Preliminary Report

Regional Access to Seeds Index for Eastern Africa

Prepared for

Access to Seeds Foundation

December 2014

Cardno
Shaping the Future

Acroynms and Abbreviations

AGRA	Alliance for Green Revolution in Africa
AFSTA	African Seed Trade Association
ASA	Agricultural Seed Agency
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
CCARDESA	Centre for Coordination of Agricultural Research and Development for Southern Africa
CGIAR	Consortium of International Agricultural Research Centers
EAC	East African Community
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
HA	Hectare
ISTA	International Seed Testing Agency
MAFC	Ministry of Agriculture Food Security and Cooperatives
MINAGRI	Ministry of Agriculture and Animal Resources
MT	Metric Ton
NARO	National Agricultural Research Association
OECD	Organization for Economic Co-operation and Development
RADA	Rwanda Agriculture Development Authority
TASTA	Tanzania Seed Trade Association
UPOV	International Union for the Protection of New Varieties of Plants
ZARI	Zambia Agricultural Research Institute

Executive Summary

This report provides baseline information on the East African regional seed sector detailing both regional and country specific scenarios. The information has been sourced from existing literature and interviews with regional and national seed sector players. Twelve countries are included in this report: Burundi, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, South Sudan, Tanzania, Uganda, Zambia and Zimbabwe.

The study was carried out under the Access to Seeds Index (ATSI) initiative which is focused on improving access to seeds by smallholder farmers, who make up the majority of farmers in Eastern Africa. The study aims at providing baseline information for the design of the Regional Access to Seeds Index for Eastern Africa.

The study gathered information on the key seed companies in the region and key parameters on Eastern Africa's agriculture and seed sectors, focusing on the general regional status, main food crops, enabling business environment, growth potential and challenges. Results indicate that the countries are heavily dependent on agriculture while smallholders contribute the bulk of the production. The formal seed sector is not well developed and therefore the majority of farmers still depend on informal sources.

The main food crops are chick pea, dry beans, groundnut, maize, millet, pigeon pea, rice, sorghum, soya, tef and wheat (field crops) and amaranthus, baby corn, beetroot, black nightshade, broccoli, carrot, cauliflower, collard, cucumber, celery onion, peas, spinach, snow peas and spider plant (vegetables). Over the past decade, the region has shown great improvement in creating an enabling business environment through market liberalization, socio-political stability, policy and legal reforms, formation of regional economic blocks and establishment of agricultural institutions. The region has high potential for agricultural growth due to abundant arable land, labour force and good climate. However, the region faces challenges such as low adoption of new technologies, poor soil and water management, insecure land tenure, high population pressure, inadequate agricultural credit facilities, low levels of input use, underdeveloped breeding programs, inadequate improved seeds and insufficient extension services. The targeted twelve countries are at different stages of agricultural development but there are efforts to encourage investment in this sector through regional initiatives.

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1 Regional Seed Sector Profile

1.1 Introduction

This preliminary study was carried out under the aegis of the Regional Access to Seeds Index for Eastern Africa to provide an overview of the seed industry in the region. The countries included are Burundi, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, South Sudan, Tanzania, Uganda, Zambia and Zimbabwe. The data in this report informs the design of the methodology for the Regional Index in a holistic way, covering the diverse industry players, the major food crops, the prevailing business environment, the agricultural growth potential and the challenges being faced by farmers.

The countries in the region are predominantly agricultural; they depend in the sector for both food security and economic growth. The majority of the farmers are smallholders, making up about 85% of the total farmers in Eastern Africa. Meanwhile, there are both informal and formal seed systems - but the former is predominant. Farmers are persistently faced with inadequate and low quality agricultural inputs such as seeds. Seed insecurity in the region is widespread despite the entry of international, regional and national seed companies into the marketplace. The seed companies active in the region are thereby being encouraged to increase their focus on seed requirements of the smallholder farmers. Correspondingly, there is need to understand the prevailing situation in the region through a baseline survey. This report is a result of such a survey carried out in late 2014. The data and information were collected through secondary sources such as review of existing literature and statistics and primary sources such as reports from country focal points and interviews with industry players.

1.2 Baseline Survey Methodology

The study was carried out to collect and collate information and data on the regional seed sector covering 12 countries for the purpose of developing appropriate tool for evaluating seed companies selected by Regional Access to Seeds Index. The information and data were sourced from literature review and industry stakeholders in both private and public sectors (Regional ATSI Baseline Survey, 2014). The limitations on this study were the variations in the sources of information in different countries and information/data gaps in some countries.

1.3 Regional Seed Sector at a Glance

Table 1 indicates various parameters on agriculture and the seed sector in the region. The region has a population totalling about 325 million with an average annual growth rate of about 2 % based on 2013 projections. The contribution of agriculture to national GDP varies from 20.3% for Zimbabwe to 51% for Burundi, while the sector employs 60% in Zimbabwe and 90% in Burundi. The contribution of agriculture to export earning is equally high, ranging from 35% in Zambia to 89.3% in Ethiopia. The statistics clearly show that these countries rely heavily on agriculture. The sector is dominated by smallholders and the bulk of the seed is sourced from the informal system.

Table 1-1 Regional seed sector at a glance

Country	Population (millions)	Agric. GDP (US$)	Agric. Employment (%)	Agric. Export Earning (%)	Arable Land (million Ha)	Smallholders (%)	Formal Seed Market (%)	Seed Volumes (tons)		
								Local	Export	Import
Burundi	10	51	89	90	1.1	90	10	No data	0	6 000
Ethiopia	94.1	50	76	89	15.4	96	10	25 000	0	No data
Kenya	40	26	69	60	5.6	75	28	39 947	5 755	1 821
Madagascar	22	30	69	40	3.5	No data	10	No data	No data	No data
Malawi	13	34	78	80	3.07	75	15	24 000	200	750
Mozambique	25.8	28	80	31.5	5.7	93	10	No data	No data	No data
Rwanda	11.7	34	89	45	1.18	90	3	6000	0	3680
South Sudan	11.3	36	49	No data	30	No data	No data	No data	No data	No data
Tanzania	49.3	25	74	24	14.5	88%	10	14000	No data	14600
Uganda	34.7	43	73	70	6.9	85	20	12 000	98 550	878
Zambia	12	20	61	35	3.8	80	15	74 150	2 500	14 500
Zimbabwe	13	20.3	60	No data	3.1	8	70	42 000	3 183	3 125

Source: Regional ATSI Baseline Survey, 2014

1.4 Main Food Crops Grown in the Eastern Africa Region

Table 1-2 shows the main food crops in the region, both field crops and vegetables. Most of the field crop seeds are sourced from within the region while the majority of vegetable seeds are imported, mainly from South Africa, Asia, USA and Europe.

Table 1-2 Main food crops grown in the Eastern Africa Region

Field Crops	Vegetables
*Chickpea	*Amaranthus
Dry beans	Baby corn
*Groundnut	Beetroot
Maize	*Black nightshade
Millet	Broccoli
Rice	Cabbage
*Sesame	Capsicum
Sorghum	Carrot
Soya bean	Cauliflower
Sunflower	Celery
*Tef	Collards
Wheat	Cucumber
	Eggplant
	French beans
	Leek
	Lettuce
	Onion
	Spinach
	*Spider plant
	Snow peas
	Tomato

Source: Regional ATSI Baseline Survey, 2014

Note: Crops with asterisk (*) are not included in the international list of crops

1.5 Enabling Environment for the Seed Business in the Region

Table 1-3 presents the various positive and negative factors influencing the seed business environment in the region. Over the past decade, the region has shown improvement in attracting investment in the seed business through policy and legal reforms that promote expanded regional seed trade. The main negative factors in the region are related to policy and institutional arrangements. The enabling business environment of countries in the region according to World Bank's ease of doing business index range from 111 to 186. However, Rwanda stands out in the region at position 46.

Table 1-3 Enabling environment for the seed business in the region

Positive factors	Negative factors
Membership to various international seed protocols e.g. ISTA, UPOV and OECD seed scheme (Malawi, Zambia, Kenya, Zimbabwe, Uganda)	Limited capacity to domesticate and implement national and regional seed policies and regulations except Kenya, Zambia, Malawi and Zimbabwe.
National and regional seed policies, regulations and standards are in place except Madagascar and South Sudan	Issues on land and agricultural policies in some of the countries
Membership to regional economic blocks e.g. COMESA, SADC and EAC	Less facilitating economic policies such as uncoordinated subsidies, levies and tax regimes
Established agricultural institutions e.g. research organizations, regulatory authorities and training institutions	Limited access to affordable credit by farmers
Rapid adoption of free market economy except Ethiopia	State control of the seed sector in some countries e.g. Ethiopia

Positive factors	Negative factors
Existence of associations of seed traders	Institutional arrangements that interfere with service delivery to the seed sector e.g. bureaucracies
Focus on agriculture as a priority sector for development	Low national budget allocation to agriculture in some countries
Skilled human resource base in most countries	

Source: Regional ATSI Baseline Survey, 2014

1.6 Eastern Africa Region's Potential for Agricultural Growth

Table 1-4 highlights the potential for growth in the region encompassing technical and socio-economic factors. The key positive factors are the availability of labour, large market, arable land and suitable climatic conditions.

Table 1-4 Eastern Africa Region's potential for agricultural growth

Technical factors	Socio-economic factors
Fast growing agricultural technologies and institutions	Increasing population and markets in the region
Establishment of relevant regional institutions e.g. ARIPO.	Ongoing policy and regulatory reforms and harmonization at national and regional level
Ease of sharing new varieties across the region through policy and legal harmonization	Establishment of regional economic blocks (COMESA, SADC and EAC)
Increased regional capacity building initiatives	Abundant arable land with high potential for agriculture
Establishment regional research bodies e.g. ASARECA, SCAR	Large pool of labor force
Favorable ecological conditions for agriculture	Increasing political stability
Vast water resources that can be used for irrigation	Fast developing communication networks
Membership to various international conventions and protocols	Increased adoption of free market economy in the region

Source: Regional ATSI Baseline Survey, 2014.

1.7 Key Challenges in the Eastern Africa Region's Agricultural Sector

Table 1-5 summarizes the key challenges facing agriculture in the Eastern African region, divided into technical, environment and socio-economic categories. The seed-related challenges include underdeveloped crop breeding programs, slow adoption of new varieties and inadequate seed supply (both basic and certified).

Table 1-5 Key challenges in the Eastern Africa Region's agricultural sector

Technical	Environmental	Socio-economic
Less developed breeding programs	Loss of soil and water resources	Gaps in land and agricultural policies
Slow adoption of new varieties by farmers	Use of environmentally unsustainable agricultural methods e.g. shifting cultivation, slash and burn	High population pressure on available arable land leading to subdivisions and reduced land holdings.
Insufficient basic seeds from public research programs	Misuse of agrochemicals e.g. pesticides causing pollution and health hazards	Socio-political instability in some countries
Limited public extension service to farmers	Prevalence of crop diseases and pests	Insecure land tenure systems
Low level of input use e.g. fertilizers	Erratic climate conditions – changes in seasonal patterns, floods and droughts	Limited affordable credit to the agriculture sector
Limited capacity in modern agricultural technologies.		High levels of poverty and low purchasing power
Less developed value addition systems		Institutional arrangements and linkages that are suitable for smallholder farmers

Source: Regional ATSI Baseline Survey, 2014

1.8 Selected International, Regional and National Seed Companies Physically Operating in the Region

Grouping of Seed Companies in Eastern Africa Region for ATSI

The region has a wide range of seed companies focusing on different countries, ecological zones, crops, parts of seed value chain and even markets. Based on the geographical coverage, the seed companies in this region may be put into 4 groups:

International Seed Companies: Seed companies which have bases in the developed countries. Most of them access the market in the region by selling their seeds, mostly through agents. A few have established some outlets while others are developing a stronger presence by starting research and production in the region.

