

VALUE CHAIN ANALYSIS AND BUSINESS MODELING ON HARICOT BEAN AND CHICKPEA IN SNNPR: ETHIOPIA



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EXECUTIVE SUMMARY

Ethiopia produces 2.8 million MT of pulses per year with estimated annual value of \$ 2 billion USD. Pulses account for 10% and 13% of the national annual production and coverage, respectively by smallholder farmers. Though inconsistent, volume of pulse production has increased by over 400,000 MT over the last five years. Oromia and Amhara Regions are the leading producers of pulses accounting for over 85% of the national pulse production while the SNNPR region accounts for 13%. The most prominent pulses within SNNPR are: haricot bean, faba beans, field pea and chickpea. Farmers grow pulses for three main reasons: (1) household consumption and human nutrition; (2) household income; and (3) soil health.

This report analyzed the value chain of chickpea and haricot beans within the operating weredas of Scaling Up Pulse Innovations for Food and Nutritional Security in Southern Ethiopia (SPIFoNS) project. The study focused on three components (1) analyses of existing value chain of chickpea and haricot bean in the target areas (2) evaluating the major constraints and opportunities for the project to contribute across the chain (agriculture to nutrition) (3) developing business models through which the project can make an impact.

There is sufficient volume of haricot bean produced by farmers in the region which can cater for value chain development with exporters and food processors based in the central market but the amount of chickpea in the region still seems low and hence getting potential high end buyers (food processors and exporters) is difficult. Different constraints and opportunities have been identified for potential intervention within the project some include organizing the cluster farmers into cooperatives to deliver to factories and exporters, linking the cluster farmers with unions processing pulses for school feeding program, facilitating access to simple technologies that support local pulse processing (for the baltinas).

Two levels of business model have been drawn-project and operational. The project level business model follows the business model canvas assessing the nine elements. The operational business models are (1) Micro Franchise (2) School Feeding (3) Rural Home-Economics. The Micro Franchise Model involves organizing a group of women to sell industrial processed pulse based nutritious food to urban households. This business model was developed by Guts Agro Industry and the company shall continue to scale-up the model to towns within the project area.

The school feeding business model shall be implemented in partnership with the bureau of education and national school feeding program. The contribution of the project towards the school feeding model shall be at two end (1) standardizing selected nutritious local menu to commercial product (2) connecting smallholder farmers to unions and companies supplying to the school feeding program. The home economics business model involves promoting a customized menu among rural households. This menu is expected to make big difference in terms of household nutrition as well as facilitating for consumption of pulses within the community. The scaling-up will be done primarily for rural households through the existing extension system with food demonstration in selected villages. Food preparation manual will be prepared by Hawassa University and delivered to the extension agents. In addition, Farm Radio International will have program on food preparation.

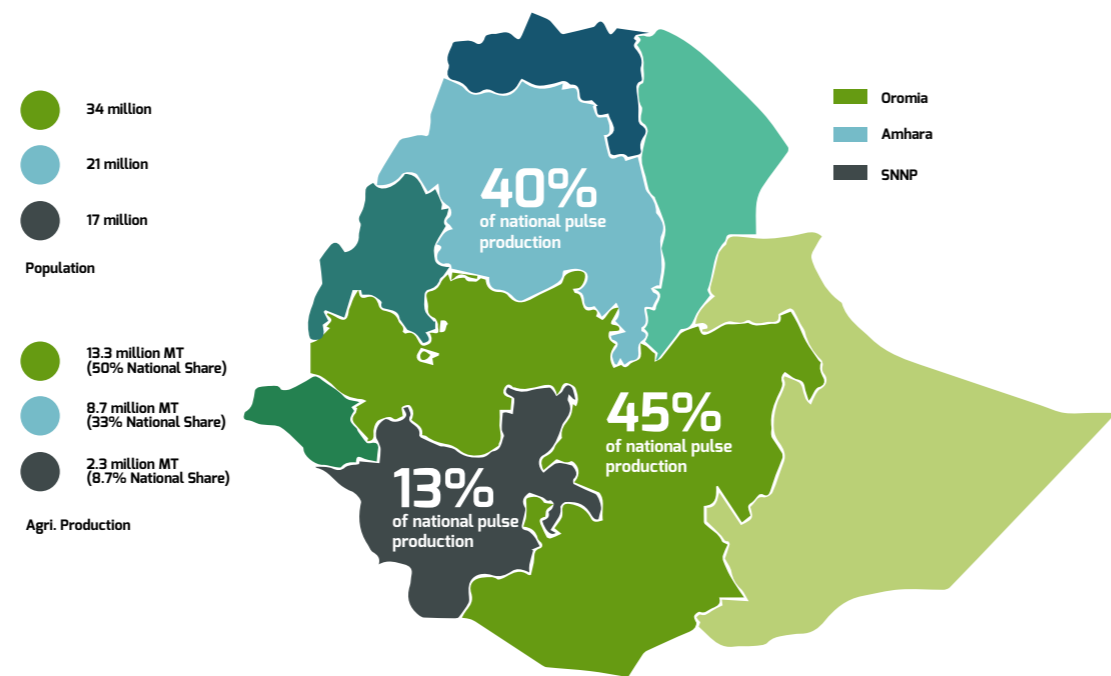
ACRONYMS/ABBREVIATIONS

ATA	Agricultural Transformation Agency
BoA	Bureau of Agriculture
BoE	Bureau of Education
BoH	Bureau of Health
CGIAR	Consultative Group for International Agricultural Research
CIFSRF	The Canadian International Food Security Research Fund
CSA	Central Statistical Authority of Ethiopia
DFATD	Foreign Affairs, Trade and Development Canada
ECX	Ethiopian Commodity Exchange
EIAR	Ethiopian Institute of Agricultural Research
ERCA	Ethiopian Customs and Revenue Authority
FAO	Food and Agricultural Organization of the United Nations
FMHACA	Food, Medicine and Health Care Administration Control Authority
GDP	Gross Domestic Product
Ha	Hectare
HU	Hawassa University
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDRC	Canada's International Development Research Centre
IFPRI	International Food Policy Research Institute
IVCD	Integrated Value Chain Development
Kcal	Kilo Calorie
KG	Kilogram
LIKE	Micro-Franchise
Meher	Major Production Season
MT	Metric Tonne
Possesse	Bean based traditional Food
SARI	South Agricultural Research Institute
SIFoNS	Scaling-up Pulse Innovations for Food and Nutrition Security in Southern Ethiopia
SNNPR	Southern Nations, Nationalities Peoples Region
UoS	University of Saskatchewan
WFP	World Food Program

1. INTRODUCTION

1.1 Ethiopia in Brief

Ethiopia is the second most populous country in Africa with total population of over 100 million. Oromia (33%), Amhara (21%) and SNNPR (18%) account for over 80% of the national population. Agriculture accounts for 39% of the national GDP and 80% of the national employment. The Ethiopian agricultural sector is predominantly smallholder farmers. According to CSA (2015/16) the country had close to 12.5 million ha land covered by grain production; Oromia, Amhara and SNNPR accounting for close to 90%. From the total stock of agricultural production; cereals, pulses and oilseeds account for 87%, 10.5% and 2%, respectively.



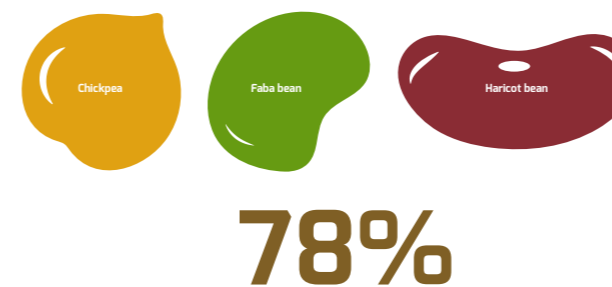
Population by region & agriculture share map

1.2 Pulses in Ethiopia

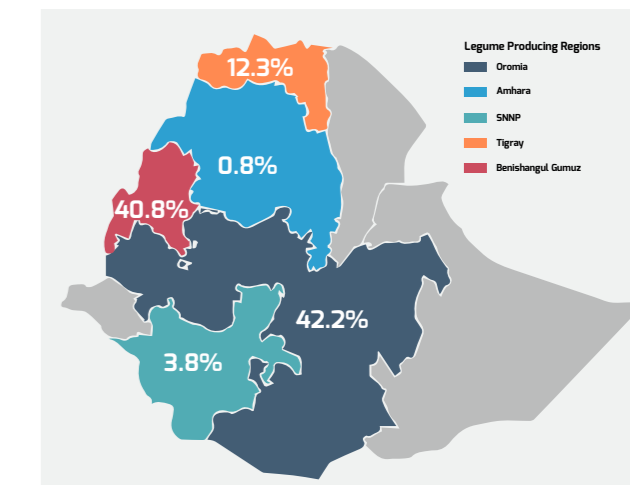
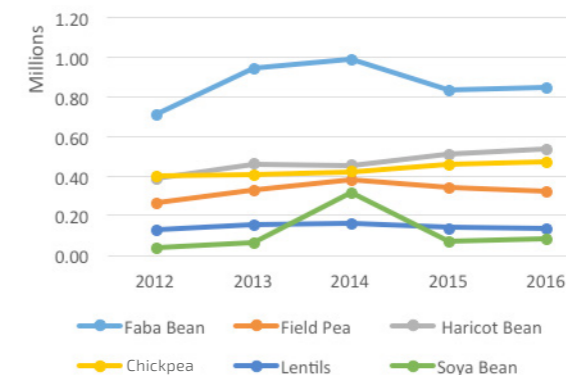
Pulses are important food and cash crops in Ethiopia. The country produces close to 2.80 million MT of pulses per year with estimated annual value of \$ 2 billion USD. They account for 10% and 13% of the national annual production and coverage, respectively by smallholder farmers. Though inconsistent, volume of pulse production has increased by over 400,000 MT over the last five years. The increase is attributed to both increased area coverage as well as improved yield per ha. Faba beans, Chickpea and Haricot bean

are the most prominent pulses, accounting for over 78% of the total pulse production. On the other hand, mung bean and soybean are fast emerging pulses particularly in the low land areas with quadruple and doubling production growths within the last five years. Oromia and Amhara Regions are the leading producers of pulses taking over 85% of the national pulse production while the SNNPR region accounts for 13%. The most prominent pulses within SNNPR are: haricot bean, faba beans, field pea and chickpea. An overview of

major pulse producing zones in Ethiopia shows that two of the top five haricot beans producing zones are located in SNNPR. Farmers grow pulses for three main reasons: **(1) household consumption and human nutrition; (2) household income; and (3) soil health.**



Production Trend for Major Pulses (2012-2016)



1.3 Ethiopia Benchmarking

Ethiopia is the third largest crop producer in Africa. According to COMTRADE (2015), the country is the 13th largest exporter of pulses in the world and the second leading in Africa only after Nigeria. It is the top producer of faba bean, chickpea, field pea, grass pea and lentils within the continent and among the top 10 producers in the world. Ethiopia grows over 12 types of pulses; ranging from the conventional pulses such as faba beans, chickpea up to the recently emerging ones such as mung bean.

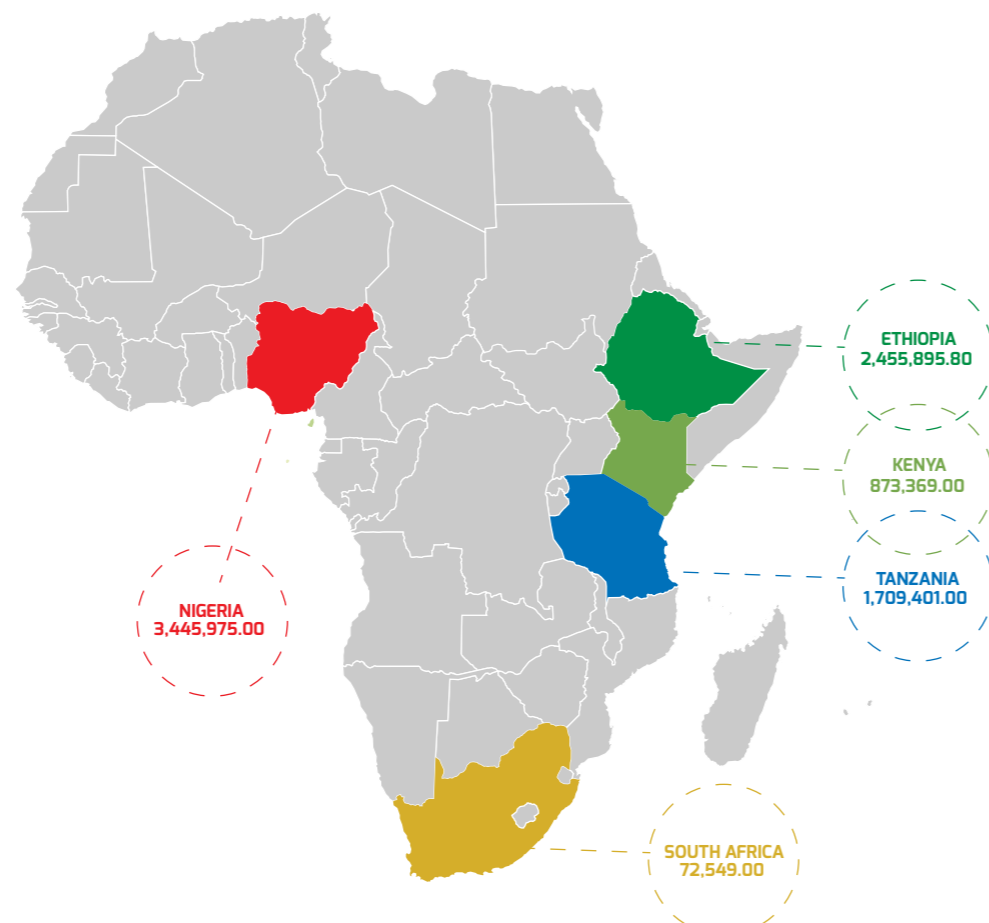
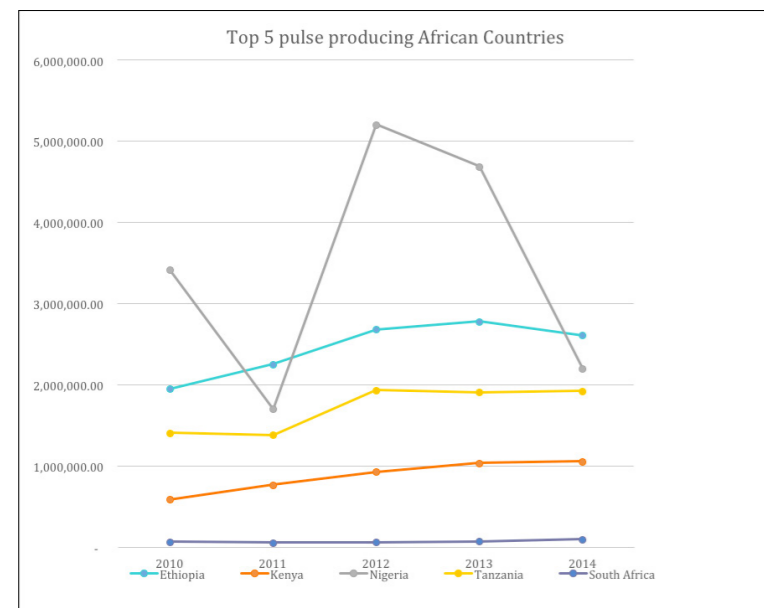
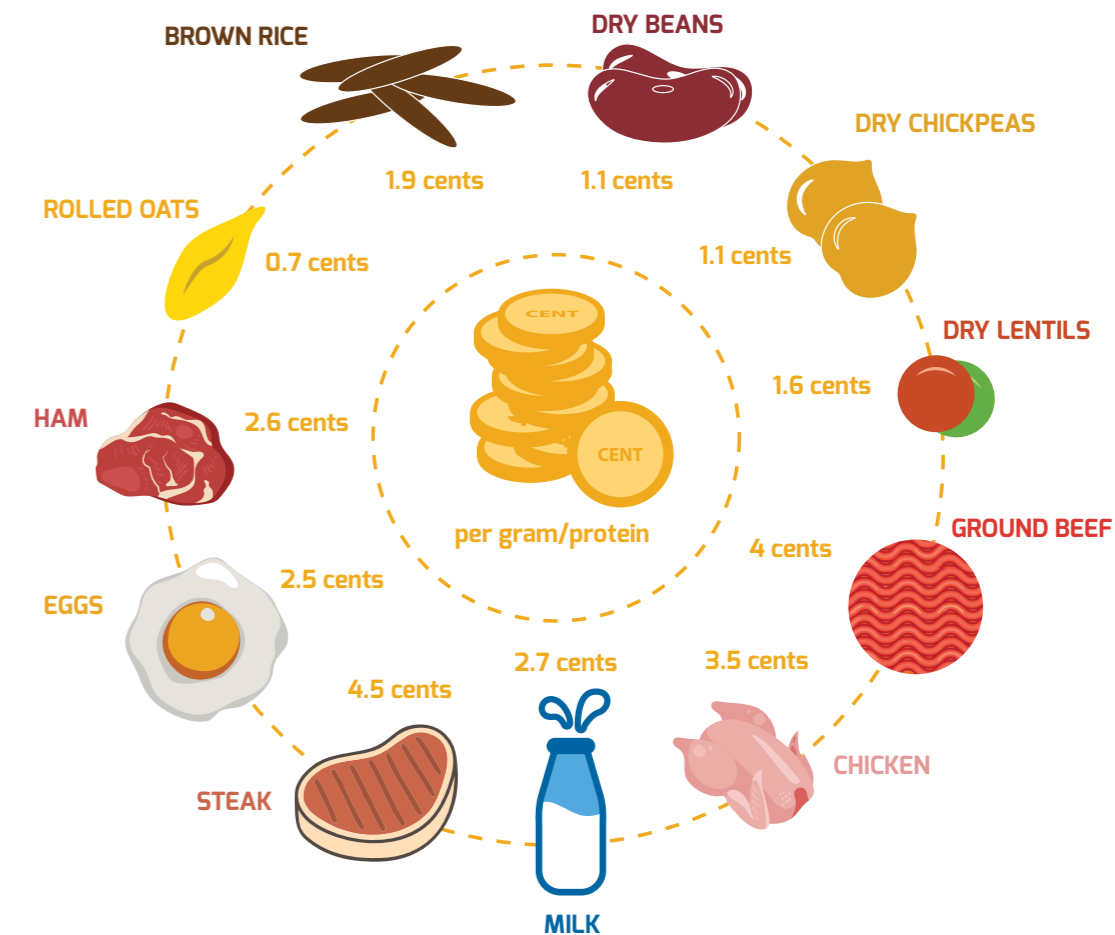


