



Access to Seeds Index

Regional Access to Seeds Index for Eastern Africa Stakeholder Engagement Report

Prepared for the

Access to Seeds Foundation

May 2015



Acronyms

| | |
|---------|--|
| AATF | African Agricultural Technology Foundation |
| AFSTA | African Seed Trade Association |
| ARIPO | Africa Regional Intellectual Property Organization |
| ASARECA | Association for Strengthening Agricultural Research in Eastern and Central Africa |
| AVRDC | The Vegetable Research Development Centre |
| BMGF | Bill & Melinda Gates Foundation |
| CGIARS | Consultative Group on International Agricultural Research |
| COMESA | Common Market for Eastern and Southern Africa |
| CYMMIT | International Maize and Wheat Improvement Centre |
| DARS | Department of Agricultural Services |
| DIS | Disease Resistance |
| DR | Drought Resistance |
| DTMA | Drug Tolerant Maize |
| EAC | East African Community |
| EMBRAPA | Empresa Brasileira de Pesquisa Agropecuária (Brazilian Corporation of Agricultural Research) |
| ERC | Expert Review Committee |
| FAO | Food and Agriculture Organization of the United Nations |
| FGD | Focus Group Discussions |
| GMO | Genetically Modified Seed |
| HY | High Yield |
| ICRISAT | International Crops Research Institute for the Semi-Arid Tropics |
| IFDC | International Fertilizer Development Centre |
| IITA | International Institute of Tropical Agriculture |
| KARO | Kenya Agricultural Research Organization |
| KEPHIS | Kenya Plant Health Inspectorate Service |
| KII | Key Informant Interviews |

| | |
|-------|--|
| MLND | Maize Lethal Necrosis Disease |
| NARS | National Agricultural Research System |
| NGO | Non-Governmental Organization |
| NTR | Improved Nutritional Content |
| OPV | Open Pollinated Varieties |
| OTR | Other Traits |
| SADC | South African Development Community |
| SCCI | Seed Certification and Control Institute |
| STAK | Seed Trade Association of Kenya |
| USTA | Uganda Seed Traders Association |
| ZARI | Zambia Agriculture Research Institute |
| ZASTA | Zambian Seed Traders Association |

Executive Summary

Nearly one billion people go hungry every day and the majority of them are in developing countries, especially in Sub-Saharan Africa. One of the major obstacles to agricultural production and food security in this region is limited access to quality inputs, particularly seeds. Improved access to quality seeds by smallholder farmers would enable them to grow and sell more food in a sustainable way.

Smallholder farms represent 80% of all farms in the region and contribute to up to 90% of agricultural production (Wiggins, 2009; World Bank, 2009c). The smallholder farmers are crucial for improved food and nutritional security in the region. They represent an untapped opportunity to achieve food and nutritional security. However, their productive potential is currently limited by various constraints including lack of quality seeds. By improving access to seeds and initiating the right agronomic practices, the seed industry can play a major role in unlocking this potential, thereby stimulating agricultural and economic growth.

The Access to Seeds Index (ATSI), an initiative sponsored by the Dutch Government and the Bill & Melinda Gates Foundation, views access to quality seeds as an essential element in the development of farmers. It also believes that seed companies can play a key role in availing quality seeds to smallholder farmers. Based on this premise, the Index aims to (1) encourage companies to increase their efforts (2) highlight best practices that others can emulate and (3) identify companies that are successful in availing quality seeds to smallholder farmers. This initiative is in the interest of seed companies because it (1) contributes to the understanding of the role of the industry and their license to operate (2) helps them to build their business and (3) it provides them with an independent platform to establish themselves as a potential party in alliances and partnerships focusing on farmer development.

This study was carried out to generate information and data necessary for determining the scope of the regional ATSI in terms of the countries, seed companies and crops to be included in the regional index for Eastern Africa. In the study, key stakeholders in the industry such as seed companies, regulatory organizations, NGOs, seed traders associations and research organizations, were interviewed and farmers engaged in focus group discussions in 12 countries in the region: Burundi, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, South Sudan, Tanzania, Uganda, Zambia and Zimbabwe. The survey provided information on the challenges facing seed companies and the efforts they are making in addressing smallholder farmers' seed requirements. These were compared with the challenges being faced by farmers and their expectations of the seed companies. Based on the information and data from the survey, sixteen seed companies and the main food crops in the region were selected. The information and data were also used for developing seven measurement areas for seed company assessment: Governance and Strategy, Public Policy and Stakeholder Engagement, Genetic Resources and Intellectual Property, Research and Development, Marketing and Sales, Capacity Building and Production. This methodology reviewed by the Regional Expert Review Committee in February 2015. The methodology was then published at the end of February.

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1 Introduction

1.1 Access to Seeds Index (ATSI) Initiative

The Access to Seeds Index is an initiative sponsored by the Dutch Government and the Bill & Melinda Gates Foundation. The two funders view access to quality seeds as an essential element in farmer development and believe that seed companies have a key role in availing quality seeds to smallholder farmers. Cardno Emerging Markets (East Africa) was engaged to develop the Regional Access to Seeds Index for Eastern Africa by conducting a baseline study through engagement of key stakeholders in the seed industry to provide information needed for the design of the Index.

The Index aims to (1) encourage companies to increase their efforts; (2) highlight best practices that others can emulate; and (3) identify companies that are successful in availing quality seeds to smallholder farmers. This initiative is in the interest of seed companies because it (1) contributes to the understanding of the role of the industry and their license to operate; (2) helps them to build their business; and (3) provides them with an independent platform to establish themselves as a potential party in alliances and partnerships focusing on farmer development

The initiative will achieve its goals by publishing an Index (ranking) every two years comparing the efforts of individual seed companies based on a set of indicators that reflect what stakeholders expect from seed companies. The data collection will require some input by companies but the Index aims to keep the burden low by using indicators based on only need-to-know questions and supporting companies in the data collection. Companies that are selected for the Access to Seeds Index will be evaluated based on publicly available information, and they will also be invited to carry out a self-assessment and provide additional data through a questionnaire. The data collection process is carried out by the research firm Sustainalytics.