Regional Seed Companies: Seed companies established within a country in the region which have operations in more than one country. This has been made possible through regional economic blocs such as SADC, COMESA and EAC. Seeds, like any other agricultural input, are traded among the member countries.

National Seed Companies: Seed companies producing and supplying seeds with one country. Most of the first seed companies in this region were government-owned. Some of them link up with universities and research institutions to breed varieties. In most of the countries these companies have been privatized or have had government shares reduced.

Niche Seed Companies: Seed companies that provide unique services to farmers matching the ecological conditions or specific farmers' requirements such as focus on local food crop species, drought tolerant varieties, and seed classes (e.g. hand plant). They exploit the gaps left by the upper categories of seed companies especially at local level. Such seed companies have developed to national and even regional levels by expanding portfolios.

Preliminary Criteria for selection of Seed companies for Participation in ATSI 2014-2015

1. Integrated business model
2. Degree of mutual identification
3. Global companies with presence and substantial business activities in region
4. Regional companies
5. National companies with large market share in their home country

Based on the above criteria the niche companies have been excluded from the selected seed companies for Regional ATSI evaluation.

1.9 Selected Seed Companies in Eastern Africa based on the Preliminary Criteria

GLOBAL	Crop		Business model				Rev
	Field	Veg	R&D	PRO	MAR	CAP	
1. Amiran		X			X	X	
2. Capstone	X	X	X	X	X	X	
3. East West Seed		X	X	X	X	X	
4. Monsanto	X	X	X	X	X	X	
5. Pioneer	X	X	X	X	X	X	
6. Pop Vriend		X		X	X		
7. Syngenta	X	X	X	X	X	X	
8. Technisem		X	X	X	X	X	
9. Vikima		X		X	X		

REGIONAL	Crop		Business model				Rev
	Field	Veg	R&D	PRO	MAR	CAP	
1. East African SC	X	X	X	X	X	X	
2. FICA	X	X	X	X	X	X	
3. Hygrotech		X	X		X	X	
4. Kenya Seed Co	X	X	X	X	X	X	
5. MRI	X		X	X	X	X	
6. NASECO	X	X		X	X	X	
7. Pannar	X	X	X	X	X	X	
8. Progene	X		X	X	X	X	
9. Victoria	X	X		X	X	X	
10. SeedCo	X	X	X	X	X	X	

NATIONAL	Crop		Business model				Rev
	Field	Veg	R&D	PRO	MAR	CAP	
1. Ethiopian SE	x	X	X	X	X	X	
2. NSC Malawi	X	X	X	X	X	X	
3. Tanseed	X	X		X	X	X	
4. Western Seed Co	X		X	X	X	X	
5. Zamseed	X	X	X	X	X	X	

Niche

Seed Company	Crops	Country	Niches
Dryland Seed Co.	OPV/dryland crops	Kenya	Smallholders in ASAL
Mukwano Seed Co.	Oil crops	Uganda	Smallholder oil crops
Victoria Seed Co.	Cereal, pulses, oil crops	Uganda	Smallholders (relief seed - refugees)
Leledet Seed Co.	OPVs, Millet, Groundnuts, Sorghum	Kenya	Neglected, smallholder crops
KARI Seed Unit	Cereal, pulses, vegetables, oil crops	Kenya	Breeder/Foundation/Basic seeds

2 Burundi

2.1 Agricultural Background

Contribution of Agriculture to Burundi's Economy

Burundi has a population of 10,888,321 with an annual growth rate of 3.1% per annum (2012 census). Agriculture is the main economic activity in Burundi. The table below outlines its contribution to the country's Gross Domestic Product (GDP), employment and foreign exchange earnings.

Table 2-1 Contribution of agriculture to Burundi economy

Economic contribution	Data
1. Contribution to Gross Domestic Product	51%
2. Contribution to employment	93%
3. Contribution to foreign exchange earnings	90%

Source: Regional ATSI Baseline Survey, 2014

Potential for Agriculture

The total area of Burundi is 27830 sq. km and 35.57% of it is arable (9 900 sq. km). The water surface area makes up 2180 sq. km supporting irrigated agriculture in 90 000 ha. The level of food vulnerability is extremely high with 61% of households facing the risk food insecurity every year due to adverse climate, declining soil fertility and rising food prices (World Food Program, 2004).These conditions are suitable for growing most food crops. The country has three main agro-ecological zones i.e. Uplands, Middle lands and Low lands. The country is small and variation in climatic conditions is minimal.

Table 2-2 Potential for agriculture in the main agro ecological zones of Burundi

Up lands	Middle lands	Low lands
Rich soils (well drained volcanic soils)	Rich soils with mild temperatures.	Rich soils derived deposition
Mild temperatures due to high elevation – suitable for wheat, maize, irish potato and other temperate crops	Suitable for most food crops	Suitable for paddy rice

Source: Regional ATSI Baseline Survey, 2014

Main Food Crops

Burundi's agro ecological zones support the growing of different crops as presented in table 2-4 below.

Table 2-3 Main food crops grown in Burundi

Field crops	Vegetables
Maize	Tomatoes
Beans	Carrots
Cassava	Cabbage
Sorghum	Onion
Rice	Pepper
Millet	Fresh beans
Groundnut	Spinach

Sweet potato	Celery
Irish potato	Leek
Wheat	Parsley

Source: Regional ATSI Baseline Survey, 2014

Scale of Farming

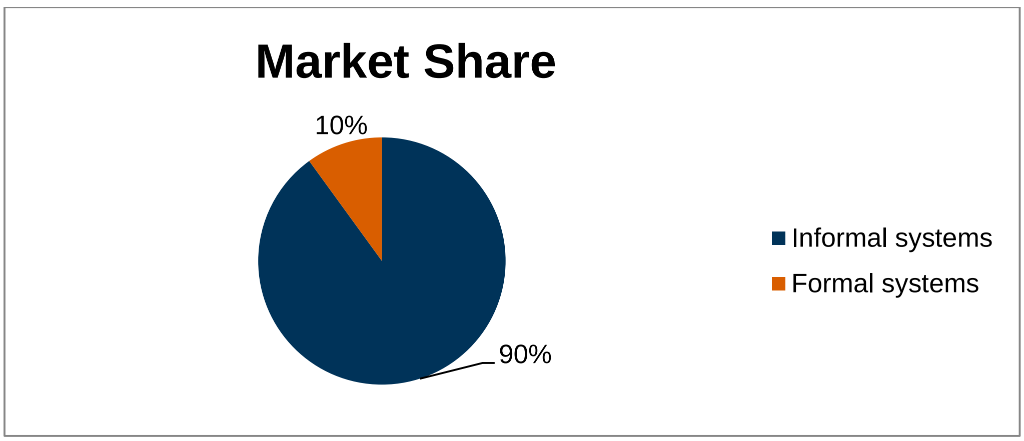
Over 90% of farmers in Burundi are smallholders. The country has high population density of 257 people per sq. km and an average land holding of 0.5 ha.

2.2 Seed Industry in Burundi

Seed Systems

Burundi's seed systems are characterized by traditional practices of seed production and maintenance, including barter trade and selling in local markets. There is also a community-based seed system which consists of farmers' organizations that are supported by non-governmental organizations (NGOs) and relief agencies. There are farmers who are emerging as producers and sellers of seeds of food and cash crops of local, improved and imported varieties. Free seed distribution is undertaken by humanitarian organizations, which source the seeds from informal sources.

Figure 2-1 Formal and informal seed market share



Over 90% of the seeds used by farmers are from informal systems i.e. they have not undergone certification process. A few seed companies in the region are now trying to gain entry into the Burundian seed market e.g. FICA, Kenya Seed and SeedCo, The volumes are still low. Most of the vegetable seeds are imported from The Netherlands and Kenya. In 2010, a total of 9646 kg of vegetable seeds were imported into Burundi. On average FAO and UN agencies, imports 3 to 4 tons per year into Burundi.

Formal Seed Production and Supply

The country imports both field and vegetable crop seeds. Local production is also being carried out but information is not available.

Table 2-4 Formal seed production and supply

Local production (metric tons	Seed import(metric tons)	Seed export (metric tons)
No data	6.0 (2009)	0

Source: Regional ATSI Baseline Survey, 2014

Major Stakeholders in Burundi's Seed Industry

Most of the stakeholders in the seed industry are development partners and non-governmental organizations as the sector mainly depends on relief programs. The Figure below highlights the key activities along the seed value chain and the main players in the sector.

Figure 2-2 Major stakeholders in Burundi's seed sector

Policy advocacy	Regulatory agencies	Research and breeding	Production, processing and/or packaging	Marketing, education, training extension/ relief

• Burundi Seed Traders Association
• Ministry of Agriculture
	• Department of Promotion of Seeds & Plants
	• Ministry of Agriculture
		• Belgium Technical Cooperation
		• Institute of Agricultural Sciences of Burundi (ISABU)
			• Farmers' Cooperatives
			• Institute of Agricultural Sciences of Burundi
				• Regional seed companies:
				  • Pannar Seed Co
				  • NASECO
				• International non-governmental organizations:
				  • World Vision
				  • Catholic Relief Service
				  • Food Agriculture Organization (FAO)
				  • Self-Help Africa

Source: Regional ATSI Baseline Report, 2014

3 Ethiopia

3.1 Agricultural Background

Contribution of Agriculture to Ethiopia's Economy

Ethiopia has a population of 94.1 million (2013 census) with an annual growth rate of 2.6%. Agriculture is the main economic activity as indicated by the statistics in the table below.

Table 3-1 Contribution of agriculture to Ethiopia's economy

Statistics	Value
1.Contribution to Gross Domestic Product	50%
2.Contribution to employment	80%
3.Contribution to foreign exchange earnings	89.3%

Source: Regional ATSI Baseline Survey, 2014

Potential for Agriculture

Ethiopia has great agricultural potential because of its vast arable land which constitutes 36.4% of the country's total land mass (1.1 million sq. km). It has a diverse climate, generally adequate rainfall and a large pool of labour force. The country has more than ten rivers, all with potential to support irrigation farming.

Table 3-2 Potential for agriculture in the main agro eco-zones

Agro eco-zones	Arid zone	Semi-arid	Semi moist	Moist	Sub-humid and humid cover	Pre humid
Potential for agriculture	Less productive and pastoral (31.5% of the country)	Less harsh (3.5% of the country)	Highly threatened by erosion (19.7% of the country).	It is the most important agricultural land of the country, and cereals are the dominant crops (25% of the country)	Provides the most stable and ideal conditions for annual and perennial crops (4%) of the county	Suited for perennial crops and forests (close to 1% of the country)

Source: Regional ATSI Baseline Survey, 2014

Main Food Crops

The diverse ecological conditions of Ethiopia support production of a wide range of food crops. The main food crops in the country are presented in table 3-2 below.

Table 3-3 Main food crops grown in Ethiopia.

