



# Pulses Value Chain in Ethiopia

## CONSTRAINTS AND OPPORTUNITIES FOR ENHANCING EXPORTS

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## EXECUTIVE SUMMARY

### PULSES IN ETHIOPIAN AGRICULTURE

This report provides an analysis of the critical role of pulses in agricultural production as a driver for economic growth and food security. Pulses, which occupy approximately 13 percent of cultivated land and account for approximately 10 percent of the agricultural value addition, are critical to smallholder livelihoods in Ethiopia.

Pulses contribute to smallholder income, as a higher-value crop than cereals, and to diet, as a cost-effective source of protein that accounts for approximately 15 percent of protein intake. Moreover, pulses offer natural soil maintenance benefits through nitrogen-fixing, which improves yields of cereals through crop rotation, and can also result in savings for smallholder farmers from less fertilizer use.

Pulses also contribute significantly to Ethiopia's balance of payments. They are the third-largest export crop after coffee and sesame, contributing USD 90 million to export earnings in 2007/08.

### THE POTENTIAL OF A VIBRANT PULSES SECTOR

Through productivity and market improvements, the critical role of pulses in smallholder livelihood and food security can be expanded. The current productivity of pulses falls significantly below the demonstrated potential. For example, current average chickpea yields are 1.2 metric tons per hectare<sup>1</sup> but the demonstrated potential in Ethiopia is 2.9 tons per hectare if accompanied by the appropriate inputs.

Estimates suggest that productivity gains from improvements in planting techniques could double overall pulse production to two million tons over a period of five years. This gain in productivity would not only increase smallholder income by 40 to 70 percent per hectare, but would also ensure greater food security through meeting domestic pulse demand.

In addition, Ethiopia could expand its foreign market presence through increased production levels, which will lead to at least doubling of its current annual exports of about 140,000 tons. Even under conservative assumption of proportionate increase in domestic consumption and export, doubling production will result in at least doubling of export earnings from US\$90 million to US\$180. If the domestic production remains at the current level, export earnings will be far greater.

### CHALLENGES IN THE VALUE CHAIN

However, a set of constraints span the pulses value-chain in production, aggregation and trading, and demand sinks/export. High-level findings are presented below:

- **Production.** Productivity is below potential due to: low input usage, especially chemical fertilizers capable of increasing yields in field trials by 10 to 80 percent; limited availability of seed and limited familiarity with the variety of existing pulse types, and; limited usage of modern agronomic practices. **Aggregation and trading.** The link between the producers and the export markets is weak, due to the large number of ineffective intermediaries operating in the value chain. The intermediaries have failed to acquire scale and operate in limited geographic areas. The fragmentation of intermediaries between the producer and consumer markets creates a lack of transparency in markets.
- **Export.** While there has been substantial growth in recent years, the current export market is underdeveloped. The less developed, fragmented exporters operating at smaller scale in the market results in inconsistent export flows and thus, inconsistent demand for exports. The major causes of limited export development are (i) inadequate market intelligence (ii) inability to leverage scale efficiencies due to smaller size and (iii) non-conducive the business environment due to missing credit and insurance; and (iv) inconsistent policy interventions.

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<sup>1</sup> This yield is substantially higher than the world average and sub-Saharan African averages of 0.8 tons/ha

## RECOMMENDATIONS

Core interventions and enabling actions can holistically strengthen the Ethiopian pulses value chain to be productive and stable, and provide year round transactions that supply domestic and international markets. These recommendations are complementary to and intended to accelerate the impact of current GOE and development partner strategies:

- **Increase inputs to improve productivity.** Access to inputs is a key step in bridging the yield gap between current and potential production. Phosphates and other fertilizers should be supplied to farmers, along with knowledge on how to use them effectively. Seed multiplication should be increased to adequately supply the needs of exporters and domestic demand. Pulse breeding should expand, and leverage varieties used in other countries. Extension should incorporate pulses into the curriculum.
- **Enhance linkages between exporters and producers.** Stronger linkages between exporters and smallholders will lead to a more efficient value chain where demand signals are clearly communicated to the producers, and where inputs are available to ensure proper production of the necessary export pulses. Actions to enable consistent supply between producers and exporters may include: provision of regional-specific input packages; development of new varieties appropriate for export; leverage of cooperatives to provide consistent input supply and off-take.
- **Provide adequate market to the exporters and farmers.** ECX will play an important role in market transparency, quality, and aggregation for exports. However, exporters association and other relevant agencies assume the responsibility of tracking both domestic and international markets
- **Strengthen the export sector.** Developing the export sector will drive foreign reserve earnings and will create a steady demand pull for pulses, thereby acting as a catalyst for the sector. Exporters should be supported through a business environment more conducive to investment and policies aimed at bolstering exporters' scale, knowledge base, as well as business acumen.

However, realizing the potential of the pulses value chain cannot be done in isolation; it can only work if other components of the agriculture system are in place: extension, improved seed, and soil fertility measures. This report shows how Ethiopia can chart a practical path of initiatives to realize the potential in the pulses value chain, while increasing incomes of its small holder farmers and delivering on food security objectives.

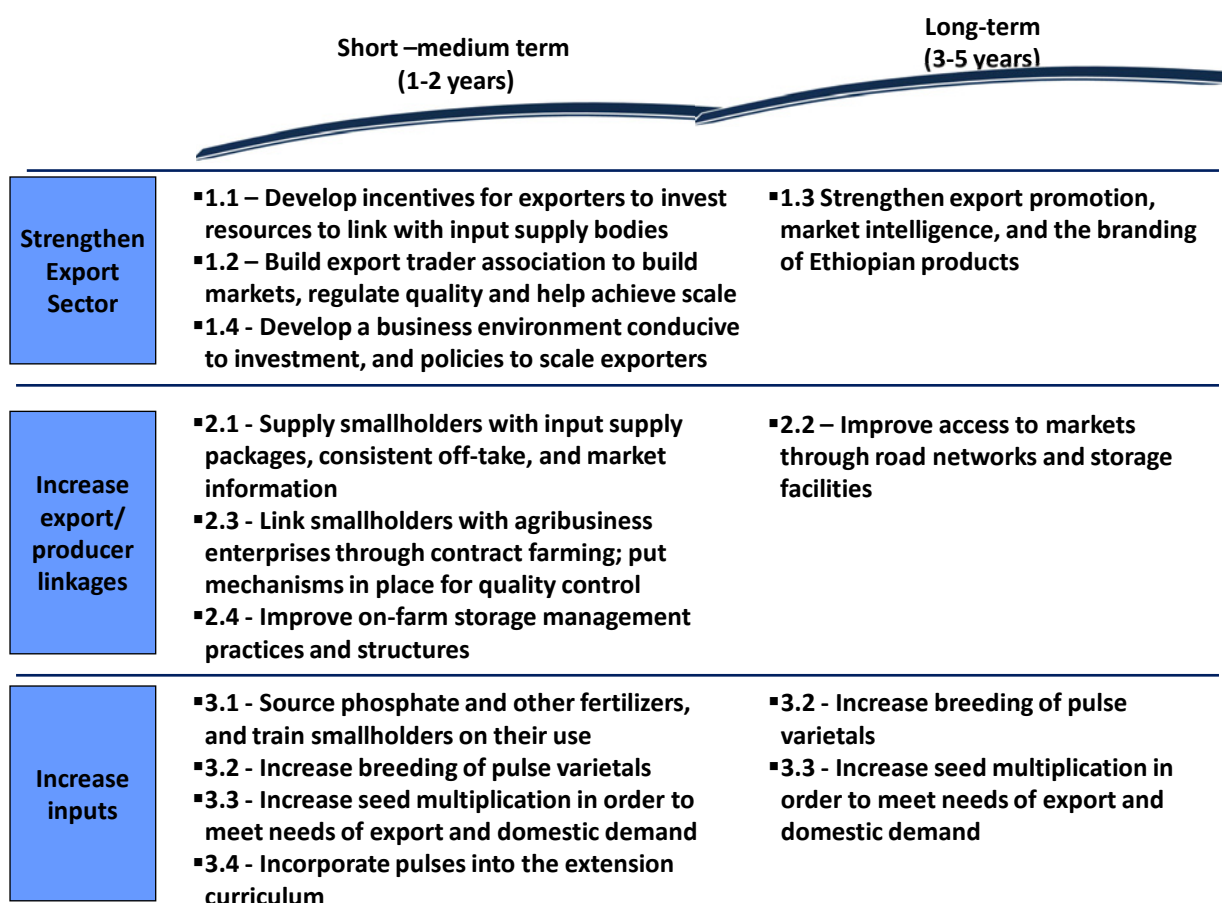
## THE WAY FORWARD

With a clear, fact-based vision for the aspiration, a credible plan of action, and the support of an effective performance management process, Ethiopia will be in a strong position to mobilize the resources needed to deliver on these constraints. Ethiopia can convert this potential into critical improvements in food security and livelihood for the country. The recommendations of this report offer a first view on how Ethiopia can chart a practical path of initiatives to achieve these goals.

Implementing the recommendations outlined in this report will require human and financial resources. They will also require a level of sequencing and coordination that have in the past been challenging to implement at a national and regional level. To achieve these objectives, the GOE will need to work closely with all its partners (donors and development community, NGOs, cooperatives and unions, public and international research organizations, private sector and the various organizations working directly with farmers at the local level).

This report provides a preliminary view on the sequencing of various activities to strengthen the pulses value chain. A preliminary view of the sequencing of activities that could strengthen the maize value chain follows:

**Figure 1: Overview of recommendations and activity sequencing**



## ACKNOWLEDGEMENTS

Since the maize sector diagnostic was initiated in November 2009 at the request of H.E. Prime Minister Meles Zenawi, over one hundred collaborators have generously participated in the process, from smallholder farmers and rural Development Agents to research institutes and the Ministry of Agriculture and Rural Development.

The Ministry of Agriculture and Rural Development provided guidance and leadership throughout. We are particularly grateful to H.E. Minister Ato Tefera, State Minister Dr. Abera Deressa, State Minister Bashir Abullahi, State Minister Mitiku Kassa, State Minister Yaekob Yalla and their colleagues in the federal Ministry, regional Bureaus of Agriculture and Rural Development, and the *woreda* and *kebele*-level offices. Dr. Solomon Assefa, Director General of the Ethiopian Institute for Agricultural Research, and his colleagues at EIAR also provided invaluable input.

A panel of Ethiopian experts including Dr. Seme Debela, Dr. Solomon Bekure, Dr. Teferi Amakeltech, Yeshi Babunuki, Dr. Berhande Gebrikidan, Dr. Tesfai Kumsa and Dr. Gete Zeleke has provided ongoing guidance.

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Beyond the local, regional, and federal governments, a broad number of Ethiopian institutes, research organizations, NGOs, private sector partners, and others engaged with teams of researchers in developing the content and recommendations from this work. These include: Addis Ababa University, Agricultural Research Institutes in Amhara, SNNP, Tigray, and Oromia, Bahir Dar University, Ethiopian Commodities Exchange, Ethiopian Institute for Agricultural Research, Ethiopian Seed Enterprise, Haramaya University, Jimma University,

Many donors and global experts were also engaged directly in the process. The CGIAR representations in Addis Ababa provided generous use of facilities for consultant teams and expert leadership in the diagnostic areas, with particular thanks to the International Food Policy Research Institute, the International Water Management Institute, and the International Livestock Research Institute. We would also like to recognize the many institutions and donor agencies who contributed: the Alliance for a Green Revolution in Africa, ACDI-VOCA, African Development Bank, CARE, Catholic Relief Services, Center for International Agriculture in the Tropics, Center for International Forestry Research, CIMMYT, the Royal Dutch Embassy, the Food and Agriculture Organization, GTZ, International Development Enterprises, IPMS, Iowa State University, Michigan State University, Natural Resources Institute, Oxfam, Oxford University, PanVac, Sasakawa Africa Association, SNV, Islamic Relief, JICA, Save the Children, Technoserve, Tamrat, University of Texas A&M, Tufts University, UN OCHA, University of Minnesota, USAID, Wageningen University, Washington University, World Bank, and the World Food Program.

## ACRONYMS

AEMFI	Association of Ethiopian Microfinance Institutions
AMC	Agricultural Marketing Corporation
DA	Development Agents
ECX	Ethiopian Commodity Exchange
EGTE	Ethiopian Grain Trading Enterprise
EHPEA	Ethiopian Horticulture Exporters and Producers Association
EIAR	Ethiopian Institute of Agricultural Research
EOPEC	Ethiopian Oilseeds and Pulses Export Corporation
ETB	EThiopian Birr
FSS	Food Security Strategy
FTC	Farmer Training Center
GOE	Government of Ethiopia
IFPRI	International Food Policy Research Institute
ILRI	International Livestock Research Institute
IPMS	Improved Productivity through Market Access
MoARD	Ministry of Agriculture and Rural Development
NGO	Non-Governmental Organization
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
SDPRP	Sustainable Development and Poverty Reduction Program
SNNP	Southern Nations and Nationalists and Peoples
USD	United States Dollar

## BACKGROUND

Agriculture is the core driver for Ethiopia's growth and long-term food security. The stakes are high: 15 to 17 percent of the Government of Ethiopia's (GOE) expenditures are committed to the sector<sup>2</sup>, agriculture directly supports 85 percent of the population's livelihoods<sup>3</sup>, 43 percent of gross domestic product (GDP)<sup>4</sup>, and over 80 percent of export value<sup>5</sup>.

Ethiopia's agricultural sector has witnessed consistent growth since 2003: maize production has expanded at six percent *per annum*, and the aggregate export value across all commodities has grown at 9 percent *per annum*<sup>6</sup>, underpinning an eight percent annual growth rate in GDP<sup>7</sup>. Public investment has expanded access to productive inputs, such as hybrid maize seed and fertilizer<sup>8</sup>. Concerted government spending in extension has also established over 8,500 Farmer Training Centers (FTCs) and trained 63,000 Development Agents (DAs) from 2002 – 2008<sup>9</sup>. However, the agriculture sector continues to face a set of constraints that restrict further and accelerated growth. Markets are underdeveloped, federal and regional level public and private sector partners lack capacities to implement, some gender imbalances continue to be unaddressed, safety nets account for a large proportion of agricultural spending, irrigation potential remains underdeveloped, shortages

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<sup>2</sup> World Bank PER, 2008

<sup>3</sup> CIA 2009 est

<sup>4</sup> Data from MoFED quoted in the Policy and Investment Framework

<sup>5</sup> MoARD, as announced in March 2010, US Department of State, 2010

<sup>6</sup> FAOStat, 1998 to 2008

<sup>7</sup> World Bank (2008)

<sup>8</sup> Refer to the seeds and soil fertility diagnostic reports for more details

<sup>9</sup> Refer to the extension diagnostic report for more details

of improved inputs hinder growth, and key areas of the enabling environment require improvement. Most importantly five to seven million Ethiopian's remain chronically food insecure<sup>10</sup>.

