Food and Agriculture Organization of the United Nations

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Table of Contents

List of Figures

List of Tables

Key messages

Promoting regional trade in pulses in the Horn of Africa

Pulses are crucial in nutritious diets. They provide cheap proteins and micronutrients. Because they are low-fat and fibre-rich they contribute to combating obesity. Pulses and other grain legumes like soy and groundnut are the only plants that can fix nitrogen in the soil, making farming systems more climate smart. Pulses are also important as a cash crop for local, regional and international markets, often produced by women. An increased demand for processed food based on pulses offers opportunities of employment and entrepreneurship for women and youth, while the demand for pulses and residues as animal feed is also growing due to changing diets.

Prospects of global and regional trade in pulses are good. India is still the largest producer and importer of pulses in the world, but also in (the Horn of) Africa trade flows are growing. Urbanisation trends and changing diets, but also the aid programmes in the region create particular dynamics in the pulses market. Ethiopia is quickly becoming a major player in pulses, while Sudan is still one of the main producers of groundnut in Africa.

Despite all these opportunities, pulses production and yields in Africa and the Horn remain lagging behind potential. There is also a lack of reliable information on the actual and potential of regional trade. Public and private investments have long favoured cereal crops over pulses. This Note highlights the main challenges faced by stakeholders along the value chain. Effective public-private dialogue at a regional level could contribute to addressing those constraints, by sharing best practices and coordinating activities around a regional strategy.

1. Introduction

Through the Malabo Declaration on "Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods", African leaders strongly voiced their determination that Africa should be able to feed itself by 2025. This ambitious agenda, completely aligned with the SDGs, but even more ambitious for setting the goals five years before the SDG horizon of 2030, stresses the need to increase public and private investments in agriculture, necessary to boost production and productivity. But it also captures the importance of trade in achieving food and nutrition security on the continent. Tripling intra-African agricultural trade is now much more central in the agricultural transformation agenda than it has been before. The focus on making diets also more nutritious and food systems more resilient to external (climate) shocks, ensures that Africa's overarching policy framework for agricultural transformation and food security, the Comprehensive Africa Agriculture Development Programme (CAADP), is an inclusive and sustainable agenda for the future.

There is an increasing recognition of the benefits that pulses and other grain legumes such as groundnut and soybean have in improving food security, nutrition and creating more sustainable and climate-resilient food systems. Pulses are highly nutritious and a relatively cheap and accessible source of protein for many people around the world. Because of their ability to fix nitrogen in the soil, they play an important role in improving soil fertility. The 68th UN General Assembly declared the year 2016 the International Year of Pulses to increase awareness of their nutritional and agronomical qualities as well as of the challenges faced by pulse farmers, both small and large. There is however a lack of information on current trends, and potential, of formal and informal trade in pulses in Africa. This Briefing Note therefore explores how to strengthen the development of regional pulses value chains and promote more trade in pulses.

The African Regional Economic Communities (RECs) have an important role to play in detailing areas of joint collaboration between their member states. The logic behind this is that many obstacles to agricultural transformation and food security in Africa – including various barriers to trade in food staples – require regional solutions, and cannot be solved by individual states acting alone. Improving food and nutrition security (including via effective CAADP implementation) therefore requires regional cooperation to support and complement national efforts and processes. In relevance to increasing intra-African trade, the Declaration of the Abuja Food Security Summit in 2006 called for promoting the production of rice, maize, legumes, cotton, oil palm, beef, dairy, poultry and fishery products as strategic commodities at the continental level, while cassava, sorghum and millet were identified at the sub-regional level. Also, the Declaration encourages member states to fast track the development of these strategic commodities and the implementation of trade agreements adopted in the RECs.

Promoting regional agricultural trade to strengthen agricultural transformation, for instance, is central to the strategy that all of the RECs have set out for themselves. In the case of the Common Market for Eastern and Southern Africa (COMESA), priority area 2 of COMESA's Regional CAADP Compact envisages activities that can help remove barriers to agricultural trade and link farmers to markets. To bring this to practice, in the Regional Agricultural Investment Plan - Priority area 2 (RIPA-II in short) COMESA has elaborated the concept of value chain specific platforms to foster public-private dialogue at a regional level. These regional platforms[1] will be piloted in a subset of COMESA Member States where specific agro-food value chains have been prioritised because of their importance in food security, existing trade in the region and potential for development.

[1] The COMESA Secretariat, with support from ECDPM and FAO, convened a series of multistakeholder consultations with a view to establishing these regional platforms for public-private policy dialogue and partnerships in four different COMESA sub-regions. See http://caadp.comesa.int/en/news/value-chain-platforms-key-to-market-access-and-trade-facilitation-kalonji/ for a report on the RIPA-II Validation Workshop held in Lusaka, Zambia, in December 2015.

This type of regional platform can contribute to building trust between different value chain actors, increase inclusivity of the dialogue and promote policy reform and investments. Public-private dialogue on specific key bottlenecks, along specific borders, allows for more concrete engagement, political commitment and commercial incentives. Initiatives aimed at strengthening regional value chains and public-private partnerships should take into account a number of issues including monitoring of the implementation and impact of policy reform, integrated approaches that holistically address the different challenges agricultural value chain actors are facing, and last but not least, take into account the political economy dynamics.

After presenting the unique characteristics of pulses and describing production and trade trends in Africa, this Note focuses on the Horn of Africa sub-region, particularly on Ethiopia, Sudan and Djibouti (hereafter the term 'Horn' is used to refer to these three countries collectively)[2]. The legume crop value chains have been identified as strategic value chains for the COMESA sub-region of the Horn of Africa (Ethiopia, Sudan and Djibouti) because of their importance in food security, soil fertility and both intra-regional and global trade flows.

This Note discusses the opportunities and challenges to develop regional pulses value chain in the region, drawing from literature review and interviews with key stakeholders. The challenges in designing a coherent package of policies and investments to boost intra-regional trade discussed in this Note will also be useful for other value chains. To address those challenges, commercially and politically-savvy public-private platforms for regional value chain development can be useful to remove regional bottlenecks, enforce transparent rules and build trust among public-private and formal and informal players (including through a public knowledge/market info/monitoring agenda).

2. Why promote pulses?

Pulses play an important role in improving food and nutrition security. They contain double or triple the amount of proteins as cereal grains do, provide calories and essential micronutrients and are low in fat and high in fibre. In developing countries pulses and other grain legumes like groundnut and soybean are the cheapest sources of protein (see Table 1), especially for poor people. Because of their unique capacity to fix nitrogen from the atmosphere, they improve soil fertility and help in making farming systems more climate smart. Pulses contribute to rural incomes because of their increasing importance as a cash crop for local, regional and international markets (India for instance is currently stipulating agreements with several African countries for them to supply pulses during its off-season). Rapid urbanization is driving the growing demand for processed food based on pulses. This offers opportunities of employment and entrepreneurship in both large and small-scale industries and could be an attractive sector for rural and urban youth. Changing diets are increasing the demand for pulses, pulse stalks and groundnut and soybean meal as animal feed.

[2] In the analysis of regional pulses value chains the focus will be less on Djibouti because of its small population and limited agricultural potential.

2.1. What are pulses?

Pulses come in many shapes and sizes and can be found in different climatic conditions across Sub-Saharan Africa. They are the edible seeds of plants of the legume family (grain legumes) and they have in common that they grow in pods and can be dried and stored for longer periods of time without refrigeration. Well-known pulse crops are lentils, beans, peas and chickpeas, faba beans, cowpeas (black-eyed peas) and pigeon peas.

Soybean and groundnut are also grain legumes, but because they are primarily used for oil extraction, FAO[3] defines them as oilseeds, not as pulses. Soybean and groundnut have the same advantages for human health and environmental sustainability as pulses and share a number of similar challenges farmers face. This note aims to inform value chain actors in the Horn about the opportunities and challenges of strengthening regional pulses value chains, and thus focuses primarily on trends, opportunities and challenges of pulse value chains in Africa, but where relevant, also discusses issues regarding soybean and groundnut. The grains of soybean and groundnut are quickly becoming an important part of farming systems in Africa. They take up an important part of diets of poor producers and consumers in developing countries (Nedumaran et al. 2015). In the Horn region this brief focuses on, governments and private sector have shown a keen interest in promoting soybean and groundnut production: Sudan is the number five producer of groundnut in the world and Ethiopia's production of soybean is growing rapidly.

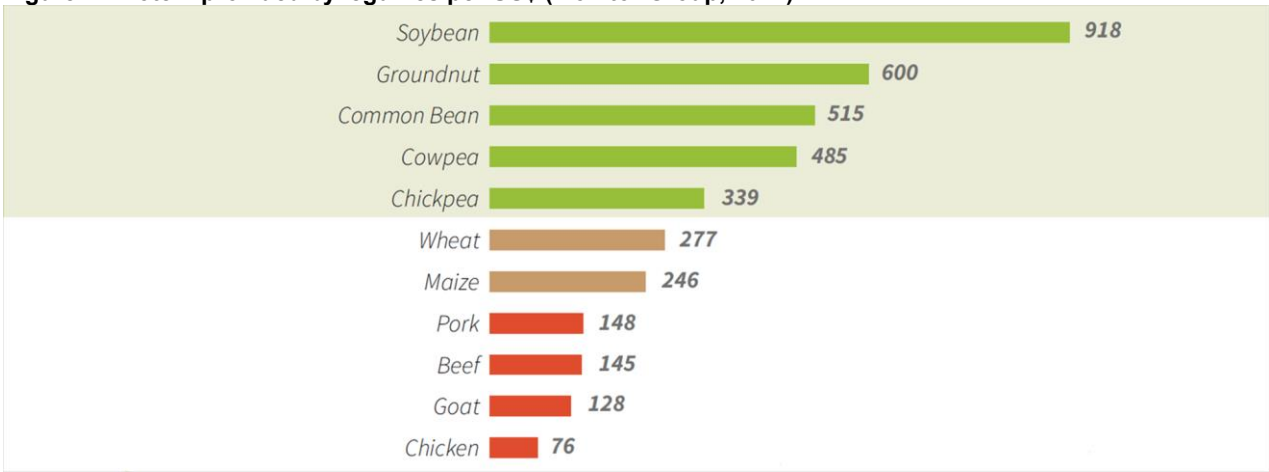
2.2. The nutritional benefits of pulses

Pulses are an important source of protein and other important micronutrients such as vitamins, iron, zinc and antioxidants. In India for instance, large parts of the population are vegetarian or vegan and pulses are a key component of their diet. Because they can be easily stored and are widely available, their low price makes them much more accessible for poorer households as a source of protein than meat. Pulses are thus good value for money, providing essential proteins and micronutrients (see Figure 1). They can be categorized as a resilience-building crop.

In Africa, pulses account for 4% of total calorie intake, but provide for more than 10% of protein intake (FAO cited in Maredia 2012). The role of pulses in African diets varies according to local context, but it is estimated that the importance of pulses as a source of protein is bigger in Africa than in other regions in the world (see Figure 2). In Ethiopia, for example, pulses account for 15% of total protein intake, while in Rwanda and Burundi pulses account for 38% and 53% of total protein intake respectively (FAO 2005-2007 data in Maredia 2012).

