Two springs in the FB provide natural spring water.
- ✓ Reservoir dam: The dam was established in response to requests from residents (the Chief or District Council) and completed in 2016. A water intake pump (siphon) and a main water channel are also installed. Responsibility for its management has been transferred to the MOA.

In addition, according to the DACO, the FB is included in the area covered by the "Expansion of Community-Based Smallholder Irrigation Development Project" currently being implemented by JICA.

4) Communication infrastructure

Zamtel has set up a communications tower in Mujimanzovu Palace on the west side of Solwezi FB. The service is currently down due to technical problems, but it will be available in 2019. The tower will provide 2G connectivity in most of the southern part of Solwezi FB. In contrast, the northern area of Solwezi FB has no telecommunications infrastructure except around the T5 road, and no plans for its development could be confirmed by this survey.

The Lunga River is expected to be utilized for irrigation

Access road in the FB: Large vehicles can enter, but the furrows are too deep to pass through in some spots

Figure 9-33: Current status of infrastructure development in Solwezi FB and the surrounding area

（6） Agricultural potential

Mushindamo District, where Solwezi FB is located, has an annual rainfall of about 1,200 mm and is classified as Region III in the Agroecological Zones published by Zambia's MOA (see Figure 9-1). It has an elevation of about 1,200–1,300 m and is characterized by a relatively large temperature difference between day and night. The soil is classified as ferrasol, and it is characterized as being slightly more clayey and generally less fertile than strongly weathered or loam soils. It is a strongly acidic soil, with a pH of 3.8–4.4. Solwezi FB's natural environment is similar to that of nearby Luswishi FB, as is the potential market for agricultural products. According to a ZDA report, crops with high investment potential in the Northwest Region include pineapples, cassava, soybeans, maize, sunflowers, and sweet potatoes. As in Luswishi FB, grains, such as wheat, are suitable for cultivation, as are fruit trees, such as bananas, avocados, cashew nuts, and citrus trees.

（7） Expected impacts of FB development

1） Land acquisition and resettlement

Because no census has been conducted at Solwezi FB, its exact population is unknown, but according to estimates of the chairman of Section A, the village head of Kabulubulu, and farmers' representatives from the Mujimanzovu area, a total of 850 households comprising about 6,050 people live in Solwezi FB as of 2019. The breakdown is 250 households, 50 villages, and 1,250 people in North Section A; 200 households, 40 villages, and 1,000 people in North Section B; and 400 households and 3,800 people in South Section A. A village in this area can be thought of as an aggregate of family, siblings, and relatives, and villages include only five to eight households.

Land acquisition and resettlement in Solwezi FB has been relatively infrequent, but the

following cases have occurred.

- Samona Farms
  - According to a representative of Samona Farms, before it began its investment, the planned land for development (about 2,800 ha) was uninhabited, with only 26 households cultivating the land. After the company consulted with the Chief, the Chief secured alternative land for the affected farmers outside of Samona Farms' plot, and the company reclaimed the alternative land as relocation assistance. The alternative land was provided based on the land area that had actually been cultivated before the relocation (1–2 limas per household).
  - However, according to the local residents, the affected farmers were relocated without any compensation. The farmers expressed their dissatisfaction that the company said to them, "All the money needed has been paid to the government, and none to the affected farmers."

- Integrity Farms (* This farm is on the south side of Samona Farms, but it may be outside of Solwezi FB. The MOA is currently examining its location.)
  - Integrity Farms said that 10–20 households were cultivating land on its project site (2,800 ha) before it started business. When it consulted with the Chief, the Chief provided an alternative site outside of Integrity Farms to the affected farmers, and the company paid for land clearing and so forth.

- African Garden
  - According to the Farm Manager of African Garden, the company consulted with the Chief and paid the necessary compensation, as 4–5 households were living on the project site (1,400 ha) before the company started conducting business there.

2) Land and natural resource use

Local farmers collect wild animals, mushrooms, and shrub fruits in the nearby forests, and they catch fish in the nearby rivers for food. Because meat is too expensive to be affordable, animal protein often comes from wild animals even in villages close to the main road. Some households buy fish at the market.

Based on the experience of Luena FB, which is relatively well developed, there is concern that FB development may displace local farmers from the shrubland (woodland) where they previously harvested forest resources and may encroach upon protected forests. According to the Mushindamo Forest Officer, only four staff members (two Forest Officers and two Forest Guards)

were assigned to the vast Mushindamo District, and because they could not patrol sufficiently owing to a chronic budget shortage, the capacity of the Forest Department should be strengthened when promoting FB development.

3) Local economy, such as employment and livelihood

Many of the small-scale farmers in Solwezi FB produce maize, but owing to a lack of distribution channel options (markets), they sell maize to a private company, Mutanda Farm, located tens of kilometers west of Solwezi's city center. The selling price of maize is ZMK 2.60/kg (or ZMK 130/50 kg bag), but farmers pay ZMK 20–40/bag, which is equivalent to 20% to 30% of the selling price of maize, as collection fees. Farmers in less accessible areas pay higher fees. In addition, a transportation fee (ZMK 700/vehicle for heavy-duty trucks) is charged separately. Typically, neighboring farmers pile up their harvests together when they rent a truck to save on rental costs. If commercial farmers in the FB establish contract farming with the neighboring small-scale farmers and can either transport agricultural products at a lower cost than the existing system or buy them at an appropriate price considering the amount of transportation, small-scale farmers will be able to earn more income.

According to the PACO, ensuring a market for agricultural products is one of the challenges of promoting agricultural development in the province. In his opinion, when FB development enables access to the market, new crops, such as tomatoes, will be introduced more frequently, and the livelihoods of smallholder farmers will be improved.

For small-scale farmers, agricultural machinery, such as tractors, is expensive and difficult to purchase. To address this situation, Africa Garden is considering a business model that provides tractor farming services to smallholder farmers to increase their agricultural productivity in return for recovering some of their harvest. However, farmers' fields in the area are not rectangular, and tree stumps that are several tens of centimeters above ground level traditionally remain in the cultivation land, making it unsuitable for tractors. The small farmers therefore need to change their traditional farming methods to benefit from FB development.

4) Local society, including CGRM

According to the PACO, in the event of any conflict, the traditional grievance mechanism is for local residents to seek advice from the Chief, who then consults the advisory body. The north side of Solwezi FB is somewhat different, with Sections A and B establishing the FB Development Committee around the same time as the Solwezi FB was established in 2012 and 2013. The committee is appointed by the Chief and consists of ten members: one chairman, one secretary, one treasurer, and seven members. There is no term of office, and members continue to serve unless there are special circumstances. Committee meetings are held twice a month to

discuss not only FB development but also various problems and concerns in the village, and the committee consults with the Chief if necessary.

In the southern part of Solwezi FB, a relatively strong development movement has taken root within the FB, and the complaints from residents suggest that the traditional grievance mechanisms may not be functioning adequately. Conversely, in the northern part of the FB, organizational problems may not be apparent because there are no significant development activities. When implementing EIAs and RAPs for Solwezi FB, it will be necessary to establish a system in which all stakeholders, including the FB's residents and Chiefs, can participate in the decision-making process.

9.6.8. Shikabeta FB

（1） Geographical Information

Shikabeta FB is located in northern part of Rufunsa District in Lusaka Province. The distance from Lusaka to the FB via the Great East Road (Route T4) and RD 493 is about 190 km (about three hours by car); thus, it is the closest FB to Lusaka among the ten FBs. The total area of Shikabeta FB is 74,000 ha. Notably, the FB is located within the Game Management Area (GMA), one of Zambia's Protected Areas.

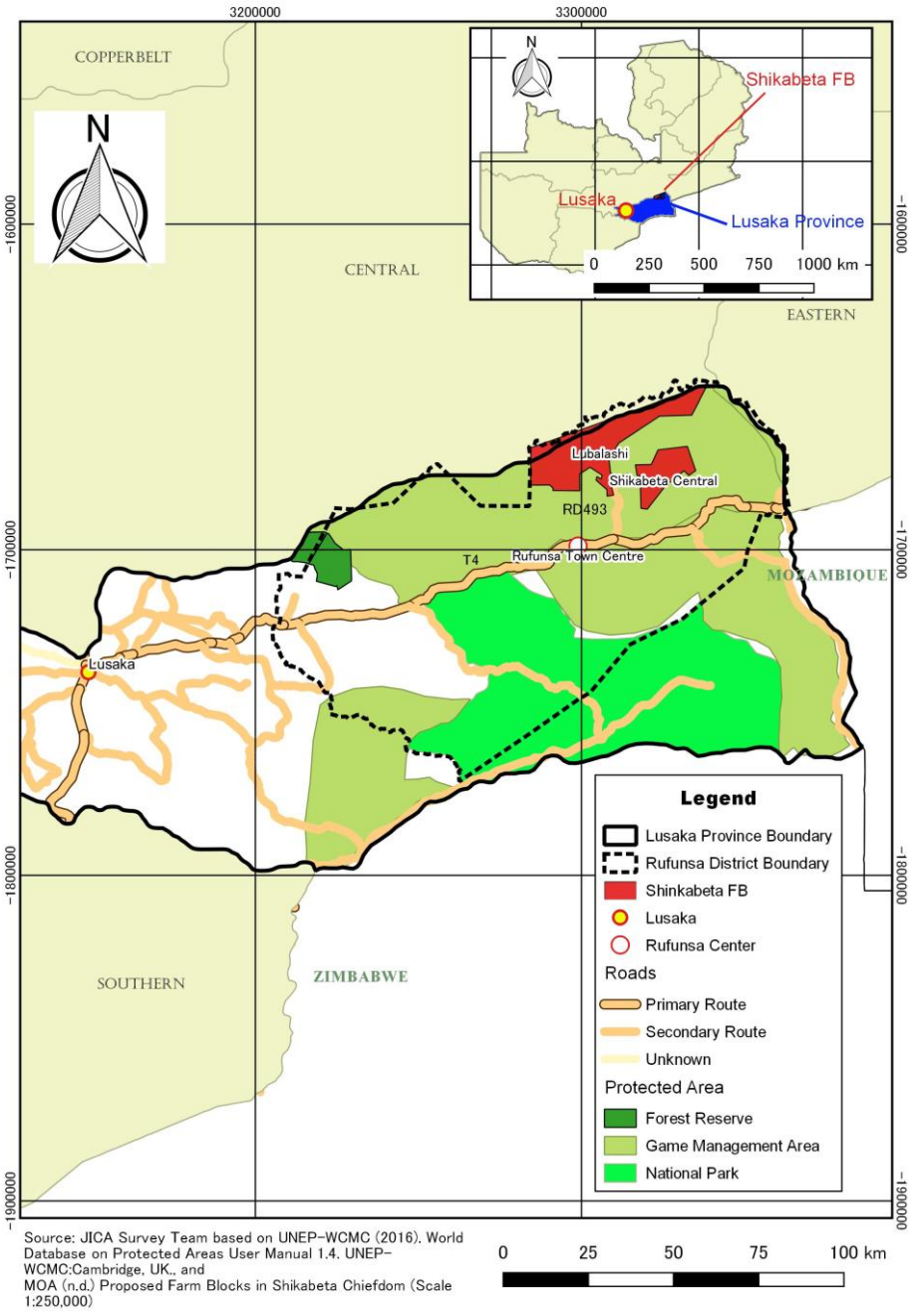
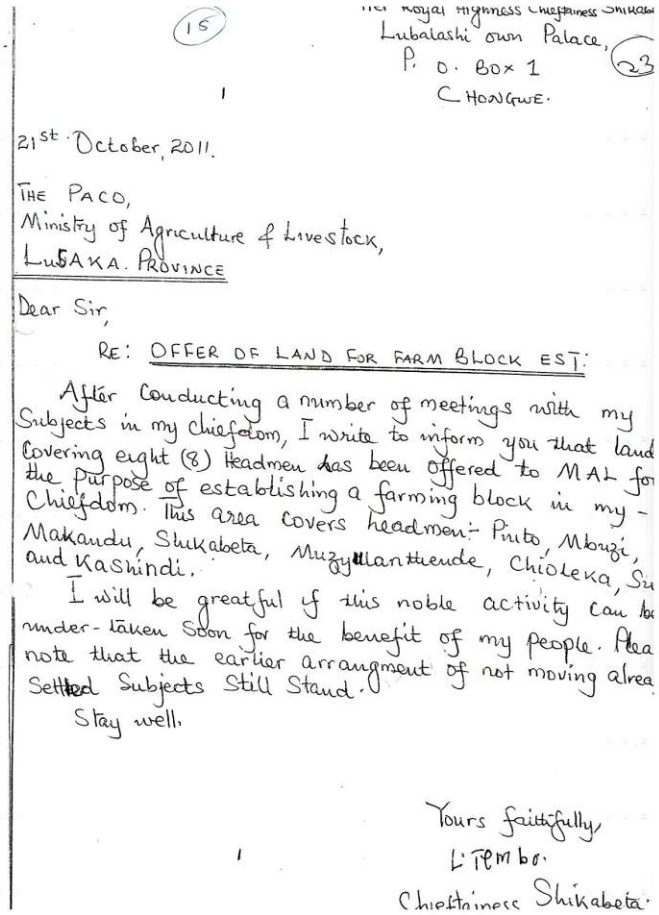


Figure 9-34: General layout of Shikabeta FB

Source: The Survey Team

(2) Background

Shikabeta FB was established in 2011, and the land was surrendered by Chieftainess Shikabeta (see Figure 9-35). At that time, she asked the MOA to avoid involuntary resettlement. However, since 2014, the government has allocated little budget to Shikabeta FB, and FB development progress has been very slow. In 2017, PACO conducted a social survey to understand the current situation in Shikabeta FB, and the report was submitted to TCFDBP.



Her Royal Highness Chieftainess Shikabeta
Lubalashi own Palace,
P. O. Box 1
CHONGWE.

21st October, 2011.

THE PACO,
Ministry of Agriculture & Livestock,
LUSAKA. PROVINCE

Dear Sir,

RE: OFFER OF LAND FOR FARM BLOCK EST.

After conducting a number of meetings with my Subjects in my Chiefdom, I write to inform you that land Covering eight (8) Headmen has been offered to MAL for the purpose of establishing a farming block in my Chiefdom. This area covers headmen: Pinto, Mbozi, Makandu, Shikabeta, Muzyamanthende, Chiolera, Su and Kashindi.

I will be greatful if this noble activity can be under-taken Soon for the benefit of my people. Plea note that the earlier arrangment of not moving alrea Settled Subjects Still Stand.

Stay well.

Yours faithfully,
L. TEMBO.
Chieftainess Shikabeta.

Figure 9-35: Official letter from Chieftainess Shikabeta to the MOA offering her land for Shikabeta FB

Source: Chieftainess Shikabeta

(3) Basic agricultural information for Shikabeta FB

As shown in Figure 9-34, Shikabeta FB consists of two blocks, namely, Lubalashi and Shikabeta Central. It includes 24 villages in a total area of about 74,000 ha, with 261 households comprising 1,428 people. The ratio of planted to total area is about 1% (637.75 ha), and the average planted area per household is about 2.4 ha. The agricultural products in the Shikabeta Central area are maize, sorghum, soybeans, and vegetables in descending order of production area. The yield of soybeans in Shikabeta (1 ton/ha) is only 40% of the provincial average yield (2.5 ton/ha[39]). The livestock raised in this area are chickens, goats, ducks, and cattle.

Table 9-30: Basic agricultural information of Shikabeta FB

	Lubalashi	Shikabeta Central	Total
Area	58,204.25 ha	16,223 ha	74,427.25 ha
Demography	7 villages, 457 people, 81 households, 10 of which are female-headed	17 villages, 971 people, 180 households, 23 of which are female-headed	24 villages, 1,428 people, 261 households

[39] MOA, Lusaka Province Department of Agriculture (2018), *2017 Annual Report*

	(12%)	(13%)	
Agriculture	Agricultural household number: 66	Agricultural household number: 194	
No. of livestock	Chickens: 747 Goats: 134 Cattle: 0 Ducks: 0	Chickens: 1,135 Goats: 400 Cattle: 1 Ducks: 18	Chickens: 1,882 Goats: 434 Cattle: 1 Ducks: 18
Area planted Breakdown of production area and yield (tons per hectare) of major products	152.6 ha (2.3 ha/household on average)	485.05 ha (2.5 ha/household on average) - Maize: 90.5 ha (2.5 t/ha) - Sorghum: 92 ha (2 t/ha) - Soybeans: 23 ha (1 t/ha) - Vegetables: 3.6 ha (no data)	637.65 ha (2.4 ha/household on average)

Source: The Survey Team, based on the Lusaka Province PACO (2017), *Field Report on Social Survey Conducted in her Royal Highness Chieftainess Shikabeta's Chiefdom* and *Questionnaire Survey* to the PACO/DACO

（4） Investment progress

As of June 2019, only Shikabeta Irrigation Company Limited has started doing business in Shikabeta FB. Through a loan from the AfDB, the MOA is implementing The Agricultural Productivity and Market Enhancement Project (APMEP), which seeks to (i) increase agricultural production, (ii) increase market engagement in agricultural production, (iii) enhance the institutional capacity of key agriculture sector players, and (iv) contribute to the reduction of chronic malnutrition in participating districts. The APMEP has facilitated the development of seven irrigation schemes in selected project areas that will be managed and operated by private companies. The companies are owned by water user associations, and their core activity is commercial crop farming (both irrigation and rainwater). Shikabeta Irrigation Company Limited is one of the seven companies.[40] According to the DACO, the company registered in 2019 and cleared 552 ha of land. The planned irrigation area is 444.5 ha, and it plans to produce rice, sugarcane, and wheat for sale in Lusaka. The DACO also added that the establishment of processing and packing yards is planned. Table 9-29 summarizes current progress.

Table 9-31: Progress of investors' and farmers' business development in Shikabeta FB

Category	Existing number	Names of actors who currently conduct business activities	Planned number	Names of actors who plan to conduct business activities
Core investors (10,000 ha)	0		0	
Commercial farmers (1,000–5,000 ha)	0		0	
Medium-scale farmers	1	Shikabeta Irrigation Company Limited	14	Company not yet determined, but Irish

[40] Zambian Job Hunter, https://zambianjobhunter.com/job/description/-LgCVQNftRv-3XkqxSPt (accessed on July 21, 2019)

(100–1,000 ha)				potatoes and fruits and vegetables are planned
Small farmers (0–100 ha)	0		0	

Source: The Survey Team

（5） Progress of infrastructure development

The DACO explained that electrification in Shikabeta FB has progressed to about 50% of the plan. Currently, electrification is only available from the center of Rufunsa to the elementary school, but electrification is planned to extend from the school to Shikabeta Irrigation Company Limited in the future. Currently, the FB has no internet access. Irrigation facilities have not been developed. There is a plan to pump water from the Lunsemfwa River, but the lack of a power supply is a bottleneck. Among the trunk roads, the Great East Road (four lanes on the Lusaka side and two lanes in the center of the Rufunsa side) is paved, whereas RD 493 is one or two lanes of laterite pavement (see Figure 9-34 and Figure 9-36). The access roads in the FB are not well developed. The current status of Shikabeta FB's infrastructure is shown in the photo collection in Figure 9-36.

The Great East Road (around Lusaka)[41]

Junction of the Great East Road (back, paved) and RD 493 (front, laterite)

[41] Photo: Wikipedia, https://en.wikipedia.org/wiki/Great_East_Road (accessed on July 20, 2019)

Road surface conditions of RD 493

Access road in the FB

Rural Health Center in the FB (to be upgraded to a hospital in the future)

Primary School in the FB (to be upgraded to a full boarding secondary school in the future)

Maize milling machine driven by a diesel generator

Existing residence with a solar panel (center) and crop storage (right)

Figure 9-36: Progress of infrastructure development in Shikabeta FB

（6） Expected impacts of FB development

1） Land acquisition and resettlement

As mentioned above, the Chieftainess ordered that the Shikabeta FB follow a basic development policy of not causing resettlements. This policy was confirmed when the Survey Team interviewed the PACO and the DACO in June 2019. According to the PACO and the DACO, no households have been eligible for resettlement or compensation as a result of FB development, but seven years have passed since the last social survey, and the numbers of households and residential areas are expected to have increased. In addition, households may be affected when infrastructure development plans, such as access roads in the FB, are carried out. To assess the future impact, it is necessary to at least re-conduct the census and socio-economic surveys and draw up a development plan (a layout map showing future land-use plans and the planned infrastructure) for the FB.

2） Impact on lands and natural resource use

According to the DACO and local farmers, the traditional farming practices are called *ukumbunga* and *madimba*. With the former method, harvested shrubs are piled up, dried well, and lit and burned, and planting then takes place on the post-burned site. The latter is method is used for planting crops along the Lunsemfwa River basin on alluvial soils utilizing residual moisture after the rainy season. These farming methods are applied because of a lack of money to purchase expensive fertilizers.

In addition, local farmers harvest wild mushrooms, bush meat (rodents), honey, and timber for home construction from a nearby forest, and they catch barbel fish and tilapia in a nearby river. Most of these products are consumed at home.

At present, the impacts on these traditional farming methods and local resource utilization due to FB development are unknown. Prior to the full operation of the FB, it is recommended to formulate various plans, such as a farming plan, a land-use plan, an irrigation plan, and so on with the active participation of local residents to minimize adverse impacts to the community.

3） Impact on the local economy, such as employment and livelihood

A farmer who was engaged in the picking logs at the Shikabeta Irrigation Company Limited reported being paid ZMK 1,200 after working for three months. The positive impact is that the money raised from this piecework was spent improving and renovating his house. For instance, he bought iron sheets for roofing, kitchen utensils, and a radio.

If FB development is in full swing and various employment opportunities are created, the expected positive impact is an increase in farmers' cash income, which will contribute to local economic growth in turn.

4） Impact on local society, including traditional leaders

The local decision-making mechanism in Shikabeta FB is the same as that in Kalungwishi FB; if there are any complaints or conflicts, residents consult the Chief through the village headman or headwoman (see Figure 9-30). Although the coordinates of the 24 villages are not available, a development plan need to be formulated by taking the local balance into consideration, as supporting a specific village may cause conflicts of interest and the misdistribution of benefits and damages.

5） Impact on existing social infrastructure and services

As shown in Table 9-32, the priority of the FB residents is improving access to agricultural markets, health facilities, and domestic water.

Additionally, a farmer living in the FB says that he hopes that the FB development program can improve children's route to school because, at present, children have to cross the Lunsemfwa River, which is infested with crocodiles. Furthermore, he hopes that the development of the FB will improve access to modern technologies, such as tractors and storage facilities; better markets; and various training opportunities related to agribusiness.

Table 9-32: Percentage of households that can access social services in Shikabeta FB (2012)

	Lubalashi	Shikabeta Central	Total
Area	58,204.25 ha	16,223 ha	74,427.25 ha
Demography	7 villages, 457 people, 81 households, 10 of which are female-headed (12%)	17 villages, 971 people, 180 households, 23 of which are female-headed (13%)	24 villages, 1,428 people, 261 households
Social services (Percentage of service availability)	Number of surveyed households: 56	Number of surveyed households: 179	
1. Agri. Extension	100%	100%	
2. Crop Marketing	4%	1%	
3. Education	73%	80%	
4. Health Service Center	48%	66%	
5. Domestic water supply	50%	27%	
Land title holders	0%	0%	

Source: The Survey Team, based on the Lusaka Province PACO (2017), *Field Report on Social Survey Conducted in her Royal Highness Chieftainess Shikabeta's Chiefdom*

6） Ecosystem and protected area

Shikabeta FB is located directly in the center of the Luano GMA, which has a total area of

8,930 km^2 (equivalent to 893,000 ha). The Luano GMA[42] is categorized as an International Union for Conservation of Nature (IUCN) Protected Area Category IV[43]: Habitat/Species Management Area. This type of area aims to protect particular species or habitats, and its management reflects this priority. However, in Zambia, GMAs are established as a buffer to avoid external impacts on National Parks in areas where economic activities, such as hunting, housing, and farming, are permitted under certain rules. The targeted National Park is Lower Zambezi National Park, which is categorized as an IUCN Protected Area Category II: National Park. This categorization aims to protect large-scale ecological processes along with the complementary species and ecosystems characteristic to the area, and it also provides a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities. The park is home to more than 60 species of mammals, more than 400 species of birds, and many other types of wildlife[44].

According to the DACO, some of the FB land is within the game animal corridor. Thus, very little agricultural activity can be undertaken unless the land-use policy is changed from a GMA to agriculture. The MOA had a discussion with the game management committee, and the process of changing the land-use policy has already started; it will be completed by November 2019.

If the Luano GMA is completely excluded from the protected area list, there is a concern that it will indirectly affect ecosystems, as its function as a buffer for the Lower Zambezi National Park will be partially lost. In addition, Sydney (2010) [45] reported that the Luano GMA is home to the famous but rare Zambian Parrots. Thus, Shikabeta FB's direct impact on the Luano GMA is also a major concern.

[42] Protected Planet, Luano GMA, https://www.protectedplanet.net/4095 (accessed on July 21, 2019)
[43] IUCN, Protected Area Categories, https://www.iucn.org/theme/protected-areas/about/protected-area-categories (accessed on July 21, 2019)
[44] Lower Zambezi.com, https://www.lowerzambezi.com/index.html (accessed on July 21, 2019)
[45] Sydney Tembo (2010), An Examination of the Residents' Perceptions of Impacts of Nature Based Tourism on Community Livelihoods and Conservation: Case Study of Chiawa Game Management Area, Zambia

9.6.9. Musokotwane FB

（1） Geographical information

Muskotowane FB has an area of 117,000 ha. It is located in the Kazungula District of Southern Province and is bordered by three countries, namely, Zimbabwe to the southeast, Botswana to the south, and Namibia to the southwest. The distance from Lusaka to Musokotwane FB is about 460 km (see Figure 9-37). The name of Musokotwane FB derives from that of Chief Musokotwane, who administers the surrendered area.

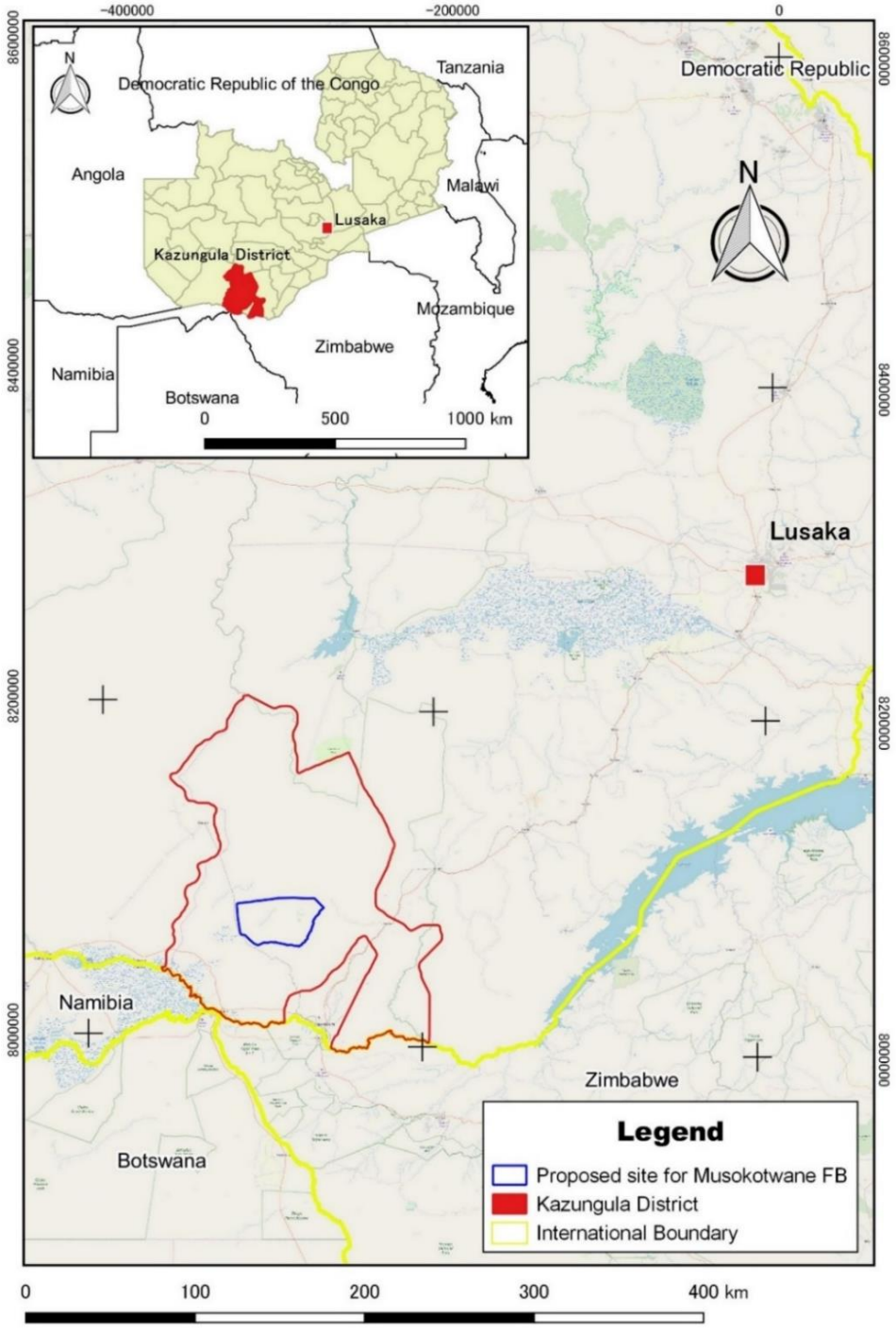


Figure 9-37: General layout of Musokotwane FB

Source: The Survey Team

(2) Background

The selection process for FB candidate sites in Southern Province commenced in 2007. The land administrated by Chief Nyawa was a top candidate for the FB because he had a positive opinion of FB development and because other candidate lands were considered unsuitable for agriculture owing to sandy soils or less feasible owing to succession disputes. However, in March 2010, other civil servants from the Office of the Vice President in Land Resettlement visited the chiefdom and collected GPS coordinates without the Chief's knowledge. After this event, the Chief realized that squatters needed to be removed from his chiefdom before starting any discussion about the FB development program and requested that Department of Agriculture remove them, but they explained that it was not their mandate.

