



Pulses

Key Messages:

- *Pulses are important food and cash crops in Tanzania. Productivity is way below potential due to: reliance on rainfed agriculture and limited use of improved seeds, fertilizer, agro chemicals and improved agronomic practices. Enhanced access to these inputs and agricultural extension services will contribute towards enhancing productivity.*
- *Demand for pulses is growing at national, regional and international levels; supporting farmers and traders to get better access to market information and trade facilitation services will enable them tap into that potential.*
- *Collective action is very important in Tanzania especially because many actors along the pulses value chain operate at a small scale. It will be useful to support farmers to establish or strengthen producer and traders associations to increased access to inputs, bargaining power and access to market information.*
- *To stimulate investment in pulses, the Government should improve business environment from production to marketing including maintenance of reasonable tariffs and removal of non-tariff barriers.*

1. Introduction

Pulses (leguminous plants) are widely grown in Tanzania; more than half of the farmers in the country grow pulses (National bureau of Statistics NBS, 2012; Stahley et al., 2012; Bennett et al, 2014). They occupy about 12% of the land cultivated for annual crops (NBS, 2013). Pulses cultivated in the country include common bean (also known as dry beans), cowpeas, pigeon peas, green gram, soybean, chickpeas, mung beans and groundnuts. Pulses are of high importance to human nutrition and are also a key source of income for smallholder farmers in Tanzania (Chemronics International, 2010; United Republic of Tanzania URT, 2016; Karanja, 2016). They contribute heavily to the national food security by providing a range of essential nutrients including protein, carbohydrates, dietary fiber, minerals and vitamins. They are an affordable substitute for animal protein, especially among the poor. Furthermore, some pulses such as groundnuts and soybean are rich sources of edible oil and are also important sources of animal feed. Pulses also bring environmental benefits as they offer natural soil maintenance benefits through nitrogen fixation, which improves soil fertility and thereby reducing the need for application of nitrogenous fertilizers to support plant growth (Maredia, 2012; Food and Agriculture Organization FAO, 2015).