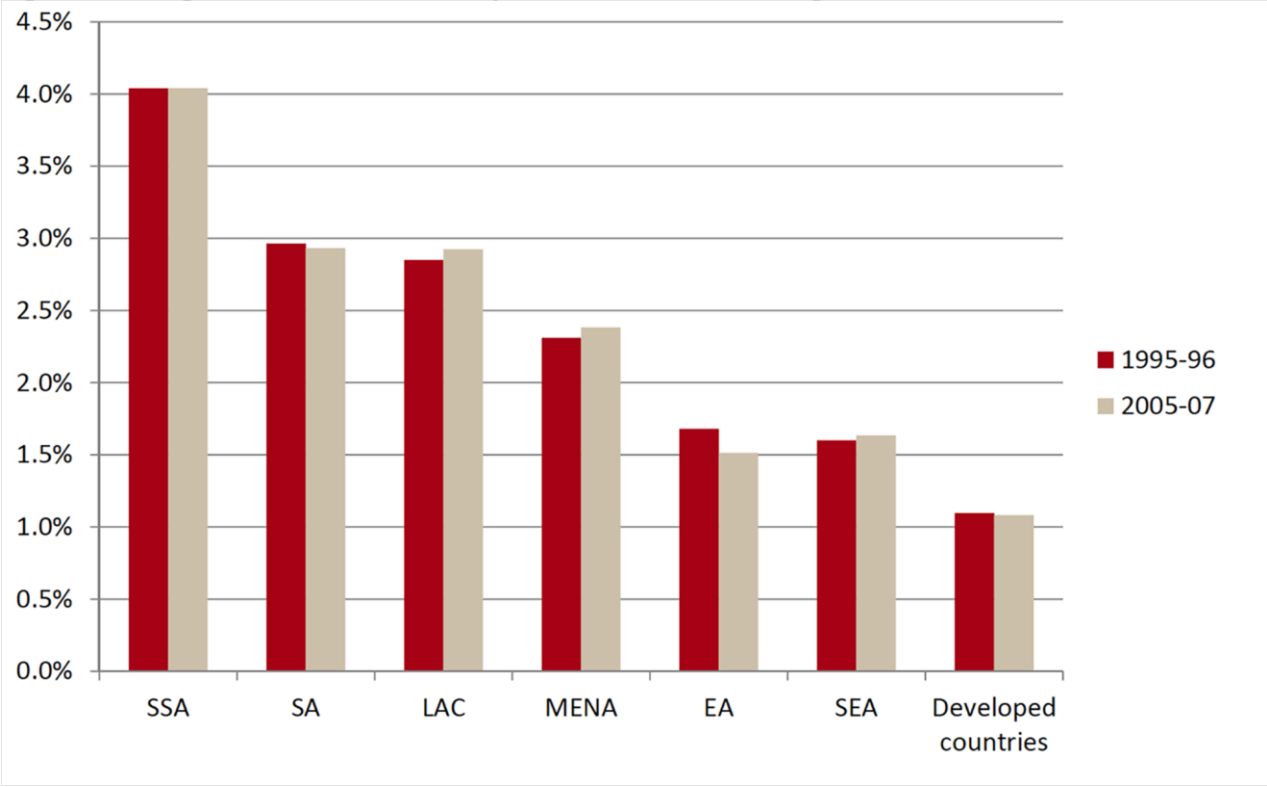
[3] FAO 1994 Definition and classification of commodities. Crops from the legume family can also be used as vegetables (e.g. green peas, green beans), for oil extraction (e.g. soybean, groundnut) and for sowing/feed purposes (e.g. clover, alfalfa). In other words: all pulses are legumes, but not all legumes are pulses. According to the FAO definition, legume crops used as oil seed, vegetable or for sowing purposes are not considered pulses

Figure 1: Protein provided by legumes per US$ (Monitor Group, 2012)



Source: Van den Broek et al. 2014

Figure 2: Pulse grains contribution to total protein intake in different regions, 1994-1996 and 2005-2007



Source: Maredia 2012

In many African diets, pulses are used in soups, relishes and sauces that accompany staple cereals such as maize and wheat. Pulses are also complementary in micronutrient content to these staple starches. Each provides amino acids the other is low in, contributing to reducing anaemia levels of households that mostly depend on starchy foods, often the very poorest households (Global Pulse Confederation, n.d.). Pulses are also important because of the low-fat, high protein, high fibre contribution to diets, as well as essential important micronutrients such as iron, zinc, folic acid and magnesium. This fits well with the need for healthier diets to combat the growing obesity epidemic in the developing world (the number of obese or overweight people in developing countries has been rising from 250 million to almost 1 billion in under

three decades[4]). Because of the diversity of micronutrients pulses offer, they also play an important role in fighting hidden hunger; currently 2 billion people are suffering from micronutrient deficiency[5].

2.3. A climate-smart crop

Integrating pulses in crop rotation[6] is a well-known way of sustainably increasing productivity and profitability of farming systems. Pulses have the unique ability to fix atmospheric nitrogen in the ground. By working together with nitrogen fixing bacteria in root nodules called rhizobia, they are able to make their own nitrogen fertilizer. Because of this symbiotic process, the grains of pulse crops contain two or three times more protein nitrogen than cereal grains. When the plant dies, it leaves nitrogen in the soil that other plants can take up. Cereal crops grown in the same field, either at the same time or after the pulse crop, take advantage of this. Farmers can reduce the use of nitrogen fertilizer[7], one of the most energy-intensive and polluting agro-chemicals[8] used in farming systems. Pulses can often give a boost to soil microbes, decreasing the risk of plant diseases and use of pesticides. Integrating pulses in rotation with cereals or other crops can break pest cycles common to monocultures. Integrating pulses and other grain legumes in farming systems is a key element of conservation agriculture or climate-smart agriculture. Perennial tree legumes such as pigeon pea are often used in agroforestry approaches[9].

Poor soil nutrition, including lack of nitrogen, is one of the main limiting factors of increasing production in many countries in Africa. However, blanket fertilizer use can have negative effects on soil fertility and yields. Adequate analysis of soil characteristics is thus crucial to best take advantage of fertilizer use and integration of legume crops in farming systems. Nitrogen fixation by legume crops is of particular importance in developing regions in Africa, where access to nitrogen fertilizer for smallholder farmers is often limited and prices are much higher than in Asia, due to the high cost of transport and 'small-quantity' distribution and retailing.

3. Trends in production, consumption and trade of pulses

This section provides some big picture trend data for global production, consumption and trade of pulses (and other grain legumes such as soybeans and groundnuts) in order to provide context for the discussion in later sections about pulses production and trade in the Horn.

4 See https://www.odi.org/future-diets
5 See http://www.who.int/nutrition/topics/ida/en/
6 Crop rotation is the successive cultivation of different crops in a specified order on the same fields, to avoid soil depletion and break pest life cycles and pest habitats
7 Including pulses in crop rotations decreases the fossil fuel use in nitrogen fertilizer manufacture, transport, distribution and the nitrous oxide emission from soils.
8 The chemical process of producing nitrogen fertilizer (usually made of ammonia) is highly energy-intensive. The gases released when nitrogen fertilizer is taken up by the soil, atmospheric nitrous oxide, are major greenhouse gases.
9 See http://blog.worldagroforestry.org/index.php/2013/12/19/replacing-industrial-fertilizers-with-legume-trees-beans-for-thought/

3.1. Global trends in production, consumption and trade of pulses

Pulses crop varieties were co-domesticated together with cereal crops. Due to their nutritional importance, their use in animal feed production and their nitrogen fixation characteristics, pulses continue to be cultivated for human and livestock consumption and as part of a crop rotation strategy with cereal crops. Pulses crops are adapted to different kinds of agro-climatic conditions and can grow in both subtropical and temperate climates. In addition, many pulses varieties are drought resistant and can endure poor soil fertility. These factors contribute to the prevalence of pulses cultivation around the world.

Global production

Globally, pulses are the second most planted crop after grasses (mainly cereals) in terms of acreage, with over 85 million hectares of pulses harvested in 2014 (see Table 1). In that same year, 77.6 million tonnes of pulses were produced globally. Global production of pulses and other grain legumes (soybeans and groundnuts) has increased over 1% per year since 1980 (Nedumaran et al., 2015).

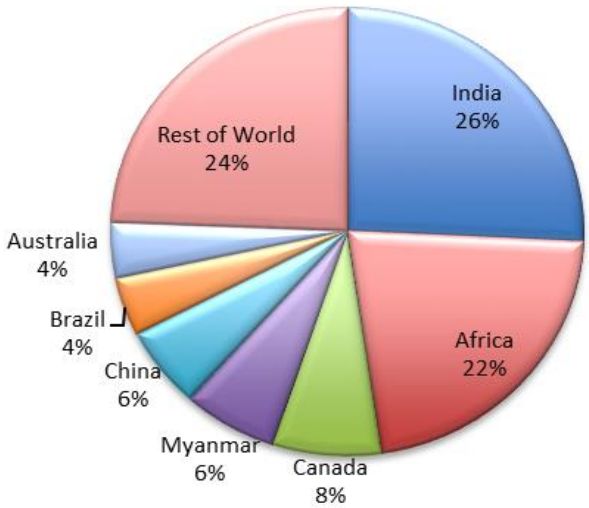
Table 1: Global production of pulses and other grain legumes, 2014

	Production (tonnes)	Area harvested (Ha)	Yield (Kg/Ha)
Pulses	77,599,253	85,627,492	9,062
Soybeans	308,436,056	117,718,624	26,201
Groundnuts	42,444,356	25,680,294	16,528

Source: FAOSTAT

India, the world's largest consumer of pulses (due, among other things, to its large vegetarian population), is also the world's biggest producer of pulses, accounting for more than a quarter of global production in 2014. Other important global producers include Canada, Myanmar, China, Brazil and Australia (See Figure 3). Africa as a whole accounts for 22% of global production of pulses.

Figure 3: Global production of pulses, 2014

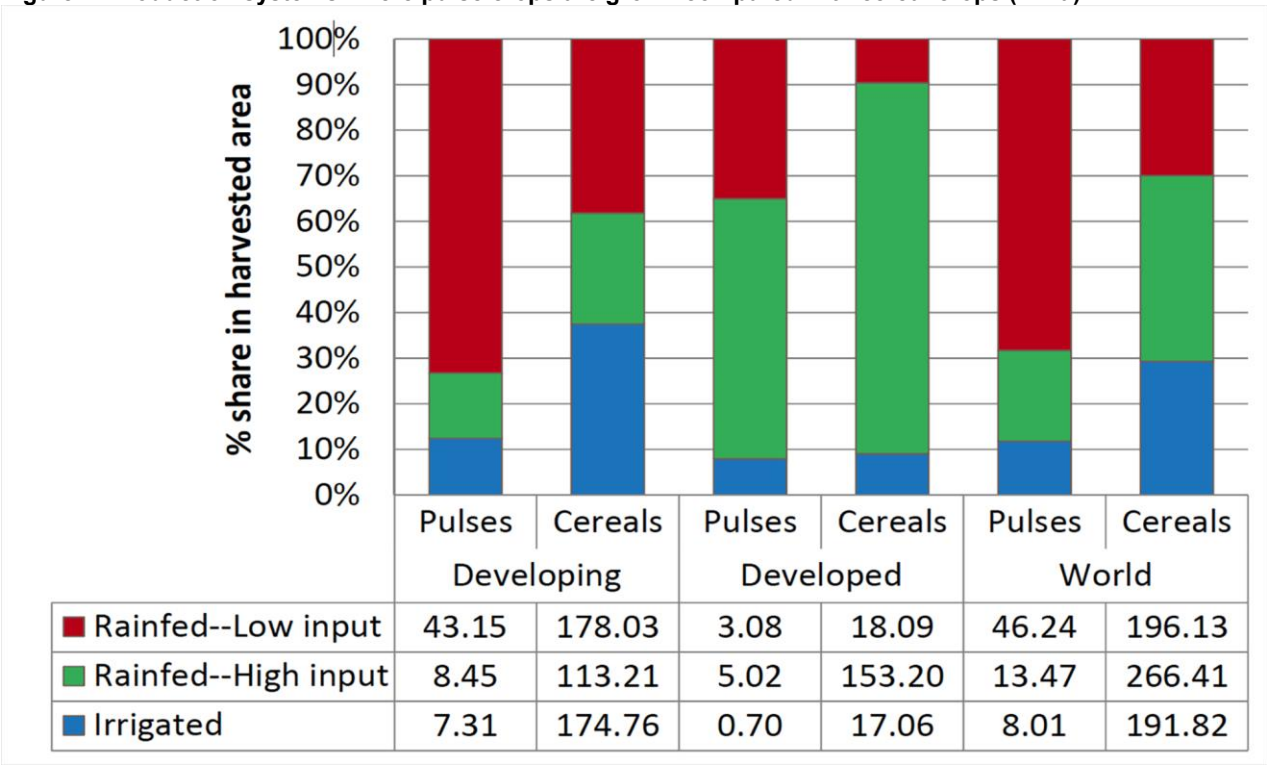


Source: FAOSTAT

Over the past decade, global pulses yields have increased modestly, and in 2014 the average global yield was just over 900kg per hectare. Yields vary greatly across different countries and regions though, with average yields of around 2000kg per hectare in North America and Europe, but less than 700kg per hectare in Africa and Southern Asia (See Figure 5). This discrepancy is largely due to differences in pulses production systems found around the world. In major developed country producers such as Canada and