The Access to Seeds Index is therefore an instrument that matches the expectations of stakeholders in and around the seed industry with companies' performance in addressing global food security challenges. It also brings transparency to the contribution of individual companies, while providing guidance to companies that seek to assume greater responsibility in this area.

1.2 Rationale for Access to Seeds Index

Nearly one billion people go hungry every day worldwide and the majority of them are in developing countries, especially in Sub-Saharan Africa. One of the major obstacles to agricultural production and food security in these regions is limited access to quality inputs, particularly seeds. Access to quality seeds by smallholder farmers would enable them to grow and sell more food in a sustainable way. With global population predicted to reach nine billion by 2050, food production has become central to policy and development agendas. In the Eastern African region, smallholder farmers constitute over 80% of the total and they are crucial for improved food and nutritional security in the region. However, their productive potential is currently limited by various constraints including lack of quality seeds. By improving access to seeds and initiating the right agronomic practices, the seed industry can play a major role in unlocking this potential, thereby stimulating agricultural and economic growth.

2 Approach and Methodology of the Regional Access to Seeds Index for Eastern Africa

The key components in the development of the methodology of the Regional Access to Seeds Index for Eastern Africa:

1. Preliminary baseline survey to develop the scope of the Regional Index in terms geographical coverage, companies and crops
2. Identification of key stakeholders in the seed industry and scope of the Regional Index (seed companies and crops) based on existing literature
3. Identification and appointment of country focal points for in-country stakeholder and farmer engagement
4. Research and feedback from the industry players through stakeholder engagement (seed companies, seed traders associations, regulators, farmers, non-governmental organizations [NGOs], research organizations and regional bodies)
5. Methods used in Stakeholder Engagements
 - 6.1 Key Informant Interviews (KIIs) with seed companies and other stakeholders
 - 6.2 Focus Group Discussions (FGDs) with farmer groups
 - 6.3 Preparation of tools to capture data and information from stakeholders in the selected countries
6. Development of scope, indicators and measurement areas based on data and information obtained from the seed industry through the survey
7. Formation and engagement of the Expert Review Committee (ERC) for review of the Index methodology and results for publication
8. Sharing the Regional Index Methodology with seed industry stakeholders

Based on the above approach and methodology, the scope of the Regional Index was defined and twelve countries in Eastern Africa were selected: Burundi, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Tanzania, Uganda, Zambia, South Sudan and Zimbabwe. The information and data collected was also used to define the scope of the Regional Index in terms of seed companies and range of crops to be included in the Regional Index.

2.1 General Characteristics of the Region's Seed Sector

The survey on the seed industry in the region revealed the following characteristics specific to the region:

- The Index countries are all net importers of food and are constantly faced with food and nutritional insecurity
- These countries have high potential for agriculture but the arable land is not fully utilized for agriculture
- Agriculture is dominated by smallholder farmers who contribute over 85% of the production (Wiggins, 2009; World Bank, 2009)
- The bulk of the seeds that farmers use (over 80%) are sourced from the informal sector, old OPVs and landraces
- The countries in the region are linked by three active economic blocs facilitating trade in agro-inputs and produce i.e. SADC, EAC and COMESA, and it is the most active and interlinked seed business network on the continent

- The region has harmonized seed policies, regulations and standards, though implementation is a challenge
- The countries have various degrees of public sector control of the seed sector e.g. subsidized prices of inputs such as seeds, controlled seed distribution and prices
- Categories of seed companies
 - > International
 - > Regional
 - > National
 - > Niche
- Most international seed companies deal in vegetables (mainly imports); few do local production
- Major regional and international seed companies trade in their own varieties
- Smaller companies depend on public-bred varieties and also act as agents of the major companies that do not have physical presence in the region
- Most companies on the global Index do not have physical presence in the region, but their products are in the market through agents/traders
- Declining extension service from the public sector; increasing takeover of this function by seed companies and NGOs.

2.2 Development of the Scope of the Regional Access to Seeds Index for Eastern Africa

2.2.1 Selection of the Countries to Participate in the Index in Eastern Africa Region

The countries to participate in the Regional Index were selected based on the criteria below:

1. Food and nutritional insecurity – net food importers, i.e. the countries that are categorised as Low - Income Food Deficit by FAO (2014 list).
2. High potential for agriculture, i.e. percentage of arable land in the country
3. Agriculture dominated by smallholder farmers, i.e. proportion of smallholder farmers.
4. Countries linked by regional seed market networks through the regional economic blocs, i.e. SADC, EAC and COMESA
5. Existence of seed policies, regulations and standards.

Table 2-1 **Selected Countries for the Regional Access to Seeds Index for Eastern Africa** (Source: Cardno stakeholder engagement)

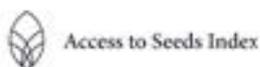
| Country | Selection Criteria for Regional Index Countries | | | | |
|------------|---|---------|----------|--------------|-----|
| | 1 | 2 | 3 | 4 | 5 |
| Burundi | Yes | 35.7% | 90% | EAC, COMESA | Yes |
| Ethiopia | Yes | 36.4% | 85% | COMESA | Yes |
| Kenya | Yes | 25% | 75% | EAC, COMESA | Yes |
| Madagascar | Yes | 5% | No data | SADC, COMESA | Yes |
| Malawi | Yes | 30% | 75% | SADC, COMESA | Yes |
| Mozambique | Yes | No data | No data | SADC, COMESA | Yes |
| Rwanda | Yes | 52% | Over 90% | EAC, COMESA | Yes |

| | | | | | |
|-------------|-----|---------|----------------|------------------------|-----|
| South Sudan | Yes | No data | No information | EAC, COMESA (observer) | No |
| Tanzania | Yes | 16.4% | 88% | SADC, EAC | Yes |
| Uganda | Yes | 80% | 85% | EAC, COMESA | Yes |
| Zambia | Ye | 47% | 80% | SADC, COMESA | Yes |
| Zimbabwe | Yes | 8% | 90% | SADC, COMESA | Yes |

Regional ATSI target countries



1. Burundi
2. Ethiopia
3. Kenya
4. Madagascar
5. Malawi
6. Mozambique
7. Rwanda
8. South Sudan
9. Tanzania
10. Uganda
11. Zambia
12. Zimbabwe



2.3 Key Stakeholders in the Seed Industry in the Region

The stakeholders in the seed industry were identified through literature review and confirmation through peer recognition and by seed traders associations. The following stakeholders were identified as key in the seed industry in the region;

- Seed companies
- Regulators
- Farmers
- Ministries of agriculture
- NGOs
- Research organizations
- Traders' associations
- Academic institutions
- Regional and international institutions (such as COMESA and FAO)

2.3.1 Identification and Appointment of Country Focal Points for In-Country Stakeholder Engagements

Focal points were appointed in each of the Index countries to mobilize and collect information from stakeholders in the seed industry. They were selected based on their experience in the seed industry. The focal points were provided with a checklist to guide the interviews and focus group discussions.