Figure 1.3 1 ****Africa pulse production map

1.4 Household Consumption and Nutrition

The majority of population in Ethiopia doesn't have access to expensive animal protein sources such as egg, milk and meat. These added to the fact that more 45 million people are fasting from animal food sources for nearly 200 days/year; means that household utilization of pulses plays invaluable role in improving nutritional status. Pulses are the most cost-effective sources of protein that accounts for approximately 15 percent of protein intake (IFPRI, 2010). According to FAO (2016), pulses are also rich in complex carbohydrates, micronutrients, protein and B-vitamins, which are vital parts of a healthy diet and high energy. For example WFP's 'super cereal', used a lot in emergency relief, consists of maize, soybean and chickpea; and is very high in both energy (380 kCal/100 g) and protein (at least 14%) (WFP, 2013). Within the context of SNNPR, where the SIFoNS project focuses, pulses are even far important for nutritional balance. ENSET, the staple food within the region, is rich in carbohydrate but poor in protein, vitamins and micronutrients. Common bean as a leading pulses in the region has been playing invaluable role in bridging the protein deficiency. The chart below shows cost per gram of protein.



Source: <https://plenteousveg.com/cost-vegan-protein-vs-animal-protein/>

1.5 Source of Income

Pulses are important cash crops for farmers. A study conducted by IVCD (2014) indicated that pulses have higher return per ha compared to most cereals; namely maize, wheat and barley. As estimated by the participants of the focus group discussions within this study, 40% of the product is consumed at farm households,

around 50% is marketed to the regional and central markets, while 10% is reserved as seed for the next season. During the field survey of this research farmers noted that pulses are critical cash crops serving the highest cash needs of the household such as for sending children to school and paying input loans.

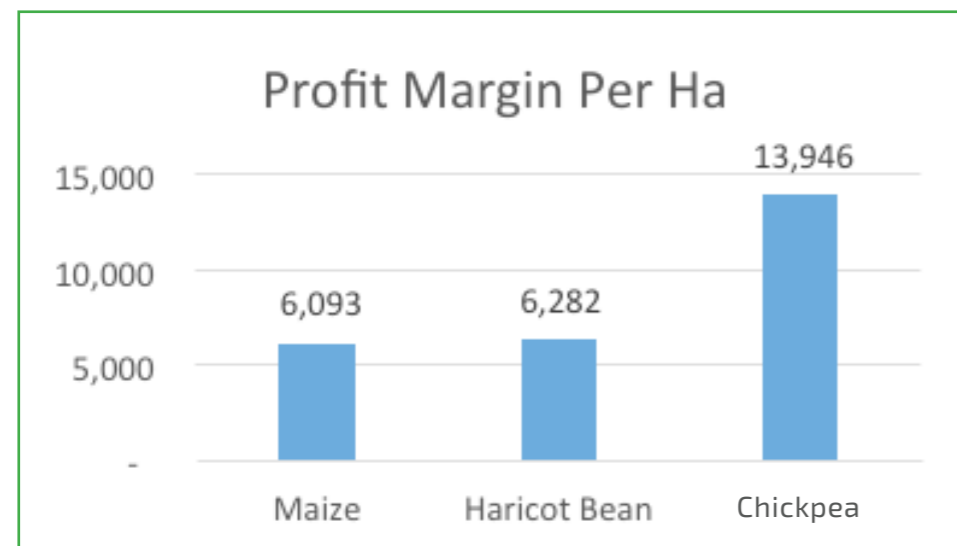
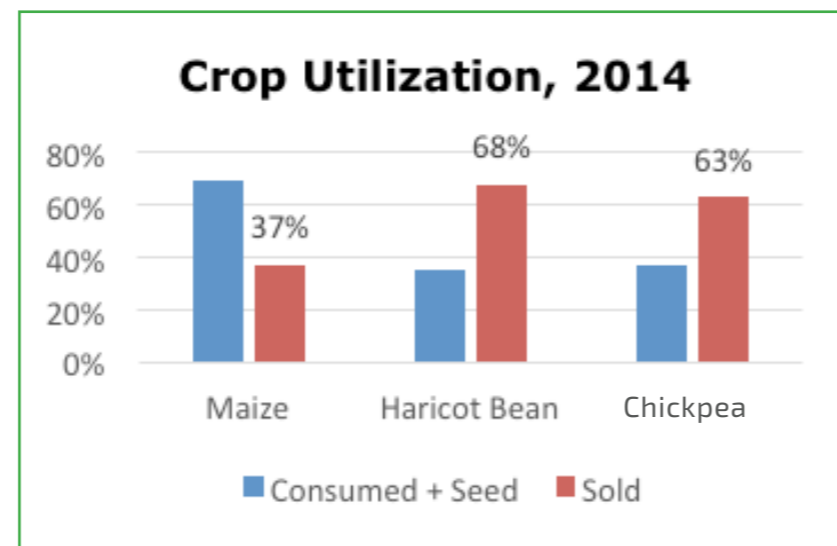


Figure 1.5 1Economic analyses of chickpea



1.6 Source of Foreign Currency

Ethiopia generated US \$ 194 million from export of pulses in 2015. Pulses are the third-largest export crop after coffee and oilseed. The most prominent export pulses are haricot bean (\$ 116 million), chickpea (\$25 million) and faba beans (\$ 26 million). Looking at the export trend for the last five years, pulse export has shown an average annual growth of 20%. The three major export destinations of Ethiopian pulses are Pakistan, Sudan and India.

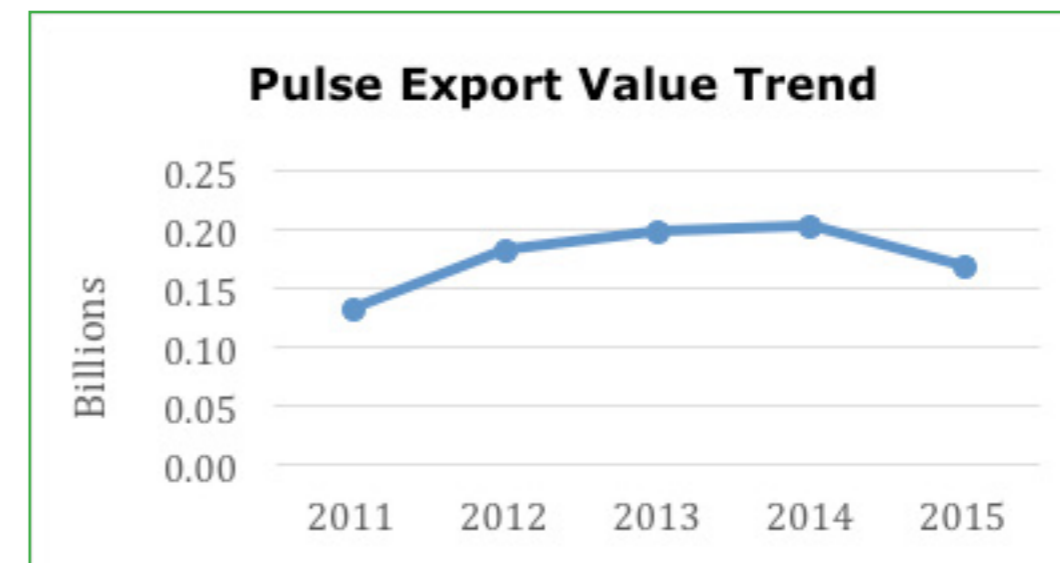


Figure 1.6 1Pulse Export trend

****Export earnings trend from Pulses

1.7. Improved Soil Health

Pulses have been grown as important rotational crops to improve soil fertility. They are biological nitrogen fixers resulting in the creation of a symbiosis between the plant roots and soil bacteria (Giller and Wilson 1991 cited in FAO 2016). Biological nitrogen fixation provides approximately 100 million metric tonnes of

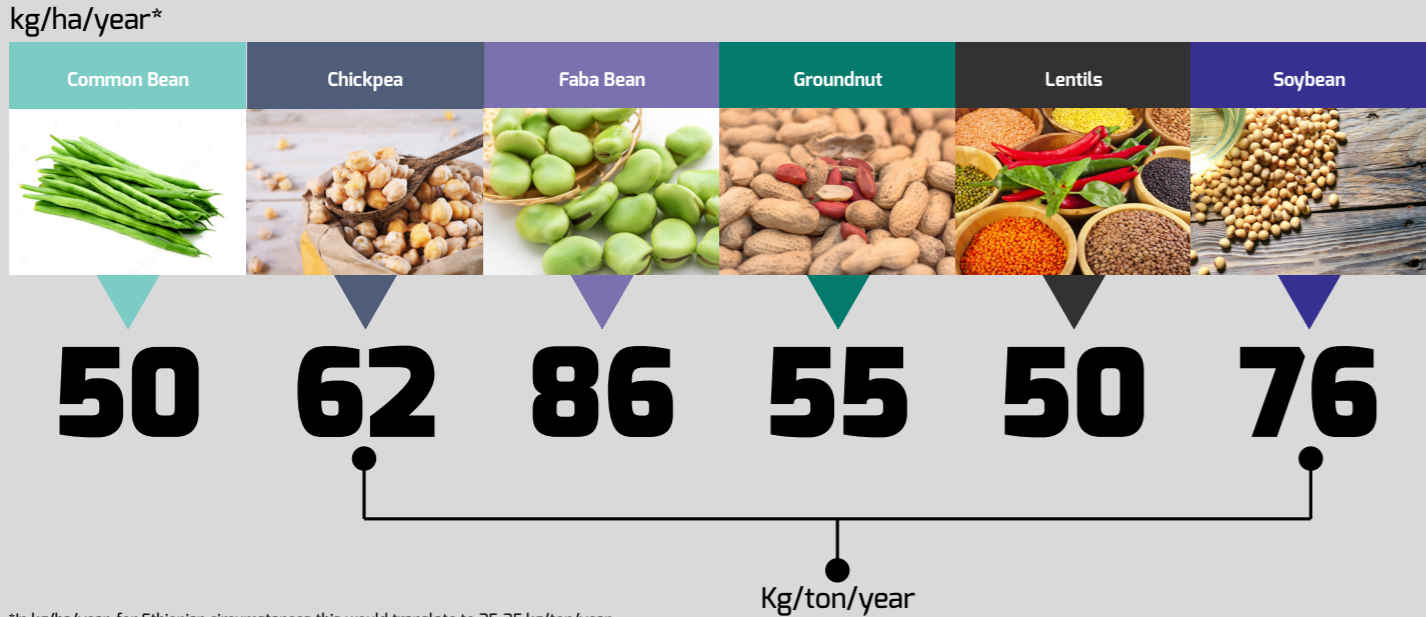
N, which leads to an annual saving of around USD10 billion on N fertilizer (Graham, 2008; Howieson et al., 2008). In turn, the fast growth of legumes can improve the soil-protective land cover (protecting the soil from wind and water erosion) and helps to break pest, disease and weed cycles in cereal cropping systems

(CGIAR, 2012). Table 4 gives an overview of the nitrogen fixation capacity of a number of selected legumes. Ethiopian farmers have long adopted pulses as important rotational crop after cereals and vegetables.

1.8. Increased Farm Intensity and Reduced Risk

In addition to nitrogen fixation, some pulses have demonstrated great resilience in drought and harsh weather; implying reduced risk for smallholder farmers. Legumes often take up a special position in the farming system as an intercrop or second crop, increasing the crop-

ping intensity. Especially chickpea and grass pea are known for utilizing the residual soil moisture that remained after the main cropping season still producing good yield.



2. CHICKPEA VALUE CHAIN ANALYSIS

2.1 Overview

Chickpea is the third widely produced legume in Ethiopia after faba bean and haricot bean. Ethiopia produces over 470,000 MT of chickpea that makes it the fifth leading producer in the world. It is the leading producer in Africa, accounting for close to 40% of total production of the continent. Chickpea is an important consumption as well as cash crop for smallholder farmers. The grain is consumed in green, dry roasted and powder (shiro). It is a key source of high-quality protein, with a wide range of essential amino acids. Over the last five years Ethiopian has exported over US \$ 197 million worth of chickpea.



Figure 2.1 1 Chickpea export trend (2011-2015)

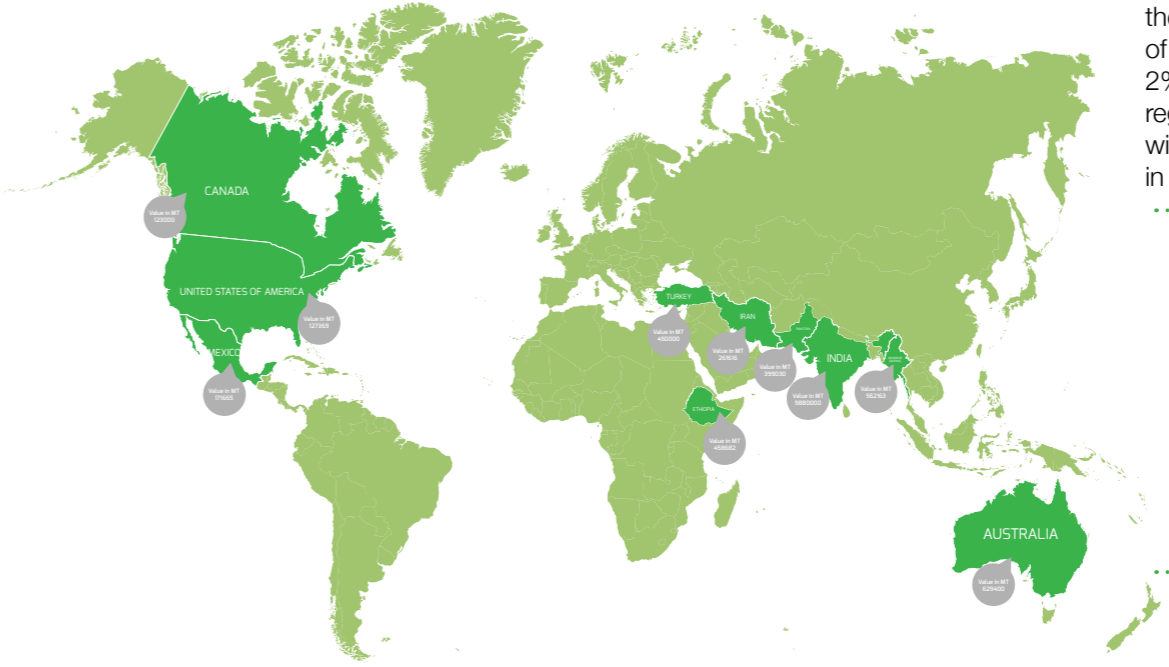
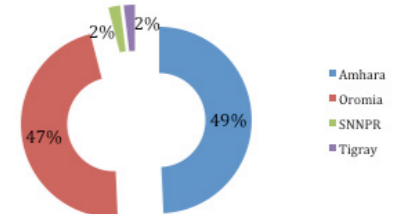


Figure 2.1 2 Leading Chickpea Producers (2014)

Chickpea is often grown as a second crop after main maize and teff harvests, utilizing residual soil moisture. It is produced in the mixed crop-livestock farming systems of the central, north and northwestern highlands of the country. Amhara (49%) and Oromia (47%) are by far the largest producers of chickpea in Ethiopia; accounting for over 96% of the national stock. Production in SNNPR region account for only 2%. Over the last five years, chickpea coverage and volume in the region has increased by 76%. The major chickpea producing areas within SNNPR are Gorgahe, Wolayita. However, the crop has potential in many other areas such as Gamgofa, Halaba and Silte.