Then, several meetings with Chief Musokotwane were held and, in 2012, Chief Musokotwane agreed to surrender 116,762 ha of his land for Musokotwane FB development.[46]

However, since then, there has been a budget shortage, and no specific survey has been conducted to formulate a concrete plan for FB development as of June 2019. The alienation of the land from customary to state land for the FB has not occurred[47], and it is not possible to begin FB development with the current land status.

(3) Basic agricultural information for Musokotwane FB

According to Nanyati Clinic in the FB, the population of Nanyati Catchment, which covers almost the same area as the FB covers, was 6,960 in 2018[48]. The population lives on agriculture, and the major agricultural products cultivated are maize, groundnuts, cotton, cowpeas, sorghum, and sunflowers. The LHO of the Southern Province mentioned that the FB's land is cracking clay vertisol, which is very fertile and highly productive soil. The livestock in Kazungula District includes 10,500 chickens, 4,850 cattle, 1,700 goats, 1,000 guinea fowls, 900 pigs, and 50 sheep. The area planted and the volume of production in Kazungula District are shown in Table 9-33.

[46] Musokotwane Royal Establishment (2012), Application for Land by the Ministry of Agriculture and Livestock for the Musokotwane Farm Block, dated June 19, 2012

[47] The PACO of the Southern Province submitted the site plan of the FB to the Kazungula District Council in 2012 to start the land alienation process, but the process has not made progress.

[48] According to the DACO, 6,000 households reside in the FB.

Table 9-33: Area planted and production of major crops in Kazungula District

Crop	2017		2018		2019	
	Area planted (Ha)	Production (ton)	Area planted (Ha)	Production (ton)	Area planted (Ha)	Production (ton)
Maize	45,835	83,331	30,536	34,181	34,196	5,405
Sorghum	2,851	1,628	1,357	674	3,168	53
Millet	349	165	684	359	25	–
Sunflower	2,397	1,121	3,638	1,581	2,878	77
Groundnut	9,030	3,823	4,245	1,546	6,305	980
Soyabean	80	67	1,109	484	595	–
Cotton	259	201	264	132	1,057	56
Mixed beans	249	116	195	56	90	–
Bambara nuts	38	17	243	211	633	24
Cowpeas	822	350	709	285	1,734	57
Sweet potatoes	616	3,052	914	2,507	45	–
Wheat	*	*	*	*	*	*

* Produced by large-scale commercial farm under irrigation BUT the ONLY large-scale farm available does not grow wheat anymore.
Source: Ministry of Agriculture & Central Statistical Office_Crop Forecast Survey

(4) Progress of infrastructure development

The current status of major infrastructure developed in Musokotwane FB is described in this section and in Figure 9-38.

1) Electricity

A 33 kV transmission line stretches to Kantumbi in the FB. According to ZESCO, electricity will be available once the transmission line between Smonga and Sekute has been rehabilitated. The electrification of facilities, including schools and rural health centers in the FB, is being implemented by the REA. The total budget is ZMK 1.9 million, and the project is expected to be completed by the middle of 2019.[49] However, according to the DACO, the rate of electrification progress throughout the FB will remain at around 15% even if this rural electrification project is completed.

2) Roads

Road access to the FB is not convenient. The trip from Livingstone to Kantumbi in the FB requires an approximately two-hour drive using M10 and R153. R153 is an unpaved and narrow road, and there are two drifts crossing two rivers. The volume of water that overflows the drifts during the rainy season is sometimes too high to cross the drifts. Another route from Livingstone to the FB utilizes T1, U4K, and U2. The width of U4K is around 5 m, and its condition is better than that of R153, but the trip takes about four hours. The RDA of Southern Province plans to propose incorporating the upgrading of R153 and U2 into the Road Sector Investment Program (2020-2030). The upgrade includes paving the road between Smonga and Nyawa and replacing the drifts with bridges.

3) Irrigation and dams

The average annual rainfall is 600 to 700 mm, meaning that irrigation is necessary for stable agricultural production throughout the year. However, irrigation has not yet been developed. The FB has a community earth pond, but it is used as a water source for livestock rather than as a source of irrigation

[49] The source is Rural Electrification Authority, Makunka Grid Extension Project Profile. It was not completed as of December 2019.

water. The two rivers flowing in the FB, the Ngwezi and Nanyati Rivers, can be tapped as a source of water for irrigation during the rainy season, but the rivers are seasonal rather than perennial. Groundwater is available, but its yield is as low as 1.5 to 2.5 liters/second. Thus, both rivers and groundwater should be tapped as water sources for irrigation in the FB. The Zambezi River is a large perennial river and is a reliable water source for irrigation, but the FB is 40 km away from the river.

4) Telecommunications

One telecommunications tower is located 17 km away from the FB, and no tower exists inside the FB. Thus, almost all the FB area is outside of the mobile phone network.

5) Airport

Livingstone International Airport is located in Livingstone, which is the nearest city from the FB and the largest city in Southern Province. It has many regular international flights, including 25 flights per week between Livingstone and South Africa and four flights per week between Livingstone and Kenya. These routes are serviced by passenger planes, but each aircraft has a small cargo space. There is no cold storage near the airport, but sufficient space is available on the premises. The airport has a 3,000-meter runway that enables large airplanes, including Boeing 767[50] cargo planes, to take off and land.

The trunk road (Livingstone-Kazungula Road) and its junction to Musokotwane FB. The FB is 60 km from this point.

Billboards about the rural electrification project and road improvement projects in the FB

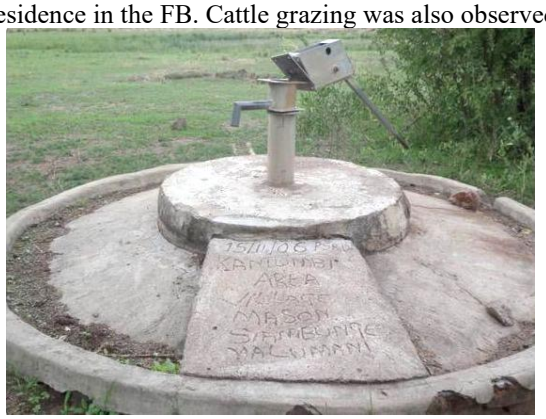
Drift on R153 to cross the Ngweze River

A farmer's current cultivation plots in the FB

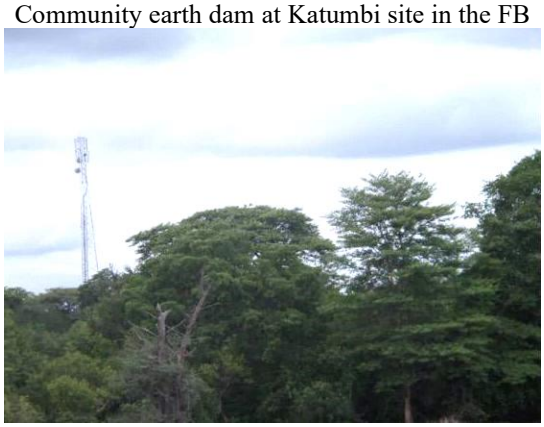
[50] This plane can carry 150 tons of cargo.

Residence in the FB. Cattle grazing was also observed.

Community earth dam at Katumbi site in the FB



Abandoned well with handpump at the Katumbi School



Communications tower at the Makunka site 17 km away from the FB

Access roads in the FB

Agricultural bulking center at Makunka site 17 km away from the FB. Neighbouring farmers bring their harvested crops to the center.

Figure 9-38: Progress of infrastructure development in Musokotwane FB

（5） Investment progress

Thus far, no agricultural investments have been made in the FB, including planning. In 2013, an Indian investor planned to develop a large-scale sugarcane plantation covering at least 10,000 ha of land in the FB, but the development process of the FB did not progress, so he abandoned his plan. In August 2019, Sable Transport, a Zambian company that manages Kafue Sugar, planned to develop a large-scale palm tree plantation and a processing factory covering at least 10,000 ha of land in the FB, but the Zambezi River was located too far away to use as a source of irrigation water, and the plan was abandoned.

According to the Chief, many officers from the Ministry of Finance, the MOA, and even a team of

Israelites have visited the FB, but no tangible investments or allocations of land to the people have resulted.

(6) Expected impacts of FB development

1) Land acquisition and resettlement

In Musokotwane FB, a fundamental policy of avoiding resettlement was not confirmed. The DACO reported that there are about 3,400 households in the FB, but the exact number is uncertain because a census survey has not been carried out. Chief Musokotwane shared his observation and concern that a number of squatters have been moving into the FB owing to inactivity in the FB. If development is further delayed, the issues of relocation and compensation for the permanent structures built will arise.

2) Impact on land and natural resource use

The degree of impact is unknown, as no socio-economic survey of the existing residents has been conducted, and no land-use and infrastructure development plans for the future FB have been created. Almost all of the FB residents are Tonga, who engage in settled agriculture and use non-timber forest products, such as mushrooms and caterpillars, to a limited extent.

3) Impact on the local economy, such as employment and livelihood

One feature of Musokotwane FB that it borders Namibia, Botswana, and Zimbabwe. If an environment that can meet the demands of these markets, especially irrigation facilities, electrical facilities, and access roads for producing and selling agricultural products, is established in the future, job creation and local economic development are expected to result.

9.6.10. Chikumbiro FB

(1) Geographical information

Chikumbiro FB is located in the Lundazi District of Eastern Province. The one-way trip from Lusaka to Lundazi city center via Chipata from Route T4 is 750 km (11 hours by car). Chikumbiro FB is located about 20 km from Lundazi center, and its total land area is 100,000 ha.

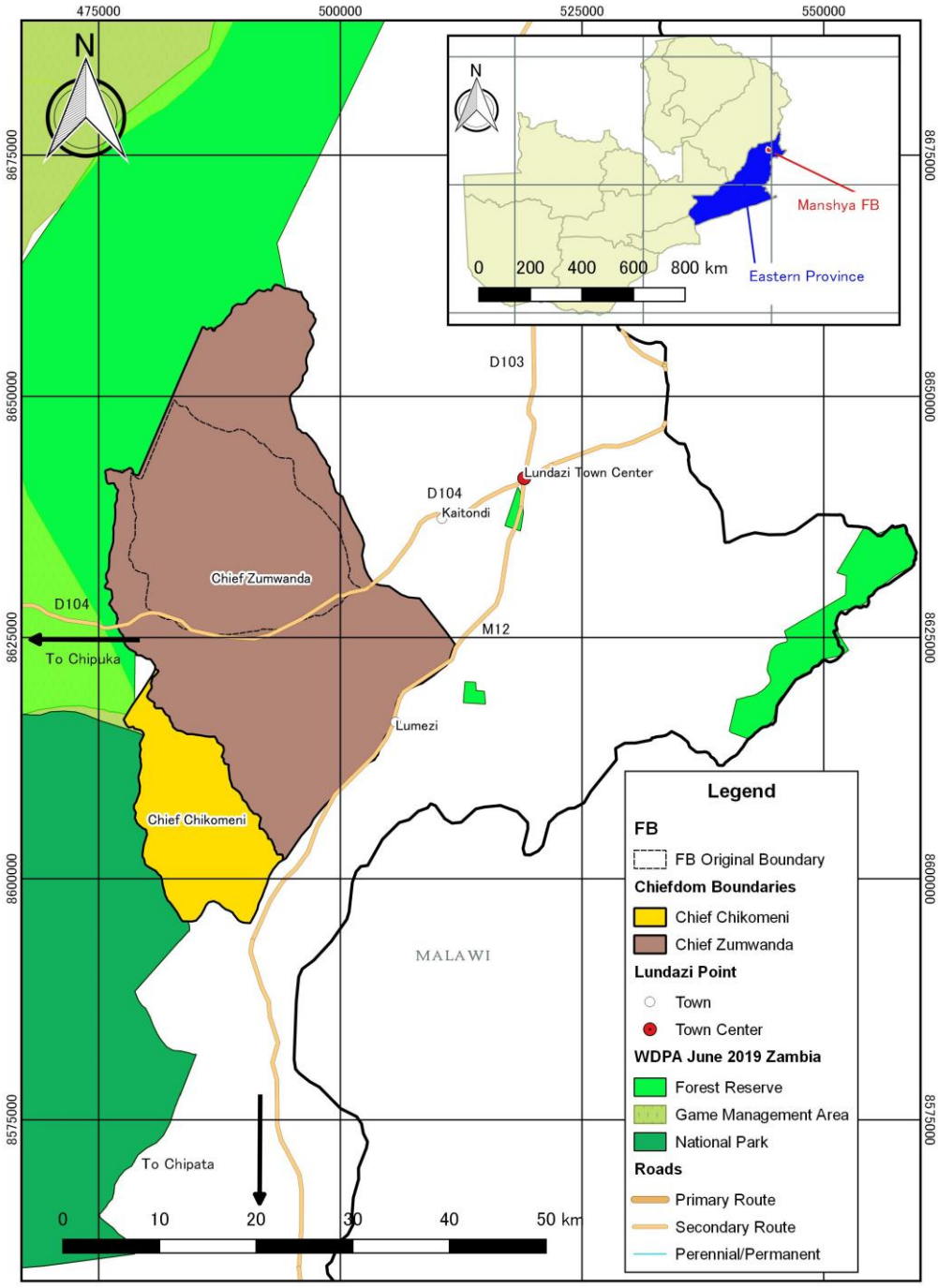


Figure 9-39: General layout of Chikumbiro FB

Source: Made by the Survey Team based on materials obtained from the PACO and the DACO

(2) Background

Chikumbiro FB comprises land owned by two chiefs who each oversee 54,000 ha and 46,000 ha of land. The land consists of four camps[51], namely, Kapongolo, Zimawanda, Chitala, and Nkhanga, in the Lundazi District of Eastern Province.

Chikumbiro FB was selected because (i) the land has good soil and is suitable for agricultural cultivation, (ii) it has few residents, and (iii) it has water access from rivers. Maize and cotton are the major products in the FB.

A feasibility study was conducted in 2009 upon the establishment of the FB. A soil sampling survey was conducted in 2011, and an environmental social survey was conducted for 54,000 ha of land in 2012. The development of Chikumbiro FB has not progressed since then. One traditional leader agreed to alienate his land area of 46,000 ha. However, he has also accepted immigrants from outside the FB owing to the delay in the FB's development. Thus, the population of Chikumbiro FB increased from 7,654 in 2009[52]. Given these circumstances, the PACO and the DACO recognize that FB development needs to move forward in the 54,000 ha section, where the surveys were already completed, to control the inflow of people. According to the DACO, 28 farmer groups, consisting of 2,215 male and female members, are present in the four camps.

Two FB management committees at the district government and community levels were formulated at the commencement of the FB. The related entities and ZESCO are listed as members of the district level committee, but only the names of these organizations are indicated in the district list, and the members may have changed. The committee at the field level consists of 22 members, but the member list is not available. The PACO and the DACO have not communicated with these FB management members since 2013 owing to a delay in development progress caused by the central government.

(3) Basic agricultural status in Chikumbiro FB

Table 9-34 indicates the estimated production area, average yield, and estimated production volume in three of the four camps in Chikumbiro FB. The MOA initially planned to have CVs for maize and cotton.

[51] The "Camp" is a smallest administrative segment below district.
[52] Source: Socio-economic Survey Report on Chikumbiro Farm Block in Lundazi District, Ministry of Agriculture and Cooperatives, 2009

Table 9-34: Estimated production area, average crop units, and estimated production in Chikumbiro FB in 2007–2008

Camp	Kapongolo			Zumwanda			Chitala		
Crop	ha	Average unit crop	Estimated production	ha	Average unit crop	Estimated production	ha	Average unit crop	Estimated production
Maize	1,908	40 x 50kg	76320 x 50kg	3,870	40 x 50kg	1,588,000 x 50kg	1,095	40 x 50kg	43,800 x 50kg
Soybeans	84	18 x50kg	1512 x 50kg	102	18 x 50kg	1,836	58	18 x 50kg	1,044 x 50kg
Groundnuts	120	15 x 45kg	1800 x 45kg	260	15 x 45kg	3,900 x 45kg	696	15 x 45kg	10,440 x 45kg
Beans	23	8 x 50kg	184 x 50kg	360	8x 50kg	2,880 x 50kg	26	8 x 50kg	208 x 50kg
Sunflower	256	16 x 20kg	4096 x 20kg	300	16 x 20kg	4,800 x 50kg	96	16 x 20kg	1,536 x 20kg
paddy	7	70 x 50kg	70 x 50kg	10	10 x 50	100 x 50kg	7	10 x 50kg	70 x 50kg
Finger millet	5	120 x 50kg	120 x 50kg	---	8x50kg	-	132	8 x 50kg	1,056 x 50kg
cotton	70	350 000kg	350 000kg	1,200	500kg	700,000kg	435	500kg	7,500kg
tabako	31	21700kg	21700kg	25	700kg	17,500kg	27	700kg	18,900kg
cassaba	20	40 ton	40 ton	16	2 tons	32 tons	40	2 tons	80 tons
sweet poteto	25	50 ton	50 ton	40	2 tons	80 tons	85	2 tons	170 tons

Source: The PACO of Eastern Province

According to farmers in the FB, the potential for agriculture in the FB is as follows.

- The soil quality of the existing land is better than average and is stable.
- There are scattered ponds from which water is available for agriculture.
- Extension services are provided by DACO extension officers.
- Farmers are eligible to buy agricultural inputs equivalent to a total of ZMK 2,000 by receiving ZMK 400 from farmers' cooperatives and ZMK 1,600 from the government through the E-voucher system.
- Farmers cultivate sunflowers, cotton, groundnuts, maize, sorghum, soybeans, and horticultural crops (e.g., tomatoes, onions, cabbage, and oranges) as their commercial base. All of these crops are produced at good volumes.

Farmers indicated their expectations for FB development in the Survey and expressed that they are able to meet the crop demands of a CV.

Cotton is one of the major crops in Eastern Province. The Survey identified eight cotton-related companies, including NWK (South Africa), Pawaopgate (India), Highland (India), and Mt. Meru (South Africa), that have been doing business in Eastern Province. Among them, NWK is the largest cotton-processing company, with 58,667 out-growers. These companies mainly export their products to China.

NWK owns a processing plant near Lundazi (outside of Chikumbiro FB) and processes cotton cultivated by its out-growers (around 1 ha per grower). It buys the cotton at ZMK 3.2–3.8/kg, which is not an attractive price for farmers. The price has dropped as low as ZMK 1/kg in 2018. The PACO and the DACO expect that a CV will participate in the FB and support cotton production with stable prices and higher productivity.

According to an extension officer at the District Agricultural Coordination Office, farmers

have shifted their cultivation from cotton to soybeans owing to the unfavorable price of cotton. Figure 9-40 indicates that the production of soybeans is not stable.

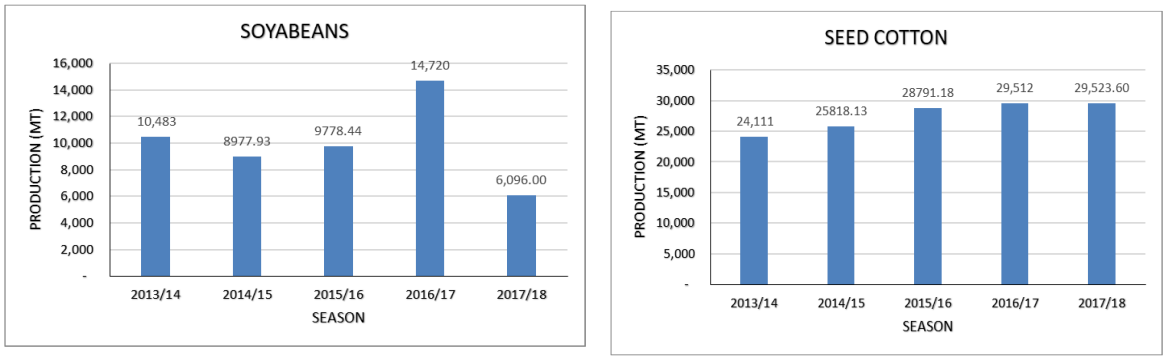


Figure 9-40: Soybeans and seed cotton in Lundazi District

Source: The DACO of Lundazi District

(4) Progress of infrastructure development

The FB is 20 minutes by vehicle from the nearest city, Lundazi, in Lundazi District. Because the road to the FB is unpaved, as shown in Figure 9-41, it is necessary to take a detour to reach the FB during the rainy season.

The Survey Team identified one elementary school and one health center, and the road network is not developed. For telecommunications, mobile phones are used in the FB. As of June 2019, Chikumbiro FB has no electrification. In Lundazi city, electricity is available from Malawi, a neighboring country. If electricity is not procured from Malawi, blackouts occur in Lundazi. ZESCO plans to extend the national grid from Chipata, capital of Eastern province, to Chama in Muchinga province via Lundazi City[53].

Farmers in Chikumbiro FB depend on rainfall. Plans have been made to construct three dams for irrigation, but none has been realized yet.

Unpaved road to Chikumbiro FB.

Agriculture input dealer in Chikumbiro FB

Farmers point out that not only farmland but also living conditions should be secured if they are relocated

[53] Interview with ZESCO.

Elementary school in the FB

Open market in the FB
Daily commodities, vegetables, and meat are available

Banana plantation in the FB

Groundnuts are sold in the FB market

Solar panel on the roof of the meeting place in the FB.
Farmers use electricity to charge their mobile phones.

Maize collection point near the FB

Figure 9-41: Infrastructure and market in Chikumbiro FB

(5) Investment progress

No company has invested at in Chikumbiro FB at this time. Out-growers of NWK, the largest cotton processing company in Zambia, cultivate cotton in Chikumbiro FB. The staff of NWK who were interviewed were positive about becoming an CV, as development progress in the FB would benefit the company.[54]

(6) Expected impacts of FB development

1) Land acquisition and resettlement

Farmers in Chikumbiro FB have the flexibility to change their cultivation depending on the demand of a CV. They do not oppose relocation into or out of the FB. They told the Survey Team that living conditions, such as the availability of schools and health centers should be secured if they are relocated,

The interviewed farmers who are located outside of Chikumbiro FB (the target farmers of JICA's technical cooperation project) expressed a low probability of relocating into the FB. They also expressed positive opinions about producing the crops demanded by the CV as out-growers with agreeable conditions.

[54] However, investment in the FB is determined by the head office of Lusaka.

2) Impact of land use and the utilization of local resources

No impact identified owing to a lack of information about the plan and its present status.

3) Impact to the social economy such as employment and livelihood

Direct employment and contract farming are expected to increase. The increased income of residents inside and outside of the FB is expected to boost the regional economy. As indicated in Figure 9-41, for example, an open market is periodically held in the FB. FB development can attract buyers and sellers to this market.

9.7. FB Development by Other DPs

The following are the assistance projects and programs of other DPs and their views on FBs.

（1） AfDB

1） Current state of Luswishi FB development project (since January 2019)

AfDB has planned to invest in Luswishi FB. The FS review was approved internally in 2018, but the loan has not yet been approved because the liabilities of the Zambian government have become too large. Thus, the original plan (115 million USD for a loan to the Zambian government and 105 million dollars for a loan to the private sector) was transformed into providing 90% of the total amount as a loan to the private sector of and 10% of the total amount as a grant to the Zambian government. In the modified plan, 90% of the original plan is divided into four investment packages with PPPs: 1. transmission lines and electrical grids, 2. toll roads, 3. an irrigation facility at a scale of 1,000 ha for small-scale farmers, and 4. the Staple Crop Processing Zone (SCPZ) project.

The SCPZ project shown in Figure 9-42 consists of four components. First, an “agro-processing hub” (50–100 ha) will be installed within the FB. An agricultural processing complex will be subdivided within the FB (1-ha per plot), and social infrastructure will also be developed. Second, five agro-transformation centers will be placed around the agro-processing hub within the FB. At these centers, the private sector is expected to establish facilities for purchasing and selling collected agricultural products and shops selling agricultural inputs. Third, hubs for collecting agricultural produce will be developed in the areas surrounding the agro-transformation centers within the FB through private investment. At these hubs, agricultural produce will be collected from the surrounding farmers, including those located outside the FB. Fourth, smallholder farmers within and outside the FB will be encouraged to utilize these facilities. Although the key concept of FB development is to bring in a CV and develop the FB around the CV, the SCPZ aims to increase the production of crops and processed products

through investments by a diverse set of companies. The production and processing of soybeans as feed, as well as staple crops, including mangos, avocados, peanuts, and honey, are all being considered, and hybrid poultry farming at the scale of one million chicks per year is also expected, but aquaculture is not being considered.

(2) DFID

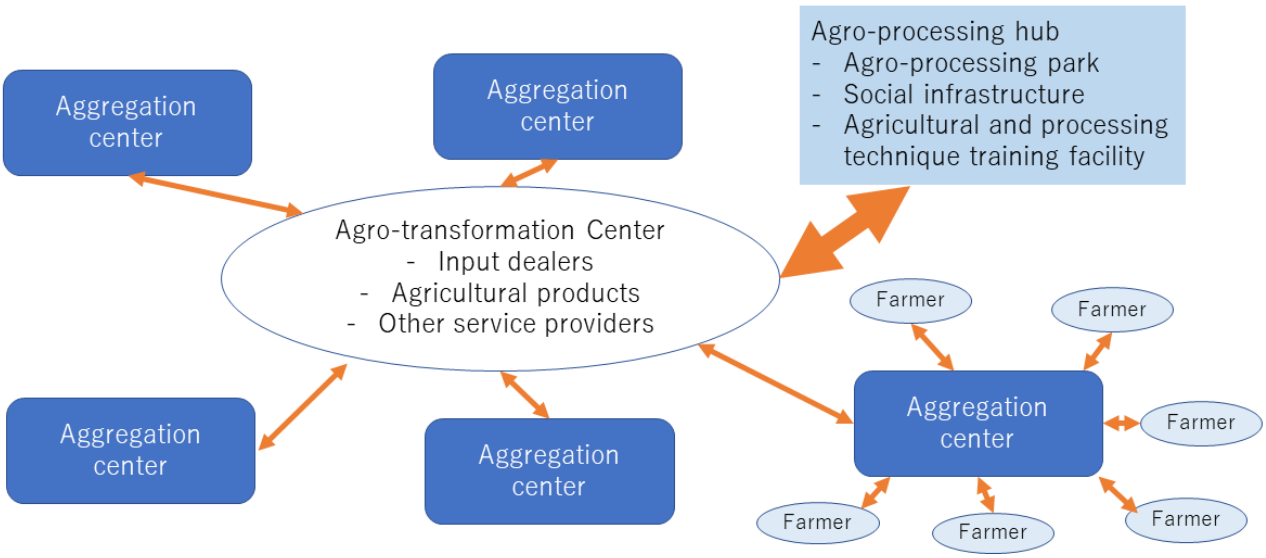


Figure 9-42: Project overview for the Staple Crop Processing Zone (SCPZ)

Source: Developed by the Survey Team based on an interview with the AfDB

The DFID is not involved in FB development. The DFID believes that it is unclear whether the Zambian government sufficiently considered the market and the means of approaching it when it creating the FBs. The DFID observes that no significant progress toward the future development of FBs is expected. The DFID also believes that the government's export policies should be implemented based on a long-term strategy because sudden embargos on exports by the government are a risk for farmers who produce and sell export-oriented agricultural products to CVs.

(3) IFAD

IFAD is not involved in FB development. According to IFAD, it is unclear whether FBs are designed so that smallholder farmers, who are designated as out-growers in FBs, can benefit.

(4) EU

The EU has no information on FBs. If JICA supports FB development, the EU may be able to collaborate with JICA if the target FBs and the areas supported by EU programs overlap.

（5） USAID

Since 2018, USAID has been running the Tenure and Global Climate Change Project (TGCCP), which aims to preserve land ownership. Under the TGCCP, target settlements are selected, landowners are identified, and certificates are issued. Through this process, the project aims to promote stable land use and investments. The project activity steps are: 1. the consent of the Chief and briefings with residents; 2. the development of organizations, such as a village land committee; 3. the development of a resource map; 4. the division of land; 5. the completion of plotting land; and 6. the creation of an organization in charge of updating plots and map ledgers. Thus far, activities have been implemented for 500 settlements, 15,000 land plots, and 30,000 individuals.