A cross-section of the seed industry stakeholders was interviewed. The summary of the stakeholders engaged in the interviews and focus group discussions is presented in table 2- 2.

Table 2-2 Summary of the Number of Stakeholders Engaged in the Survey

| Country | Stakeholders Engaged (Interviews and Focus Group Discussions) | | |
|------------|---|---------------|---|
| | Seed Company CEOs | Farmer Groups | Other Stakeholders (traders associations, regulatory and regional bodies, non-governmental organizations) |
| Burundi | 3 | 2 | 3 |
| Ethiopia | 3 | 2 | 6 |
| Kenya | 10 | 1 | 3 |
| Madagascar | 3 | 2 | 3 |
| Malawi | 4 | 1 | 3 |
| Rwanda | 2 | 2 | 5 |
| S. Sudan | 2 | 2 | 4 |
| Tanzania | 5 | 2 | 3 |
| Uganda | 6 | 1 | 5 |
| Zambia | 5 | 1 | 3 |
| Zimbabwe | 9 | 1 | 3 |

2.3.2 Data and Information Processing

The raw data and information from focal points in the different countries were sent to the Cardno East Africa office in Nairobi for processing and analysis. The data and information were organized in tabular and matrix format for ease of interpretation and clarity. The matrices and tables are presented alongside descriptive graphics for better explanation.

2.4 **Results of Stakeholder Engagement in the Index Countries**

2.4.1 Seed Companies

Seed companies in the Index countries were interviewed using a checklist to get information and data necessary for setting the scope of the Regional Index in terms of seed companies. The interviews were conducted by focal points in each of the 12 countries.

2.4.2 Prior Knowledge and Perception of the Index by Companies

The seed companies were asked if they had prior knowledge of the Access to Seeds Index and their opinion on it. After the feedback from each of the companies, the interviewer shared with them the objectives and focus of the Access to Seeds Index. Based on the brief background, the seed companies expressed their perception of the initiative.

More international seed companies had heard about the Access to Seeds Index compared to the regional and national companies. The international companies got the information from previous forums that the Access to Seeds Foundation participated in but most regional and national seed companies were informed by their seed traders' associations. However, some of the companies had no information on the initiative. Most of the seed companies supported the initiative and some indicated that they are already taking into account smallholder farmers' interest in their strategy and operations. However, some of the seed companies were either indifferent or sceptical about the initiative and expressed fear that the initiative may be unfair to small seed companies and would be unable to ensure accuracy of data and information collected from the seed companies during assessment.

2.4.3 Seed Companies' Prior Knowledge and Perception of Access to Seeds Index

Out of the 29 seed companies interviewed in the survey, 40% had prior knowledge of the Index. About 60% of the seed companies supported the initiative but the remaining had some reservations such as doubt on the sustainability, support from regulatory agencies, continued feedback to companies, and integrity of the information to be used in ranking the companies.

2.4.4 Companies' Focus on Smallholders

Most seed companies indicated that they already focus on smallholder farmers who form the bulk of their clients. Although they have different views on the challenges facing smallholder farmers in accessing quality seeds, they identified 14 main challenges. These challenges include limited information/knowledge on the available suitable seed varieties, limited seed distribution networks caused by poor physical infrastructure and unreliable agro-dealers. Other challenges are unviable small and scattered farming units in rural areas and low purchasing power due to poverty, lack of credit and low market prices for farm produce. They were of view that the challenges cannot be addressed by seed companies alone. They said there is need for involvement of the whole agriculture sector because some of the challenges are beyond their scope of influence for instance such as low market prices for farm produce.

Table 2-3 Major Challenges Facing Smallholder Farmers in Accessing Quality Seeds Based on Seed Companies' View

| Challenges | (%) responses based on 35 seed companies * |
|--|--|
| 1. Low purchasing power by smallholder farmers due to poverty, lack of credit and low market prices for farm produce | 26 |
| 2. Limited information/knowledge on the available suitable seed varieties | 24 |
| 3. Limited seed distribution networks due to poor physical infrastructure, unreliable agro-dealers and unviable small and scattered farming units in rural areas making seed distribution by companies expensive | 24 |
| 4. High prevalence of counterfeit/adulterated seed in the market | 14 |
| 5. Perception by smallholder farmers that quality seed is expensive and requires more inputs | 10 |
| 6. Limited availability of quality seed especially during planting season | 9 |
| 7. Limited markets for farm produce, which discourages farmers from adopting quality seeds | 8 |
| 8. Inaccessibility to other inputs such as fertilizers | 7 |
| 9. Inappropriate crop varieties such as those not suitable for smallholder farmers due to taste, color etc. | 2 |
| 10. Unreliable weather conditions such as drought | 2 |
| 11. Shortage of processing facilities and stores for seed | 2 |
| 12. Limited arable land for seed production in Rwanda and Burundi | 1 |
| 13. Generational hindrances – The aging farming generations are slow in adopting new technologies such as new varieties | 1 |
| 14. New virulent crop diseases | 1 |

*Please note that the percentages in this column are not meant to add up to a hundred due to multiple responses from each company. The percentages have been rounded to the nearest whole number.

The interviews were carried out on 29 seed companies in the region. The data was converted and expressed in percentages (Table 2-3).