Chickpea Production - Regional Share



Average Annual Chick Pea Production for 'Meher' Season (2006/07 - 2011/12)

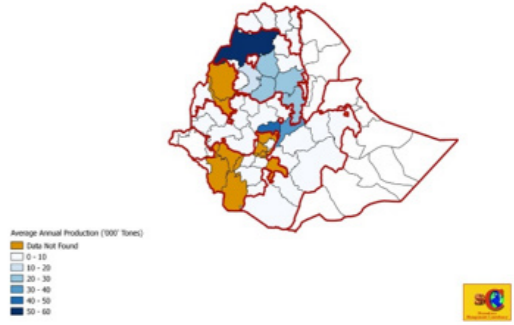
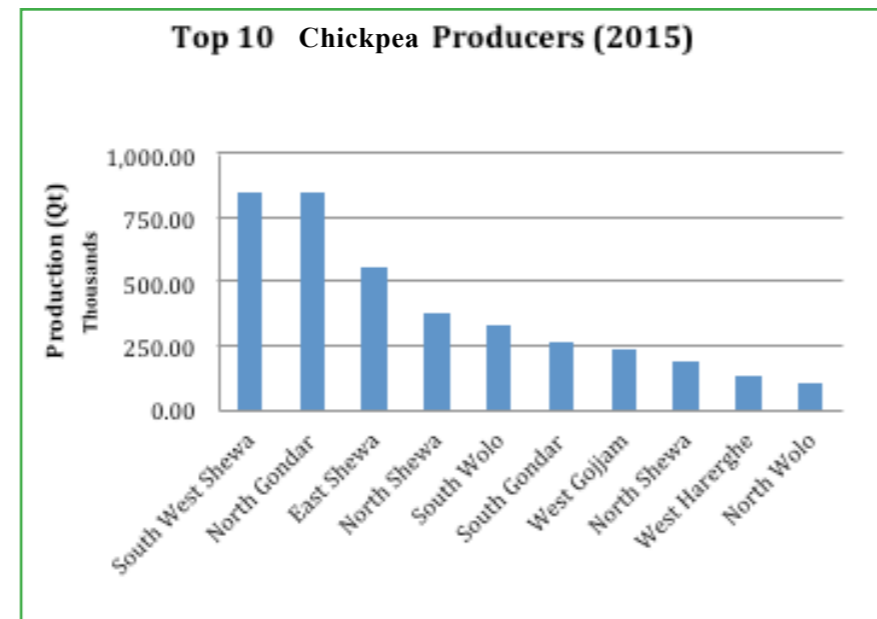
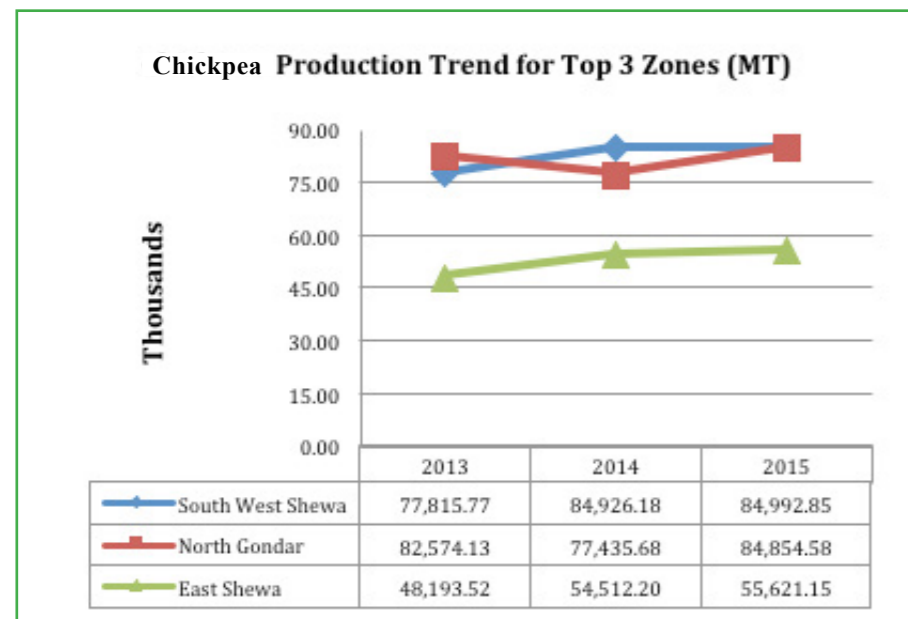


Figure 2.1 2: Current chickpea production areas in Ethiopia



2.2 Production Perspectives

Chickpea is the third most important pulse in the target weredas. An average of 0.2 ha per household is reported to be allocated for chickpea production. The crop is produced as a rotational crop or using residual moisture after harvesting teff and maize. The three major producing weredas in the target intervention areas are Abeshge, Meskan and Sodo. Yield per ha is estimated to be 0.95 MT. There is a

big difference between farmers who planted improved seed and those of conventional seed. On average 60% yield difference is observed. Looking at the differences across regions, areas at Guraghe have highest yield while those in Halaba and some in Wolayita have the lowest. Farmers noted three important success or failure factors when growing chickpea (1) disease and pest (2) weather condition (3) access to input particularly improved seed and experience of the farmers. The major constraints farmers noted during the field interviews are (1) cost and availability of the inputs, (2) skills related to good agronomic practices and (3) marketing & storage. Farmers also noted that they gained three major benefits from the project that can boost their future productions (1) additional income to finance both input and other household costs (2) soil improvement and (3) land use efficiency.

DISTRICT	AVERAGE PRODUCTIVITY (QT/HA)
Halaba	7.5
Humbo	8.0
Damot Weyide	8.4
Silti	8.9
M/Badewacho	9.0
Hulbareg	9.3
Damot Gale	9.8
Sodo	10.8
Meskan	11.6
Abeshighe	11.8

Figure 2.2 1 Chickpea Average Productivity

2.3 Bulking and Logistics

On average production volume per household is 0.34 MT. Farmers keep the produce for 2 months. As in the case of most other crops chickpea in SNNPR is stored for three major reasons (1) market speculation (2) household food stock and (3) seed stock. Farmers noted post-harvest infestation and weight losses as some of the challenges during storage. The most common storage practice is use of woven sack and in order to protect infestation farmers fumigate with chemicals. It has been noted that fumigation with chemicals has created a health risk from consuming residual chemicals particularly in the case of chickpea where roasted consumption is a common practice. Though cooperatives and unions exist in many parts of the operating weredas their activities in relation to output bulking and marketing is minimal (less than 2%). In order to resolve this, the project adopted cluster based intervention but still the volume per cluster is small and hence cost of bulking is high.

2.4 Sales and Marketing

The majority (54%) of the sales of chickpea production within the project area take place right after the meher harvest season. Farmers sell the product in three forms (1) green pod (2) roasted or boiled (3) grain. The green pod and roasted/boiled often are sold by farmers along the main road, particularly those close to the major cities. The grain sales is the principal form but significant number of farmers also noted they sold seed (notably in Sodo, Abeshge and Meskan wereda).

Three-decision making factors are involved in chickpea sales (1) cash need (2) price risk (3) post-harvest loss. The major driver (95%) of the farmers is the cash need mainly to repay for input loans. Pressure from input loan suppliers (government) push them to sell their produce at lower prices even if they know from experience that prices are higher during lean seasons. The input credit supplier, Omo Micro Finance, often seeks collection within two months of harvesting season to minimize risk of default from farmers selling early and spending the money somewhere else.

2.5 Pricing

Average national price of chickpea for the last three years is indicated in the table below. Chickpea price has more than doubled between 2012 and 2014; mainly due to poor harvest in South Asian countries. Taking the last three years data, price has increased by 57% on average. Analysis of price across seasons within a year indicate that there is strong variation (64%) in price across seasons within a year whereas variation across supply chain is marginal. The highest variation is observed in Damot Gale and Badewacho weredas while the lowest in Meskan wereda. This shows that farmers can greatly merit by stocking produce until lean seasons but the challenges of cash shortage and post-harvest loss is a major bottleneck. Price difference among improved and local varieties is the other important factor observed from the field. On average improved chickpea varieties fetch 25% higher than the local varieties. Three factors determine market price (1) availability of buyers (2) volume of product per market day and (3) prices within the surrounding markets as well as the in the central market. The availability of buyers is particularly important in emerging weredas where chickpea is not widely produced. Most of the buyers come to the major production belts and few weredas such as Daramalo have no big production means that traders don't appear in those markets. Farmers noted that they take price.

Chickpea Price Trend

Year	Price (USD/MT)	Variation over a year	Variation over 3 years
2012	420		57%
2013	900	122%	
2014	920	5%	

Price variation over the year – Chickpea

Price	Average Price	Price Variation	
Harvest	500		64%
Intermediate	660	32%	
Lean	820	24%	

Table 2.5 1: Price variability

2.6 Household Consumption

Evidence from the farmers' survey indicated that 40% of the chickpea is consumed at home. The form of consumption varies among weredas but the most common household food items made from chickpea are (1) shiro (2) roasted (3) boiled. In some areas farmers noted that they use chickpea as ingredient for children and lactating mum porridge. The level of awareness about the nutritional value of pulses by wereda is indicated in chart below. The discussion with women group shows that knowledge about nutritional benefit of pulses is sound. Over 78% of the interviewees mentioned pulses are good to feed to mothers and children as they will not get hungry very soon and strengthen the body.

Awareness of pulse nutritional Advantage

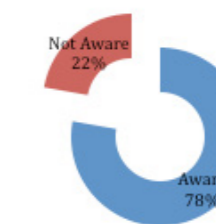
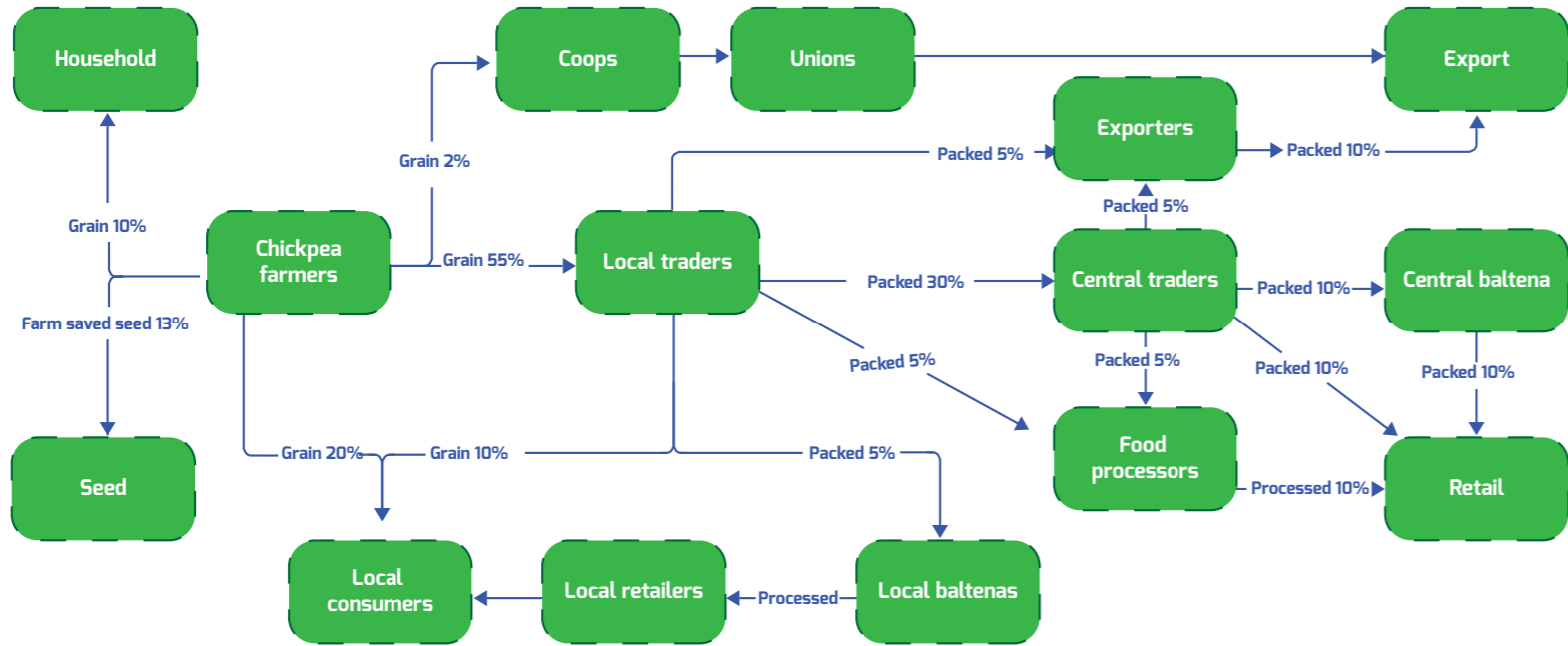


Figure 2.6 1: Pulse Nutritional Awareness

2.7 Value Chain Mapping

The chart below highlights a typical chickpea value chain in the target weredas. As can be seen from the chart the majority of the produce (90%) is sold to local traders who often bulk and supply to regional traders/aggregators. This then deliver to processors in Addis Ababa or supply to exporters. The participation of cooperatives in the seed value chain is stronger (accounting for 40% of the seed supply to farmers); however, when it comes to grain the cooperatives have limited role in the target areas absorbing only 2% of the total marketed production. Farmers noted

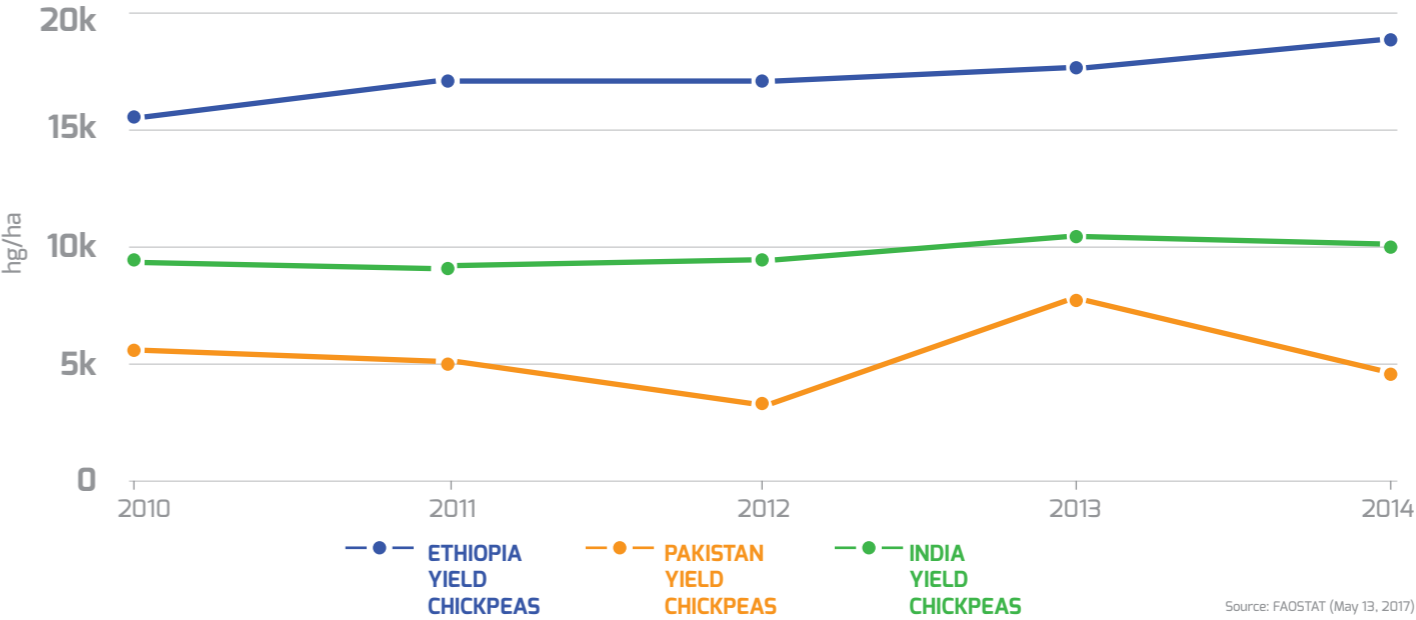
three major constraints within the supply chain (1) brokers (2) lack of sufficient number of buyers (3) fluctuating prices. However, this is sometimes over exaggerated given the aforementioned remark that price variation across chain is marginal; and hence the effect of brokers in destructing the supply chain is minimal. Four end consumption points of chickpea are worth mentioning: export, baltina processing, nutritious food and the rural household consumption.