According to USAID, Zambian land can generally be divided into customary (approximately 70%) and state-owned land (approximately 30%). The former type is land used for individuals' livelihoods, and the owners can build dwellings or practice agriculture. Ownership of this land is granted by a Chief at no cost, but the land cannot generally be bought or sold. The latter type is land for industry, and it is also ceded by a Chief to an individual in areas up to 250 ha for free. However, it cannot be reverted to customary land even if it is not used for its intended purpose. This policy is the reason that the area customary land, which accounted for 94% of Zambia's land at the time of its independence, has decreased over time. Note that the Ministry of Lands and Natural Resources is not involved because land certificates under the TGCCP are issued for customary land.

USAID is aware of FBs, but does not have any detailed information.

9.8. Conclusions

The Conclusions of the FB Survey are as follows:

(1) General conclusions

- The Survey visited all ten FBs in ten provinces in June 2019 and obtained general information, including geographical information and land areas, administrative information, development progress, available drawings and plans, investment progress by companies or individuals, current infrastructure conditions, and so on in the FBs.

- A short description of FB development progress is summarized in Appendix 3, "Farm Block Inventory Sheet".

- A common challenge that all FBs struggle with is infrastructure development, especially trunk roads to reach the FBs, access roads in the FBs, electricity facilities, communication facilities, and irrigation facilities.

- The expected positive impacts of FB development are the creation of employment opportunities; the improvement of beneficiaries' incomes; the realization of effective and efficient farming through the usage and acquisition of improved technology and machinery; improved access to social infrastructure, including the shortening of travel times to schools and health centers; access to a stable market; better living standards; local economic growth; and the effective use of local natural resources.

- The expected negative impacts of FB development are land acquisition and resettlement, the loss of cultivation lands that are main source of people's livelihoods, accidents and diseases due to inadequate working conditions, decreased intake of valuable forest resources (e.g., fish, caterpillars, mushrooms, honey, etc.), local conflicts of interests, and the loss of biodiversity.

(2) Particular conclusions

- Only Luena FB has core investors. Although Kalungwishi FB does not yet have core investors, the process of allocating land to two candidate companies is in progress. A proposal has been made to the MOA regarding the placement of multiple 10,000 ha core investors in one FB.

- Regardless of the approval status and contents, the FBs where an SEA, EIA, or Environmental and Social Management Framework has been implemented for the entire FB area are Nansanga, Luena, Luswishi, Kalungwishi, and Chikumbiro FBs.

- No FBs have prepared an RAP framework for entire FB. RAP studies in some specific blocks have been implemented and are underway in Luswishi FB and Nansanga FB, respectively.

- Bridge construction on the Manshya and Lwangwa Rivers, which are the natural boundaries of Manshya and Kalungwishi FBs, is essential infrastructure for both FBs to promote commercial

activities.

(3) Evaluation of the FBs

In preparation for evaluating the FBs, the Survey Team categorized the ten FBs according to four levels of development progress, as shown in Table 9-35. The categorization was carried out based on FB development progress, namely, i) alienation of land for the FB, ii) plotting of the FB, and iii) investments by companies.

Table 9-35: Development progress of the FBs in Zambia

Development progress	Alienation of land for the FB	Plotting the FB	Company investments	FBs
Development progress level 1	✔	✔	✔	Luswishi FB, Copperbelt Province Luena FB, Luapula Province Nansanga FB, Central Province Kalungwishi FB, Northern Province
Development progress level 2	✔	×	✔	Solwezi FB, Northwest Province Manshya FB, Muchinga Province Shikabeta FB, Lusaka Province
Development progress level 3	✔	×	×	Musokotwane FB, Southern Province Chikumbilo FB, Eastern Province
Development progress level 4	×	×	×	Kalumuwange FB, Western Province

Source: The Survey Team

Next, the Survey Team evaluated the ten FBs according to the criteria summarized in Table 9-36.

Table 9-36: Evaluation criteria of the FBs in Zambia

Category	Sub-category
● Development potential	● Company investments ● Agricultural potential ● Access to markets
● Infrastructure	
● Land status	
● Environmental and social considerations	● Resettlement ● Impact on the natural environment
● Appropriateness for Japan's official development assistance	

Source: The Survey Team

Table 9-37 shows the results of the FB evaluation. Luswishi and Luena FBs have the highest total score, and both of them have the best development potential scores. Moreover, neither of them has an extremely low score for any criterion except for the resettlement risk of Luena FB because the residents engage in a form of slash-and-burn agriculture called *chitemene*. After the top two FBs, Solwezi FB has the third-highest evaluation score. This FB achieves the second-highest score in development progress and has no extremely low score for any criterion. Nansanga and Manshya FBs achieve the fourth-highest

score. Nansanga FB's evaluation is low for company investments, but it has high development potential. Although Manshya FB attracted many investment plans, its high resettlement risk lowers its score.

The FBs with low scores are Kalungwishi, Musokotwane, and Kalumuwange FBs. Several weaknesses cause each FB's low score. In Kalungwishi FB, the infrastructure is poorly developed, and the development of the whole FB is led by a Chinese company[55], resulting in low appropriateness for Japan's official development assistance. No company investments are planned in Musokotwane FB, and its agricultural potential is also low. In Kalumuwange FB, the land alienation process is not completed.

[55] An EIA (not approved) was prepared by the company.

Table 9-37: Results of the FB evaluation

Category	FB and Province	Development potential			Infrastructure	Land status	Environment and social consideration		Appropriateness for Japan's official development assistance	Total score	Total score excluding the score of Companies' investment
		Company investments	Agricultural potential	Access to markets			Resettlement	Impact on natural environment			
Development progress 1： ・Land alienation: done ・Land demarcation：done ・Investments (including plan) by commercial farmers/core ventures：at least 1	Luswishi FB Copperbelt Province	4	5	5	2	5	3	2	2	28	24
	Luena FB Luapula Province	5	5	4	3	5	1	2	3	28	23
	Nansanga FB Central Province	2	4	4	2	5	2	2	2	23	21
	Kalungwishi FB Northern Province	2	4	2	1	5	1	2	1	18	16
Development progress 2： ・Land alienation: done ・Land demarcation：not yet ・Investments (including plan) by commercial farmers/core ventures：at least 1	Solwezi FB Northwest Province	4	5	4	1	4	3	2	2	25	21
	Manshya FB Muchinga Province	4	4	3	1	5	1	2	3	23	19
	Shikabeta FB Lusaka Province	1	3	5	2	5	2	1	3	22	21
Development progress 3： ・Land alienation: done ・Land demarcation：not yet ・Investments (including plan) by commercial farmers/core ventures：at least 1	Musokotwane FB Southern Province	1	1	4	2	2	3	2	3	18	17
	Chikumbilo FB Eastern Province	1	5	2	1	5	1	2	3	20	19
Development progress 4： ・Land alienation: not yet	Kalumuwange FB Western Province	1	3	3	1	1	3	1	3	16	15
	Rating	Hight：5, Relatively high：4, Moderate：3, Relatively low：2, Low：1									

Source: The Survey Team

9.9. Recommendations

The recommendations of the FB Survey are as follows:

- When conducting a socio-economic survey of the existing residents in the planning stage of a future FB development project, it is necessary to carefully investigate not only the agricultural incomes of the households but also other income sources, such as forest (woodlands) resources, so as not to lose valuable nutrient sources and means of existing residents' livelihoods through the implementation of FB development. At the same time, to avoid and minimize the negative effects of disorderly resource deprivation and overharvesting, it is recommended to include the perspective of sustainable natural resource management in the FB development plan.

- Infrastructure development, such as roads, telecommunications and irrigation facilities, is an urgent issue, and support is highly in demand. When carrying out future FB development projects, engineers with rich experience in the African region must be secured according to the type of infrastructure to be developed (e.g., electric engineers, road engineers, irrigation engineers, etc.).

- To avoid or minimize adverse impacts on the natural and social environment caused by the implementation of FB development projects, it is recommended that the project team work with its the Zambian counterparts to prepare an appropriate framework for an EIA and RAP to be applied for the entire FB development. It should also help to prepare environmental and social guidelines for individual investors and monitor compliance.

- If the National Land Policy currently under review is formally formulated, obtaining approval for the ESIA prior to commencing a project will be one of the conditions for allocating lands for large-scale investment projects. As various legal frameworks are in progress, it will be necessary to formulate an appropriate project implementation plan based on the latest policy and legal frameworks when carrying out a project.

- Referring to the implementation structure planned in the Kalunguwishi FB, it is recommended to establish an operation and management body when implementing an FB development project to enable sustainable and effective use of infrastructure facilities and land to be developed in the future.

Appendices

Appendices

Appendix 1 Major nutrition-related indicators for sub-Saharan Africa

Region	Country	Prevalence of stunting under five years old (%, 2017)	Prevalence of wasting (2017)	Prevalence of anemia among women of reproductive age (%, 2016)	Prevalence of undernourishment (%, 2014–16 average)
West Africa	Ghana	18.8	4.7	46.4	6.3
	Cabo Verde	N/A	6.9	33.3	12.7
	Gambia	24.6	11.0	57.5	9.8
	Guinea	32.4	8.1	50.6	18.5
	Guinea-Bissau	27.6	6.0	43.8	26.1
	Côte d'Ivoire	21.6	6.1	52.9	21.1
	Sierra Leone	37.8	9.5	48.0	25.7
	Senegal	16.5	9.0	49.9	11.7
	Togo	27.6	6.6	48.9	16.2
	Nigeria	43.6	10.8	49.8	9.0
	Niger	40.6	10.1	49.5	12.3
	Burkina Faso	21.1	8.6	49.6	20.8
	Benin	32.2	5.0	46.9	9.9
	Mali	30.4	13.5	51.3	5.9
	Mauritania	27.9	14.8	37.2	9.4
	Liberia	32.1	5.6	34.7	38.4
Central Africa	Gabon	17.0	3.4	59.1	9.1
	Cameroon	31.7	5.2	41.4	6.5
	Republic of the Congo	21.2	8.2	51.9	37.7
	Democratic Republic of the Congo	42.7	8.1	41.0	N/A
	Sao Tome and Principe	17.2	4.0	46.1	9.8
	Chad	39.8	13.3	47.7	38.4
	Burundi	55.9	5.1	26.7	N/A
	Equatorial Guinea	N/A	3.1	43.7	N/A
	Central African Republic	39.6	7.6	46.0	60.3
East Africa	Uganda	28.9	3.5	28.5	38.6
	Ethiopia	38.4	10.0	23.4	22.8
	Eritrea	N/A	15.3	38.1	N/A
	Kenya	26.2	4.2	27.2	22.5
	Comoros	31.1	11.3	29.3	N/A
	Djibouti	33.5	21.6	32.7	19.4
	Sudan	38.2	16.8	30.7	25.1
	Seychelles	7.9	4.3	22.3	N/A
	Somalia	N/A	15.0	44.4	N/A
	Tanzania	34.5	4.5	37.2	32.1
	Madagascar	48.9	7.9	36.8	41.1
	Mauritius	N/A	15.7	25.1	5.6
	Rwanda	75.1	2.0	22.3	34.0
	South Sudan	N/A	24.3	34	N/A
South Africa	Angola	37.6	4.9	47.7	24.8
	Zambia	40.0	6.2	33.7	44.4
	Zimbabwe	27.1	3.3	28.8	48.2
	Swaziland	25.5	2.0	27.2	21.0

	Namibia	22.7	7.1	N/A	26.1
	Botswana	N/A	7.2	30.2	26.8
	Malawi	37.4	2.8	34.4	24.5
	Mozambique	N/A	6.1	51	30.4
	Lesotho	33.4	2.8	27.4	12.9
	South Africa	27.4	2.5	25.8	5.8
North Africa	Algeria	11.7	4.1	34.9	4.7
	Egypt	22.3	9.5	28.5	4.8
	Tunisia	10.1	3.3	30.2	4.9
	Morocco	N/A	2.3	36	3.9
	Libya	N/A	6.5	31.7	N/A

Source: The Survey Team, based on FAOSTAT.

Appendix 2 Selection of target FBs for the second field survey of FBs

1. Selection of target FBs for the second field survey of FBs

The Survey Team conducted a second field survey of the FBs to collect basic information so that players in the public and private sectors could consider the FBs as targets for development investments in the future. The Survey Team selected the target FBs for the second field survey based on information collected during the first field survey of the FBs using the following process. The Survey Team first excluded three FBs for several reasons, then divided the remaining FBs into two groups according to the degree of progress of companies' investments, and finally chose a few FBs from each group.

2. Exclusion of FBs

(1) Environmental and social considerations

The Survey Team excluded the following FBs because they were assessed as being high risk from the perspective of environmental and social considerations.

- Shikabeta FB (Lusaka Province): This FB is located inside a Game Management Area (GMA).
- Luena FB (Luapula Province): The majority of residents in this FB are the Bemba, who traditionally make a living from slash-and-burn agriculture. They carry out their farming, including burn agriculture, outside of the buffer zone. The Zambian government states that farmers will not be compensated for loss of livelihood relying on burn farming, even if it is lost owing to development activities, because burn agriculture is illegal. Based on this standpoint of the Zambian government, separating the FB with the buffer zone may increase the risk of conflict between residents and commercial farmers in the FB. The relatively large population within the FB is also a risk factor. However, when the number of residents who conduct burn agriculture is low, the risk of conflict in this FB can be assessed as low.

(2) Appropriateness as a target for Japan's official development assistance (ODA)

The following FBs are excluded based on their appropriateness as a target for Japan's ODA.

- Kalungwishi FB (Northern Province): The China Railways Seventh Group conducted a feasibility study on development in Kalungwishi FB in 2017. The group has already signed a memorandum of understanding with the MOA and has been raising funds for infrastructure development in the FB (e.g., it plans to borrow USD 394 million from the China Export-Import Bank). An F/S has already been implemented, and there is a plan to promote infrastructure development led by China, which reduces the appropriateness of selecting this FB as a target for Japan's ODA.

3. Prioritized FBs

(1) Selection process

The Survey Team chose candidate FBs from two FB categories: i) FBs in which some private companies have planned investments and ii) FBs in which no private companies have planned investments. The former category is given higher priority, and, thus, four FBs in this category were selected as target FBs for the second field survey. Two FBs in the latter category were also chosen.

① FBs in which private companies have planned investments

Investments by private companies are expected in some FBs, and, thus, FB development can be carried out in collaboration with these companies. The FB development assistance will mainly address the later stages of FB development planning. Specifically, Luswishi FB, Manshya FB, Solwezi FB, and Nansanga FB fall into this category, and all of them were selected as survey targets.

② FBs in which no private companies have planned investments

In some FBs, no or almost no investment plans have been presented by any private companies. For FBs without any investment plans, FB development can be planned from scratch in collaboration with the Zambian government. The FB development assistance will mainly address the initial stages of FB development planning. Kalumuwange FB, Musokotwane FB, and Chikumbiro FB fall into this category, and Kalumuwange FB and Musokotwane FB were chosen as the targets for the second field survey. The reason for selecting these two FBs is that the information previously gathered on them is not sufficient, as they were surveyed only by local assistants.

4. Selection results

- FBs in which private companies have planned investments: Luswishi FB (Copperbelt Province), Solwezi FB (Northeast Province), Manshya FB (Muchinga Province), and Nansanga FB (Central Province).
- FBs in which no private companies have planned investments: Kalumuwange FB (Western Province) and Musokotwane FB (Southern Province).

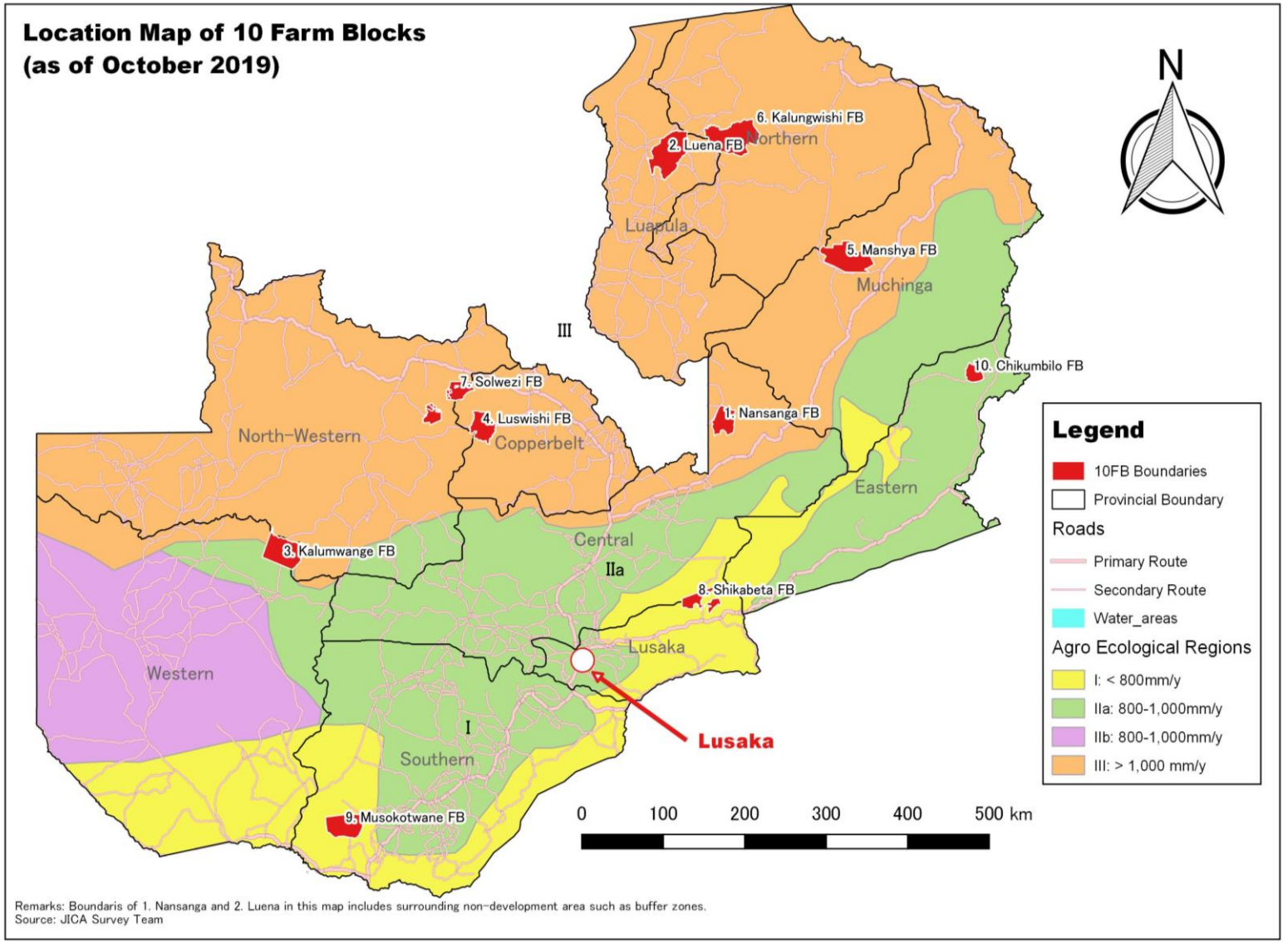
Appendix 3

Farm Block Inventory Sheet

March 2020

FARM BLOCK INVENTORY SHEET

Table of Contents



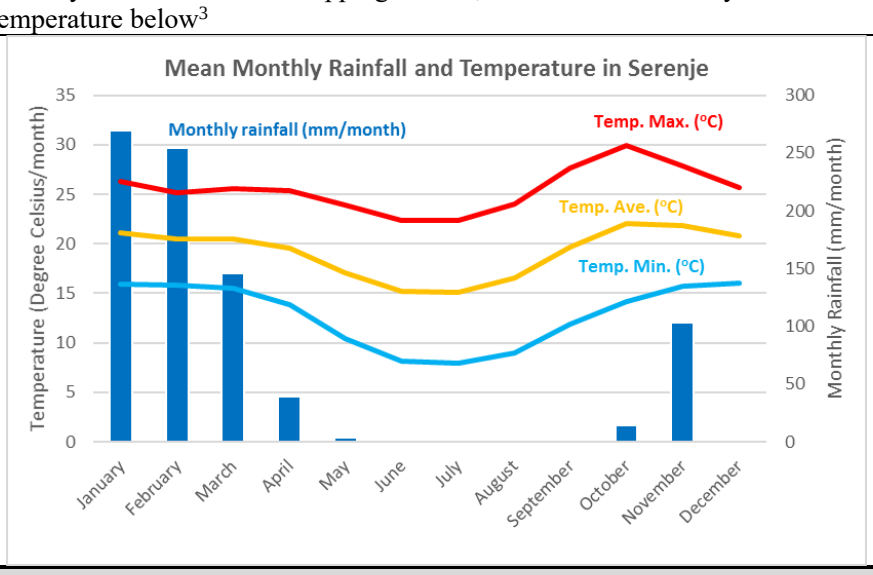
Location Map of the 10 Farm Blocks

1. General Information

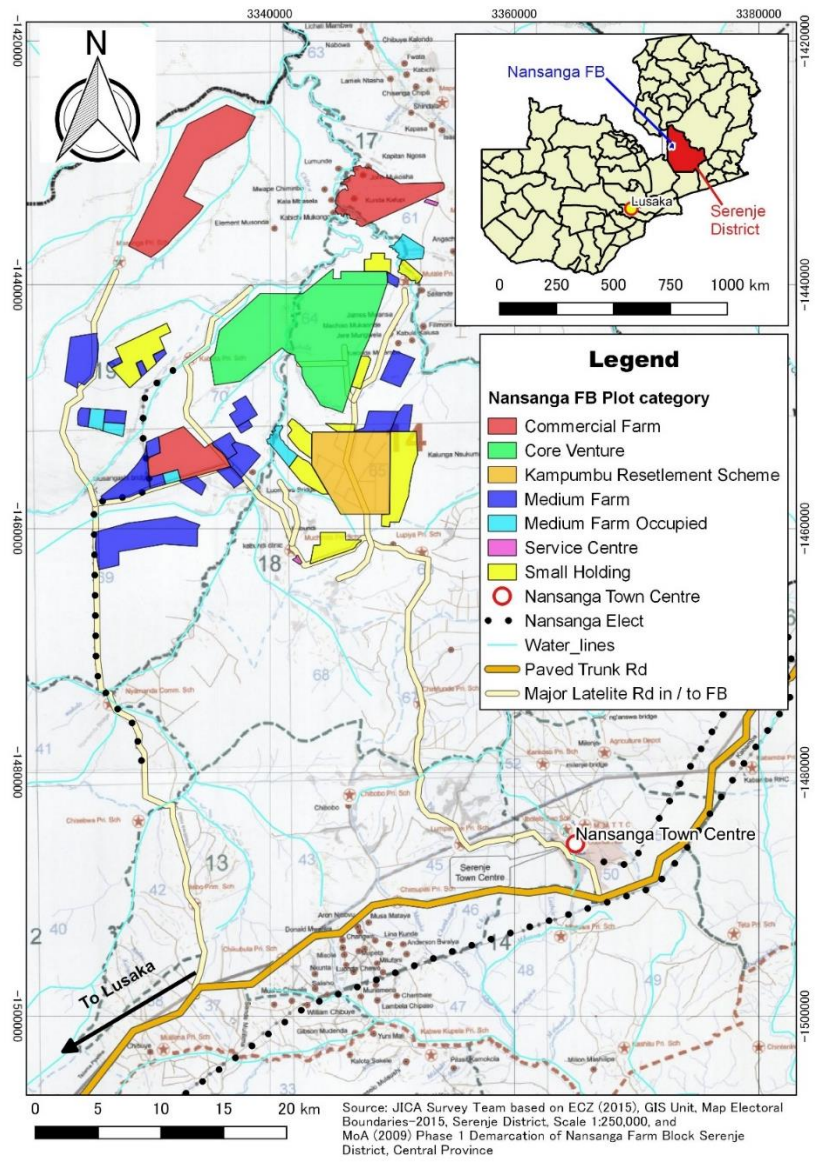
Province name and its population[1]	Central (1.4 Million in 2011 and 1.7 Million in 2020)
District name and its population	Serenje (172,569 in 2011 and 214,487 in 2020)
Latitude	S. 12° 42' ~ S. 13° 02' (WGS84)
Elevation (m.a.s.l)	1,200 m ~ 1,3000 m
FB Area	133,000 ha
FB year established	2003
Contact person	Province: Dr. Adreen Nansungwe, PACO, adreennansungwe@yahoo.com +260977361386 / 955361386 District: Mr. Jacob M. Shawa, DACO, jmshawa@yahoo.co.uk, +260966324085
Accessibility	500 km from Lusaka (430km: Lusaka to Sereneje: Paved road with 6hrs by car, 60km: Serenje to the FB: unpaved road with 1.5hours by car)

2. Natural Environment

Agro-climate zone[2] : III: More than 1,000mm of mean annual rainfall with 140-200 days of the rain-fed cropping season, and a mean monthly rainfall and temperature below[3]



Layout Map 1 General Location Map of Nansanga FB



3. Basic Agricultural Information

Potential products:	Maize, Beans, Soybean, Tabaco, Cassava, Wheat		
Total arable land area (ha)	120,000	Current cultivation area (ha)	10,000
Potential irrigation area (ha)	10,000	Current irrigation area (ha)	10
Soybean cultivation area (ha)	N/A	Poultry farming area (ha)	N/A
Fish cultivation area (ha)	N/A	Number of existing cooperatives	N/A

Core investors (10,000ha scale)	Existing Number: 0	Planned Number: N/A	Major products: -
Commercial farmer (1,000-5,000ha)	Existing Number: 1	Planned Number: 2	Major products: Maize, Soybean, Wheat, Timber
Medium scale farmer (100-1,000ha)	Existing Number: 47	Planned Number: N/A	Major products: N/A
Small farmer (0-100 ha)	Existing Number: 300	Planned Number: N/A	Major products: N/A

4. Infrastructure Development

Item	Current situation and problems/issues	Rate
Electricity	33kV with 103km & 11kV with 66km of electricity lines are installed. However, electricity coverage in the FB is insufficient due to a lack of finance.	★★☆☆☆ Poor
Internet access & communication coverage	Very poor. Both telephone communication and the internet are not accessible in a large part of FB.	★☆☆☆☆ Very poor
Irrigation infrastructure	9 Center pivots for correctional services are installed. All 3 irrigation dams are located outside of Nansanga FB but need rehabilitation.	★★☆☆☆ Poor
Access Rd in FB	Laterite roads with 100 km are constructed and the roads, roadside grass and box culverts are well maintained. However, some parts of roads are inaccessible in the rainy season. A small bridge (L=15m, W=2.5m approx.) seriously damaged and needs rehabilitation.	★★★☆☆ Fair
Trunk road to FB	It takes 1.5 hours from paved T2 road to Core Venture Farm in Nansanga FB by 4 x 4 vehicle in the dry season. Although there are several potholes on the pavement, the trunk road is in good condition. Weed along the roadside is also well managed by road authority as well as district.	★★★★☆ Very Good
Others if any (education, health facilities, etc.)	Existing rural health centers (RHC), primary schools, depots, etc. are about 10 to 30km away from the existing community in the Core Venture Farm plot.	★★☆☆☆ Poor

5. Profiles of Existing Projects in FB

Project Name	Proponent & Fund	Project Outline (Product, By-product, Market, Project scale, Area in ha)	Total number of Beneficial Farmers or Households and their relationships	Total number of affected farmers or Households	Land Disputes (yes/no)	Status of RAP	Remarks, Observations
Zambia Correctional Services	Maize, Soybean, and Wheat (GRZ)	Domestic market	N/A	N/A	No	Not clarified by ZEMA	—

[1] Central Statistical Office (2013) *2010 Census of Population and Housing, Population and Demographic Projections 2011- 2035*
[2] The Zambia Soil Health Consortium (n.d.) *Integrated Soil Fertility Management in Zambia*
[3] Climate-DATA. ORG https://en.climate-data.org/ (Accessed on June 24, 2019)

6. Agri-Business Potential

Product	Input & Production	Distribution & Processing	Sales & Consumption	Rate
Soybean	Input accessibility is not well developed, while the area is highly suitable for soybean production	The road condition is one of issues for soybean transportation. Soybean processing is not conducted in this area.	Market access is not convenient for farmers while there are plenty of soybean buyers in the center of Serenje.	★★★★☆ Good
Chicken Meat	Input access is not developed well. Chickens are raised by small scale farmers only.	The condition of the internal roads in the FB is not convenient for distribution. There is no activity of chicken processing.	Market potential of chicken is not high compared to the site close to a big city such as Lusaka.	★★☆☆☆ Poor
Cultured Fish	Not many aquaculture activities in the FB. However, two dams exist, and the third dam is under construction. Potential of cage fish farming could be considered.	The condition of the internal roads in the FB is not convenient for distribution. There is no cold chain system nor fish processing factory in the area,	Market potential of fish is not high compared to the site close to a big city such as Lusaka. However, potential of export exists due to its proximity to DR Congo.	★★★☆☆ Fair

7. Environmental and Social Considerations

Current status of SEA/ESIA/RPF/RAP for entire FB	SEA (2009), RAP under study
Environmental sensitive area in and around FB[4]	Musangashi Forest Reserve 1979 lies adjacent to the western part of Nansanga FB. Other PA areas around the FB are: Luwombwa Forest Reserve 1970, Serenje Forest Reserve 1981 and name unknown Forest Reserve around Kafinda GMA and Kasanka NP.