Field crops	Domestic Vegetables	Export vegetables
Maize	Tomatoes	French beans
Teff	Cabbage	Baby marrow
Wheat	Carrots	Baby corn
Sorghum	Spinach	Snow peas, Snap peas, mange tout
Oats	Onion	Cherry tomatoes
Millet	Eggplant, cauliflower	Capsicums
Rice	Traditional vegetables, including Amaranths	
Dry beans		

Field crops	Domestic Vegetables	Export vegetables
Groundnuts		
Sesame		
Chick pea		

Source: Regional ATSI Baseline Survey, 2014

Scale of Farming

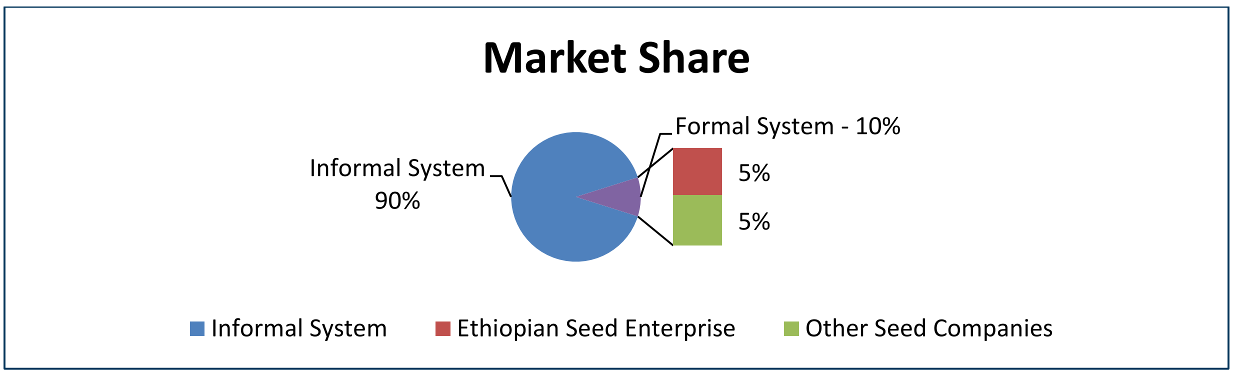
The scale of farming in Ethiopia is categorized as follows: The smallholder farmers cover 96% of farmed land while large scale farmers account for only 4%. The large scale land holding vary from as small as five hectares for horticultural crops to as large as 4,000 ha for cereal producers. Of the smallholder farmers, about 55.7% of farming households cultivate less than 0.5 hectares and some 80% cultivate less than 1 hectare (CSA, 2003, Part I: 91–93).

3.2 Seed Industry in Ethiopia

Seed Systems

Ethiopia's seed industry is government-controlled, with largely centralized seed production and distribution. The industry has both formal and informal systems (see figure 3-1 below).

Figure 3-1 Formal and informal seed market share in Ethiopia



3.3 Formal Seed Production and Supply

Formal seed production and supply in Ethiopia is presented in table 2-5 below. Seed imports are from South Africa, Zimbabwe and Kenya. Ethiopia is the largest seed importer in Eastern Africa region as it is the region's smallest seed producer yet it has the highest potential for agriculture.

Table 3-4 Formal seed production and supply in Ethiopia (2008)

Local seed production (metric tons	Seed import (metric tons)	Seed export (metric tons)
20,000 – 30,000	No data	0

Source: Regional ATSI Baseline Survey, 2014

3.4 Major Stakeholders in the Seed Industry

The seed industry has major players from the public sector and some from the private and NGO sectors. Figure 3-2 below shows the various stakeholders and their roles in the industry.

Figure 3-2 Major stakeholders in Ethiopia's seed industry

Policy advocacy	Regulatory agencies	Research and breeding	Production, processing and/or packaging	Marketing, education, training extension
• Ethiopian Seed Growers & Processors Association • Common Market for Eastern & Southern Africa Countires (COMESA) • ASARECA • Institute for Biodiversity Conservation (IBA) • Integrated Seed Sector Development (ISSD)	• Ministry of Agriculture • Ethiopian Institute of Agricultural Research	• Ethiopian Institute of Agricultural Research • Regional Agricultural Researh Institute • CGIAR	• Ethiopian Seed Enterprise • Oromia Seed Enterprise Private Farmers • Pioneer Hybrid Seed Ethiopia • Bureau for Agriculture & Rural Development (BoARD)	• Ethiopian Seed Enterprise • Non-governmental organizations • Farmer cooperatives • Regional seed companies

Source: Regional ATSI Baseline Survey, 2014

4 Kenya

4.1 Agricultural Background

4.2 Contribution of Agriculture to Kenya's Economy:

Kenya's population is estimated to be 44.35 million with an annual growth rate of 2.7% (World Bank, 2013). Agriculture is the main economic activity as indicated by the statistics in Table 4-1.

Table 4-1 Contribution of agriculture to Kenya's economy

Economic contribution	Value
Contribution to Gross Domestic Product	26%
Contribution to employment	75 %
Contribution to foreign exchange earnings	60%

Source: Regional ATSI Baseline Survey, 2014.

Potential for Agriculture

Only 8% of Kenya's total land mass (584,000 square kilometres) is arable. The country has three broad agro ecological zones: humid region (highlands), sub-humid region (lake region and western Kenya) and arid & semi-arid region (northern and eastern Kenya).The three zones support different crops and farming systems, but crop production is only possible under irrigation in the semi-arid region.

Table 4-2 Potential of agriculture in the main agro ecological zones of Kenya

Humid zone	Sub humid zone	Arid and semi-arid zone
Good climatic conditions	Good climate conditions	Abundant land
Good soils	Abundant water	Fertile soils
Large local market due to high population	Good domestic and regional markets	Low crop pest prevalence
Low prevalence of pests and diseases		High potential for irrigation along the main rivers
High irrigation potential because of presence of permanent rivers		

Source: Regional ATSI Baseline Survey, 2014

Main Food Crops

Kenya's three agro ecological zones support the growing of different crops as presented in Table 4-3 below.

Table 4-3 Main food crops grown in Kenya

Field crops	Domestic vegetables
Maize	Tomatoes
Wheat	Carrots
Barley	Spinach
Sorghum	Onion
Dry beans	Kale/collards
Rice	Traditional vegetables (amaranths, black nightshade, spider plant)
Millet	Fresh beans
Groundnuts	Baby corns
Sesame	Snow peas
Soya bean	Capsicum

Field crops	Domestic vegetables
	Eggplant
	Okra
	Water melon

Source: Regional ATSI Baseline Survey, 2014

Scale of Farming

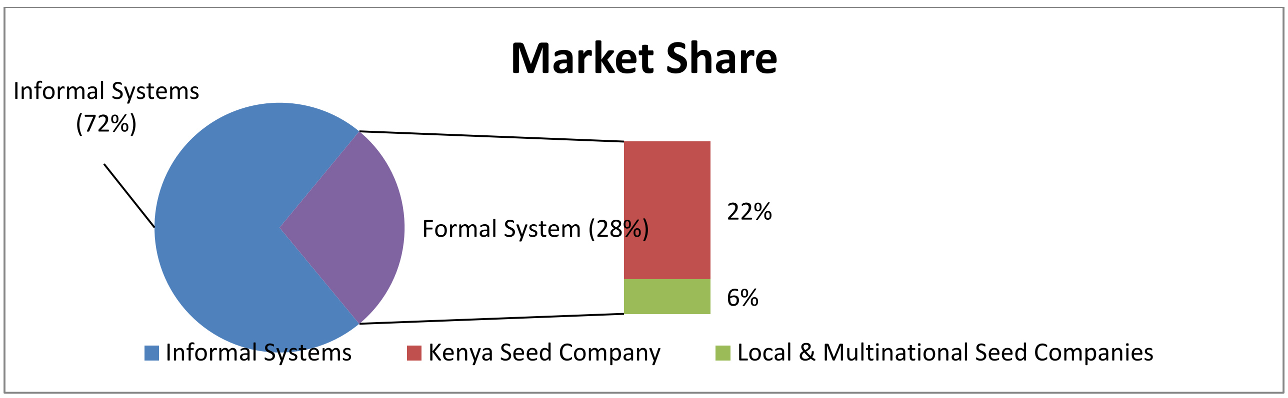
There are three categories of farming in Kenya according to the size of land holdings; small scale (0.2 - 3 hectares) medium scale (3 - 49 hectares) and large scale (50 hectares and above). About 75 % of Kenyan farmers are in the small scale category.

4.3 The Seed Industry in Kenya

Seed Systems

Kenya's seed industry operates under a liberalized market economy. There are 129 registered seed companies of which 25 are active. The seed industry has both formal and informal systems (see Figure 3-1). The formal system is dominated by Kenya Seed Company, which controls 70% of the market. The informal seed sector accounts for approximately 72% of the total seeds produced in Kenya (Wekundah J.M, 2012). Seeds for traditional crops are mainly from the informal system but those for maize and rice (66% and 85% respectively) are supplied from the formal sector.

Figure 4-1 Formal and Informal Seed Market Share



Formal Seed Production and Supply

The bulk of the formal seeds are produced locally. The seed imports come from Southern African countries for maize and Europe for vegetables. Formal seed production and supply in 2013 is shown in Table 4-4 below.

Table 4-4 Formal seed production and supply in Kenya (2013)

Local production (metric tons)	Seed import (metric tons)	Seed export (metric tons)
39,947,340	5,755,385	1,821,265

Source: Regional ATSI Baseline Survey, 2014

Major Stakeholders in Kenya's Seed Industry

The seed industry has players from the private, public and non-governmental sectors as presented in Figure 4-2:

Figure 4-2 Major stakeholders and their roles in Kenya's seed industry

Policy advocacy

- Ministry Of Agriculture
- Agricultural Sector Coordination Unit
- Technical Working Groups
- District Agricultural Development Committees
- Egerton University - Tegemeo Institute
- Seed Trade Association of Kenya
- Africa Seed Trade Association
- Kenya National Federation of Agricultural Producers
- Kenya National Farmers Congress
- Plant Breeders Association
- Agro–Dealers Association
- Kenya Farmers Association
- Cereal Growers Association
- Association of Genealogists and Researchers in Archives

Regulatory agencies

- Kenya Plant Health Inspectorate Service

Research and breeding

- Kenya Agricultural Research Institute
- Kenya Seed Company/ Simlaw Seeds
- Public universities such as Jomo Kenyatta University of Agriculture and Technology and the University of Nairobi
- Local seed companies
- Multinational companies:
  - Monsanto
  - Pannar
  - Pioneer
  - Seed Co.
- CGIAR
- Africa Agricultural Technology Foundation
- Association for Strengthening Agricultural Research in Eastern and Central Africa
- Association of Genealogists and Researchers in Archives

Production, processing and/or packaging

- Kenya Seed Company / Simlaw Seeds
- Kenya Agricultural Research Institute's Seed Unit
- National Irrigation Board
- Local and multinational Seed companies
- Private farmers and contract growers
- Multinational companies
- Community based organizations (CBOs)
- One Acre Fund
- Association of Genealogists and Researchers in Archives
- United States Agency for International Development (USAID)

Marketing, education, training extension

- Kenya Agricultural Research Institute
- Ministry of Agriculture
- University of Nairobi's Seed Enterprise Management Institute (SEMIs)
- Kenya National Federation of Agricultural Producers
- Kenya National Potato Farmers
- Local and multinational seed companies
- Agro-dealers, agents & sub-agents.
- Community based organizations (CBOs)
- One Acre Fund
- FIPS Africa
- CGIAR
- Africa Agricultural Technology Foundation
- Agricultural Cooperative Development International/ Volunteers in Overseas cooperative Assistance
- Association of Genealogists and Researchers in Archives
- United State Agency for International Development

Source: Regional ATSI Baseline Report, 2014

5 Madagascar

5.1 Agricultural Background

Contribution of Agriculture to Madagascar's Economy:

Madagascar's population is estimated to be 22.9 million with an annual growth rate of 2.8% (World Bank 2013). About 76% of the population lives below the poverty line, most of who are in the rural areas. Agriculture is the main economic activity as indicated by the statistics in Table 4-1.