All the seed companies accepted that they have a role in working with smallholder farmers to alleviate the challenges they face in accessing seeds. However, some of them – especially the regional and national ones – indicated that they faced constraints due to limited resources. Others suggested a lack

of an enabling environment caused by lack of relevant appropriate policies and regulations. The companies were in agreement that the efforts being made so far are not adequate and smallholder farmers are still not well served.

To mitigate the challenges they perceive to exist in the seed market, most of the seed companies concentrate their efforts in increasing production of quality seed to ensure availability, increasing and extending distribution networks to farmer level in rural areas, providing technical support and after-sales services and supporting national agricultural extension services. Table 2- 4 presents the roles of seed companies in alleviating the challenges faced by smallholder farmers in accessing seeds.

Table 2-4 Role of Companies in Alleviating Smallholder Farmers' Challenges

| Roles of seed companies | (%) responses based on 35 seed companies * |
|--|---|
| Increased production of quality seeds to ensure availability | 23 |
| Increased and extended distribution networks to farmer level in rural areas | 15 |
| Collaboration and support of national agricultural extension services | 15 |
| Providing agronomic /technical support and after-sales services | 10 |
| Farmer capacity building in partnership with NGOs and cooperatives in Zambia | 9 |
| Increased product awareness through radio, billboards, trial samples | 8 |
| Developing appropriate seed varieties such as those that are early maturing/drought tolerant | 7 |
| Appropriate seed packaging for smallholder farmers such as small affordable size | 5 |
| Employing strategies to prevent counterfeiting such as through fool-proof packaging and labeling | 5 |
| Supporting farmers to access credit and produce markets | 3 |
| Employing strategies for cost of production such as nuclear seed production | 3 |
| Engaging smallholder farmers in seed production | 1 |
| Offering bonuses to farmers in terms of seeds ¹ | |
| Timely stocking of seeds (local and imports) to ensure prompt availability to farmers | 1 |
| Setting uniform prices | 1 |

*Please note that the percentages in this column are not meant to add up to a hundred due to multiple responses from each company. The percentages have been rounded to the nearest whole number.

The interviews were carried out on 29 seed companies in the region. The data was converted and expressed in percentages (Table 2-4).

Some seed companies have devised different ways of accessing remote rural areas by distributing seeds using motorcycles. This is because communication infrastructure is a major challenge in most rural areas. There is also an example of a company that has focused on production of stable varieties to ensure farmers get adequate seeds of the required varieties every season. Other seed companies carry out in-country seed production to reduce cost and sometimes engage smallholder farmers in production.

To mitigate the challenge of seed distribution, some seed companies are re-investing their profit into market expansion. In cases of seed shortage, farmers plant whatever seeds they have. To reduce the impact of this problem, there is an example of a company that has established product ambassadors at community level to facilitate distribution of seeds to smallholder farmers. This company also relies on its seed sellers for extension service and scratch technology to counter counterfeits.

Other seed companies are putting up farmers' training centres in collaboration with the government with a focus on intensive farming technologies. They partner with finance institutions to support farmers'

access to credit. To address the problem arising from the ageing farming generation and is also working with the youth to promote their participation in agriculture. One company has 10 training centres countrywide which are used for disseminating knowledge to farmers.

The use of mobile phones in the region is on the increase and five seed companies reported use of the technology to disseminate information about seeds to farmers. Some seed companies in the region have tried to make seeds affordable mostly by setting the same price across the country.

In an effort to serve the needs of smallholder farmers, one practice is to focus the company's breeding on traits for early maturing and drought tolerance while emphasizing short season varieties. Meanwhile, other companies in the region have adopted small seed packages. Some companies provide seeds to farmers directly on-farm. There is also an example of a company that prioritized disease and drought tolerance in their breeding program for the region. Another is the practice of consolidating small farm holdings into seed villages so as to engage smallholders in seed production. Despite all the efforts by the seed companies the expectations of the smallholder farmers in the region are largely unmet.

The seed companies in region are focused on smallholder farmers who make over 80% of their clientele. In their focus they address the challenges facing the smallholder farmers i.e. crop/variety suitability, appropriate seed packages, capacity building, and awareness creation, produce market access, anti-counterfeit strategies and seed affordability

2.4.5 Seed Company Profiles

The profile of seed companies in terms of the crop diversity and seed volume: The seed companies in the region have a wide range of crops in their portfolio covering both field and vegetable crops. The volume of seeds by the companies varies depending on their capacity. Most of the international seed companies have larger proportion of hybrid seeds in their seed stocks. The regional and national seed companies have a fair balance of open pollinated varieties to hybrids in their stocks. This situation is preferable in the region because it provide farmers with choices. However, most of the international seed companies do not deal in open pollinated varieties. The bulk of the seed is being traded by the regional and national seed companies.

The number of seed companies which responded to the questions on their seed portfolio were 32; three of them did not respond.

The proportions of OPV to hybrids vary greatly in the region. Most of the crops having high proportions of OPVs are mainly vegetables and local crops. Maize has the highest proportion of hybrids. Most of the national and regional companies produce OPVs alongside hybrids. The international companies concentrate more on hybrids.

Seed Companies' profile in terms of the ecological zones they cover in the region: The ecological zones in the Index regions are diverse in terms of altitude, rainfall regimes, temperatures, soils and other factors. Seed companies have put efforts in coming up with suitable varieties and technologies to match the variations in the ecological conditions. Most of the companies have varieties for different ecological zones including those for irrigated agriculture which is on the increase such as green-house farming. The focus of the companies seems to depend on the ecological ranges in a country. For instance, they cover all agro-ecological zones but focus more on the humid and sub-humid agro-ecological zones.

The region has a wide range of ecological conditions supporting different farming systems i.e. humid, sub-humid arid and semi-arid. Most of the farmers depend on rainfall for crop production and where possible they supplement with irrigation in cases of dry spells. In semi-arid and arid areas little crop production is being carried out due to low and unreliable rains except for the areas with irrigation. The scale of farming in the region ranges from large scale commercial to small scale subsistence. .