At the request of the Government of Ethiopia (GOE), in 2009, the Bill & Melinda Gates Foundation agreed to undertake diagnostic reviews of Ethiopia's seed system, irrigation, extension, agricultural finance, soil fertility/fertilizer and markets value-chains for maize, livestock, and pulses. Jointly, these sub-sector diagnostics inform a separate holistic report with systems-level recommendations across agriculture. This systems-level work captures common themes from the more siloed diagnostics and identifies priority areas to drive food security and growth. The integrated, summary report also provides an implementation strategy for a program to accelerate agricultural development in Ethiopia.

The development of these reports has been led by senior fellows with the International Food Policy Research Institute (IFPRI), the Ethiopian Institute for Agricultural Research (EIAR), the International Livestock Research Institute (ILRI), the International Water Management Institute (IWMI), and the Association of Ethiopian Microfinance Institutions (AEMFI). Throughout their work, these sector experts worked closely with technical experts at the Ministry of Agriculture and Rural Development (MoARD) as well as other local stakeholders and local and international content experts.

The findings of the sub-sector diagnostics and the system-wide report are a complement to national GOE strategies, namely PASDEP II, along with corollary projects financed by the GOE and its development partners. The purpose of the work is to support the GOE to help accelerate the achievement of PASDEP II's goals for sustainable growth, food security, and a pathway to middle-income status by 2025.

## METHODOLOGY OF DIAGNOSTIC WORK

In close consultation with the Ministry of Agriculture and Rural Development (MoARD), a team of local and global experts, led by International Food Policy Research Institute (IFPRI), undertook the pulses value-chain diagnostic in Ethiopia from January 2010 to March 2010. Over 50 stakeholders, including many small-scale farmers, were consulted as part of the process at the *kebele*, *woreda*, regional, and federal level. An independent Ethiopian expert panel, an international content group, development partners, local institutions, NGOs, and other actors also provided input into this work. These discussions culminated in a wide-ranging stakeholder convening held in the beginning of March 2010, where the team's preliminary finding and recommendations were presented. This final report reflects the input of all local partners and stakeholders currently operating in the pulses value chain in Ethiopia.

This sectoral analysis, similar to the diagnostic work in other sub-sectors of Ethiopia's agricultural system facilitated by the Gates foundation at the request of the Prime Minister, consisted of a rigorous multi-step process, described below:

- **Extensive review of the relevant literature.** The pulses value-chain in Ethiopia has been the subject of only limited investigation. The team conducted an exhaustive review of the existing reports, which provided a baseline understanding and starting point for the team's work. A listing of the various reports consulted is contained in Appendix 1. Further, an analysis of international cases provided a context to understand the enabling factors in other economies for successful interventions.
- **In-depth key informant interviews.** Over 70 stakeholders, including MoARD, BoARD, *woreda* and *kebele*-level government staff, development partners, research institutes, traders, cooperatives, unions, farmers, investors, and others participated in interviews. Appendix 2 contains the complete list. The interviews brought context to and surfaced constraints identified in the literature review; they also provided a soundboard to validate findings and recommendations.

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<sup>10</sup> Expert interviews



- **Analysis of primary qualitative and quantitative data.** Primary data was collected to fill key gaps in the existing data set. This fact-driven analysis allowed teams of consultants to make sectoral projections and modeling around constraints and opportunities in the pulses value-chain. These analyses, in conjunction with informant interviews and literature reviews, provided the basis for a broad set of systemic recommendations designed to strengthen the current Ethiopian pulses value-chain.
- **Multi-stakeholder convenings.** Convenings were held toward the end of the study to present, test and further refine the team's initial findings and recommendations. These convenings were attended by regional and federal government officials, private sector representatives, as well as national and international research organizations.
- **Synthesis and validation with expert panels.** These meetings served as a final review of the recommendations and findings. Three separate expert panels were consulted during the review process: an independent Ethiopian panel; an international content expert group; and a high-level advisory group for cross-sectoral and broad development issues. Input was provided by these panels in an iterative process, consisting of meetings and direct comments into documents, held over a period of several months. During this period, the team also continued to receive feedback from MoARD leadership.

The methods sought to combine academic rigor with a participatory, forward-looking, and actionable process with the stakeholders in Ethiopia who, at the end of the day, are the protagonists who will be affected by and take leadership in the implementation of the findings and recommendations of this work. It also sought to interact directly with the farmers who are not only the primary beneficiaries of the work, but the final link in the chain in implementing recommended interventions. The incorporation of a farmer perspective, with a focus on gender, ensures that recommendations are demand driven, catering to the needs of the end beneficiaries.

## INTRODUCTION:

The pulse industry has developed significantly with little intervention, and great potential exists to increase the production and impact of pulses through proactive and targeted support. Rough calculations suggest that Ethiopia could expand its foreign market presence by at least doubling its current exports of ~140,000 tons<sup>11</sup> (USD 90 million<sup>12</sup>) through increased production levels. Smallholder income could also be increased by at least 40-70 percent per hectare of pulses planted through greater pulse productivity (with better inputs and sound agronomic practices). There is an opportunity to stabilize and increase supply by improving production up to the full potential (of 2 million tons) which would meet domestic demands, helping to ensure food security<sup>13</sup>.

Section one is divided into three parts. Part one provides an overview of Ethiopia's production system for pulses, identifying the primary production regions and the agro-ecologies poised for growth. Part two reviews trends in the market, with a discussion of the remarkable growth in both cultivated land and aggregate production in key varieties, along with the unexpected price collapse in 2008/09. The final part touches on the nutritional and income potential of pulses for smallholder livelihoods, particularly women, who are responsible for the majority of harvest and value-addition activities in Ethiopian pulses.

Section two provides a value-chain analysis. The section looks at production, aggregation and marketing, and commercialization for export. Section three provides the details for a set of actionable recommendations, followed by an implementation plan. Recommendations are divided in three parts, following the structure of the value-chain analysis, focusing on on-farm productivity, marketing and

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<sup>11</sup> Central Statistics Agency (2008/09); MoARD

<sup>12</sup> FAOStat (2007)

<sup>13</sup> Assumes an increase in yield from 1.2 to 2 tons per hectare, accompanied by a 5% increase in current acreage



export. The implementation plan gives a sequencing, prioritization and ownership for the timing and different actors involved in the first five-year window.

## CHARACTERIZATION OF PULSES SUBSECTOR

### Overview of Ethiopia's Pulses Production System

Twelve pulse species are grown in the country. Of these, faba bean (*Vicia faba* L.), field pea (*Pisum sativum* L.), chickpea (*Cicer arietinum* L.), lentil (*Lens culinaris* Medik.), grass pea (*Lathyrus sativus* L.), fenu greek (*Trigonella foenum-graecum* L.) and lupine (*Lupinus albus* L.) are categorized as highland pulses and grown in the cooler highlands. Conversely, haricot bean (*Phaseolus vulgaris* L.), soya bean (*Glycine max* L.), cowpea (*Vigna unguiculata* L.), pigeon pea (*Cajanus cajan* L.) and mung beans are predominantly grown in the warmer and low land parts of the country. Among the individual varieties, faba beans (broadly known as horse beans) accounts for the greatest portion of production<sup>14</sup>, at 36 percent, followed by haricot beans (17 percent) and chickpeas (16 percent). Other pulses (e.g., lentils, peas, lupines, and mung beans) account for the remaining 32 percent<sup>15</sup>.

While pulses are grown throughout the country, and account for 13 percent of cropped land area, production is concentrated in the Amhara and Oromiya regions (Table 1), which together account for 92 percent of chickpea production, 85 percent of faba bean production, 79 percent of haricot bean production, and 79 percent of field pea production. The region is also the largest producer of three out of the four major pulses varieties in the country (faba beans, chickpeas, and haricot beans), while Oromiya leads production in the other major variety - field peas.

Table 1 provides a snapshot of production levels disaggregated by region and pulse variety. Explanations of low production in the other regions include: agro-climatic conditions; limited market access leading to less commercialization (as these regions are further away from main urban centers and seaports leading to limited access to both domestic and international markets), and; low population density. According to the 2007 national census, Amhara, Oromiya, and Addis Ababa account for 64 percent of the total Ethiopian population, compared to 6 percent and 1 percent in Tigray and Benishangul, respectively.

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<sup>14</sup> Note that the importance of faba beans is limited by disease (chocolate spot) and the bulky nature of its seed (200 kg per hectare needed).

<sup>15</sup> Central Statistics Agency (2008/09); MoARD

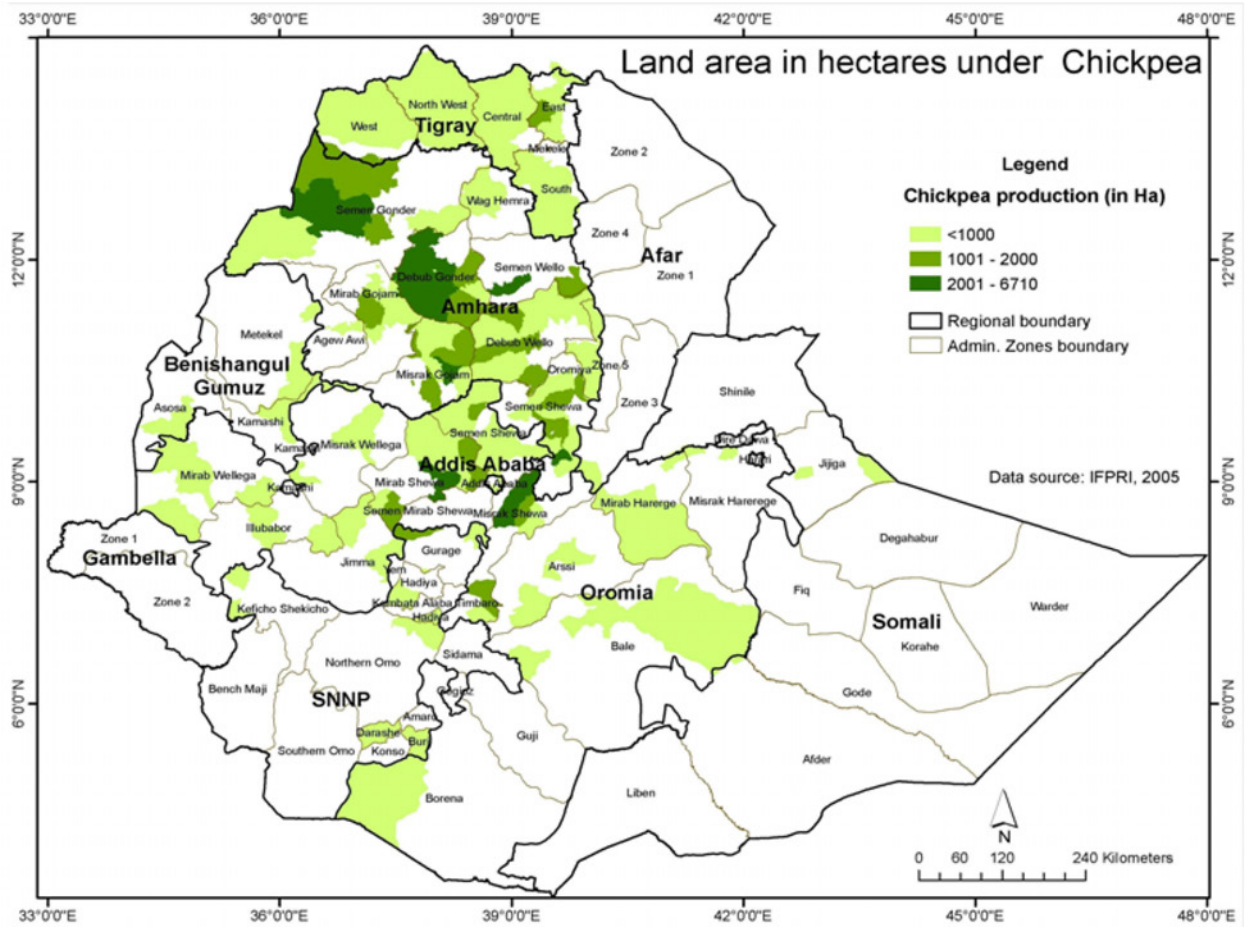
**Table 1: Pulse production in Ethiopia by region, 2007**

Region	Population (million)	% of total population	Production shares by pulse types			
			Faba beans	Field peas	Chick peas	Haricot beans
Amhara	17.2	23.3	48	20	62	42
Oromiya	27.2	36.7	37	58	30	37
SNNP	15.0	20.4	10	18	3	15
Tigray	4.3	5.8	4	1	5	5
Benishangul Gumuz	0.67	0.9	0	2	0	0
Total production (in '000 tons)	---	---	696	330	312	268

Source: CSA 2008/09, Area and Production report; CSA 2007 census report for the population.