Table 5-1 Contribution of agriculture to Madagascar's economy

Economic contribution	Value
1.Contribution to Gross Domestic Product	30%
2.Contribution to employment	70 %
3.Contribution to foreign exchange earnings	40%

Source: Regional ATSI Baseline Survey, 2014

Potential for Agriculture:

The size of arable land is 5% of the country's total land mass (587,041 square kilometers), which is mostly a rough terrain with many valleys and hills. However, the country does have many positive agricultural aspects including fertile soils, good climate and high irrigation potential due to the presence of multiple permanent rivers and lakes.

Table 5-2 Potential for agriculture in the agro ecological zones of Madagascar

High humid	Highlands	North-West lowlands	South-West lowlands
Small area – suitable for crops requiring high humidity	Soils are well drained but poor in nutrients	Low lying with water logged land suitable for paddy rice production	Vast plain with well drained soils.
	The temperatures are mild supporting crops like wheat	Soils are rich in nutrients arising from deposition.	Suitable for crops like sorghum and maize.
			Availability of water resources for irrigation

Source: Regional ATSI Baseline Survey, 2014

Main crops

The ecological conditions in the different zones of Madagascar support the growing of different crops such as field crops and vegetables as presented in Table 5-3 below.

Table 5-3 Main crops grown in Madagascar

Field crops	Domestic vegetables
Maize	Tomatoes
Groundnut	Carrots
Rice	Cucumber
Potato	Egg plant

Field crops	Domestic vegetables
Dry beans	Capsicum
Rice	Onion
Sorghum	

Source: Regional ATSI Baseline Survey, 2014

Scale of Farming

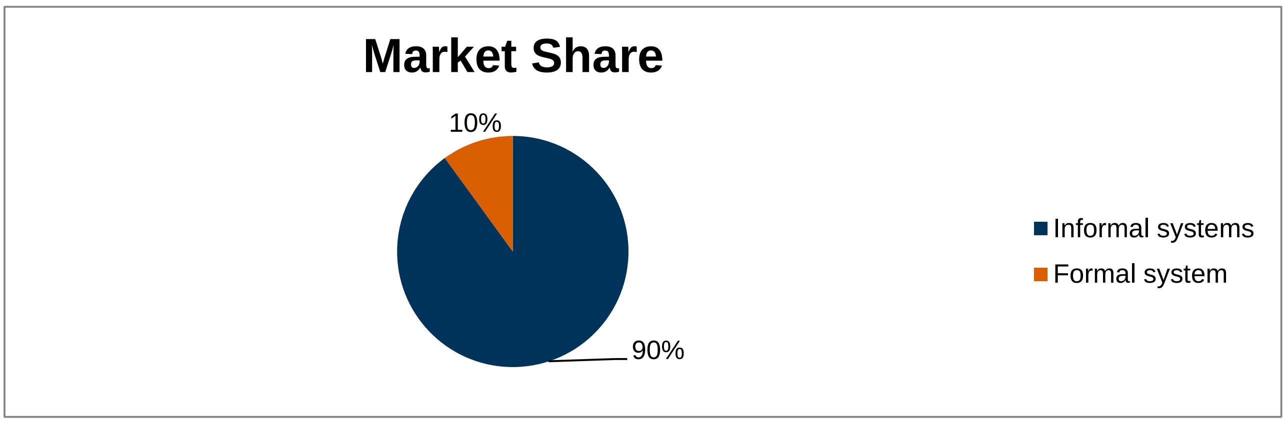
The land holding of small farms is on average from 0.5 to 1.3 hectares.

5.2 The Seed Industry in Madagascar

Seed Systems

Madagascar's seed industry is still at the initial stages of development. The formal seed market is controlled by the government through Seed Multiplication Centers and Seed Growers Groups. The amount of seed produced is low and the bulk of the seed (over 90%) is from the informal sector, mainly farm saved seeds.

Figure 5-1 Formal and Informal Seed Market Share



Formal Seed Production and Supply

The seed production by the Multiplication Centres and by Seed Growers' Groups amount to about 2500 tons per year. The crops are mainly of rice, wheat, beans and sunflower. Some of the seeds in the market are imported as presented in table 5-4.

Table 5-4 Formal Seed Production and Supply

No data

5.2.2 Major Stakeholders in Madagascar's Seed Industry

The seed sector has players from the private, public and non-governmental sectors as presented in Figure 5-2

Figure 5-2 Major stakeholders in Madagascar’s seed industry

Policy advocacy
- Ministry of Agriculture
- National Seed Council (CONASEM)

Regulatory agencies
- Variety Admission Committee
- Seed Control Service

Research and breeding
- FOFIFA
- FIFAMANOR

Production, processing and/or packaging
- The Malagasy Association for Seed Promotion
- Seed Multiplication Centers E.g.
  - Andri-Ko
  - SCAA
  - Sakay
- Seed Growers Groups E.g.
  - Meva Seed Potato Growers' Cooperative
- FOFIFA
- FIFAMANOR

Marketing, education, training extension/ relief
- CONASEM
- Seed Grower Groups
- International non-governemtal organizations E.g.
  - CARE International
  - Catholic Relief Services

Source: Regional ATSI Baseline Survey, 2014

6 Malawi

6.1 Agricultural Background

Contribution of Agriculture to Malawi's Economy

Malawi's population is estimated to be 16.36 million with an annual growth rate of 2.8% (World Bank, 2013). About 38% of the population lives below the poverty line. Agriculture is the main economic activity as indicated by the statistics in Table 6-1.

Table 6-1 Contribution of agriculture to Malawi's economy

Economic contribution	Value
1.Contribution to Gross Domestic Product	34%
2.Contribution to employment	80 %
3.Contribution to foreign exchange earnings	80%

Source: Regional ATSI Baseline Survey, 2014

Potential for Agriculture

The amount of arable land is 30% of the total land mass (118,484 square kilometers). Malawi has five broad agro ecological zones: Escarpment, Plateaux, Lakeshore & Upper Shire and Lower Shire Valley. The five zones support different crops and farming systems. Some of the positive attributes displayed in these areas include good climate, fertile soils, and good regional markets.

Table 6-2 Potential for agriculture in the main agro ecological zones of Malawi

Escarpment	Plateaux	Lakeshore	Upper Shire	Lower Shire Valley
Wide open grasslands ideal for maize	Predominantly grassland under protection as National Park	8% of Malawi, deep rich soil, vast plain with water surfaces suitable for irrigation	8% of Malawi, deep rich soil, vast plain with water surfaces suitable for irrigation	Flood plain suitable for paddy rice. Rich black cotton soils Truncated by rivers suitable for irrigation

Source: Regional ATSI Baseline Survey, 2014

Main Food Crops

The ecological conditions in the different zones of Malawi support the growing of different crops such as field crops and vegetable as presented in Table 6-3 below.

Table 6-3 Main food crops grown in Malawi

Field crops	Domestic Vegetables
Maize	Tomatoes
Groundnut	Carrots
Pigeon pea	Cucumber
Sorghum	Egg plant
Dry beans	Cabbage
Rice	

Source: Regional ATSI Baseline Survey, 2014

Scale of Farming

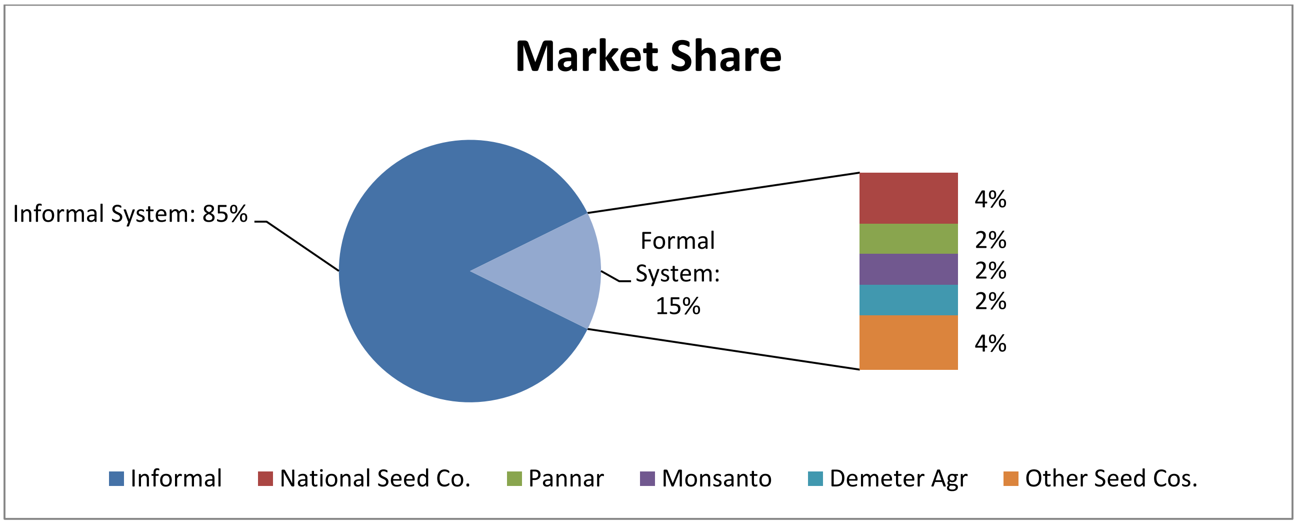
The smallholder farmers are about 11 million, accounting for 75% of food production, and they cultivate a total of 5.3 million hectares. Most of the farmers cultivate less than 1 hectare of land.

6.2 The Seed Industry in Malawi

Seed Systems

Malawi's seed industry operates under a liberalized market economy. There are over 20 seed companies in the country, some of which are managed under smallholder farmers' associations. The seed industry has both formal and informal systems (see figure 6-1). The formal system accounts for 15% and informal 85%.

Figure 6-1 Formal and informal seed market share



Formal Seed Production and Supply

Formal seed production and supply in 2013 was as shown in table 6-4 below. The bulk of the formal seeds are produced locally. Most of the seed imports are vegetables, which are imported from neighbouring countries in SADC and Europe. The country exports some maize and bean seeds to South Africa, Botswana and the Democratic Republic of Congo.

Table 6-4 Formal seed production and supply in Malawi (2013)

Local production (metric tons)	Seed import (metric tons)	Seed export (metric tons)
24,000	200	750

Source: Regional ATSI Baseline Survey, 2014

Major Stakeholders in Malawi's Seed Industry:

The sector has players from the private, public and non-governmental sectors as shown in Figure 6-2.

Figure 6-2 Major stakeholders in Malawi's seed industry

Policy Advocacy

- Ministry of Agriculture and Food Security
- Southern African Development Community
- Common Market for Eastern & Southern Africa
- Integrated Seed Sector Development in Africa (ISSD)

Regulatory Agencies

- Department of Agricutlural Research & Technical Services (DARTS)
- Seed Services Unit
- International Seed Testing Association

Research and Breeding

- Public Universities E.g.
  - University of Malawi
  - Bunda College of Agriculture
- Local, Regional & Multinational companies E.g.
  - Monsanto
  - Capstone Seed Co.
  - Pioneer
  - Seed Co.
  - Seed Tech
- CGIAR

Production, Processing and/or Packaging

- Local, Regional & multinational Seed Cos.
- Private Farmers
- Community Based Organizations E.g.
  - Association of Smallholder Seed Multiplication Action Group

Marketing, Education, Training Extension

- Local & Multinational Seed COs
- Agro-dealers, Agents & sub-agents.
- Association of Smallholder Seed Multiplication Action Group
- Agricultural Development & Marketing Corporation (ADMARC)
- Voluntary Organizations & non-governmental Organizations E.g.
  - Concern Universal
  - Action Aid
  - Oxfam
  - Self Help Africa
  - Africare
  - Church Action for Relief and Development
- Department of Agricultural Extension

Source: Regional ATSI Baseline Survey, 2014

7 Mozambique

7.1 Agricultural Background

Contribution of Agriculture to Mozambique's Economy

The population of Mozambique is 25.83 million and is growing at the rate of 2.5%. The proportion of the population living below poverty line is 54.7%.