Number of PAHs and PAPs[5]	Nos of PAPs	Nos of PAHs	Others
Total Nos of PAHs and PAPs in Entire FB	N/A	N/A	N/A
Total Nos of PAHs and PAPs in Core Venture Plot (CVP)	556	91	—
-PAHs owning land with farm permit, living in CVP	138 >	23 >	—
-PAHs owning land without farm permits, living in CVP	253 >	44 >	—
-PAHs NOT owning land but living in CVP	0	0	—

[Key Findings / Remarks] Total number of PAHs and PAPs in the entire FB is unknown due to data deficiency. PACO answered that the total number of PAHs in CVP is 67 while the reconnaissance survey (MoA 2019)[6] reported 91 and all of them are residents. Encroachment of professional and non-professional squatters into the earmarked CVP are causing an increment of PAPs.

Languages spoken and its percentage	Lala (100%)
Religion and its percentage	Christianist (100%)
Any important event, cultural activities by religion or ethnic group recognized by the community	Church gathering and *Chibwela Mushi* (This traditional ceremony brings together 19 Lala and Swaka traditional leaders of Bena Nyendwa, a royal clan who celebrate with their people a good crop harvest and preservation of life[7]
Any important traditional farming system recognized by each ethnic group (for example *Citemene* for Bemba people)	IFIKUKA Farming System
Main economic activities	Primary occupation: Farming and Secondary occupation: Livestock rearing
Chiefdom in the area where FB located at	Chief Muchinda
Fundamental principle of resettlement and compensation to affected people	Nobody loses land
Any economic activities to be restricted in FB area	Illegal land and forest resource management such as logging without permission, slash-and-burn farming
Any non-economic activities to be restricted in FB area	No particular
Existing land disputes	No particular

[Expected positive impacts]
- Livelihood improvement through formal/informal employment
- Better accessibility to social infrastructures (better roads, school, clinic, Water supply)
- Better accessibility to trading centers, training centers, and markets (CV: Core Venture), etc.
- The existing population in the customary area are very content with the approach of non-displacement and associated benefits of the FB.

[Expected negative impacts]
- Physical displacement but no more vacant lands exist around the CVP
- Limited land that will not enable the traditional shifting cultivation (traditional ways of securing fertile soils)
- Limited to no land for expanding extended families
- Loss of access to forest products beyond their boundaries (wild fruits, mushrooms, caterpillars, timber and other building materials) charcoal burning (though negative),

[Recommendations]
- Conduct a land inventory to establish the land sizes of the settlers
- No resettlement, in which case the settlers are moved along the edge of the CV farming area in a buffer zone (Luena Model)
- Implementation of the stakeholder meeting with meaningful participation to improve community's awareness
- Continuous engagement with the stakeholders and communities to dispel uncertainties, as this is affecting their livelihoods at present
- Considerations of non-cultivated lands of PAPs. There is a huge gap between Reconnaissance survey result (2.6ha /HH on an average) vs Interview result (100-200ha/HH)
- Provision of appropriate in-kind compensation and/or assistance for relocation and restoration of the livelihood of PAPs
- Amicable solution for scattered graves in the CVP based on the discussion with PAPs and other stakeholders.
- Review recommendations from the ongoing RAP exercise before disclosure to the stakeholders and communities.

8. Donors

—	—

9. Other Remarks

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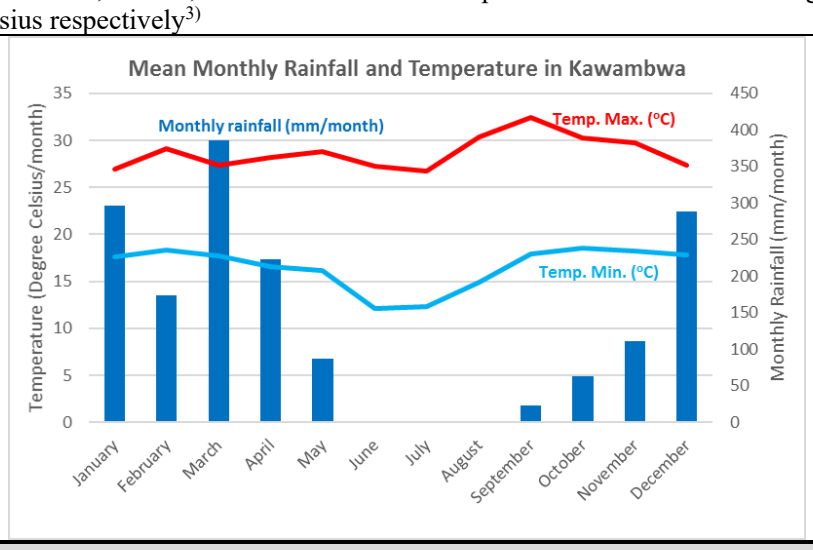
[4] UNEP-WCMC (2019), World Database on Protected Area (downloaded on May 22, 2019)
[5] JICA Survey Team (2019) *Questionnaire survey to PACO Central Province*
[6] MoA (2019) *Nansanga Core Venture Farm Resettlement: Reconnaissance Survey /Inventory*
[7] Zambia Daily Mail Limited (2016) *Lalas, Swakas rejoice Ichibwela Mushi,* http://www.daily-mail.co.zm/lalas-swakas-rejoice-ichibwela-mushi/ (Accessed on June 27, 2019)

1. General Information

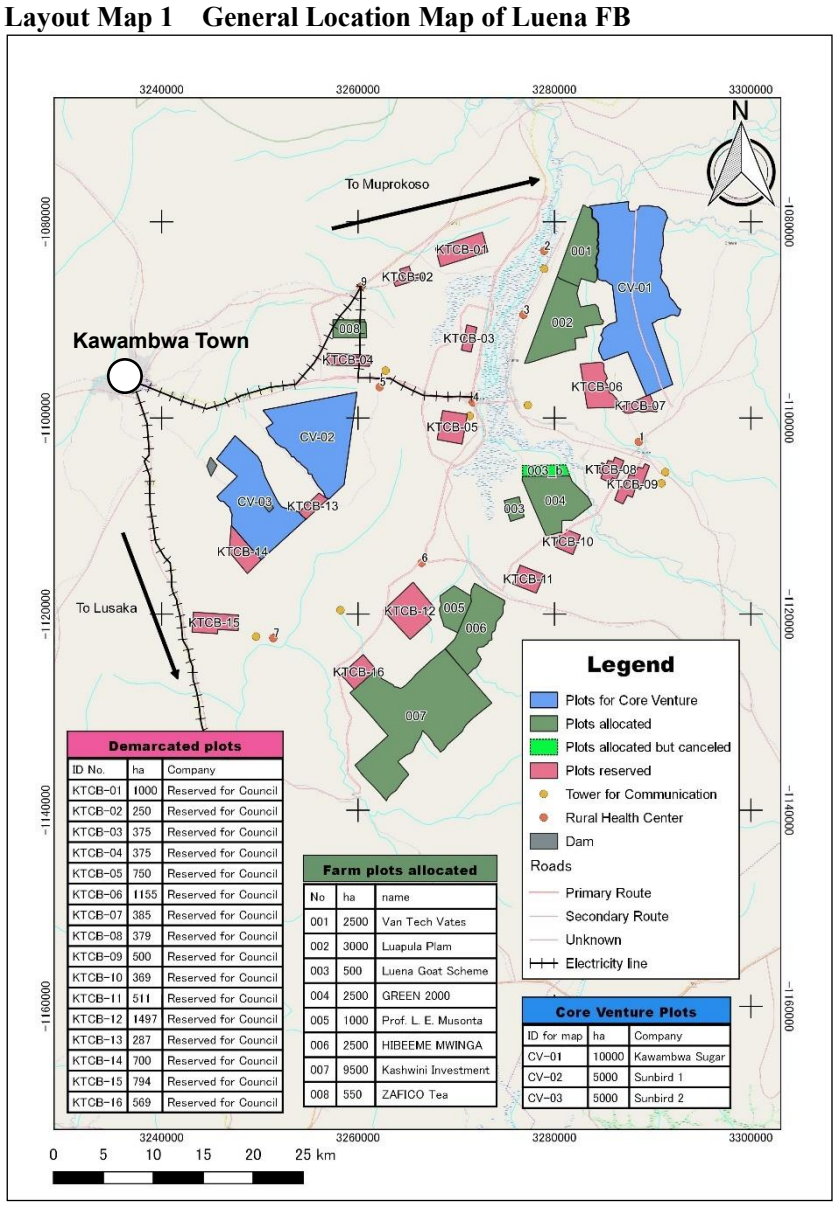
Province name and its population[8]	Luapula (1.0 Million in 2011 and 1.3 Million in 2020)
District name and its population	Kawambwa (137,841 in 2011 and 176,332 in 2020)
Latitude	S. 9° 45' ~ S. 10° 20' (WGS84)
Elevation (m.a.s.l)	1,200 m ~ 1,3000 m
FB Area	100,000 ha
FB year established	2007
Contact person	Province: Mr. Chate Godwin, PACO, gchate@yahoo.co.uk District: Mr. Davis Mwansasu, DACO, davismwansasu@gmail.com, +260966901403
Accessibility	Car: 950 km from Lusaka (14 hours) or Airplane + Car: 1 hr flight from Lusaka to Mansa Airport, and 2.5hrs from Mansa to Kawambwa by car. (Flight is available only Mon., Thu, and Sat.)

2. Natural Environment

Agro-climate zone[9]: III: More than 1,000mm of mean annual rainfall with 140-200 days of the rain-fed cropping season. In Kawambwa, the annual rainfall amount is 1,652mm, mean Max. & Min. temperature is 28.7 and 16.5 degree Celsius respectively[3)]



Layout Map 1 General Location Map of Luena FB



3. Basic Agricultural Information

Potential products:	Sugarcane, Cassava, and Tea		
Total arable land area (ha)	100,000	Current cultivation area (ha)	N/A
Potential irrigation area (ha)	N/A	Current irrigation area (ha)	N/A
Soybean cultivation area (ha)	N/A	Poultry farming area (ha)	N/A
Fish cultivation area (ha)	N/A	Number of existing cooperatives	N/A
Core investors (10,000ha scale)	Existing Number: 2 Planned Number: N/A Major products: Sugar, Cassava		
Commercial farmer (1,000-5,000ha)	Existing Number: 2 Planned Number: 6 Major products: Tea, Oil palm, Goat, Maize, Wheat, Vegetable, Spice		
Medium scale farmer (100-1,000ha)	Existing Number: N/A Planned Number: N/A Major products: N/A		
Small farmer (0-100 ha)	Existing Number: N/A Planned Number: 1,200 Major products: N/A		

4. Infrastructure Development

Item	Current situation and problems/issues	Rate
Electricity	As shown in the above location map, electricity lines are installed western and northern sides of the FB by ZESCO. By the end of 2019, ZESCO will extend the existing line stopped at Senior Chief Mushota's palace 9km eastward to Kawambwa Sugar Farm	★★★☆☆ Fair
Internet access & Communication	Thanks to 7 communication towers exist in the FB, mobile phone service is available almost all area in the FB. Internet speed is not very fast but not in a noisy environment.	★★★☆☆ Fair
Irrigation infrastructure	Two dams exist in the western part of the FB but its function and conditions are not confirmed. Core ventures collect water from their boreholes.	☆☆☆☆☆ Data Deficient
Access Rd in FB	Main access roads in the FB have 5m width and made by laterite. However, the road in the remote part of the FB narrows to 3m or less so as even light vehicles cannot pass by one another. Construction of a Mushota-Chama bridge will improve East-West traffic in the FB, because current residents are forced to use deviation to keep off a 3km width swamp.	★★☆☆☆ Poor
Trunk road to FB	Trunk roads with two lanes are paved, and ROW are well secured. Potholes and damage on road shoulders are observed but it is not at a significant level.	★★★★☆ Very Good
Others if any (education, health facilities, etc.)	Currently, 7 rural health centers, several schools, and Christian churches exist in the FB.	★★★☆☆ Fair

5. Profiles of Existing Projects in FB

Project Name	Proponent & Fund	Project Outline (Product, By-product, Market, Project scale, Area in ha)	Total number of Beneficial Farmers or Households and their relationships	Total number of affected farmers or Households	Land Disputes (yes/no)	Status of RAP	Remarks, Observations
Kawambwa Sugar	Private	1. Exporting sugar to RDC, 2. Selling electricity generated from Bagasse	No beneficial farmers yet because nursery has started in 2017	N/A	N/A	Not clarified by ZEMA	–

[8] Central Statistical Office (2013) *2010 Census of Population and Housing, Population and Demographic Projections 2011- 2035*
[9] The Zambia Soil Health Consortium (n.d.) *Integrated Soil Fertility Management in Zambia*

		to ZESCO					
Sunbird Bioenergy	Private	1. Selling biofuel to ZESCO	No beneficial farmers yet because the nursery started in 2018	More than 750 to 800 PAPs	N/A	Not clarified by ZEMA	―

6. Agri-Business Potential

Product	Input & Production	Distribution & Processing	Sales & Consumption	Rate
Soybean	Input accessibility is not convenient. Soya production potential is relatively high.	The road condition of the internal roads in the FB is not convenient for distribution. There is no activity of soybean processing.	Market potential of soya is relatively low due to the distance from Lusaka, while it may have when it comes to selling soybean to DRC	★★★☆☆ Fair
Chicken Meat	Input access is not developed well. Chickens are raised by small scale farmers only.	The condition of the internal roads in the FB is not convenient for distribution. There is no activity of chicken processing.	Market potential of chicken is not high compared to the site close to a big city such as Lusaka.	★★☆☆☆ Poor
Cultured Fish	Not many aquaculture activities in the FB, although there is a potential of production, as water availability is high, and plan of dam construction is prepared.	The condition of the internal roads in the FB is not convenient for distribution. There is no cold chain system nor fish processing factory in the area.	Market potential of fish is not high compared to the site close to a big city such as Lusaka.	★★☆☆☆ Poor
Sugarcane	Kawambwa sugar would provide necessary inputs including the seedling of sugarcane and bio-fertilizer for its production to contracted farmers. Weather condition is suitable for sugarcane production.	The condition of the internal roads in the FB is not convenient for sugarcane distribution. Kawambwa sugar will construct a sugar processing factory by 2021.	Development of Kasomeno-Mwenda road would facilitate the sugar export to DRC.	★★★★☆ Good
Cassava	There are not many issues in producing cassava in this area. No information was obtained regarding the contract farming of cassava operated by Sunbird Bioenergy.	The condition of the internal roads in the FB is not convenient for cassava distribution. A bio-ethanol processing plant will be constructed by Sunbird Bioenergy, although a detailed schedule of its construction is not obtained.	Detailed information including a market potential of cassava bio-fuel is not obtained through the survey.	N/A

7. Environmental and Social Considerations

Current status of SEA/ESIA/RPF/RAP for the entire FB	SEA or EIA as a whole Luena FB (2017) JST is awaiting DACO to provide a copy of the approved report to JST.
Environmental sensitive area in and around the FB[10]	Forest Reserve Name Unkown (ZMB) No.9, 10, and 11, and Mankalala Forest Reserve are adjacent to Luena FB. One of the National Parks, Lusenga Plain (IUCN Category II, 1971) is located 15km northward from Luena FB.

Number of PAHs and PAPs[11]	Nos of PAPs	Nos of PAHs	Others
Total Nos of PAHs and PAPs in the entire FB	9,600 (estimated)	1,600 (estimated)	―
Total Nos of PAHs and PAPs in Core Venture Plot (CVP)	More than 750 to 800 PAPs	N/A	―
-PAHs owning land with farm permit, living in CVP	N/A	N/A	N/A
-PAHs owning land without farm permits, living in CVP	N/A	N/A	N/A
-PAHs NOT owning land but living in CVP	N/A	N/A	N/A

[Key Findings / Remarks] Abovementioned number of PAPs are estimated based on the interview with the Land Husbandry officer in Kawambwa District. According to him, 80% of the population (about 45,000 persons) are happy with FB development while the rest is unhappy due to the loss of their cultivation land.

Languages spoken and its percentage	Bemba and Chisanga
Religion and its percentage	
Any important event, cultural activities by religion or ethnic group recognized by the community	
Any important traditional farming system recognized by each ethnic group (for example *Citemene* for Bemba people)	
Main economic activities	Farming and fishing
Chiefdom in the area where FB located at	Senior Chief Mushota, Chief Chama, and Chief Mukanta、
Fundamental principle of resettlement and compensation to affected people	No physical displacement by creating “Buffer Zone”
Any economic activities to be restricted in FB area	Illegal land and forest resource management such as logging without permission, slash-and-burn farming
Any non-economic activities to be restricted in FB area	No particular
Existing land disputes	Not existing, but there is a potential risk of land disputes unless proper compensation and resettlement assistance are taken.

[Expected positive impacts]
- Livelihood improvement through formal/informal employment (e.g. ZAFFICO)
- Acquiring advanced farming techniques
- Model of no physical displacement and creation of buffer areas commended.
- Non impacted local community content with the block development as it will open up the area for development.

[Expected negative impacts]
- (20% of populations are unhappy with FB
- Communities living in the buffer areas in proximity to the demarcated areas will lose farmland located in the demarcated areas, e.g. Sunbird farms have taken over farmland belonging to communities in Mapipo village
- There will be hunger unless the annexed farmlands are compensated in kind. (e.g. not confirmed yet if RAP of Sunbird is approved by ZEMA)
- Direct impact of the local forests, as the PAPs whose land has been annexed, are encroaching on the existing local forests leading to deforestation.
- Enslavement of local people, due to the poor working conditions.
- Poor working conditions for the current workers employed, possibilities of breach of labor laws, inadequate OHS (e.g. ZAFFICO), for instance, employees provide their protective clothing and work from 04.00hrs to 16.00hrs

[Recommendations]
- To subdivide planned demarcated plots for smallholder (current plan is 1,200plots with 5~20 ha)

[10] UNEP-WCMC (2019), World Database on Protected Area (downloaded on May 22, 2019)
[11] Kawambwa District Agriculture Office (2018) Kawambwa Meteorological Data

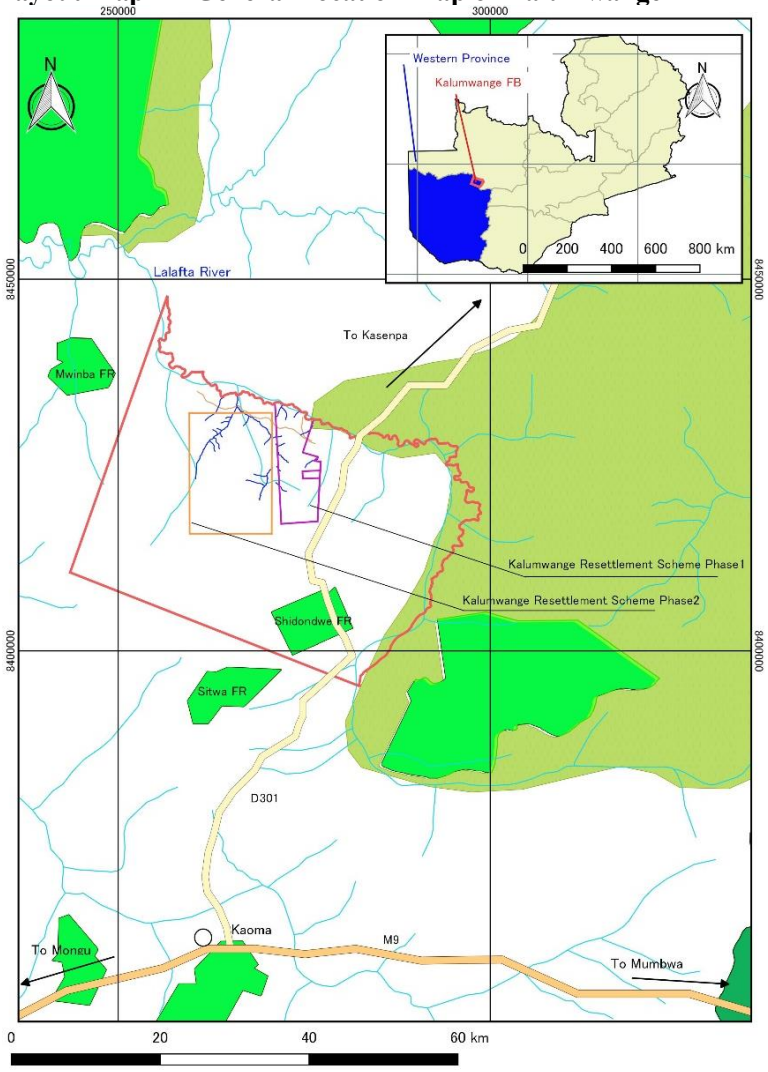
● Prioritize PAPs for land allocation (the PAPs should be allocated land first prior to the advertisement. ● Securing expandability of the FB (for both private and community) ● Thorough compliance with laws and regulations and enforcement of ESMP (e.g. Manganese mining company) ● Conduct or review and implement a RAP ● Acceleration of infrastructure development especially the road network ● Key sectors to be involved in the oversight of the farm block activities e.g. MOA, Forestry Department, Department of Water Resources Development (DWRD), Health, and District Council. These should be pooled in a district and local level technical governance structure.	
8. Donors	
Groupe European de Development (GED) Africa and Development Bank of Southern Africa	187 kilometer Mwenda-Kashiba road project which will be constructed at a total cost of USD475 million under the Private Public Partnership (PPP). This will include the construction of a modern bridge across Luapula River and a Border Post at Kashiba, will connect Zambia to Congo DR in Luapula Province through Chipili and Mwense districts[12].
9. Other Remarks	
—	

[12] Zambia Reports "Mwenda Kashiba Road to Cost USD475 Million Under PPP" dated on 9 February 2018, https://allafrica.com/stories/201802090170.html (Accessed on June 1, 2019)

1. General Information

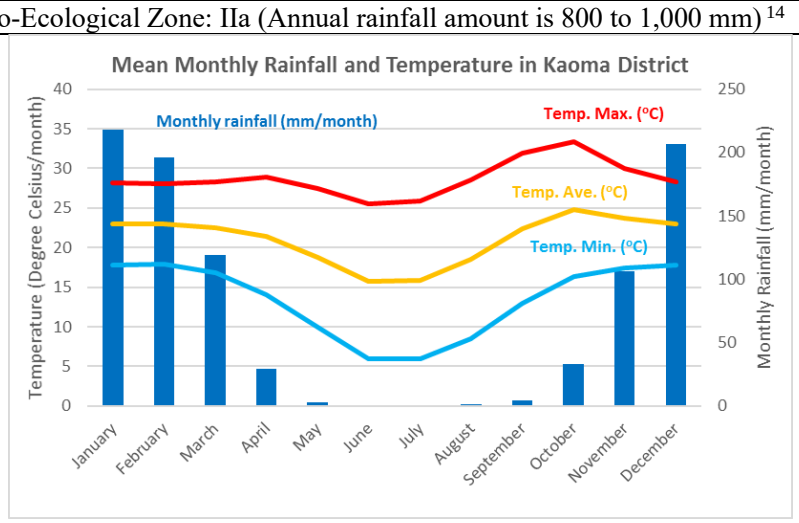
Province name and its population[13]	Western
District name and its population	Kaoma
Latitude	S. 14°01' ~ 14°32' (WGS84)
Elevation (m.a.s.l)	1,130~1,250
FB Area	140,000 ha
FB year established	2014
Contact person	Moonga Blesswell Hwula Senior Land Husbandry Officer Cell: +260 977 846 444 Email: mhwula@gmail.com
Accessibility	460km (6hrs by car) from Lusaka via Route M9 and D301.

Layout Map 1 General Location Map of Kalumwange FB



2. Natural Environment

Agro-Ecological Zone: IIa (Annual rainfall amount is 800 to 1,000 mm)[14]



The difference in precipitation between the driest month and the wettest month is 218 mm. Throughout the year, temperatures vary by 9.1 °C.[15].

Soil type: The soil in this FB is classified into Ferralsol and Acrisol, which are strongly weathered, low fertility and acid soil. The range of soil pH is 3.2-4.4.

3. Basic Agricultural Information

Potential products:	Cashew nut, Cassava, Millet, Sorghum, Rice, Maize, Cattle Ranching, Small Ruminants, Fish farming, Dairy		
Total arable land area (ha)	N/A (to be identified after F/S)	Current cultivation area (ha)	N/A (to be identified after F/S)
Potential irrigation area (ha)	N/A (to be identified after F/S)	Current irrigation area (ha)	N/A (to be identified after F/S)
Soybean cultivation area (ha)	N/A (to be identified after F/S)	Poultry farming area (ha)	N/A (to be identified after F/S)
Fish cultivation area (ha)	N/A (to be identified after F/S)	Number of existing cooperatives	N/A (to be identified after F/S)
Core investors (10,000ha scale)	Existing Number: 0 Planned Number: N/A Major products: -		
Commercial farmer (1,000-5,000ha)	Existing Number: 0 Planned Number: N/A Major products: -		
Medium scale farmer (100-1,000ha)	Existing Number: 0 Planned Number: N/A Major products: -		
Small farmer (0-100 ha)	Existing Number :0 Planned Number: N/A Major products: -		

4. Infrastructure Development

Item	Current situation and problems/issues	Rate
Electricity	No electricity at all.	★☆☆☆☆ Very Poor
Internet access	Two communication towers belonging to MTN[16] and Zamtel are available.	★★☆☆☆ Poor
Irrigation infrastructure	Two dams exist in the FB. Only one farmer pumps up water for irrigation. There are two perennial rivers and their subsidiary streams in the FB.	★☆☆☆☆ Very Poor
Access Rd in FB	40% of planned access roads are installed in the FB.	★★☆☆☆ Poor
Trunk road to FB	There is a district road (D301) that links Kaoma to Kasempa passes through the FB. This road is to be tarred.	★★★☆☆ Fair
Others if any (education, health facilities, etc.)	A health post exists in Kalumwange resettlement scheme but not a hospital. Primary, secondary and high schools exist in the FB. Six hummer mills exist, but no other food processing industries in the FB.	★★☆☆☆ Poor

5. Profiles of Existing Projects in FB

Project Name	Proponent & Fund	Project Outline (Product, By-product, Market, Project scale, Area in ha)	Total number of Beneficial Farmers or Households and their relationships	Total number of affected farmers or Households	Land Disputes (yes/no)	Status of RAP	Remarks, Observations
N/A							

6. Agri-Business Potential

Product	Input & Production	Distribution & Processing	Sales & Consumption	Rate
Soybean	Soybean is not cultivated much in this area (totally 381 ha in Kaoma district only in 2019)	Road network of this FB is not well developed yet. There is no soybean processing activity in this area.	Market potential of soybean in this area is low due to the limited soya production and thus, fewer numbers of soybean demanders.	★★☆☆☆ Poor
Chicken Meat	There are some broiler farms near the FB. There is a limitation of the availability of input.	Road network of this FB is not well developed yet. There is no processor in the area.	Market potential of chicken meat is not so high due to the small population of the province.	★★☆☆☆ Poor

[13] Central Statistical Office (2013) *2010 Census of Population and Housing, Population and Demographic Projections 2011- 2035*
[14] The Zambia Soil Health Consortium (n.d.) *Integrated Soil Fertility Management in Zambia*
[15] Climate-Data Org. Kaoma District
[16] Mobile Telephone Network. The name of a cellular service provider.

Cultured Fish	Not many aquaculture activities in the FB, although there is a potential of production, as water availability is high, and plan of dam construction is prepared.	The condition of the internal roads in the FB is not convenient for distribution. There is no cold chain system nor fish processing factory in the area.	Market potential of fish is not high compared to the site close to a big city such as Lusaka.	★☆☆☆☆ Very Poor

Other potential crops to be noted:
According to the ZDA report, cashew nuts, cassava, millet, sorghum, rice, maize, etc. are listed as crops with high investment potential in the Western Province. Although this FB does not necessarily have a better natural condition than other FBs, it is considered to be suitable for the cultivation of soybean and fruit trees such as citrus.

7. Environmental and Social Considerations

Current status of SEA/ESIA/RPF/RAP for entire FB	No study was conducted.
Environmental sensitive area in and around FB[17]	Shidondwe Forest Reserve (IUCN Category: Not Reported) is located within the Kalumwange FB. The eastern boundary of Kalumwange FB lies adjacent to Kafue National Park (IUCN Category II), 1971. Distance from Kansonoso-Busanga Game Management Area (GMA) (IUCN Category IV), 1971 and Kabanga Forest Reserve, 1973 to Kalumwange FB are 11km and 15km respectively.

Number of PAHs and PAPs	Nos of PAPs	Nos of PAHs	Others
Total Nos of PAHs and PAPs in Entire FB	About 3,700	About 600	―
Total Nos of PAHs and PAPs in Core Venture Plot (CVP)	N/A	N/A	N/A
-PAHs owning land with farm permit, living in CVP	N/A	N/A	N/A
-PAHs owning land without farm permits, living in CVP	N/A	N/A	N/A
-PAHs NOT owning land but living in CVP	N/A	N/A	N/A

[Key Findings / Remarks]
Estimated number of population in Kalumwange FB is 8,877 population with 1,652 households. Breakdown is shown below;
1) Kalumwange Central: 3,697 population with 616 households in 56 villages (Multiplied by population growth rate)
2-1) Kalumwange Resettlement Scheme phase1: 2,925 population with 585 households[18]
2-2) Kalumwange Resettlement Scheme phase2: 2,255 population with 451 households
Although the majority of the residents in Kalumwange FB is living either in Kalumwange Central or Kalumwange Resettlement Scheme, there are some more residents within the FB area.