Australia, the pulses production system is characterised by large (and growing) commercial farms connected to international commodity markets, while in developing country producers, pulses farming systems are dominated by smallholder farmers growing pulses in low input rain-fed systems, often for household consumption (with surplus sold at the local markets). Developing country pulses producers often have weak agronomic knowledge and poor access to market information, finance and other key inputs such as fertilizer and improved seeds. Many use relatively low yielding varieties of pulses crops and pulse varieties with low drought and disease resistance.

Figure 4: Production systems where pulse crops are grown compared with cereal crops (m ha)

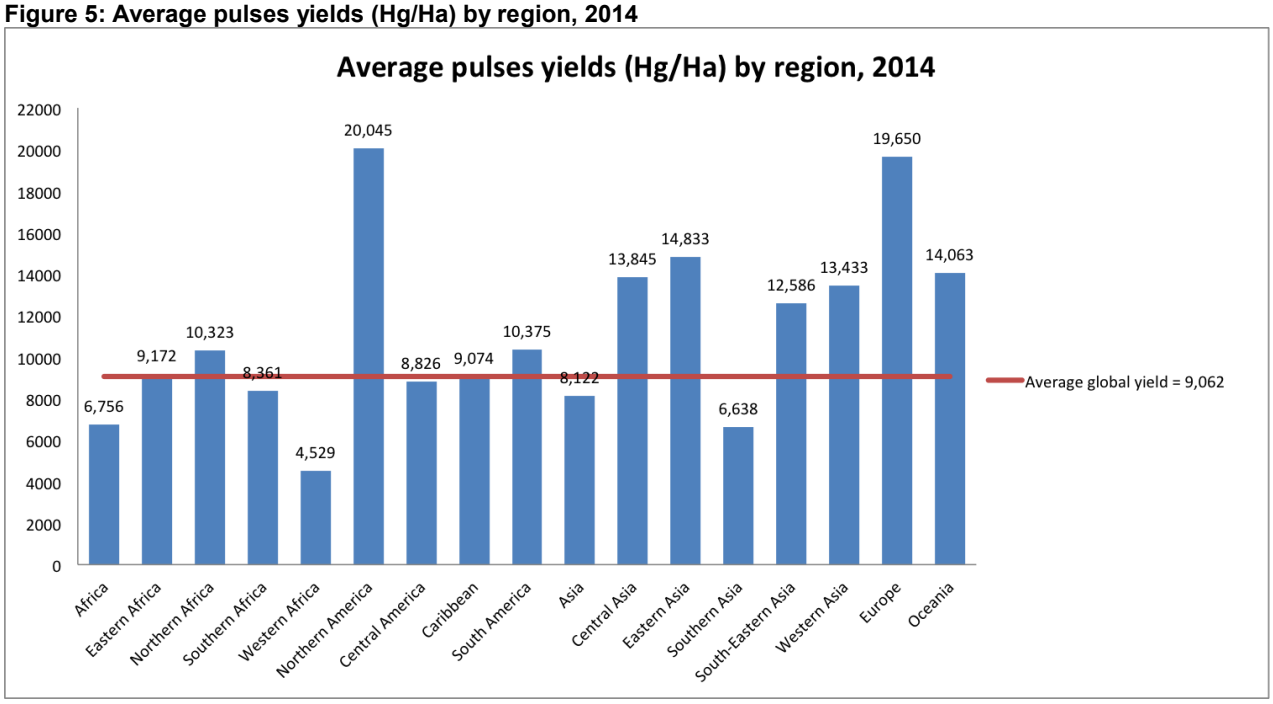


	Developing		Developed		World	
	Pulses	Cereals	Pulses	Cereals	Pulses	Cereals
Rainfed--Low input	43.15	178.03	3.08	18.09	46.24	196.13
Rainfed--High input	8.45	113.21	5.02	153.20	13.47	266.41
Irrigated	7.31	174.76	0.70	17.06	8.01	191.82

Source: HarvestChoice (SPAM database circa 2000) cited in Maredia, 2012

These factors have been exacerbated in many developing countries by an underinvestment and underappreciation of pulses in agricultural policies and in agricultural research and development initiatives. In many developing countries there are still policies promoting cereal production at the expense of pulses, and most investment in crop research and development (R&D) has gone to developing drought- and disease-tolerant varieties of staple cereals such as wheat, rice and maize.

Figure 5: Average pulses yields (Hg/Ha) by region, 2014



Source: FAOSTAT

Global consumption

According to the Food and Agricultural Organisation (FAO), per capita consumption of pulses (excluding other grain legumes such as soybeans and groundnuts) has seen a slow but steady decline in both developed and developing countries, dropping from 7.6kg per person per year globally in 1970, to around 7kg per person per year today. These trends reflect changing dietary patterns and consumer preferences and the failure of domestic production to keep pace with population growth in many countries. The only two regions of the world in which per capita consumption has increased in recent decades are North Africa and the Middle East.

Global trade

Nearly 15% of all pulse production is traded on the global market. In 2014, global pulses exports were worth over 10 billion USD (See Table 2). Major traded pulses include lentils, peas and various bean varieties. Soybean exports in 2014 were worth almost 60 billion USD. Africa accounts for 9.5% of global pulses exports, with around a quarter of African exports destined for other countries on the continent.

Table 2: Global and African trade in pulses, soybeans, groundnuts and products made from soybeans and groundnuts, 2014 (USD '000s)

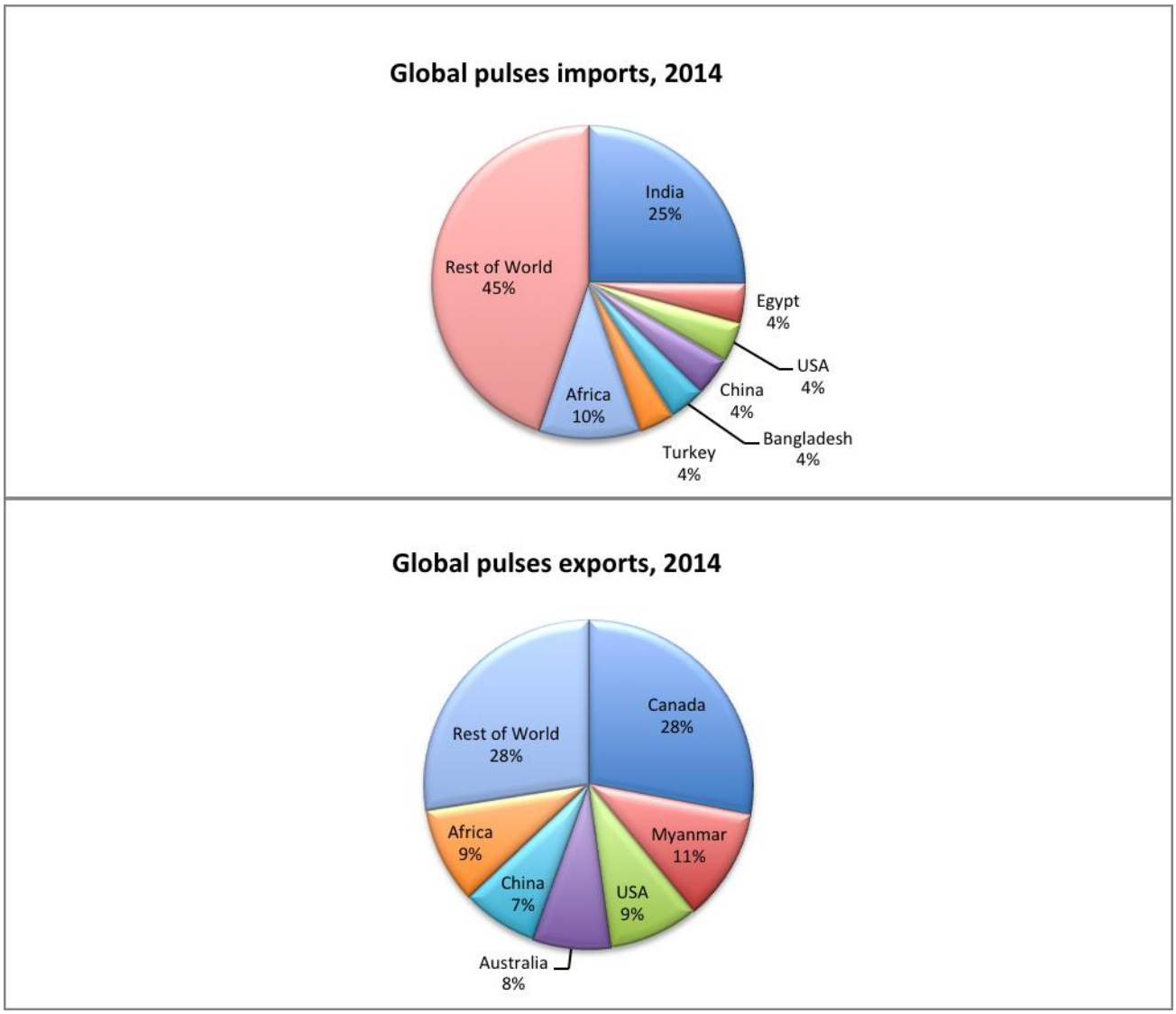
HS code	Product label	Global exports	African exports (share of global exports)	Intra-African trade (share of African exports)
0713	Pulses	10,365,451	983,720 (9.5%)	247,276 (25.1%)
071310	*Peas*	*2,115,250*	*71,316 (3.4%)*	*18,306 (25.7%)*
071320	*Chickpeas*	*1,051,982*	*56,777 (5.4%)*	*8,016 (14.1%)*
071331	*Black gram, green gram (mung beans)*	*1,250,412*	*79,074 (6.3%)*	*15,113 (19.1%)*
071332	*Adzuki (red mung) beans*	*141,738*	*9,973 (7%)*	*2,262 (22.7%)*
071333	*Kidney beans*	*2,074,177*	*463,784 (22.4%)*	*125,885 (27.1%)*
071334	*Bambara beans*	*2,674*	*338 (12.6%)*	*282 (83.4%)*
071335	*Cowpeas*	*35,350*	*7,749 (21.9%)*	*1,922 (24.8%)*
071339	*Other beans*	*583,231*	*55,890 (9.6%)*	*23,739 (42.5%)*
071340	*Lentils*	*2,087,956*	*20,873 (1%)*	*15,418 (73.9%)*
071350	*Faba (broad) beans*	*408,729*	*47,472 (11.6%)*	*31,465 (66.3%)*

071360	*Pigeon peas*	*318,337*	*101,620 (31.9%)*	*103 (0.1%)*
071390	*Other pulses*	*295,615*	*68,854 (23.3%)*	*4,765 (6.9%)*
1201	Soybeans	59,010,064	56,895 (0.1%)	33,737 (59.3%)
1202	Groundnuts (raw)	2,272,852	119,679 (5.3%)	61,432 (51.3%)
200811	*Groundnuts, prepared or preserved (excl. w/sugar)*	*2,001,569*	*20,392 (1%)*	*13,669 (67%)*
1507	Soybean oil and its fractions	9,082,383	233,945 (2.6%)	174,109 (74.4%)
1508	Groundnut oil and its fractions	327,257	46,038 (14.1%)	1,389 (3%)
2304	Oilcake, etc. (soybean)	32,254,983	60,905 (0.2%)	60,661 (99.6%)
2305	Oilcake, etc. (groundnut)	51,010	24,608 (48.2%)	1,077 (4.4%)

Source: International Trade Centre (ITC) Trade Map and own calculations

India is the most significant importer of pulses, accounting for a quarter of global imports in 2014, while Canada is the most significant exporter of pulses, accounting for 28% of exports in 2014. Other major exporters include Myanmar, the US, Australia and China.