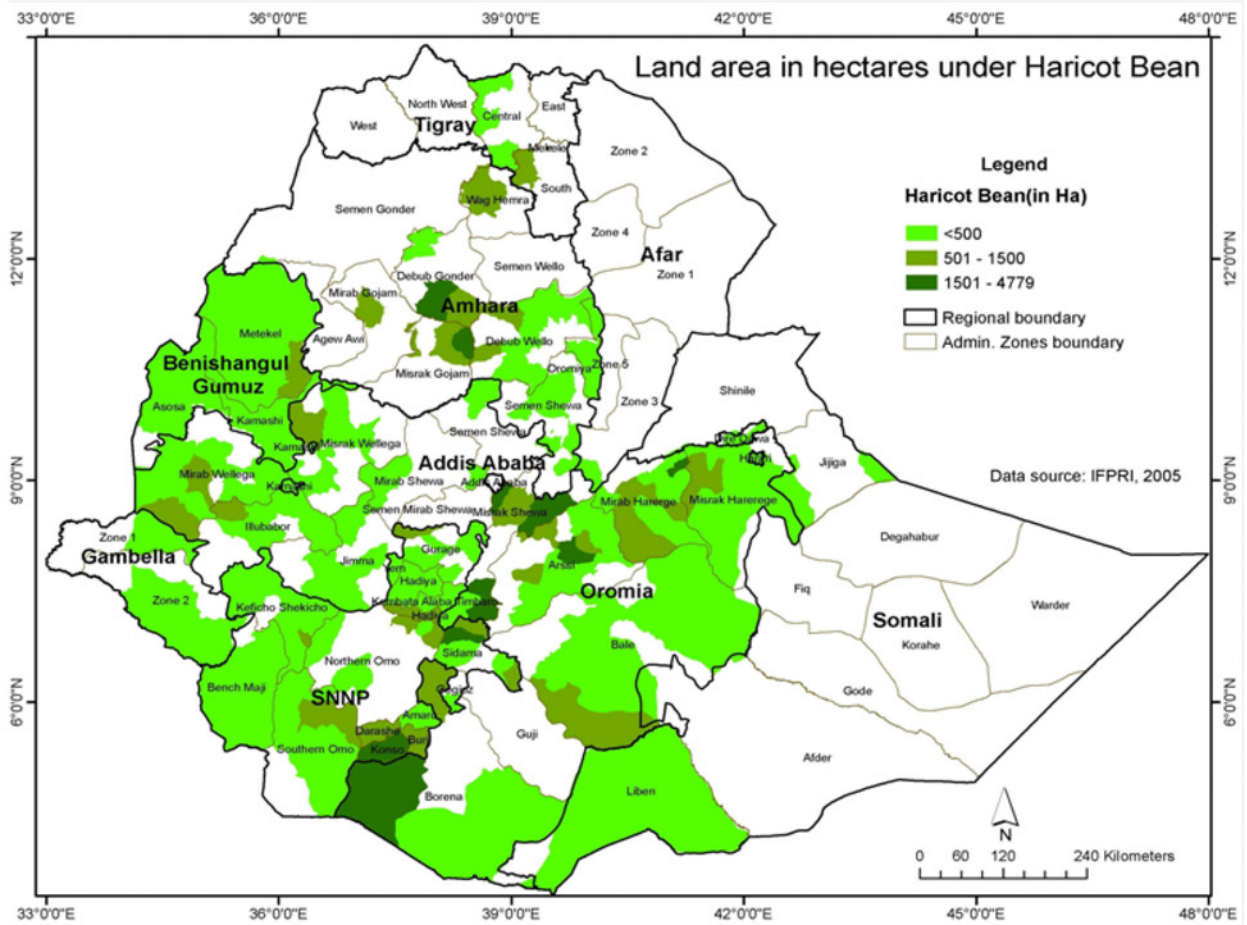
The spatial distribution of pulses cultivation is presented in Figure 2 shows the relationship between agro-climatic conditions and pulses production. Note that chickpea and lentils are primarily grown on dark soils on residual moisture, which is a predominant soil type in west and north Shewa zones of Oromiya; north and south Gonder, south Wollo, north Shewa, east and west Gojam Zones of Amhara; Goro zones of SNNPR; and the east Tigray zone. Faba beans and field pea, on the other hand, are grown during the main season on both red and black soils primarily in Amhara, Tigray, Oromiya and SNNP regional states. Haricot beans are concentrated in the relatively dry and warmer parts of the country mainly along the Rift Valley. Production of haricot beans is also expanding in SNNP region, Gambella and Benshangul-Gumuz regional states (Figures 3 and 4).

Figure 2: Geographic distribution of chickpeas



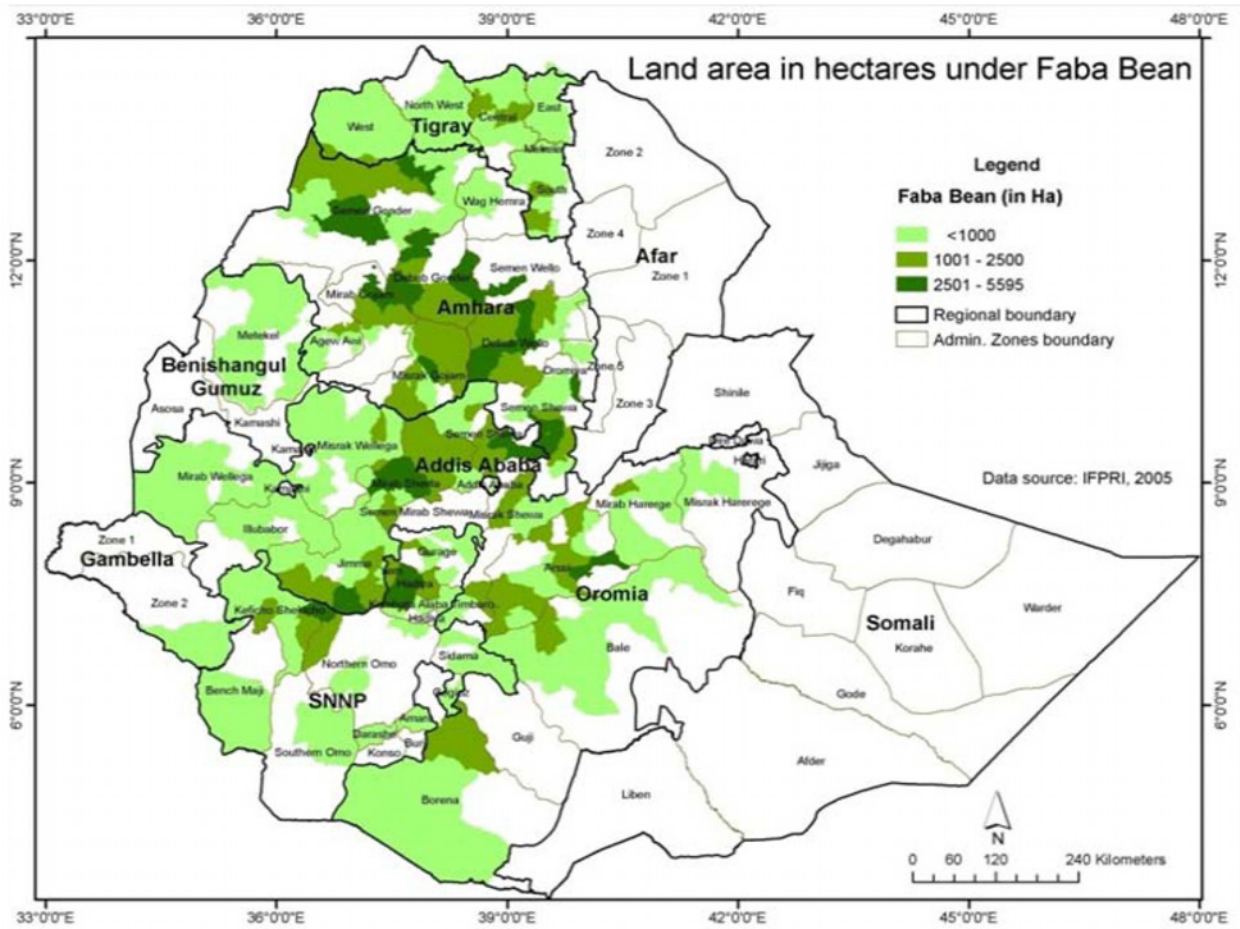
Source: Alemu et. al, 2009

Figure 3: Geographic distribution of haricot beans



Source: Alemu et. al, 2009

Figure 4: Geographic distribution of faba beans



Source: Alemu et. al, 2009

### Recent growth of the pulse sub-sector

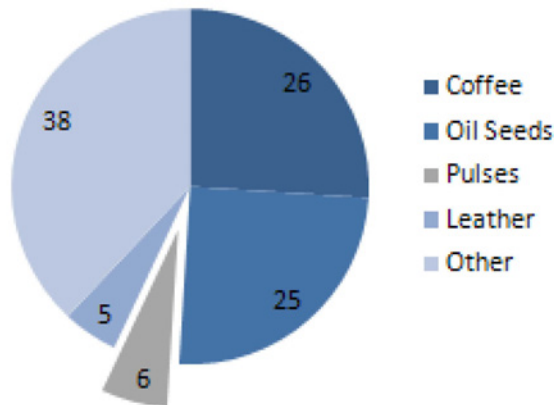
Ethiopia is now one of the top ten producers of total pulses in the world, the second-largest producer of faba beans after China, and the fifth or sixth largest producer of chickpeas<sup>1617</sup>. Within Ethiopia, pulses are the third-largest crop export behind coffee and oil seed, and represent a USD 90 million export industry (Figures 5 and 6).

16 Ranking depends on which years are selected (e.g., fifth based on average production 2005-2007, sixth based on 2008 data).

<sup>17</sup> FAOStat (2008)

**Figure 5: Importance of pulses export to total export earnings**

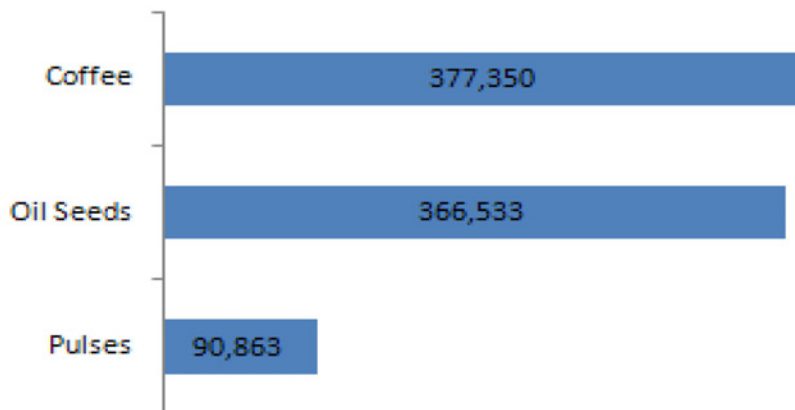
**Percent of Total Export Earnings, 2008/09**



Source: Authors' computation based on data obtained from NBE

**Figure 6: Importance of pulses export to total export earnings**

**Export Earnings, 2008/09, 000s USD**

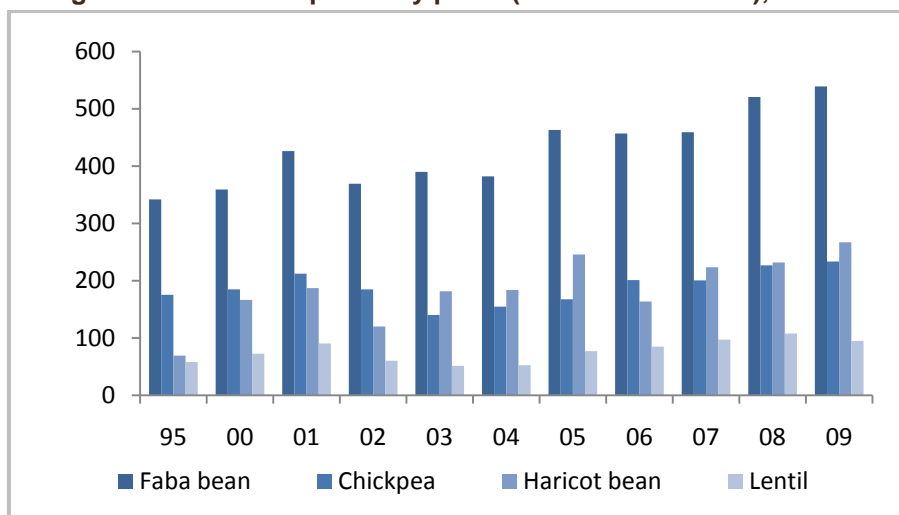


Source: Authors' computation based on data obtained from NBE

The role that Ethiopia now plays in the international pulse market can be attributed to significant growth rates in pulse production over the last decade (Figure 8, Figure 9)<sup>18</sup>. For instance, in 1994/5 the country produced only 742 thousand tons of pulses, compared to 1.25 million tons in 1999/2000 and to 1.8 million tons in 2007/08 (Figure 7). This growth of 243 percent between 1994/95 and 2007/08 implies an annual growth rate of 17 percent. Growth rates for individual varieties of pulses are even higher. The total production of haricot beans, a key export, was only about 34 thousand tons in 1994/95 and increased nearly tenfold to 330 thousand tons in 2008/09. From 1994/95 – 2008/09, rates of production growth for chickpea, haricot bean, faba bean, and lentil were 12, 43, 7, and 15 percent respectively. For each variety, the rates of production growth outpaced rates of growth in cultivated land, suggesting parallel gains in per hectare productivity.

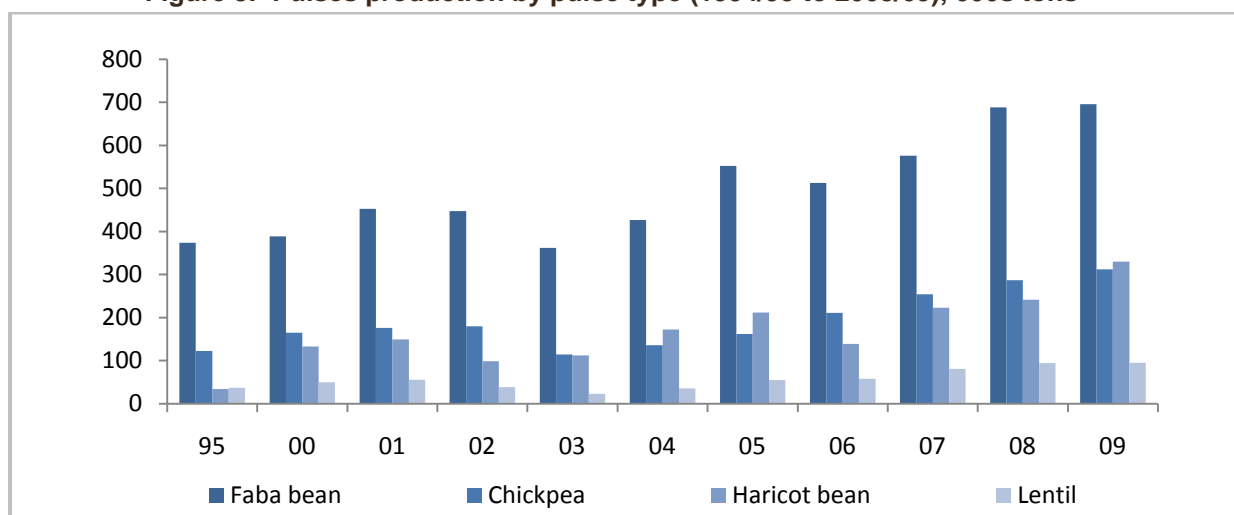
<sup>18</sup> The market liberalization provided initial boost. Prior to the market reform measures of the 1990s, pulses and oilseeds were under the control of country's grain marketing board that restricted private sector entry into the export markets

**Figure 7: Pulses crop area by pulse (1994/95 to 2008/09), 000s ha**



Source: Authors' compilation based on CSA Agricultural Sample Survey Reports for various years.