- Land alienation process has not been completed. Although Local Chief Mwene Kasimba signed the document for transferring land title in 2018, Senior Chief Nariele has not agreed with the FB development. The senior Chief is not satisfied with agricultural development in this area over the years.
- No particular surveys have been conducted in Kalumwange FB due to a lack of finance and insufficient consent from the Chiefs.
- According to the local residents and district officers, none of the farmers in Kalumwange FB have their land title deed.
- Local Chief Kasempa reported that the number of villagers who have been given a consent paper from the local chief is less than 10 persons.

Languages spoken and its percentage	Lozi 90% and remain 10% by Mbunda and Nkoya
Religion and its percentage	Christian
Any important event, cultural activities by religion or ethnic group recognized by the community	Cheke ya mbunda and Kuomboka
Any important traditional farming system recognized by each ethnic group (for example *Citemene* for Bemba people)	None
Main economic activities	Agriculture
Chiefdom in the area where FB located at	Consent was given by Chief Mwene Kasimba but not yet from Senior Chief
Fundamental principle of resettlement and compensation to affected people	Not determined yet due to the FB development progress.
Any economic activities to be restricted in FB area	Not determined yet
Any non-economic activities to be restricted in FB area	Not determined yet
Existing land disputes	None

- The district is highly understaffed especially at the technical level such as BEOs, Food and Nutrition Officer, Principal technical officer, District marketing officer, etc.
- Buyers offer a very low purchase price to small farmers, as a quick solution to solve immediate cash challenges while FRA (Food Reserve Agency) takes time to pay in the case of maize.
- JTI gives inputs in the form of seeds, chemicals and fertilizer. The company deducts the cost of inputs given to the farmers at the times of sale and buys the rest of the produce.
- In terms of the development plan of Kalumwange FB, communication between the central government and district level including the local chief is insufficient while many people ask the local chief for land allocation in the earmarked FB area.

8. Donors

ZNFU (Zambia National Farmer's Union)	Sensitization for FISP e-voucher program. A total of 9,547 received cards under FISP program. 1,500 farmers are members of ZNFU, out of 23,000 farmers in Kaoma district (translates into 7%)
FAO	CASU: Conservation Agriculture Scaling up Project.
UNHCR	Poultry production (village chicken), field crop production, bee keeping, aquaculture, vegetable growing and agroforestry (Tree for life project) in Mayukwayukwa refugee camp.
Others	Concern Worldwide, APPSA, IITA, Keepers Zambia, Cheshire Homes/SHA.

9. Other Remarks

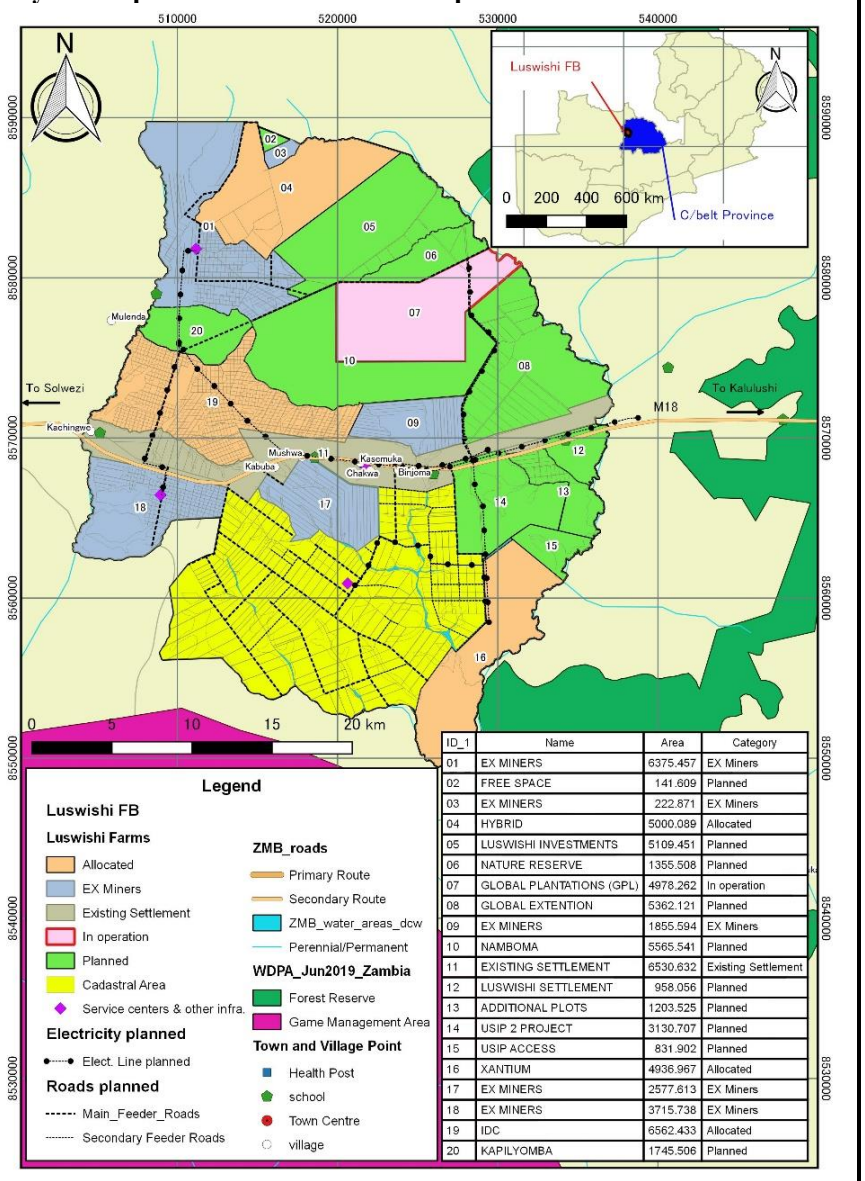
―

[17] UNEP-WCMC (2019), World Database on Protected Area (downloaded on May 22, 2019)
[18] Kalumwange Resettlement Committee (2019)

1. General Information

Province name and its population[19]	Copperbelt: 2,605,116 (2019)
District name and its population	Lufwanyama: 102,755 (2019)
Latitude	S 12° 45' ~ 13° 10' (WGS84)
Elevation (m.a.s.l)	1,100-1,300 m
FB Area	100,000 ha
FB year established	2008
Contact person	Mr. Peter Akeebu (district) Mr. Valentine Machelo, Land Husbandry Officer (provincial)
Accessibility	130 km west of Kalulushi, along M18 Kalengwa road

Layout Map 1 General Location Map of Luswishi FB

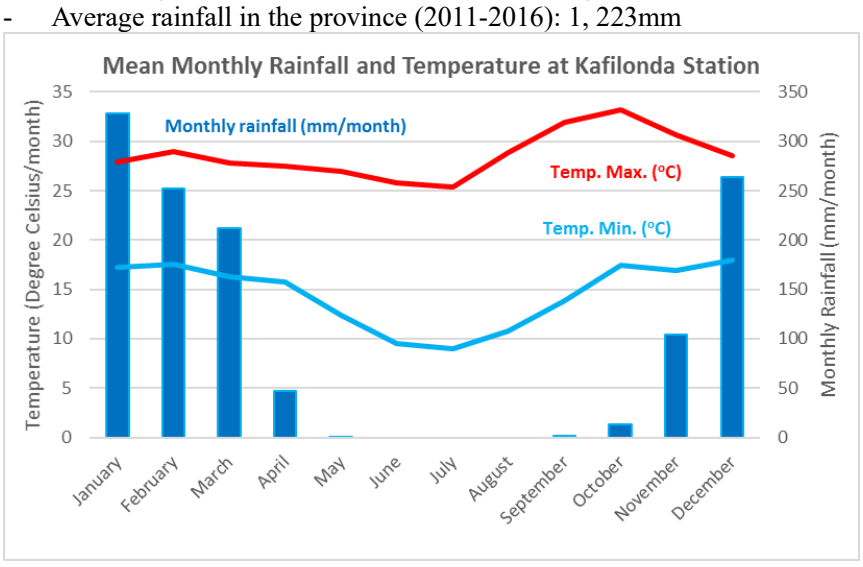


ID_1	Name	Area	Category
01	EX MINERS	6375.457	EX Miners
02	FREE SPACE	141.609	Planned
03	EX MINERS	222.871	EX Miners
04	HYBRID	5000.089	Allocated
05	LUSWISHI INVESTMENTS	5109.451	Planned
06	NATURE RESERVE	1355.508	Planned
07	GLOBAL PLANTATIONS (GPL)	4978.262	In operation
08	GLOBAL EXTENTION	5362.121	Planned
09	EX MINERS	1855.594	EX Miners
10	NAMBOMA	5565.541	Planned
11	EXISTING SETTLEMENT	6530.632	Existing Settlement
12	LUSWISHI SETTLEMENT	958.056	Planned
13	ADDITIONAL PLOTS	1203.525	Planned
14	USIP 2 PROJECT	3130.707	Planned
15	USIP ACCESS	831.902	Planned
16	XANTIUM	4936.967	Allocated
17	EX MINERS	2577.613	EX Miners
18	EX MINERS	3715.738	EX Miners
19	IDC	6562.433	Allocated
20	KAPILYOMBA	1745.506	Planned

2. Natural Environment

Agro-Ecological Zone III (humid subtropical)[20]

- Temperature: Maximum mean ranged from 25.8 °C to 33.2°C; Minimum mean ranged from 7.5 to 17.5 °C. (5-year average)
- Average rainfall in the province (2011-2016): 1, 223mm



Above data shown in the figure is 5 years (2011-2016) mean temperature maximum and minimum, and mean monthly rainfall.[21]

Soil type: The soil in this FB is classified into Ferralsol, which is strongly weathered, low fertility and acid soil. The range of soil pH is 3.8-4.4.

3. Basic Agricultural Information

Potential products:	Soybean, Wheat, Sunflower, Maize, Poultry, Dairy, Vegetables and fruits (Citrus), Beef		
Total arable land area (ha)	87,669 ha allocated	Current cultivation area (ha)	N/A
Potential irrigation area (ha)	Same as above	Current irrigation area (ha)	500 ha (center pivot by Olympic Milling)
Soybean cultivation area (ha)	3,500 ha (rainfed by Olympic Milling)	Poultry farming area (ha)	0
Fish cultivation area (ha)	0	Number of existing cooperatives	0
Core investors (10,000ha scale)	Existing Number: 0 Planned Number: 1 Major products: Soybean, Wheat		
Commercial farmer (1,000-5,000ha)	Existing Number: 4 Planned Number: 2 Major products: Soybean, Wheat, Vegetables and fruits (Citrus), Dairy		
Medium scale farmer (100-1,000ha)	Existing Number: 300 Planned Number: 0 Major products: N/A		
Small farmer (0-100 ha)	Existing Number: 1,020 Planned Number: 310 Major products: N/A		

4. Infrastructure Development

Item	Current situation and problems/issues	Rate
Electricity	Only available electricity is what is extended form a school outside the FB (11 kV) to Global Plantation. Rural Electrification Authority plans to expand 33 kV to the FB, but this is not designed to be utilized by core-ventures and commercial farmers, but mainly for the local community. AfDB is planning to develop PPP projects aiming to ensure sufficient electricity supply into the FB.	★☆☆☆☆ Very Poor
Internet access	Only limited locations. Rely on satellite. Discussing with AfDB for installing communication facilities.	★★☆☆☆ Poor
Irrigation infrastructure	Core ventures such as Global Plantation have developed a dam at their own expense. Discussing with AfDB for the construction of dams for big farms and small irrigation.	★☆☆☆☆ Poor
Access Rd in FB	AfDB is planning to improve FB internal roads by PPP.	★★☆☆☆ Poor
Trunk road to FB	M18 road is planned to upgrade to DBST under the phase 2 (2016-2018) of Link Zambia 8000 program, while it has not been implemented.	★★★☆☆ Good
Others if any (education, health facilities, etc.)	Four schools exist. Four more service centers in FB is planned.	★★☆☆☆ Poor

5. Profiles of Existing Projects in FB

Project Name	Proponent & Fund	Project Outline (Product, By-product, Market, Project scale, Area in ha)	Total number of Beneficial Farmers or Households and their relationships	Total number of affected farmers or Households	Land Disputes (yes/no)	Status of RAP	Remarks, Observations
Global Plantation (GPL)	Global Plantation (GPL), private	Farm operation is subcontracted to Olympic Milling. Selling soybeans to Global Industry at Ndola for oil processing. By-products are sold to	100 farmers with possible expansion to 310 farmers who are taking technical training program	N/A	Project Proponent answered that complaints about compensation	N/A	Farmland is to be expanded to 10,000 ha (See Plot No.08 in the map above)

[19] Central Statistical Office (2013) *2010 Census of Population and Housing, Population and Demographic Projections 2011- 2035*
[20] The Zambia Soil Health Consortium (n.d.) *Integrated Soil Fertility Management in Zambia*
[21] PACO Copper belt Province (2018) Annual Report, 2018

		ZAMBEEF etc. for livestock feed materials. Allocated farm area is 5,000 ha	by IDC/TAHAL.		were solved, but some affected farmers are still complaining.		
Hybrid Poultry Farm Ltd.	Hybrid Poultry Farm Ltd., private	Not in actual operation. Currently maize for feed. Allocated land area is 5,000 ha.	N/A	4 HHs	Not confirmed	N/A	–
Xantium Dairies Zambia	Xantium Dairies Zambia, private	Not in actual operation. Dairy. Land area allocated is 5,000 ha.	N/A	Project Proponent reported that 21 HHs are resettled to other lands allocated by Chief. However, the actual number of PAHs is much bigger according to the farmers.	Some affected farmers are still complaining.	N/A	–
Luswishi Agro project	IDC/TAHAL	Not in actual operation. Irrigated Vegetables (In Greenhouses), Citrus, Wheat. 300 Small-scale farmers) Land area allocated is about 6,500 ha.	Not sure but 310 small scale farmers are taking technical training.	176 PAHs. Of which 3 institutional, 12 physical only, 45 physical and economical, and 94 cultivation field only.	No complaints from PAPs so far.	RAP is on-going	**Resettlement Working Group** consists of 12 representatives selected by villagers, Chie, Project Proponent, RAP consultant, Gov't, ZEMA, etc. is established.

6. Agri-Business Potential

Product	Input & Production	Distribution & Processing	Sales & Consumption	Rate
Soybean	Input accessibility is not convenient yet, but It might improve through the intervention of core venture. Soya production is suitable in this area.	Internal road network needs to be improved. There is a processing factory near the FB.	Market potential of soybean is very high due to its location close to a soybean processing factory.	★★★★★ Very good
Chicken Meat	There is a potential for hatchery production as there are a fairly large number of broiler farms in Copperbelt.	Internal road network needs to be improved. There is no processing factory near the FB.	Market potential for chicken meat is high due to the large population of Copperbelt and its proximity to DR Congo.	★★★★☆ Good
Cultured Fish	Not many aquaculture activities in the FB, although there is a potential of production, as a plan of dam construction is prepared.	Internal road network needs to be improved. There is no cold chain system nor fish processing factory in the area.	Demand for fish in Copperbelt province is high next to Lusaka and Central provinces. Proximity to DR Congo might be another market advantage.	★★★☆☆ Fair

Other potential crops to be noted:
According to the ZDA report, maize, horticultural crops, coffee and soybean are listed as crops with high investment potential in Copperbelt Province. Moreover, considering local climatic conditions, the FB is suitable for growing wheat and fruit trees such as banana, avocado, cashew nut, and citrus.

7. Environmental and Social Considerations

Current status of SEA/ESIA/RPF/RAP for entire FB	EIA of whole FB (done in 2011) is not approved by ZEMA. - SEA (done in January 2012) - ESIA and RAP for the cadastral area (done in 2018) are not approved by ZEMA
Environmental sensitive area in and around FB[22]	North and East borders of Luswishi FB lie adjacent to Lamba Forest Reserve. Lunga-Luswishi Game Management Area (GMA) is located 3km southward direction. Areas that run the risk of a large scale increase in soil erosion

Number of PAHs and PAPs	Nos of PAPs	Nos of PAHs	Others
Total Nos of PAHs and PAPs in Entire FB[23]	4,888 (2,272 in cadastral area)	940 (345 in cadastral area only)	–
Total Nos of PAHs and PAPs in Core Venture Plot (CVP)	N/A	N/A	N/A
-PAHs owning land with farm permit, living in CVP	N/A	N/A	N/A
-PAHs owning land without farm permits, living in CVP	N/A	N/A	N/A
-PAHs NOT owning land but living in CVP	N/A	N/A	N/A

[Key Findings / Remarks] Each investor has their compensation scheme.	
Languages spoken and its percentage	Mainly Lamba and Kaonde, some Tonga (resettled from Southern Region) and minorities
Religion and its percentage	Christian
Any important event, cultural activities by religion or ethnic group recognized by the community	Katangarapanondo (a kind of festival held after harvesting season in September to October)
Any important traditional farming system recognized by each ethnic group (for example *Citemene* for Bemba people)	Not really acknowledged, but recently there is an influence by Tonga people that 100% bush cleaning without remaining stumps of trees on the ground.
Main economic activities	Farming (originally practice hunting and collecting)
Chiefdom in the area where FB located at	Local Chief: Shibuchinga
Fundamental principle of resettlement and compensation to affected people	It should comply with national laws but there is no clear policy set for Luswishi FB specifically, and hence this invites uneven resettlement and compensation practices in the FB. RAP of IDC/TAHAL is well prepared unlike other investors in the FB.
Any economic activities to be restricted in FB area	Illegal activities against national laws and district bylaws such as hunting wildlife (buffalos, family of impala, etc.) without a license.

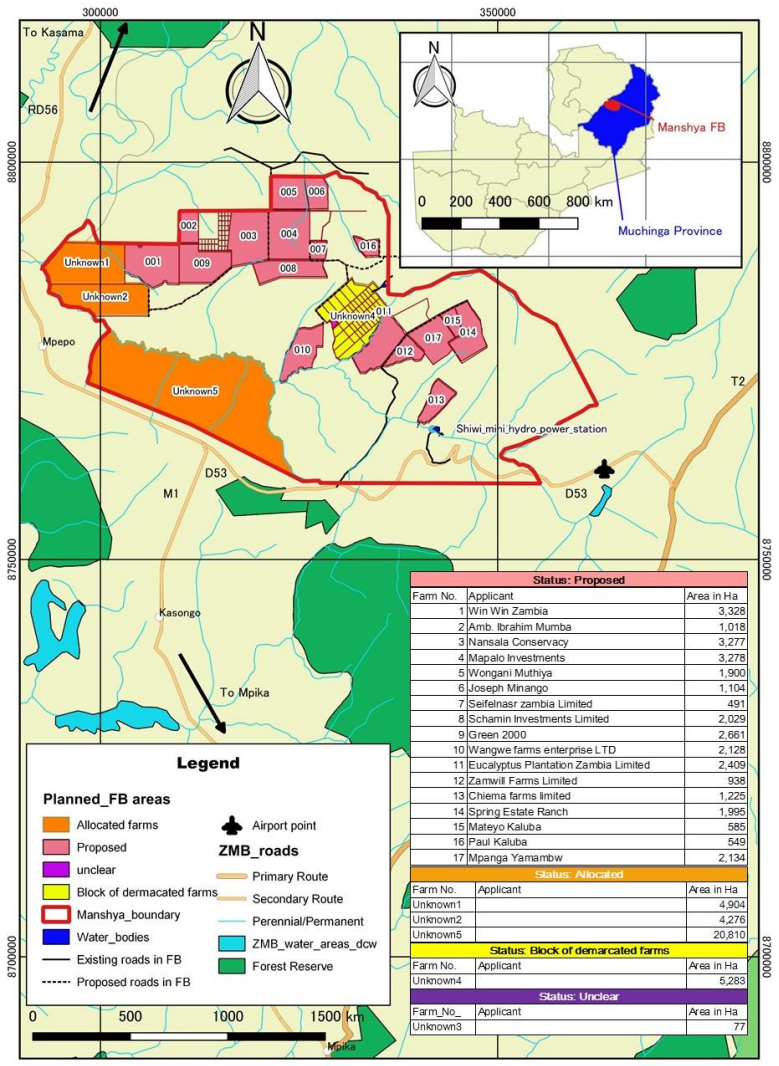
[22] UNEP-WCMC (2019), World Database on Protected Area (downloaded on May 22, 2019)
[23] The number above is estimation by resident farmers in FB (2019) and the lower number in the brackets is estimation by RAP (2018)

Any non-economic activities to be restricted in FB area	N/A
Existing land disputes	Complaints about compensation were solved by the Resettlement Working Group.
● When Global Industries stopped their business, people resented for it stating compensation is no enough. Eventually, it is resolved.	
8. Donors	
AfDB	
9. Other Remarks	
There is fertile land and enough water resources in FB, FB carries big potential. This will promote the marketing of agricultural goods.	
Merits: Capacity building by training, also give farmers more choices for sales. Small farmers are expected to benefit. Core venture is supposed to give a market. Demerit/concern would be the prices to be contracted	
Access to FB, starting with small vehicles, is limited. Without a road, no investment.	
Finance: Since 2016 no funds have been given (only have done for initial activities such as surveys).	

1. General Information

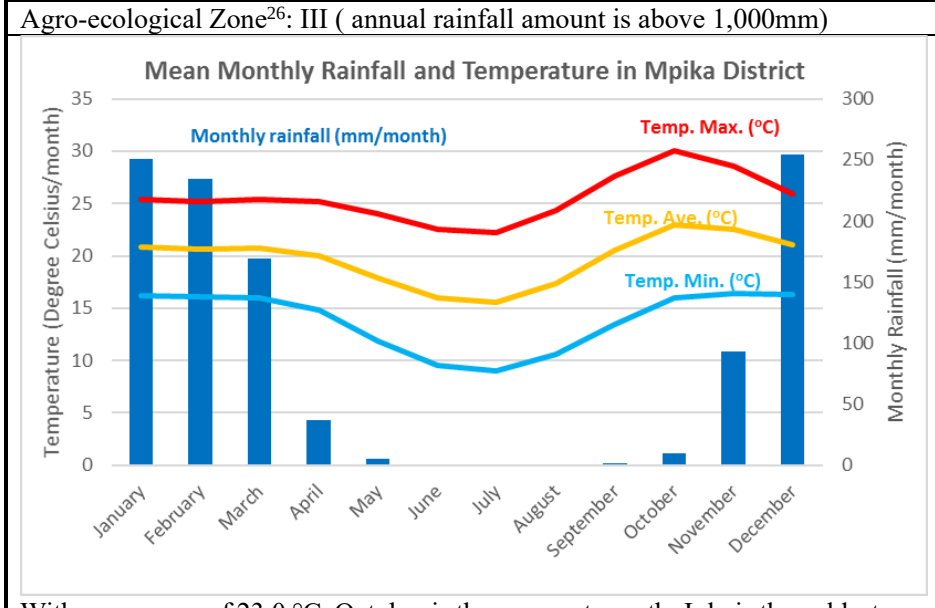
Province name and its population[25]	Muchinga (609,847 in 2011 and 1,178,294 in 2035 projection)
District name and its population	Shiwang'andu (82,000 in 2018), Mpika and Nkachibiya
Latitude	Between S 10°52′ ~ 11°13′ WGS84
Elevation (m.a.s.l)	1,400 to 1,500
FB Area	147,000 ha
FB year established	2012
Contact person	Mr. Stephen Syansingu, Senior Technical Officer (Land Husbandry Officer), +260977444442, stesya42@gmail.com
Accessibility	800km from Lusaka (about 12 hours by car) *Charter Flight between Lusaka-Shiwang'undu takes 1 hour.

Layout Map 1 General Location Map of Manshya FB[24]



2. Natural Environment

Agro-ecological Zone[26]: III (annual rainfall amount is above 1,000mm)



With an average of 23.0 °C, October is the warmest month. July is the coldest month, with temperatures averaging 15.6 °C. The precipitation varies 254 mm between the driest month and the wettest month. Throughout the year, temperatures vary by 7.4 °C[27].

3. Basic Agricultural Information

Potential products:	Maize, Millet, Rice, Sorghum, Soybeans, Groundnuts, Sweet potatoes		
Total arable land area (ha)	About 120,000 ha	Current cultivation area (ha)	N/A
Potential irrigation area (ha)	About 50,000	Current irrigation area (ha)	N/A
Soybean cultivation area (ha)	N/A	Poultry farming area (ha)	Not sure in FB, but about 49,000 heads of chicken in whole Shiwang'undu district.
Fish cultivation area (ha)	N/A	Number of existing cooperatives	300
Core investors (10,000ha scale)	Existing Number: 0 Planned Number:1 Major products: Ranching		
Commercial farmer (1,000-5,000ha)	Existing Number: 1 Major products: Horticulture (growing tomatoes at present) and Livestock (goat rearing) Planned Number: 20 Major products: N/A		
Medium scale farmer (100-1,000ha)	Existing Number: 0 Planned Number: 3 Major products: N/A		
Small farmer (0-100 ha)	Existing Number: N/A Planned Number: N/A Major products: Beans, cassava, finger millet, maize and groundnuts		

4. Infrastructure Development

Item	Current situation and problems/issues	Rate
Electricity	Not yet. To tap electricity from the Shiwangundu small hydropower station is in pipeline.	★☆☆☆☆ Very poor
Internet access	Not yet but can access from existing tower stations outside the block (poor coverage)	★★☆☆☆ Poor
Irrigation infrastructure	None inside the block but the existing Shiwangundu small hydropower station dam on the southern boundary can be used for irrigation.	★☆☆☆☆ Very poor
Access Rd in FB	Feeder road (D53) from Shiwang'andu to the hydropower station. The roads are all gravel and unmaintained. No access from the boundary into the FB due to lack of bridges.	★☆☆☆☆ Very poor
Trunk road to FB	T2 – Kapiri Mposhi – Nakonde road, M1 – Mpika- Kasama RD56 – Chinsali – to M1 (Upgrading D53 – Chinsali – to M1 to bituminous level is planned)	★★★☆☆ Fair
Others if any (education, health facilities, etc.)	There are clinic and elementary school along D56	

5. Profiles of Existing Projects in FB

Project Name	Proponent & Fund	Project Outline (Product, By-product, Market, Project scale, Area in ha)	Total number of Beneficial Farmers or Households and their relationships	Total number of affected farmers or Households	Land Disputes (yes/no)	Status of RAP	Remarks, Observations
Mr. Wongani Muthiya	Private	Started since 2018. Out of 1,900 ha of allocated land, horticulture (currently	N/A	N/A	N/A	N/A	―

[24] Study Team prepared based on the data obtained from Muchinga Province PACO office (July, 2019)
[25] Central Statistical Office (2013) *2010 Census of Population and Housing, Population and Demographic Projections 2011- 2035*
[26] The Zambia Soil Health Consortium (n.d.) *Integrated Soil Fertility Management in Zambia*
[27] Climate Data Org (Mpika District) https://en.climate-data.org/africa/zambia/muchinga/mpika-5678/#climate-graph (downloaded on July 16, 2019)

		tomato) is cultivated in 5 ha only. Besides, goat launching (100 heads) is in operation. Products are for sale to the domestic market in Kasama, Mpika, and Chinsali.					

6. Agri-Business Potential

Product	Input & Production	Distribution & Processing	Sales & Consumption	Rate
Soybean	Input accessibility is not well developed although natural condition in this area is suitable for soybean cultivation	Road condition from farming site to the market is not convenient for soybean transportation. Soybean processing is not conducted in this area	COMACO is the major buyer of soybean. Due to less soybean cultivation area, it does not attract soybean buyers.	★★★☆☆ Fair
Chicken Meat	There are several large-scale broiler farms near the FB.	Road condition from farming site to the market is not convenient for transportation of chicken. There is no processor in this area.	Market potential for chicken meat is not so high due to the small population of the province.	★★☆☆☆ Poor
Cultured Fish	Not many aquaculture activities in the FB. Plan of dam construction, as a potential site for cage fish farming, has not been identified.	The condition of internal roads in the FB is not convenient for distribution. There is no cold chain system nor fish processing factory in the area.	Market potential of fish is not high compared to the site close to a big city such as Lusaka.	★★☆☆☆ Poor
Goat Meat	Saudi Arabia is keen on small ruminant in Zambia and other African countries but their concern on Zambia's small stock is disease-free[28]. Currently, the major production area of goats in Zambia is Western Province and the current production volume in Manshya FB is very small (100 heads only). Manshya FB may have a potential of goat production if adequate facilities including a livestock barn and protective vaccination system are established and breeds demanded by Saudi Arabia are released.	As Manshya FB is one of the most vulnerable FBs for infrastructures, especially the road and bridge construction is highly required. Manshya FB is located relatively close to Dar es Salaam Port in Zambia (about 1,200 km in distance)	Saudi Arabia's retail price (USD) of export quality goats originating from Somaliland with confirmation of excellent and good are 131 and 120 respectively[29] while the goat prices from the local market in Zambia with the range of ZMK 150 to 500 per live goat (USD 12 ~ 40). Annual meat consumption growth rate in Saudi Arabia is 6.2% on an average[30]. Saudi embassy representative said the export market for sheep and goats had the potential to go beyond the borders of the Kingdom to include the entire Gulf region.	★★★☆☆ Fair

7. Environmental and Social Considerations

Current status of SEA/ESIA/RPF/RAP for entire FB	No ESIA was conducted. The provincial staff conducted some of the studies such as soil and demographic studies.
Environmental sensitive area in and around FB[31]	Within 20 km from the proposed FB boundary, there are three Protected Areas (PAs): Luangwaw Forest Reserve 1973, South Luangwa National Park (IUCN Category: II), 1971, and Lavushi Manda National Park (IUCN Category II), 1972. This includes, Ecologically important habitats, Habitats of endangered species for which protection is required under local laws and/or international treaties (plenty endangered tree species), Areas that run the risk of a large scale increase in soil salinity or soil erosion, Areas with special values from an archaeological, historical, and/or cultural points of view, and with a traditional lifestyle, or areas with a special social value called shifting cultivation (Chitemene system).