Figure 6: Global pulses imports and exports, 2014



Source: International Trade Centre (ITC) Trade Map and own calculations

Countries in North Africa are the most significant importers of pulses in Africa. Major African importers of pulses include Egypt (ranked 2nd among importing countries in 2014), Algeria (12th) and Sudan (23rd) (See Table 3).

Table 3: Major African importers of pulses (HS 0713) in 2014

Importer	Imports	Share of global imports	Global rank
Global imports	10,691,436		
Africa	1,124,371	10,5%	
Egypt	439,974	4,1%	2
Algeria	229,766	2,1%	12
Sudan (including South Sudan)	107,251	1,0%	23
South Africa	67,981	0,6%	34
Angola	58,047	0,5%	37
Kenya	34,499	0,3%	50
Libya	34,046	0,3%	51
Ethiopia	27,194	0,3%	54
Morocco	25,822	0,2%	58

Source: International Trade Centre (ITC) Trade Map and own calculations, *includes South Sudan

Intra-African trade

Between 2012 and 2014, African countries imported close to 200m USD of pulses per year (on average) from other African countries. Kidney beans are by far the most commonly traded pulses between African countries, accounting for almost 43% of all pulses traded between African countries between 2012 and 2014. Trade in groundnuts (including prepared or preserved groundnuts) is slightly bigger than trade in kidney beans.

Table 4: Intra-African trade in pulses, soybeans and groundnuts (USD '000s)

HS code	Description	Annual average 2012-2014
0713	Pulses	193,795
071333	*Kidney beans*	*83,226*
071350	*Faba (broad) beans*	*31,158*
071339	*Other beans*	*18,160*
071310	*Peas*	*17,501*
071331	*Black gram, green gram (mung beans)*	*13,561*
071340	*Lentils*	*8,804*
071320	*Chickpeas*	*7,953*
071390	*Other pulses*	*6,742*
071332	*Adzuki (red mung) beans*	*3,830*
071360	*Pigeon peas*	*1,402*
071335	*Cowpeas*	*1,289*
071334	*Bambara beans*	*152*
1201	Soybeans	21,374
1202	Groundnuts (excluding roasted or otherwise cooked)	72,386
1507	Soybean oil and its fractions	137,552
1508	Groundnut oil and its fractions	1,018
200811	*Groundnuts, prepared or preserved (excluding preserved with sugar)*	*13,172*
2304	Oilcake and other solid residues from soybean oil extraction	51,985
2305	Oilcake and other solid residues, from groundnut oil extraction	1,470

Source: International Trade Centre (ITC) Trade Map and own calculations

3.2. Production and trade trends in the Horn

Pulses (and other grain legumes), especially haricot bean, chickpea, peas, soybean and groundnut are produced for household consumption and as a cash crop in both Sudan and Ethiopia. The production of pulses as cash crop and small scale processing of crops like faba bean or chickpea contribute to improved

livelihoods, mainly for women. Regional trade flows of pulses are significant and growing (e.g. most pulses consumed in Djibouti are from Ethiopia, faba bean from Ethiopia is exported to Sudan, chickpea from Sudan is exported to Egypt, red kidney bean is exported from Ethiopia to Kenya). Pulses trade in the region is said to be largely informal and based on traditional and long term trading relations within communities living across the borders (Van den Broek at al. 2014, interviews), so the actual total regional trade flows are likely to remain underreported.

Pulse crops are grown in all the main agricultural production regions in Ethiopia and Sudan and used in crop rotation, intercropping or second cropping in all cereal systems, such as for teff (main Ethiopian cereal), sorghum (main cereal for Sudan), maize, wheat and barley. Small pockets of production of chickpea and haricot bean are found in the higher planes of Day and Randa in the north of Djibouti. The large diversity of agro-ecological zones in Ethiopia makes it suitable for production of a large variety of pulse crops. Ethiopia is already the largest continental producer of chickpea, lentil and faba beans, and together with Rwanda is showing the fastest growth figures in production for haricot bean (FAOSTAT). Pulses are important in both large commercial farming systems, producing for the high-end market, medium sized smallholder farmers producing for local and cross-border markets where pulses fetch good prices, and subsistence farmers where pulses play an important part in household food security. Production of legume crops is increasing, and legumes are the third-largest export crop after coffee and sesame in Ethiopia.

Table 5: Ethiopian production of pulses, soybeans and groundnuts, 2014

	Production (tonnes)	Area harvested (Ha)	Yield (Hg/Ha)
Pulses (total)	2,614,131	1,516,268	17,241
Beans, dry	513,725	323,326	15,889
Broad beans, horse beans, dry	838,944	443,107	18,933
Chick peas	458,682	239,755	19,131
Lentils	137,354	98,869	13,893
Peas, dry	342,637	230,667	14,854
Pulses, nes	71,350	43,660	16,342
Vetches	251,439	136,884	18,369
Soybeans	72,184	35,260	20,472
Groundnuts	103,706	64,649	16,041

Source: FAOSTAT

In Sudan, the main legume crop grown and exported is groundnut. Sudan is the number five producer worldwide, and the export of groundnuts provides much needed foreign exchange. According to a UNDP study from 2014[10], groundnut cultivated area represents about 35% of total cash crop area. One of the two main production areas of groundnuts is Darfur. The protracted crisis in this region has a huge impact on livelihoods, with loss of infrastructure and basic services, and limiting farmers ability to access markets, finance, labour and necessary inputs. The production of groundnut in this main producing region has declined[11].

Sudan is also a large producer of faba beans (broad beans), seventh in the world after Egypt with yields above the global average (Nedumaran et al. 2015).

[10] Available through http://reliefweb.int/report/sudan/groundnut-production-sudan-opportunities-ahead-and-unseen-challenges

[11] See http://www.sd.undp.org/content/sudan/en/home/operations/projects/crisis_prevention_and_recovery/Pro-PoorValueChainIntegrationProject.html

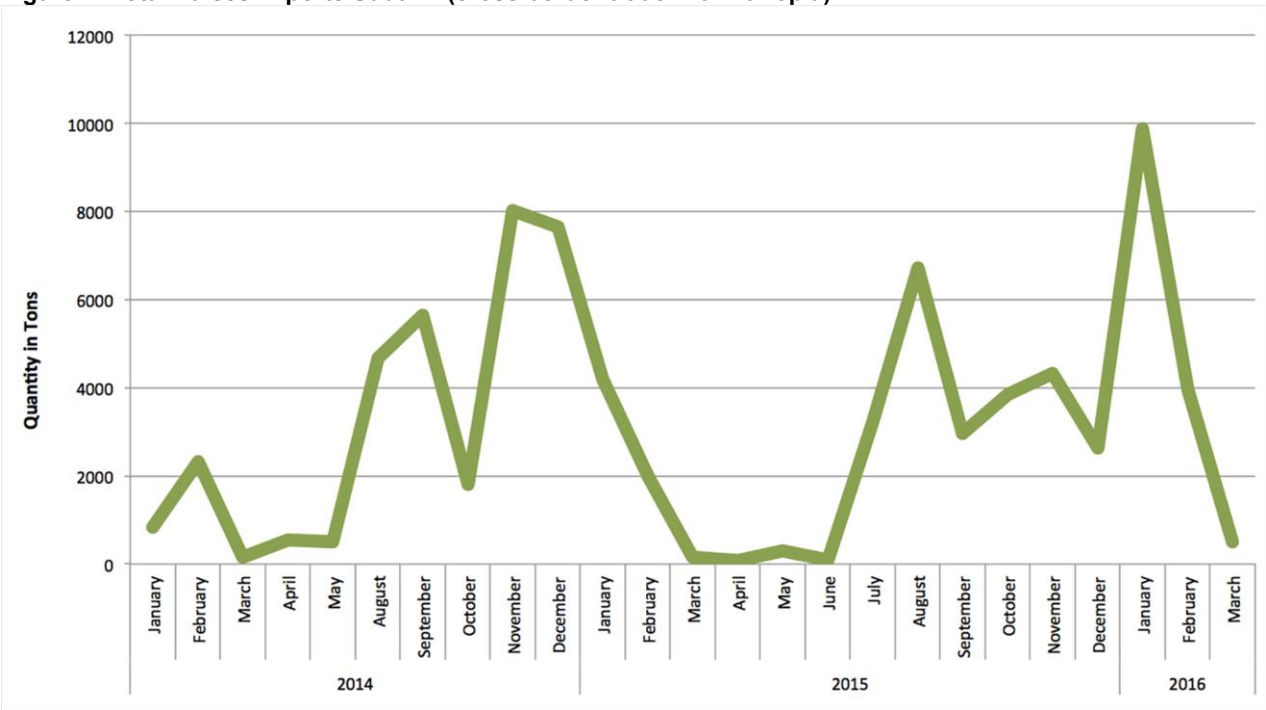
Table 6: Sudan's production of pulses and groundnuts, 2014

	Production (tonnes)	Area harvested (Ha)	Yield (Hg/Ha)
Pulses (total)	356,500	448,500	7,949
Beans, dry	12,000	3,500	34,286
Broad beans, horse beans, dry	160,000	75,000	21,333
Chick peas	14,500	8,000	18,125
Cow peas, dry	80,000	260,000	3,077
Pulses, nes	90,000	102,000	8,824
Groundnuts	1,880,000	2104,000	8,935

Source: FAOSTAT

Domestic consumption outstrips supply for faba bean though, making Sudan a net importer of faba bean, mostly from Ethiopia, especially during the off-season. Cross-border trade monitoring by the Famine Early Warning Systems Network (FEWS NET) shows that in Sudan flows of other pulses like chickpea, lentils and haricot beans from Ethiopia are common. Sudan also produces cowpea, but exports are negligible.

Figure 7: Total Pulses imports Sudan - (cross border trade with Ethiopia)



Source: FEWS NET

Ethiopia has become a significant exporter of pulses, globally and regionally. Ethiopia's main pulses export is kidney beans, which accounted for 59% of Ethiopia's pulses exports between 2012 and 2014. 12.7% of Ethiopia's pulses exports between 2012 and 2014 were destined for Sudan (including South Sudan). Sudan is Ethiopia's biggest market for its faba bean exports, accounting for 92.5% of Ethiopia's faba bean exports between 2012 and 2014. Faba bean is also the main pulses export to Sudan, accounting for more than three quarters (76.6%) of Ethiopia's pulses exports to Sudan between 2012 and 2014.