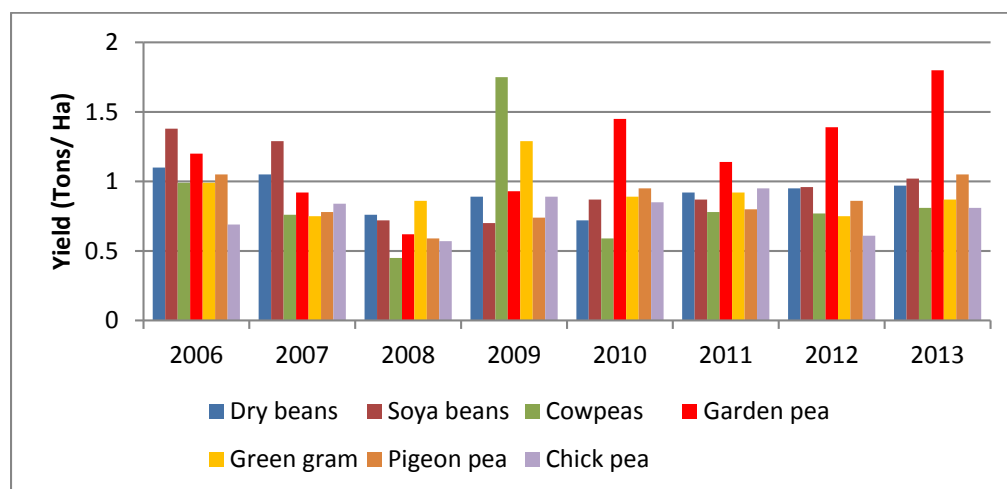


2. Production, Productivity, Structure Conduct and Performance

Production and Productivity

Production levels of pulses in Tanzania have increased from around 760,000 tons in 2000 to close to 1.6 million tons in 2014 (URT, 2016). Common bean is most widely grown grain legumes in Tanzania; the country ranks the 7th in global bean production (Ronner and Giller, 2012). Tanzania produces about 13% of the entire African bean crop (USAID-COMPETE, 2009). Productivity among the smallholder legume farmers is quite low, ranging between 0.5 and 1.8 tons per hectare compared to the potential production of up to 3 tons per hectare (Figure 1). Most of the production increase is attributed to growth in areas under production than to rapid productivity increase. The area under production has increased for most legumes in the recent past (Ronner and Giller, 2012). Pulses have short maturation period and considerable adaptation to high temperatures and drought, hence, they are grown widely in Tanzania including in semi-arid and drought prone areas. Every region and agro ecological zone in Tanzania produces one or several types of pulses. The leading zones in terms of pulses production are Lake, Central, Southern and Northern (URT, 2016). Major legume producing regions in each of these zones are: Dodoma (Central), Arusha, Manyara (Northern), Iringa, Njombe, Lindi, Mbeya, Mtwara, Rukwa, and Ruvuma (Southern) and Shinyanga and Mwanza (Lake).

Figure 1. Annual Yields of Selected Pulses in Tanzania (2006-2013)



Source: Ministry of Agriculture Livestock and Fisheries (MALF) Statistical Database, 2015



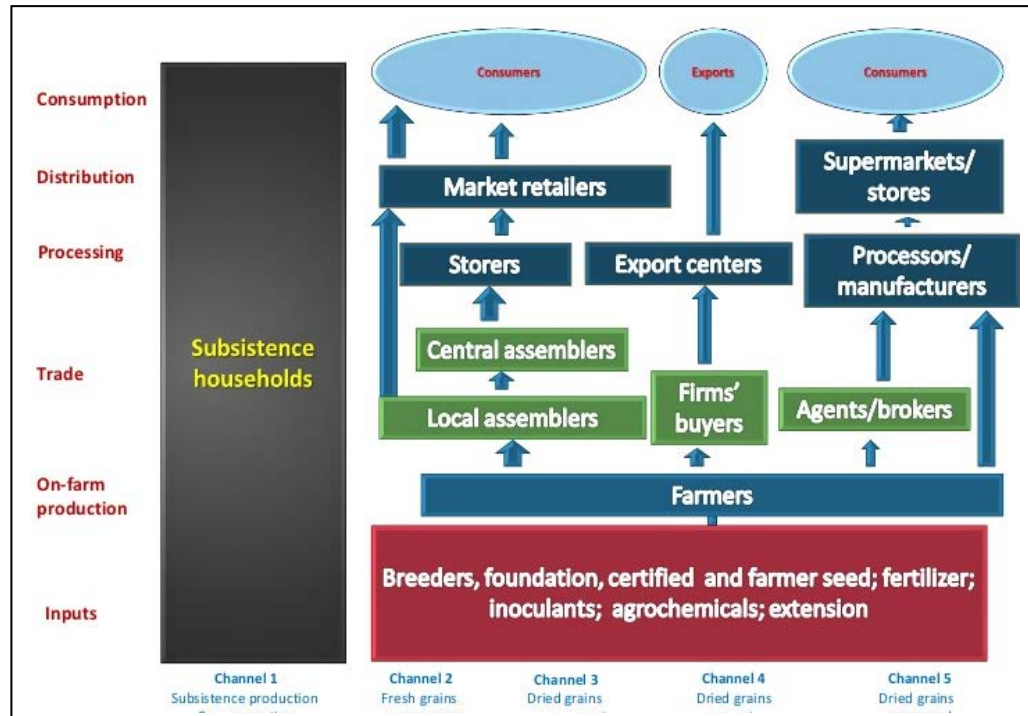
Structure, Conduct and Performance

About 30 percent of pulses are produced by large-scale farmers while the remaining 70 percent is produced by small-scale farmers with less than four acres (1.6ha) of farming land (USAID-COMPETE, 2009). The smallholder farmers grow pulses primarily for subsistence and only sell a small proportion of their produce. The market structure is relatively competitive (URT, 2016). Buyers (traders) are of two types: there are many small buyers that buy pulses for local markets and a few big buyers who buy large volumes of pulses for processing, selling in the local market and for exporting. The big buyers have large modern storage facilities for storing large volumes of pulses and sell them in future.

Pulses Value Chain

The pulses value chain in Tanzania is comprised of various actors working at different nodes (from production to consumption). Figure 2 presents the pulses value chain map.

