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SOYBEAN IN THE DEMOCRATIC REPUBLIC OF CONGO—A MARKET SYSTEMS ANALYSIS

FEED THE FUTURE MARKET SYSTEMS AND
PARTNERSHIPS ACTIVITY

MARCH 2023

ACKNOWLEDGEMENTS

This document was made possible through support provided by the U.S. Agency for International Development (USAID) under the terms of Contract No. 7200AA20C00054, the Feed the Future Market Systems and Partnerships Activity managed by DAI. The opinions expressed herein are those of the author(s) and do not necessarily reflect the views of USAID or the United States Government.

This document was prepared by Wellspring Development Capital and DAI.

Recommended citation

Gregoire Poisson, Caterina Raimondi, Joel Moktar, and Michael Shaw. Soybean in the Democratic Republic of Congo—a Market Systems Analysis. Washington, D.C.: United States Agency for International Development (USAID). Prepared by DAI and Wellspring Development Capital for Feed the Future Market Systems and Partnerships (MSP) Activity, 2023.

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ACRONYMS

ATA-DRC	Agenda for the Transformation of Agriculture in the Democratic Republic of Congo
CAM	Competitive Appraisal Matrix
COPROSEM	Conseil Provincial Semencier (Provincial Seed Council)
CSB	Corn Soy Blend
DRC	Democratic Republic of Congo
FAO	Food and Agriculture Organization of the United Nations
FCDO	Foreign Commonwealth and Development Office
FEC	Fédération des Entreprises du Congo (Federation of Enterprises of Congo)
IFC	International Finance Corporation
INERA	National Institute for Agricultural Research and Studies
KI	Key Informant
MFI	Microfinance Institution
MT	Metric Ton
NGO	Non-Governmental Organization
SENASEM	Service National des Semences (National Seed Service)

UNDP	United Nations Development Program
USAID	United States Agency for International Development
WFP	World Food Programme

1. Summary

The soybean market in the Democratic Republic of Congo (DRC) can be broadly divided into four segments: soy cake for animal feed, imported corn soy blend (CSB) distributed by humanitarian agencies, such as the World Food Programme (WFP), soy oil (a niche urban market), and locally produced soy flour for human consumption.

The animal feed sector is the largest segment, requiring 30,000 MT of soy per year, while official domestic production falls short at approximately 25,000 MT. Except for three vertically integrated commercial cattle ranches that grow soybeans for their own use, soy production in the DRC is mainly carried out by approximately 235,000 smallholder farmers who cultivate soy on small plots of land (typically around 0.2 ha) using traditional farming methods. Farmers realize low average yields of only around 0.5 MT/ha due to poor agricultural practices, inadequate or low use of fertilizers or inoculant, and the lack of improved seed and extension services. Soy flour processing capacity in the DRC is currently low and mainly relies on charity donations and NGO offtake for feeding programs. Medium-scale soy cake offtakers in Kinshasa mostly use imported soy cake.

2. Background & Context

Objectives and methodology

The purpose of this report is to present an in-depth market systems analysis for the soy value chain in DRC. The approach combined a mix of rapid desk research and stakeholder interviews, with Gregoire Poisson leading the fieldwork in person in this phase. The team triangulated inputs among available literature, key stakeholder interviews, and the latest quantitative data available. This involved leveraging ÉLAN, IFC, the World Bank, USAID/DRC, and the team's personal networks to reach out to key informants. A series of in-depth interviews was conducted with different primary value chain actors and players performing supporting functions. The data collected was used to conduct in-depth analysis of the core market, supporting functions, and rules for each value chain, identifying constraints and opportunities at the firm and system level.

Soy was selected alongside rice and poultry for in-depth market systems analysis through a Competitive Appraisal Matrix (CAM) methodology, which involved shortlisting from a list of 10 pre-selected agricultural value chains. The CAM is a tool used to screen value chain actors across three main criteria: competitiveness, systemic impact, and feasibility. Based on the findings, maize, palm oil, and poultry scored the highest across these criteria, but given other considerations—e.g., the need to coordinate with other donor priorities as well as political economy and environmental concerns—poultry, rice, and soy were selected.

The following report provides an overview of:

- the soy market system, including current supply and demand dynamics in the core market for soy for human consumption and animal feed;
- an overview of the key constraints holding back market system functioning and growth at the firm and system levels (e.g., supporting functions and rules); and
- initial guidance and partnership potential for interventions in the sector.

There is limited reliable data on the consumption, production, or import of soy for the DRC. This analysis, therefore, aims to triangulate consumption and production estimates from official sources (e.g., FAO) with primary data collected from key industry informants (e.g., importers and producers).

DRC soy sector overview

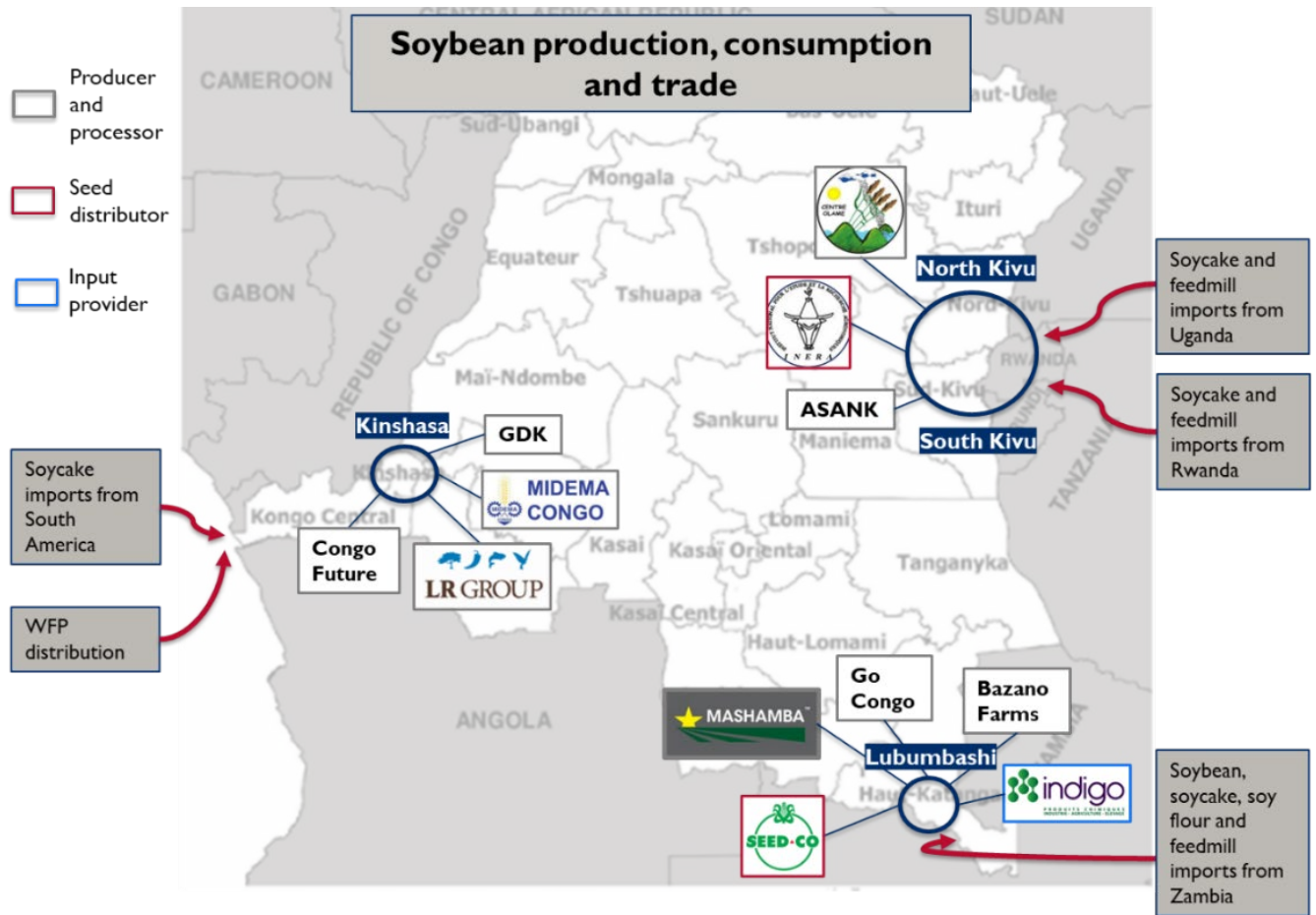
Soybeans are an excellent source of vegetable protein and fat for human consumption. When grown as part of a crop rotation system, soy promotes soil health through nitrogen exchange and introduction of biomass, benefiting not only the crop itself, but also subsequent crops. It is also a key industrial crop, both because it performs best under intensive mechanized farming systems and because it is a key crop for the worldwide livestock industry. About 80% of the world's soy production stems from three countries: Brazil (122 million MT in 2020), U.S. (112 million MT), and Argentina (49 million MT). Soybean is produced and consumed across Africa, but large-scale production is centered in relatively few countries, including South Africa (~1.2 million MT), Nigeria (~0.6 million MT), and Zambia (~0.3 million MT)¹.