Table 7: Ethiopia's main exports of pulses, soybeans and groundnuts, 2012-2014 (average exports per year in USD '000s)

HS code	Description	Destination	
		Sudan*	World
0713	Pulses	30,777	241,887
071333	*Kidney beans*	*1,075*	*142,997*
071320	*Chickpeas*	*4,152*	*40,886*
071390	*Other pulses*	*1,070*	*25,627*
071350	*Faba (broad) beans*	*23,561*	*25,473*
071339	*Other beans*	*104*	*4,404*
071331	*Black gram, green gram (mung beans)*	*465*	*2,194*
1201	Soybeans	284	15,407
1202	Groundnuts	0	11,023
200811	*Prepared or preserved groundnuts*	*97*	*97*

Source: International Trade Centre (ITC) Trade Map and own calculations, *includes South Sudan

Both the Sudanese and Ethiopian governments have a strong focus and preference of promoting export to high-end export markets such as Europe, the USA, Middle East and China. Trade with neighbouring countries is considered more costly and complicated. The continued reliance on traditional markets and low prioritisation of other African markets is further impacted by the limited market information available, the low purchasing power in these markets, and similarity in products in the region. Information on the market dynamics in African countries, including the policy environment and seasonality of the crops to penetrate these markets effectively, is not readily available. Poor infrastructure and connectivity at regional level also limit access to potential markets. Other challenges faced by exporters are the low volumes, inaccessibility of farms, poor storage and quality issues. High logistical costs as a result of government bureaucracies, corruption, and unregulated fees and charges especially in Sudan remain barriers to building effective and predictable export trade systems. The financial limitations mentioned earlier in regard to the strict government controls in Ethiopia, and the unfavourable environment for foreign transactions in Sudan have also impacted on the level of export trade registered.

4. Plenty of opportunities for pulses in the Horn

In this section, we take a closer look at the main pulses and other grain legume value chains in the Horn region, focusing in particular on the main actors and factors that drive these value chains in Ethiopia and Sudan.

4.1. Drivers of increased demand for pulses and other grain legumes in the region

Demographics and urbanisation

Ethiopia is the second most populated country in Africa (after Nigeria) and is projected to reach 130 million people in 2030[12]. This huge consumer market is not only attracting international investors[13], it also offers huge potential for domestic and regional investment in key food commodities. Pulses are central in many Ethiopian dishes, e.g. shiro, a popular pulse-based sauce. Moreover, Ethiopians have a fasting period of over 200 days a year, and a range of pulses is consumed during this fasting period. Population growth, combined with rising incomes is expected to be a main driver for sustained demand for pulses.

[12] See http://www.fao.org/nr/water/faonile/products/Docs/Poster_Maps/POPULATIONBIG.pdf
[13] See e.g. http://www.howwemadeitinafrica.com/sabmiller-targets-ethiopias-consumer-market-potential/

Urbanisation is another key driver of an increased demand for pulses and pulse-based products, both in Sudan and Ethiopia. According to official figures from the Ethiopian Central Statistics Agency, the urban population is projected to nearly triple from 15.2 million in 2012 to 42.3 million in 2037. According to a study by the African Development Bank[14], there is a shift from the poor upward. This could be a strong driver towards the consumption of more processed pulse-based foods. The urban population in Sudan is also increasing. According to various interviewees, in Sudan, people in cities are adopting more Arab-oriented diets, partly explaining the growing demand for faba bean, which is used in a popular Arab breakfast dish. If marketed well, growing urban middle classes aware of the health benefits associated with consumption of pulses could become another driver of increased pulses consumption.

Increased demand for animal feed

Both Ethiopia and Sudan have prioritised the development of their livestock sectors in order to increase domestic production of meat and dairy products, e.g. in the Sudanese NAIPs and the Second Growth and Transformation Programme (SUDNAIP 2014 and GTP-II). If, as is likely, such a development leads to increased demand for animal feed in the region, this could provide a strong rationale for developing regional value chains in pulses and grain legumes. In Sudan, the fresh stalks of groundnuts are used as animal feed to provide additional nutrients and for animal fattening purposes. In Ethiopia, stalks of different pulse crops, such as faba beans and lentils are used as animal feed, and provide additional income to farmers involved in the production of pulses (Van den Broek 2014). There is a growing demand for soybean meal for the poultry industry in Sudan, while in Ethiopia; soybean meal is used in the production of animal feed for pets and livestock. Groundnut meal is also used to complement animal diets in Sudan. In Sudan, in interviews the Ministry of Livestock acknowledges the growing significance of pulses stalks as animal feed, however in the absence of clear mechanisms to ensure sufficient supplies through backward linkages with crop farmers, the production of pulses and other grain legumes has not been promoted.

Processed foods high on the agenda

The ambition to increase value addition in agricultural value chain through processing is central in both countries agricultural growth strategies (Second Growth and Transformation Plan (GTP-II), Sudanese SUDNAIP). Processing of pulses and grain legumes such as groundnut and soybean are part of these strategies. Although the food-processing industry in Ethiopia is the largest manufacturing industry (39% of total value added by the manufacturing industry in 2009/2010), it is relatively limited a value of 900 million USD. Low competitiveness in the market and low demand (annual expenditure on processed food per capita in 2010/2011) makes for a challenging environment for large and medium processing companies (Southoudt et al. 2013). In Sudan, the main food-processing industry is linked to the shelling of groundnut and crushing for the production of groundnut oil (Konandreas 2009).

The most basic steps in the processing of pulses are drying, sorting, grading and packaging. Availability of packaging materials and technology is problematic, both in Sudan and Ethiopia (Van den Broek 2014, Konandreas 2009, interviews). Baltenas, an Ethiopian type of cottage industry processing pulses, split chickpea (kike), processed hot pepper (berbere) and mixes like shiro, are growing in number and catering both urban and rural consumers. The baltena sector includes both household businesses and larger companies, in rural towns as well as major cities. Baltenas, active in Ethiopia at both local and regional, are very active in the chickpea value chain, but they also play a role in the value chains of other pulses and grain legume value chains, including lentils, faba beans, groundnuts and red haricot beans.
In Ethiopia, cooperatives are moving into processing of pulses such as chickpea, taking advantage of tax exemptions granted to cooperatives. In Sudan there could be potential to develop food-processing in for example the faba value chain, but there is little investment visible both from government or private sector. Low-cost technologies for the cleaning, splitting, roasting and milling of dry pulses could be made more

[14] The middle of the pyramid: Dynamics of the middle class in Africa, Mthuli Ncube, Charles Leyeka Lufumpa, Steve Kayizzi-Mugerwa, AfDB Market Brief, April 20, 2011

available to support these industries, as well as support in business development, warehouse management, access to finance and marketing.

Unique dynamics of aid and relief in the region

The demand by aid and relief organisations in the Horn of Africa causes specific dynamics in the local and regional pulses market, both in the areas of sourcing and in processing. Government and United Nations agencies such as the World Food Programme (WFP) have a big impact on both the Sudanese and Ethiopian markets due to the size of their operations. Pulses and vegetable oil are part of the standard food basket of the WFP and the quantities it purchases on local and international markets are significant. For example, according to the WFP Sudan Purchasing Unit, WFP Sudan purchases 20,000 tonnes of beans or chickpeas per season. According to different stakeholders (farmers, exporters) the WFP and government agencies such as the Strategic Grain Reserve in Sudan have had market distorting effects.

There are a number of private sector companies in Ethiopia that are catering for the 'nutritious food' sector. UN support to public-private partnerships with Ethiopian companies to produce highly nutritious food for the aid programmes has been significant (see Table 8). An example of one of these companies is GUTS Agro Industry. It started producing supplements (containing chickpeas) for moderately malnourished children. These supplements were produced for the WFP, in partnership with Pepsico and with support from the United States Agency for International Development (USAID). GUTS Agro Industry has diversified its range of products and now also produces other pulses-based products like shiro and chickpea snacks targeting bottom-of-the-pyramid customers. The unreliability and seasonality of demand from the relief market, combined with the low (but potentially growing) local market demand for processed food, complicates the business case of a processing industry.

Table 8: Funding to Ethiopian companies by UN organisations (in USD)

Ethiopia UN Funding	Product	2003	2007	2008	2009	2010	2011
Healt Care Food Manufacturer	nutrition	654,521					
Hilina Enriched	nutrition		801,375	1,191,162	5,162,885	6,484,248	8,045,074
Food Processing Center PLC	prepared/preserved foods						805,012
Avon Industries PLC	nutrition		37,498		66,298		
Fits Private Limited Company	nutrition		76,777	38,429	56,120		49,655
Kalu Works Ethiopia PLC	nutrition		79,844	70,735			
ESMS Selective Marketing Service	tomato concentrate			86,406			
Faffa Food Share Company	corn soy blend			149,686			
	prepared/preserved foods				65,970	101,659	106,910
Fast Foods Supply Enterprise	supplementary food pack			39,461			
	prepared/preserved foods				43,000	62,239	
Various Suppliers	food			30,212,539	40,431,278	88,415,760	42,684,636

Source: Southoudt et al. 2013

4.2. Potential for more research and regional input value chains for pulses

Improving access to better seeds

There is potential for a regional value chain of improved pulse seed. Poor access to improved varieties of pulse crops is one of the major obstacles to increasing productivity and profitability of pulse crops. Currently, there is not enough improved seed being multiplied, both in Sudan and Ethiopia, making improved seed expensive and many times simply not available. Medium-sized smallholders and larger commercial farmers Development, testing and promotion of new varieties adapted to the local agro-ecological and socio-economic conditions could improve the availability and reduce the cost of improved seed.

The development, adaptation and dissemination of improved seed is recognised as one of the main research priorities in Ethiopia[15]. Private sector partnerships in research in the region such as CGIAR's Tropical Legumes Programme and the Wageningen-led programme N2Africa (closely cooperating with the National Agricultural Research Centres and CGIAR centers in the region, have been tailored around adaptation improved seed to the local conditions, technology development and sharing of knowledge and skills. Private sector in both countries has been proactive in driving the research process, but this has been inhibited by the limited capacities at the research institution to multiply and distribute the seed material. Government investment in research institutions remains low, especially in Sudan, while capacity levels at the institutes are also limited as well as their capacity to develop modern and efficient technologies for the agricultural sector. Partnerships involving foreign research institutions and academia have been more effective in addressing an integrated research agenda as defined by private sector.

Strengthening seed systems, from the most formal multinational seed companies selling improved seeds through agro-dealers to the informal farmer-saved or community-based seed systems is crucial to provide farmers access to quality seed[16]. Farmers source from different seed systems, according to their needs and investment possibilities. Legume seed systems are usually informal semi-structured seed systems involving individuals or communities offering relatively cheaper and readily available seed. This system constitutes about 60-80% of the total seeds used. This causes farmers to only buy occasionally. Also, legume seeds are relatively bulky (100–200 kg seed is required per hectare) (Van den Broek 2014). The Integrated Seed Sector Development Programme supports the development of a market-oriented, pluralistic, vibrant and dynamic seed sector in Africa through for example support to farmers' groups in the development of viable local seed businesses producing for a local market.