Figure 2. Pulses Value Chain Map in Eastern and Southern Africa



Source: Rusike *et al*, 2012



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The figure maps out the main elements along the pulses value chain classified according to the activities played by the chain actors. The activities are: research and seed production/multiplication, input supply, production, assembling/trading, wholesaling, processing, and retailing/outlets (Table 1). Rusike *et al* (2012) and Mponda *et al* (2013), indicate that the movement of legumes from production to consumption generally follows five channels, namely:

- Channel 1: Subsistence production, in which the farmers consume their own produce
- Chanel 2: Production and sale of fresh unprocessed pulses
- Chanel 3: Production and dried unprocessed pulses within the country
- Chanel 4: Production and dried unprocessed pulses for exports
- Chanel 5: Production and dried processed pulses within the country and outside the country

The types and number of actors involved in pulses marketing vary depending on the channel. Quality controllers are important actors in the pulses value chain especially at the input, storage, processing, consumption and international trade stages.

Table 1. Key Actors in the Pulses Value Chain

Node	Key Actors
Consumers	Household consumers, hotels and restaurants, schools, colleges, hospitals and government institutions (military, prisons, hospitals)
Retailers	Retailers, supermarkets
Processing	Food and feed manufacturers, packaging and grading companies
Wholesale/Export	Inter-regional traders, international exporters
Local trading	Primary local traders, village collectors, local assemblers, firms' buyers and agents/brokers, transporters
Production and on-farm storage	Smallholder farmers, medium scale farmers, large scale farmers, farmer groups/associations, private agribusiness companies
Input	<ul style="list-style-type: none">• Suppliers (agro dealers, seed traders, seed companies, fertilizer companies, chemical companies, machinery agents and companies)• Stakeholders involved in seed production and multiplication such as: breeders, researchers, seed certification agencies, seed producers (multipliers) (individual/farmer groups/associations), seed companies, organizations involved in research and seed production and multiplication (these include national and international research institutions)

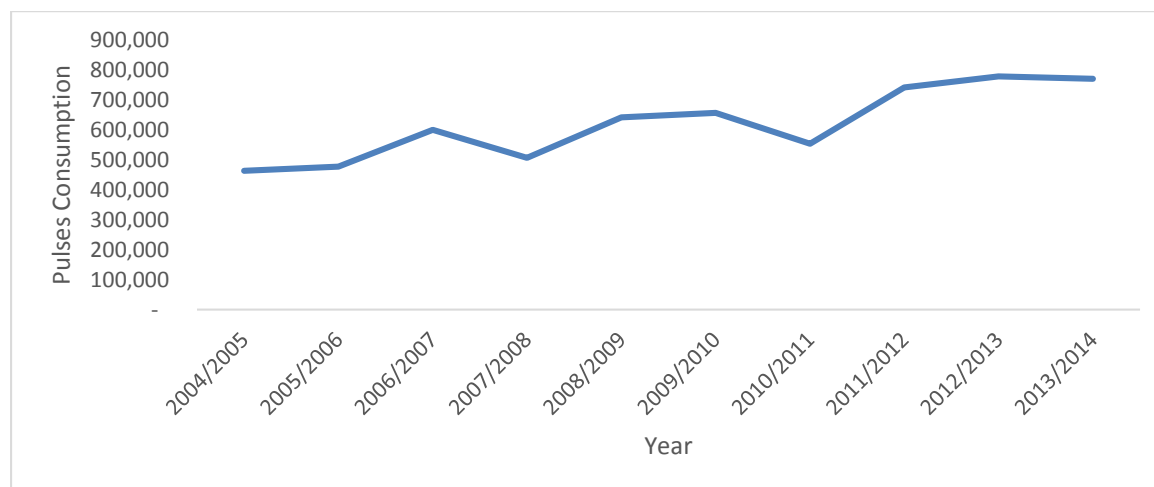
Source: Compiled by the authors based on Rusike *et al*, 2012 and URT, 2016



3. Consumption

There is a general increase in the consumption of pulses at national, regional and international levels. Domestic annual consumption for pulses increased by 43 percent in the last decade from 450 tons in 2004/05 to 790 tons in 2013/2014 (Figure 3). At the regional level, there is a growing demand for common beans and soybeans in the Southern Africa Development Community (SADC) and the East African Community (EAC) countries. At a global level, the South Asian Region (including India, Pakistan, Bangladesh, Nepal, Bhutan and Sri Lanka) account for the largest proportion of global consumption followed by European countries. The South Asian Region imports more than 4 million tons of pulses every year, with India leading the way (URT, 2016).