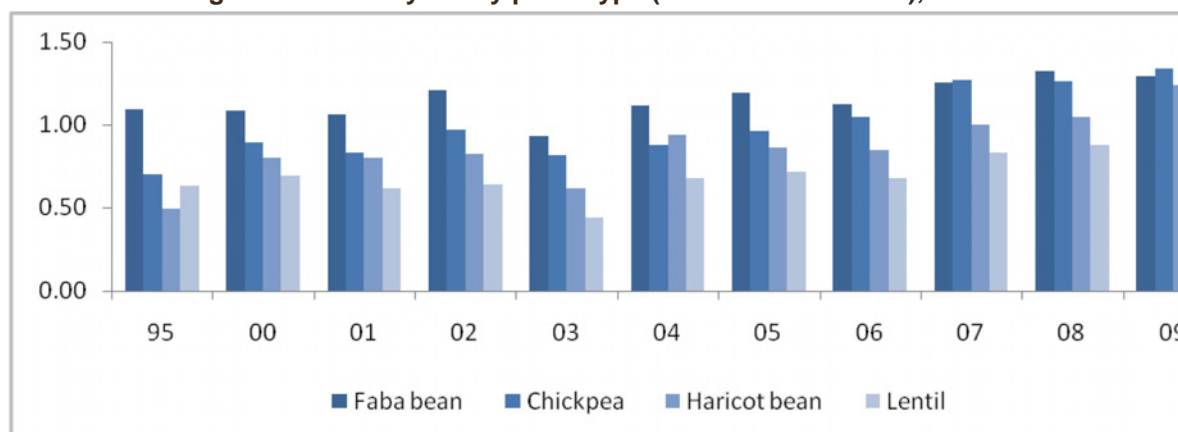
**Figure 8: Pulses production by pulse type (1994/95 to 2008/09), 000s tons**



Source: Authors' compilation based on CSA Agricultural Sample Survey Reports for various years



**Figure 9: Pulses yield by pulse type (1994–95 to 2008–09), tons/ha**

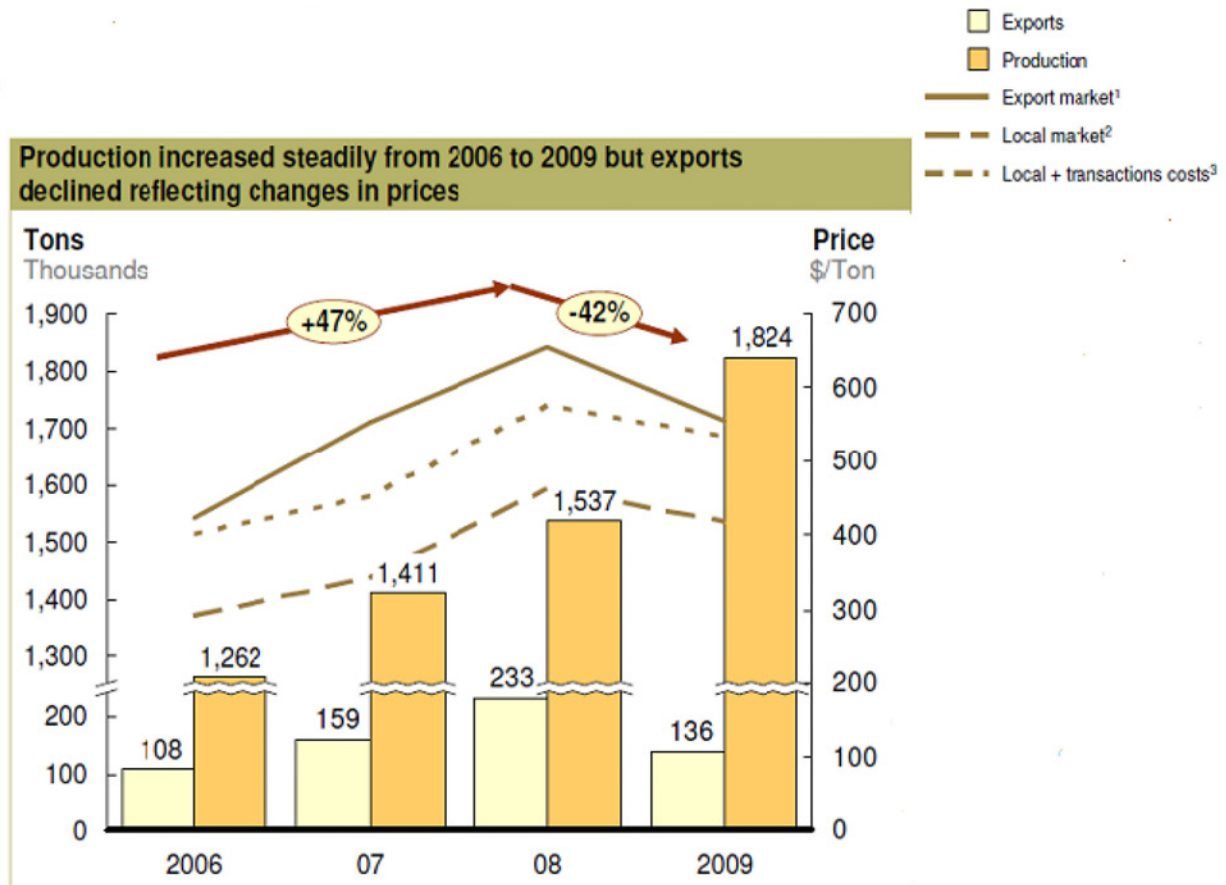


Source: Authors' compilation based on CSA Agricultural Sample Survey Reports for various years.

Although production continued to increase through 2009, export volumes dropped by 42 percent in 2008/09 (from 233 tons to 136 tons)<sup>19</sup>. As shown in Figure 10, after consistent growth in prices in global pulse markets for several years, global prices fell in 2008/2009. This caused the local price for pulses to rise above the export parity available to smallholder farmers. Farmers sold on domestic markets (as the export price was not high enough to justify transport and cleaning costs), further depressing the farm-gate price, or stored their pulse supply, anticipating an upswing in the global price. This price volatility exacerbated challenges throughout the value chain, causing sourcing problems for exporters and traders and limiting ability for the off-take market to function. This impact also had lagging effects on pulse production, with estimates showing fewer pulses planted in 2009/2010 season and a potential for pulse shortages in 2010.

<sup>19</sup> Central Statistics Agency (2009)

Figure 10: Trends in pulses export performance



Source: Central Statistics Agency (2009)

### Public policies

Public policy has played a small yet vital role in facilitating the growth of the pulses sub-sector, by liberalizing markets in the late 1990s and encouraging private sector entry. During the 1980s, the government took over all aspects of grain marketing, reducing private sector participation in the grain and pulses markets. For instance, the licensed traders' share in Agricultural Marketing Corporation's (AMC) annual purchase of cereals declined from 70 percent in 1982 to only 10 percent in 1986<sup>20</sup>. The same was true for oilseeds and pulses.

The GOE initially had a separate marketing agency devoted to market development for pulse exports, the Ethiopian Oilseeds and Pulses Export Corporation (EOPEC). The organization later merged with the Ethiopian Grain Trading Enterprise (EGTE) in 1999 as part of a broader consolidation and liberalization effort on the part of GOE. The policies paved the initial path for private sector participation in the pulse sector, contributing to improvements in production and exports. That said, EGTE's role has not been clear. Purchases to date for export continue to show very little correlation with the production volume of pulses, raising critical questions about the value-chain, from issues of quality and aggregation related with production, to questions of commercialization for export (Table 2).

<sup>20</sup> Gutema, 1987

**Table 2: Share of EGTE's local purchase from total production by pulses type**

Year	Lentil		Faba bean		Chickpea		Haricot bean	
	EGTE purchase (tons)	Share of total production (%)	EGTE purchase (tons)	Share of total production (%)	EGTE purchase (tons)	Share of total production (%)	EGTE purchase (tons)	Share of total production (%)
2005	26	0.047	44	0.008	21	0.013	239	0.113
2006	0	0.000	0	0.000	46	0.022	103	0.074
2007	36	0.045	0	0.000	185	0.073	335	0.150
2008	6	0.006	58	0.008	126	0.044	544	0.225

Source: CSA for the production and EGTE Annual report for EGTE purchase

In recent years, to develop the potential of the sector to supply high quality products for both the domestic and export market, various policy initiatives have been undertaken to increase the competitiveness of smallholder farmers. The initiatives seek to promote improved pulse production technologies with high yielding varieties, adoption of recommended fertilizer application rates and crop protection practices, and the promotion of pulse export trade and financing incentives to enhance the competitiveness of pulse exporters. In large part, these farm-level efforts have fallen short of achieving the key goals of increasing smallholder productivity, maintaining steady and high quality production, and ensuring consistency in export volumes, primarily because of the lack of inputs, effective agencies to implement, and a cross-sectoral vision for the sector with the confidence of multiple stakeholders.

### **Contributions of pulses to smallholders' livelihood**

Pulses contribute to smallholder livelihoods in multiple ways (see case study – story of a small farmer). Firstly, pulses can play a significant role in improving smallholders' food security, as an affordable source of protein (pulses make up approximately 15 percent of the average Ethiopian diet<sup>21</sup>) and other essential nutrients. As a protein source, pulses are more affordable for smallholders than meat, fish, and dairy products, and for the 40 percent of Ethiopians who practice orthodox Christianity, pulses become the single largest source of protein during the fasting period.

Secondly, pulses can have an income benefit for smallholders, both in terms of diversification and because they yield a higher gross margin than cereals. The income benefits of diversifying from cereals to pulses for one smallholder farmer are exemplified in the case study, and Table 3 demonstrates the net profit of wheat, barley and teff, compared to faba beans and chickpeas. The results demonstrate that pulses are generally more profitable than cereals, giving smallholders an economic incentive to increase pulse production. Faba beans provide the highest net return among the crops considered, while chickpeas provide higher returns than barley and teff, but comparable returns to wheat.

<sup>21</sup> FAOStat

### Case study – Pulses and livelihood: Story of a small farmer

Hailu Balcha is a small farmer in the Ada woreda of the Oromiya region in Ethiopia, consulted during the diagnostics. Like his forefathers, he grew cereals, mainly teff, for the food security of his family. Hailu also had a few livestock and grew vegetables, generating some cash income. He had never thought of growing pulses as an income source until an extension agent approached him in 2007. The agent, who was receiving training under a project called Improving Productivity through Market Access (IPMS), encouraged Hailu to allocate one hectare of land to a high yielding chick pea variety. Following the instructions from the extension agent, he plowed his plot three times at an interval of two weeks. He did not use any chemical fertilizer, but did use 60 gms of bio-fertilizer, which he mixed with 130 kilograms of high yielding seed just before sowing. The other costs of cultivating his one hectare plot included 48 days of labor, two kilograms of insecticides, and the use of his donkeys. When all costs are added, Hailu spent ETB 6,955 and harvested 5.27 tons of chickpeas. Despite these costs, Hailu ended up making a net profit of ETB 12,744.26 (USD 1,449) from selling at a market price of ETB 3,738 per ton. Given that teff prices were ETB 4,450 per ton in 2007 and average yield is only one ton per hectare, Hailu's income from chickpea cultivation is 286 percent higher than what Hailu would have earned had he cultivating teff in his plot.

Source: Authors' write up based on the data from IPMS model farmers' report

**Table 3: Gross margin analysis for selected crops per hectare**

Item	Wheat	Barley	Teff	Faba bean	Chickpea, Desi
Gross returns	3,486	2,656	2,961	2,521	6,204
Total costs	2,761	2,473	2,366	1,235	5,484
Net profit	725	183	595	1,286	720

Source: Team analysis

Within chickpea varieties, a recent analysis of production costs and market opportunities of Desi and Kabuli chickpeas in Ethiopia demonstrated that farmers would yield more income by switching from the production of traditional desi chickpeas, which use low input production methods, to the production of high yielding Kabuli chickpeas, while employing improved management<sup>22</sup>. The switch from the use of low input, low output to input intensive production technologies, while requiring a higher initial investment, provides higher returns, thereby justifying the additional costs.

However, much of the pulse production in Ethiopia is also consumed on-farm (approximately 65 to 90 percent), and only the remainder is marketed, demonstrating that smallholder farmers primarily produce pulses for subsistence needs, and this income benefit may not be realized. However, it is worth noting is that the proportion of marketed pulse output varies significantly across regions, pulse types and production year<sup>23</sup>. For example, a study of smallholders in *Alaba* district showed that smallholder farmers sold 46 percent of their haricot bean and chickpea produce. Thirdly, an indirect benefit of pulse production is the crop residues, which are widely used as animal feed thereby supporting livestock – an often important means of livelihood for smallholders.

In addition to improving food and nutritional well-being, pulses can also improve soil health. Pulses have nitrogen fixing properties that can reduce fertilizer usage for cereals in the next season by up to 60 percent (if the recommended fertilizer dosage is otherwise adhered to<sup>24</sup>). Given that

<sup>22</sup> Shiferaw et al. (2007)

<sup>23</sup> Ferris and Elly (2008); Gebremedhin and Hoekstra (2008)

<sup>24</sup> Note that recommended fertilizer dosages are not usually adhered to in Ethiopia – please refer to the soil fertility diagnostic for more details

cereal production causes higher soil nutrient depletion, rotating between pulses and cereal will not only contribute towards maintaining soil health but can also reduce the country's fertilizer usage.

Finally, as the third largest crop export product in terms of total value (USD 90 million), pulses have a positive impact on the trade balance, and contribute to the country's foreign exchange reserves. However, only 140,000 tons out of 1.6 million are exported<sup>25</sup>. Assuming domestic consumption remains the same, small percentage increases in production could dramatically boost export volumes, further contributing to the balance of payments.

## RESULTS OF VALUE CHAIN ANALYSES

A successful and sustainable pulse industry presupposes that value chain actors are well integrated and function as a unified system in a way that maximizes the welfare of all actors involved from production up to consumption. The pulse value chain in Ethiopia, however, is far from efficient and fraught with several challenges. This value-chain analysis attempts to identify the various impediments in order to develop possible interventions that can improve the performance of the value chain.

As an analytical framework, the value chain is divided here into three broad stages, namely production, aggregation and marketing, and commercialization towards exports. Table 4 illustrates the key challenges at each of the three distinct value chain stages. The characterizations of each stage were based on interviews with stakeholders across the value chain and participatory rapid assessments performed by the diagnostic team. The challenges facing each stage of the value chain are further elaborated in the subsequent sections.