Biofertilizer to increase pulse yields

The development of a vibrant regional bio fertilizer value chain is key to strengthen the productivity and profitability of pulses value chains in the region. Using bio fertilizer has shown to increase yields of both pulse crops and cereal crops planted afterwards[17]. Inoculation of legume crops and soil with good strains of rhizobacteria (biofertilizer) can enhance even more the availability of nitrogen and phosphorus to the host plant, soil and subsequent crops. It is one of the cheaper inputs pulse crop farmers can use to improve productivity and nitrogen-fixing capacities of their crop. Inoculant production and use in Africa and Ethiopia and Sudan have remained low, but according to several agricultural research programmes (N2Africa, TL3) the potential of a regional biofertilizer value chain should be explored. Programmes promoting the use of inoculants have been implemented, but adoption has been limited due to weakly developed marketing

[15] See http://www.n2africa.org/content/value-chain-analyses-grain-legumes-n2africa
[16] See SIMLESA Policy Briefs, http://repository.cimmyt.org/xmlui/bitstream/handle/10883/4630/57095.pdf?sequence=4
[17] See https://agrilinks.org/agexchange/agexchange-resource/improving-crop-yields-ethiopia-early-impacts-rhizobia-inoculated

channels, poor quality assurance (running the risk of losing confidence of farmers in the product) and inadequate capacity within the extension services (Bala et al. 2011). Better coordination and pooling of resources at a regional level could remedy a number of flaws of these initiatives. In Eastern Africa, rhizobium inoculants are produced by private companies in Kenya, Uganda and more recently (2010) in Ethiopia (Huising et al., 2013). The National Soil Laboratory in Ethiopia, other research centers and some development programmes distribute these biofertilizers to smallholder farmers. They are used for faba bean, chickpeas, lentils, field pea, haricot bean, soybean and mung bean.

Sharing experience with the value chain approach and strengthening innovation capacity

Research and extension services in Ethiopia and Sudan are very often weak and information provided is usually focused on technical issues, and not able to take into account the complexity of agricultural intensification systems. Specifically for the pulses value chains, weakly developed input supply systems for seed, inoculants, fertilizers, herbicides and pesticides and machinery hire services can be concrete impediments to improve production. Profitability of farming systems and the capacity to invest in improved input and field management of farmers can be hindered by poor access to output markets and lack of farmers' capacity to participate in markets and lack of financing. A value chain approach can target improving access of smallholder farmers to input and output markets. Innovation in the pulses value chain, e.g. the use of improved varieties or biofertilizer, depends on the needs and incentives of farmers and should differentiate between different types of farmers.

For large commercial farmers and medium smallholder farmers the ease of mechanised harvesting of cereal crops prompts them to prefer cereal crops over pulse crops, which is still largely done by hand. Cost benefit calculations have shown that integrating pulses in the long term is more profitable and sustainable, by lowering costs of inputs, improving yields and maintaining soil fertility[18]. Improved access to improved seeds and specific fertilizer, such as phosphorus-based fertilizer and rhizobial inoculant (biofertilizer) could incentivise these farmers to grow pulses. Agronomic knowledge on markets and the benefits of integrating pulses in rotation with cereals, thereby increasing yields of cereal crops, reducing fertilizer and pesticide use could encourage these farmers to grow more pulses.

4.3. Promising policies in the Horn?

Agricultural policies slowly turning towards pulses

Governments in the region, as elsewhere in developing countries, have favoured cereal staple crops in agricultural development policies over pulse crops (Nedumaran 2015, Van den Broek 2014). Development partners have focused on more export oriented value chains such as coffee or cotton, both in terms of investments in research in improved breeds as well as investments in inputs. Price policies like credits, improved access to seeds and other inputs and insurance, usually favour cereal production. This trend is changing In Ethiopia, government agencies have demonstrated interest in promoting production of pulses and other grain legumes and in promoting value chain development activities.

In Ethiopia, the Agricultural Transformation Agency (ATA) has been established to address specific systemic bottlenecks by strengthening capacities, and to introduce new technologies and approaches to accelerate agricultural development. One of these approaches is the agricultural commercialization cluster approach, which involves 'using a market-driven and geographically based approach to accelerate the transition of farmers from subsistence to commercial orientation'. ATA has started working in the four main crop regions of Ethiopia (Oromia, Amhara, SSNP and Tigray region). Through the cluster approach, a number of pulses and other grain legumes have been prioritised, in particular, chickpeas and haricot beans in Oromia and Amhara region, but also lentils, faba bean and soybeans (ATA, n.d.).

[18] See http://www.agri-learning-ethiopia.org/wp-content/uploads/2015/10/AKLDP-Inoculants-brief-Feb-2016.pdf

In Sudan, the CAADP National Agricultural Investment Plan which was validated and launched at a Business Meeting held in October 2016[19], provides a broader framework of engagement across different sectors beyond agriculture based on the CAADP principles related to trade, nutrition, research, etc. Following the oil boom, the 2008 soaring food prices and the loss of main oil revenues after the secession of South Sudan, there is a renewed interest by Government in the revival of the agricultural sector as evidenced with the Agricultural Revival Programme, the Producer Societies Bill, and promoting PPPs in agriculture. Some interviewees express their scepticism to what extent this renewed interest is accompanied by the appropriate financial resources and institutional capacity. Government's priorities have remained focused on agriculture-related infrastructures like dams, railways and paved roads, while public agricultural expenditures such as extension services or investment in agricultural research have remained low. In terms of GDP, agriculture and agriculture related sectors expenditures represent only around 1 percent of GDP, whereas if investments in agriculture-related sectors were excluded, the share of agriculture public expenditures to GDP would be around 0.3 percent, less than the average of the developing countries of 1-2 percent (Sudan NAIP 2015).

Agricultural in the three countries (Djibouti, Sudan and Ethiopia) have been under reform quite significantly in the recent decades. For Djibouti and Sudan these reforms were partly due to the requirements of entering the WTO, such as liberalizing prices of goods and services, reducing subsidies and privatizing public enterprises. In a 2009 assessment of Sudan's agricultural potential, support to the agricultural sector in the form of institutional capacity, extension services, marketing facilities, marketing statistics and other soft and hard infrastructure were considered to be still very limited (Konandreas 2009). Agricultural commodities are supposed to benefit from lower taxes, but State imposed taxes paid by traders when they transport agricultural goods across the different states to the market centres/export markets are still in practice. In Ethiopia, the economy has opened up more to private sector activity e.g. in the seed sector, a sector which was previously fully under government control.

Despite these reforms, in all three countries key commodities such as wheat and sorghum flour and edible oil are heavily subsidised or market prices are controlled by government agencies. These subsidies and government's continued engagement in agricultural marketing have a distortive effect on the market. The development of the soybean value chain in Ethiopia for example is hampered by the involvement of the government in the development of the palm oil market, signing agreements with the Malaysian government to build processing capacity to refine locally part of the 95% of daily edible oil consumption coming from this country. Guaranteed minimum prices for some commodities can cause disincentive to invest in other, possibly more competitive crops. Sudan government guarantees prices for wheat since 2008 following the global food crisis, with consumer prices subsidized by 20%, while producer prices were upped by 20%.

Trade relations: increasing opportunities for border trade

Despite Ethiopia's reluctance to join the COMESA Free Trade Area and Sudan's relative isolation caused by the international sanctions, both countries do endeavour to strengthen trade relations in the region. Ethiopia has opted to establish bilateral agreements covering transport, trade, investment, mining and tourism with its neighbours Sudan, Uganda and Kenya. A Framework Agreement on Trade, Economic and Technical Cooperation with Sudan abolishing tariff barriers, easing rules of origin on trade between the two and establishing a MoU for customs cooperation was agreed on in 2015. Ethiopia also introduced a licensing system that regulates cross-border trade with Sudan, Kenya, Djibouti, and Somalia. It stipulates the types of goods that can be traded, how often, and how far from border posts goods can be traded (Byiers 2016). According to Konandreas (2009) the border trade agreements with neighbouring countries that Sudan's Ministry of Trade has been organizing, have had several positive results, referring to the

[19] See http://news.sudanvisiondaily.com/index.php/opinion/science/713-sudan-caadp-high-level-stakeholders-business-meeting-hlbm-18-october-2016-khartoum-sudan

"establishment of a crop export upgrading center in Dongola and the increase in area under crop production of beans, chick peas, broad beans, shamar and sesame in Northern State and river Nile State". More research would be needed to assess how these bilateral agreements are promoting regional trade and to which extent regional trade would benefit from Ethiopia's signing of the COMESA FTA.

Trade relations between Ethiopia and Djibouti are expected to receive a boost from the recently launched railway between Djibouti and Addis. The 750 km long railway connects Addis Ababa with the port of Djibouti. Already before the opening of the railway, around 70% of traffic through Port Djibouti consists of imports to and exports from Ethiopia (Mekonnen and Lulie, 2014). The new railway will take products between Ethiopia and Djibouti in about 10 hours, while trucks could take up to three days along the road. The opening of the railway increases the importance of Djibouti in Ethiopia's legume crop value chain, as it is the main port for the majority of Ethiopian commodities. The railway will most likely also boost cross-border trade, as it connects the bean and groundnut producing areas in East Oromia with the border town of Dewele.

5. Addressing bottlenecks to the development of pulses value chains in the Horn

As highlighted above, there is potential for increasing production and regional trade of pulses and other grain legumes in the Horn, and for the development of regional value chains. The growing and increasingly urban population in the region represents an important source of demand, as does the demand of aid and relief organisations. There is also growing willingness by public and private sector actors, especially in Ethiopia, to invest in the pulses value chain. Ethiopia is already exporting more than 90% of its faba exports to Sudan, not even counting the large flows of informal cross-border trade. At the same time, there are still a number of challenges that are likely to hinder effective domestic and regional value chain development. This section highlights some of the key bottlenecks to the development of regional pulses and other grain legume value chains, and also indicates how a regional multi-stakeholder platform approach could potentially address these bottlenecks.

5.1. Key bottlenecks in the value chain

Financial restrictions

In both Ethiopia and Sudan, controls on cross-border financial transactions have had an inhibiting effect on external trade by limiting the inflows and outflows of foreign exchange required to facilitate trade. In Ethiopia's case, transactions are heavily regulated by the Ethiopian Government through national financial regulations and policies. In the case of Sudan, US sanctions have had a similar chilling effect on cross-border financial transactions, contributing to the relatively limited range of trade partners that Sudan has continued to engage with in recent years. Most COMESA countries as a result have been left out of the business agreements that Sudan has with trading partners, while for Ethiopia, the low trade levels with other COMESA countries have been attributed to the strict financial controls, and limited access to market and trade information on most of the COMESA countries.

Trade barriers

The COMESA Simplified Trade Regime[20] (STR) is a trade regime that can be used by all COMESA Member States. Its objective is to reduce the burden of cross-border trade bureaucracy for small scale traders. Sudan has used the STR for trade with DRC and Egypt. Sudan's trade outside COMESA is guided by other bilateral and multilateral instruments such as the Greater Arab Free Trade Area (GAFTA). Ethiopia has not ratified the COMESA Free Trade Area and only selectively adopted a number of COMESA instruments. It has not adopted the COMESA STR on grounds that this does not adequately address the trade agenda with its neighbors states. Ethiopia is however in dialogue with COMESA on issues of SPS standards policy harmonization, Rules of Origin under the Tripartite Free Trade Area, and trade facilitation issues.

International sanitary and phytosanitary (SPS) standards as serve as the benchmark for agricultural trade standards in Ethiopia, Sudan and Djibouti, but compliance to these international standards remains a key challenge for exporters of pulses in countries. Sudan has had the harsh experience of a ban of groundnuts in the EU market due to exceeding levels of aflatoxin. Improvements are needed at the farm level and along the value chain, e.g. better post-harvest preparations (Konandreas 2009 and UNDP 2014), as well as increased investments in regulatory agencies to control and monitor SPS requirements, specifically aflatoxin levels. Packaging is also a problem to access high-end markets such as the European market. Export to neighbouring countries with less high standards can offer a differentiated market for these products. The potential of neighbours like Sudan-Ethiopia to reach 'equivalence agreements' in terms of respective standards/SPS rules could be explored.