The spread of each company in terms of ecological range depends on the diversity of its germ-plasm. For instance, one company targets wide ecological zones because it has a wide range of products. Another company also covers a wide ecological range in the region because it has a diverse germ-plasm. The company has special varieties of green maize (Ph 3253), which are commonly grown off-

season under irrigation. Another company also has widely adapted varieties suitable for smallholder farmers who constitute 95% of the company's customer base.

Some companies focus on humid and sub humid areas while others have varieties adapted to broad eco-zones especially from mid to low altitude. One company has greater focus on intensive irrigated and greenhouse based crop production while another focuses on humid zones because of high potential for production. Some companies claim arid and semi-arid areas have low demand for seeds and the production levels are low but the company has some suitable varieties for these areas. Like other public organizations, the company targets all the country's zones as a national obligation.

In the private sector, the spread of companies is dictated by the demand for seeds in each eco zone.

2.4.6 Companies' Research and Development Activities

Sources of genetic materials: Plant genetic materials for seed production are the backbone of any seed company. The seed companies in the region have different sources of genetic lines and even parent materials for breeding and seed bulking respectively. Most international and some regional seed companies have their own breeding programs. While most of the national, small upcoming companies depend on national public research organizations, universities and Consultative Group on International Agricultural Research (CGIARS) for the crop varieties for seed bulking. Some of the seed companies at regional and national levels carry out selection of indigenous local crops such as vegetables and bulk for marketing. The companies with breeding programs carry out a variety of development in specific sites including other regions and bring them into the country for adaptability trials before adoption.

Source of parent material for seed production: Over 45% of the seed companies interviewed have their own breeding programs and therefore produce their own varieties. Some of the breeding work is carried in collaboration with international and national research organizations and this accounts for 48% of the seed companies. Most of the seed companies own breeding programs are either international or regional in their geographical coverage. The universities in the region are also contributing to variety breeding but to a limited extent i.e. 0.1% of the seed companies. Three seed companies reported to be working with universities in their breeding programs. The seed companies have little involvement in selection and breeding of indigenous crops and land races (0.1% of the seed companies).

Some companies do most breeding work in one part of the region and conduct adaptability trials only in one country. There are also examples of companies that market seeds imported from abroad, while others have their own breeding sites abroad and in the region. Some seed companies' access public bred varieties from CGIARs and National Breeding Programs and then maintain lines after adaptability tests. 6.8% of the seed companies depend on national research organizations for the crop varieties they bulk for marketing.

Most of the international seed companies do breeding in their countries of origin. Most of the breeding programs in the region are on cereals and not vegetable. Most vegetable varieties are sourced from outside the region. The indigenous crop varieties are only available from the public research institutions and public seed companies because private seed companies are not very keen on investing in them.

Seed companies' goals in their breeding programs: The different seed companies focus on various traits in the varieties they breed or produce. The main traits that are adopted by seed companies in their breeding programs include improved nutritional contents (NTR), disease resistance (DIS), drought resistance (DR), high yielding varieties (HY) and others (OTR) such as acidity tolerance, nutrient efficiency, taste and shelf-life. Table 2-6 below presents the research focus by different seed companies in the region.

Table 2-5 Seed Companies' Research And Development Goals

| Research and Development Goals | | | | | | | | | |
|--------------------------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|
| 1 (NTR) | | 2 (DIS) | | 3 (DR) | | 4 (HY) | | 5 (OTR) | |
| Field crops | Vegetables | Field crops | Vegetables | Field crops | Vegetables | Field crops | Vegetables | Field crops | Vegetables |
| 24% | 10% | 55% | 41% | 55% | 41% | 52% | 48% | 24% | 17% |

The seed companies are focusing more research efforts on field crops than on vegetables. Most of the vegetable seeds in the region are imported. Most of the research programs are directed towards improving traits on disease tolerance, drought tolerance and high yields. Some efforts are directed towards nutritional value of the crop varieties. Other crop traits of importance in the region are shelf-life for vegetables, nitrogen use efficiency and tolerance to adverse soil conditions e.g. acidity.

The seed companies' research programs are largely influenced by market demand and environmental conditions. Most of the research work is carried out in partnership with international and regional organizations. Most of the established seed companies have their own gene banks for storing genetic materials. Their support to public gene banks is limited.

Key features of seed companies' research and development: R&D programs of most seed companies are driven by market demand, climatic conditions and disease/pest prevalence. The seed companies have a wide range collaboration and partnership in their research programs. The research organizations working closely with seed companies in the region are CGIAR such as CYMMIT, IITA, ICRISAT, CIAT and national research institutions in the index countries.

2.4.7 **Organization of Operations of Seed Companies; Seed Production and Processing**

The seed companies in the region which do local seed production depend on contract production as well as their own production (for those with land). Some of the seed companies produce seeds in one country and market in the other. The seed companies are involving smallholders in seed production mostly for open pollinated varieties which do not require much technical skills e.g. cowpea, sorghum and groundnut.

Twenty-nine (29) seed companies in the region were interviewed on how they carry out seed production and processing operations.