The soy sector in the DRC is still in its early stages of development, with demand for animal feed and human consumption outstripping domestic production. Official figures estimate limited production of approximately 25,000 MT in 2020², whereas industry consultations for this study indicate that the animal feed industry in DRC alone imports an additional ~30,000 MT of soy per year. DRC also has limited installed processing capacity to convert soybean into soymeal, refined oil, or other processed soy products for human consumption. Soy is primarily grown in the Kivu regions of the country by small-scale farmers for domestic consumption and sale to local markets. In recent years, some large farms and cattle operations in Haut-Katanga have also started planting soybean to use in stock feed. As the poultry (e.g., around Kinshasa) and livestock industries require much larger volumes of soy cake (the dry output of soybean which is used as the primary protein ingredient for all poultry feed, also known as soymeal) than local producers can supply, the majority is currently imported.

¹ FAOSTAT 2020

² Ibid.

Figure 1: Soybean production, consumption, and trade



3. Core Market

Supply and demand dynamics

There are four main soy market segments in the DRC: soy cake for animal feed, imported CSB distributed by humanitarian agencies such as WFP, soy oil, and locally produced soy flour. The table below outlines the key attributes of each market segment, end market buyers, and potential for inclusive development if local production could be scaled up.

Table 1: Soybean market segmentation summary

Market Segment	Defining attributes	End Market Buyers	Inclusive Development Potential
Soy cake/meal for animal feed	Almost entirely imported; high level of demand as poultry producers need steady supply and large volumes	Poultry meat and egg producers (mainly large commercial farms), feed mills, livestock farms	High — if local production can displace imports
Imported CSB	Product prepared from maize and soybean and consumed as a porridge; almost exclusively distributed by humanitarian organizations/NGOs	WFP	Low — some potential for local manufacturing but not a long-term, sustainable offtake market
Soy milk and flour	Limited demand, although soy is a cheap source of protein cultural preferences mean consumption is mainly limited to Kivus	Urban consumers looking for a health supplement, especially in the Kivus; NGOs	High — local demand could increasingly be met by local producers and processors
Soy oil	Niche market served almost entirely by imports; few consumers willing to pay 20% premium vs palm oil	Better-off urban middle class	High — soy cake can only be produced if there is a market for its by-product (soy oil)

Data on soy consumption levels in DRC is generally poor or unreliable. There is no official data on imported soy cake for animal feed, and therefore, consumption estimates were reliant on aggregating estimates from various industry interviews. FAO provides data on imported soy oil and local soybean production, but the latter is likely unreliable and also does not disaggregate by animal or human consumption. The exception is data on imported CSB, as WFP publishes data on annual distribution within the DRC. The following section assesses each segment in more detail and provides some estimates around consumption volumes. In the “Supply side opportunities and constraints” section, volumes of soybean that would need to be produced locally to meet total demand are estimated.

Soy cake for animal feed

Soy is a key source of protein for white protein livestock (e.g., poultry, dairy, and aquaculture such as tilapia and catfish, etc.) raised in intensive systems (vs scavenging systems), and backyard subsistence poultry. The bean is processed using solvent or mechanical extraction to extract the oil and produce low-fat cake at a ratio of approximately 0.2 MT of oil and 0.8 MT of cake from 1 MT of beans.³ Globally, 53% of global soy cake is fed to poultry and 29% to pigs, with the remainder being used in aquaculture, feeding dairy and beef cattle, and other animal farming.

In DRC, soy cake is primarily used in the poultry industry. According to industry consultations, the top four feed mills and poultry layer operations in DRC need around 25,000 MT of soy cake per year, and total animal consumption in the country is likely above 30,000 MT per year once other poultry, pork, and livestock producers are included.

As there are no industrial soy mills in the DRC, soy cake is entirely imported. Import destinations reported by the main feed mill and poultry layer operations include Zambia (for Congo Oeufs in Lubumbashi), Argentina and Brazil (for GDK, Congo Future, and LR Group in Kinshasa), or Rwanda and Uganda (ASANK). These businesses say they would be interested in buying locally, but there is no soy production around Kinshasa and insufficient soy to provide for animal feed needs in Katanga. In North Kivu, some of the soy is bought locally when its price is competitive compared to imports.

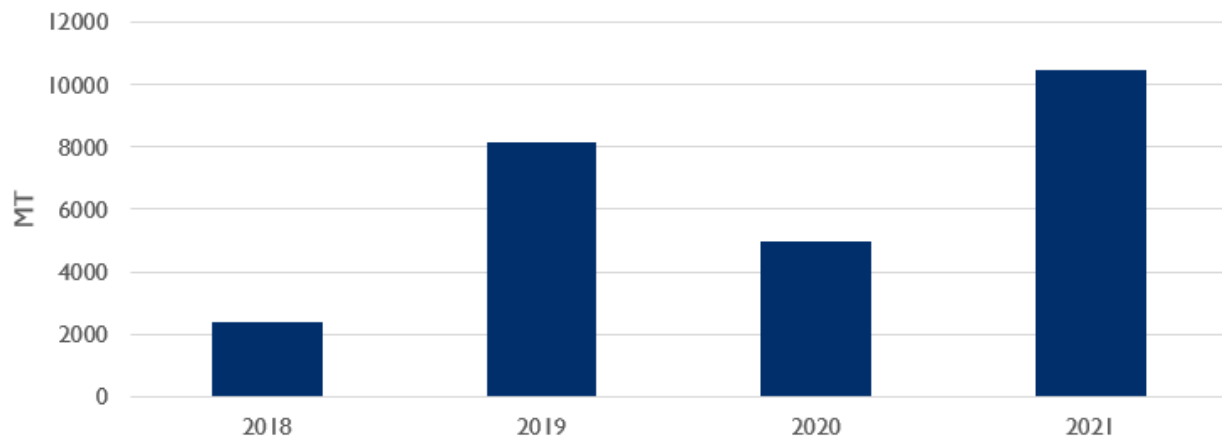
Imported CSB

WFP imported and distributed 10,491 MT of CSB in 2021 as part of its program to address food insecurity in the DRC. CSB (otherwise known as Super Cereal plus) is a blend of maize, soybean (24% by weight), and vitamin and mineral premix used to make porridge or gruel.⁴ It is typically manufactured by agribusinesses in Turkey, China, South Africa, and Europe and distributed by WFP in food insecure regions or humanitarian crises globally. As shown in the graph below, volumes of CSB imported and distributed fluctuate year-on-year, although the overall trend has been upward since 2018. If the 2021 volume of CSB imported by WFP was produced domestically, it would require approximately 2,500 MT of raw soybean as an input.