Weak market information systems

Private sector stakeholders and associations indicated that they have better (access to) market information on their traditional markets in the Middle East, based on the traditional business linkages and the frequent interaction. Information channels on the neighboring markets and regional COMESA Member States is much less developed. Public or commercial Market Information Systems (MIS) are new to both Ethiopia and Sudan, with a few recent initiatives limited to providing information on farm gate and local market prices such as FARMERS/FEWS-NET [21]in Sudan and ATA initiatives in Ethiopia. In Ethiopia, only the Ethiopian Commodity Exchange (ECX) is providing real time market prices. The Ethiopian Pulses, Oilseeds and Spices Processors-Exporters Association (EPOSPEA), the association of Ethiopian pulse exporters, also compiles general market information for its members. Access to market information remains a challenge to the export business community in Sudan and Ethiopia, especially on the trade and investment opportunities in the COMESA region.

5.2. Building on national level platforms

National level multi-stakeholder platforms to promote the development of specific agricultural value chains (including pulses) exist in Ethiopia and Sudan. These platforms were created primarily to facilitate stakeholder interaction and engagement and share information and knowledge, and are supposed to provide a space for dialogue between government and other actors on common challenges affecting the

[20] The COMESA STR applies to consignments of US$1,000 or less, and foresees a simplified certificate of origin, for a list of goods agreed between the two neighbouring COMESA countries, and avoids having a clearing agent, and paying duties on them. In addition, most of the border crossings now also have a Trade Information Desk, which helps traders fill out forms, and register complaints. See http://ecdpm.org/talking-points/crossing-border-malawi-zambia-zalewa-route/

[21] The Famine Early Warning Systems Network (FEWS NET) is a global effort that delivers early warnings of hazard, food insecurity, vulnerability to food insecurity, and famine. Every country office is independent. In Sudan they have partnered with the Department of Planning of the MoA. FARMERS is an SMS mobile based system for collecting and disseminating market information that started in 2011. FARMERS/FEWS-NET also engage in cross-border trade monitoring.

value chain. A regional platform for pulses and other grain legumes could build on these initiatives to address specific bottlenecks affecting the production and trade of these products in the Horn.

Multi-stakeholder platforms in Ethiopia

The emergence of multi-stakeholder platforms in Ethiopia is a trend closely related to the presence of development partners in the country, and their focus on the agricultural sector. The Value Chain Business Platform/Alliance concept, supported by development partners, has been adopted by the ATA as a private sector engagement model to be replicated in other agricultural value chains. For pulses and other grain legumes, value chain alliances have been created for soybean, chickpea, and haricot bean, and these meet periodically to identify and address value chain specific issues. Such meetings are aligned to the pre-planning, pre-harvesting and postharvest stages of the crop.

The Ethiopian Pulses, Oilseeds and Spices Exporters Association (EPOSPEA) is the umbrella association for private sector actors involved in the production, processing, marketing and trade of these products. The Association has a strong member base, but focuses on the export part of the value chain, not so much on the production or input part of the value chain. With the support of USAID, EPOSPEA tried to create a regional association to facilitate dialogue on policy issues on commodities of common interest and also regulate commodity prices, but this did not materialize.

In Ethiopia, private sector associations are enjoying more public support than n Sudan. Ethiopian private sector associations engage in activities supported by donors and other industry related activities. The Chamber of Commerce of Addis Ababa with support from development partners has set up the Soybean Platform, aimed at strengthening farmer-market linkages in the soybean sector. The Private Sector Development Task Force (PSDTF) is a public/private sector platform created to improve dialogue on pertinent issues affecting the private sector in all sectors including agriculture, and create an enabling environment for private sector development. The Task Forces are organised at Federal level and meet every two months. ATA is the facilitator, and issues discussed include trade licensing, technology development, finance support, and a range of policy issues. The PSDTF is co-chaired by representatives from ATA and USAID, while GUTS, a lead exporter and processor of chickpeas represents national business, and Diageo, a large international consumer goods company, represents international business.

Spaces for dialogue in Sudan

In Sudan, there has been less development partner involvement and less public investment in creating spaces for public-private dialogue. Most recently, with support from FAO, public and private stakeholders together with development partners have established a platform for agribusiness across different sectors. These ‘agribiz platforms’ seem to be picking up pace, with a clear leadership role for private sector and an enabling role for government. Commodity Councils have been established by government to support dialogue and interventions aimed at improving production and access to inputs for specific commodities, but their relevance to the private sector is rated low by some of the companies interviewed. They are viewed as government platforms, and as providing limited space to address private sector issues. The Guar Bean Commodity Council was recently created to coordinate the revival and development of the guar bean value chain, but based on the first activities, seems to driven largely by a research agenda and not direct involvement of interested private sector actors. Another promising initiative is the Impact Hub Khartoum[22], aimed to develop promising business models. The agricultural sector has been identified as a focus sector. The Impact Hub has contributed to the establishment of an agro services company, set up together with large farmers but guaranteeing access for smallholder farmers and refugees joining through cooperatives.

[22] See http://www.impacthub.net/stories/2016/09/27/impact-hub-undp-launch-first-edition-of-accelerate2030

5.3. Challenging policy environment

Although both governments of Sudan and Ethiopia have expressed interest in developing and investing in the pulses value chain, strengthening public-private dialogue in this region could be extremely challenging. Limited political space and significant government control on the economy might affect the capacity to build trust between stakeholders, one principal aim of public-private dialogue. Incentives for accountability can be lacking and it may be difficult to create space for weaker value chain actors. A lack of institutional capacity and issues to do with poor governance, lack of transparency in budget management, the tenacity of heavy bureaucratic procedures could also reduce the sustainability of regional initiatives. Initiatives like the agribusiness platforms in Sudan and the Value Chain Business Platforms in Ethiopia could be a positive sign.

Level playing field

According to Poulton et al. (2014) Ethiopia is one of the few countries in Sub-Saharan Africa that shows strong domestic political incentives to invest in smallholder agriculture[23]. This has been translated into significant public investment in agricultural extension with some impacts on growth and poverty reduction (Dercon et al. 2008 cited in Poulton et al. 2014). According to Berhanu 2012 (cited in Poulton et al. 2014) increased investment has been driven by the objectives of growth and political control. The crucial role of the private sector to achieve the objective of economic growth is acknowledged. However, points of political control, e.g. through the distribution of fertilizer, are not easily abandoned. The trade-off between these two economic policy directions limits the extent to which systemic bottlenecks in the value chains have been addressed [24]. In Ethiopia, the current situation of political unrest illustrates indeed how the ideal of rural transformation is still far from being realised.

The slow pace of liberalisation of the market for improved seeds is a good case in point. Despite explicit strategies to give more space to private sector players and a strong push of influential donors, international seed companies still find it very hard to penetrate the Ethiopian seed market. The demand for improved seed for legume crops (e.g. high-yielding or drought resistant varieties) in both Sudan and Ethiopia remains largely unmet, resulting in farmers paying high prices or not accessing improved seeds at all. The potential for private sector to effectively perform in the seed industry in Ethiopia is limited by the strong presence of government that assumes multiple roles as service provider and regulator, and setting the seed prices on the local market[25]. Because of capacity constraints, and because it has traditionally focused on cereal crop seeds, it is not able to fulfil the demand of the market (Van den Broek 2014). The strict imports regime is also a deterrent to private sector. There is significant potential for the private sector to take advantage of the opportunity to supply the demand for improved pulses, especially catering for the export oriented pulses such as chickpea and haricot bean. Domestic private sector however has shown a limited ability to curb this trend, partly due to capacity restraints and weak linkages between the national agricultural research centres, private sector parties, extension services and articulated demand of smallholder farmers.[26]

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[23] According to Poulton et al. (2014) Ethiopian government 'incentives [to invest in smallholder agriculture] are seen to be strong where governments recognise they could be vulnerable to (eventual) overthrow if they do not generate broad- based benefits for rural populations'.

[24] According to Poulton et al. (2014): 'The imperative of political control sits uneasily with a facilitating, participatory approach to extension and has also meant that the government has been resistant to advice to liberalise key input markets even though greater choice for farmers could enhance the returns to extension investment.'

[25] Through the Ethiopian Seed Enterprise and the Regional Seed Enterprises the Ethiopian government provides about 75% of the seed supplied in the country, and controls and sets seed prices on the seed market. Private sector participation is estimated at about 15% of the market share, while the rest is addressed by farmers through self generated seed and farmer seed exchange.

[26] ACOS is an example of an Ethiopian private company that has been able to overcome these challenges. It has successfully introduced improved pulse seeds in the country, but has had to take big losses in the process. Currently, they are working together with cooperative unions and insurance companies in an innovative approach that spreads the risk of the higher cost of the seed between the different stakeholders.

In Sudan, the involvement of the government in economic activity is not as direct and explicit as in Ethiopia. Government agencies have considerable impact on agricultural value chains in general, albeit to a lesser extent than in Ethiopia. The Grain Strategic Reserve Corporation (GSRC) for example plays an important role in the value chain itself, being both a buyer and a seller of commodities with the aim to stabilize the prices of key strategic food commodities. The GSRC is also assigned by commercial banks to receive loan repayments 'in-kind' in the form of the produce from farmers in the recovery of the loans disbursed by the commercial banks. The complexity and high transaction costs of this type of procedure compared to a monetary transaction are also considered a disincentive for banks to lend to farmers (Konandreas 2009). Extension services do not have a big reach and there is not a similar coordinating body like ATA able to catalyze agricultural development. The Agricultural Revival Programme in Sudan has similar objectives, but is not matched in size nor mandate with ATA.

6. Conclusion: Towards a regional public-private platform for pulses value chain development?

There is a strong ambition on the part of Africa's leaders to promote greater food security in Africa through, among other things, promoting sustainable agricultural transformation and facilitating increased intra-regional trade in agro-food products. Given the importance of pulses for food and nutrition security and their key role in sustainable agricultural practices, promoting increased production and trade of pulses fits very well with the national, regional and continental agricultural and food security policy processes such as those aligned with the Malabo Declaration and the various national and regional CAADP Compacts and Investment Plans. In the Horn, a Regional Pulses Platform could be an effective mechanism to promote increased production and trade, and to facilitate the development of an inclusive and effective regional value chain for pulses and other key grain legumes such as soybeans and/or groundnuts.

Over the past two years, COMESA, of which the Horn countries are all members, has begun promoting regional multi-stakeholder platforms as a way to strengthen the development of regional value chains in key agro-food commodities. This is meant to provide an inclusive, politically savvy approach to designing a coherent package of policies and investments to boost intra-regional food trade.[27] Through such an approach, key challenges to advancing relevant regional integration processes can be identified in a bottom-up fashion, taking into account the interests and needs of value chain stakeholders that have a genuine interest in catalysing the development of the value chain. Instead of ambitious plans for comprehensive free trade agreements that still seem very far from political reality, these pragmatic partnerships between public and private stakeholders are meant to encourage initiatives that address specific bottlenecks and key innovation challenges in regional value chains. By building on real political commitment and working with commercial interests, and by focusing on building trust between stakeholders, regional multi-stakeholder platforms can facilitate change in policies and practices, such as the removal of specific trade barriers for a small set of priority food commodities, along specific borders.