Figure 1: Mode of Seed Production by Companies

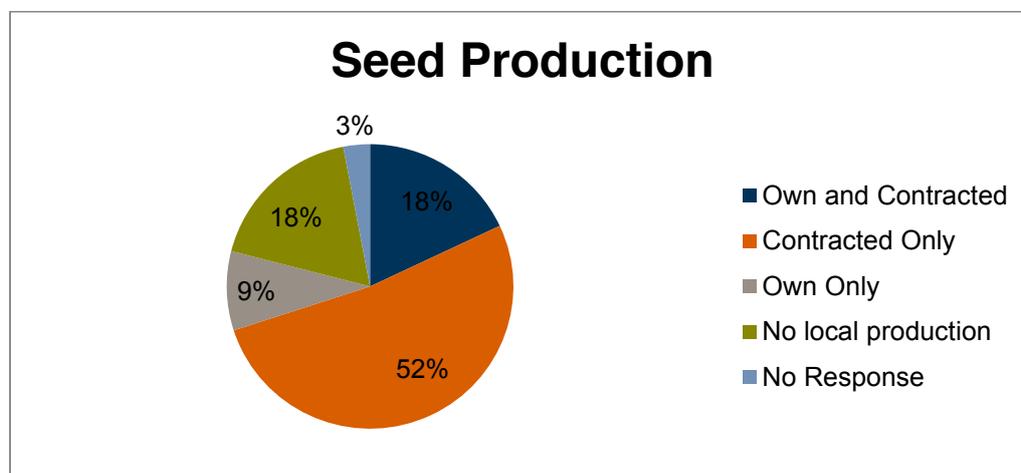
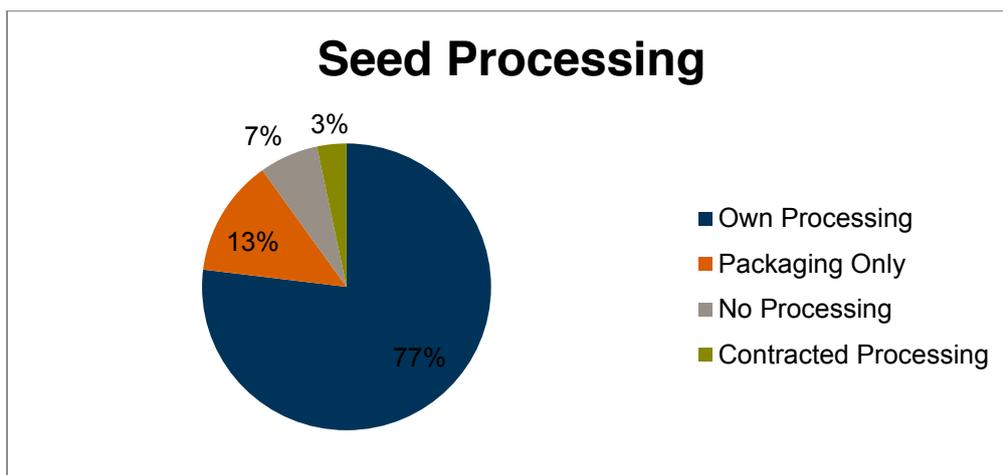


Figure 2: Mode of Seed Processing by Companies



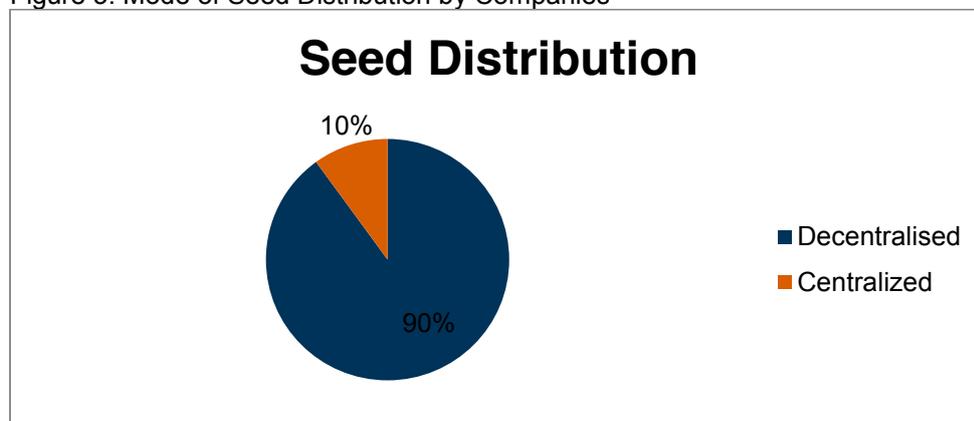
Most seed companies have their own processing facilities. Some the seed which depend on bulk seed importation undertake packaging only. There are some which deal in already packed seeds. Sixty six per cent of them engage smallholder farmers in seed production especially cereals and legumes such as sorghum, maize (OPV), cow pea, pigeon pea and groundnuts.

2.4.8 Seed Marketing and Distribution by Seed Companies

Seed companies in the region have adopted different strategies to ensure farmers access their seeds. Some have centralized distribution systems while others have strived to reach out to farmers by having decentralized systems. Sub-optimal seed distribution networks have been singled out as a major obstacle to farmers accessing seeds. The seed companies are using agro-dealers in their distribution but the distance from seed stores to farmers is still far (over 5km). The knowledge and awareness of farmers on existing or new varieties is still limited, which reduces adoption rates. Seed companies have stepped in with various strategies to increase adoption through demonstration and advertisements. The seed sellers are crucial in delivering seed to farmers and sometime play extension role by advising farmers who buy seeds. They are also important in maintaining the quality of seed in store prior to sale. It is therefore important that they are well equipped with skills to offer technical support to the farmers.

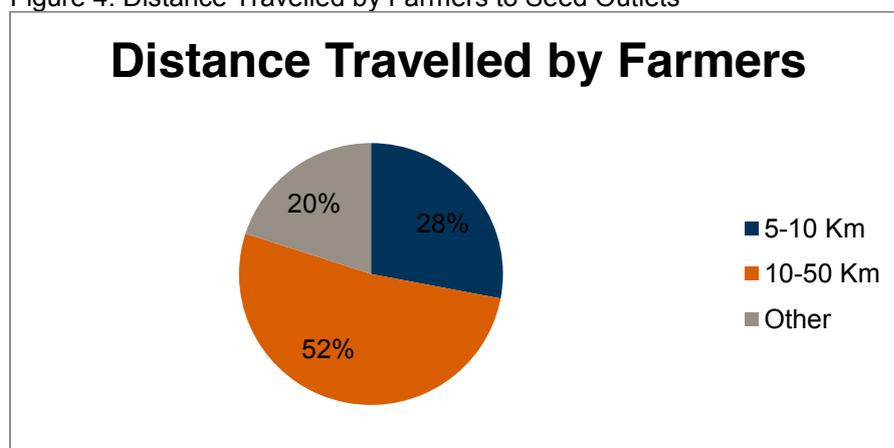
Most seed distribution network in the region is composed of large scale distributors (agents), medium size distributors (sub-agents) and small scale retailers (stockists). These distribution networks take the form of decentralization and most of the seed in the region is distributed through this channel. However, a few seed companies do direct distribution to farmers, cooperatives and some time to retailers directly.