³ Fraanje, W. & Garnett, T. (2020). Soy: food, feed, and land use change. (Foodsource: Building Blocks). Food Climate Research Network, University of Oxford.

⁴ WFP specifications for Super Cereal

Figure 2: CSB distributed by the WFP in DRC



Source: WFP, 2018; WFP, 2019; WFP, 2020; WFP, 2021

Soy flour and milk

Soy is an emerging staple in some areas of DRC, particularly in North and South Kivu where it is consumed as a substitute for dairy in tea or porridge (*bouillie*). However, this staple food is relatively unknown outside the Kivus except in the communities that have been supported by NGOs and development programs, such as UNDP in Kasai or more recently the government-sponsored Agenda for the Transformation of Agriculture in the DRC (ATA-DRC). Linked to this, human consumption of soy is often viewed as reserved for the sick or malnourished and therefore, there are cultural prejudices against soy flour in household diets for many rural communities.⁵

Soy flour and milk is typically processed informally and sold in wet markets. In the Kivus, subsistence consumption of soy is less common than other staple products such as cassava or beans, but is quite prevalent for children, lactating mothers, and sick family members⁶. Soy flour is sold in wet markets in Goma and Bukavu and in small quantities in Lubumbashi. Processed products like soy milk and fortified flour blends can also be found in markets. Retailers in Lubumbashi noted three sources of demand for processed soy products: local consumers, humanitarian organizations and NGOs, and livestock farmers. Despite some production in Haut-Katanga, the soybean and soy flour sold in Lubumbashi is mostly imported from Zambia.

Total human consumption of soy flour and milk in DRC is difficult to assess. FAO statistics estimate that total production of soybeans in DRC is 24,000 MT (FAOSTAT 2019), but given the small volumes produced and traded, industry informants feel this figure may be overstated. It is also not clear what proportion of this domestic production is split between animal feed and processing into soy flour domestically, although based on consultations it is likely that the majority goes to animal feed.

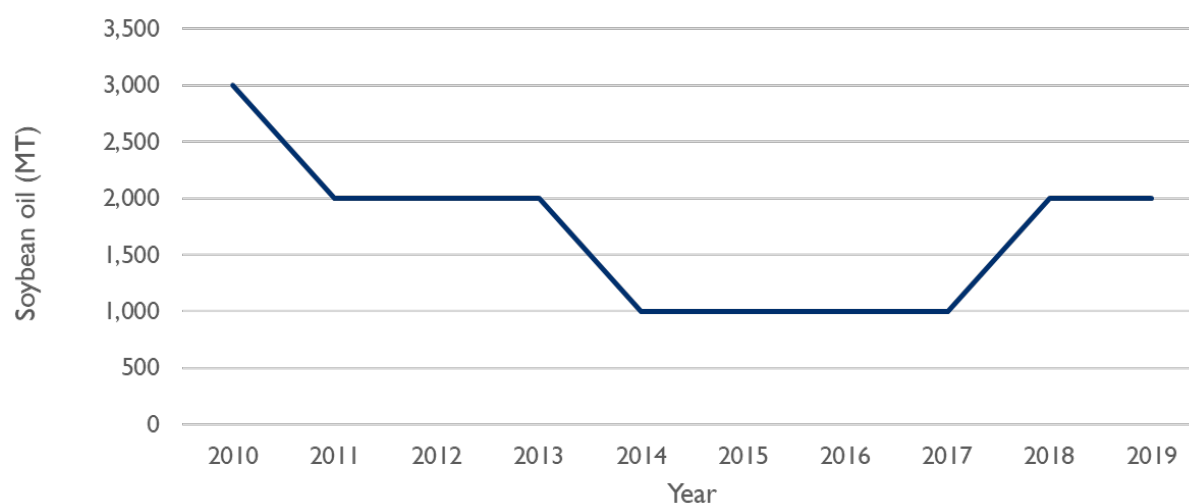
⁵ https://pdf.usaid.gov/pdf_docs/PA00ZBKM.pdf

⁶ Political Economy Analysis: Coffee, Dried Bean, and Soybean Value Chains SVC 2017

Soy oil

Soy oil is a niche market segment in DRC, with official figures showing imports of between 1–3,000 MT over the past decade (see graph below). DRC consumers have a strong preference for palm oil, which has been prevalent historically as palm is endemic and is typically 20% cheaper in a very cost-sensitive market. For comparison, official stats indicate that 395,000 MT of palm oil was consumed in DRC in 2019.⁷ Industry consultations indicate that there is limited local production of soy oil domestically by some of the vertically integrated cattle farms (e.g., Mashamba—see case study in following section) which process their own soy cake for feed and sell the oil locally.