2.7.1 The Export Chain

As noted above Ethiopia exports over 1.38 million MT of chickpea per year. The large seeded Kabuli varieties are the most prominent for the export market. Currently, most of the chickpea exported from the country comes from central and northwestern parts of the country: East Shewa, South West Shewa, North Shewa, North Gondar and Parts of Gojjam. The exporters get most of their chickpea from regional assemblers or wholesalers at Mesalemia in Addis Ababa. Pakistan, United Arab Emirates and India are the leading importers of Ethiopian chickpea. The export demand is highly driven

by the international market. The major competing countries for Ethiopia are South Asian countries such as Pakistan, Afghanistan and India. The chickpea from these countries is noted as large seeded than the one from Ethiopia. Ethiopia has a better yield per ha compared to these countries but the total volume of production for countries like India is nearly double that of Ethiopia. Currently, the only potential weredas, which are selling bigger volume, are Abeshge, Meskan, Sodo and Hulbareg. In these areas farmers noted that there are many buyers sending chickpea to exporters in Addis Ababa or Adama.



2.7.2 The Baltina Chain

The baltina is fast emerging value chain for chickpea. It refers to sets of pulse, spices and other food ingredients made for home consumption targeting urban and semi-urban middle class consumer. Baltinas produce split chickpea (kike), powder chickpea (shiro), processed hot pepper (berbere) and mixes (mitin shiro). They also produce packed roasted chickpea and mixed pulse powders for baby and lactating mothers. Baltinas are mostly (over 90%) women enterprises (individual or group). Most are not specialized in only chickpea and use a wide range of ingredients (including grass pea and field pea) to produce shiro. Currently, it has become an industry that includes both household businesses and larger companies, spreading from rural towns to the major cities. The baltina chain absorb over 10% of the chickpea production within the country. The major feature of Baltina businesses is the limited working capital it requires and easy to start. In the project area notable women groups such as Mame Baltina in Hawassa, Korea Women Ent. in Sodo, Umi in Butajira; selling their products to local consumers. On average a baltina enterprises process 0.2 MT per week.

2.7.3 The Nutritious Food Chain

This chain refers to agro processing companies such as FAFA, Guts, Hilina who are using pulses as partial or main ingredients in the processing of baby food, FAMEX, or other food products. The baby food formula such as Cerifam of Fafa and Superman of guts have an average of 20% chickpea as ingredient. FAMEX products mostly supplied to the drought prone areas through the WFP also use 15-20% chickpea /soybean as major protein source. Evidence from the processors indicated that the most prominent pulses used in baby food formula as well as FAMEX are chickpea and soybean. The two are often used exclusively. The nutritious food industry is currently absorbing an estimated amount of 10% of chickpea produced in the country. This is expected to increase with an increased national investment in light agro industrial processing.

2.7.4 Rural Household Value Chain

Chickpea is an important household food security as well as a cash crop. As estimated by the participants of the focus group discussions, 40% of the product is consumed by the rural community itself, around 50% is marketed to the regional and central markets, while 10% is reserved as seed for the next season. The total marketed chickpea is channeled through local traders and assemblers, wholesalers, retailers and cooperatives. Wholesalers take the biggest share (around 38% of the total volume) while the others take up 12% together.

2.8 Economic analysis

Chickpea, though often used as a second crop, still competes well with the main season crops teff and maize in terms of profitability. This is partly due to lower costs in terms of land preparation and weeding, and yields and prices are still relatively high. Farmers benefit from an increasing export market price that grew from around US\$463 in 2014 to US\$ 900 in 2016, making chickpea more and more a real cash crop for farmers. The farm gate price is still around 80% of the retail price for chickpea, while price trends within the year are strongly upward, reflecting the potential benefits of proper storage.

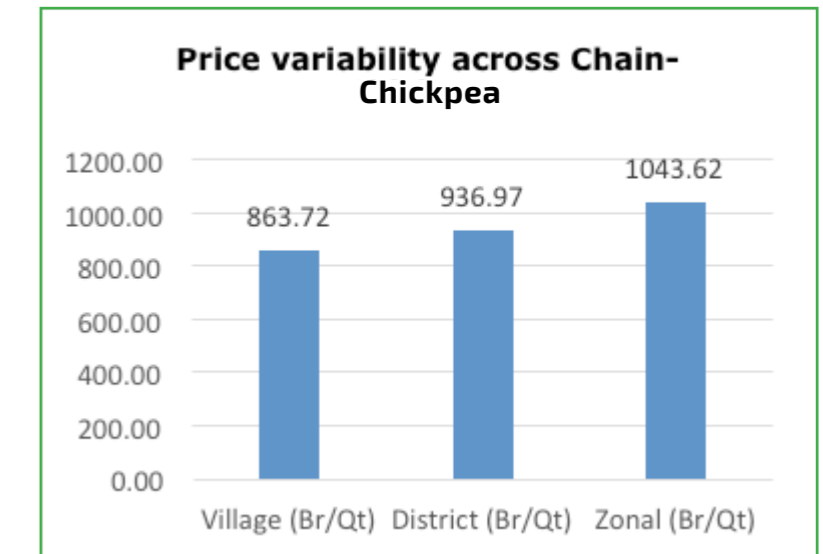
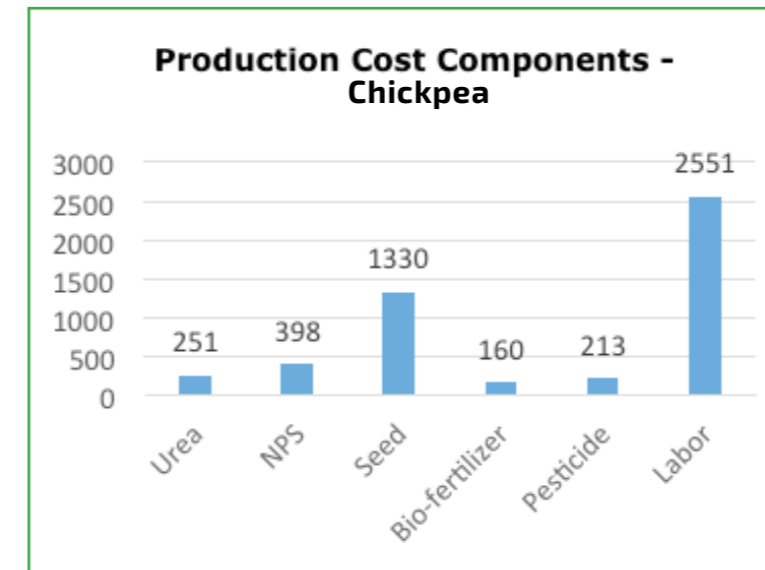
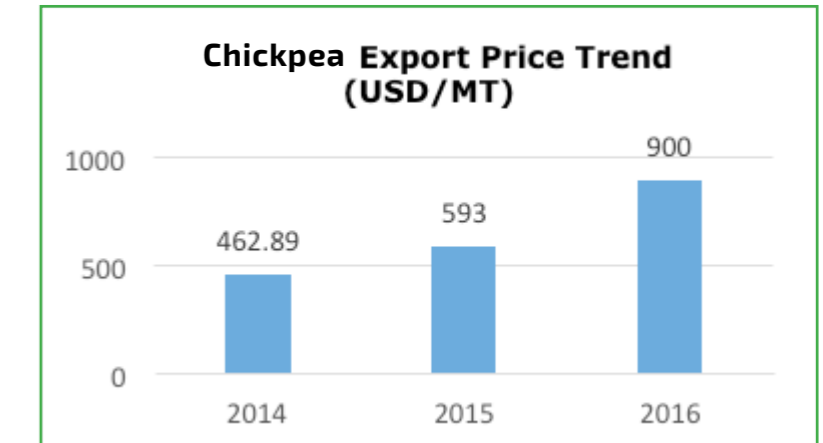
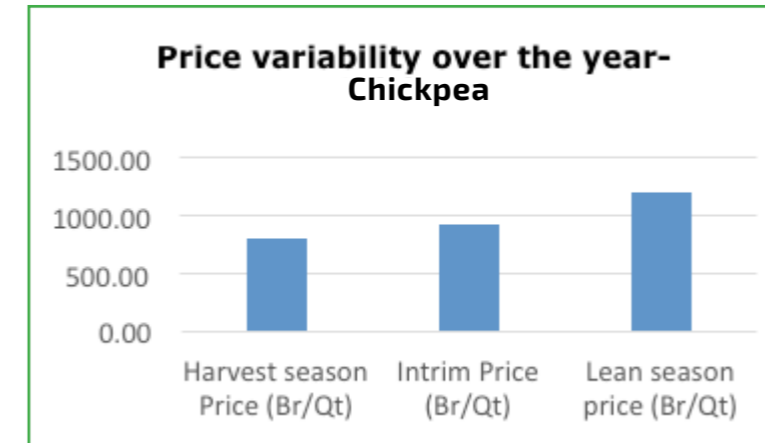


Figure 2.8 1: Economic analyses of chickpea

2.9 Possible Value Chain Interventions

2.9.1 Production

Scale

Increasing the scale and market orientation of chickpea produced in the region is very important. As noted above the volume produced per household in most of the weredas hardly justifies economic viability for bigger buyers such as ACOS, FAFFA and Guts. Often these buyers demand a minimum of 40 MT bulked at a point with predetermined level of quality. Though, areas like Abeshge, Sodo, Meskan and Hulbareg still have production volumes that can cater for industrial buyers, most others like Damot Gale, Daramalo and Badawacho have limited volume. In these areas the project should intensify scaling-up but at the same time, work on other options for market linkage-link with household and school feeding value chain.

Marketable Varieties

Most of the industrial buyers (exporters and food processors) demand the Kabuli variety (includes Habru, ACOS Dube) and hence production should have a continuous look at the most demanded varieties. Extending the existing private partnership to more companies such as ACOS Ethiopia (the leading exporter of pulse) is important for two reasons: (1) have their own varieties that have proven market (2) are willing to give contract farming for their specific varieties. The new varieties of Hawassa University are more preferred by farm households as suitable for cooking and healthy to eat. The baltinas on the other hand prefer the yellow, small seeded variety.

Sustainable Input Delivery

Another major intervention point for chickpea production could be sustainable input delivery system. Currently, farmers in the project area are getting seed from south seed enterprise, inoculant from HU and agro chemicals either from private agro dealers or bureau of agriculture. This is neither coordinated nor sustainable. As mentioned above seed is among the major constraints that undermine increased production in the weredas. Besides farmers have noted lack of pesticides as major production constraints. A possible intervention point could be strengthening the current clus-

ter based seed producer farmers to emerge as seed and input cooperatives where they increase other inputs namely inoculant, agro chemical into their portfolio. Possibly, backward integration through exporters and private input suppliers could be considered as an option. For the cooperative model, linkages can be made with ATA's activities (as further elaborated on in their Chickpea Working Strategy).

2.9.2 Aggregation

In order to get minimum volume, proper aggregation is essential. Currently, local traders buy the majority of the chickpea in the intervention weredas. In areas where chickpea is not mainstream crop, there is only petty trading than aggregators sitting with weighing scales. This will remain major challenges in some of the project intervention areas such as Daramalo. Most of the farmers within the project areas are organized into cluster. This makes the time and cost of collection easier. But the fact that the clusters are loose networks means that they don't have shared sales and marketing schedules i.e. they often sale at different time of the season mostly depending on household cash needs. Establishing a formal cooperative system that can prepay farmers and stock the product until prices improve, will have an important impact on farmers' income as well as ease of bulking minimum volume that can cater for industrial demand.

2.9.3 Processing

Simple Processing Innovations

The baltinas will remain a major surge in the coming years as more and more urban and semi-urban population switches from home-made food ingredients to on shelf products. However, the baltina processing enterprises (both smaller and larger) has several constraints undermining their scale and quality of operation. The current processing practice is highly traditional where women have to manually sort, roast, clean and pack the products. The milling machines are outdated and often not easily accessible for most women. As such low cost and cottage level technological innovations such as electrical sorting, roasting, washing and cleaning machines would be of high value. The businesses also merit a lot from sound interventions in relation to branding, marketing, product handling, business planning, financial management (and access to finance).

The other important intervention point at processing level could be support in product development and branding that can meet demand of both local and international market.

There are limited ranges of chickpea based processed products, notably baby food and FAMEX. The Ethiopian government is currently promoting light agro industries across different parts of the country (including one being built in Yirgalem) this would provide opportunity to closely partner with potential companies but existing companies like Guts Agro, ENRICH Agro and Helina could be interesting entry points in partnering to forge for new product development and branding that ultimately create more market for farmers and options for households.

2.9.4 Exporting

Evidence from exporters indicate that Ethiopian chickpea is less competent at the international market both due to price and quality. The domestic price is often higher than the international market partly due to the big local demand but importantly because of low yield per ha that provides limited economies of scale. Besides, exporters noted that the international market is seeking for large seeded specific varieties such as ACOS Dube and Habru while the Ethiopian production is still widely the small seeded Desie types. Farmers noted that the large seeded varieties are sometimes not disease and drought resistant. Creating a sound partnership with bigger exporters such as ACOS and working with Ethiopian Oil Seed, Pulses and Spices Exporters

Association could be of great importance both in facilitating access to market linkage as well as joint variety development, selection or scaling-up. These companies can both play a role in chain integration by working together with groups of farmers as well as standalone activities that can improve warehouse management, financial management. Cooperatives or Unions could be involved in this as well, though they are currently already receiving much support and an alternative pathway is worth exploring.

2.9.5 Value-chain coordination

Coordination in the chain will be crucial to link the actors in terms of input supply, market information, cleaning, sorting and grading and processing, as well as linking key value-chain actors to important services as access to finance, agronomic support and business management. A chickpea business platform is recommended, both at national level and zonal level. In this aspect SiFCON should create alliance with existing national legume and chickpea platforms such as the Ethio-Netherlands Trade for Agricultural Growth, N2Africa, International Trade Center, ATA and National Chickpea Forums lead by EIAR and ICRISAT.

3.HARICOT BEAN VALUE CHAIN ANALYSES

3.1. Overview

Haricot bean is one of the most important grain legumes grown in Ethiopia. The principal production belts are, Central Oromia, SNNPR and Western Amhara. While white pea beans are common in central oromia and western Amhara, red kidney beans are commonly produced in SNNPR. According to CSA (2015/16) the country produced over 500,000 MT of common bean from 355,000 ha of land. In addition to the main Meher season, significant volume is produced in Belg season. Average productivity per ha is around 1.5MT despite the potential of over 2.5 MT/ha. Based on the CSA data of 2015/26, the biggest producer of haricot bean, both white and red, is the Oromia (51%), SNNPR (27%) and Amhara (20%) accounting for 98% of the national production. The SNNPR account for over 27% of the national share but still there is a significant production in belg season, which is not accounted in this share. SNNPR, is the leading producer of red haricot beans. Wolayita is the biggest producer of haricot bean followed by Sidama and Gamo Gofa.

Haricot bean is the leading export pulse for Ethiopia, generating over 144 million USD per annum. It accounts for over 70% of the national pulse export income. The crop is also one of the most important foodstuffs particularly in SNNPR. In this region haricot bean is used for different types of household food and is an important source of proteins, carbohydrates, vitamins and minerals. Dishes such as Possess and Bulenta (mix of boiled beans, maize, cabbage and other vegetables) are common in the rural areas. In urban areas, boiled beans, soup and some specialized food for mothers and babies are practiced.