Figure 3: Mode of Seed Distribution by Companies



The distance travelled by farmers to seed distribution points is very critical to farmers' use of improved seeds. Some farmers have to travel long distances to reach seed stores. Different seed companies have invested in taking closer to the farmers. The maximum distances to the seed stores vary from 5km to over 50km.

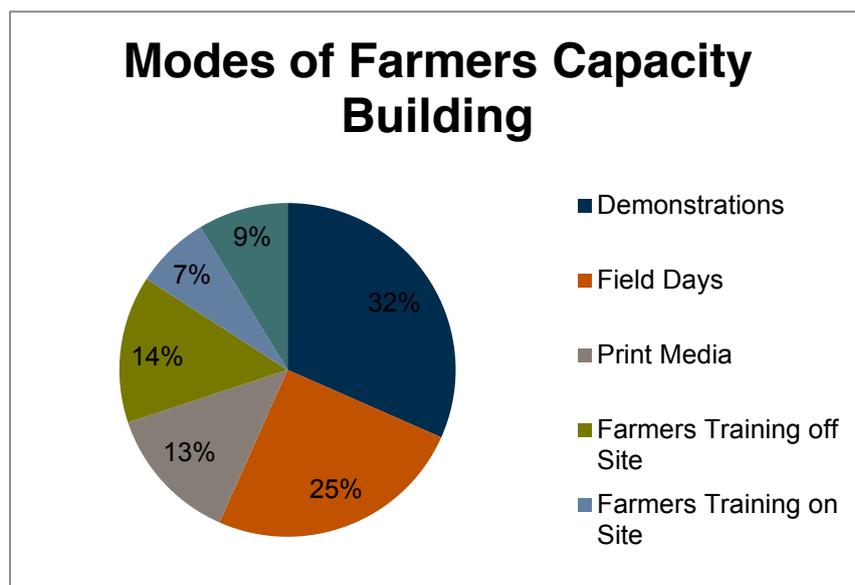
Figure 4: Distance Travelled by Farmers to Seed Outlets



The seed companies are keen on the cost of seed distribution when setting agro dealer networks especially in the rural areas. Some of the factors they look into are the communication systems, seed demand and availability of reliable agro-dealers.

The adoption of new crop varieties is being promoted by seed companies in the region through demonstration, field days, agricultural shows, use of farmers training centres, own premises, radio, television, billboard, print media (pamphlets, leaflets, newspapers) and on-farm training. Different seed companies are adopting various methods in promoting their varieties. The rate of application of the different methods by seed companies vary (Figure 5).

Figure 5: Mode of Farmers' Capacity Building by Companies



All the seed companies train their agro-dealers on the products usually at the beginning of the planting season. Some seed companies focus the training on farmers expecting the increased capacity of the farmers to improve demand.

Other services being provided by the seed companies are supporting the farmers to access produce market, withdrawal and replenishment of old seed stock, input insurance on behalf of farmers due to drought, diagnosis of diseases, sale of pesticides and chemicals, delivery seed to farmers' clubs, van services in seed distribution, free call-in services, tricycle delivery services, credit to distributors to transfer stock to farmers and participation in government programs to supply seeds

2.4.9 **Companies' Activities on Farmer Capacity Building**

It was noted that public farmer extension service is on the decline and that many seed companies have taken up the task of enlightening their clients on various farming technologies. Some of these activities are carried out in partnership with other organizations such as NGOs and research organizations. The main modes of knowledge transfer and awareness creation include farm visits, field days, demonstrations, scheduled trainings, distribution of literature, use of radio, television and information & communication technology (ICT).

Table 2-6 Companies' Activities on Farmer Capacity Building

| Extension service to farmers | Type of targeted training |
|---|---|
| Agricultural extension service to framers and seed growers | E-learning, farmer academy, targeted literature |
| Using in-house agronomists | Training and out-of-country exposure to community leaders |
| Demonstration plots with partners such as NGOs | Farmer training on how to attain optimal variety yields |
| Good agronomic practices | Planned field visits for farmer's e.g. research stations. |
| Product knowledge | |
| Demonstrations, field days and after-sales service especially on new products | |
| Extension service based on request by farmers | |
| Use of Field days and trade fares in extension | |

| Extension service to farmers | Type of targeted training |
|---|---------------------------|
| Farmer days | |
| Extension service to agro-dealers | |
| Use of sales staff to offer extension service to farmers when consulted. | |
| After-sales agronomic service and farm visits at early stages of variety introduction | |

93% of the 29 seed companies interviewed offer extension services to farmers and seed growers in the region. 1% of them build the capacity of farmers through targeted training. Few seed companies are engaged in targeted training, this could be attributed to the required resources. Most of the seed companies use in house agronomists, demonstrations and field days.

2.4.10 **Companies' Business Environment**

The seed companies' view on how to improve their business to support smallholder farmers varied. However, strategies that were cited mostly included increased extension services support, improved variety adoption, training farmers on use of certified seeds, financial support to farmers and increased seed distribution through agro-dealer outlets and network.

Table 2-7 Seed Companies Views on Key Areas to Improve Seed Business to Support Smallholder Farmers' Access to Seeds

| Key feature needing improvement | Frequency (%) based on responses from 35 seed companies |
|--|---|
| 1. Increase extension services support, improved adoption, support in training farmers on use of certified seeds | 21 |
| 2. Financial support to farmers, agro-dealers to pay upfront for seeds and credit be made available to farmers | 19 |
| 3. Increase seed distribution/agro-dealer outlets and network | 12 |
| 4. Improve infrastructure to reach more farmers | 7 |
| 5. Larger human resource base | 5 |
| 6. Empowerment of farmers' organizations | 5 |
| 7. Awareness campaigns/increase promotional material | 4 |
| 8. Improve Irrigation facilities | 4 |
| 9. Improve private /public partnerships for better access to farm inputs by farmers | 4 |
| 10. Removing non-tariff barriers and easier movement of seeds across the region | 4 |
| 11. Improve produce markets | 4 |
| 12. Improve seed policies, regulations and enforcement to get rid of counterfeit seeds in the market | 4 |
| 13. Improve seed production, processing and storage facilities | 4 |
| 14. Respond to farmers' preferences for traits in varieties | 4 |
| 15. Need for good, reliable agro-dealers | 2 |
| 16. Reduce public sector interference in the seed industry and improve partnerships | 2 |

In the view of the seed companies the main areas that need more focus to improve seed business environment for the benefit of smallholder farmers are increased extension services and capacity building of farmers, accessibility to financial resources, increased seed distribution networks, improve infrastructure and produce market access. The areas highlighted represent the gaps existing in the crop production value chain.