Figure 3: Total soybean oil imports

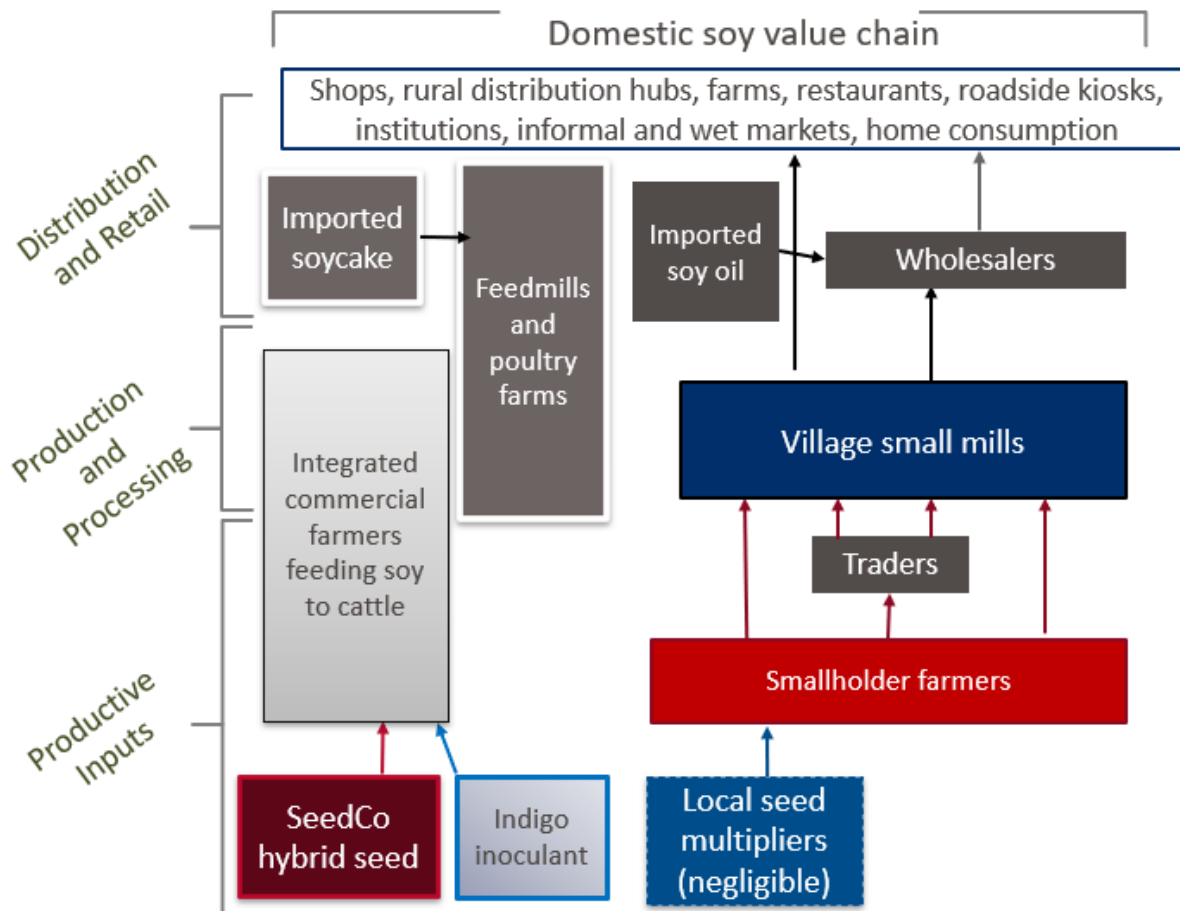


Source: FAOSTAT, 2023

Supply side opportunities and constraints

The diagram below provides an overview of the soy value chain in the DRC. As is explored in more detail in this section, production is mainly concentrated in the Kivus and Haut-Katanga province. Most smallholder farmers producing soy are located in the Kivu regions, while some larger commercial farms can be found in Katanga. The milling of soy flour is largely informal and located around the Kivus close to consumers (see previous section). The poultry industry, which imports soy cake for feed, is located in three hubs: around Kinshasa, Haut-Katanga, and the Kivus.

⁷ Statista, FAOSTAT, 2023



Source: Wellspring soy value chain model for DRC

Inputs

The main inputs for commercial soy production include seed, fertilizer, inoculant, and crop protection chemicals. However, in DRC, only large commercial farmers use these inputs. If available, smallholders at best use certified seeds donated by humanitarian or development projects.

Seed

DRC soybean seed primarily comes from smallholders reusing seed from their previous crop harvests, despite this resulting in poor yields. Soy requires around 100 kg of seeds per ha⁸ and most smallholders do not have the resources to purchase commercial improved seed for this purpose. However, reusing traditional seed generally results in lower yields. According to multiple industry consultations and sector studies, the use of improved seeds could substantially increase yields. In the Kivus, smallholders who use improved seeds can reach yields of approximately 0.8–1.4 MT per ha

⁸ <https://www.shs.farm/soya-bean-yield-per-hectare/>

(depending on other inputs and production practices) from rainfed production, instead of currently reported averages of 0.4 MT per ha using recycled seed.⁹

According to industry consultations, DRC’s regulatory institutions lack the capacity to properly ensure seed quality. In a typical commercial seed system, seed quality must be upheld by the seed producer and safeguarded by seed regulatory institutions, including with varietal maintenance, through field inspections and laboratory testing. The National Institute for Agricultural Research and Studies (INERA) and the National Seed Service (SENASEM) lack the financial, technical, and human resources to properly ensure seed production quality. INERA produces base seeds in small quantities, mostly when financially supported by a specific project (currently the ATA-DRC program which aims to provide soy base seeds to farmers in seven different sites, including in Kivu and ex-Katanga). SENASEM continues to certify each year to serve the primarily donor-driven seed market.

Local multiplication of certified seed is negligible. The Provincial Seed Council (COPROSEM), a public-private seed platform for consultation on seed issues operating in the Kivus, lists several soy seed multipliers, including Baraka, Anany, EMTH, and SEMKI. Seed multipliers use base seed sourced with INERA to produce certified, first generation (F1) seeds. F1 seeds have the highest yields and can be recycled up to two more times in following harvests, although yields decrease with every generation. According to consultations, EMTH—the largest of these producers in terms of soy—has produced just 12 MT of seeds in 2021, enough to farm just 120 ha.

Given the lack of reliability of the local seed system, commercial producers prefer to buy imported seeds. The main seed distributor in DRC providing soy seeds is SeedCo (see case study below), an international seed company selling throughout the ex-Katanga province. Consultations with the company indicate that their soy seed sales (between 50 and 100 MT per year) have been increasing and are mainly driven by a handful of larger commercial cattle farms in Katanga. However, many farms and agro-dealers also reported importing directly.

⁹ USAID Feed the Future Strengthening Value Chain Activity, Political Economy Analysis: Coffee, Dried Bean and Soybean Value Chains. Prepared by J.E. Austin Associates Inc, 2017

Case study: SeedCo—Main soy seed importer and distributor

SeedCo is a pan-African, publicly listed, seed company with a DRC office based in Lubumbashi. Revenues in 2022 are estimated at US\$1.4–1.5 million from sales of 600 MT of maize seed and close to 100 MT of soy seed, with minor additional sales volumes from dry beans and horticultural seeds. The company's largest client is the public sector—approximately 60% of sales are to the Haut-Katanga and Lualaba Governments through their maize subsidy scheme.

Soybean seed sales have increased over the last few years, from 20 MT in 2018 to close to 100 MT in 2022. This was driven by large commercial cattle farms in Katanga, specifically Go Congo, Mashamba, and Bazano farms, which together purchased approximately 80 MT of soy seed. SeedCo soybean seed is sold at US\$2.50/kg and encounters stiff competition as many large commercial farms and agro-dealers prefer to source their product directly from Zambia.

SeedCo's Managing Director claims the company has not been profitable yet as it has not reached the scale where it can breakeven. Key challenges include long border controls and import costs, as well as converting farmers to hybrid seed.

Fertilizer and inoculant

A benefit of soy is that the soy plant has nitrogen-fixing properties. The plant roots host rhizobia (a bacteria) which converts nitrogen in the soil into ammonia used by the plant to grow. Consequently, soy does not require as much nitrogen fertilizer as other crops that cannot fix atmospheric nitrogen, such as maize or wheat, and can grow in relatively poor soil.¹⁰ Use of rhizobia inoculant helps this process and increases soy yields. Soy's ability to improve soil health and fertility by adding nitrogen to the soil can reduce the need for nitrogen fertilization in subsequent crop rotation cycles. As such, both small and larger commercial farms use soy in rotation with maize. This style of farming is then highly complementary with poultry and egg production given these are the two main inputs for poultry feed.

The use of inoculants and fertilizers among soy smallholders in the DRC is generally low due to limited availability, price, and lack of knowledge on products and how or when to use based on crop and soil condition. According to interviews with agro-dealers, fertilizer is expensive for smallholders and soil testing, as well as soybean adapted fertilizer, are not readily available in DRC. Unlike some agricultural technologies, inoculants do offer a strong return on investment to small-scale farmers, and since they are low cost (US\$5 per ha), they are more accessible than many other technologies. However, the inoculant industry in sub-Saharan Africa is in its infancy, and promotion and provision of inoculants has been driven largely by the public sector to date, such as the N2Africa program. While growing the inoculant market in sub-Saharan Africa will take time, the potential for impact is high, and the potential for greater private sector returns will continue to rise as the soybean sector grows.