**Table 4: Overview of challenges in the pulses value chain**

Challenge	Description
Low on-farm productivity	Smallholder productivity constrained by limited use of improved inputs, small fragmented plots, marginal soils, limited use of improved varieties, and inadequate farm management practices
Inefficient marketing system	Limited effectiveness of marketing due to involvement of many actors, leading to excessive handling and weak demand signals, and inadequate financing and transport
Inconsistent export supply	Limited relationship between exporters and importing countries, unstable and erratic demand from importing countries leading to limited number of contracts between exporters and producers

### Production

The primary producers of pulses are smallholders with small and dispersed plots under rain fed conditions. Women are also heavily involved in production, conducting the majority of on-farm labor during both planting and harvest, with additional activities in value-addition. While there have already been productivity gains in the pulses subsector – for instance from 2000 to 2008, yields for faba bean increased 20 percent, from 1.06 tons/ha to 1.3 tons/ha,<sup>26</sup> – this study suggests that there is significant potential for further productivity gains. Comparisons between current yields with international and on-farm trial benchmarks demonstrate that for both faba beans and chickpeas, Ethiopia has substantially lower yields than on-farm trial and international yields would suggest possible.

For example, although the Ethiopian average chickpea yield, at 1.2 tons per hectare<sup>27</sup>, is higher than countries including India, farm tests on experimental plots in Ethiopia have achieved yields from 2.9 to 3.5 tons per hectare<sup>28 29</sup>. This implies a minimum productivity gap of at least 150 percent. For faba beans, the gap between actual and potential productivity is even wider, with the potential to more

<sup>25</sup> Central Statistics Agency (2008/09); MoARD

<sup>26</sup> Mesfin et al., (2008)

<sup>27</sup> Central Statistics Agency (2008/09)

<sup>28</sup> Based on crop trials in 2004

<sup>29</sup> FAOStat; Ethiopian export promotion agency document (May 2004)

than triple the productivity from 1.3 tons per hectare to 4.0 tons per hectare. Bridging this gap would make Ethiopia third among major bean producing countries, as measured by production.

At the farm level, productivity appears to be severely constrained by three major factors<sup>30</sup>: **(i)** limited or no use of chemical fertilizers for pulses (e.g., phosphates); **(ii)** very limited availability of improved seeds (most pulses are grown from unimproved cultivars with low genetic potential); and **(iii)** the use of conventional agronomic practices (e.g., sub-optimal crop rotations, poor seed bed preparation). Each of these factors is further explained below.

#### Limited use of chemical fertilizers

Although pulses need little or no nitrogen (depending on the variety), they benefit from phosphates, potassium and zinc, among other nutrients. Studies in Ethiopia and elsewhere have demonstrated the productivity benefits for pulses from phosphate fertilizers (e.g., super-phosphates) in particular, currently not used in Ethiopia. Studies on chickpeas in Pakistan and Jordan showed yield gains of 65 percent and 88 percent respectively (depending on the initial soil health and moisture conditions), while yield increases of 25-80 percent and 55-150% have been seen with faba beans and field peas respectively<sup>31</sup>.

Fertilizer use in Ethiopia is comparatively low, averaging 25 kg/ha of nutrients<sup>32</sup>, and much of this is currently applied on cereals. The currently limited use of chemical fertilizers on pulses is due to: lack of awareness of the benefits of fertilizer for pulses; limited access to credit; and the lack of phosphate fertilizers imported into Ethiopia. In many of the rural sites the diagnostic team visited, the majority of the farmers mistakenly thought that pulses did not need chemical fertilizers. In places where farmers did know about benefits of fertilizer application, access to credit was the primary reason cited for not using fertilizer.

The use of fertilizer is especially important in light of multiple Ethiopia-specific studies that assert that soil fertility depletion is one of the fundamental biophysical causes for declining *per capita* production<sup>33</sup>. For instance, estimated soil nutrient losses for the highlands of Ethiopia are high, exceeding 122 kg of N, 82 kg of K and 13 kg of P per cultivated hectare<sup>34</sup>.

#### Limited availability and use of improved seeds

The pulse research program in Ethiopia has released a number of improved pulse varieties including 20 faba bean, 26 field pea, 16 chickpea, 36 haricot bean, 7 lentil and 13 soybean varieties<sup>35</sup>. As depicted in Figure 11, these varieties, if used with recommended input packages, have the potential to increase pulse yields two to three fold. The merits of these varieties have been confirmed by nationwide technology demonstration programs conducted throughout the country with farmers, researchers, extension agents and other stakeholders. Yet, despite the release of this large number of improved pulse varieties, that are adapted to a wide range of rainfall, soil and altitude regimes, the use of certified improved seeds by farmers is very low. A combination of factors explain low adoption: on the one hand, supply side constraints including extension, limit

“I do not know if improved seed is worth it so I don't use it”

— Farmer visited on field visit in Oromia

“Farmers save seed and re-use but do not realize deterioration of productivity over time”

— Pulse expert at research institute

<sup>30</sup> Research team field visits; Getachew et al. (2006); Amanuel and Daba (2006); Hailelassie et al. (2007); MoARD (2008).

<sup>31</sup> Getachew et al. (2006)

<sup>32</sup> NAIA (2002)

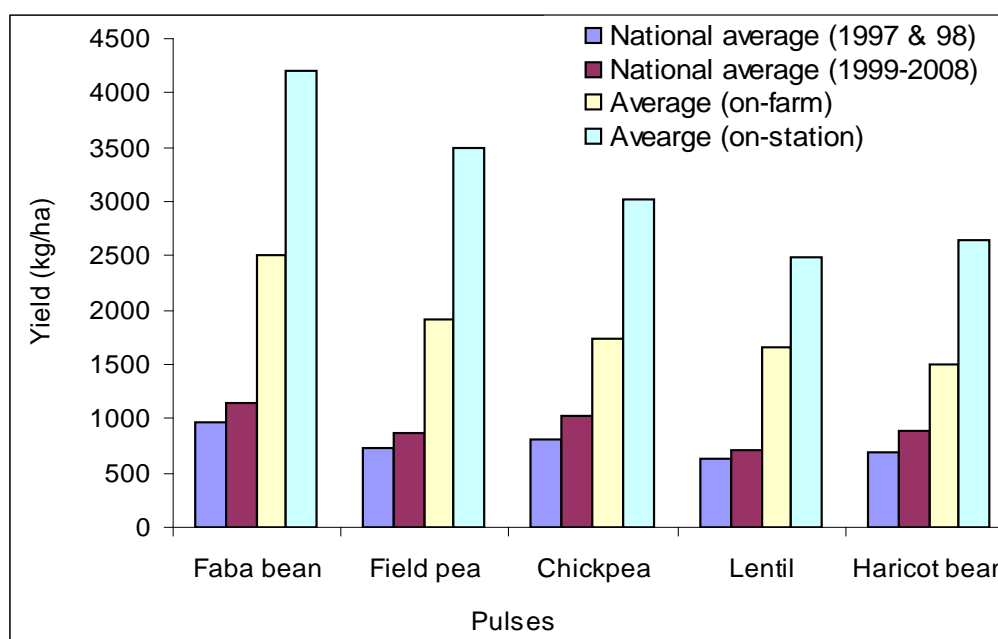
<sup>33</sup> Refer to the soil fertility diagnostic report for more details

<sup>34</sup> Hailelassie et al. (2007)

<sup>35</sup> MoARD (2008)

the knowledge of smallholder on production practices and benefits of diversification; on the other hand, a set of market-led demand constraints, particularly the price instability in 2008, led to diminished trust in the pulses sector for small producers after declining market returns.

**Figure 11: Yield gap for key pulse varieties in on-farm and on-station trials**



Source: CSA, various years

#### Modern agronomic practices not widely used

While agronomic practices such as the timing of plowing, fertilizer and insecticide applications, crop rotation, and weeding and harvesting are critically important to achieve optimum productivity, many farmers are unaware of their benefits. Limited knowledge of best practices for overall agronomic practices and post-harvest management has resulted in poor quality, low yielding pulses.

In particular, the lack of crop rotation is a key issue with respect to farm management practices. Currently, 13 percent of the land area used for grain production in any one year is devoted to pulses, suggesting a significant portion of the remaining cultivated area for grain is under mono-cropping. Farmers may mono-crop cereals to meet the family's need for cereal grain for food at the expense of long-term sustainability of the farming system. However, crop rotation presents significant potential – research on cropping systems in Ethiopia indicates that the improvements in soil fertility from optimal crop rotation (e.g., planting wheat after faba beans) improved grain yields of wheat by more than one ton per ha<sup>36</sup>. The adoption of optimal rotations, besides increasing the productivity of pulses and the subsequent cereal crop through improving soil fertility, can increase farmer income as area devoted to pulses increases.

#### Product aggregation and trading

The analysis of aggregation and trading (otherwise referred to as marketing) examines the flow of pulses from their origin (producer) to their final destination. Several studies have characterized the pulse marketing channels in Ethiopia, and have concluded that, with the exception of haricot beans, the marketing system of pulses is highly underdeveloped, and more or less similar to that of cereals<sup>37</sup>.

<sup>36</sup> Amanuel and Daba (2006)

<sup>37</sup> Hailu et al. (1994); Gezahegn and Dawit (2006); Bekele and Hialemarlam (2007); Dawit et al. (2010)



Pulse marketing, from producer to consumer, is a complex process involving handling from multiple intermediaries. There are three separate levels of marketing as shown in Figure 12:

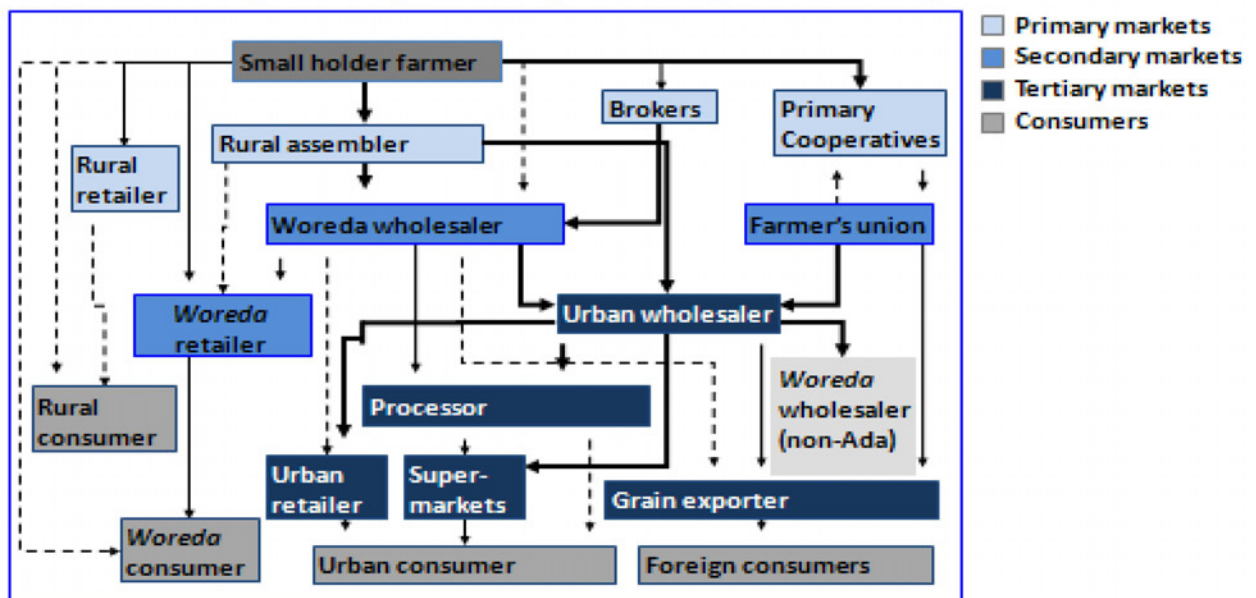
- **Primary markets** (buyers who buy directly from the producers) include rural retailers, rural assemblers, brokers, and primary cooperatives
- **Secondary markets** (buyers who purchase products primarily from originators) include *woreda* retailers, *woreda* wholesalers, and farmers unions
- **Tertiary markets** include urban wholesalers, urban retailers, processors, supermarkets, and grain exporters, and are located in larger cities such as Addis Ababa and Nazereth (Adama)

“I don’t weed too much... pulses don’t need it”  
— Farmer visited on field visit

“Farmers plant on marginal lands, they know it helps soil nutrients but lowers the yield of pulses”  
— Pulse expert

The interaction between the actors in these markets is demonstrated in Figure 12. The complexity of the marketing system is not only exemplified by the multitude of players, but by the many paths that pulses can take to reach end consumers. From primary markets, produce may or may not pass through secondary and/or tertiary market actors before reaching consumers.

Figure 12: Stylized chick pea marketing chains in Ethiopia



Source: IPMS Chick peas document (2007)

Aggregation from producers often takes substantial effort as production is from about 11 million households that are spread over large and hard to reach areas. Many actors are involved in aggregation and trading - the number of actors and their economic performance is unknown. Some estimate that there are thousands of aggregators (including assemblers, retailers, wholesalers, farmers’ union, processors and exporters) operating at different levels in the value chain.

Traders typically operate in small geographic areas and trade relationships are based heavily on social capital. The relatively large number of actors working in a highly fragmented manner, coupled with poor road infrastructure and the inability for large-scale international traders to track products, implies high transaction costs for aggregators and traders.

The three major constraints in pulse aggregation and trading are: (i) the complex marketing chain means that quality is reduced through excessive handling and the demand signal is lessened from multiple middle men separating producers and exporters; (ii) there are financial constraints and logistical limitations; and (iii) infrastructure challenges create transportation difficulties. These constraints are expanded upon in the following sections.

#### Complex marketing chain results in lower quality and weaker demand signals

The negative implications of a complex marketing chain are that: (a) the quality of the product is reduced through excessive handling; and (b) the demand signal is lessened due to the multiple middlemen separating producers and exporters so smallholders are unknowledgeable about the quality and type demands in end markets.

Quality is an important parameter that determines both the price and volume of pulse exports. Exporters estimate that they reject 10 to 25 percent of produce due to quality standards, which impinges upon both the profitability of exporters and ultimately the prices paid to farmers. The most important quality parameters dictating pulse export quality include: seed size, color, appearance, and existence of mixtures (Table 5). Most of these parameters are dictated by the type of pulse variety (traditional versus improved), management practices and post-harvest handling.