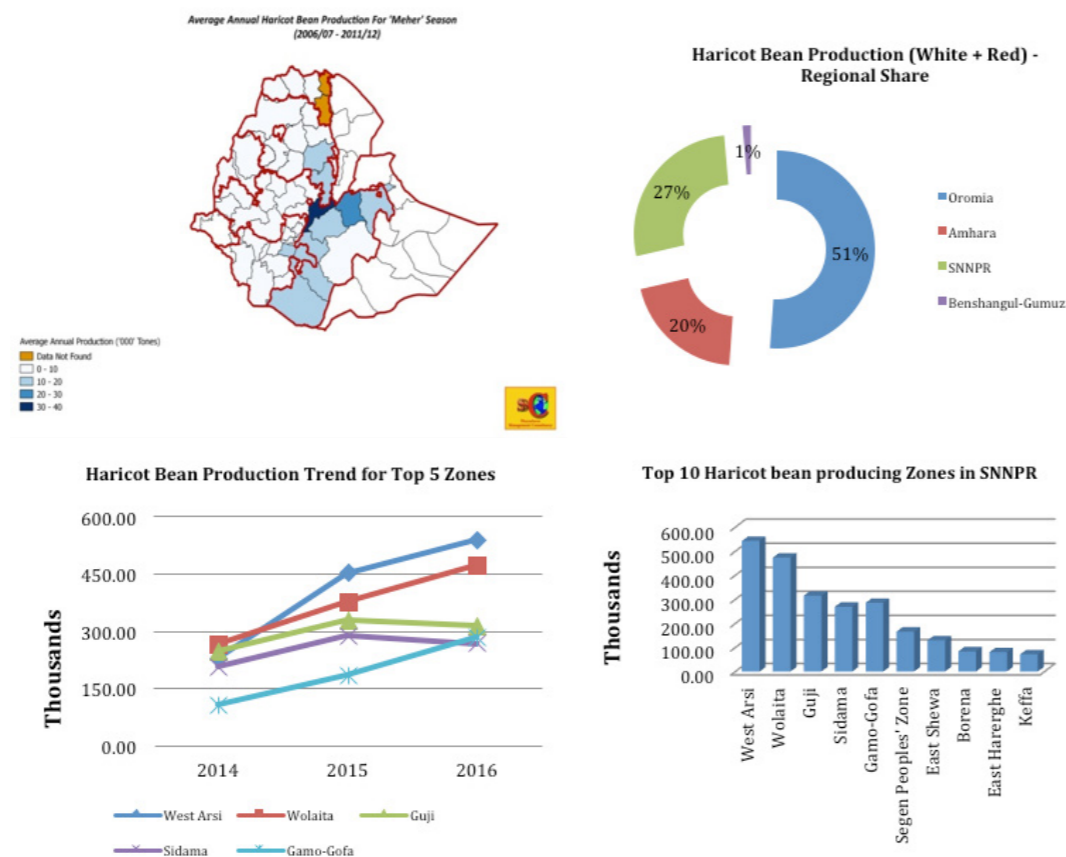


Figure 3.1 1: National Haricot Bean Production overview

3.2. Production Perspectives

Average of 0.38 ha per household is allocated for haricot bean within the target weredas. Haricot bean is produced both during the Meher and Belg seasons in most weredas. The three leading producing weredas are Kucha, Boricha and Damot Gale. Average yield per ha in the 15 weredas is 1.2 MT and the most prominent variety is Hawassa Dume. Average yield is the highest in Silte (2.5 per MT) and lowest in Daramalo (0.8 per ha). Yield difference of 20% is reported between farmers who planted improved and local varieties. In addition to yield, they noted that the new varieties are more disease and drought resistant. Farmers plough the land on average 4 times and the application of inputs is minimal; 79 Kg NPS fertilizer per ha. The primary cost drivers are Labor, NPS fertilizer and Seed. Farmers are highly positive about the merits of growing more beans both as cash crop and household food security. However, they noted that there are several constraints that stifles productivity-storage, cost of inputs and marketing are the major ones. Farmers mentioned three major reasons for growing haricot beans, cash crop, food crop and the soil fertility impact.

Districts	Harvesting window/ Season	
	Belg	Meher
Meskan		Oct-Nov
Sodo		Oct-Nov
Abeshighe		Sep-Oct
H.Zuria		Oct-Nov
Boricha		Oct-Nov
Kucha		Oct-Nov
Daramalo	July	Oct-Nov
Damot Gale	May	Nov
Damot Woide	May-June	Nov
Humbo	August	August
Shashego	May-June	Nov-Dec
Silti	June	
Hulbareg	July	
Halaba	August	Oct-Nov

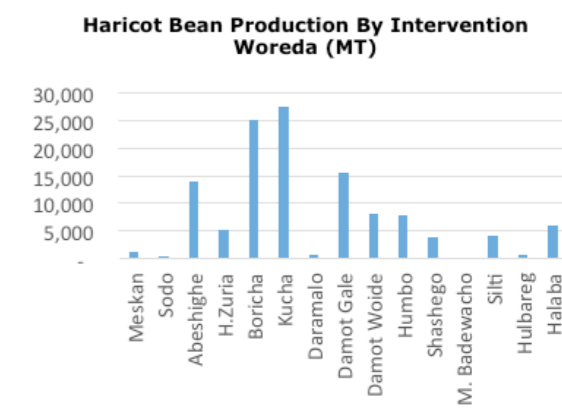
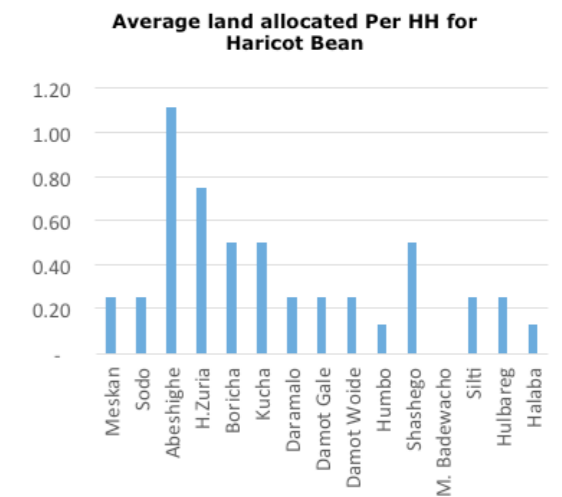
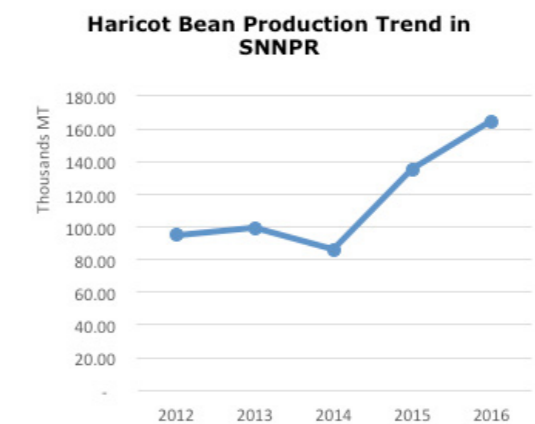


Figure 3.1 2: Haricot Bean Production Overview SNNPR

3.3. Bulking and Storage

Unlike chickpea, production of haricot bean is more prominent in the region. Beans are the second major crops grown in the intervention weredas after maize. One average production volume per household is 0.4 MT. Farmers keep the produce for 1.5 months. The storage of belg production is much shorter because of the high demand for cash during the months of September. The belg produce is better in terms of seed uniformity but often has high moisture content and high risk of mold. On the other hand the meher production in some cases suffer from high degree of seed variability due to rain shortage but overall farmers think the quality of meher production is better than that of belg. The most common storage practice is use of woven sack and in order to protect infestation farmers fumigate with chemicals. Farmers noted three major problems in haricot bean storage (1) high pest infestation (2) rust particularly for belg production season (3) weight loss over time. Unlike chickpea there are many buyers (both cooperatives and traders) of Common bean mainly because SNNPR is a major bean belt.

3.4. Sales and Marketing

The majority of farmers sell to the nearby markets, mainly (84%) to grain dealers. The average sales per market day are 50 MT. The major driver for farmers to bring produce to market is cash need, better market price and post-harvest loss respectively. Farmers noted that they get market information only for the markets around their vicinity. Unavailability of buyers is not a major problem as the region is known for haricot bean production and several traders purchase from there. Four quality indicators are mentioned for haricot bean (1) Color (2) level of dryness (3) admixtures and (4) uniformity. Traders in the region noted that the haricot bean particularly in the belg season has a high moisture level. The seed uniformity is mentioned as a major problem by traders interviewed, this particularly a challenge for the local varieties. Traders noted that red, dark and speckled beans are mixed and it takes a lot of time and cost to sort at point of aggregation. The market demand, often for export, gives a high weight to seed uniformity.

Quality Index

1. Color dark red is the most preferred one;
2. Moisture level less than 8%;
3. Admixture less than 2% foreign matters such as chaff, sand and soil and
4. Uniformity greater than 98%



Figure 3.1 3: Farmers selling decision factors summary.

3.5. Value Chain Mapping

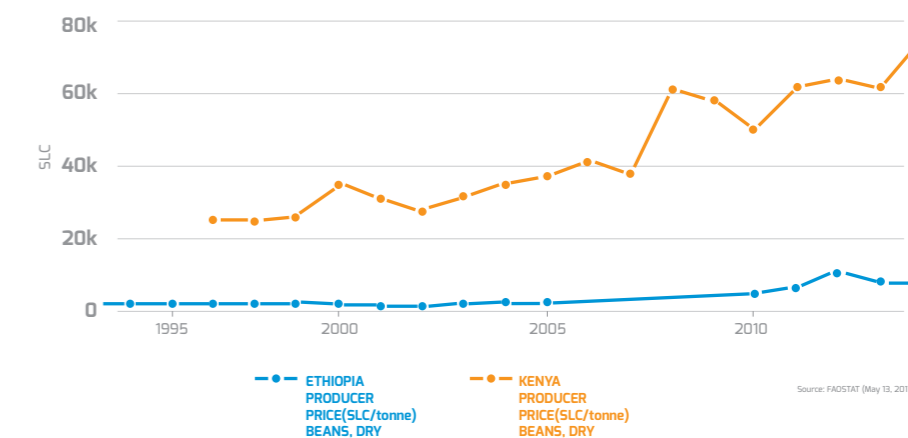
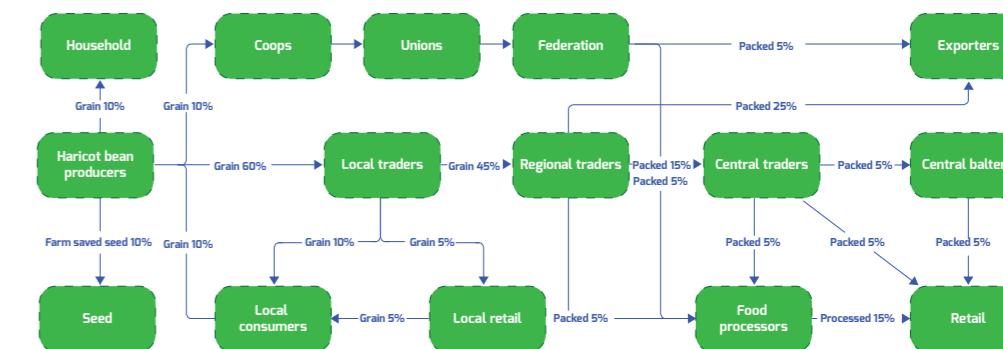
There are two end chains of haricot beans: export and household consumption. About 27% of the haricot bean is consumed at home 36% is exported, 7% used as seed and rest used by urban consumers. The typical haricot bean value chain in most of the weredas is demonstrated in the graph below. Looking at influence and power within the chain it was observed that the end buyers-mainly exporters have big influence in price making. Market information within the chain is often channeled through brokers. The local traders get this from brokers based in central markets such as Adama and Addis Ababa.

3.5.1. The Export Chain

Haricot bean is the leading export pulse from Ethiopia. It is traded on ECX platform. The export channels for white beans and red kidney bean often follow different routes. While the white pea beans are exported formally through Djibouti, the red kidney bean particularly within SNNPR region is often smuggled to Kenya. Virtually all of the export houses for white pea bean are located in Adama, which is the major market en route to Djibouti. At present most are small to medium sized export companies, with some larger exceptions like the AWAD Brothers, EKT, Soretti and ACOS. In the focus

group discussions and interviews it came out that only an estimated 30% of the red haricot bean is traded legally. And from the legal trade channels about two-thirds is traded through the cooperative-union channel. The rest, one-third, goes through certified traders' channel. Out of the total illegal trade, 80% takes the Moyale - North Kenya route. The rest, 20%, goes to Addis Ababa and Nazareth, and then to Djibouti. Illegal trade is popular as no taxes have to be paid and networks with North Kenya are strong.

The formal channel of common bean trading follows ECX route. ECX has got authorized traders who can bulk in the nearby warehouses and then the product will be auctioned to exporters and buyers on the trading platform in Addis Ababa. Cooperatives and unions have the special right of direct export without ECX involvement. Though ECX brings some degree of transparency and governance to the value chain there are major challenges in relation to availability warehouses closer to the farmers, inconsistent grading systems and importantly the challenge of competing with more flexible informal system. The export chain for haricot bean absorbs over 36% of the national production.



3.5.2. Baltina and Food Processing Chain

The baltina chain absorbs a small amount (5%) of beans for clean and packed retailing, processing of baby food and in rare case shiro. Dried packed beans are more popular in the big hotel chain for boiled bean breakfast menu. The big supper market chains also shelf-dried beans for high-end consumers. In relation to the food processors, beans are less popular compared to chickpea and soybeans. However, there is application for feed processing particularly the rejects from export swine feeding. Few factories also use beans as ingredients as protein source. Though one of the most widely industrial processed products is a canned bean, there is no company currently engaged in this. The food and feed processing industry takes about 5% of the national production.

3.5.3. Rural Household Value Chain

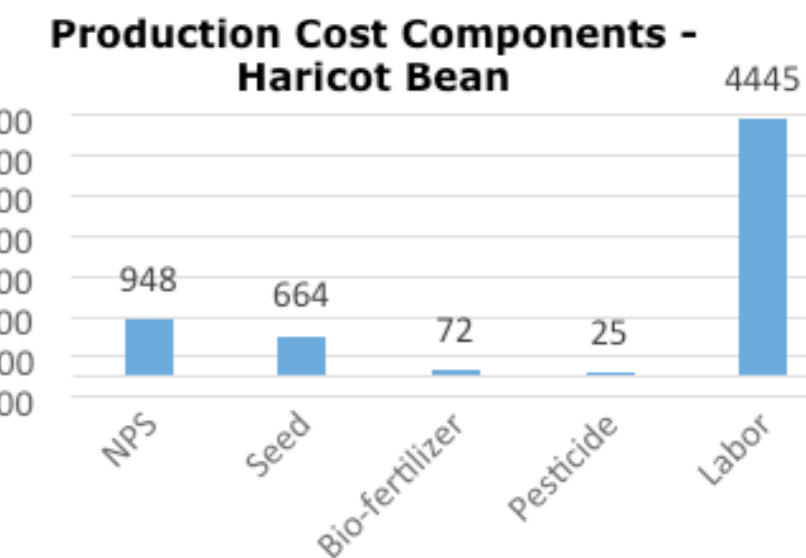
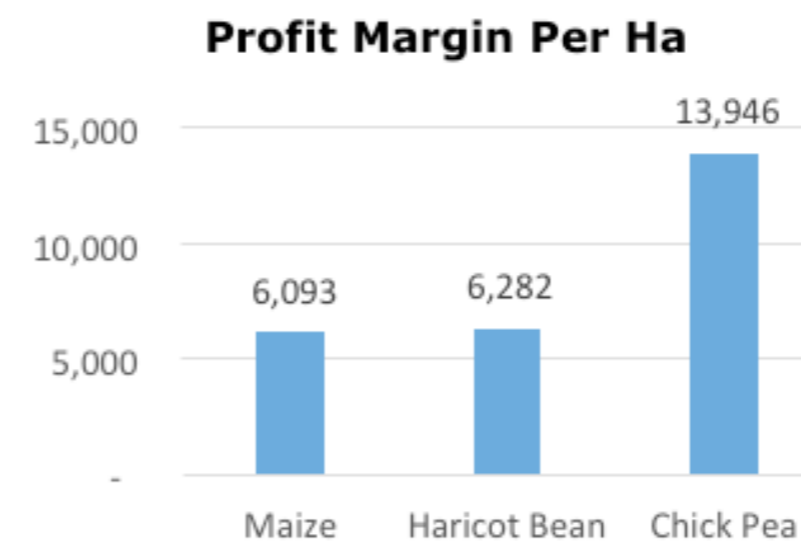
Haricot bean is important food crop. Evidence from farmers in the project area revealed that 27% of the produce is consumed at household. The bean is consumed in different form: boiled, ground and sometimes cooked with other cereals such as maize and sorghum. The discussion with the women group indicated several nutritionally rich haricot bean based menus in the regions. Among the menus indicated on the table below, possess in Gamo-gofa, Bulenta in Hadiya and Poche in Welayita are worth noting. These menus are prepared from haricot bean, maize, vegetables (spinach and cabbage). A nutritional analysis of possess indicated that the menu is rich in protein as well as micronutrients.