Large commercial farms reported using inoculants provided by Indigo (see case box below), as well as phosphorus and lime to help improve their yields.

¹⁰ Fraanje, W. & Garnett, T. (2020). Soy: food, feed, and land use change. (Foodsource: Building Blocks). Food Climate Research Network, University of Oxford.

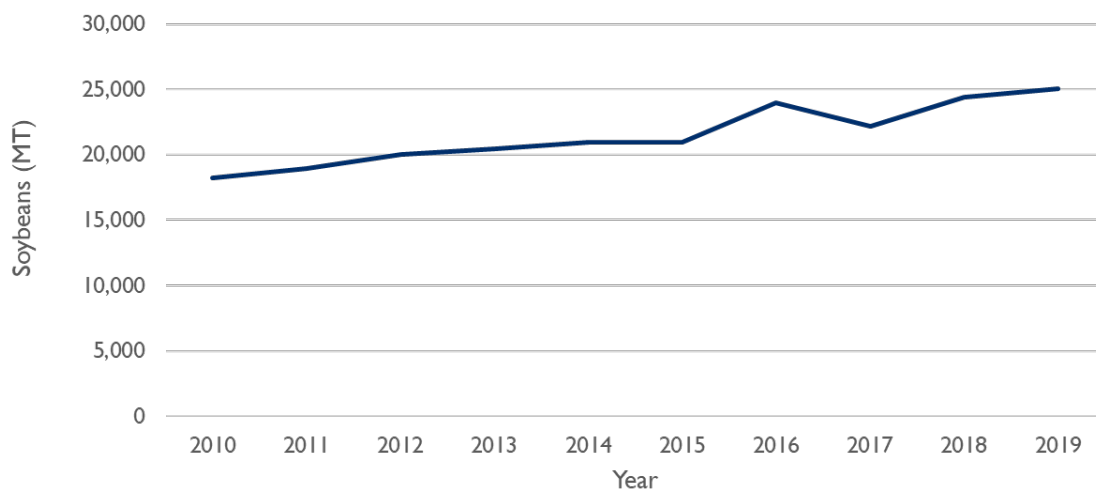
Case study: Indigo—Agro-chemical distributor

Indigo is an input supplier based in Kinshasa. In 2016, it opened a second office in Lubumbashi. Indigo’s key products include fertilizers, pesticides, fungicides, herbicides, and water treatment products. Indigo sells mycosol, an inoculant for soy. Its clients include large soy commercial farms based in Haut-Katanga and Lualaba (e.g., Go Congo, Bazano, and Mashamba). Some of the key challenges the company reported included competition with unlicensed imported products and limited ability to pay among clients, although this was not limited to soy-related products.

Production

DRC’s Ministry of Agriculture figures suggest that 500,000 MT were produced in 2018;¹¹ however, key informant interviews suggest this is a significant overestimation. **FAO estimates that local production has reached a more realistic 25,000 MT on 47,000 ha of land in 2019**, with annual volumes having grown 38% over the past decade (see graph below). According to estimates provided by Fédération des Entreprises du Congo (FEC), North and South Kivu account for 13,000 MT of soy or more than half of national production. There is no material soy production around Kinshasa despite there being high demand for soy from the poultry industry due to agro-climatic conditions being poor for cultivation.¹²

Figure 5: Total soybean production

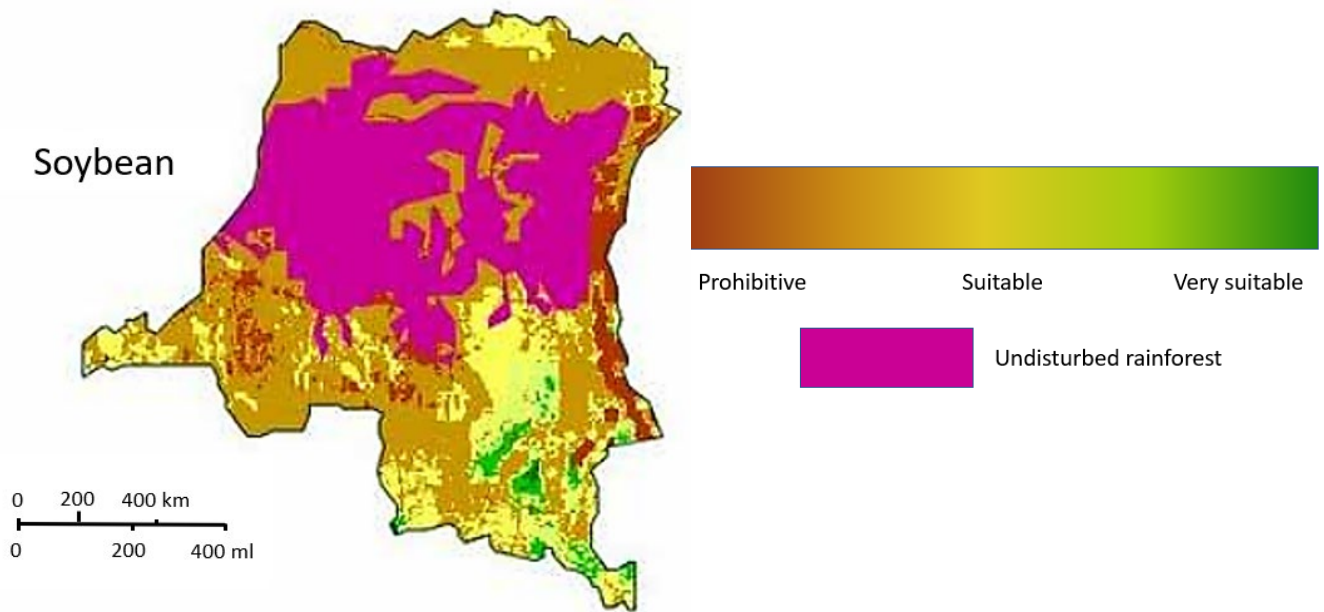


Source: FAOSTAT, 2023

¹¹ DRC Ministry of Agriculture, 2019

¹² DRC Soy Suitability Map (UNDP, CAADP, NEPAD, 2013). Other industry figures pointed out Feronia’s failed efforts to produce rice above 1 MT/ha and the agronomic challenges with the failed Bukanga-Lonzo Agro-industrial park

Figure 6. Soy Suitability Map



Source: Democratic Republic of Congo Investment Opportunities Brief, CAADP Investment Facilitation Programme. UNDP, CAADP, and NEPAD, 2013.

Smallholder farms

Soy production in the DRC is predominantly carried out by smallholder farmers, who typically cultivate soy on small plots of land (typically around 0.2 ha) using traditional farming methods. Farmers usually grow soy as a cash crop alongside other crops such as maize, beans, and cassava. They often intercrop soybeans with other crops to maximize land use. Smallholder farmers mostly use reused soybean for seed, rely on natural rainfall for irrigation, and typically do not use fertilizers (except sometimes manure) to improve soil fertility. Some smallholders are part of farmer groups or cooperatives and receive seeds and inoculant as support from development projects, and a small proportion operate as contract farmers for companies such as EMTH (see case study below).