Table 7-1 Contribution of agriculture to Mozambique's economy

Economic contribution	Value
1. Contribution to Gross Domestic Product	28%
2. Contribution to employment	81 %
3. Contribution to foreign exchange earnings	31.5%

Source: Regional ATSI Baseline Survey, 2014.

Potential for Agriculture

Mozambique has a variety of regional agro-climatic zones which range from arid, semi-arid, to the sub-humid and humid highlands. With the large majority of agricultural production being rain-fed, weather variability is a major factor in determining crops' performance.

Table 7-2 Potential of agriculture in the main agro ecological zones of Mozambique

Semi-arid	Sub-humid	Humid
Vast land	Water resources – rivers	Water resources – rivers
Water resources – rivers	Rich soils – ferrasols	Rich soils laxisols, leptosols.
Rich soils - fluvisols		

Source: Regional ATSI Baseline Survey, 2014

Main Food Crops

The main food crops grown in the country are presented in table 7-3.

Table 7-3 Main food crops grown in Mozambique

Field crops	Vegetables
Maize	Tomatoes
Cassava	Carrots
Beans	Cabbage
Sorghum	Onion
Groundnuts	Lettuce
Rice	Traditional vegetables
Millet	
Sweet potato	

Source: Regional ATSI Baseline Survey, 2014a)

Scale of Farming

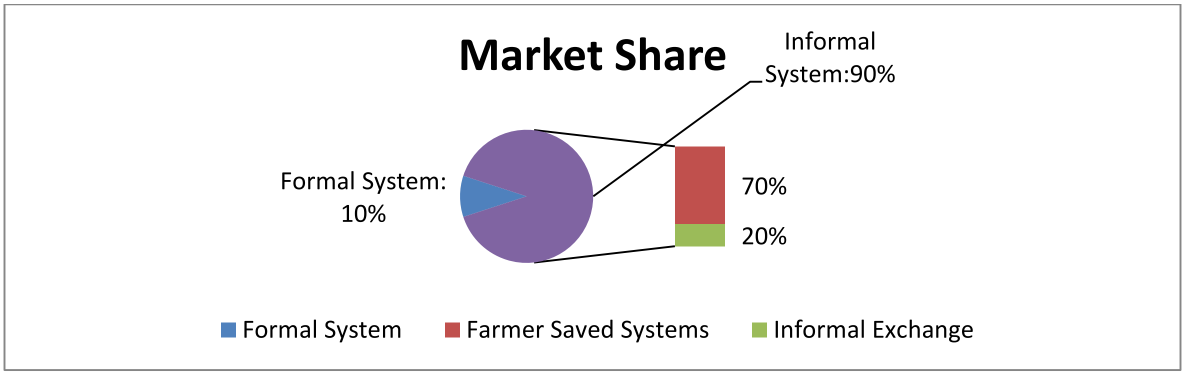
The small scale land holding is about 1.3 ha and they make up 93% of the farmers in the country.

7.2 Seed Industry in Mozambique

Seed Systems

The Mozambican seed sector is characterized by the farmer-saved seed system and informal exchange. The formal sector is relatively small, as shown in the figure below.

Figure 7-1 Formal and informal seed market share



Formal Seed Production and Supply

Most of locally produced are informal and the only national seed company, SEMOC has operational challenges and seeking partnership. A variety of vegetable seeds are imported into the country from neighbouring countries.

Table 7-4 Formal seed production and supply in Mozambique

No data

Major Stakeholders in Mozambique Seed industry

Figure 7-2 Major stakeholders in Mozambique

Policy Advocacy

- Ministry of Agriculture and Food Security
- Southern African Development Community
- Common Market for Eastern & Southern Africa
- Integrated Seed Sector Development in Africa (ISSD)

Regulatory Agencies

- National seed service
- International Seed Testing Association

Research and Breeding

- Public Universities e.g.
  - Edoudor Mondlane
- Local, Regional & Multinational companies E.g.
  - Monsanto
  - Capstone Seed Co.
  - Pioneer
  - Seed Co.
  - Ikuru Seeds
  - Semente Palfeita
  - Phoenix seed co.
  - Beira Limpex
- CGIAR

Production, Processing and/or Packaging

- Local, Regional & multinational Seed Cos.
- Private Farmers
- Community Based Organizations E.g.
  - Association of Smallholder Seed Multiplication Action Group

Marketing, Education, Training Extension

- Local & Multinational Seed COs
- Agro-dealers, Agents & sub-agents.
- National Union of Smallholder Farmers Association
- Voluntary Organizations & non-governmental Organizations E.g.
  - Concern Universal
  - Action Aid
  - Oxfam
  - Self Help Africa
  - Africare
  - Church Action for Relief and Development
- Department of Agriclutural Extension

8 Rwanda

8.1 Agricultural Background

Contribution of Agriculture to Rwanda's Economy

Rwanda's has an estimated population of 11.78 million with an annual growth rate of 2.7% (World Bank, 2013). Agriculture is the main economic activity in in the country as indicated by statistics in Table 8-1, which show agriculture's contribution to the economy.

Table 8-1 Contribution of agriculture to Rwanda's economy

Statistics	Value
1.Contribution to Gross Domestic Product	34%
2.Contribution to employment	84 %
3.Contribution to foreign exchange earnings	42.1%

Source: Regional ATSI Baseline Survey, 2014

Potential for Agriculture

Rwanda is a small country with an area of 26,336 square kilometres. The total arable land is about 1.4 million hectares, which is 52% of the total surface area of the country. However, the actual area cultivated has exceeded 1.6 million hectares in recent years. Most of the country has favourable climatic conditions but the terrain comprises of steep slopes, which makes soil erosion a serious problem.

Table 8-2 Potential for agriculture in the main agro ecological zones of Rwanda

Agro eco zone	North West	South West	South Central	North Central	East
Potential for Agriculture	Good climatic conditions with adequate rainfall.	Good climatic conditions with adequate rainfall.	Good climatic conditions with adequate rainfall.	Good climatic conditions with adequate rainfall.	Lower rainfall than the rest of Rwanda.
	Volcanic fertile soils. Highly susceptible to erosion.	Acidic soils, concomitant soil erosion. Soils are poor to moderate for agriculture.	It has sandy loam soils and serious degradation. Soil fertility ranges from very poor to moderately suitable for agriculture.	High mountains, very steep slopes, and susceptibility to erosion.	Because it is drier, this eastern plateau was traditionally reserved for pastoral uses.

Source: Regional ATSI Baseline Survey, 2014

Main Crops

Table 8-3 Main food crops grown in Rwanda

Field crops	Domestic Vegetables
Maize	Tomatoes
Wheat	Carrots
Sorghum	Spinach
Sesame	Onion
Dry beans	Cabbages
Rice	Traditional vegetables
Millet	
Groundnuts	

Source: Regional ATSI Baseline Survey, 2014

Scale of Farming

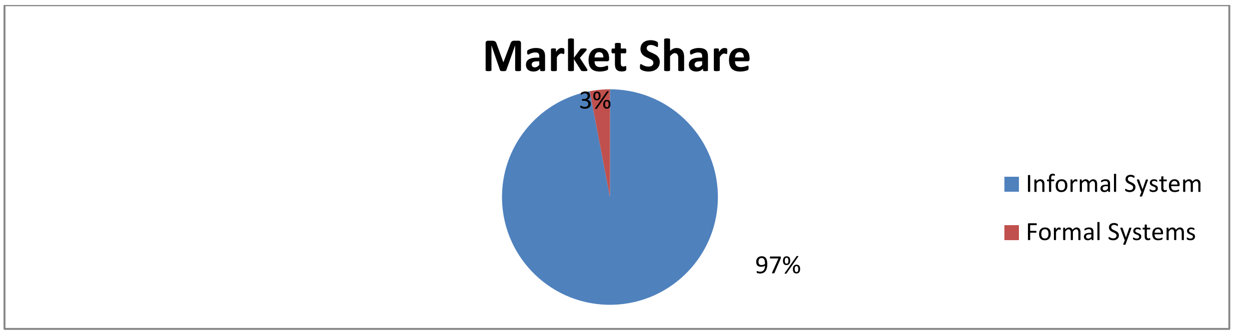
All farming in Rwanda is done by smallholder farmers. Landholdings are very small with more than 60% of households cultivating less than 0.7 hectares, 50% cultivating less than 0.5 hectares and more than 25% cultivating less than 0.2 hectares. This constraint is aggravated by the fact that most farms have multiple scattered plots.

8.2 Seed Industry

Seed Systems

Rwanda’s seed industry is underdeveloped. The formal seed system covers only 3% of the sector (see Figure 8-1). The formal system, which is based on services provided by the public sector stakeholders, is new and has developed in response to an increase in agricultural productivity. .

Figure 8-1 Formal and informal seed market share



Formal Seed Production and Supply

Formal seed production in Rwanda is under Rwanda Agricultural Development Authority (RADA). The authority certification processes.

Table 8-4 Formal seed production and supply in Rwanda

Local production (metric tons	Seed import(metric tons)	Seed export (metric tons)
6000	3680	0

Source: Regional ATSI Baseline Survey, 2014

Major Stakeholders in Rwanda’s Seed Industry

Rwanda’s seed industry has players from the private, public and non-governmental sectors. Farmer associations are major players. Figure 8-2 shows the various stakeholders and their roles in the industry

Figure 8-2 Major stakeholders and their roles in Rwanda's seed industry

Policy advocacy	Regulatory agencies	Research and breeding	Production, processing and/or packaging	Marketing, education, training extension

• Rwanda Civil Society Platform (RCSP)
• Seed Traders Association of Rwanda
	• Ministry of Agriculture & Animal Resources
	• Rwanda Agricultural Board
	• Rwanda Aagricultural Development Authority
		• Rwanda Institute of Agric. Sciences
		• University of Rwanda
		• CGIAR
			• RADA Seed Unit
			• Farmer groups and associations E.g
			  • Ituze Association
			  • Imbaraga Rwanda Farmers Association
			  • Conseil Consultaif des Femmes
			  • Hinga Volcano Seed Co.
				• Regional seed companies:
				  • Kenya Seed Company (Rwanda) Ltd
				  • Seed Co
				  • Cooperatives

9 South Sudan

9.1 Agricultural Background

Contribution of Agriculture to South Sudan's Economy

The population of South Sudan is 11.3 million and is growing at the rate of 4.1% per annum. The country is undergoing socio-political instability and oil is the major contributor to the national economy. Agricultural production is low and food insecurity high. The contribution of agriculture to the national economy is presented in table 9-1.

Table 9-1 Contribution of agriculture to South Sudan's economy

Economic contribution	Value
1. Contribution to Gross Domestic Product	36%
2. Contribution to employment	80
3. Contribution to foreign exchange earnings	No data

Source: Regional ATSI Baseline Survey, 2014

Potential for Agriculture

South Sudan has six main agro-ecological zones with various agricultural potentials. They include Arid belt, flood plains, green belt, hills and mountains, iron stone plateau and Nile/Sobat corridor. They are suitable for a wide range of crops.