Hawassa Zuria	Boricha	Kucha	Daramalo	Abeshighe	Meskan	Silti	Shashego	M. Badewacho	Halaba	Damot Gale	Damot Woide	Humbo
Nufro	Nufro	Nufro	Nufro	Nufro	Nufro	Nufro	Nufro	Nufro	Nufro	Nufro	Nufro	Nufro
Stew	Stew		Stew	Stew	Stew	Stew	Stew					
								Bulenta				
								Oshecha				
								Soup				
						Mitin			Mitin	Mitin	Mitin	Mitin
										Pourage		

Table 3.1 1: Major haricot bean based menus by wereda.

Parameters	Nutritional Content
Crude Protein (gm/100gm)	5.59
Crude Fat (gm/100gm)	7.11
Crude Ash (gm/100gm)	2.20
Crude Fiber (gm/100gm)	1.81
Carbohydrate (gm/100gm)	30.12
Moisture (gm/100gm)	53.17
Energy (Kcal/100gm)	206.83
Calcium (mg /100gm)	2.92
Iron (mg /100gm)	1.47
Zinc (mg/100gm)	0.45

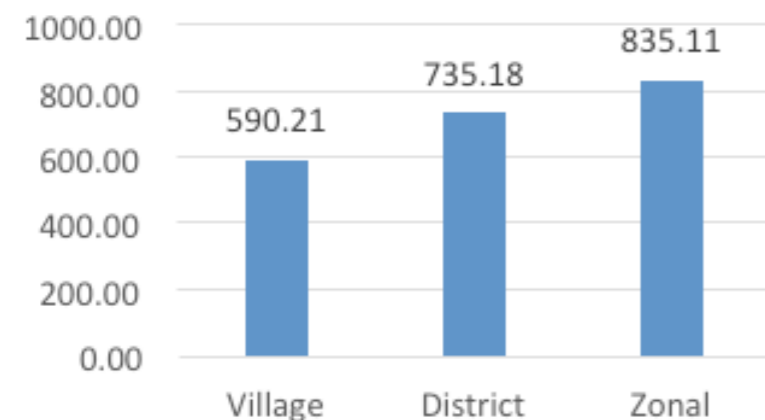
Table 3.1 2: Nutritional analyses of possess



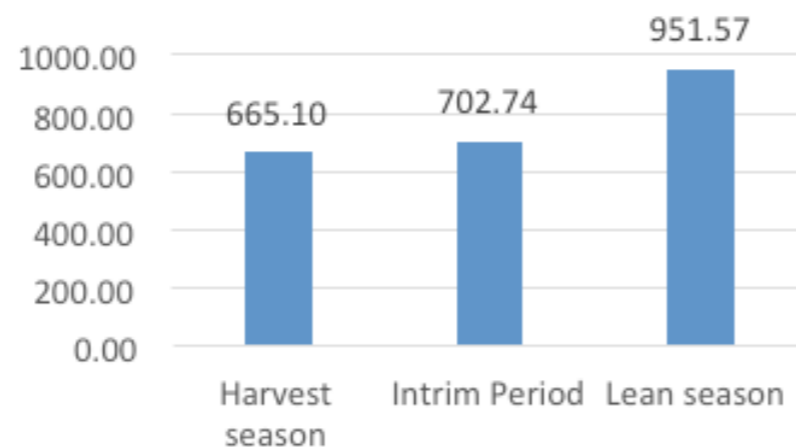
3.6. Economic analysis

The economic analyses confirm that red kidney bean has a high profit margin compared to maize, though its yield is much lower (1.6 tons compared to 5.8 tons of maize). This is mainly because of the high farm gate price per quintal (at ETB 703 per quintal intrim-season). The farm gate price is less than 42% of the zonal price. As indicated earlier, the red haricot bean is a real cash crop and 68% is sold to the market. Overall, the prices are set by the exporters who take the Kenyan market as a reference point. In recent years, the export price shows declining trend from USD 786 in 2014 to USD 591 in 2016. Price fluctuation within the year is relatively high, with a farm gate price of around ETB 665 just after harvest and close to ETB952 just before the next harvest, reflecting the high demand and poor packaging and storage practices.

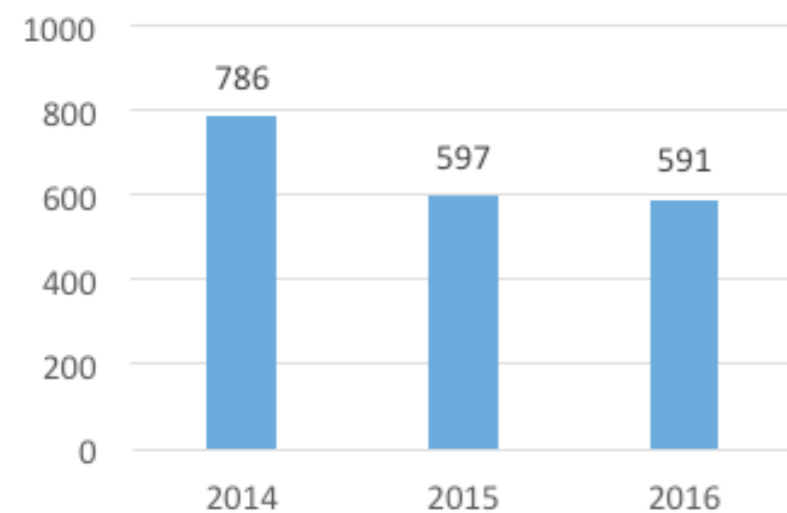
Price variability across Chain - Haricot Bean



Price variability over the year - Haricot Bean



Haricot Bean Export Price Trend (USD/MT)



Key Constraints Rating

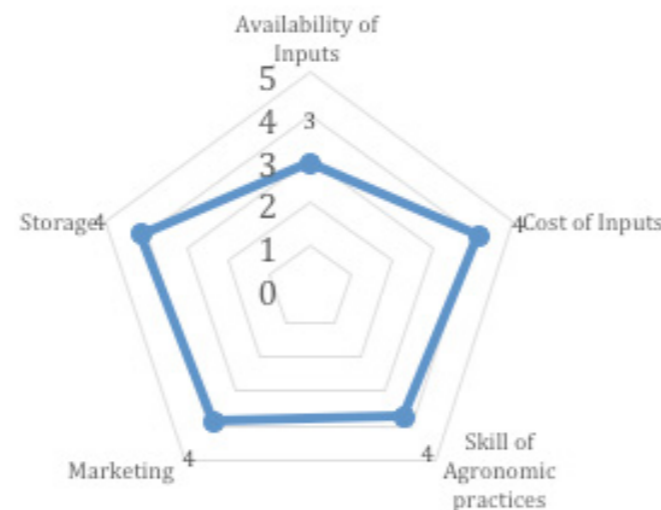


Table 3.1 3: Economic analyses for red haricot bean

3.7. Possible Value Chain Interventions

3.7.1. Production

Consistent Quality

Both local traders and central exporters mentioned three major quality problems (1) lack of uniformity in terms of color and seed size (2) high level of moisture content particularly the belg production (3) admixture. Evidence from exporters show that speckled and dark red beans are getting increasing demand from the canning industry. However, the haricot bean from Ethiopian farmers is often not consistent in size as well as color, which makes expensive to clean and sort. The moisture content for export is around 8% on average. However, the moisture in belg produce often goes upto 15%. There is high risk of aflatoxin unless dried immediately. In addition weight loss at drying bring risk to buyer of seller.

Incentive for Quality

Though the ECX has introduced grades for haricot beans, at farmer level the benefits of this system have not yet been clearly under-

stood. A study by IVCD (2014) revealed that substantial quality problems exist in the chain. Pea beans observed at the Oromiya Grain Trade Exchange commonly contained 20% impurities and moisture content was high. If incentives could be improved in the chain, farmers could gain by reducing moisture content (longer drying period), lowering impurities (by better cleaning and sorting) and better packaging (other bags). This typically requires a value-chain approach whereby farmers, local traders and wholesalers and exporters work together, developing transparency and trust. Zonal business platforms (also inviting the banks, the ECX and the Zonal Bureau of Agriculture) could broker such deals and assist in setting up transparent grading systems.

Marketable Varieties

As noted above the export market has special preference. The principal end market for common bean is the canning industry which often looks for size, texture and uniformity. Farmers in the region currently make farming decision mainly based on agronomic compatibility and household food security. Hawassa Dume is the most prominent variety and also the one advocated by the project. As in the case of the chickpea it is good to bring companies like ACOS on board to the project, which will have a dual benefit of accessing their varieties for scale-up and securing market.

Access to inputs

Several strategies can be laid out to better link the farmers to the necessary inputs: private chain integration, the cooperative model and/or the establishment of commercial farmers service shops (or agro-dealer system). E.g. ACOS PLC, a major white pea bean exporter, has experimented with directly linking farmers to improved inputs, providing pre-financed quality seed and extension support for good agricultural practices. The model seems cost effective and if supply can be guaranteed (e.g. through building long-term partnerships or through contract farming) this model can revolutionize the production system. Also, the Cooperative Union model can be followed. Already strong Unions are present in the South and these are supplying high amounts of seed to farmers. Providing other inputs as well could expand this. In general, the cooperative-union system has focused more on input supply-particularly improved seed than on output marketing, making it easier to expand this service by including inoculants and agro-chemicals as well. Another model has been recently piloted in the CNFA- Commercial Farm Services project. A number of input shops (also providing extension advice) are set up in the Oromiya Region. This model could be expanded to

more weredas where bean production is high (the indicated haricot bean hotspots). Overall, the Rift Valley has relatively good accessibility, which could be at the advantage of the farm service shops. The ISSD pilot of direct seed marketing in Arsi Negele proves this; as five seed companies showed interest to directly market their seed in this Rift Valley woreda.

3.7.2. Product and Market Development

Most of the industrial processed food products are using other pulses such as chickpea, soybean and field pea despite the fact that common bean is as nutritious as these legumes. The major challenge as mentioned by the companies is the fact that processing technologies are less adaptable for Common bean. The project could assist these companies in developing products. Among others industrial products suitable for urban consumers with features of easy to cook, nutritionally enriched and packed with sound standards are worth noting.

Improving and Scaling-Up Household Menus

During the field research, some interesting common bean based menus have been found. Among others the possesse from Gamo Gofa seems rich in nutrition and embedded within the local communities. The menu has common bean, maize, cabbage, potato, onion and many other homegrown products. A possible intervention for the project could be to sport the piloting and scaling-up of these types of menus to other weredas as well as linking it with institutional markets such as school feeding programs of WFP and Government BoE.

Market Development

The market development should mainly target urban consumers where common bean consumption is not as common as in rural areas. Experience from other East Africa countries show that dry beans are one of the most common food items. Some studies show that approximately 2 million dry beans are demanded within East Africa. Creating consumer awareness about beans and developing consumer friendly products will greatly improve the market potential for common beans.

Low Cost Canning-Value Addition

Though Ethiopia still has range of canned beans imported, there is no canning factory. At most of the super markets in Addis Ababa canned beans and peas are widely available. High-end consumers and foreigners mainly because of the cost implication mostly consume these products. Assisting Ethiopian companies to engage in low cost canning has strong business case both for the businesses and backward linkages. In this regard focus could be made on medium and small enterprises possibly women owned for multiple impact.

3.7.3. Value-chain coordination

Coordination in the chain will be crucial to link the actors in terms of input supply, market information, cleaning, sorting and grading and processing, as well as linking key value-chain actors to important services as access to finance, agronomic support and business management. A haricot bean business platform is recommended, both at national level and zonal level. In this aspect SiFCON should create alliance with existing national legume such as the Ethio-Netherlands Trade for Agricultural Growth, N2Africa, International Trade Center, ATA and National Chickpea Forums lead by EIAR and ICRISAT.

4. BUSINESS MODEL ANALYSES

4.1. Major Gaps within the Value Chains

Unpredictable Price: Farmers often base their farming decisions on historical prices i.e. the higher the price for this year the more production for next year. This often leads to higher supply that in turn results in decreasing prices. Even within the same production season, farmers have limited information about markets beyond their vicinity. Their product-market deliveries are determined by previous week's price, which sometimes have high degree of variations given the fact that more farmers bring product when the price during previous weeks was high. At the market place, farmers are usually price takers.

Marketing Window: Both chickpea and haricot bean have few months of market window. The fact that SNNPR is not a major chickpea producer means that most of the major buyers (processors and exporters) are not actively sourcing from this area; exceptions are the weredas in Gurage zone. This somehow limits the possible range of buyers. In the case of haricot bean, there are more active buyers during the major marketing seasons. Since haricot bean is mainly for export availability of buyers often is dependent on the export season.

Aggregation: Major buyers usually need minimum scale; at least 40 MT truck. Reaching such a scale is easy for haricot bean as there is huge production but for chickpea it is time taking with the exception of weredas in Gurage zone. In addition, there are known chickpea belts in the country and most buyers focus on those areas. With the expansion of the project there is an opportunity to have more volume that can attract buyers to the region. In the short term, the project adopted cluster based intervention model where farmers growing chickpea are within accessible radius distance but the cluster farmers are not organized as bulking and selling units and hence farmers act independently.

Farmer Organizations: In most of the operating weredas there are unions involved in bulking and trading grain. In few cases such as Sidama, Silte and Gurghe the union have processing facilities. However, the unions are not influential in the market as they usually buy insignificant quantities. Besides the unions often starting purchasing late due to financial constraints and periodic delays in decision-making.

Production Constraints: Farmers noted lack of agricultural inputs including finance, seed and agro chemicals as some of the major constraints. Availability as well as affordability of inputs is a major constraint. There are few agro dealers in the area. Though some seed growing farmer clusters or cooperatives are emerging they still need further capacity building.

Weak Chain Integration: The level of backward and forward integration is weak. Most of the exporters based in the central markets don't have sufficient information about how their export or processing inputs are sourced. Often they procure through brokers. Likewise farmers hardly have any information about prices and quality requirements at the other end of the chain. Information within the chain is often circulated through brokers and sometimes not accurate.

Range of Pulse Based Household Menus: There is significant consumption of both chickpea and haricot bean within the region. However, the range of household menu made from the two pulse products is not diverse. The common menus are in the form of shiro, boiled and roasted. In some areas such as Gamo Gofa, Hadiya there is a mainstream local dish with more nutritional content.

4.2. The Project Partnership Models

The project advocates for production of pulses as important rotational crops for improved soil fertility. As evidenced in the analyses a rotation of pulses and cereals increases yield by 20% on average. Alongside increasing yield the project has actively been pursuing linking agriculture to nutrition by promoting consumption of pulses and introducing enriched pulse based menus. As noted in the sections before pulses are the cheapest sources of protein per

gram. Besides they have important micronutrients. In this project pulses products suitable for both urban and rural families have been developed and promoted. The SiFCON project is a public-private partnership project with key aim of improving food and nutrition security and income through sustainable farming practices and nutritional menus. The roles and responsibilities of the public and private partners are illustrated in the graph below.