Soybean production in the DRC is affected by low soil fertility, poor agricultural practices, and lack of improved seed and extension services, which lead to average yields estimated at around 0.54 MT per ha.¹³ This is very low when compared to other countries with similar agro-ecological conditions. For example, Uganda and Zambia have reported soy yields of 1.44 MT and 1.41 MT per ha, respectively.¹⁴ There are no statistics regarding the number of farmers that produce soy in DRC but given an average smallholder's area under soy cultivation of 0.2 ha (estimates based on key

¹³ FAOSTAT, 2020. Pockets of higher yield reported in Rutshuru and around Birava using improved crop rotation and interplanting methods, with one KI reporting yield up to 1MT

¹⁴ Ibid

informant interviews, then **235,000 Congolese farmers would have been engaged in soy production in 2019 to achieve the FAO estimate of land under cultivation.**

Case study: EMTH soy outgrower scheme

EMTH is a business based in Rutshuru that contracts smallholders to produce maize, beans, and soy. EMTH multiplies base seed into R1 on its accredited 30 ha farm. In 2022, it produced 35 MT of maize and 12 MT of soybeans seed. INERA could not provide the 3 MT of base seeds it had ordered.

EMTH contracts 1,260 households to produce soy and maize as outgrowers. It provides seed on credit and recovers this by deducting the cost from value of the crop the farmer supplies at the end of the season. In 2022, outgrowers produced 50 MT of soybean, which was purchased for US\$730/MT and traded on to processors like Centre Olame in Bukavu at a high price of US\$930/MT. It hopes to contract 2,500 households this year. Going forward, EMTH wants to process soy into CSB and sell this to health centers.

Large commercial farms

In Haut-Katanga and Haut-Lomami, large commercial cattle farms are operating a fully vertically integrated model from growing feed crops through to producing finished meat products. Whilst most commercial farms in Katanga grow maize, three leading farms also grow soy: Mashamba Enterprises (200 ha, 660 MT), Go Congo (100 ha, 400 MT), and Bazano (120 ha, 500 MT). Combined, these three farms produced 1,560 MT of soy in 2022. If overall production remained at a similar level to those reported by FAO in 2019, this would represent about 6% of overall soy production in DRC. It should be noted that there are very few viable smallholders around these large farms, and they have limited appetite to establish soy outgrower schemes. The FCDO-funded Élan program attempted to do this but was not able to scale its pilot.

The process starts with the cultivation of soybeans. These crops are grown using mechanized production systems and modern farming inputs such as hybrid seed, inoculant, other fertilizers, and crop protection chemicals. Once the crops are harvested, they are stored and then processed into stock feed. The cattle are then reared on a mix of grazing and supplemental feed. The farms then slaughter their own cattle and butcher/process them into various products for sale, including via their own retail outlets. In an integrated farm, the waste produced from the cattle can also be used as fertilizer for the maize and soybean crops, creating a closed-loop system. This helps to reduce waste and improve soil health. Having full integrated control throughout their supply chain also helps these businesses' resilience in a market characterized by multiple market failures.

Case study: Mashamba—vertically integrated cattle farm with soy production for feed

Mashamba Enterprises is one of the largest integrated agri-farms in Lubumbashi with 6,000 ha under cultivation. It is part of the large and diversified Teichmann Group and is partially owned by Moise Katumbi, the former Governor of Katanga Province. Mashamba is developing an integrated model: it farms maize and soy, processes into soy cake and soy oil, feeds the maize and soy cake to their cattle, and sells the meat and soy oil through its retail network of seven shops.

The company produced 5,000 MT maize and 660 MT soy in 2022. It could not plant in December 2022 due to late rains but expect to produce 1,000 MT of soy in 2024. Mashamba also own a maize mill with 200 MT per day processing capacity and a soy mechanical extruder that can process 2 MT per hour. This type of soy processing has limitations since it can only produce higher fat content soy cake and a crude soy oil (vs clear refined oil that is required for packaged products sold in mainstream outlets), however that appears to be good enough to be competitive and meet the needs of their local market. Mashamba estimates that soy cake costs US\$650/MT to import in 2022 and US\$450/MT to produce. Crude soy oil can be sold through its own retail outlets to local consumers at approximately US\$2,500 per MT. The market appears reliable since they sold 250 MT within six weeks in 2021.

Mashamba maintains a cattle herd of ~10,000 and slaughters 600 cows per month. It also rears a small number of pigs and fish and is considering launching a poultry operation. Mashamba also wants to expand its feed manufacturing operation to produce a wider range of animal feed (cattle, pigs, fish, and poultry), as well as human foods that include soy.

Processing

There is very little commercial soy processing in the DRC. In the Kivus, processing is mostly small-scale and artisanal, turning soybean into human consumer products such as soy flour, soy milk, or soy blends. In Katanga, integrated farms Mashamba and Go Congo are experimenting with light industrial soy processing to produce basic soy cake and crude (i.e., unrefined) soy oil (see case study above). There are also three animal feed mills in Kinshasa which primarily serve the poultry sector, but they do not use local soy.

Soy flour mills

Soy must be processed before being consumed, using mills to process the soy into flour. Soy flour is a fine powder made by grinding soybeans into a flour-like consistency. It is a versatile ingredient used in a variety of food products, and in the Kivus and Katanga is mostly turned into tea and porridge.

To produce soy flour, the first step is to clean and sort the soybeans to remove any impurities. The cleaned soybeans are then dehulled, which involves removing the outer shell or hull of the soybean. This step is important as it helps to increase the protein content of the flour. After dehulling, the soybeans are typically roasted or toasted to improve the flavor and reduce any anti-nutrients that may be present in the raw soybeans. Roasting also helps to improve the digestibility of the soybeans. Once the soybeans have been roasted, they are ground into a fine powder using a grinder or mill. The resulting powder is soy flour, which can be further processed to produce different types of food, including soy biscuits and maize-soy blends.

NGOs have assisted cooperatives in financing soy mills, but they require high capital investment and maintenance and are not always well maintained. Soy flour mills in DRC are typically small-scale operations, run by local entrepreneurs or cooperatives. They may be powered by

electricity, diesel generators, or manual labor. The largest of these processors—Centre Olame in Bukavu—buys approximately 10 MT of soybean a month but has depended on multiple large charitable donations to supply their processing machines as well as a generator. Still, even maintenance of these machines is a challenge with tools and technicians in limited supply. The market for these products is also largely dependent on NGO offtake for feeding programs.

Case study: Centre Olame—small-scale soy flour mill

Centre Olame in Bukavu is a mill that processes soybeans into various products, including soy flour, soy milk, and tofu. The center was established in the 1960s by the social assistance agency of the Catholic Archdiocese of Bukavu to provide a source of income for local farmers and promote the use of soy as a sustainable source of protein. In addition to providing support to female victims of sexual violence, the center also supports local peace-building and community reconciliation, microfinance, job training, and health and nutrition. Under its nutrition activities, Centre Olame produces soy biscuits and maize-soy-sorghum blend (*masoso*), buying around 10 MT a month of soybean from Goma at US\$900 per MT.

Soy cake mills

Industrial soybean processing plants process soybeans into soy oil and soybean meal (also known as soybean cake). The process of soybean milling typically involves the following steps:

1. **Cleaning and conditioning:** The soybeans are first cleaned to remove any impurities, such as dirt, stones, and debris. They are then conditioned to soften the seeds and make them more pliable for processing.
2. **Cracking and dehulling:** The soybeans are cracked to break them into smaller pieces and then dehulled to remove the outer seed coat. This process produces soybean splits, which are further processed into soybean meal and soy oil.
3. **Extraction:** The soybean meal and soy oil are extracted from the soybean splits using a solvent such as hexane. The solvent is then removed from the mixture through a process called distillation, leaving behind soybean meal and soy oil.