Number of PAHs and PAPs	Nos of PAPs	Nos of PAHs	Others
Total Nos of Potential PAHs and PAPs in Entire FB	N/A	N/A	Estimated number of the current population is 21,000 persons and 4,600 households.[32]
Total Nos of PAHs and PAPs in Core Venture Plot (CVP)	N/A	N/A	
-PAHs owning land with farm permit, living in CVP	N/A	N/A	
-PAHs owning land without farm permits, living in CVP	N/A	N/A	
-PAHs NOT owning land but living in CVP	N/A	N/A	

[Key Findings / Remarks]

- Forest plays an important role in the people who harvesting non-wood forest products such as Caterpillars, Mushrooms, Orchids, wild fruits, Chikanda[33], and herbal medicines.
- It is desirable to formulate sustainable natural resource management plans when formulating FB development plan in this area, because the potential impact of a large-scale development project like FB does not remain within the site, but also spread directly or indirectly to the surrounding area of the FB
- Percentage share of households' income who are using forest products in neighboring villages (Kasama and Mpika) is agriculture (40 to 50%) and followed by Forest income (20 to 35%) and trading (5 to 20%)[34].
- Traditional ceremonies such as pray for rain (good harvest) take place at the top of the mountain or hills, in the cave, or under the big tree, etc. These unmovable assets have historical, cultural and social value for the local community and hence they should be well involved at the early planning stage of the FB development in order to minimize adverse impact due to the FB development.

Languages spoken and its percentage	Bemba and Bisa at 90%
Religion and its percentage	Christianity and 70%
Any important event, cultural activities by religion or ethnic group recognized by the community	Traditional ceremonies (Ukusefya pa Ng'wena ceremony), and Christian festivities
Any important traditional farming system recognized by each ethnic group (for example *Citemene* for Bemba people)	*Chitemene* and *Fundikila* for both ethnic groupings. Fundinka is "Grass-mound" system of cultivation. Briefly, the process involves the formation towards the end of the rainy season of mounds of grass covered by earth on a previously fallowed site. The grass roots within the mound during the dry season, and at the start of the next rains the mounds are levelled, and plant crops and beans in rotation.

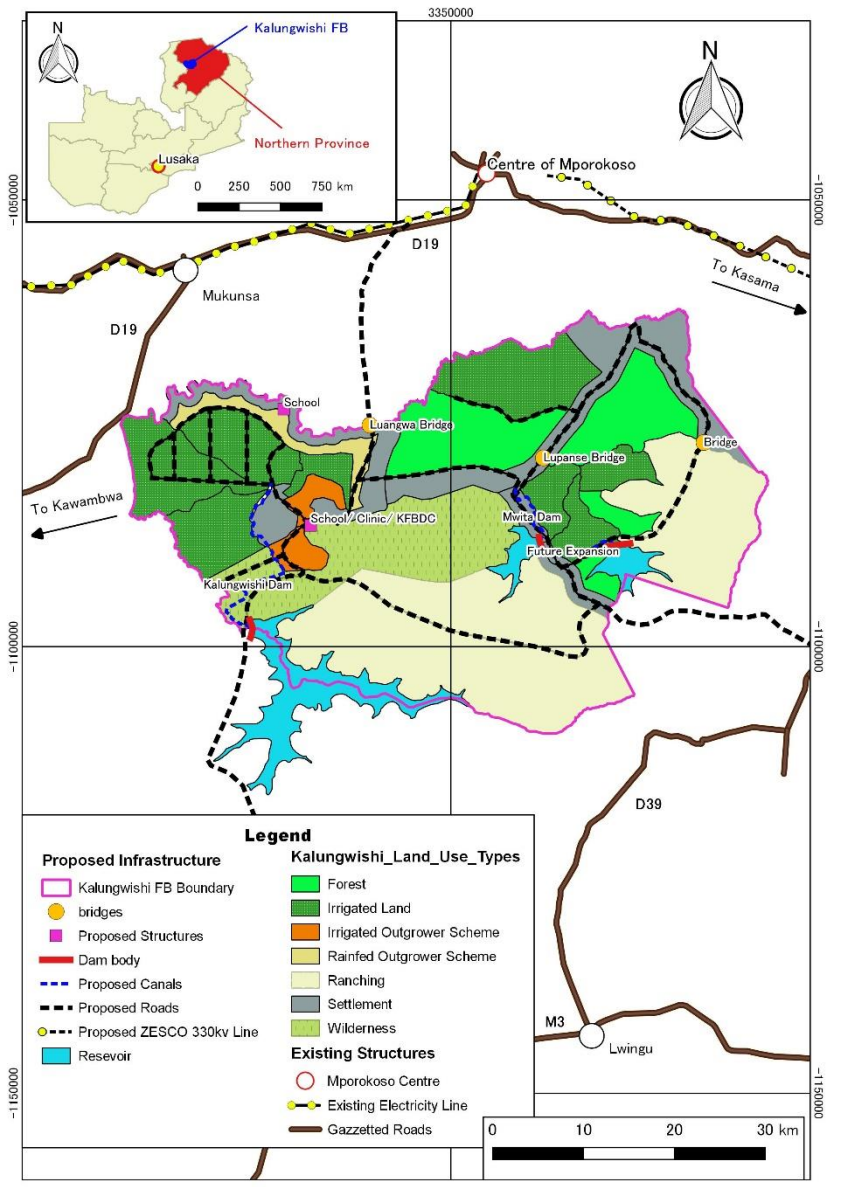
[28] African Trading.com, *Trade opportunity for Zambian sheep and goat producers*
[29] CGIAR (2016), *Saudi Arabia end-market requirements and the implications for Somaliland livestock exports*
[30] NRI (2018) *Outline and Market of Agriculture, Fisheries, and Food Industries in Saudi Arabia*
[31] UNEP-WCMC (2019), World Database on Protected Area (downloaded on May 22, 2019)
[32] Study Team calculated based on the results of the interview to Senior Agriculture Officer (SAO) Chinsali Province, and DACO Kanchibiya (Dec. 2019)
[33] Zambian Kitchen, Chikanta Recipe, https://zambiankitchen.com/chikanda-recipe/, (Accessed on 26th July 2019)
[34] World Bank（2008）, Technical Annexes, Policies, incentives and options for the rural poor, Managing the Miombo Woodlands of Southern Africa

	It is believed that Fundinka has a beneficial effect on soil conservation.
Main economic activities	Farming, fishing and trading
Chiefdom in the area where FB located at	Chief Nkula, Chief Kabamba, Chief Mukwikile and Chief Mpepo in three districts
Fundamental principle of resettlement and compensation to affected people	The MOA will follow the resettlement policy and other statutory requirements of Zambia, the supporting institution's provisions and international practice, particularly the World Bank requirements. When Chief Kabanda wrote the letter of offer of land to the MOA in 2012, he attached the following conditions; (A) There would be no displacement of the local communities in the FB, and (B) That the land with established beacons was land surrendered and belonged to MOA.
Any economic activities to be restricted in FB area	Not planned
Any non-economic activities to be restricted in FB area	Not planned
Existing land disputes	N/A
8. Donors	
—	—
9. Other Remarks	
● There is a COMACO office in Chinsali which is about 1.5 hours driving from Manshya FB.	

1. General Information

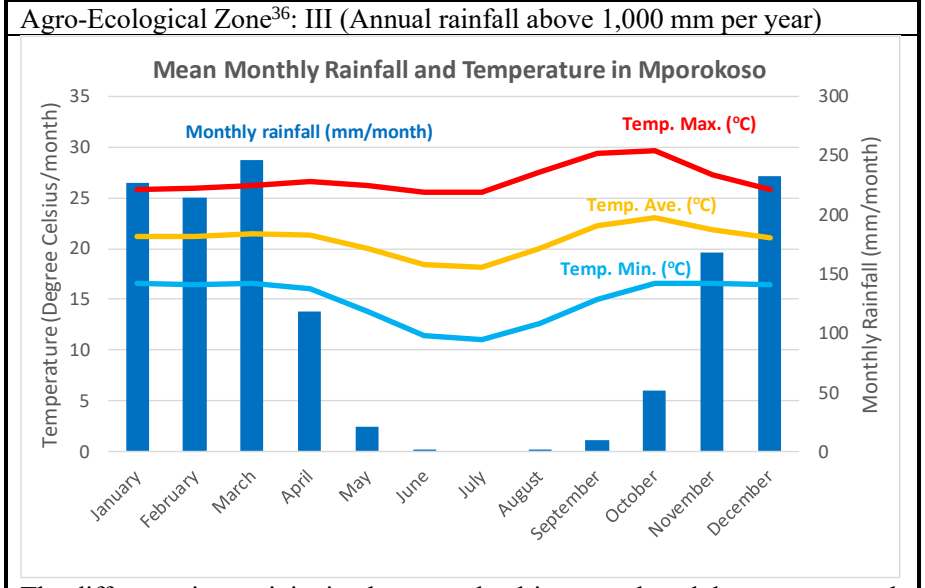
Province name and its population[35]	Northern (Population; 934,310 in 2011 and 1,911,761 in 2035 projection)
District name and its population	Lunte and a part of Mporokoso (Population 102,301 in 2011 and 197,171 in 2035 projection)
Latitude	S 9° 54' ~ 9° 30' (WGS84)
Elevation (m.a.s.l)	1,280 ~ 1,400
FB Area	200,000 Ha
FB year established	2017
Contact person	LAWRENCE BWEMBYA, Senior Land Husbandry officer in PACO office (in Kasama), 0977110865, EMAIL: bwembyajr14@gmail.com
Accessibility	1,035km (about 14 hours by car) from Lusaka via Serenje and Mpika (T2 road followed by M2 and D20)

Layout Map 1 General Location Map of Kalungwishi FB



2. Natural Environment

Agro-Ecological Zone[36]: III (Annual rainfall above 1,000 mm per year)



The difference in precipitation between the driest month and the wettest month is 246 mm. During the year, the average temperatures vary by 4.9 °C. Annual rainfall amount is 1,290 mm on an average.[37] The general insolation range expected in the FB area would be 10 hours per day in July to 4 hours per day in January. At a latitude of 100S, the maximum possible duration of bright sunshine is 11.5 hours in June and 12.7 hours in December[38].

3. Basic Agricultural Information

Potential products:	Tea, Maize, Millet, Rice, Sorghum, Soybean, Groundnuts, Oil palm, Small Ruminants, Fish farming, and Cattle Ranching		
Total arable land area (ha)	About 118,000 ha	Current cultivation area (ha)	1% (200ha)
Potential irrigation area (ha)	About 48,000 ha	Current irrigation area (ha)	N/A
Soybean cultivation area (ha)	Not existing but Consolidated Farming Ltd is planning to produce wheat and soybeans.	Poultry farming area (ha)	Not existing but planned ranching area is about 65,000 ha
Fish cultivation area (ha)	N/A (to be at dam reservoirs if a dam is constructed)	Number of existing cooperatives	N/A
Core investors (10,000ha scale)	Existing Number: 0 Planned Number: 2	Major products: Wheat, Soybean, and Seed (crop and variety not specified yet)	
Commercial farmer (1,000-5,000ha)	Existing Number: 0 Planned Number: N/A	Major products: N/A	
Medium scale farmer (100-1,000ha)	Existing Number: 0 Planned Number: N/A	Major products: N/A	
Small farmer (0-100 ha)	Existing Number: 0 Planned Number: N/A	Major products: N/A	

4. Infrastructure Development

Item	Current situation and problems/issues	Rate
Electricity	Currently, there is no electricity in Kalungwishi FB and awaiting fund release. In Phase 1 of Kalungwishi FB Development Project to be funded by EXIM Bank of China through China Railways Seventh Group. (Construction work of Project phase 1 is from 2017 to 2021), 33 and 11kV power lines with a total length of about 150km are planned.	★☆☆☆☆ Very poor
Internet access	Only one-fifth of the FB area close to the town side is barely covered by internet access though it is in poor condition and awaiting fund release for further development. ZICTA approved another nine towers to be constructed. This will cover over 114,000 ha which means around 55% of the FB area is to be under internet coverage.	★★☆☆☆ Poor
Irrigation infrastructure	Currently, there is no electricity in Kalungwishi FB and awaiting fund release. As a phase one of the earlier mentioned project, construction of one dam (Kalungwishi Dam, 30m height Earth dam) and concrete canal with 28km length for 10,000 ha of irrigation area, and weirs for out-grower scheme are planned.	★☆☆☆☆ Very poor
Access Rd in FB	Road network entering to and inside of the planed FB area not developed at all. Currently, vehicle is required to use a vessel (pontoon) for crossing Manshya river for entering to /exiting from the FB. In Phase 1, a gravel road network with 210km length, two bridges crossing Luangwa River and Luapanse River connecting to the FB are planned.	★☆☆☆☆ Very poor
Trunk road to FB	Mporokoso district is accessible via an almost completely paved road from Kasama, 151 km in length (Route D20/D19). As of April 2017, only 3km of this road remains to be surfaced. The Mporokoso-Kawambwa road (D19), 138km in length, and the Kasama-Luwingu is mostly of	★★★☆☆ Fair

[35] Central Statistical Office (2013) *2010 Census of Population and Housing, Population and Demographic Projections 2011- 2035*
[36] The Zambia Soil Health Consortium (n.d.) *Integrated Soil Fertility Management in Zambia*
[37] Climate Data Org. Mporokoso District
[38] CREC China Railway Seventh Group (2017) Final Report for Feasibility Study for the Proposed Kalungwishi Farm Block (prepared by RANKIN)

	gravel and awaiting fund release as of 2019 June.	
Others if any (education, health facilities, etc.)	Construction of two schools for existing villagers which enables students to access a school within a 5km radius (Ministry of Education's standard for school location) within the FB is planned. In addition, one clinic and one farm training center and housing are also included in the phase 1 project scope.	

5. Profiles of Existing Projects in FB

Project Name	Proponent & Fund	Project Outline (Product, By-product, Market, Project scale, Area in ha)	Total number of Beneficial Farmers or Households and their relationships	Total number of affected farmers or Households	Land Disputes (yes/no)	Status of RAP	Remarks, Observations
Not exist							

6. Agri-Business Potential

Product	Input & Production	Distribution & Processing	Sales & Consumption	Rate
Soybean	No available information regarding the accessibility of input. The area is suitable for soybean cultivation.	Road network in the FB is not yet developed, which makes soybean transportation difficult. Soybean processing is not conducted in the area.	Market potential of soybean is relatively low due to the far distance from Copperbelt and Lusaka province where soya processors are located.	★★★☆☆ Fair
Chicken Meat	There are some broiler production activities near the FB.	The condition of internal roads in the FB is not convenient for distribution. There is no processor in the area.	Market potential of chicken meat is not so high due to the small population of the province.	★★☆☆☆ Poor
Cultured Fish	Not many aquaculture activities in the FB. However, plan of dam construction exists as a potential site for cage fish farming.	The condition of internal roads in the FB is not convenient for distribution. There is no cold chain system nor fish processing factory in the area.	Market potential of fish is not high compared to the site close to a big city such as Lusaka.	★☆☆☆☆ Very Poor

7. Environmental and Social Considerations

Current status of SEA/ESIA/RPF/RAP in entire FB	No assessment report has been developed except for Environmental and Social Framework enclosed to the F/S report for Kalungwidhi FB development.
Environmental sensitive area in and around FB[39]	50km from two National Parks named Nsumbu (IUCN Category: II), 1985 and Lusenga Plain (IUCN Category: II), 1971, and 5km from Mporokoso Forest Reserve 1967

Number of PAHs and PAPs	Nos of PAPs	Nos of PAHs	Others
Total Nos of PAHs and PAPs in Entire FB	N/A	4,268 HHs in 67 villages	―
Total Nos of PAHs and PAPs in Core Venture Plot (CVP)	N/A	N/A	N/A
-PAHs owning land with farm permit, living in CVP	N/A	N/A	N/A
-PAHs owning land without farm permits, living in CVP	N/A	N/A	N/A
-PAHs NOT owning land but living in CVP	N/A	N/A	N/A

[Key Findings / Remarks] Majority of areas where villages exist are earmarked for settlement site in the phase 1 project so involuntary resettlement is to be minimized (see gray color in the above map).

Languages spoken and its percentage	Bemba 99%, and Lungu 1%
Religion and its percentage	Christianity 99% and others 1%
Any important event, cultural activities by religion or ethnic group recognized by the community	Traditional ceremony (Ukusefya pa Ng'wena ceremony) Easter, Christmas, Lent
Any important traditional farming system recognized by each ethnic group (for example *Citemene* for Bemba people)	Conventional farming, *chitemene, fundikila*
Main economic activities	Subsistence farming, trading
Chiefdom in the area where FB located at	
Fundamental principle of resettlement and compensation to affected people	Not concretely determined yet, but to be determined by Kalungwishi FB Development Committee to be established in Phase 1 of the project.
Any economic activities to be restricted in FB area	To be determined by Kalungwishi FB Development Committee to be established in Phase 1 of the project.
Any non-economic activities to be restricted in FB area	Ditto
Existing land disputes	N/A

- Operation strategy is well planned. The function of the implementation body (Kalungwishi FB Development Corporation: KFBDC) to be established including "Use cost principle" for sustainable use of infrastructure and " Land Tenure System" in order to attract farmers from small to large, from corporate to family-owned and operated businesses, Title Deed for a piece of land will be issued only after 14 years of showing commitment to developing that land. This might be one of the good models for other FB developments.

8. Donors

China Railways Seventh Group	Kalungwishi FB Development (345 Million USD)

9. Other Remarks

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[39] UNEP-WCMC (2019), World Database on Protected Area (downloaded on May 22, 2019)

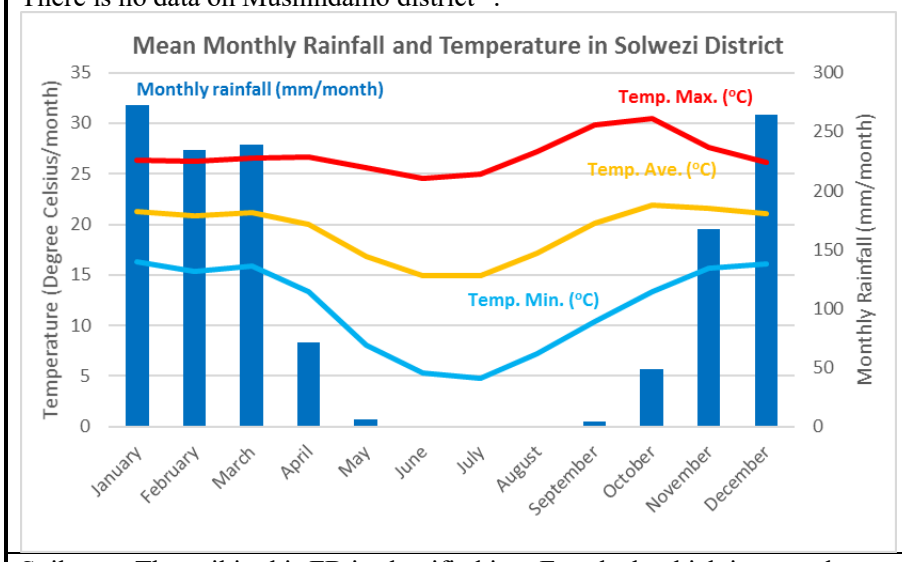
1. General Information

Province name and its population[40]	North Western: 926,485 (2019)
District name and its population	Mushindamo (former Solwezi): N/A
Latitude	S12°25' ~ 12°54'(WGS84)
Elevation (m.a.s.l)	1,200 ~ 1,360 m
FB Area	100,000 ha
FB year established	2008
Contact person	Mr. Nawa Mulope, Ag. SLHO
Accessibility	610 km from Lusaka

2. Natural Environment

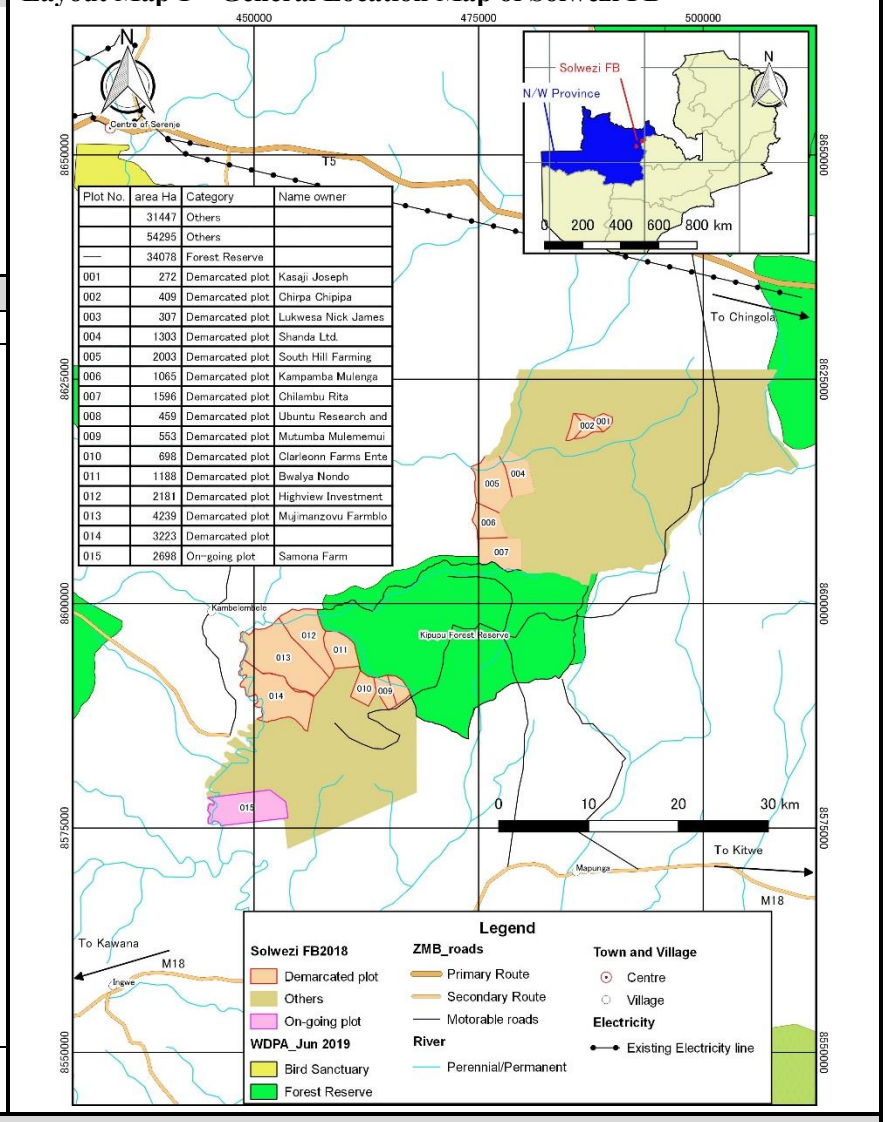
Agro-Ecological Zone: III (humid subtropical)[41]

The province on average throughout the year had at least 68 rain days with an average rainfall of at least 827.36 mm (2018). It had at least 153 rain days with an average rainfall of at least 1,918.03 mm in the previous year. Solwezi district counts rainfall of 87.18 mm on a monthly average (2018). There is no data on Mushindamo district[42].



Soil type: The soil in this FB is classified into Ferralsol, which is strongly weathered, low fertility and acid soil. The range of soil pH is 3.8-4.4.

Layout Map 1 General Location Map of Solwezi FB



Plot No.	area Ha	Category	Name owner
	31447	Others	
	54295	Others	
—	34078	Forest Reserve	
001	272	Demarcated plot	Kasaji Joseph
002	409	Demarcated plot	Chirpa Chipipa
003	307	Demarcated plot	Lukwesa Nick James
004	1303	Demarcated plot	Shanda Ltd.
005	2003	Demarcated plot	South Hill Farming
006	1065	Demarcated plot	Kampamba Mulenga
007	1596	Demarcated plot	Chilambu Rita
008	459	Demarcated plot	Ubuntu Research and
009	553	Demarcated plot	Mutumba Mulememui
010	698	Demarcated plot	Clarleonn Farms Ente
011	1188	Demarcated plot	Bwalya Nondo
012	2181	Demarcated plot	Highview Investment
013	4239	Demarcated plot	Mujimanzovu Farmblo
014	3223	Demarcated plot	
015	2698	On-going plot	Samona Farm

3. Basic Agricultural Information

Potential products:	Major crops: Maize, Rice, Millet, Soybean, Irish potato, Mixed beans, Sweet potato, Popcorn, Sugarcane Observation: Little production of fruits in this province, even though there is a potential to increase production. Some banana, mango, papaya, pineapple production without any management.		
Total arable land area (ha)	N/A	Current cultivation area (ha)	N/A
Potential irrigation area (ha)	N/A	Current irrigation area (ha)	0
Soybean cultivation area (ha)	0	Poultry farming area (ha)	0
Fish cultivation area (ha)	0	Number of existing cooperatives	0
Core investors (10,000ha scale)	Existing Number: 0 Potential Number: 0	Major products: -	
Commercial farmer (1,000-5,000ha)	Existing Number: 2 Potential Number: 8	Major products: Maize, Wheat, Stevia, Banana	
Medium scale farmer (100-1,000ha)	Existing Number: 0 Potential Number: 6	Major products: -	
Small farmer (0-100 ha)	Existing Number: Unknown Potential Number: Unknown	Major products:	

4. Infrastructure Development

Item	Current situation and problems/issues	Rate
Electricity	Electricity (33kV) is installed at the primary school located at the boundary of Solwezi FB. No other electricity lines inside the FB area. ZESCO is considering tapping electricity from Luano-Kasempa 66kV power line for supplying electricity to the southern part of Solwezi FB while there is no concrete plan.	★☆☆☆☆ Very poor
Internet access	Zamtel has installed a communication tower in Mujimanzovu Palace. This communication tower will provide 2G network to the entire area of the Southern part of Solwezi FB	★★☆☆☆ Poor
Irrigation infrastructure	Lunga River and its tributary can be the main irrigation source. The ministry of water has developed several irrigation facilities including a dam in the FB.	★☆☆☆☆ Very poor
Access Rd in FB	2 principle feeder road connecting the FB to T5, M8 and M18 are planned to upgrade to gravel road by RDA. Those roads will be improved by 2020 while its realizability is not clear due to the financial issue.	★☆☆☆☆ Very poor
Trunk road to FB	M18 road is planned to upgrade to DBST under the phase 2 (2016-2018) of Link Zambia 8000 program, while it has not been implemented.	★★★☆☆ Fair
Others if any (education, health facilities, etc.)	No particular information available	

5. Profiles of Existing Projects in FB

Project Name	Proponent & Fund	Project Outline (Product, By-product, Market, Project scale, Area in ha)	Total number of Beneficial Farmers or Households and their relationships	Total number of affected farmers or Households	Land Disputes (yes/no)	Status of RAP	Remarks, Observations
Samona Farm	Samona Farm Private	Soybean, Maize, Wheat, Stevia, Avocado, and Macadamia nuts. Currently selling stevia to Stevia processing company in Indonesia. Final destination for the consumption of Stevia is	Employing about 10 farmers. There is a possibility to increase the number of employees based on the development progress.	26 PAHs	Need reconfirmation but some farmers expressed their complaint against displacement.	N/A	—

[40] Central Statistical Office (2013) *2010 Census of Population and Housing, Population and Demographic Projections 2011- 2035*
[41] The Zambia Soil Health Consortium (n.d.) *Integrated Soil Fertility Management in Zambia*
[42] Climate Data Org, Solwezi District, https://en.climate-data.org/africa/zambia/north-western-province/solwezi-46472/

		China.					
Africa Garden	Africa Garden, Private	Fruit orchard (Banana, Mango), Soybean, Maize, Cattle, Piggery, Goat. Will start tomato, cabbage, and onion from 2019 season. Target market is Kasumbalesa in RDC.	AG is interested in contract farming with local farmers or renting a tractor with an operator for plowing smallholder's plots however non-rectangle plots with many stumps are unsuitable to start such business.	5 to 6 PAHs	Not confirmed	N/A	–

6. Agri-Business Potential

Product	Input & Production	Distribution & Processing	Sales & Consumption	Rate
Soybean	Input accessibility is not developed well although production potential of soybean is high.	Issue in transportation is the lack of road network in the FB. Soybean processing is not conducted in this area.	Market potential is relatively high due to the closer distance to Ndola where soybean processors are located.	★★★★☆ Good
Chicken Meat	There is a large number of broiler farms near the FB, but there is a limitation of the availability of input.	The condition of internal roads in the FB is not convenient for distribution. There is no processor in the area.	Market potential is not so high, due to the small population of the province.	★★☆☆☆ Poor
Cultured Fish	Not many aquaculture activities in the FB. Plan of dam construction, as a potential site for cage fish farming, has not been identified.	The condition of internal roads in the FB is not convenient for distribution. There is no cold chain system nor fish processing factory in the area.	Proximity to Copperbelt province and DR Congo might be considered as a market advantage.	★★☆☆☆ Poor

Other potential crops to be noted:
According to the ZDA report, pineapples, cassava, soybeans, maize, sunflowers, sweet potatoes, etc. are listed as crops with high investment potential in Copperbelt Province. Moreover, considering local climatic conditions, the FB is suitable for growing wheat and fruit trees such as banana, avocado, cashew nut, and citrus.