Figure 3. Annual Trend of Pulses Consumption (tons) in Tanzania



Source: MALF, 2015

4 Constraints and opportunities in the pulses value chain

4.1 Constraints

Production level

The constraints at production level include limited access to productivity enhancing inputs (such as quality seed, fertilizer and agro chemicals), reliance on rain fed agriculture, limited access to agricultural finance, limited access to land for investment, limited access to agricultural



extension and farmer support services, susceptibility to pests and diseases (e.g. *Alectra vogelii*, a semi-parasitic weed), low soil fertility and poor crop management practices (Ronner and Giller, 2012).

Trade and Marketing

There are many constraints to the trade and marketing of pulses in Tanzania, the key one is unfavorable policy environment to encourage trade investments in this value chain. Actors in the pulses value chain face various constraints in the form of tariff (e.g. import taxes, value added tax) and non-tariff barriers (e.g. cumbersome, costly or lengthy administrative procedures). Other constraints are limited quality of transport infrastructure in rural remote areas, limited access to financing for trade, lack of proper marketing information, inefficiencies in pulses marketing system and limited integration of smallholder farmers in national and regional value chains (Birachi et al, 2016).

Value Addition and Agro-processing

Currently, Tanzania has inadequate value addition and agro-processing activities for pulses. This contributes to high post-harvest losses and diminishes farmers' benefits on legume production. The key constraints to agro-processing and value addition are limited access to processing facilities, limited access to credit to establish agro processing facilities and limited adoption of improved technologies for post-harvest handling and value addition.

4.2 Opportunities

Increase in Production: There is growing demand for pulses due to population growth, awareness of pulses as an alternative source of protein and increase in demand for pulses as raw materials for animal feed processing plants. Growth in demand for pulses provides an opportunity for increased production to meet the growing demand. Pigeon peas, chickpeas and dry peas are the pulses showing the fastest global market growth for consumption as dhal. The demand for soybean for human food and livestock feed is growing as well at national regional and global levels. The potential for increased production for sale in Tanzania and for export is enormous given the country's suitability for production of pulses (FAO, 2015).



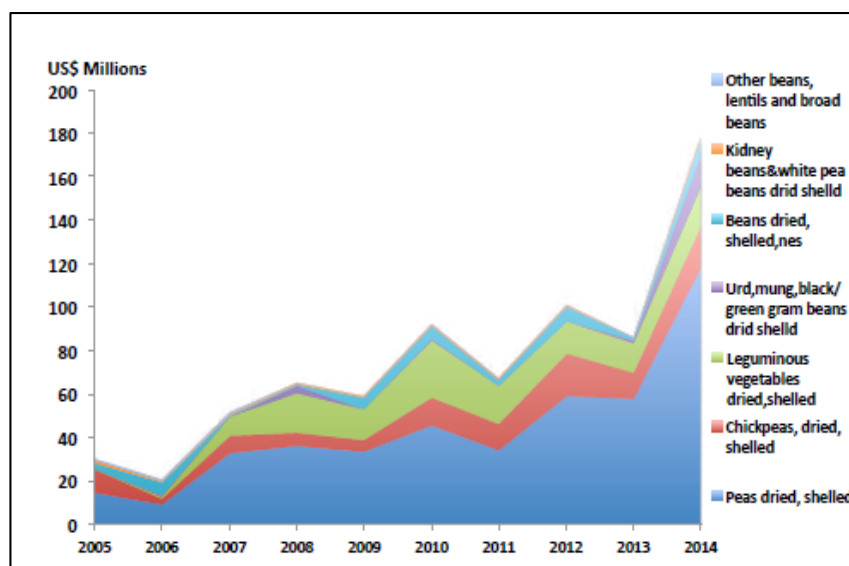
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Expansion in pulses trade at national, regional and global levels: There are opportunities to invest in pulses trade at national, regional and international markets and recent statistics illustrate this potential while annual export trends show increases since 2005 (Figure 4). Pigeon pea and chickpea constitute a large part of the export volume, followed by common bean, groundnut and soybean (URT, 2016): India is the main importer for URT's pigeon peas; about 27% of India's pigeon pea imports come from Tanzania. Tanzania also exports pulses to the Netherlands and it is estimated that 80% of the bean export is destined to that country. Other important markets for Tanzanian pulses are the United Kingdom, Italy and Canada (URT, 2016).