A Regional Pulses Platform in the Horn could provide a space for dialogue between key public and private stakeholders, such as public bodies, private companies, farmers and traders, in the region to address these issues in the context of promoting regional trade in pulses and other grain legumes. A Regional Pulses Platform would engage key stakeholders across the regional pulses value chain in the Horn, including farmers and farmer organisations, input and services providers, processors, traders, transporters,

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[27] See http://ecdpm.org/wp-content/uploads/FINAL-KIGALI-RIPA-II-REPORT-3.pdf and http://caadp.comesa.int/en/news/value-chain-platforms-key-to-market-access-and-trade-facilitation-kalonji/

retailers, national governments and regulatory agencies, consumer organisations and regional institutions, to work jointly on key innovation challenges. Such a platform could also engage stakeholders from the informal sector, whose participation is crucial for the development of a regional pulses value chain.

A Regional Pulses Platform would not need to start from scratch. Lessons on how this regional approach is advancing can be drawn from the case of the dairy value chain in Eastern Africa. COMESA, with support from ECDPM and FAO, convened a series of multi-stakeholder dialogues, with a view to establishing a 'East African Dairy Platform' for public-private policy dialogue and partnerships between dairy sector stakeholders in Kenya, Rwanda and Uganda. These multi-stakeholder dialogues provided an opportunity for key stakeholders to jointly identify the most pressing bottlenecks and innovation challenges affecting the development of the dairy value chain in the region[28]. COMESA's experience[29] shows that even though it takes time to bring together key stakeholders and identify and prioritize issues a platform could address, there is willingness to engage in this type of multi-actor process. Value chain stakeholders such as dairy farmers, traders, service providers and regulators will benefit from collective action and innovative partnerships and approaches to address the complex and interrelated challenges[30].

Strengthening regional pulses value chains has a strong potential to contribute to better food and nutrition security and more sustainable and profitable farming systems in the Horn. Opportunities are offered by population and urbanisation trends, combined with an increased demand for animal feed and processed foods. Already existing intra-regional trade could benefit from a more coordinated approach, e.g. in raising awareness of consumers of the nutritional benefits of pulses, addressing trade inefficiencies and sharing approaches to improve the enabling environment that encourage small and larger farmers to integrate pulses in their farming systems. The current economic and political context of the Horn poses challenges to an effective engagement of the private sector. However, the acknowledgement of the central role of the private sector in Sudan, Ethiopia and Djibouti by its governments and the long-lasting trade relations between the countries should provide enough fertile soil for collaboration on a Regional Pulses Platform.

[28] See http://ecdpm.org/wp-content/uploads/Report-Workshop-Dairy-Value-Chain-Nairobi-2016.pdf for a detailed description of the key innovation challenges identified by the different stakeholders and the priority activities the Platform could take on to tackle these challenges.

[29] See http://ecdpm.org/events/technical-workshop-regional-dairy-value-chain-development/ and http://ecdpm.org/events/consultative-meeting-east-african-dairy-platform/ for more information on the multi-stakeholder meetings that were organised in the context of the East African Dairy Platform.

[30] See Bingi, S., Tondel, F. 2015. Recent developments in the dairy sector in Eastern Africa: Towards a regional policy framework for value chain development. (Briefing Note 78). Maastricht: ECDPM.

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Annex

Production trends per variety

This section provides information on production, consumption and trade of the most widely produced pulses (including soybeans and groundnuts) in Africa to provide some context and perspective of pulses production on the continent.

Table 9 Major players in production for grain legumes 2012-2014

	Dry Bean	Chickpea	Cowpea	Pigeonpea	Lentil	Faba Bean	Soybean	Groundnut
Global average 2012-2014 (million tonnes)	24,21	13,07	7,32	4,43	4,96	4,4	276,04	42,62
Major player	India	India	Nigeria	India	Canada	China	USA	China
Production (million tonnes)	3,8	8,8	3,97	2,99	1,6	1,64	94,06	16,55
% of total	16%	67%	54%	67%	32%	37%	34%	39%
Major African player	Tanzania	Ethiopia	Nigeria	Malawi	Ethiopia	Ethiopia	South Africa	Nigeria
Production (million tonnes)	1,10	0,43	3,97	0,28	0,15	0,92	0,79	3,10
% of total	5%	3%	54%	6%	3%	21%	0,29%	7%
Growth rate Africa % (FAO Stat 2008-2013)	10.3	10,6	8,1	11,2	13,1	4,5	7,7	2,9

Source: FAOSTAT 2016 Authors elaboration

Cowpea

The most important pulse crop in Africa is cow pea. Africa accounts for more than 95% of total global production, which was 7.3 million tonnes annually between 2012 and 2014. It is grown mostly by smallholders in the semi-arid tropics (drought-prone savannahs and in the Sahel), where it is well adapted to the high temperatures, low rainfall and poor soil conditions.

Nigeria is the largest producer in the world, accounting for more than half of global production, producing a total of almost 4 million tonnes annually between 2012 and 2014 (FAOstat). In Nigeria, selling cowpea fodder during the dry season results in a 25% increase in annual income for farmers. Small scale processing and selling of cowpea-based snacks and the sale of green pods of cowpea are significant sources of income for women (cgiar.org). Fifty-two percent of Africa's production is used for food, 13% as animal feed, 10% for seed, 9% for other uses, and 16% is wasted (http://www.iita.org/cowpea).

Common bean

The other main pulse crop produced in Sub-Saharan Africa are categorised by FAO as 'dry beans'. The FAO definition of dry beans includes all types of Phaseolus beans like mung beans, black and green gram, moth beans and common beans. In South Asia mung beans, gram and moth beans are very important. In Sub Saharan Africa common beans (haricot beans) are the most widely produced bean variety

(Nedumaran 2015). They are the primary staple for more than 200 million people in the region (cgiar.org). Production is concentrated in Eastern Africa. Tanzania is the largest producer, but production and yields in Rwanda and Ethiopia are growing fast (FAOSTAT).

Yields for common beans are generally very low, but have been increasing in the recent years. There are three main production systems for common bean: the most common is the semi-subsistence system where beans are part of multiple cropping systems, combined with maize and cassava for example. Commercial farms in for example the Central Rift Valley and some farms in Malawi and Tanzania produce in highly productive systems. Highly subsistence systems are also widespread, e.g. in Eastern Kenya (Katungi, 2009).

Faba or broad bean

The faba bean is grown in temperate and subtropical regions. In Africa, it is mostly grown in Ethiopia, Egypt and Sudan, at higher altitudes. Compared to other pulses, yields of faba bean are very high. Ethiopia is the second largest producer in the world, after mainland China, and with 920,000 tonnes between 2012 and 2014 accounted for 21% of global faba production (Nedumaran et al. 2015).

Chickpea

Chickpea is one of the most nutritious pulse crops with higher levels of protein than most other legumes. It ranks second in area under cultivation and third in production among the pulses worldwide. Originally, chickpeas were grown in temperate regions, but newer varieties are adapted to tropical and subtropical climates in Africa, North America and Oceania (cgiar.org). India produces almost two thirds of total global production, but still imports e.g. form Ethiopia, the largest African chickpea producer (FAOSTAT). In Ethiopia, it is grown in the highlands between 1700 and 2400 meters above sea level in mixed crop-livestock farming systems. It is usually produced in rotation with wheat or teff, the main Ethiopian cereal. Chickpea can also be grown as a relay or second crop, using remaining residual soil moisture after a cereal crop. It is a favoured crop by smallholder farmers for both household consumption as well as a cash crop in Ethiopia because of its low labor requirements and relatively high yields. It is estimated that 40% of produce is consumed by the farmers and their neighbours, 10% kept as seed for the next season and 50% sold to regional and central markets (Van den Broek 2014).

Soybean

Soybean is the most produced legume crop in the world, accounting for annual production between 2012 and 2014 of 276 million tonnes. Only a small portion of total production is directly consumed as food. Most of it is processed to produce soybean oil and soybean meal or cake. Soybean oil is one of the most used cooking oils and used in many processed food products and industrial products like paints and wax. Soybean meal is the largest source of protein feed in the world and one of the key ingredients of animal feed. In Africa dry soybeans are used to produce milk substitutes and flour, which . The bean curd can be fried and eaten as a breakfast food or snack. The mature beans have to be soaked and cooked for a long time to break down the toxic compounds in the beans.

African production pales in comparison to the production capacity in the Americas where USA, Brazil and Argentina together are responsible for 85.4% of production. There is however a growing interest in soybean production in Africa. According to more recent figures from ICRISAT Nigeria is now producing more soybean than South Africa, which used to be the largest African producer. South Africa produces almost 800.000 tonnes of soybean per year between 2008 and 2013, less than 0.3% of total global production (see Table 9). UNCOMTRADE data shows that Ethiopia in 2015 was Africa's largest soybean exporter. While production and acreage for soybean in Africa is growing, the global growth rate of production and harvested area is decreasing. Global soybean trade experienced a dip in 2015 (soybean

prices dropped nearly 25% according to the World Bank) possibly due to the slowdown of Chinese growth and Chinese demand for soy.

In both Ethiopia and Sudan, increased local and regional demand for feed is becoming an important pull for soybean production, as well as the large parts of the Ethiopian population that fast (abstain from meat and milk) for more than 200 days per year (Sopov and Sertse 2014).

Groundnut

Groundnut is the fifth most widely grown crop in Sub-Saharan Africa behind maize, sorghum, millet and cassava. Nigeria is Africa's main producer of groundnut; West and Central Africa account for 70% of total African groundnut production. The total production of groundnut on the African continent between 2008 and 2013 is 11 million tonnes.

International agricultural research estimates that about one-third of the groundnut produced globally is eaten and two-thirds are crushed for oil, which apart from cooking oil has many industrial applications. Residue from the oil pressing process is used as animal feed and fertilizer. Groundnut stems and leaves are used as fodder (cgiar.org). Because of its high nutritious value it is used by UN organisations as key food stuffs in their food aid and relief programmes. Groundnut is a popular rotation crop, integrated in farming systems with cotton, maize, sorghum or other cereals.

After years of stable growth, yields of groundnut in Sub-Saharan Africa have been rapidly declining in the last few years, mainly due to erratic rainfall and drought. One of the main problems in groundnut production and postharvest management affecting food safety and export of groundnut is aflatoxin. This mycotoxin is also found in other crops e.g. maize and through infected feed finds it's way to milk and meat. It's linked to linked to stunting, disease, cancer and death and is considered an important food safety hazard. Its incidence can be reduced by improving postharvest handling and storage conditions.

Lentils and mung bean

Africa only accounts for 3,8% of lentil production, mostly concentrated in Ethiopia. Demand is high in both local and international markets, fetching high local prices, which probably contributed to the 60% increase in production between 2006 and 2012 in this country (Van den Broek 2014).

Mung bean is a dryland pulse crop that has seen an increase in production in Ethiopia in recent years , following growing demand from export markets in e.g. India, Indonesia and the Middle East31. FAO statistics on this pulse crop are included in the wider category of 'dry beans', making it difficult to track increased demand and production.

[31] See http://addisfortune.net/articles/mung-beans-become-sixth-commodity-on-ethiopias-exchange-floor/

There is an increasing recognition of the benefits that pulses and other grain legumes such as groundnut and soybean have in improving food security, nutrition and creating more sustainable and climate-resilient food systems. Pulses are highly nutritious and a relatively cheap and accessible source of protein for many people around the world. Because of their ability to fix nitrogen in the soil, they play an important role in improving soil fertility. The 68th UN General Assembly declared the year 2016 the International Year of Pulses to increase awareness of their nutritional and agronomical qualities as well as of the challenges faced by pulse farmers, both small and large.

Also, there is potential for increasing production and regional trade of pulses and other grain legumes in the Horn, and for the development of regional value chains. The growing and increasingly urban population in the region represents an important source of demand, as does the demand of aid and relief organisations. There is also growing willingness by public and private sector actors.