7. Environmental and Social Considerations

Current status of SEA/ESIA/RPF/RAP in entire FB	EIA planned. RAP not started.
Environmental sensitive area in and around FB[43]	Solwezi FB North and South sandwich Kipupu Forest Reserve, 1961. In other words, Kipupu Forest Reserve was excluded from the development area. In addition, the north border of Solwezi FB lies adjacent to Lamba Headwaters Forest Reserve, 1978. A bird sanctuary near the Solwezi town reported by WDPA is not recognized by Zambia Bird Watch and hence available bird species are not sure.

Number of PAHs and PAPs	Nos of PAPs	Nos of PAHs	Others
Total Nos of PAHs and PAPs in Entire FB	N/A	N/A	N/A
Total Nos of PAHs and PAPs in Core Venture Plot (CVP)	N/A	N/A	N/A
-PAHs owning land with farm permit, living in CVP	N/A	N/A	N/A
-PAHs owning land without farm permits, living in CVP	N/A	N/A	N/A
-PAHs NOT owning land but living in CVP	N/A	N/A	N/A

[Key Findings / Remarks]
- Estimated number of the population in Solwezi FB is 6,050 population with 850 households. Breakdown is as follows;
  - North: Section A: 250 Households with 1,250 people in 50 villages and Section B: 200 households with 1,000 people in 40 villages.
  - South: 400 households with 3,800 people.
- Many investors have been processing their land title in the FB, but land plotting of the FB has not been completed.
- It is important to involve all the stakeholders (residents of the FB and chiefs) in every step of the development of the FB. Otherwise, social conflict will likely to happen. In the event of a conflict, people go to a chief for advice. Chiefs have their council (advisors). So, chiefs are the key to mediate the conflict.

Languages spoken and its percentage	Lamba, Kaonde
Religion and its percentage	Mostly Christian
Any important event, cultural activities by religion or ethnic group recognized by the community	*Lubinda Ntonga* ceremony by Kaonde people
Any important traditional farming system recognized by each ethnic group (for example *Citemene* for Bemba people)	No
Main economic activities	Farming
Chiefdom in the area where FB located at	Not confirmed but two chiefs alienated their lands to the FB development
Fundamental principle of resettlement and compensation to affected people	Not determined yet
Any economic activities to be restricted in FB area	Not determined yet
Any non-economic activities to be restricted in FB area	Not determined yet
Existing land disputes	Not confirmed.

- Although no specific development progress has been made in Solwezi FB, in other words, there is room to formulate plans with residents' active participation.
- Like Manshya FB, limitation or change of land use and natural resource usage due to the FB development is concerned if residents are not properly involved in the planning stage.
- Sustainable forest management plan for Kipupu Forest Reserve should be developed, because the direct and indirect impact on the ecosystem, natural resources, etc. in the reserve is anticipated.

8. Other Donors

JICA	A part of the target area of "Expansion of Community-Based Smallholder Irrigation Development Project (E-COBSI)" exists in Solwezi FB.

9. Other Remarks

In this province, vast areas of land are not cultivated and for the development of agriculture, a market of agricultural products is a major challenge. The development of the FB (Access to the market, skill development, and potential of new crops (e.g. tomato)) would be a driver to develop the market of agricultural products and the agricultural sector.

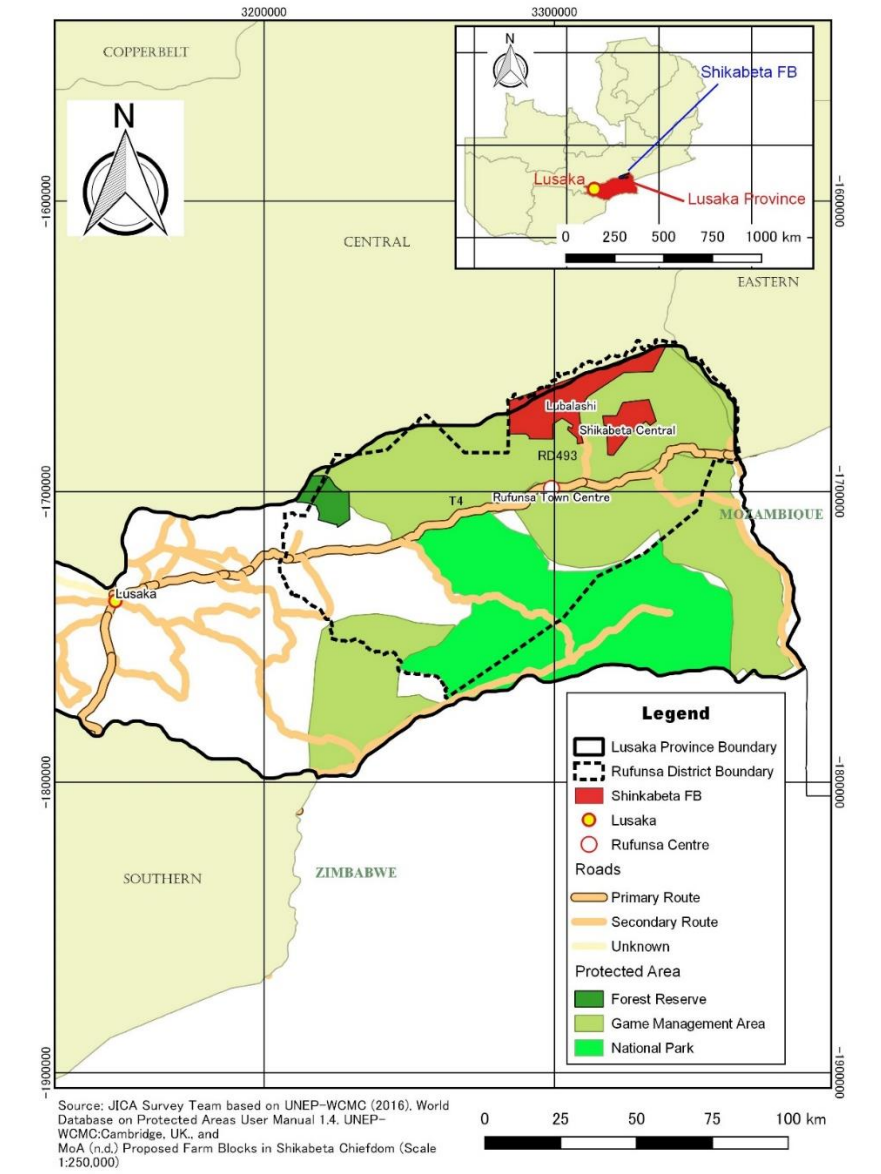
Finance is the biggest problem of the project. The land is given for the FB in 2008, but nothing is implemented except for the formulation of layout and plotting some lands to some investors. They have submitted all the documents to implement a baseline survey to the Ministry of Agriculture, but no budget is allocated so far.

[43] UNEP-WCMC (2019), World Database on Protected Area (downloaded on May 22, 2019)

1. General Information

Province name and its population[44]	Lusaka: 3238,430 (2019)
District name and its population	Rufunsa (Former Chongwe: 255,981 in 2019 and 355,313 projection in 2035)
Latitude	S. 14° 38' ~ 14° 58' (WGS84)
Elevation (m.a.s.l)	470 ~ 1,050 m
FB Area	74,427.25 ha
FB year established	2011
Contact person	Mr. Lngu Moses, Senior land Husbandry officer. Cell:+260953110861 Email:mosesing50@yahoo.com
Accessibility	190km (3 hours by car) from Lusaka to Shikabeta FB via Route T4 (The Great Easter Road) and RD 493.

Layout Map 1 General Location Map of Shikabeta FB



Source: JICA Survey Team based on UNEP-WCMC (2016), World Database on Protected Areas User Manual 1.4. UNEP-WCMC:Cambridge, UK., and
MoA (n.d.) Proposed Farm Blocks in Shikabeta Chiefdom (Scale 1:250,000)

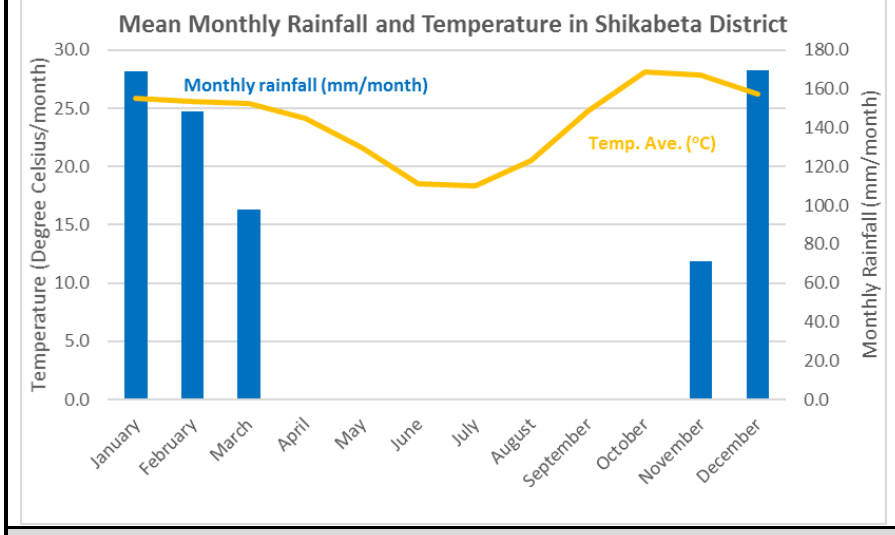
2. Natural Environment

Agro-Ecological Zone[45]: I (Annual rainfall amount is less than 800mm)

Meteorological characteristics[46]

- Average monthly precipitation (mm) in the FB (2014-2018): Max 156-184; Min 0
- Average monthly temperature: Max 28.01-28.35; Min 18.15-18.40
- Average monthly humidity (%): Max 85.00-85.40; Min 1.10-2.43
- Annual sunshine duration (hour): Max 13.00-13.02; Min 11.00-11.90

The soil characteristics along the Lunsemfwa River being the major source of water are generally alluvial soils rich in organic matter. The upland soils are well-drained Loamy clays. Some portions of the FB are mountainous.



3. Basic Agricultural Information

Potential products:	Maize, Soybean, Sorghum, Vegetables, Poultry and Goat ranching		
Total arable land area (ha)	14,821.75 ha	Current cultivation area (ha)	552 ha
Potential irrigation area (ha)	14,821.75 ha	Current irrigation area (ha)	552 ha
Soybean cultivation area (ha)	23 ha	Poultry farming area (ha)	No data in ha but almost all villages rear chicken
Fish cultivation area (ha)	N/A	Number of existing cooperatives	N/A
Core investors (10,000ha scale)	Existing Number: 0 Planned Number: 0	Major products: -	
Commercial farmer (1,000-5,000ha)	Existing Number: 0 Planned Number: 0	Major products: -	
Medium scale farmer (100-1,000ha)	Existing Number: 1 Planned Number: 14	Major products: Irish potatoes and Fruit vegetable	
Small farmer (0-100 ha)	Existing Number: 181 Planned Number: 140	Major products: Irish potatoes	

4. Infrastructure Development

Item	Current situation and problems/issues	Rate
Electricity	50% of poles only for School. Planned to tap electricity from School to Shikabeta Irrigation company. Poles and lines being erected. Some farmers are using solar power panels and batteries for phone call communication.	★★☆☆☆ Poor
Internet access	Currently no internet access at all. To upgrade the phone network.	★☆☆☆☆ Very poor
Irrigation infrastructure	552ha to be Irrigated by Shikabeta irrigation company. Future plan is to utilize water from perennial river Lunsenfa, but the problem is a lack of electricity.	★★☆☆☆ Poor
Access Rd in FB	Rain season becomes impassable and it should be upgraded to all-weather roads.	★☆☆☆☆ Very poor
Trunk road to FB	Trunk road, the Great East Road, an only highway linking Eastern Province with the rest of the country, and also the major link between Zambia and Malawi and between Zambia and northern Mozambique is in good condition though it needs periodical maintenance. RD 493 with 30km in length between Karoma to the FB needs pavement.	★★★★☆ Good
Others if any (education, health facilities, etc.)	Only primary school and rural health center are available. Upgrading to full boarding secondary school and hospital is planned respectively. Building of a police post is also planned.	★★★☆☆ Fair

5. Profiles of Existing Projects in FB

Project Name	Proponent & Fund	Project Outline (Product, By-product, Market, Project scale, Area in ha)	Total number of Beneficial Farmers or Households and their	Total number of affected farmers or Households	Land Disputes (yes/no)	Status of RAP	Remarks, Observations

[44] Central Statistical Office (2013) *2010 Census of Population and Housing, Population and Demographic Projections 2011- 2035*
[45] The Zambia Soil Health Consortium (n.d.) *Integrated Soil Fertility Management in Zambia*
[46] Questionnaires filled by DACO, Rufunsa District, Lusaka Province

			relationships				
Shikabeta Irrigation Company	Shikabeta Irrigation Company	Registered in 2019 and started land clearing for rice, wheat, and sugarcane production to be sold to Lusaka. Establishment of a processing and packaging yard is planned.	N/A	N/A	under the current law, part of the FB land is under Game animal corridor. Therefore, very little Agricultural activities can be done as at now that is how the dispute comes in.	N/A	–

6. Agri-Business Potential

Product	Input & Production	Distribution & Processing	Sales & Consumption	Rate
Soybean	Input accessibility is relatively good. Rainfall is not sufficient for rainfed soybean cultivation.	Current road network in the FB is not convenient for soybean distribution. Soybean processing is not conducted in this area	Soybean market potential is high in the aspect of the close location to Lusaka.	★★★☆☆ Fair
Chicken Meat	Input accessibility is relatively good. There are a large number of large-scale broiler farms near the FB.	The condition of internal roads in the FB is not convenient for distribution. There are several processing firms near the FB	Proximity to Lusaka is considered a market advantage.	★★★★☆ Good
Cultured Fish	Not many aquaculture activities in the FB. Plan of dam construction, as a potential site for cage fish farming, has not been identified.	The condition of internal roads in the FB is not convenient for distribution. There is no cold chain system nor fish processing factory in the area.	Proximity to Lusaka is considered a market advantage.	★★☆☆☆ Poor

7. Environmental and Social Considerations

Current status of SEA/ESIA/RPF/RAP in entire FB	EIA for the entire FB is yet to be carried out. The project model does not require a resettlement action plan (RAP) since people do not need to be resettled.
Environmental sensitive area in and around FB[47]	Shikabeta FB is located within Luano Fame Management Area (GMA) (IUCN Category IV), 1971. Within 30km from the FB boundary, there are three more Protected Areas named; West Petauke Game Management Area (GMA), IUCN category VI, 1971, Lower Zambezi National Park, (IUCN Category II), 1983, and Rufunsa GMA, IUCN category IV, 1980. Above includes Primeval forests, tropical natural forests, Ecologically important habitats, and Areas that run the risk of a large scale increase in soil salinity or soil erosion

Number of PAHs and PAPs[48]	Nos of PAPs	Nos of PAHs	Others
Total Nos of PAHs and PAPs in Entire FB	N/A	N/A	Population in 2012 in the FB was 1,428 persons and 261 HHs. At this stage, it is not clear if they are to be affected or not.
Total Nos of PAHs and PAPs in Core Venture Plot (CVP)	CVP not identified	CVP not identified	–
-PAHs owning land with title deed, living in CVP	CVP not identified	CVP not identified	–
-PAHs owning land without title deed, living in CVP	0	0	–
-PAHs NOT owning land but living in CVP	N/A	N/A	N/A

[Key Findings / Remarks]
- The project requirement is to leave the current residents in the FB in their respective areas and provide support in terms of capacity building.
- An evaluation for tree crops, houses and other unmovable assets as used to value the compensation package. However, Shikabeta FB does not need to compensate anyone.
- The above census survey was carried out by PACO in 2012, hence it should be updated to capture the current population and their settlement pattern, etc.
- All residents in the Shikabeta FB do not have land title deeds.

Languages spoken and its percentage	Soli-85% and Nyanja 15%
Religion and its percentage	Christians: 100%
Any important event, cultural activities by religion or ethnic group recognized by the community	Traditional ceremony called as *Nkomba lyanga*
Any important traditional farming system recognized by each ethnic group (for example *Citemene* for Bemba people)	*Ukubunga* and *Madimba* (*Ukubunga*: It involves cutting shrubs in the field and heaping them. Then the cut material is burnt after drying. *Madimba* is a practice of planting crops in winter in alluvial soils along the banks of Lunsefwa River utilizing the residue moisture in the soil)
Main economic activities	Farming, small livestock rearing and fishing
Chiefdom in the area where FB located at	Chieftainess Shikabeta
Fundamental principle of resettlement and compensation to affected people	No resettlement and no compensation
Any economic activities to be restricted in FB area	Not determined yet
Any non-economic activities to be restricted in FB area	Not determined yet
Existing land disputes	Not confirmed

- The FB is located in GMA. Solution is the change of land use classification from GMA to Agricultural use. A process, which has started through Department of Wildlife and Tourism. Under the current law, part of the FB land is under Game animal corridor. Therefore very little Agricultural activities can be done as at now that is how the dispute comes in. The game management committee declaring interest while on the other hand, MOA wants the land for the FB development. The process of changing land use policy from GMA to Agricultural use has already started and will be completed by November 2019.

8. Donors

–	–

9. Other Remarks

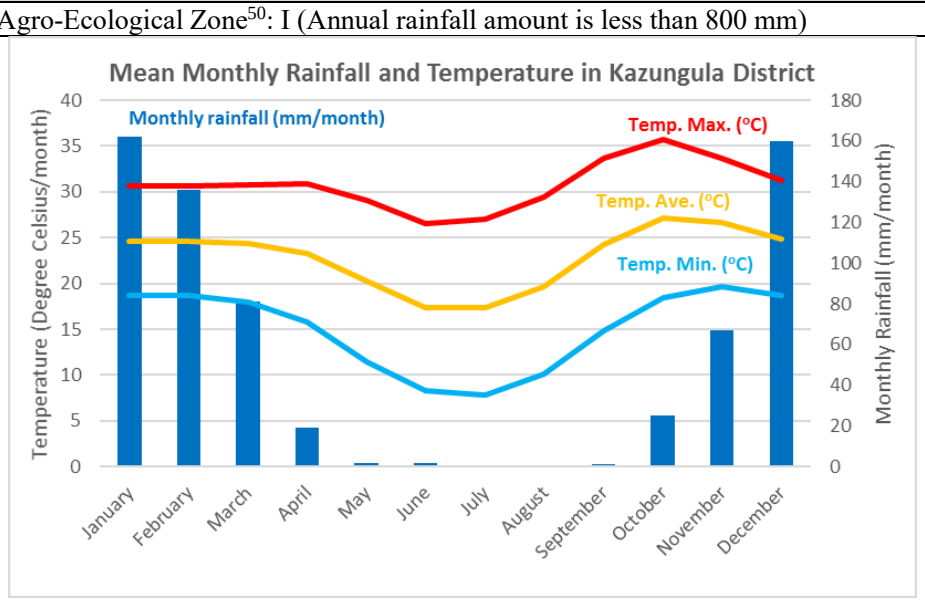
Major challenge is financing. No funding since 2012.

[47] UNEP-WCMC (2019), World Database on Protected Area (downloaded on May 22, 2019)
[48] PACO (2012) *Field Report on the Social survey in her royal highness Chieftainess Shikabeta's Chiefdom*

1. General Information	
Province name and its population[49]	Southern: 2,077,229 in 2019 and 3,184,855 in 2035 projection
District name and its population	Kazungula: 154,995 in 2019 and 289,947 in 2035 projection.
Latitude	S17° 10' ~ 17° 25' (WGS84)
Elevation (m.a.s.l)	990 ~ 1,150
FB Area	116,762 ha
FB year established	2011
Contact person	Moonga Blesswell Hwula, Senior Land Husbandry Officer, Cell: +260 977 846 444 Email: mhwula@gmail.com
Accessibility	460km (about 6 hours by car)

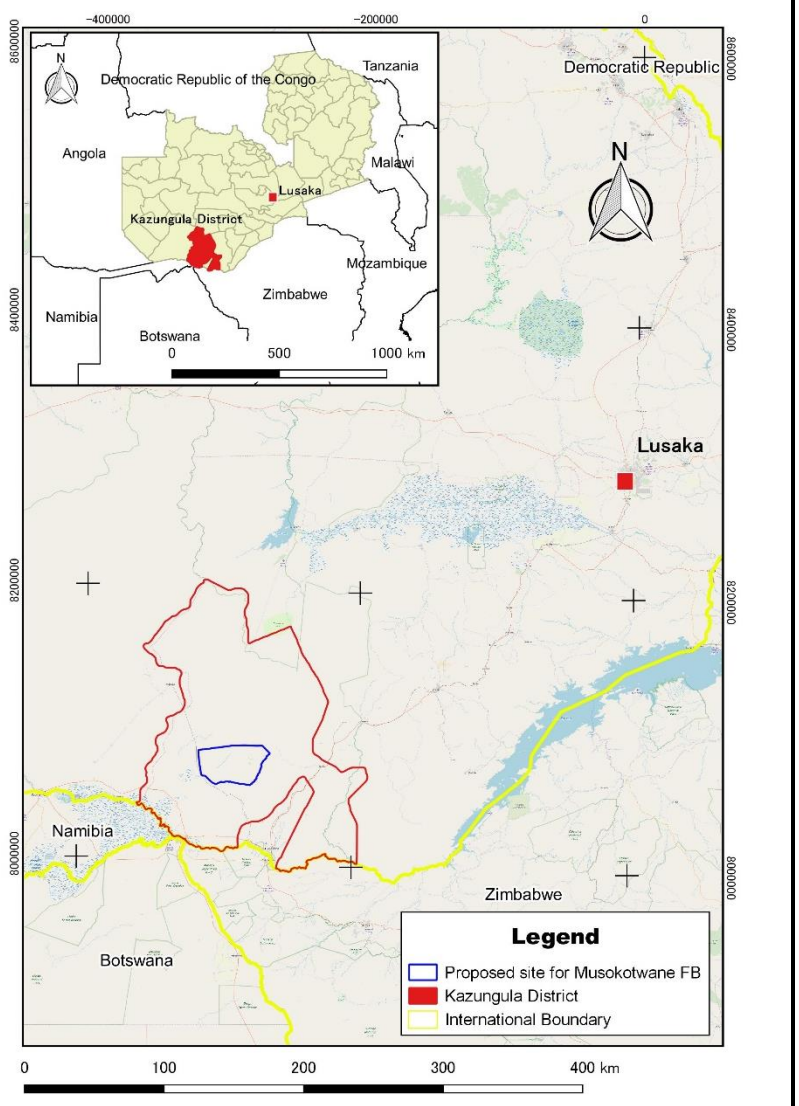
2. Natural Environment

Agro-Ecological Zone[50]: I (Annual rainfall amount is less than 800 mm)



Between the driest and wettest months, the difference in precipitation is 162 mm. The variation in temperatures throughout the year is 9.7 °C.[51]

Layout Map 1 General Location Map of Musokotwane FB



3. Basic Agricultural Information			
Potential products:	Millet, Sorghum, Maize, Sugarcane, Cotton, Tobacco, Cattle Ranching, Dairy, Piggery, Poultry, Fish farming		
Total arable land area (ha)	N/A	Current cultivation area (ha)	N/A
Potential irrigation area (ha)	N/A	Current irrigation area (ha)	N/A
Soybean cultivation area (ha)	N/A	Poultry farming area (ha)	N/A
Fish cultivation area (ha)	N/A	Number of existing cooperatives	ZNFU KAZUNGULA exists with 1,680 members.
Core investors (10,000ha scale)	Existing Number: 0 Potential Number: N/A	Major products: N/A	
Commercial farmer (1,000-5,000ha)	Existing Number: 0 Potential Number: N/A	Major products: N/A	
Medium scale farmer (100-1,000ha)	Existing Number: 0 Potential Number: 50	Major products: Cotton, Sorghum, and Sunflower	
Small farmer (0-100 ha) **Note: This is just existing farmers, but not settlers for the FB program specifically.**	Existing Number:3,400 Potential Number: 5,000	Major products: Maize, Groundnuts, cotton, cowpeas, sorghum, sunflower	

4. Infrastructure Development

Item	Current situation and problems/issues	Rate
Electricity	Power transmission line of 33kV has been extended to Kantumbi in the FB. Electricity will be available once rehabilitation of the existing transmission line between Smonga and Sekute is completed by ZESCO. Electricity poles have already been put in Kanchele school, Kanchele market, Katumbi school and Nanyati Rural Health center. DACO is planning to connect to two more schools that are not connected and other farmsteads. Estimated number of current benefited households by electrification is 500 HHs, but the percentage installed is only 15%.	★★★☆☆ Fair
Internet access	There is Airtel and Zamtel tower 17km away at Makunka. Estimated number of current benefited households by communication tower is 850 HHs, the percentage network coverage is 60%. DACO is planning to do lobby service providers to put internet towers in the FB area.	★★☆☆☆ Poor
Irrigation infrastructure	N/A.	★☆☆☆☆ Very poor
Access Rd in FB	There are few roads in the FB opened by the local community (Percentage installed is only 20%). DACO is planning to gravel the access roads.	★☆☆☆☆ Very poor
Trunk road to FB	It will take around two hours from Living stone to Kantumbi in the FB through M10 and R153. R153 is an unpaved and narrow road passing two drifts that will not be passable if the volume of water flow is too much during the rainy season. 70% of the planned work was completed and 3,000 HHs are benefitted by this road. Another route from Livingstone to the FB takes T1, U4K and U2. It is a wider and better condition than R153, but it takes four hours to reach the FB. RDA Southern province office plans to include upgrading and rehabilitation R153 and U2 into Road Sector Investment Program (2020-2030) including paving between Smonga and Nyawa and putting bridges at Ngweze and Nanyati rivers	★★★☆☆ Fair
Others if any (education, health facilities, etc.)	Livingstone International Airport exists at Livingstone. It has a 3,000m length landing field and a vast field where storage can be constructed. There are four government schools and four community schools in the FB. There is a clinic in the FB but it needs to be upgraded	★★★☆☆ Fair

[49] Central Statistical Office (2013) *2010 Census of Population and Housing, Population and Demographic Projections 2011- 2035*
[50] The Zambia Soil Health Consortium (n.d.) *Integrated Soil Fertility Management in Zambia*
[51] Climate-Data Org. Kazungula District, https://en.climate-data.org/africa/zambia/southern-province/kazungula-919897/ (Downloaded June 11, 2019)

5. Profiles of Existing Projects in FB

Project Name	Proponent & Fund	Project Outline (Product, By-product, Market, Project scale, Area in ha)	Total number of Beneficial Farmers or Households and their relationships	Total number of affected farmers or Households	Land Disputes (yes/no)	Status of RAP	Remarks, Observations
N/A							

6. Agri-Business Potential

Product	Input & Production	Distribution & Processing	Sales & Consumption	Rate
Soybean	Input accessibility is not well developed. Rainfall is not sufficient for soybean cultivation.	Road network is not developed, which makes soybean transportation difficult. Soybean processing is not conducted in this area.	Market potential of soybean is relatively low due to the far distance to Lusaka and Copperbelt.	★☆☆☆☆ Very poor
Chicken Meat	There is a limitation of the accessibility of inputs.	Road network is not developed, which makes chicken transportation difficult. There is no processor in the area.	Market potential of chicken meat is not so high due to the small population of the province.	★☆☆☆☆ Very poor
Cultured Fish	Not many aquaculture activities in the FB. Plan of dam construction, as a potential site for cage fish farming, has not been identified.	The condition of internal roads in the FB is not convenient for distribution. There is no cold chain system nor fish processing factory in the area.	Market potential of fish is not high compared to the site close to a big city such as Lusaka.	★☆☆☆☆ Very poor

7. Environmental and Social Considerations

Current status of SEA/ESIA/RPF/RAP for entire FB	No study has been conducted.
Environmental sensitive area in and around FB[52]	Surrounding Protected Areas (PAs) are Sichifula Game Management Area (GMA), IUCN Category IV, 1971 and three Forest Reserves named Zimba Hills 1967, Bovu 1952, and Martin 1953 with isolation distances of 10 to 30 km from the boundary of the proposed FB.