Table 9-2 Potential for agriculture in the main agro ecological zones of South Sudan

Arid belt	Flood plains	Green belt	Hills and mountains	Ironstone Plateau	Nile/Sobat Corridor
Fertile soils	Fertile soils	Fertile soils	Cool climate/good rains	Fertile soils	Fertile soils
	Water resources	Water resources	Fertile soils	Good climatic conditions	Water resources

Main Food Crops

Table 9-3 Main food crops grown in South Sudan

Field crops	Vegetables
Maize	Tomatoes
Bulrush	Carrots
Cassava	Cabbage
Sorghum	Onion
Rice	Traditional vegetables
Millet	
Cow pea	
Pigeon pea	
sesame	
Ground nuts	
wheat	
Soya bean	

Source: Regional ATSI Baseline Survey, 2014

9.2 Seed Industry

Seed Systems

Formal seed system in South Sudan is almost non-existent. The bulk of the seed is supplied through informal systems. Many farmers get support through relief seeds especially after catastrophes.

Figure 9-1 Formal and informal seed market share

No data

Formal Seed production and supply

Most of the formal seeds are imported as relief support to farmers. Some of the regional seed companies are slowly entering the market through agents.

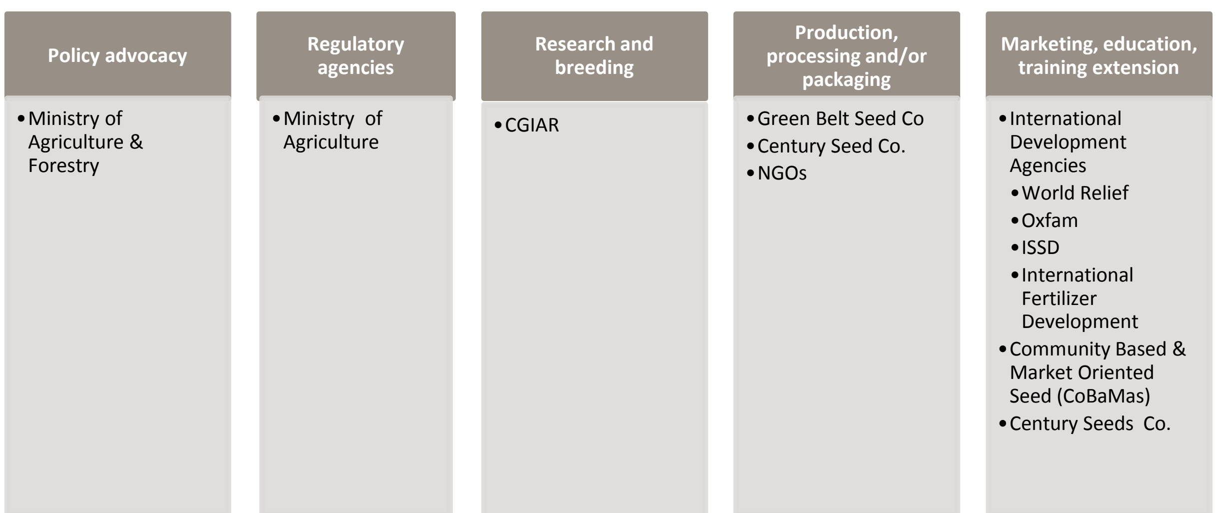
Table 9-4 Formal seed production and supply

Local production (metric tons)	Seed import(metric tons)	Seed export (metric tons)
No data	No data	No data

Major Stakeholders in South Sudan Seed Industry

Various stakeholders play crucial roles along the country's seed industry value chain as highlighted by the diagram below.

Figure 9-2 Major stakeholders in South Sudan's seed industry



Source: Regional ATSI Baseline Survey, 2014

10 Tanzania

10.1 Agricultural Background

Agriculture Contribution to Tanzania's Economy:

Tanzania has a population of 49.25 million (World Bank, 2013) with an annual growth rate of 3%. Agriculture is the main economic activity in Tanzania as indicated by the following statistics (Table 10-1) that show agriculture's contribution to the economy.

Table 10-1 Contribution of Agriculture to Tanzania's Economy

Statistics	Value
1.Contribution to Gross Domestic Product	25 %
2.Contribution to employment	80 %
3.Contribution to foreign exchange earnings	85%

Source: Regional ATSI Baseline Survey, 2014

Potential for Agriculture

The amount of arable land is 16.4% of the total land mass (947,300 sq. km).Only 4% of arable land is farmed. In general based on weather, soil fertility and food crop production, Tanzania has 7 main agro ecological zones ecologies. The zones support different crops and farming system. While the northern highlands and the South and West highlands have the best rainfall and good soils there are crops suitable for the rest of the agro eco zones thus making Tanzania's agricultural potential relatively large.

Table 10-2 Potential for agriculture in the main agro ecological zones of Tanzania

Humid zone	Sub humid Zone	Semiarid Zone
Good climatic conditions	Good climate conditions	Abundant land
Good soils	Abundant water resource	Fertile soils
Large local market due to high population	Good domestic and regional markets	Low crop pest prevalence
Low prevalence of pests and diseases		High potential for irrigation main rivers
Availability of skilled labour		
High irrigation potential (permanent rivers)		

Source: Regional ATSI Baseline Survey, 2014

Main Crops

Tanzania grows a wide range of food crops for domestic consumption and export. The main food crops are listed in table 10-4

Table 10-3 Main food crops grown in Tanzania

Field crops	Domestic Vegetables
Maize	Tomatoes
Wheat	Cabbage
Pigeon peas	Carrots
Sorghum	Spinach
Dry beans	Onion
Rice	Eggplant
Millet	Traditional vegetable (Amaranthus),
Groundnuts	Beetroot
Sesame	Cauliflower
	Fresh beans

	Baby corns
	Snow peas
	Capsicum
	Eggplant
	Watermelon
	Mange tout
	Baby marrow

Source: Regional ATSI Baseline Survey, 2014

Scale of farming

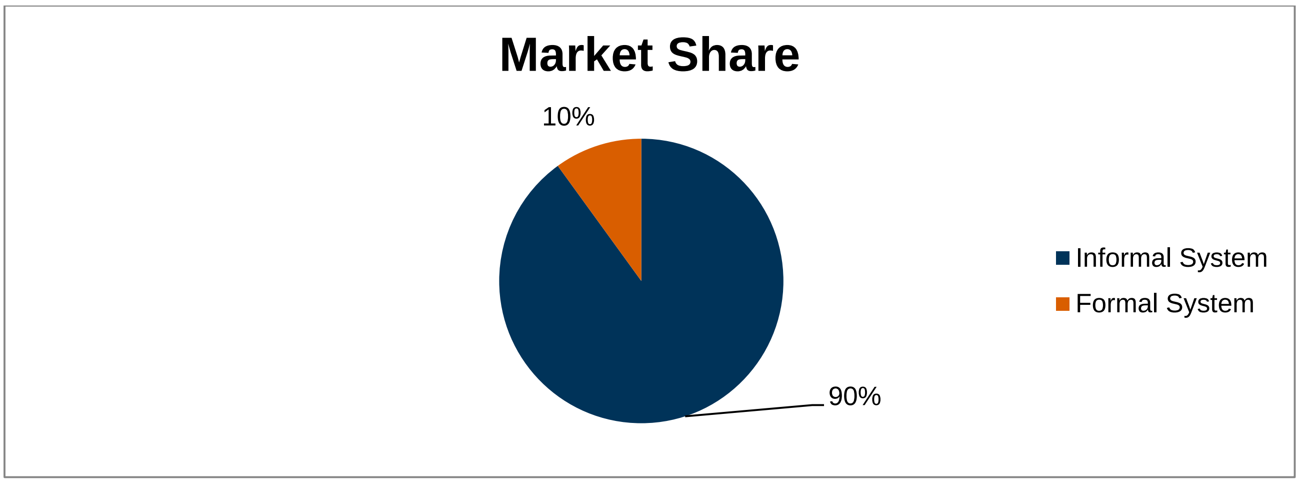
The scale of farming in Tanzania is categorized as follows: Small scale – less than 3 ha; medium scale 3-5ha.; and large scale averaging 1000ha.(state farms) and large private farms averaging 900ha. Small holder farmers dominate agriculture they occupy 88% of agricultural land.

10.2 Seed Industry

Seed systems

Tanzania's seed industry is operating under liberalized market economy and currently there are 56 registered seed companies in Tanzania, 12 are producing certified seed**.** The seed industry has both formal and informal systems (see figure 10-1).

Figure 10-1 Formal and informal seed market share



Formal Seed Production and Supply

Formal seed production and supply in Tanzania is shown in table 10-4 below. Seed imports are mainly from South Africa, Zimbabwe and Kenya. Tanzania is a major seed importer in the region.

Table 10-4 Formal seed production and supply (2011/2012)

Local production (metric tons)	Seed import(metric tons)	Seed export (metric tons)
14,000	14,600	No data

Source: Regional ATSI Baseline Survey, 2014

Major Stakeholders in the Seed Industry:

The sector has major players from the private, public and non-governmental sectors who play various roles that aid in the development of the seed industry. Figure 10-2 summarizes the various stakeholders and their roles in the industry.

Figure 10-2 Major stakeholders in Tanzania's seed industry

Policy Advocacy

- Ministry Of Agriculture Food Security & Cooperative (MAFC)
- Tanzania Seed Trade Association (TASTA)

Regulatory Agencies

- Plant Breeder Rights Association
- Tanzania Official Seed Certification Institute (TOSCI)
- Agricultural Seed Agency (ASA)
- National Variety Release Committee
- National Biosafety Committee

Research and Breeding

- Division of Research & Development in Universities
- National Plant Genetic Resource Center (NPGRI)
- Public University E.g. Sokoine University & Local Seeds Cos
- Multinational companies E.g.
  - Monsanto
  - Pannar
  - Pioneer
  - Seed Co.
- CGIAR
- Alliance for a Green Revolution in Africa (AGRA)
- Association for Strengthening Agricultural Research in Eastern and Central Africa

Production, Processing and/or Packaging

- Non-governmental Organizations E.g
  - Envirocare
  - Participatory Ecological Land Use Management (PELUM)
  - Prollinova
- Agro dealers and agro-dealer associations
- Individual farmers
- Tanzania Farmers Association
- Local, regional and multinational Seed Cos. E.g
  - Tanseed
  - East West Seed Co
  - Monsanto
  - Pop Vriend (T) Ltd
- Mtandao wa Vikundi vya Wakulma
- Community Based Organizations

Marketing, Education, Training Extension

- Local, regional & Multinational Seed COs
- Agro-dealers, Agents & sub-agents.
- Community Based Organizations
- FIPS Africa
- CGIAR

11 Uganda

11.1 Agricultural Background

Contribution of Agriculture to Uganda's Economy:

Uganda's population is estimated to be 37.58 million with an annual growth rate of 3.3% (World Bank, 2013). Agriculture is the main economic activity as indicated by the statistics in Table 11-1.

Contribution of Agriculture to Uganda's Economy

Economic contribution	Value
1.Contribution to Gross Domestic Product	43%
2.Contribution to employment	80 %
3.Contribution to foreign exchange earnings	70%

Source: Regional ATSI Baseline Survey, 2014

Potential for Agriculture

The total size of arable land is 80% of the country's land mass (197,100 square kilometres). Only 30% of the arable land is farmed. Uganda is endowed with a warm climate and regular rainfall which provides one of the best environments for agricultural production in sub-Saharan Africa. The country has two broad agro ecological zones.

Table 11-1 Potential of agriculture in the main agro ecological zones of Uganda

Semi-Arid plateau	Bimodal highlands
High potential for Agriculture but requires irrigation	Good climatic conditions with reliable rainfall
	Fertile volcanic soils
	Abundant water resources

Main Food Crops

The ecological conditions in the different zones of Uganda support the growing of different crops such as field crops and vegetables as presented in Table 11-3 below.