However, farmers are often unaware of the characteristics desired by the end markets (e.g., exporters) and developing smallholders' knowledge on the quality requirements of the international market, including pulse aggregators and traders, would benefit all involved in the value chain.

**Table 5: Ethiopian grades and standards for chickpea**

Quality traits	Maximum allowable limit (%)		
	Grade 1	Grade 2	Grade 3
Total damaged seeds	0.3-1.0	1.0-1.5	1.5-2/0
Broken grains	0.5	1.0	1.5
Wrinkled grains	2.0	4.0	8.0
Cracked coat	3.0	5.0	7.0
Foreign matter	0.2	0.3	0.5

Source: Compiled by Shiferaw et.al 1997 from Quality and Standards Authority of Ethiopia (QSAE)

#### Financial and logistical limitations

Availability of inputs such as quality seeds, fertilizer and credit is crucial for an efficient and effective marketing system. However, consultations with primary cooperatives, unions and government officials indicated that only about 1 percent of primary cooperatives and 10 percent of the unions have access to credit. This suggests that aggregating and trading activity is limited by constrained access to finance, at least for smaller marketing actors. Larger traders in the major cities, however, are able to access formal credit to finance their business<sup>38</sup>.

Other than financial constraints, limited storage facilities and lack of timely market information have constrained the efficiency of market actors involved in pulse aggregation and trading. In terms of market information, market participants typically have either no or ill-informed information on prevailing grain prices, supplies, stocks and inter-regional grain flows. A source of market information for importers and exporters, who seldom operate and scale and are largely fragmented, is limited. Market

<sup>38</sup> Please refer to the agricultural finance diagnostic report for more details

information to importers and exporters is also unavailable. As for storage facilities, post-harvest crop losses due to inadequate and poor-quality storage are a fundamental problem in Ethiopia, at about 15 to 20 percent of all pulse production is lost.

#### Infrastructure challenges create transportation difficulties

High transaction costs lead to lower prices for producers, higher prices for urban consumers, and suppressed export competitiveness. It is worth noting that, despite the fact that Ethiopia is among the top pulse producers in the world, the price received by farmers is relatively low compared to other pulse producing countries (Appendix 4).

Finally, despite recent improvements in road networks, Ethiopia still suffers from inadequate road networks. Most rural households are still located in areas that cannot be accessed by motorized vehicles. Smallholder farmers depend on pack animals and human labor to transport their surplus produce to primary markets. Assemblers and other market actors often pay high transportation costs to move their purchases to secondary and tertiary markets. Consequently, moving crops around is not only slow but expensive.

#### **Commercialization/Export**

As with all commodities traded in highly competitive markets, information on the demand and consumption patterns of pulses is critical for designing appropriate interventions that enhance the competitiveness of the pulse sub-sector. Consumers, be it domestic or international, indicate their demand through the price they are willing and able to pay, and the market transmits the price signal to producers so that they may respond accordingly. In the pulse market in Ethiopia, however, a number of factors restrain the market forces required to provide the right signal to all actors in the value chain. In this section, the major demand pulls for Ethiopian pulses, as well as and the factors that affect demand and supply, are discussed.

**Table 6: Pulse grain use in Ethiopia, 2007**

Type of Pulse	Number of households (million)	Pulse grain use (%)		
		Marketed	Consumed	Other <sup>39</sup>
Faba Beans	3.8	18	64	18
Haricot Beans	2.5	13	72	15
Field peas	1.7	18	65	17
Chickpeas	1.0	18	64	18
Lentils	0.7	28	51	21

Source: CSA (2008)

#### Domestic consumption and marketable surplus

Pulses are a significant portion of the Ethiopian diet, particularly for rural and peri-urban consumers. Among pulses varieties, grass pea, pigeon pea and cow pea are mainly used for domestic consumption, while haricot beans, faba beans, chickpea, lentils and field pea are primarily exported. Table 6 summarizes the end markets for the primary pulses in Ethiopia. This table demonstrates that the bulk of the pulses are consumed on-farm, with marketed output accounting for only 13 to 28 percent of production, depending on the variety.

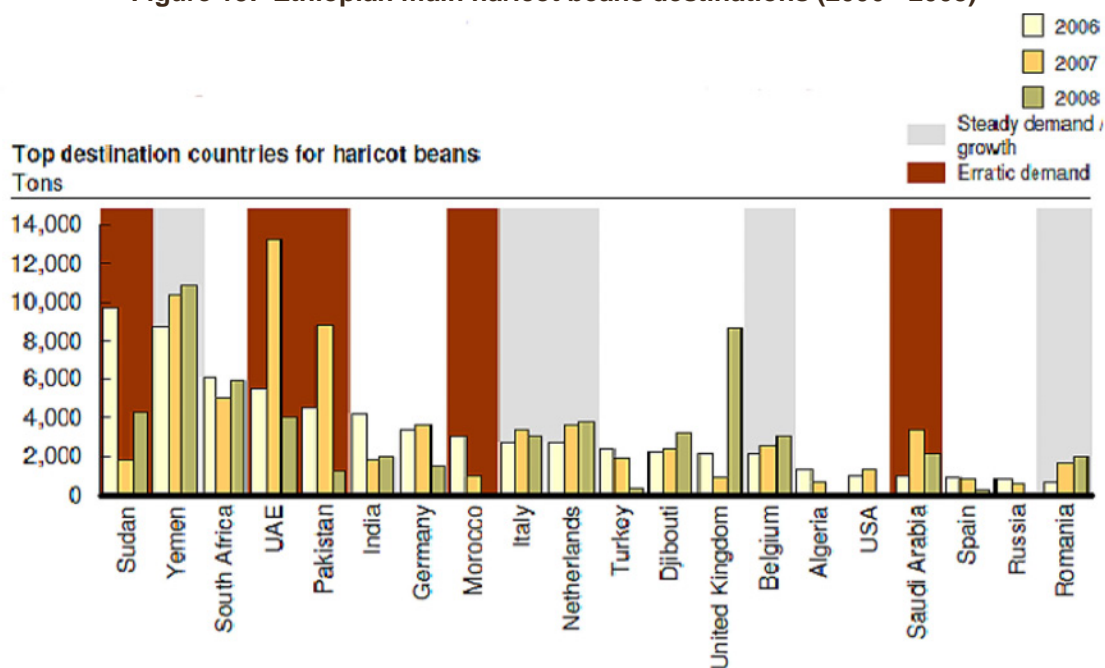
As this table suggests, smallholders market surplus grains in small quantities of varying quality and farmers are not well integrated to the market. The small quantity of pulses produced and sold coupled with high transportation and transaction costs incurred in pulse aggregation and trading reinforce the subsistence orientation of the smallholder farmers.

#### Exports

Pulses are the third most important crop for Ethiopia, as measured by export earnings. The most important export pulses include: haricot beans, chickpeas, faba beans, lentils and field peas. Ethiopia exports pulses to many countries in Africa, the Middle East, Europe, Asia and America. The major haricot bean destinations include the Sudan, Yemen, South Africa, and UAE. The importance of these countries as a destination for Ethiopian pulses, however, varies from year to year. As depicted in Figure 13, while the demand for Ethiopian pulses grew steadily in Yemen, India, Italy, Netherlands, Belgium and Romania, demand was erratic for Sudan, UAE, Pakistan, Morocco and Saudi Arabia. Ethiopia, therefore, needs to work to ensure consistent demand for its pulse exports, and it will be difficult to maintain steady demand by country.

<sup>39</sup> Includes seed, wages in kind, animal feed and post-harvest losses

Figure 13: Ethiopian main haricot beans destinations (2006 - 2008)



Source: CSA (2010)

The price collapse in 2008/09 after nearly fifteen years of consistent growth in pulse exports, with a significant acceleration of 43 percent between 2005/6 – 2008/2009, must be considered. Nonetheless, domestic prices rose much faster than international prices in the boom, while in the decline, world pulse prices fell more sharply than domestic prices. The implication is that price increases in local markets made exporting pulses less attractive. As depicted in Table 7, local market prices plus transaction costs are greater than foreign market prices, suggesting exporters took a loss by selling below cost.

Table 7: Breakdown of chickpea production prices (USD/ton)

Items	Price structure	Scenario	
		Low price	High price
1	Raw material	366	742
2	Production	16	16
3	Sales and marketing	17	17
4	Transport to Djibouti	26	26
5	Exporter margin	21	40
6	Retail Value	446	841
7	FOB value	555	650
8	Difference (Item 7 minus 6)	109	- 191

Source: Team analysis (based on interviews and field visits)

Another factor impacting pulse exports is that the pulse export sector is dominated by a large number of small-scale exporters lacking scale efficiency, many of which operate in lower quality markets. For instance in 2007, about three quarters of pulse exporters exported less than 500 tons, contributing only 20 percent to export value. On the other hand about 6 percent of the exporters contributed 45 percent to total export value, exporting 2000 tons of pulse grain (Appendix III). Barriers to scale-up are driven by several factors, including consistency of supply, quality of supply and lack of strong relationships with foreign buyers. Small-scale exporters have difficulty maintaining good,

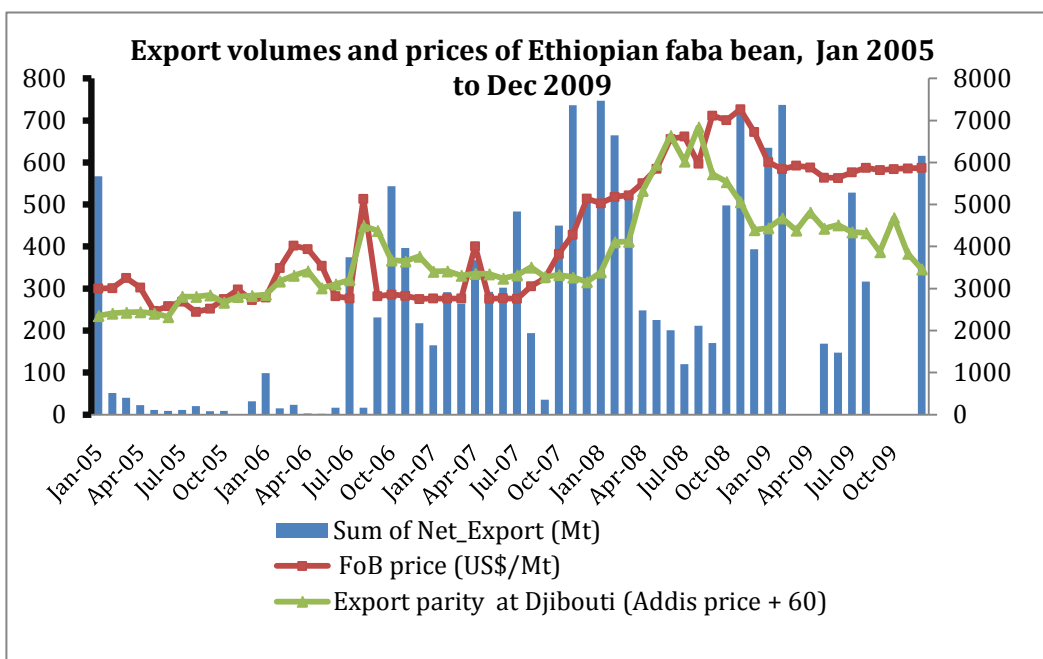
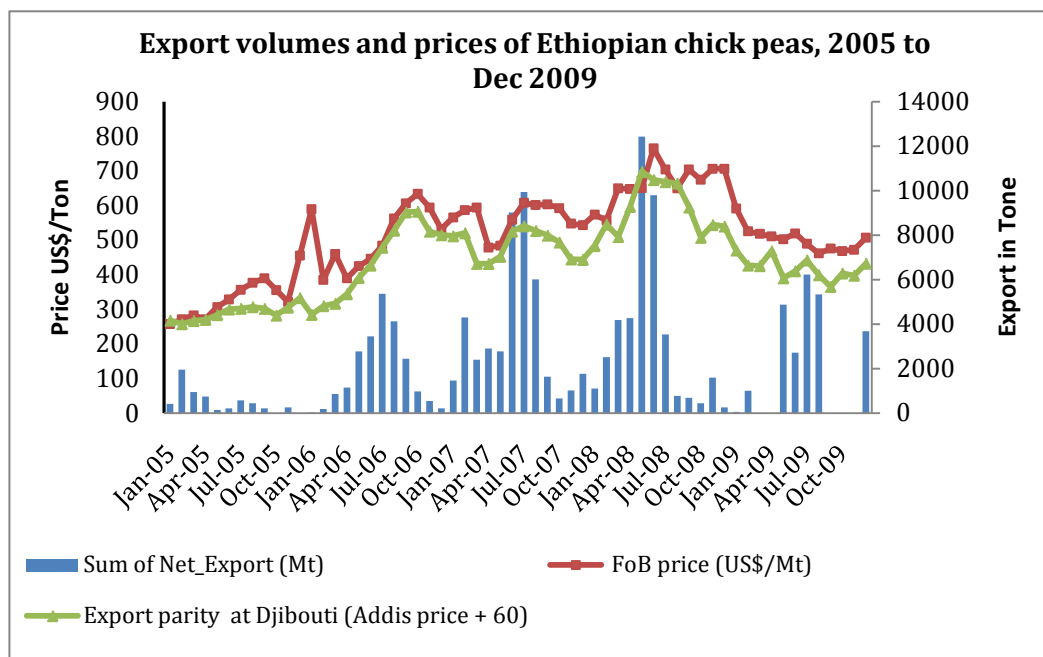
premium demand contracts. Moreover, the capacity needed to forecast demand for pulses in the foreign market is lacking, especially in smaller exporters. Building the capacity of small-scale exporters and encouraging new large scale investments is crucial in order to develop the export sector.

A further obstacle to new entrants is the perceived business risk in Ethiopia. World Bank indicators highlight Ethiopia's business climate as being less attractive than neighbors such as Kenya. Another hurdle is that foreign investors are only allowed to acquire export licenses if they add visible value to pulses, limiting new entry.

#### *Explanation for 2009 export drop*

One of the main reasons for initiating this diagnostic was a sudden drop in export in late 2009. Table 7 has portrayed one scenario where export can be unprofitable if domestic prices are relatively higher than the international prices, which is what many stakeholders had pointed out. However, an analysis of export volume and parity prices gives a different explanation. Figure 13 presents such an analysis for chick peas and faba beans. Notice the big change in the export volume trends. Compared to earlier years, export volumes shows a very different trends in 2009, when export of both chick peas and faba beans dropped down to zero in March-April and September –November of 2009.