Soybean mills can vary in size and capacity, from small-scale operations that process a few MT of soybeans per day to large industrial facilities that can process hundreds of MT of soybeans per day. In Haut-Katanga, only the former can be found, with Mashamba and Go Congo able to process less than 2 MT a day. However, both these businesses and others like Congo Oeufs are planning to expand.

In Kinshasa, there are three medium-large offtakers who currently import roughly 17,000 MT/annum global soy cake for poultry feed production: GDK, Congo Future, and LR Group. However, they all import soy cake because there is no significant production and supply of soy in the Western part of DRC. In case soy production is developed, they would all be keen to procure locally if the pricing is viable.

Only one company, GDK, currently sells feed to third party farmers. Midema have also historically been a feed producer and soy cake buyer, but it has not been producing feed or farming poultry since 2019. When interviewed, senior management stated that they intend to restart their feed manufacturing and sales in 2023, which would create some competition for GDK and likely improve value available to smaller farmers (measured by price, quality, and overall feed conversion rates to animal protein). All industry key informants stressed that improved feed availability, quality, and value will be critical for the poultry sector to be competitive, achieve growth, and associated impact in Western DRC, even if in the short- to medium-term this will be reliant on continued imports of soymeal from global markets.

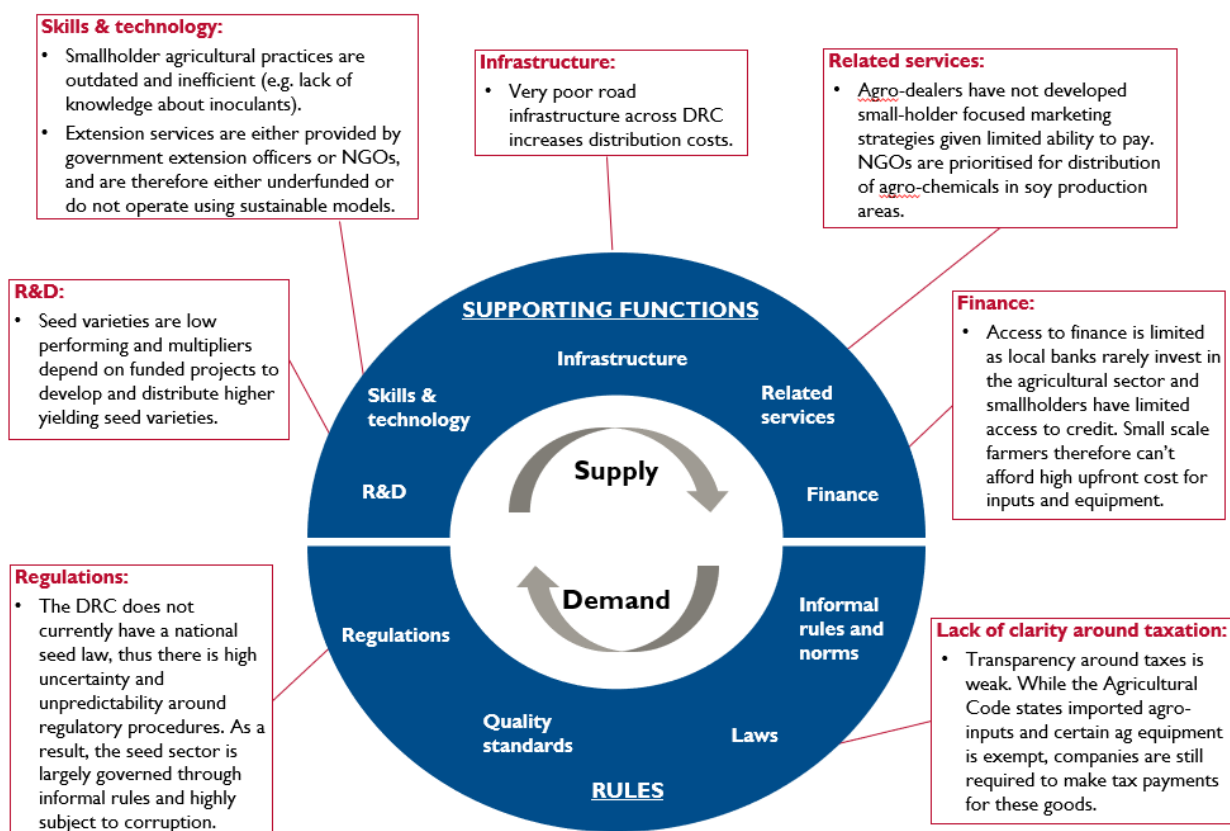
4. System-level Constraints

The previous chapter highlighted that despite demand from the animal feed industry and human consumption and good potential for soy production in the DRC, there are several critical producer/firm-level constraints which mean demand for soy outstrips supply. These include limited availability and use of improved seeds, fertilizer, and inoculant, as well as a lack of commercial processing capacity (except for the vertically integrated cattle farms in Haut-Katanga). As a result, much of the soy produced in the DRC is sold in its raw form, with little value-added processing.

In addition to these key firm-level issues, the enabling environment for the soy sector in DRC hinders sector growth. The following section provides a summary of system-level constraints which hinder the expansion and efficiency of the soy sector in the DRC.

Supporting functions and rules

Figure 7: Constraints to supporting functions and rules in the soybean sector



Supporting functions

Agro-dealers: Consultations indicate that there are still very few agro-dealers currently offering agro-chemicals in the soy production areas. Most of them target NGOs rather than smallholders and have not developed smallholder-focused marketing strategies. The FCDO-funded Élan program attempted to develop agro-dealer networks with very limited success due to a lack of consumer demand.¹⁵

Agricultural extension: Agronomic practices employed by smallholder farmers are generally outdated and inefficient. Public extension services face several challenges, including limited funding, inadequate infrastructure, and insufficient numbers of trained extension agents and there is no private agricultural extension system. This issue extends beyond the soy sector. In the late 1990s, the government extension system essentially collapsed due to donor funding withdrawal and lack of public sector funding. Since then, training on modern agronomic practices is provided on an ad-hoc basis by NGOs which often lack adequate experience and capacity. There is also no clear strategy to ensure sustainable and coordinated delivery of these extension services.¹⁶

¹⁵ Consumer Education: How to Sell Seeds to Smallholder Farmers in the DRC. FCDO Elan Program, 2019

¹⁶ Transforming the Agricultural Sector of the Democratic Republic of the Congo. FCDO, 2021

Processing: There are very few soy mills in DRC. Most are low-capacity soy flour mills depending on unreliable generators and poorly maintained. These mills are used to produce human food (soy flour, soy biscuit/cake, masoso, soy oil, and soy milk) in small quantities. The growth of the sector depends on the development of industrial soybean processing plants producing soybean cake for animal feed, but these do not exist in DRC.

Access to finance: Developing production, processing, and support services (input distribution, crop procurement and storage, industrial milling, and distribution logistics) requires significant capital expenditure and seasonal working capital. Given the political, commercial, security, and operating risks in DRC, many external investors and/or industrial project developers are likely to prefer investment opportunities for oil seed processing in other regional countries, especially given the current shortage of soybean production to meet supply requirements. Likewise, for annual working capital, DRC banks are known to be risk averse in supporting the agricultural sector, with agricultural lending representing less than 5% of bank's lending portfolio¹⁷. This affects production by hampering farmers' ability to purchase inputs or use other productivity enhancing technologies.