Table 11-2 Main food crops grown in Uganda

Field crops	Vegetables
Maize	Tomatoes
Sorghum	Carrots
Millet	Spinach
Groundnuts	Onion
Dry beans	Traditional vegetables (amaranths, black nightshade, spider plant
Rice	Chilli
Sesame	Okra
Groundnuts	

Source: Regional ATSI Baseline Report, 2014

Scale of Farming

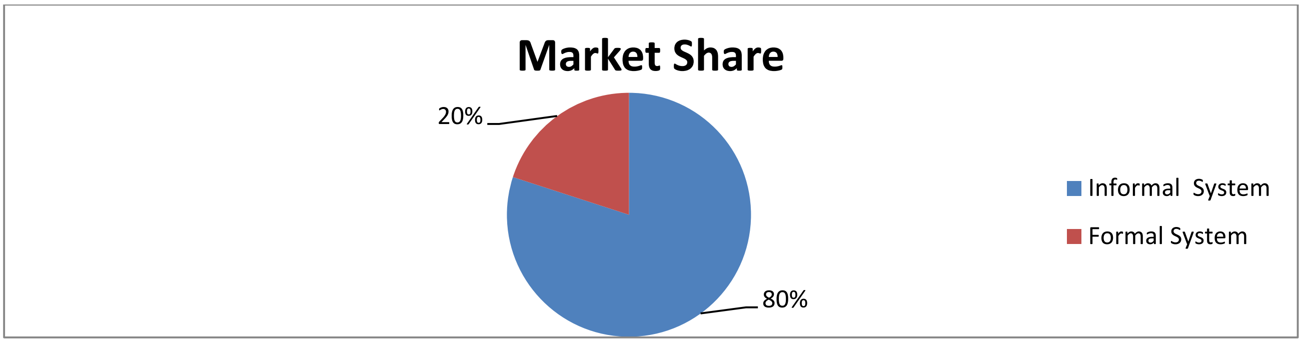
The scale of farming in Uganda is categorized as follows: Small scale – less than 5 hectares, medium scale 5-15 hectares and large scale is (15 hectares and above). About 85% of Ugandan farmers are in the small scale category.

11.2 The Seed Industry in Uganda

Seed Systems

Uganda's seed industry operates under a liberalized market economy. There are 23 registered seed companies all of which are active. The seed industry has both formal and informal systems (see Figure 11-1).

Figure 11-1 Formal and informal seed market share



Formal seed production and supply

Formal seed production and supply in 2008 was as shown in table 11.4.
The bulk of the formal seeds are imported from Southern African countries (maize) and Europe (vegetables).

Table 11-3 Formal seed production and supply in Uganda (2008)

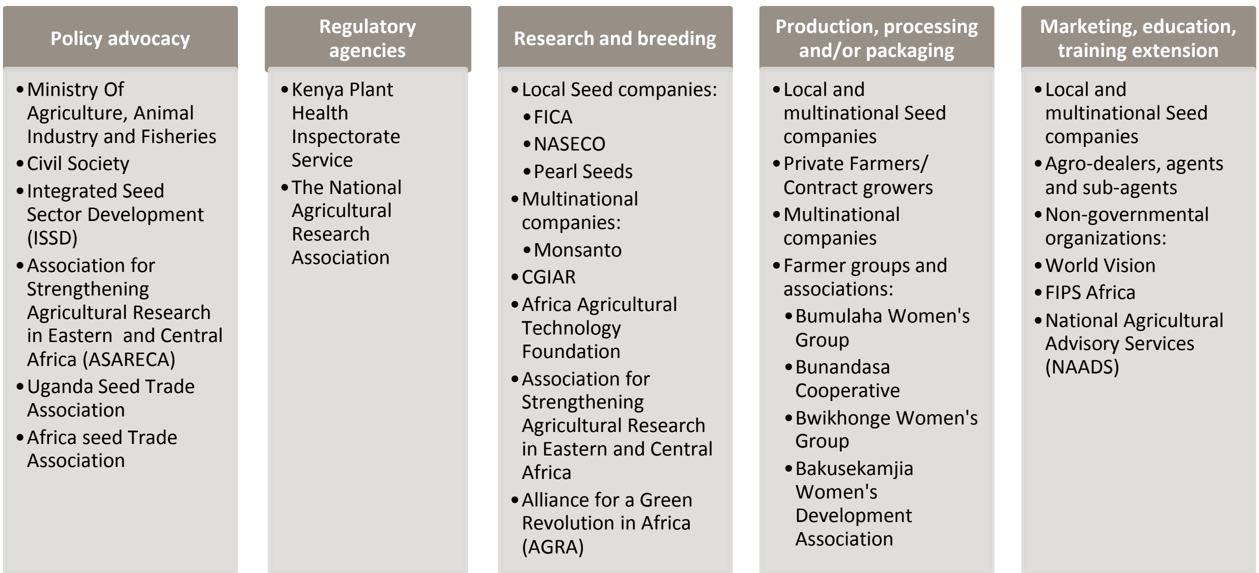
Local production (metric tons)	Seed import(metric tons)	Seed export (metric tons)
12,000	98,550	0

Source: Regional ATSI Baseline Survey, 2014

Major Stakeholders in Uganda's Seed Industry

The seed industry in Uganda has players from the private, public and non-governmental sectors as presented in Figure 11-2

Figure 11-2 Major Stakeholders in Uganda's seed industry



Source: Regional ATSI Baseline Report, 2014

12 Zambia

12.1 Agricultural Background

Contribution of Agriculture to Zambia's Economy

Zambia's population is estimated to be 14.54 million with an annual growth rate of 3.2% (World Bank, 2013). Poverty levels in rural areas stand at 80%. Agriculture is the main economic activity as indicated by the statistics in Table 12-1.

Table 12-1 Contribution of agriculture to Zambia's economy

Economic contribution	Value
1.Contribution to Gross Domestic Product	20%
2.Contribution to employment	70 %
3.Contribution to foreign exchange earnings	35%

Source: Regional ATSI Baseline Survey, 2014

Potential for Agriculture

The amount of arable land is 47% of the country's total land mass (752,000 square kilometers). Zambia has four broad agro ecological zones; Plateau with higher rainfall, Plateau with medium rainfall, Kalahari sand with medium rainfall and the Valley. These four zones support different crops and farming systems.

Table 12-2 Potential for agriculture in the main agro ecological zones of Zambia

Plateau (high rainfall)	Plateau medium rainfall	Kalahari	Valley
Good conditions for rainfed agriculture – low cost of production	Good for most tropical crops - sorghum	Good deep well drained soils	Fertile soils from deposition
Support a wide range of crops	Rainfed crop production possible	Suitable for deep rooted crops	

Source: Regional ATSI Baseline Survey, 2014

Main Food Crops

The ecological conditions in the different zones of Zambia support the growing of different crops such as field crops and vegetable as presented in Table 12-3 below.

Table 12-3 Main food crops grown in Zambia

Field crops	Vegetables
Maize	Tomatoes
Groundnut	Carrots
Pigeon pea	Cucumber
Millet	Lettuce
Soya	Cauliflower
Sorghum	Egg plant
Dry beans	Cabbage
Rice	Beet root
Wheat	Broccoli
	Leek

Source: Regional ATSI Baseline Survey, 2014

Scale of Farming

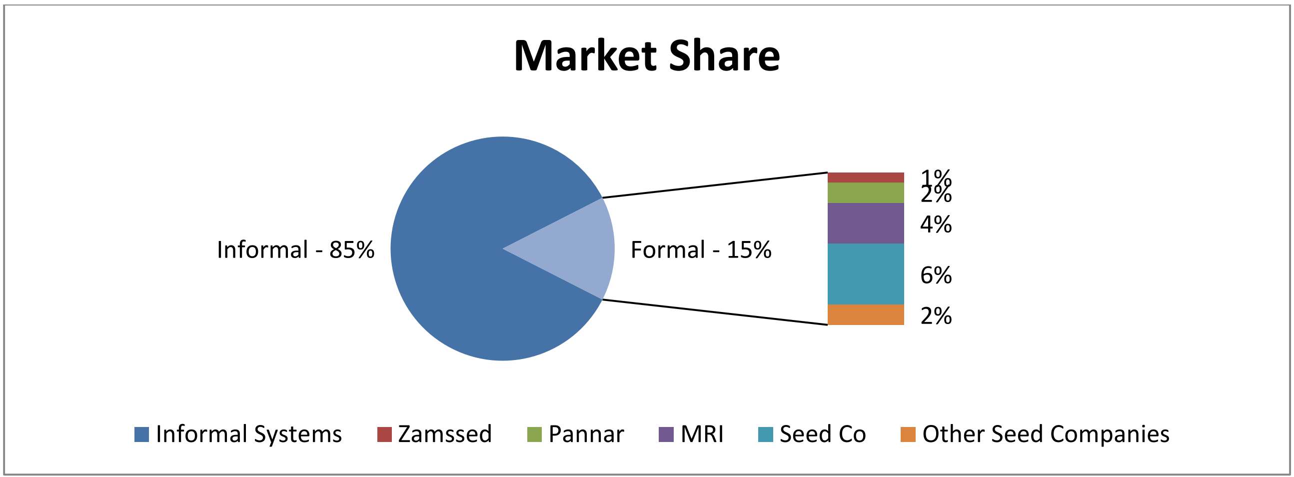
The smallholder farmers contribute 80% of food crop production. Small scale land holding is less than 5 ha; medium scale is 5-20 ha and large scale is above 20 ha.

12.2 The Seed Industry in Zambia

Seed Systems

Zambia's seed industry is liberalized and there are over 20 seed companies, some of which are managed under smallholder farmers' associations. The seed industry has both formal and informal systems (see Figure 10-1). The market is dominated by three major seed companies; Zamseed, Pannar and Monsanto. Most of the seeds for the minor or traditional crops come mainly from the informal system.

Figure 12-1 Formal and informal seed market share



Formal Seed Production and Supply

Formal seed production and supply in 2013 is shown in Table 12-5 below.

The bulk of the formal seeds are produced locally. Most of the seed imports are vegetables, which are imported from South Africa and Europe. Some maize and bean seeds are exported to Kenya, South Africa, Botswana and the Democratic Republic of Congo.

Table 12-4 Formal seed production and supply in Zambia (2013)

Local production (metric tons)	Seed import (metric tons)	Seed export (metric tons)
74,150	2,500	14,500

Source: Regional ATSI Baseline Survey, 2014

Major Stakeholders in Zambia's Seed Industry:

The seed industry has players from the private, public and non-governmental sectors as presented in Figure 12-2

Figure 12-2 Major stakeholders in Zambia's seed industry

Policy advocacy

- International institutions:
  - Common Market for Eastern and Southern Africa (COMESA)
  - Organization for Economic Cooperation and DevelopmenT
  - Southern African Development Community
- Ministry of Agriculture and Livestock

Regulatory agencies

- Seed Control and Certification Institue of Zambia
- Zambia Seed Trade Association
- Africa Seed Trade Association
- Southern African Development Community

Research and breeding

- Zambia Agriculture Research Insitute
- Local seed companies E.g.
  - Syngenta/Maize Research Institute
  - Zamseed
- Regional & Multinational companies E.g.
  - Monsanto
  - Pannar
  - Hygrotech
  - Seed Co.
  - Pioneer Seed
- CGIAR
- Africa Agricultural Technology Foundation

Production, processing and/or packaging

- Local seed companies
- Private farmers/ contract growers
- Regional and multinational companies E.g.
  - Seed Co
  - Monsanto
  - Progene Seeds
  - Pionner
  - Pannar
- Community based organizations

Marketing, education, training extension

- Ministry of Agriculture and Livestock
- Local and multinational seed companies
- Agro-dealers, agents and sub-agents
- Community based organizations and farmer groups
- CGIAR
- Non-governmental organizations

Source: Regional ATSI Baseline Survey, 2013

13 Zimbabwe

13.1 Agricultural Background

Contribution of Agriculture to Zimbabwe's Economy

Zimbabwe's population is estimated to be 14.15 million and is growing at 3% per annum (World Bank, 2013). It was one of the most agriculturally productive countries in Africa before changes in land policy in the late 1990s. Agricultural production has declined and 80% of the population lives below the poverty line. Agriculture is the main economic activity as indicated by the statistics in table 13-1.