**Figure 14: Trends in export volumes and parity prices of chick pea and faba beans in Ethiopia, 2005-09**



However, the main reasons for concerns are drops in March and April, not so much so for October and November, because these months historically records low exports of these commodities. According to these graphs, decline in exports was clearly not due to relatively higher price in the domestic markets, as export parity price (green line) was far below fob prices. This requires further probing, but one possible explanation for the drop in March 09 exports might have to do with price expectations by the farmers and traders. Enjoying high prices for several consecutive months, both producers and traders might have found it difficult to accept the new low prices. This is the classic case of lag effects in economic time series. Another explanation might be the thinness of market—that is, even though pulses were sold in domestic market and prices were being recorded, the volume might



have been too small and transactions were too fragmented for an exporter to viably buy and export. Indeed, during stakeholders' consultations, many exporters indicated that cooperative unions and farmers organizations, which had sizeable stocks, were asking prices at which the exporter could not export profitably. Again, the fact that farmers' groups and coops were asking for higher price and holding onto their stock was not irrational behavior. Because prices were higher in the previous years, and because they didn't have information about international markets, these groups formed a price expectation that did not match with sudden drop in international prices.

## **RECOMMENDATIONS**

Available evidence suggests that the pulse sub-sector has huge potential to reduce poverty and contribute to sustained economic development. Despite the country's potential and sustained development efforts to get the sub-sector moving, the competitiveness of the pulse sub-sector and hence its continued contribution to economic development is threatened by low on-farm productivity, inefficient marketing system and inconsistent supply that does not meet export quality. Recommendations intended to address these three challenges are summarized below.

The pulses sector could be strengthened by enhanced on-farm productivity and developing a more efficient chain of inputs and off-take, driven by a strong, stable export sector (with a minimum of three to five strong export players) to ensure consistent international demand. Effective on-farm production practices and decision-making would include use of phosphate fertilizer on appropriate soil types, use of improved seed in areas with the capacity to support it, increased adoption of modern agronomic practices (e.g., weeding, depth of planting etc.), full crop rotation to ensure healthy soils, and consideration market demand as well as household needs when choosing varieties. Capable aggregators would support improved farmer production and commercialization, through standardization in inputs aligned with agro-ecology, and transparent and nationally-consistent off-take contracts with accepted, published market pricing. Finally a broad range of well-developed exporters would have strong links to the international commodity markets. In order for the sector to play a key role in increasing farm income, contributing to improved food security, and improving the balance of trade, coordinated and integrated effort by multiple actors along the pulse value chain is required.

Three major interventions are suggested to emphasize development of the industry structure by focusing on creating both a demand pull and a supply push:

- Increasing productivity through improved input usage
- Linking the export market to producers to stimulate quality and supply
- Strengthening the export sector

Taken as a whole, these interventions represent a cohesive set of actions that can be pursued to strengthen the Ethiopian pulses value chain. Improving production is key to stabilizing and growing the pulses value chain, while commercialization provides a demand pull, with the middle of the value chain an enabling mechanism to improve production.

### **Strengthening the export sector**

The export sector in the pulses value chain can be used to drive foreign reserve earnings and maintain a steady balance of trade. It also has the ability to act as a catalyst for developing the pulses market structure by creating and maintaining a steady demand pull which will stimulate the right quantities and qualities of production. Most importantly, strengthening the export pull for pulses will improve the livelihood of smallholder farmers by increasing their income and improving the productivity of their land assets for the production of cereal crops. The export-driven nature of this recommendation stems from the realization that the pulses value chain requires a stronger industry structure that is currently absent in Ethiopia. Empowering exporters and other market players will force the development of a functional pulses industry. Specific actions include:

- **Incentivize exporters to link with input supply bodies** to provide stronger vertical integration in the sector. This would include working closely with cooperatives, traders and smallholder farmers, and incentives would be contingent on solving input supply/distribution issues (e.g., seed, fertilizer) and offering off-take opportunities to smallholders. Specific incentives could include government support (e.g., financing) or policies that ensure that exporters benefit directly from their investments (e.g., providing an exception clause for pulses similar to sesame seed in ECX allowing exporters who vertically integrated with cooperatives and/or producers to directly sell their product). The government would develop this incentive program, while exporters would own implementation of program details.
- **Build a dynamic export traders association** to build markets, regulate quality and help achieve scale. This could be supported by establishing a joint vision and development program among key existing public and private actors in each sector, to align all players around a common goal. Development of this program would bring together all key players, including government entities, private companies, industry associations, cooperatives, unions and development partners. This development program would consist of several key components:
  - Clearly defined sector vision and objectives; clearly defined roadmap, roles and responsibilities for all key public and private actors; realistic production targets, and; joint governance and coordination (potentially through an annual review by an independent third party).
  - Institutionalizing a unit that tracks, analyzes, and disseminates market intelligence all key actors in the value chain.

#### Case study – Ethiopian Horticulture Exporters and Producers Association (EHPEA)

The Ethiopian Horticulture Producer Exports Association (EHPEA) was established in 2002 with the mission of promoting and safeguarding the sustainable competitive position of the Ethiopian horticulture sector within the global market. It has 83 licensed members, all of whom are registered producer exporters, and affiliations and partnerships with GOE (e.g., Ministry of Trade & Industry), other private sector players and state owned enterprises (e.g., Ethiopian Airlines, banks) and key development partners (DFID, CBI, Netherlands, French Development Corporation). Key activities of the association include facilitation of market access and linkages, supporting implementation of responsible production practices that protect employees and the environment, organizing, supporting and delivering capacity building for members, and implementing a floriculture Code of Practice.

All stakeholders participate regularly in a discussion forum to surface and mitigate the issues faced by what was an infant industry. Government support has included: a 70 percent capital loan for infrastructure; duty and tax-free status for capital items and inputs; a five year tax holiday; acquisition of land; quick customs processing for importing inputs and exporting flowers; access to foreign exchange for inputs; and cold storage at the airport. Meanwhile, Ethiopian Airlines improved air transport frequency, and reduced charges, while the media provided coverage of the potential and constraints in the industry.

The sector has seen enormous success since establishment of the association. The number of exporters has increased from five to over a hundred, foreign exchange earnings from USD 1.5 million to USD 125 million, and more than 50,000 employment opportunities have been created in the sector. Key success factors included: high market demand; the effective role of the private sector and foreign direct investment; effective government support; commitment to a common goal; and quality assurance through the Code of Practice.

SOURCE: EHPEA website, expert interviews

- Establishing a discussion forum for all stakeholders to help jointly highlight and address issues in the sector. Industry associations could be strengthened as a potential vehicle for this coordination. An example of where this has been successful is with the Ethiopian Horticulture Producer Exporter Association (EHPEA) (see case study).

- **Strengthen export promotion, local and international market intelligence, and branding of Ethiopian products**, potentially through this exporter association. Effective market information will help exporters target countries and understand their quality and variety needs. Given the variability of the various destination markets, export promotion, based on clear market intelligence, is necessary to ensure a consistent and reliable demand outlet for Ethiopian pulses
- **Improve business environment** to support exporters, making focusing on an environment more conducive to investment (e.g., contract enforcement) and policies aimed at bolstering exporters' scale (e.g., financing for expansion, export promotion/ focus on pulses, development of risk management tools including potential insurance products). There is also a need to level the playing field versus public entities, for example ensuring subsidies and credit are equally available to both public and private exporters. GOE could demonstrate commitment to entrepreneurship and innovation by recognizing innovative entrepreneurs in the value chain (e.g., through an award scheme), and/or leveraging innovative thinking from other countries. For example, study teams could be sent to connect with experts who developed ideas such as the "e-choupals" in India, or small-packs in Kenya. One option would be to establish the concept of a licensed exporter status, giving companies access to credit and support. Capacity building efforts should also be undertaken.

Below are more details on the specific implementation steps and the potential owners and stakeholders required for each steps:

**Table 8: Implementation actions to strengthen the export sector**

	Actions	Potential owners
1.1	Incentivize exporters to invest resources to link with input supply bodies	MoARD, MoTI
1.2	Build a dynamic export traders association to build markets, regulate quality and help achieve scale	MoARD, donors
1.3	Strengthen export promotion, market intelligence, and the branding of Ethiopian products	Export trader association, MoARD, ECX
1.4	Develop a business environment conducive to investment, and policies aimed at bolstering exporters' scale	MoARD, MoTI, MoFED

Source: Team analysis

### Increasing linkage between exporters and producers

Stronger linkages between exporters and smallholder farmers' and reducing transaction costs lead to a more efficient value chain where the demand signal is clearly communicated to the producers and the right inputs are available to ensure proper production of the necessary export pulses. Enhancing the efficiency of pulse aggregation and trading activities will eliminate bottlenecks and ensure that an adequate amount of grain is supplied to both domestic and international markets that meet required quality standards and quantity requirements. Recommended interventions include:

- **Input packages** - leverage existing input supply system (e.g., Agricultural Input Supply Corporation or new entities as necessary, regional research centers etc.) to assemble inputs for production in packages for distribution to smallholder farmers (appropriate quantities of seed, fertilizer, growing practices information). Packages should be easily usable by farmers in various regions addressing the challenge of developing consistent, sufficient input access for producers. This effort should build upon existing research in each region, and link with international research bodies to understand up-to-date technology in other countries to leverage this knowledge.

- **Leverage cooperatives and traders** as links to farmers to provide inputs and consistent off-take and market information. Co-operatives should play the simple role of providing appropriate pulses inputs, and act as intermediary for exporters, end-users, potentially signing contracts for delivery of exports. The Ethiopian Commodity Exchange (ECX) could also work with/ link with these cooperatives to move pulses through the system and to increase transparency/ price discovery
- **Market information** - much has been done to improve market information systems in Ethiopia, particularly through efforts of regional governments and the ECX. Existing best practice mechanisms (e.g., ECX, regional marketing information systems) should be identified and used as channels to disseminate not only price data, but also other market intelligence data needed to improve linkages in the maize value chain. Key steps include: collecting and triangulating market information data (e.g., price, demand and supply signals by region) available from different sources (e.g., crop forecasts from donors, EGTE, CSA, and regions); developing a simple, standard display of regional price, supply, and demand forecasts so farmers and aggregators can make informed buy and sell decisions; identifying current best practice information delivery channels (e.g., ECX, regional marketing information systems) and disseminating market information data, while simultaneously using the government network periodically, for example, posting data in *kebele* offices and FTCs
- **Contract farming** - link smallholders with agribusiness enterprises through the development of best practice models of contract farming. Put mechanisms in place for quality control, largely through the private sector.
- **Improve market access** through the development of road networks and storage facilities

Below are more details on the specific implementation steps and the potential owners and stakeholders required for each step:

**Table 9: Implementation actions to increase linkages between exporters and producers**

	<b>Actions</b>	<b>Potential owners</b>
2.1	Supply smallholders with input supply packages (e.g., seed, fertilizer, best practices for growing pulses), consistent off-take, and market information	Agricultural Input Supply Cooperation, cooperatives, MoARD, ECX
2.2	Support cooperatives to become simple input and off-take channels	MoARD, Federal Cooperative Agency
2.3	Improve availability of market information to smallholders, cooperatives, traders and other actors	MoARD, BoARD, CSA, EGTE, ECX
2.4	Improve access to markets through road networks and storage facilities	MoARD, Ministry of Transport
2.5	Link smallholders with agribusiness enterprises through contract farming; put mechanisms in place for quality control	Private sector, MoARD, BoARD

Source: Team analysis

### **Increasing inputs to improve productivity**

Efforts should be targeted at encouraging smallholder farmers to grow varieties that meet international quality standards, which will require appropriate cultivation and post-harvest handling practices to ensure the production and delivery of quality products. Improving the productivity of smallholders is vital to increasing not only the marketed surplus but also improve household income and food security. The capacity of small holder farmers to raise productivity and market a significant proportion of their produce depends on the interaction of a host of factors including availability of appropriate pulse production technologies, the effectiveness of the agricultural extension services, and access to credit and finance. Specific actions include:

- **Sourcing of phosphates and other fertilizers** – these should be sourced steadily and supplied to farmers with knowledge on how to use them effectively in different regions and for different pulses. This will also entail importing phosphates and other nutrients which are currently not imported to Ethiopia (in which case consideration would have to be given to the funding mechanism i.e. government funded versus private funding, versus some combination)<sup>40</sup>.
- **Expand pulse breeding** - EIAR should expand their pulse breeding programs starting with benchmarking current pulse varieties in Ethiopia vis-à-vis other countries. This will allow EIAR to leverage existing global technology and ensure the pulses germplasm in Ethiopia is the best available. Following benchmarking, EIAR should adapt and adopt these top varieties for the agro-ecological conditions in Ethiopia, focused the varieties appropriate for export, and suitable for the focus regions.
- **Increase seed multiplication significantly** to adequately supply the needs of exporters and other domestic demand. Seed enterprises (such as ESE, RSEs, and private seed growers) can begin growing pulse seeds with a guarantee to buy from input suppliers. Priority should be placed on producing viable pulse varieties currently “on the shelf” in research centers (e.g., EIAR) but not in the hands of farmers.
- **Incorporate pulses into extension** - the extension system should incorporate pulses into their curriculum, including module development for farmers that explain best practice pulse production and makes the case for fertilizer and improved seed usage. Extension can also potentially help to link farmers to input providers and cooperatives focusing on pulses to ensure consistency across the chain. Extension workers should be trained in the newest technology, so they can disseminate knowledge on growing practices to farmers in support of the input packages. Strong links are needed between EIAR and extension in terms of varieties, soil fertility and crop management practices for pulses<sup>41</sup>.
- **Improve on-farm storage management practices and structures** - reduce post-harvest losses from poor storage facilities and management

The table below provides concrete actions and potential owners and stakeholders for each step to develop a market stabilization mechanism:

**Table 10: Implementation actions to increase inputs to improve productivity**

	<b>Actions</b>	<b>Potential owners</b>
3.1	Source phosphate and other fertilizers, and train smallholders on their use	MoARD, BoARD, private traders, regional and federal extension
3.2	Increase seed multiplication in order to meet needs of export and domestic demand	ESEs, RSEs, private seed growers
3.3	Increase breeding of pulse varieties, leveraging existing global technology	EIAR, regional research institutes
3.4	Incorporate pulses into the extension curriculum (e.g., fertilizer use, crop rotation)	MoARD, regional and federal extension
3.5	Improve on-farm storage management practices and structures	MoARD, BoARD, regional research institutes

Source: Team analysis

## IMPLEMENTATION

The interventions outlined above will require shifts in resources, priorities and mindsets. The holistic approach to addressing the entire value chain requires the interaction of a broader group of stakeholders than is typically used to interacting. The goals of this are to ensure that the implementation

<sup>40</sup> Please refer to the soil fertility diagnostic for more details.