Public Partners and their Roles:

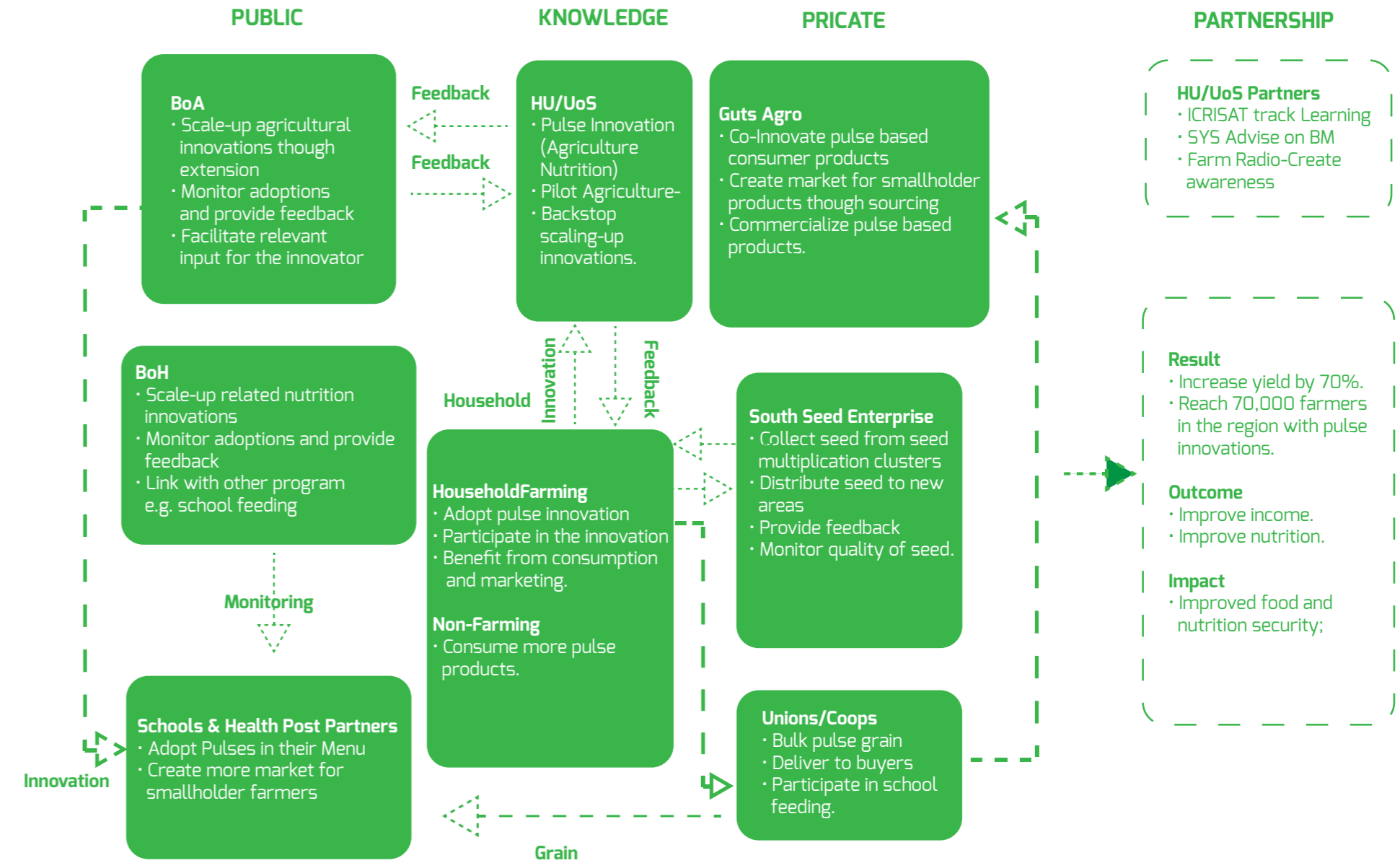
Three important public partners are actively involved so far: Bureau of Agriculture, Health and Women and Youth Affairs. The bureau of Agriculture is taking the lead role in popularizing the agricultural innovations through its extension programs. Bureau of Health on the other hand is responsible for promoting the nutritional product innovations through the health extension system. The bureau of women affairs is playing role in organizing and coaching women engaged in dealing with pulse products within the target areas. Farm Radio International as a Non Government Organization has been promoting pulse production and consumption through its radio programs.

Knowledge Partners and their Roles

The two universities (Hawassa and University of Saskatchewan) and South Agricultural research Institutes are directly involved in innovating and shaping technology packages. So far both agricultural innovation (improved seed, fertilizer rates and inoculant application with optimal practices) as well as nutritional innovation (possesse adaptation, development of snacks and legume food processing techniques) have been done. These innovations have been transferred for scale-up to the private and public partners. In addition to the above knowledge institutes, ICRISAT has been involved in developing scaling-up strategies while others such as SYS have been supporting in the development and implementation of the business models.

Private Partners

Four important private partners are actively involved thus far; Guts Agro Industry, Menegasha Bio Technology, South Seed Enterprise and Women Enterprises. Guts Agro industry is one of the leading nutritious food processing company in Ethiopia. The company has high quality pulse based baby food, snacks, FAMEX and iodized salt. It is involved in both sourcing from farmers and developing and marketing end products for consumers. The South Seed Enterprise is engaged in seed distribution within the region. Farmers who produce seed are mostly selling seed to SSE. Cooperatives and unions are supplying fertilizer; phosphorus and nitrate while Menegasha Bio Technology supplies rhizobia.



4.3. Project Business Model Canvas

Customers

The project targeted at three groups of customers: smallholder farmers, households and private businesses. The smallholder farmers are the principal recipients of the agricultural innovation packages developed by Hawassa and Saskatchewan Universities. These technological innovations are high yielding varieties and packages of innovative practices. The major benefit for the smallholder farmers is increased yield and quality of chickpea and haricot bean; hence more income or food available. The private businesses involved are the second important partners for joint product and business model innovation. Both the pulse complementary food products developed together with Guts and women inclusive business enterprises launched in the project areas. The major benefit for these private businesses is access to better sourcing (backward integration), new product development and market innovations. The last customer segments are the households (both rural and urban). These are the ultimate beneficiaries with access to enriched food at competitive price. Though the types of products for the urban and rural consumers are different both communities have merited from the nutritious pulse based products.

Value Proposition

This intervention has a unique feature of compressive agriculture-nutrition linkage with multiple impacts on farm household income, nutrition status of children and lactating mothers, and new business opportunities for women. The end products are linked with the farm products through responsible sourcing by the private partners.

Customer Communication

Face-to-Face engagement is the primary communication with farmers and women enterprise groups. Both agricultural and nutrition interventions are embedded in the extension system and hence the program pays attention for capacity building of local extension agents who support farmers and households. To date over 564 extension agents and experts have been trained. In addition a team of Hawassa University and its partners have regularly been engaging with farmers and the households. Farm Radio International and SYS have been airing awareness raising programs about the nutritional importance of pulses and the new varieties of SiFCON. There were also nutrition education programs through health extension army, women groups and school mini media.

Channels

The seed and other input innovation packages are delivered at farm gate by the private and public partners. There are three channels of delivery for the end products (nutritious food): micro-franchisee women, school feeding and health posts. The micro franchisee women are dealing with fortified pulse products of Guts agro industry and selling door to door to households. The school feeding program is mainly to children at primary school. It has dual purposes of creating nutrition awareness through school mini media and providing balanced diet to children. The promotion through health post mainly involves training and coaching health extension agents who in return train the health extension army and the women at large.

Revenue

The principal source of income for the farmers taking the seed and agricultural innovation is from sales of grain and seed. The micro franchisee women group generates income from sales of nutritious food products from Guts Agro Industry. Guts agro and other input suppliers (Menagesha Bio technology, South Seed Enterprise) benefit from selling its products.

Key Activities

Research and Innovation

Over a decade of partnership Hawassa and Saskatchewan universities have developed packages of innovation on agricultural practices that can give 20% higher yield, suitable for the local agro ecology and easily assimilated into the household food chain. Still there are ongoing researches and innovation activities in terms of new pulse based product development, household menu adaptation, and optimal scaling-up strategies, marketing and bulk-ing of products.

Technology Adoption and Commercialization

Over 70,000 farmers are to be reached for the agricultural innovations while 35 thousand people for nutrition. The major adoption and commercialization activities include piloting the technologies to various clusters of farmers in the target areas, promoting the technologies through the extension agents and community radios, facilitating access to seed and market to farmers who adopted the technologies. There were also various field days organized and brochures about the results. To date the project has trained over 564 extension agents and farmers about the packages. Likewise over 77 households and health extension agents were trained about the nutritional advantage of pulses.

Activities Related to Sustainability and Impact

Activities related to sustainability pillar include organizing farmers into cooperatives, organizing women enterprises dealing with pulses and linking farmers with market. The target is to create farmer cooperatives in each of the weredas and one women enterprise. The women enterprises will be linked to factories producing pulses based products.

Key Partners

Public Partners and their Roles:

Three important public partners are actively involved so far: Bureau of Agriculture, Health and Women and Youth Affairs. The bureau of Agriculture is taking the lead role in popularizing the agricultural innovations through its extension programs. Bureau of Health on the other hand is responsible for promoting the nutritional product innovations through the health extension system. The bureau of women affairs is playing role in organizing and coaching women engaged in dealing with pulse products within the target areas.

Knowledge Partners and their Roles

The two universities (Hawassa and University of Saskatchewan) and South Agricultural research Institutes are directly involved in innovating and shaping technology packages. So

far both agricultural innovation (improved seed, fertilizer and inoculant application with optimal practices) as well as nutritional innovation (pos-sesse adaptation, development of snacks and pulse processing technique) have been done. These innovations have been transferred for scale-up to the private and public partners. In addition to the above knowledge institutes, ICRISAT has been involved in developing scaling-up strategies while others such as SYS have been involved in supporting development and implementation of the business models.

Private Partners

Three important private partners are involved thus far; Guts Agro Industry, South Seed Enterprise and Women Enterprises. Guts Agro industry is one of the leading nutritious food processing company in Ethiopia. The company has high quality pulse based baby food, snacks, FAMEX and iodized salt. It is involved in both sourcing from farmers and developing and marketing end products for consumers. The South Seed Enterprise is engaged in seed distribution within the region. Farmers who produce seed are mostly selling seed to SSE. Other than the two there are cooperatives and unions supplying fertilizer; phosphorus and nitrate while Menagegsha Bio Technology supplies rhizobia.

Key Partners

Public partners

- . BoA
- . BoH
- . Women Affairs

Knowledge Partners

- . HU
- . UoS
- . ICRISAT
- . SYS

Private Partners

- . Guts Agro
- . MBI
- . SSE
- . WE

Key Activities

- . Research & Innovation
- . Adoption & Commercialization
- . Sustainability & Impact

Key resources

- . Seed
- . Inoculant
- . Fortified pulse based food
- . Pulse menus
- . Logistics
- . Finance
- . Knowledge & Practices

Value Proposition

- . Agriculture-nutrition linkage
- . Children & women focused
- . Providing job opportunities for women
- . Backward integration

Cost structure

- . Cost of input delivery
- . Cost of production & monitoring
- . Bulking & transport
- . Sales & marketing
- . Training & capacity building

Customer relations

- . Public extension system
- . Farm Radio Programs
- . Trainings of Trainers
- . Nutrition Education
- . Annual meetings

Channels

- . Micro Franchisee
- . School Feeding
- . Health post
- . Farm centers
- . Farm clusters
- . Transport & Bulking facilities (on site & central)

Customer segments

- . Smallholder farmers
- . Rural & Urban households
- . Private Business
- . Expected annual growth in demand of at ambition

Income streams

- . Sales of seed
- . Sales of grain
- . Sales of pulse based food products

4.4. Operational Business Models

4.4.1. Micro Franchising

Overview

Guts Agro Industry already practices this business model and has got recognition for its commitment in developing micro-franchise business model over the years. As such it was found useful for this project to focus on scaling up and adoption of the existing model than working from scratch. The micro-franchising model proposed within the context of this project has three principal objectives (1) create employment for women (2) improve household nutritional status by popularizing industrial processed pulse based products (3) create market for smallholders by linking processing company.

This model involves organizing low-income, unemployed women for door-to-door retailing of pulse based food products of guts agro-industry. Guts deliver the products to the women at wholesale price, which gives them above 10% margin. The women are given weekly targets and provided with sufficient backstopping in business and market development. These women are selected based on their (1) entrepreneurial and sales skills as demonstrated during interviews (2) recommendation by local community and experts (3) willingness to commit.

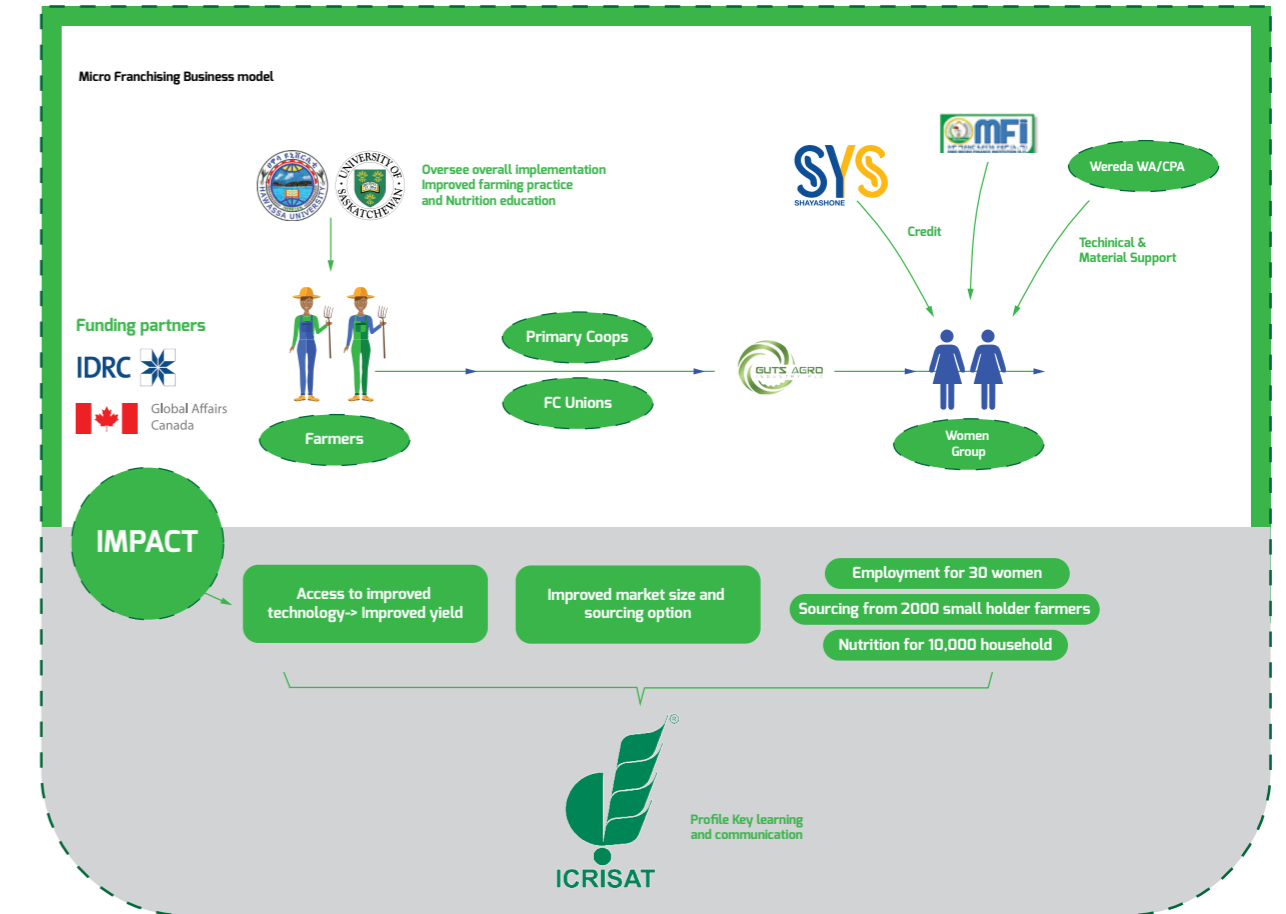


Figure 4.4.1 1: Micro-franchising Business Model

Expected Result and Impact

Job Creation

At least 30 women will be recruited, trained, licensed and start operation in door-to-door distribution of pulse based products. The women will generate USD 1.5 per day and they will be linked with a micro finance for their financial needs. Besides regular technical backstopping both from guts agro and its partners will be offered to them.

Market Linkage for Farmers

Strengthening the micro-franchise women will have an indirect impact of creating market linkage for smallholder farmers. Guts agro has promised to buy chickpea seed from farmers within the project areas as long as there is sufficient scale and quality. When the partnership fully matures a total of 2000 farmers are expected to have market linkage to Guts agro. However, it is important to note that Guts agro may not compromise on important market parameters such as quality, quantity and price. In this regard the project is expected to play invaluable role of making the farmers in the target areas as competitive as those in the traditional chickpea belts of the country (Adea, Becho, Minjar, Gondar).