Table 13-1 Contribution of agriculture to Zimbabwe's economy

Economic contribution	Value
1.Contribution to Gross Domestic Product	20.3 %
2.Contribution to employment	60%
3.Contribution to foreign exchange earnings	40%

Source: Regional ATSI Baseline Survey, 2014

Potential for Agriculture

The size of arable land is 8% of the total land mass (390,757 square kilometers). Zimbabwe is composed of broad agro ecological zones. Namely the zones support different crops and farming systems.

Table 13-2 Potential for agriculture in the main agro ecological zones of Zimbabwe

Central Plateau	Mountainous	Low veld
Suitable for tropical crops e.g. sorghum and pearl millet	Has good rainfall (over 1000 mm/year) supports most cash crops like coffee, tea.	Good deep well drained soils
The soils are but supplementary irrigation is needed for crops requiring more rains		Suitable for intensive farming

Source: Regional ATSI Baseline Survey, 2014

Main Food Crops

The ecological conditions in the different zones of Zimbabwe support the growing of different crops such as field crops and vegetable as presented in Table 13-3 below.

Table 13-3 Main food crops grown in Zimbabwe

Field crops	Domestic Vegetables
Maize	Tomatoes
Groundnut	Carrots
Pigeon pea	Cucumber
Sorghum	Egg plant
Dry beans	Cabbage
Rice	Cauliflower
Wheat	
Soya beans	

Source: Regional ATSI Baseline Survey, 2014

Scale of Farming

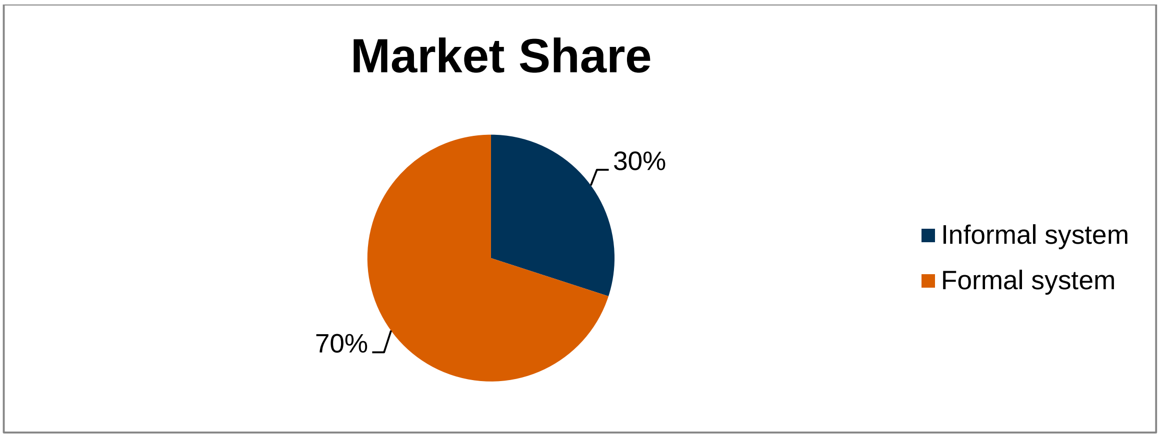
The smallholder farmers are 7.1 million in number, cultivating over 21 million hectares of land. Small holder farmers are now contributing 90% of the national food production.

13.2 The Seed Industry in Zimbabwe

Seed Systems

Zimbabwe's seed industry operates under a liberalized market economy and there are over 20 active seed companies in the country. The seed industry has both formal and informal systems. The formal seed system is developed but highly regulated. Most of the seeds for minor or traditional crops are still supplied by the informal system but the bulk of the seed is from formal systems.

Figure 13-1 Formal and informal seed market share



Formal Seed Production and Supply

The bulk of the formal seeds are produced locally. Most of the seed imports are vegetables, which are imported from Southern African countries and Europe. Some maize and bean seeds are exported to South Africa, Botswana and the Democratic Republic of Congo.Formal seed production and supply in Zimbabwe (2013)

Table 13-4 Formal seed production and supply

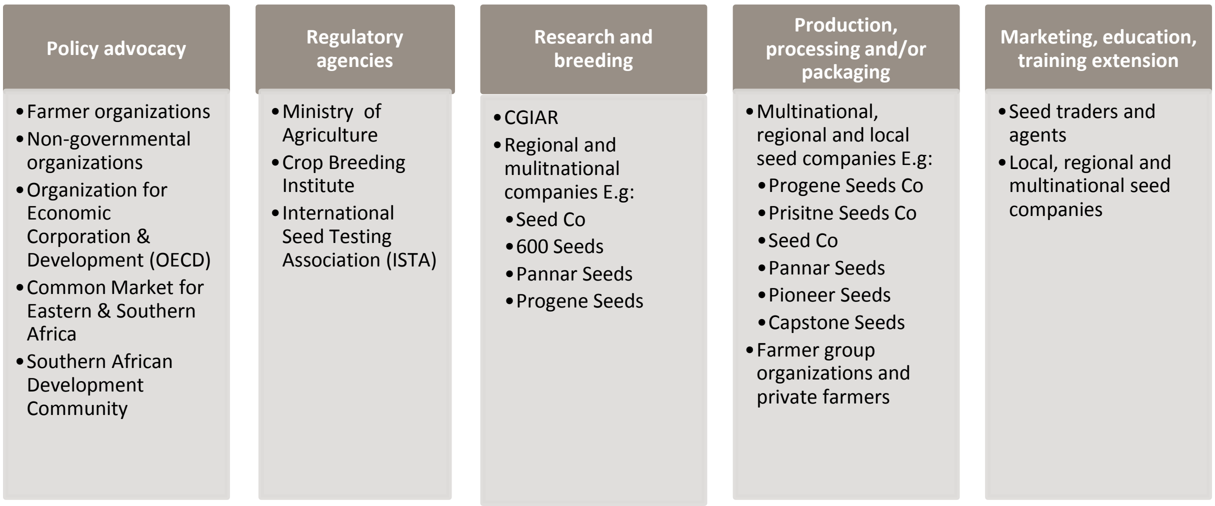
Local production (metric tons)	Seed import(metric tons)	Seed export (metric tons)
42 000	3 125	3 183

Source: Regional ATSI Baseline Survey, 2014

Major Stakeholders in Zimbabwe's Seed Industry:

The seed industry in Zimbabwe has players from the private, public and non-governmental sectors as highlighted in Figure 13-2.

Figure 13-2 Major stakeholders in Malawi's seed industry



Source: Regional ATSI Baseline Survey

14 Annex 1: Long List of Seed Companies in Eastern Africa Region

International Seed Companies

	Selection Criteria					
Seed Company	Regional Spread / Market Share %	Crop Focus	Integrated Business Model			
			R&D	Production	Marketing	Capacity building
1.Amiran Seed Company	South Sudan -15% Rwanda - Kenya	Vegetables			✓	✓
2. Capstone Seed Company	Malawi Zimbabwe	Field crops and vegetables	✓	✓	✓	✓
3. East West /Afrisem Seed Company	Madagascar Tanzania	Vegetables	✓	✓	✓	✓
4. Monsanto Seed Company	Kenya Uganda Tanzania Malawi - 15% Zambia	Field crops vegetables	✓	✓	✓	✓
5. Pioneer Seed Company	Kenya Ethiopia Zambia Zimbabwe	Field crops and vegetables	✓	✓	✓	✓
6. Syngenta Seed Company	Kenya Zambia Tanzania Malawi	Field crops and vegetables	✓	✓	✓	✓
7. Pop Vriend Seed Company	Tanzania	Field crops and vegetables		✓	✓	

Regional Seed Companies, continued

	Selection Criteria					
Seed Company	Regional Spread / Market Share %	Crop Focus	Integrated Business Model			
			R&D	Production	Marketing	Capacity building
1.Kenya Seed Company	Sudan Uganda - Rwanda Kenya Tanzania	Field crops and vegetables	✓	✓	✓	✓
2. East African Seed Company	Kenya Uganda - 1.3% Tanzania Rwanda South Sudan	Field crops and vegetables	✓	✓	✓	✓
3.Pannar seed Company	Zimbabwe - 12% Zambia Burundi Malawi - 15% Kenya Tanzania Uganda	Field crops and vegetables	✓	✓	✓	✓
4.Tanseed	Tanzania Mozambique	Field crops and vegetables	✓	✓	✓	✓
5.Hygrotech	Kenya Malawi Zambia Zimbabwe Tanzania	Vegetables			✓	✓
6. FICA Seed Company	Kenya - Tanzania Uganda - 21% Rwanda South Sudan	Field crops and vegetables	✓	✓	✓	✓

Regional Seed Companies, Continued

	Selection Criteria					
Seed Company	Regional Spread / Market Share %	Crop Focus	Integrated Business Model			
			R&D	Production	Marketing	Capacity building
7.NASECO Seed Company	Uganda - 29% Rwanda South Sudan Burundi	Field crops and vegetables				
8.Victoria Seed Company	Uganda - Rwanda Burundi S. Sudan	Field crops and vegetables		✓	✓	✓
9.Agri-Seedco	Zambia Kenya Zimbabwe - 40% Tanzania- Ethiopia Malawi Rwanda	Field crops and vegetables	✓	✓	✓	✓
10.MRI Seed Company	Zambia Tanzania Mozambique	Field crops	✓	✓	✓	✓
11.Zamseed	Zambia Malawi Tanzania Mozambique	Field crops and vegetables	✓	✓	✓	✓
12. Progene Seed Company	Zambia Zimbabwe		✓	✓	✓	✓

National Seed Companies

Seed Company	Selection Criteria					
	Regional Spread / Market Share %	Crop Focus	Integrated Business Model			
			R&D	Production	Marketing	Capacity building
1. Ethiopia Seed Enterprises	Ethiopia	Field crops and vegetables	✓	✓	✓	✓
2. Western Seed Company	Kenya	Field Crops	✓	✓	✓	✓
3. National Seed Company of Malawi	Malawi	Field crops and vegetables	✓	✓	✓	✓
4. Pearl Seed Company	Uganda - 32%	Field crops vegetables		✓	✓	✓
5. Grow More Seed Company	Uganda - 6%	Field crops		✓	✓	✓
6. Kamano Seed Company	Zambia	Field crops		✓	✓	✓
7. ARDA Seed Company	Zimbabwe	Field crops		✓	✓	✓
8. Tocek Seed Company	Zimbabwe	Field crops and vegetables		✓	✓	✓
9. Demeter Seed Company	Malawi - 15%	Field crops and vegetables	✓	✓	✓	
10. Mbegu Technologies Seed Company	Tanzania	Field crops and vegetables	✓	✓	✓	✓
11. Fumwe Seed Company	Malawi - 10%	Field crops		✓	✓	✓

Niche Companies

Seed Company	Selection Criteria		
	Focus on unique services e.g. technologies	Focus on neglected crops	Focus on difficult eco zones e.g. dry lands
1. Amiran Seed Company		Vegetables	
2. Victoria Seed Company	Uganda (no data)	Field crops and vegetables	
3. Leldet Seed Company		Vegetables	
4. KARI Seed Unit		Field crops Vegetables	
5. Pioneer Seed Company		Field crops and vegetables	
6. Syngenta Seed Company		Field crops and vegetables	
7. Pop Vriend Seed Company		Field crops and vegetables	

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