Number of PAHs and PAPs	Nos of PAPs	Nos of PAHs	Others
Total Nos of PAHs and PAPs in Entire FB	Not identified yet	Not identified yet	Survey is not yet done to determine the people to be affected, but the current number of small scale farmers in the FB is 3,400 HHs (19,800 persons) Among this, 7,000 people reside in Nanyati catchment area.
Total Nos of PAHs and PAPs in Core Venture Plot (CVP)	ditto	ditto	―
-PAHs owning land with farm permit, living in CVP	ditto	ditto	―
-PAHs owning land without farm permits, living in CVP	ditto	ditto	―
-PAHs NOT owning land but living in CVP	ditto	ditto	―
[Key Findings / Remarks]			

Languages spoken and its percentage	Toka-Leya/ more than 95% and Tonga less than 5%
Religion and its percentage	Christianity/ more than 60%
Any important event, cultural activities by religion or ethnic group recognized by the community	Lukuni lu zwa Luka ceremony to celebrate the harvest.
Any important traditional farming system recognized by each ethnic group (for example *Citemene* for Bemba people)	winter ploughing
Main economic activities	Agriculture
Chiefdom in the area where FB located at	Chief Musokotwane
Fundamental principle of resettlement and compensation to affected people	Displaced persons should be engaged and compensated accordingly
Any economic activities to be restricted in FB area	Not determined yet
Any non-economic activities to be restricted in FB area	Not determined yet
Existing land disputes	Not confirmed

8. Donors

―	―

9. Other Remarks

Land alienation process has not been completed. The FB is still customary land and not alienated as state land as of December 2019.

[52] UNEP-WCMC (2019), World Database on Protected Area (downloaded on May 22, 2019)

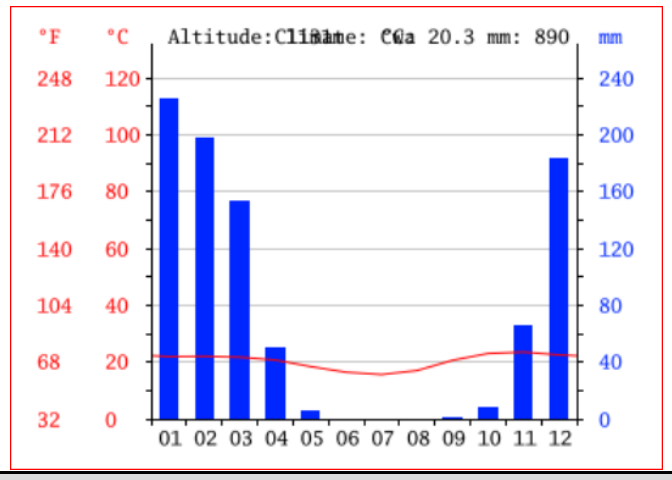
1. General Information

Province name and its population[53]	Eastern Province
District name and its population	Lundazi District
Latitude (Lundazi)	12°17'34.51"S, 33°10'41.52"E.
Elevation (m.a.s.l) (Lundazi)	1,103m
FB Area	100,000ha(54,200ha/45,800ha)
FB year established	2008
Contact person	PACO: Mr. Alex Chilala.Provincial Agricultural Coordinator, Eastern Province chilalaalex@gmail.com DACO:Mr. Michael Ngulube,District Agricultural Coordinator ,Lundazi ,ngulubemichael@yahoo.com
Accessibility	20minutes from Lundazi town by car

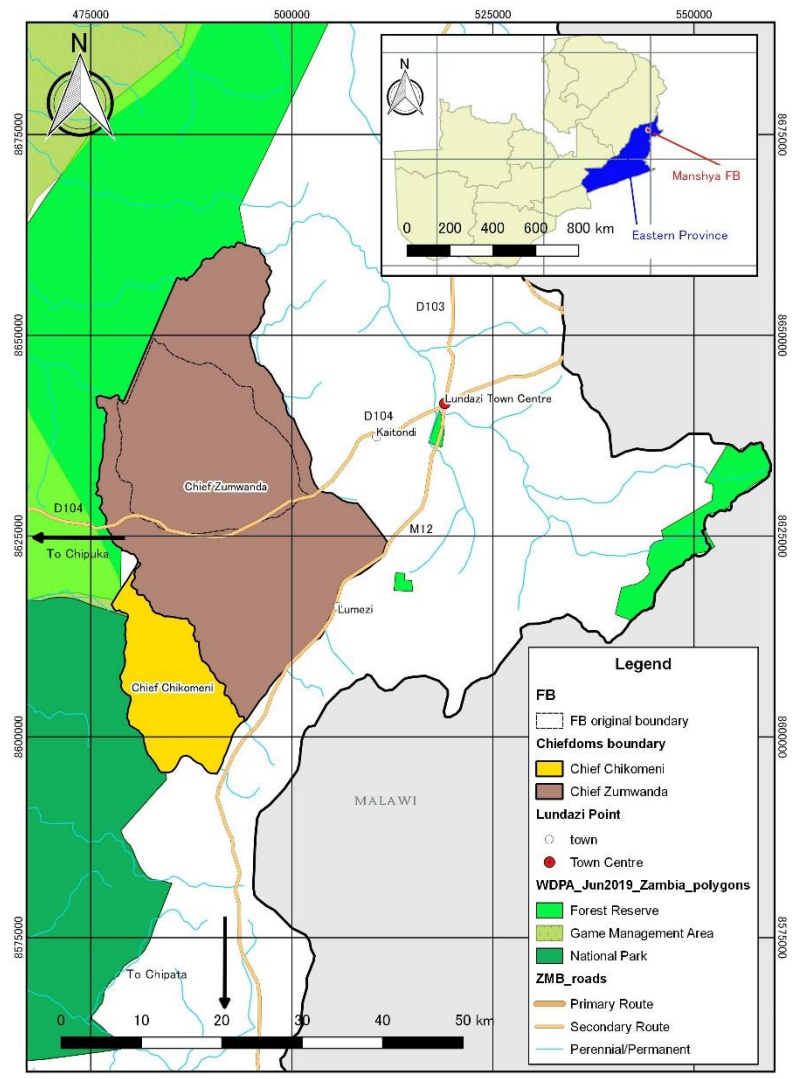
2. Natural Environment

Agro-Ecological Zone[54]: IIa (Annual rainfall amount is between 800 to 1,000mm)

- Water reservoir is existing
- Drought is a serious problem (rainfall day/year:54～71 for latest 5years)
- The highest temperature 36.2 ºC and the lowest was 9.0ºC.
- Pollutions in the air, water, soil
- There is a national park inside the FB



Layout Map 1 General Location Map of Chikumibiro FB



3. Basic Agricultural Information

Potential products:	Maize, Rice, Soybean, Groundnut, Sunflower, Cotton, Wheat, Tobacco, Sorghum, Millet, Vegetable, other beans		
Total arable land area (ha)	54,200ha	Current cultivation area (ha)	According to the Socio-Economic survey（SES）, 3,813.5ha
Potential irrigation area (ha)	According to SES, three dams are identified. 10ha can be irrigated by one dom. Therefore, the potential irrigation area is 30ha. There is a possibility of underground water irrigation. Pivot irrigation can irrigate 120ha/point, but the volume of underground water is unknown.	Current irrigation area (ha)	0
Soybean cultivation area (ha)	N/A	Poultry farming area (ha)	N/A
Fish cultivation area (ha)	N/A	Number of existing cooperatives	28
Core investors (10,000ha scale)	Existing Number: 0 Potential Number: 1 Major products: cotton, soybeans, groundnuts		
Commercial farmer (1,000-5,000ha)	Existing Number: 0 Potential Number: 0 Major products: -		
Medium scale farmer (100-1,000ha)	Existing Number: 0 Potential Number: 0 Major products: -		
Small farmer (0-100 ha)	Existing Number: 0 Potential Number: 0 Major products: -		

4. Infrastructure Development

Item	Current situation and problems/issues	Rate
Electricity	No electricity is reached. ZESCO plans to extent national grid from Chipata camp in the FB to Chamma via Lundazi town	★☆☆☆☆ Very poor
Internet access	Internet access only for mobile phones.	★★☆☆☆ Poor
Irrigation infrastructure	No. There is a plan to develop three dams in the FB	★☆☆☆☆ Very poor
Access Rd in FB	Yes, but not asphalt, need to use other roads in the rainy season	★★☆☆☆ Poor
Trunk road to FB	Yes, but not asphalt	★★☆☆☆ Poor
Others if any (education, health facilities, etc.)	One elementally junior school, One health post	★★☆☆☆ Poor

5. Profiles of Existing Projects in FB

Project Name	Proponent & Fund	Project Outline (Product, By-product, Market, Project scale, Area	Total number of Beneficial Farmers or	Total number of affected farmers or Households	Land Disputes (yes/no)	Status of RAP	Remarks, Observations

[53] Central Statistical Office (2013) *2010 Census of Population and Housing, Population and Demographic Projections 2011- 2035*
[54] The Zambia Soil Health Consortium (n.d.) *Integrated Soil Fertility Management in Zambia*

		in ha)	Households and their relationships				

No project exists

6. Agri-Business Potential

Product	Input & Production	Distribution & Processing	Sales & Consumption	Rate
Soybean	There is no available information regarding input accessibility. Soya production is suitable in this area.	Internal road network in the FB needs to be improved for better transport of soybean. Soya processing is not conducted.	Market potential is relatively high due to the presence of major aggregators in the area such as COMACO.	★★★★☆ Good
Chicken Meat	There is a small number of broiler farms near the FB.	Internal road network in the FB needs to be improved for better transport of chicken. There is no processor in the area.	Market potential of chicken meat is not so high due to the small population of the province.	★☆☆☆☆ Very Poor
Cultured Fish	Not many aquaculture activities in the FB. However, some dam construction sites, where might be potential sites for cage fish farming, are identified.	The condition of internal roads in the FB is not convenient for distribution. There is no cold chain system nor fish processing factory in the area.	Market potential of fish is not high compared to the site close to a big city such as Lusaka.	★☆☆☆☆ Very Poor

7. Environmental and Social Considerations

Current status of SEA/ESIA/RPF/RAP in entire FB	N/A
Environmental sensitive area in and around FB[55]	Southwestern boundary of Chikumbilo FB lies adjacent to Lukusuzi National Park, 1971 (IUCN Category: II) while the western boundary of the same adjacent to Lundazi Forest Reserve, 1978.

Number of PAHs and PAPs	Nos of PAPs	Nos of PAHs	Others
Total Nos of PAHs and PAPs in Entire FB	N/A	N/A	N/A
Total Nos of PAHs and PAPs in Core Venture Plot (CVP)	N/A	N/A	N/A
-PAHs owning land with farm permit, living in CVP	N/A	N/A	N/A
-PAHs owning land without farm permits, living in CVP	N/A	N/A	N/A
-PAHs NOT owning land but living in CVP	N/A	N/A	N/A

[Key Findings / Remarks]

Languages spoken and its percentage	Tumbuka and Chewa
Religion and its percentage	Christianity
Any important event, cultural activities by religion or ethnic group recognized by the community	N/A
Any important traditional farming system recognized by each ethnic group (for example *Citemene* for Bemba people)	N/A
Main economic activities	agriculture
Chiefdom in the area where FB located at	2 Chiefdoms
Fundamental principle of resettlement and compensation to affected people	The area with the least farmers is earmarked for CV. There are 500 to 1,000 residents estimated in the FB area, who will be targeted as relocations.
Any economic activities to be restricted in FB area	N/A
Any non-economic activities to be restricted in FB area	N/A
Existing land disputes	N/A

[Expected positive impacts]
- Livelihood improvement through formal/informal employment
- Better accessibility to social infrastructures (better roads, school, clinic, Water supply)
- Better accessibility to the market
- The existing population in the customary area are very content with the approach of non-displacement and associated benefits of the FB.

[Expected negative impacts]
- Physical displacement to the place without social infrastructure

[Recommendations]
- Conduct a socio-economic survey to both customary areas because the survey conducted for the first part (54200ha) is also out of date.
- Implementation of the stakeholder meeting with meaningful participation to improve community's awareness.
- Start the development of infrastructure and fix CV before farmers lose interest.
- Conduct a field trip to the successful FB for potential out-growers in the FB to keep them motivated.

8. Donors

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9. Other Remarks

If no development occurs, the chiefdom may lose momentum to provide his land.

If farmers need to be relocated, they request not only farmland but basic social infrastructures such as schools and clinics.

[55] UNEP-WCMC (2019), World Database on Protected Area (downloaded on May 22, 2019)

Summary of Farm Block Inventory Sheet (1/2)

SN	FB Name	FB Area (ha)	District	Province	Distance from Lusaka (km)	Agro Econological Zone	Potential products[1]		Agricultural Business Potential									Infrastructure Development				
							Crops, Veg, and Fruits	Livestock & Fisheries	Potential irrigation area (ha)	Access to the (potential) markets	Estimated Population within the FB	Progress of investment (e.g. number of companies invested/decided to invest)	Other business potential, if any	FVC development potential of Soya Bean	FVC development potential of Chicken Meat	FVC development potential of Fresh-fish	Risks in business development[2]	Electricity	Telecommunications and internet	Irrigation infrastructure	Access Road to FB	Feeder Roads in FB
1	Nansanga	133,000	Serenje	Central	490	III	Maize, Cotton, Tobacco, Groundnuts, Soybean	Cattle Ranching, Fish farming, Small-Ruminants, Poultry, Dairy	D.D.	Potential Market is not identified because Core Venture is not existing..	In entire FB: D.D. In CVF: 91 HHs (556 persons)	CV: 0 exist and 0 planned, Commercial: 1 exist and 2 planned, Medium: 47 exist and 0 planned		★★★★☆ Good	★★☆☆☆ Poor	★★★☆☆ Fair		★★☆☆☆ Poor	★☆☆☆☆ Very Poor	★★☆☆☆ Poor	★★★★☆ Good	★★★☆☆ Fair
2	Luena	100,000	Kawambwa	Luapula	930	III	Oil palm, Team Maize, Millet	Small Ruminants, Fish farming, Cattle Ranching	D.D.	One of Potential markets is in Lubunbashi in RDC. Mwenda Kashiba Road Project including bridge construction connecting DRC and Zambia is under study by GED/AFDB.	8,000 HHs (47,700 persons)	CV: 2 exist and 0 planned, Commercial: 2 exist and 6 planned, Medium: 0 exist and 0 planned		★★★☆☆ Fair	★★☆☆☆ Poor	★★☆☆☆ Poor		★★★☆☆ Fair	★★★☆☆ Fair	D.D.	★★★★☆ Good	★★☆☆☆ Poor
3	Kalumwange	140,000	Kaoma	Western	460	IIa	Cashew nut, Cassava, Millet, Sorghum, Rice, Maize	Cattle Ranching, Small Ruminants, Fish farming, Dairy	D.D.	Potential Market is not identified because Core Venture is not existing..	1,700 HHs (8,900 persons)	Nil.	Tobacco (JTI) exists	★★☆☆☆ Poor	★★☆☆☆ Poor	★☆☆☆☆ Very Poor		★☆☆☆☆ Very Poor	★★☆☆☆ Poor	★☆☆☆☆ Very Poor	★★★☆☆ Fair	★★☆☆☆ Poor
4	Luswishi	100,000	Lufwanyama	Copper-Belt	490	III	Maize, Horticulture, Coffee, Soybean	Cattle Ranching, Dairy and Poultry	87,669 ha	Ndola, Kitwe, Lusaka and Lubumbashi in RDC is 160km, 100km, 480km, and 220km from Luswishi FB respectively.	In entire FB area: above 940 HHs (above 4,890 persons) In Cadastral area: more than 345 HHs (1,725 persons)	CV: 0 exist and 1 planned Commercial: 4 exist and 2 planned, Medium: 300 exist and 0 planned		★★★★★ Very Good	★★★★☆ Good	★★★☆☆ Fair		★☆☆☆☆ Very Poor	★★☆☆☆ Poor	★☆☆☆☆ Very Poor	★★★★☆ Good	★★☆☆☆ Poor
5	Manshya	147,000	Shiwang'andu (Admin), Mpika and Nkachibiya	Muchinga	750	III	Maize, Millet, Rice, Sorghum, Soybean, Groundnuts, Sweet potato	D.D.	about 50,000 ha	Potential Market is not identified because Core Venture is not existing..	4,600 HHs (21,000 persons)	CV: 0 exist and 1 planned, Commercial: 1 exist and 20 planned Medium: 0 exist and 3 planned		★★★☆☆ Fair	★★☆☆☆ Poor	★★☆☆☆ Poor		★☆☆☆☆ Very Poor	★★☆☆☆ Poor	★☆☆☆☆ Very Poor	★★★☆☆ Fair	★☆☆☆☆ Very Poor
6	Kalungwishi	200,000	Lunte and Mporokoso (Admin)	Northern	990	III	Maize, Millet, Rice, Sorghum, Soybean, Groundnuts, Oil palm	Small Ruminants, Fish farming, Cattle Ranching	about 48,000 ha if dam is constructed	Tea: can be sold on the Mombasa Auction floor transported by TAZARA.	4,500 HHs (23,000 persons)	CV: 0 exist and 2 planned, Commercial: 0 exist and 0 planned Medium: 0 exist and 0 planned	Tea (labor intensive and suitable for outgrower scheme)	★★★☆☆ Fair	★★☆☆☆ Poor	★☆☆☆☆ Very Poor		★★☆☆☆ Poor	★★☆☆☆ Poor	★☆☆☆☆ Very Poor	★★★★☆ Good	★☆☆☆☆ Very Poor
7	Solwezi	100,000	Mushindano	North-Western	610	III	Pineapple, Cassava, Soybean, Maize, Sunflower, Sweet potatoes	Small Ruminants, Fish farming	D.D.	Local market and some markets in RDC. Kasumbalesa and Lubunbashi both in RDC are about 210 km and 170 km from Solwezi respectively	850 HHs (6,050 persons)	CV: 0 exist and 0 planned, Commercial: 2 exist and 8 planned Medium: 0 exist and 6 planned (if Integrity Farm locates within FB is confirmed, the number of commercial farm becomes 3)		★★★★☆ Good	★★☆☆☆ Poor	★★☆☆☆ Poor		★☆☆☆☆ Very Poor	★☆☆☆☆ Very Poor	★☆☆☆☆ Very Poor	★★☆☆☆ Poor	★☆☆☆☆ Very Poor
8	Shikabeta	74,000	Rufunsa	Lusaka	190	I	Sorghum, Maize, Horticulture, Coffee	Piggery, Poultry, Cattle Ranching, Dairy, Fish farming	About 14,800 ha	The nearest FB from Lusaka. Good accessibility to Lusaka in terms of road condition (the Great Easter Road) and distance (190km, 3 hrs. by car)	320 HHs (1,700 persons)	CV: 0 exist and 0 planned Commercial: 0 exist and 0 planned Medium: 1 exist and 14 planned	Small livestock and fish farming in Lumsenfa river was recommended by DACO	★★★☆☆ Fair	★★★★☆ Good	★★☆☆☆ Poor		★★☆☆☆ Poor	★☆☆☆☆ Very Poor	★★☆☆☆ Poor	★★★★☆ Good	★☆☆☆☆ Very Poor
9	Musokotwane	117,000	Kazungula	Southern	460	I	Millet, Sorghum, Maize, Sugarcane, Cotton, Tobacco	Cattle Ranching, Dairy, Piggery, Poultry, Fish farming	D.D.	Potential Market is not identified because Core Venture is not existing,. However, Musokotwane has good access to Zimbabwe and Botswana	3,400 HHs (19,800 persons) 7,000 people reside in Nanyati catchment area	Nil.		★☆☆☆☆ Very Poor	★☆☆☆☆ Very Poor	★☆☆☆☆ Very Poor		★☆☆☆☆ Very Poor	★★☆☆☆ Poor	★☆☆☆☆ Very Poor	★★★☆☆ Fair	★☆☆☆☆ Very Poor
10	Chikumbiro	100,000	Lundazi	Eastern	770	IIa	Maize, Millet, Sorghum, Soybean, Tobacco, Cotton	Cattle, Ranching Small-Ruminants, Poultry, Piggery	D.D.	Market is not identified, but distance to Lilongwe, capital city of Malawi is 250 km (4hrs by car).	2,000 HHs (10,200 persons)	Nil.	More than 10 companies operate cotton ginning in Eastern province, so MoA expected cotton ginning would be a business of CV when the FB was planned.	★★★★☆ Good	★☆☆☆☆ Very Poor	★☆☆☆☆ Very Poor		★☆☆☆☆ Very Poor	★★☆☆☆ Poor	★☆☆☆☆ Very Poor	★☆☆☆☆ Very Poor	★★☆☆☆ Poor

Abbreviation
AEZ: Agro Ecological Zone
D.D. : Data Deficient

Remarks
1) Zambia Development Agency (2013), Agriculture Opportunities in Zambia
Ministry of Agriculture and Livestock (2015), Investment Opportunities in Agriculture
2) This item can not be described if the company has not started business, or if the business plan has not been clarified
Climate change and peace and stability in the region is common risks in all 10 FBs.
Like the one found in Luena, possible inadequate working environment especially infringement of OHS is common risk
3) UNEP-WCMC (2019), World Database on Protected Area (downloaded on May 22, 2019)

Summary of Farm Block Inventory Sheet (2/2)

SN	FB Name	FB Area (ha)	District	Province	Distance from Lusaka (km)	Agro Econological Zone	Potential products[1]		Benefits to Smallholder Farmers				Environmental and Social Considerations				
							Crops, Veg, and Fruits	Livestock & Fisheries	Outgrower (in operation/planning stage)	Mitigation of risks in selling products by contract farming[2]	improvement of access to agricultural inputs	Adverse effect from contract farming [2]	Potential impacts on many residents with changing or loosing means of livelihood	Approval status of EIA or SEA for entire FB	Areas with indigenous peoples or other areas with special social value	Physical relationship with environmental sensitive areas[3]	Impact assessment based on the data shown in the FB Inventory Sheet (qualitative evaluation)
1	Nansanga	133,000	Serenje	Central	490	III	Maize, Cotton, Tobacco, Groundnuts, Soybean	Cattle Ranching, Fish farming, Small-Ruminants, Poultry, Dairy	Not existing		yes		yes	DACO answered that SEA was conducted in 2009 by MOA. JST is awaiting ZEMA's answer on official approval status on the report.	Not included	Adjacent to Forest Reserve	Among others, social impact due to physical displacement of 91 PAHs (about 550 PAPs) is concerned because insufficient creation of public awareness for the FB development during RAP study was observed. Relocation site is not determined yet.
2	Luena	100,000	Kawambwa	Luapula	930	III	Oil palm, Team Maize, Millet	Small Ruminants, Fish farming, Cattle Ranching	Planning but not determined in detail		yes		yes	DACO answered that SEA was conducted recently. JST is awaiting ZEMA's answer on official approval status on the report	Not included	Adjacent to Forest Reserve and National Park	Among others, loss of means of livelihood due to loss of cultivation land in large scale is anticipated (more than 2,000 PAHs; DACO's estimate). As of now, ZEMA is keeping silent if EIA/RAP for the ongoing and planned investment programs is approved officially.
3	Kalumwange	140,000	Kaoma	Western	460	IIa	Cashew nut, Cassava, Millet, Sorghum, Rice, Maize	Cattle Ranching, Small Ruminants, Fish farming, Dairy	Not existing. None of landuse plan and plot demarcation for outgrower is developed.		yes		D.D.	No ESIA Study conducted	Not included	Adjacent to GMA	The Senior Chief's consent to FB development has not yet been obtained, because he is very concerned about the advantage and disadvantage of the FB development for the livelihood of local people. This kind of chief's involvement will contribute to prevent inappropriate land acquisition and resettlement. However, at the same time, as it is right now, it has the aspect that development does not progress easily and local farmers cannot receive the benefits of development. Though the details of FB development plan are not determined yet, impact on Forest Reserves within and around the FB should be considered.
4	Luswishi	100,000	Lufwanyama	Copper-Belt	490	III	Maize, Horticulture, Coffee, Soybean	Cattle Ranching, Dairy and Poultry	Partially started. Not many farmers have skills needed by company.	Transportation cost reduction by direct selling to investor without middleman.	yes	Low labor cost, Less work opportunities for non-skilled labors (farmers), Low profit from soybean farming due to shortage of cultivation skills and experiences on soybean.	yes	EIA done in 2011 is not approved by ZEMA. SEA (2012), and ESIA (2018) and RAP (2018) for cadastral area are also conducted but not submitted to ZEMA.	Not included	Adjacent to Forest Reserve and close to GMA (3km away)	So far, complain and grievance from PAPs regarding resettlement and compensation remain at the manageable level by Resettlement Working Group in case of IDC/TAHAL. However adequacy of the said package is not sure because the income restoration level of PAHs is not confirmed yet. It seems that the members of the Resettlement Working Group (RWG) established by IDC/TAHAL project were properly selected. In contrast, inadequate way of resettlement made by other investors and farmer's strong complain on this issue were confirmed.
5	Manshya	147,000	Shiwang'andu (Admin), Mpika and Nkachibiya	Muchinga	750	III	Maize, Millet, Rice, Sorghum, Soybean, Groundnuts, Sweet potato	D.D.	Not existing		yes		yes	No ESIA Study conducted	Not included	Non-adjacent but several PAs with IUCN Category II are located within 30km from FB boundary	Like other FBs, planning is in progress without EIA and RAP (even at framework level) and involvement of local communities in the planning is not confirmed. Among others, changing usage of natural resources such as caterpillars, medical herb, mushroom, orchid, wild fruit, timber, etc. is concerned because there is a possibility that such natural resources are valuable income source as well as nutrient (See WB Report in 2008).
6	Kalungwishi	200,000	Lunte and Mporokoso (Admin)	Northern	990	III	Maize, Millet, Rice, Sorghum, Soybean, Groundnuts, Oil palm	Small Ruminants, Fish farming, Cattle Ranching	Plots for outgrower scheme is demarcated but not started yet		yes		yes	No ESIA Study conducted, but Environmental Framework	Not included	Non-adjacent but two NPs with IUCN Category II are located within 50km from FB boundary	More than 4,000 households are likely subjected to change usage of his/her lands and natural resources due to displacement and land demarcation. Implementation plan including its structure (KFBDC), relocation site for minimizing resettlement impact and outgrower scheme for economic growth is well planned. EIA and RAP was not conducted, but Environmental Framework was enclosed in the F/S report.
7	Solwezi	100,000	Mushindano	North-Western	610	III	Pineapple, Cassava, Soybean, Maize, Sunflower, Sweet potatoes	Small Ruminants, Fish farming	Not existing		yes		D.D.	ESIA planned but not carried out.	Not included	Adjacent to Forest Reserve. Bird Sanctuary is 30km away approx. from FB. However this bird sanctuary is not recognized by Zambia bird watch.	There are gaps between the testimonies of an investor and affected farmers in terms of mode of compensation against displacement and/or loss of lands. Like Manshya, limitation or change of landuse and natural resource usage may occur due to FB development, if residents are not properly involved. Sustainable forest management plan for Kipupu Forest Reserve should be developed, because direct and indirect negative impact on ecosystem, natural resources, etc. in the reserve is anticipated.
8	Shikabeta	74,000	Rufunsa	Lusaka	190	I	Sorghum, Maize, Horticulture, Coffee	Piggery, Poultry, Cattle Ranching, Dairy, Fish farming	Not existing. None of landuse plan and plot demarcation for outgrower is developed.		yes		yes	No ESIA Study conducted	Not included	Within GMA and three PAs including IUCN Category II are located within 30km	Changing land use policy from GMA to agriculture use is taking long time (at least no particular progress since January 2018). Not only GMA. The Lower Zambezi National Park is isolated only 10km from the nearest boundary of FB and environmental impact on the wildlife should be assessed at early stage. Although the resettlement impact seems insignificant in accordance with the socioeconomic survey conducted by PACO 2012 and resettlement policy established then, it should be updated to capture the current population and settlement patterns.
9	Musokotwane	117,000	Kazungula	Southern	460	I	Millet, Sorghum, Maize, Sugarcane, Cotton, Tobacco	Cattle Ranching, Dairy, Piggery, Poultry, Fish farming	Not existing. None of landuse plan and plot demarcation for outgrower is developed.		yes		D.D.	No ESIA Study conducted	Not included	Non-adjacent but there are several PAs within 10 to 30 km from FB boundary	A large scale involuntary resettlement (current population is more than 3,400 HHs; DACO's rough estimate) due to FB development is anticipated. None of landuse plan, development plan, plot demarcation plan etc. have been prepared. Income restoration of displaced people will be challenging unless the resettled people can access to irrigation facilities because this area is categorized as AEZ I (annual rainfall amount less than 600 mm per year).
10	Chikumbiro	100,000	Lundazi	Eastern	770	IIa	Maize, Millet, Sorghum, Soybean, Tobacco, Cotton	Cattle, Ranching Small-Ruminants, Poultry, Piggery	Not existing. None of landuse plan and plot demarcation for outgrower is developed.		yes		D.D.	EIA conducted in 2012	Not included	Adjacent to National Park with IUCN Category II	Population in Chikumbiro FB was above 7,600 in 2009 and it is keep increasing and local authorities are not controlling its influx.. Hence, a large scale involuntary resettlement is concerned in future. No clear mitigation measures, environmental and social management and monitoring plan etc. for mitigating adverse impact on the nearest Protected Area is presented in the EIA study report.

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