Seed Production and Seed Trade: The growing demand for pulses provides an opportunity for investment in seed production, seed multiplication and seed trade.

Value Addition and Agro-processing: Investments in value addition for pulses is an emerging opportunity. Areas of investment could be on production of human food (e.g. dhal, soy milk and fortified bean) and animal feed (through establishment of feed production facilities).

Figure 4. Annual Export Trends of Pulses from Tanzania



Source: URT, 2016

5. Development Partners Supporting the Value Chain



The development partners (DPs) have continuously supported pulses value chain development. Here are a few examples of recent interventions:

- The United States Department of Agriculture (USDA) supported '*Soya ni pesa project*' implemented by Catholic Relief Services (CRS) in Ruvuma, Njombe and Morogoro regions. The project provides training programs in various aspects of group organization and soybean production. The technical emphasis is on the quality control of seeds, seed processing (including provision of machinery), and bulking of basic seed for general distribution.
- The Bill and Melinda Gates Foundation has funded a project known as "*Changing fortunes of farmers and empowering women in the Southern Highlands of Tanzania through legumes*". The aim of the project is to increase productivity by developing and disseminating improved varieties with good agronomic practices to enable farmers to quadruple legume yields.
- The Food and Agriculture Organization of the United Nations (FAO) has supported the value chain by funding analytical studies aiming at generating information for policy makers to make informed decisions for the development of the value chain.
- The World Trade Organization (WTO) has supported the Government to develop the Value Chain Roadmap for Pulses for 2016-2020 (URT, 2016). The roadmap was developed on the basis of its process, methodology and technical assistance from the International Trade Centre (ITC) within the framework of its Trade Development Strategy Program.

6. Recommendations and Policy Implications

Scale up production and productivity of pulses

Increased production of pulses has huge potential to contribute to food security and poverty reduction by facilitating improved access to productivity enhancing inputs (such as quality seed, fertilizer, water for irrigation), enhanced access to agricultural financing, land for investment and agricultural extension and farmer support services. One of the promising means for effecting increased production is to encourage out-growers and contract farming schemes that can



facilitate enhanced access to inputs and market opportunities. For these to be effective, it is important to enact policy measures to protect all parties.

Create an enabling environment for investments in pulses value chain

Private investment in pulse production and trade by local and foreign investors requires friendly investment environment. It is important to not just focus on policy design but also policy implementation. In many cases policies and regulations to facilitate production or trade are in place; however, they are not effectively implemented due to either weak coordination among responsible agencies or weak enforcement capacity. Addressing these challenges will be useful.

Strengthen producer, processors and trader organizations

Collective action is very important in Tanzania mainly because many actors along the pulses value chain operate at small scales. Organizing agricultural actors in groups provides means for channeling necessary support or interventions. When stakeholders are organized, they are able to undertake joint activities such as input procurement and marketing, learn from each other, and access capacity building or technical support activities. Unfortunately, there are not many strong groups in the pulses value chain in Tanzania. The majority of the existing ones suffer from weak governance and inadequate technical, managerial and financial capacity. It is important for the Government to have strategic policy interventions such as training and technical support activities in support of strengthening of these organizations to enhance production, governance, management and marketing.

Address infrastructure and technological issues

Commercialization of pulses requires established supportive infrastructure. Inadequate and poor road services in remote areas result in high transportation costs by farmers and traders. Therefore, there is a need for the Government to place high priority on investing in road network. It is also important to have other supportive infrastructure such as irrigation, storage, agro processing facilities and physical market infrastructure. Similarly, it is important to support adoption of improved technologies for post-harvest handling and value addition.

Forward planning in market development

Various strategic interventions are possible for strengthening market development capacities of the sector. These include capacity-building of key institutions in the “pulses network” to



provide necessary support services, promoting pulses as a viable and growing agricultural sub-sector, developing a network of institutions to improve sector coordination, and improving the quality of products through adherence to quality standards.

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This brief draws heavily from URT, 2016 and Birachi *et al*, 2016

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Disclaimer: This commodity value chain brief does not reflect the opinion of the sponsoring agencies, but of the author based on the literature review and analysis.