Rules

Seed regulation: There is no national seed law in the DRC. This creates ambiguity around seed regulation (including for soy seed) and limits the ability of the SENASEM to regulate the sector. This has resulted in the presence of fake seed and corruption across the sector, which is exacerbated by the fact that there is limited coordination among seed sector stakeholders at the national and provincial levels to lobby for reform.¹⁸

Formal and informal taxation: There are numerous formal and informal taxes which affect actors throughout the value chain. It is not always clear which taxes are official and, in some cases, it is not clear who is collecting the tax. While the Agricultural Code provides tax exemptions on imported agro-inputs and certain agricultural equipment, this is rarely applied in practice and businesses continue to pay high taxes on such imports.¹⁹

Sectoral policies: There is no coherent set of government policies to develop local soybean, soy cake, and soy oil production that is consistent with the needs of the poultry, livestock, and aquaculture industry. For example, development finance institutions (DFIs) and donor programs have attempted to support the development and approval of a national seed law since 2015, but it still has not passed (due to lack of political will and likely vested interest).

¹⁷ [Mapping the financial sector in DRC](#). FCDO Elan program, 2015.

¹⁸ Seedclir: Democratic Republic of the Congo, 2019.

¹⁹ The Art of the Possible – Business Environment Reform in the DRC. FCDO Elan program, 2018

5. Potential Areas of Intervention

The development of the soy sector in DRC is dependent on demand from the poultry and livestock industry. Developing industrial soybean processing—to produce soy cake and oil—will be key if there is any material expansion of soybean production in the coming years. This, however, poses a sequencing problem since a large-scale processor will be unable to utilize their installed processing capacity in the early years due to shortage of available soybean supply, hence making a larger efficient processing facility (e.g., 100 MT per day solvent extraction and refinery) commercial unviable without concessional development finance assistance of some kind. An industrial facility needs to operate at a minimum of 50-60% asset utilization over a calendar year to be viable.²⁰

Furthermore, to produce soymeal competitively (versus regional and global exporters to DRC) processors would also need to maximize value from the extracted soy oil. In DRC, this is likely a challenge given the consumer preference for, and affordability of, palm oil. As such, any significant processing investment feasibility study would have to closely examine the domestic and regional market and pricing (after logistics costs) for the oil as well as the cake. Industry key informant interviews suggested that any feasibility may need to look at the Kinshasa and Angola markets together to see if that improves commercial viability.

Despite these challenges, there is growing interest in the development of the soy sector in the DRC, with some government and private sector initiatives aimed at improving production, processing, and marketing. The unmet and increasing demand for domestic soy for animal feed and oil in the country, coupled with relatively large areas that are suitable for soy production (DRC's natural endowment), could make it an attractive crop for investment and development in the future. The list of potential interventions below should be viewed in the context set out above—they are all relatively high risk given the multiple simultaneous market failures and systemic constraints holding back the sector.

Intervention 1: Support the development of new processors and improve efficiency of existing plants

- Specific support: Provide access to capital and technical support to develop or improve industrial soy crushing facilities in North Kivu, South Kivu, and Haut-Katanga. The donor and DFI community could also consider opportunities to support feed mills and poultry businesses around Kinshasa to finance and coordinate import and storage of larger volumes of soy (e.g., 10,000 MT shipments) to bring down cost of operations; however, this is likely to be challenging given the port of Kinshasa is controlled by several Lebanese trading families that may have a vested interest against this.
- Potential partners: Existing mills (Mashamba, Centre Olame, and Go Congo in Lubumbashi) or large layer operations (Congo Oeufs) in Lubumbashi; input providers, soy cooperatives, and outgrower schemes in the Kivus (Kivu Kuku, ASANK, EMTH).

Intervention 2: Support bundled input distribution and extension services around main production hubs (e.g., Kivus)

- Specific support: Support existing seed importers and inoculant and fertilizer distributors in the marketing and sales of inputs to smallholders in the Kivus and Lubumbashi and provide technical and

²⁰ Key informant interview with Mt Meru Group CFO, operators of large soy processing plants in Zambia, Tanzania, Uganda, Malawi, and Rwanda.

financial support to input providers and offtakers in developing embedded agronomic and business advisory services using innovative service delivery models (e.g., well incentivized agents or MSME agro-dealer networks).

- Potential partners: Existing seed importers in Lubumbashi (SeedCo), existing inoculant and fertilizer producers in Lubumbashi and Kinshasa (Indigo), introduce new importer in the Kivus (TBD), existing outgrower schemes and offtakers in the Kivus (EMTH, Centre Olame).

Intervention 3: Support soybean production and import substitution around animal feed industries

- Specific support: Support development of offtaker agreements and commercially sustainable outgrower schemes that include private sector provision of inputs, technical support, and credit for producers in the vicinity of animal feed industries. This will likely require concessional capital and technical assistance to develop commercially viable smallholder outgrower schemes.
- Potential partners: Existing animal feed businesses where the agronomic conditions and farmer density makes it viable for soybean production within reasonable distances based on road conditions. This likely precludes Kinshasa offtakers due to lack of viable conditions in Western DRC and should focus on large offtakers in Lubumbashi, such as Congo Oeufs, and/or existing mills in the Kivus such as Kivu Kuku and Olame.

Intervention 4: Improve financial access to sector via banks and non-bank financial institutions

- Specific support: Develop new products, such as leasing and loans for equipment or inputs, via provision of de-risking instruments alongside industry (which is willing to extend materials or inputs on credits to their supply chains), banks, microfinance institutions (MFIs), or village saving and loan associations (VSLAs). Also consider support via technical assistance or financial de-risking instruments to incentivize more investment in new projects by impact investors or credible industrial players.
- Potential partners: SME banks (Equity, TMB), MFIs (SMICO), financial advisers, USAID Invest, U.S. Development Finance Corporation, large offtakers, and input providers willing to extend credit to the supply chain.

Intervention 5: Support the passing of the seed law, tax regulation and enforcement, and sectoral policy development

- Specific support: Support private sector advocacy around those issues through capacity strengthening and coordination.
- Potential partners: Industry leaders and industry associations (FEC agriculture, soy producer associations, commercial soy producers, animal feed producers)

Table 2: Intervention summary and ranking:

Function	Intervention	Impact	Feasibility	Potential partners
Soy mills	Support the development of new mills and crushing facilities or upgrade existing soy mills in Lubumbashi and/or Kivus	High	High	Mashamba, Go Congo, or Congo Oeufs in Lubumbashi Kivu Kuku, Olame and EMTH in the Kivus
Bundled input distribution and extension services	Support quality soy seed production and distribution, support inoculant distribution, support service delivery models which integrate input sales and extension services	High	Medium	SeedCo in ex-Katanga, Indigo in Lubumbashi, new importer in the Kivus (TBD)
Soybean production	Support soybean production and import substitution through offtaker agreements and outgrower schemes	High	Medium	Congo Oeufs in Lubumbashi Kivu Kuku, Olame
Access to finance	Develop new tailored leasing or loan products for the sector, de-risk lenders through guarantees	Medium	Medium	Equity, TMB, MFIs (e.g., SMICO), financial advisers, USAID Invest, U.S. DFC
Seed regulations, taxation, and policies	Support the passing of the seed law, tax regulation and enforcement, sectoral policy development	Medium	Low	FEC agriculture, soy producer associations, commercial soy producers, and animal feed producers