<sup>41</sup> Please refer to the extension diagnostic report for more details

plan is supported by all stakeholders and all those involved in the pulses value chain take some responsibility for achieving success. Additionally, this provides a chance to coordinate efforts by numerous NGOs and research organizations aiming for similar objectives – communicating will ensure that lessons learned are shared, efforts are not duplicated and organizations are not re-inventing the wheel.

A preliminary prioritization of implementation of the recommendations over the next five years has been outlined below in Figure 14. In the short to medium term, the core priority is to establish the pulses value-chain for success and initiate the pre-conditions for basic effectiveness. In following years, actions will elevate the system to higher performance by building momentum, expanding and demonstrating early results. During this period, activities will focus on increasing the effectiveness and sustainability of the first wave of interventions.

For implementation to be successful, a range of actors including the Government of Ethiopia, the Ministry of Agriculture and Rural Development, the donor and NGO community, and the private sector will need to work together to implement the various components and programs. Ultimately, the transformational change required will need to come from within Ethiopia – from the actors in the value chain and existing institutions to the highest policy makers.

Implementation should start by focusing on high priority areas, to ensure early impact, and test the interventions where there is high-potential. Interventions could then be expanded outwards from these starting markets. The two highest pulse production areas are Amhara and Oromia, and these could be a good starting point. There are already demonstrated results revealing the potential benefits from a value chain approach in parts of these regions (e.g., East Shewa), and these are being expanded to other areas, thanks to the efforts of EIAR scientists in collaboration with BoARDs, International Research Centers, NGOs, and farmer organizations. What is needed now is to mainstream those results.

**Figure 15: Preliminary prioritization of recommended interventions**

	Short –medium term (1-2 years)	Long-term (3-5 years)
<b>Strengthen Export Sector</b>	<ul style="list-style-type: none"> <li>▪1.1 – Develop incentives for exporters to invest resources to link with input supply bodies</li> <li>▪1.2 – Build export trader association to build markets, regulate quality and help achieve scale</li> <li>▪1.4 - Develop a business environment conducive to investment, and policies to scale exporters</li> </ul>	<ul style="list-style-type: none"> <li>▪1.3 Strengthen export promotion, market intelligence, and the branding of Ethiopian products</li> </ul>
<b>Increase export/producer linkages</b>	<ul style="list-style-type: none"> <li>▪2.1 - Supply smallholders with input supply packages, consistent off-take, and market information</li> <li>▪2.3 - Link smallholders with agribusiness enterprises through contract farming; put mechanisms in place for quality control</li> <li>▪2.4 - Improve on-farm storage management practices and structures</li> </ul>	<ul style="list-style-type: none"> <li>▪2.2 – Improve access to markets through road networks and storage facilities</li> </ul>
<b>Increase inputs</b>	<ul style="list-style-type: none"> <li>▪3.1 - Source phosphate and other fertilizers, and train smallholders on their use</li> <li>▪3.2 - Increase breeding of pulse varieties</li> <li>▪3.3 - Increase seed multiplication in order to meet needs of export and domestic demand</li> <li>▪3.4 - Incorporate pulses into the extension curriculum</li> </ul>	<ul style="list-style-type: none"> <li>▪3.2 - Increase breeding of pulse varieties</li> <li>▪3.3 - Increase seed multiplication in order to meet needs of export and domestic demand</li> </ul>

Source: Team analysis



## **CONCLUSION**

### **Overview**

The findings in this report demonstrate the importance of pulses as a significant contributor to the economic and social development of Ethiopia. Pulses have the potential to be a significant driver for smallholder livelihood improvement and food security in Ethiopia. The consistent growth in the demand for exports and the relative proximity of Ethiopia to these growing markets is an opportunity to substantially boost earnings. Diversification by small-scale producers, rotating staple cereal production with cropping pulses, is an important income opportunity. From the food security dimension, the nutritional effects to enhance protein consumption for the rural poor will make needed inroads. Finally, from a macroeconomic perspective, boosted exports in pulses stands to improve foreign exchange and allow for continued imports of necessary productive inputs.

Realizing the full potential of the crop as a component of Ethiopia's long-term food security and growth relies on clear direction and execution capacity from GOE and a wide number of stakeholders. To achieve the latent potential in the sector, several constraints must be addressed. These are all within the capacity of the Ethiopian government to stimulate. A common vision among all stakeholders and the roadmap to undertaking the respective roles of different actors with the confidence in safeguards in place is critical.

### **Five-year sectoral vision**

The next five years will be a critical window to accelerate the achievement of the long-term vision for the pulses value-chain. At the close of this period, a pulses sector strengthened by enhanced on-farm productivity and a more efficient chain of inputs and off-take, driven by a strong, stable export sector to ensure consistent international demand is possible.

With a strong and functioning value-chain beginning with production, then aggregation and trading, and finally with unlocked demand sinks, GOE and its development partners, along with the private sector are in a remarkable position to place Ethiopia on the first five-year trajectory to fully develop the sector by 2025.

### **The way forward**

Accelerating the five-year vision contained in this report will undoubtedly require the effective use of significant human and financial resources. It will require a level of sequencing and coordination that has in the past been challenging to implement at a national-level, not only in Ethiopia, but in success cases globally, from Latin America to East Asia. To achieve these objectives, GOE will need to work closely with all its partners, ranging from the development community to the private sector. The recommendations contained in this report offer a preliminary view on the sequencing of various activities to strengthen the pulses value-chain.

The findings contained in this report are also complementary to a range of other findings across the diagnostic studies supported by the Bill & Melinda Gates Foundation from April 2009 to March 2010. The five-year sectoral vision for pulses relies on a set of factors contained in accompanying diagnostic reports, including a robust system of agricultural extension, a vibrant and efficient seed sector for hybrids, and access by small-scale producers to irrigation. Additionally, a set of enabling factors will deepen the impact of these recommendations, including financial services, rural infrastructure, and information and communication technologies. At every stage of the value-chain gender must be prioritized, as women are often primarily responsible for planting, harvest, value-addition, and marketing.

Since each of these sectors is mutually dependent, the recommendations and sequencing of activities for the pulses value-chain must be seen within the context of the overall recommendations provided in the holistic and integrated report submitted to the Prime Minister. With pulses as a key crop to drive Ethiopia's growth and food security, these steps will be critical to accelerating the long-term vision of achieving middle-income status by 2025.



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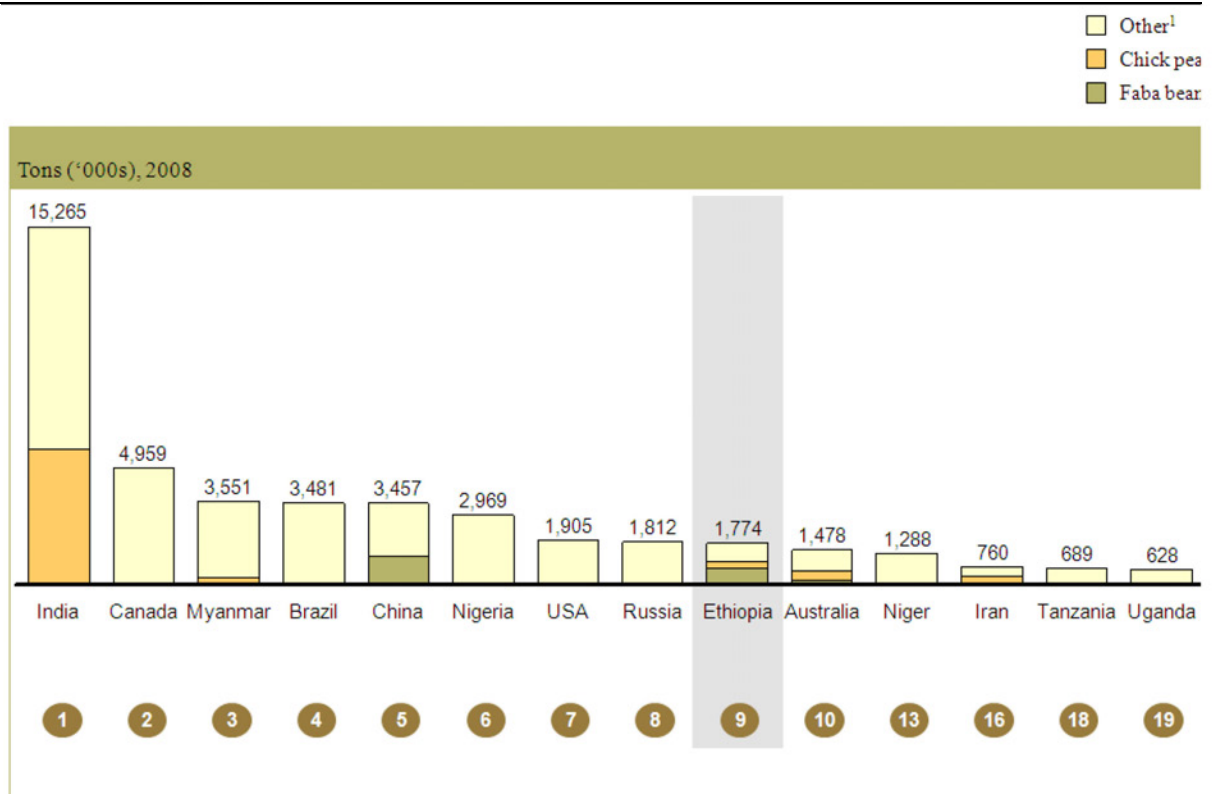
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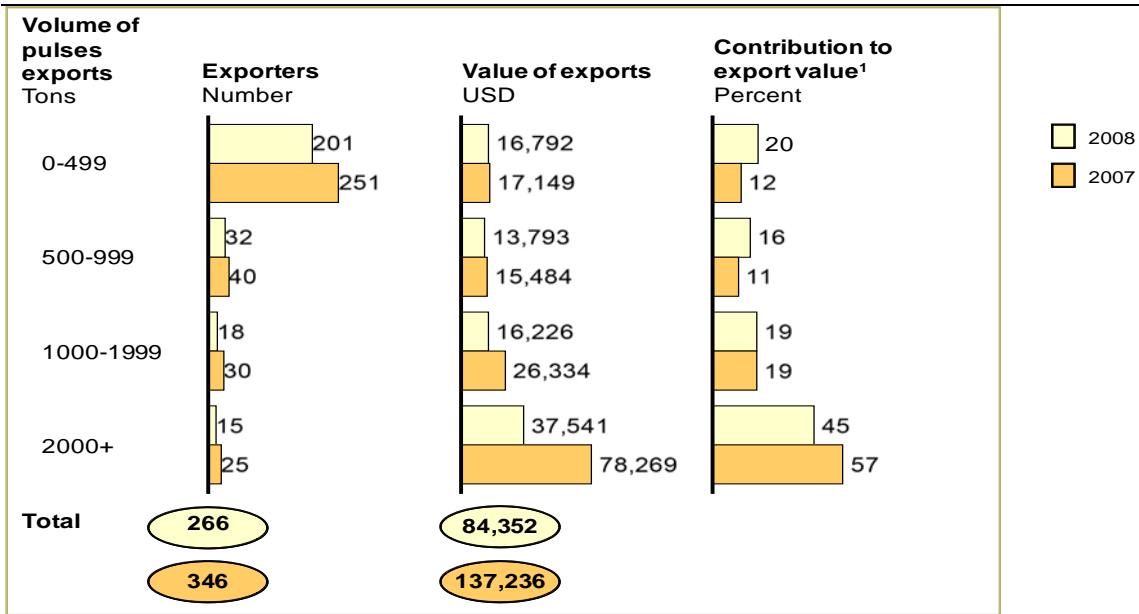
## APPENDIX 2 – GLOBAL PULSE PRODUCTION

Thousand tons (2008)



Source: FAOSTAT

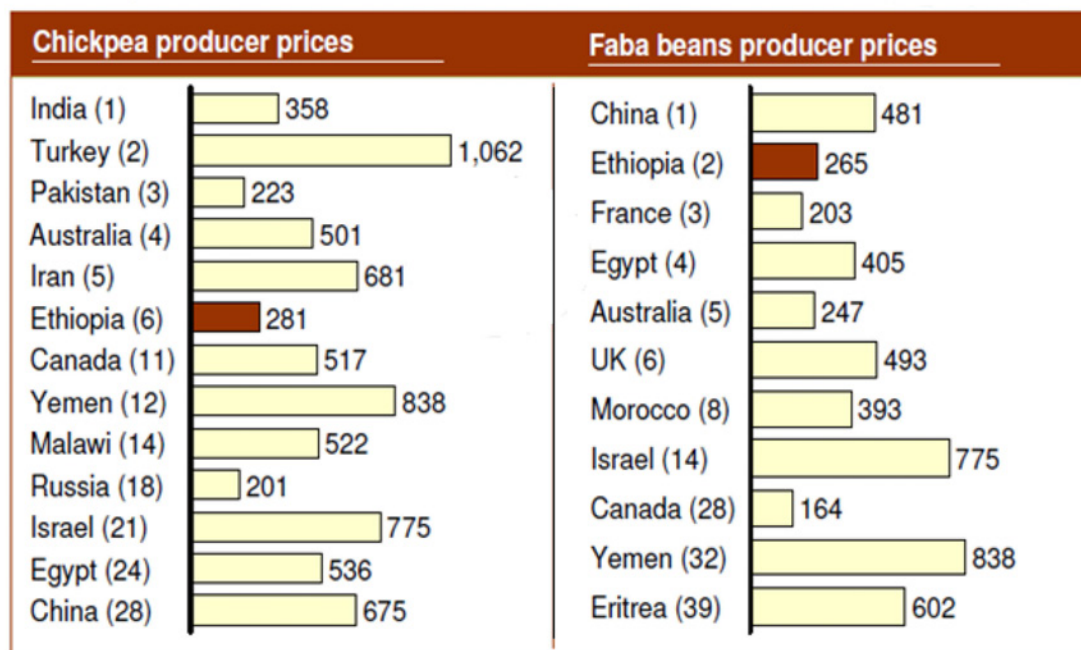
ANALYSIS OF THE VOLUME AND VALUE OF PULSES EXPORTS BY EXPORTER CATEGORIES



Source: Ethiopian Customs Authority

## APPENDIX 4 – PRODUCER PRICES RANKED BY TOTAL PRODUCTION

USD / tons, 2007



Source: FAOSTAT





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