Improved access to Nutritional Food

The Micro-Franchise women are dealing with fortified pulse based and other food products of Guts Agro. These products are certified for their quality by national and international standards. Besides the qualities, the products are supplied at affordable prices. The 30 micro franchisee women are expected to reach over 10,000 households in the two target towns. Of these household members, most beneficiaries will be children and lactating mothers as Guts agro products are produced for these target group.

4.4.2. School Feeding Model with Possesse

Overview : School Feeding

The school feeding business model targets three results (1) **improved nutritional status and reduced school drop out of children below the age of 10** (2) **create job opportunity for women** (3) **create market for smallholders via backward linkage**.

The model builds on existing WFP School feeding program among primary schools in SNNPR. The regional bureau of education in partnership with WFP is running school feeding program in 72 primary schools. The primary targets are children below the age of 10. In this business model Self Help Women will be organized and trained to cook for the school-feeding program. Pulse (beans and peas) based ingredients will be incorporated in the menu for better nutrition. The program sources the ingredients (bean, maize and peas) from unions and cooperatives within the region (Sidama Elto, Melik and Admas Unions). The school feeding program as envisaged in this project will build on similar track record but with introduction of new and improved menus as well as additional schools within the project operating areas. Both the World Food Program and the Regional Bureau of Education are strongly interested to partner with SIFCON project for the school feeding.

The primary contribution of SIFCON shall be developing a standardized highly nutrient menu which can easily be integrated into the school feeding program. As it stands Possesse shall be the most promising potential for this. Possesse as stated herein under is a menu commonly practiced in Gamigofa and parts of Welayita zones. There shall be two steps in this process. First, the existing menu shall be standardized by a team of UoS and HU Food Science Department, then the standard menu shall be processed by Guts and registered at FMHACA. Once registered Guts shall start supplying commercially to the school feeding program. It is important to note that the standardization of the menu includes replacing some of the ingredients by dried forms (example instead of fresh vegetables dried vegetable shall be used).

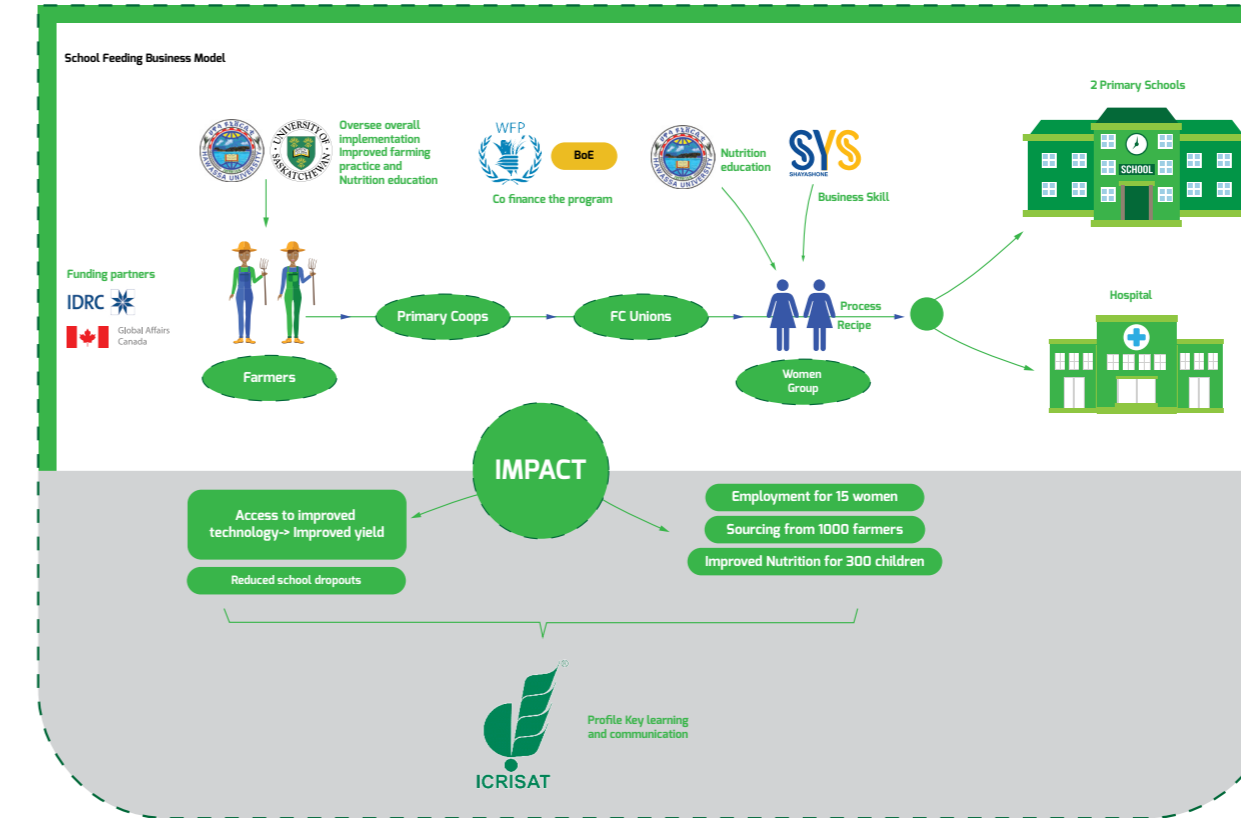


Figure 4.4.2 1: School Feeding Business Model

Expected Result and Impact

Job Creation

If successfully developed this component has a potential to reach out millions of pupils at primary school level within the region. This will create job for over thousands of women and generate income of USD \$ 1.5 per day. These women will be engaged in cooking for school feed programs that often needs some degree of basic training in food hygiene issues. Hawassa University will train and certify the women and then the WFP in partnership with regional Bureau of education will give them the jobs in their school feeding areas.

Market Linkage

Currently the school feeding program is purchasing its food ingredients from unions within the region. These unions are sourcing the grain from their member farmers. Three of the unions (Sidama Elto, Site and Admas) who supply to the school-feeding program are domiciled within the intervention weredas. But in this potential intervention Guts Agro Industry shall take ownership and leadership for the possesse delivery in a safe and hygienic way.

Access to Nutritional Food

At least 100,000 children in the target schools will get access to enriched school feeding menus adopted by Hawassa and Saskatchewan Universities and to be delivered by Gust Agro Industry. In addition, students within these schools will get nutrition education through the school mini media systems. Based on the experience of the pilot schools, this program will be cascaded to others schools within and outside the region. It is worth noting that a discussion with Addis Ababa Bureau of education about the business case was very promising.

Scalability and Sustainability

The principal customer for this business model shall be Bureau of Education running the primary schools. Recently, the Ministry of Education is developing a national school feeding program which makes it mandatory within all primary schools. In addition to schools within SNNPR, there is big potential to embed the possess based menu in Addis Ababa and other regions.

4.4.3. Traditional Food –Possesse Scale-up Business Model

Overview

Possesse is a popular pulse based household menu in Gamogofa and some parts of Wolayita zone. People know this food as nutritionally rich food. Usually, Farmers consume this food when they have critical farming activity to stay strong. The nutritional analysis of this recipe shows 5.6gm per 100 gm of protein and 206.8 Kcal per 100 gm of Energy. This indicated the recipe has high contents of energy, protein, fat and iron in addition it contains considerable amount of calcium and Zinc. This business model will focus on scaling-up the menu to new weredas through home economics and nutrition education. The scaling-up will be done primarily for rural households through the existing extension system with food demonstration in selected villages. Food preparation manual will be prepared by Hawassa University and delivered to the extension agents. In addition, Farm Radio International will have program on possesse preparation.

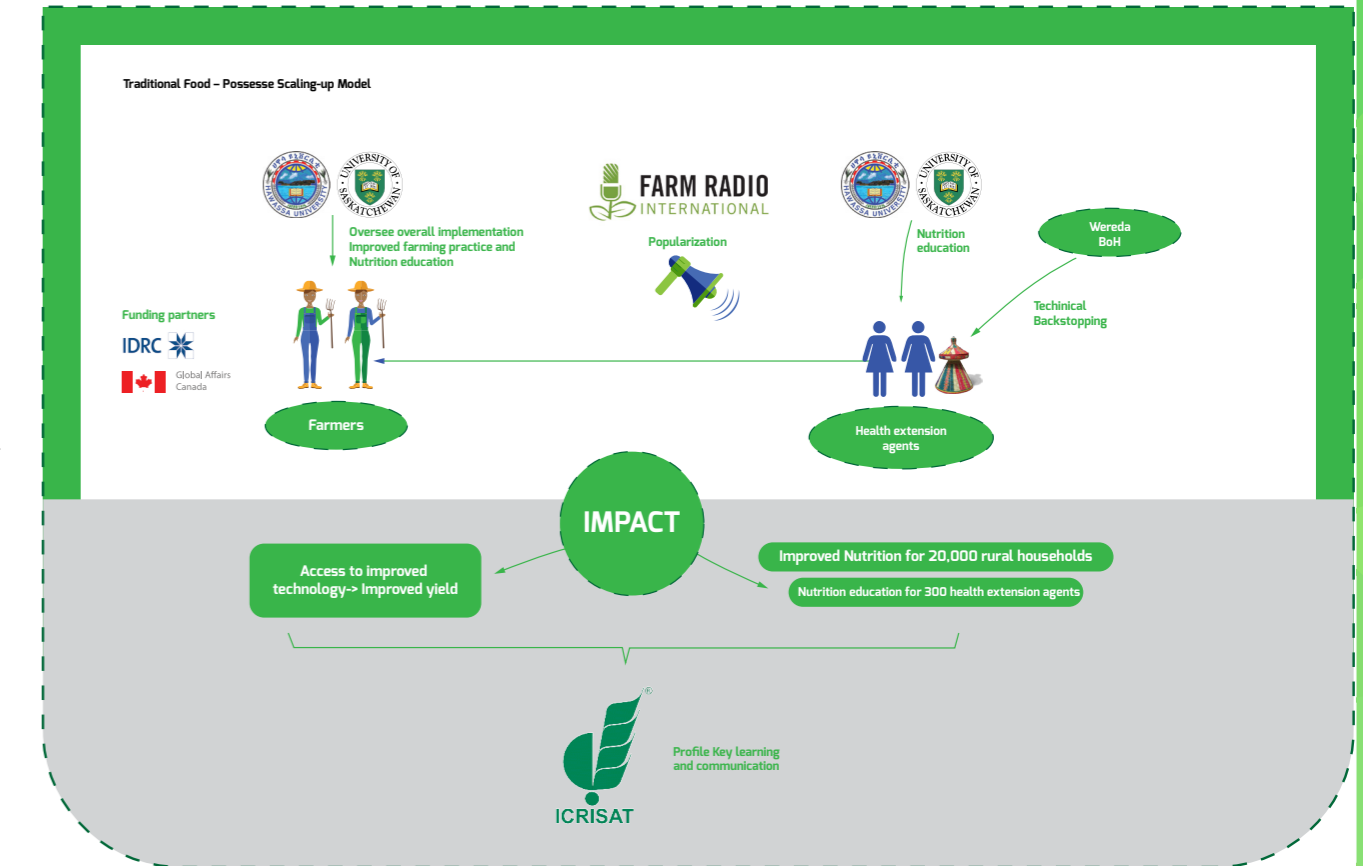


Figure 4.4.3 1: Traditional Food – Possesse Scaling-up Model

Expected Results and Impact

Nutrition Education

At least 300 extension agents will be trained about the home economics of possesse. These extension agents in return will train or build awareness to over 100,000 households. There will be posters and manuals to be distributed to the extension agents and health posts where the pilot is launched. If and when possible the possess menu will be integrated with school feeding program business model noted above. Besides there will be food demonstrations at different sites.

Access to Nutrition

A total of 20,000 people will adopt the possess menu. These households will have improved nutrition given the fact that possesse is highly enriched menu. The households may customize some of the ingredients to what they have at home with common bean being the principal component. Learning will be tracked for the early adopted farmers to develop mass scale-up through radios and all project intervention weredas.

5. CONCLUSION

Average of 0.38 ha per household is allocated for haricot bean within the target weredas. Haricot bean is produced both during the Meher and Bleg seasons in most weredas. The three leading producing weredas are Kucha, Boricha and Damot Gale. Average yield per ha in the 15 weredas is 1.2 MT and the most prominent variety is Hawassa Dume. Average yield is the highest in Silte (2.5 per MT) and lowest in Daramalo (0.8 per ha). Yield difference of 20% is reported between farmers who planted improved and local varieties. In addition to yield, they noted that the new varieties are more disease and drought resistant. Farmers plough the land on average 4 times and the application of inputs is minimal; 79 Kg NPS fertilizer per ha. The primary cost drivers are Labor, NPS fertilizer and Seed. Farmers are highly positive about the merits of growing more beans both as cash crop and household food security. However, they noted that there are several constraints that stifles productivity-storage, cost of inputs and marketing are the major ones. Farmers mentioned three major reasons for growing haricot beans, cash crop, food crop and the soil fertility impact.

Chickpea is the third most important pulse in the target weredas. An average of 0.2 ha per household is reported to be allocated for chickpea production. The crop is produced as a rotational crop or using residual moisture after harvesting teff and maize. The three major producing weredas in the target intervention areas are Abeshge, Meskan and Sodo. Yield

per ha is estimated to be 0.95 MT. There is a big difference between farmers who planted improved seed and those of conventional seed. On average 60% yield difference is observed. Looking at the differences across regions, areas at Guraghe have highest yield while those in Halaba and some in Wolayita have the lowest. Farmers noted three important success or failure factors when growing chickpea (1) disease and pest (2) weather condition (3) access to input particularly improved seed and experience of the farmers. The major constraints farmers noted during the field interviews are (1) cost and availability of the inputs, (2) skills related to good agronomic practices and (3) marketing & storage. Farmers also noted that they gained three major benefits from the project that can boost their future productions (1) additional income to finance both input and other household costs (2) soil improvement and (3) land use efficiency.

Compared to common bean the volume of chickpea produced in the area is small but because of the SiCON project it is increasing over the years. Farmers liked the quality and yield of the seed packages offered by the project but it was noted that the volume is small and hence limited scale to date. A detailed value chain analyses along with potential hot spots for the project are given the main document but among others the project should focus on organizing the cluster farmers into cooperatives to deliver to factories and exporters, linking the

cluster farmers with unions processing pulses for school feeding program, facilitating access to simple technologies that support local pulse processing (for the baltinas).

As evidenced on many facts on the ground the intervention on the agricultural side seems promising and potentially being scaled up by the bureau of agriculture as well. However, the nutritional side of the interventions as well as sound the linkage between agriculture and nutrition needs further development. In this regard, the business models developed for the project are intended to address both the market access for agricultural intervention pillars and nutritional targets for the nutrition components. The business models for the project as well as operational level have been discussed in detail. It should be noted that some of the results of the business models are based on the assumption of project life cycle beyond the current phase. In particular, the school feeding and possess promotion shall be done in any subsequent project phases.

In this study three potential business models have been identified: micro franchise ("LIKE") model of Guts Agro Industry, School feeding and Possese scaling up.

The Micro-Franchise-like model involves organizing low-income, unemployed women for door-to-door retailing of pulse based food products of guts agro-industry. Guts deliver the products to the women at wholesale price, which gives them above 10% margin. The women are given weekly targets and provided with sufficient backstopping in business and market development. These women are selected based on their (1) entrepreneurial and sales skills as demonstrated during interviews (2) recommendation by local community and experts (3) willingness to commit.

The school feeding model builds on existing WFP School feeding program among primary schools in SNNPR. The regional bureau of education in partnership with WFP is running school feeding program in 72 primary schools. The primary targets are children below the age of 10. In this business model Self Help Women will be organized and trained to cook for the school-feeding program. Pulse (beans and peas) based ingredients will be incorporated in the menu for better nutrition. The program sources the ingredients (bean, maize and peas) from unions and cooperatives within the region (Sidama Elto, Melik and Admas Unions). The school feeding program as envisaged in this project will build on similar track record but with introduction of new and improved menus, namely, Standardized Possese menu to be developed by Hawassa and Saskachuan Universities and commercially delivered by Guts Agro Industry. Both the World Food Program and the Regional Bureau of Education are

strongly interested to partner with SiFCON project for the school feeding.

The Posesse scaling up model focuses on scaling-up the menu to new weredas through home economics and nutrition education. The scaling-up will be done primarily for rural households through the existing extension system with food demonstration in selected villages. Food preparation manual will be prepared by Hawassa University and delivered to the extension agents. In addition, Farm Radio International will have program on possese preparation.

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