The main challenges facing seed companies in the region in relation to business environment include limited working capital and seed counterfeits. Table 2-10 highlights other challenges being experienced by seed companies in the region.

Table 2-8 Challenges, Strategies, and Relationships in the Seed Sector (Frequencies Based on Responses from 35 Seed Companies)

| Challenges (Frequency) | Frequency | Strategies | Frequency |
|--|-----------|---|-----------|
| 1. Counterfeit seed industry and inadequate regulation | 7 | New packaging technology – seed tagging and barcoding Product awareness Timely and consistent seed distribution before planting Maintaining high quality seeds | 6 |
| 2. Funding/liquidity in market/timely payment by debtors, limited working capital, high cost of inputs | 7 | Maximize and priorities available resources Sourcing finance from low interest agencies Selective recruitment of Agrodealers Ensure small seed packages for smallholders Fund raising | 4 |
| 3. Smallholder farmers' price sensitivity and low purchasing power yet their numbers are high | 4 | Ensure small packages for smallholders Working with partners Increase extension services | 4 |
| 4. Unreliable and defaulting agrodealers - stockists not remitting funds as per contractual agreements | 4 | Deal more with distributors Maximize use of available resources Availability of collateral for distributors Selective recruitment of agrodealers | 4 |
| 5. Inaccessibility to smallholder farmers - lack of capacity to cover entire country | 4 | Organising farmers into seed production clusters | 3 |
| 6. High competition | 4 | Maintain high quality seeds to remain competitive Collaboration with NGOs to reach farmers | 3 |
| 7. Public sector interference in the seed industry and lack of regulatory frameworks to get rid of counterfeit seeds | 4 | Advocacy for non-interference Active in Seed Association of Kenya Started Kilimo Insurance /IFC Discussing issues in the right forums | 3 |
| 8. Inadequate extension to farmers as it is expensive for companies to interact with all farmers face-to-face | 4 | Working with stakeholders Providing motorbikes for Government extension workers | 1 |
| 9. Climate Change | 3 | Get drought resistant varieties Diversification of products | 2 |
| 10. Diseases such as Maize Lethal Necrosis Disease (MLND) | 3 | Breeding for disease resistance | 2 |
| 11. Input subsidy for farmers | 3 | Popularise hybrid seeds Training of farmers | 1 |

| Challenges (Frequency) | Frequency | Strategies | Frequency |
|---|-----------|--|-----------|
| 12. Cultural preference for farm-saved seeds | 2 | Increase awareness through demonstrations - Use schools for demonstration plots to capture childrens' attention - Ensure small packages for smallholders | 2 |
| 13. Unfavourable policies and obstacles to regional trade | 2 | Lobby through seed associations | |
| 14. High investment in seed activities | 1 | Maintain high quality to remain competitive | 2 |
| 15. Difficulties in estimating the seed market and market for seed is small | 1 | Dissemination of information to farmers Diversify and spread geographically | 1 |
| 16. Seed smuggling at border areas | 1 | | |
| 17. OPVs | 1 | | |

2.4.11 Organizations Working with Seed Companies

The seed sector in the region is quite active and has many collaborative efforts that focus on different areas of the seed value chain. The composition of collaborators varies from country to country and from one company to another. The main collaborators and partners in the seed sector are seed traders' associations, government ministries, input manufacturers and distributors, research organizations, regulatory authorities and farmer organizations. Table 2-11 presents the details of collaborations and partnerships in the seed sector.

Table 2-9 Organizations Working with Seed Companies

| Type of organizations | Specific organization | Nature of collaborations |
|--------------------------------------|--|--|
| Research and Regulatory Institutions | Ministry of Agriculture(Kenya, Malawi, Uganda, Zambia, Zimbabwe); National Agricultural Research Institutes (Kenya, Malawi, Uganda, Zambia , Zimbabwe) National Regulatory Bodies (Kenya, Malawi, Uganda, Zambia, Zimbabwe) | Regulatory and policy issues, crop breeding and technology transfer. |
| CGIAR Centres | CIMMYT, CIAT, WARDA/New Rice Africa, ASARECA,ICRISAT | Crop variety development, access to new varieties, source of basic seed |
| Seed Trade Associations | Seed Traders Association of Kenya, Malawi , Uganda, Zambia and Zimbabwe; Africa Seed Traders Association | Policy advocacy, seed market access and regional seed networks, |
| Input Suppliers | Fertilizer and chemical companies IFDC | Improved access to associated inputs to farmers for higher crop production |

| Type of organizations | Specific organization | Nature of collaborations |
|--|---|--|
| Grain Traders | Cereal Growers Association(Kenya), East African Grain Growers Association Grain Traders (Uganda) | Access to produce market and better price offers for farmers |
| NGOs | NGOs e.g. Technoserve , One Acre Fund, Red Cross | Support to farmers in extension service, capacity building and policy advocacy |
| Others (mostly service providers and Investors) | AATF, DTMA, USAID, BMGF, Investors; Pearl Capital Partners, UAP Insurance, Safaricom, Investors | Access to financial, insurance and communication services |
| Universities | Conservation Farming Unit (University of Zambia) | Technology development and dissemination |

2.5 Results from Farmer Group Discussions

2.5.1 Farmers' Perspective of the Seed Sector

Some smallholder farmers in the index countries were engaged in focus group discussions to get their perspective and views on access to quality seed. Table 2-12 below highlights the crops being grown by interviewed smallholder farmers and the challenges related to access to quality seeds and attention from the seed companies.

Table 2-12 Crops Being Grown by Smallholder Farmers and Problems in the Use of Quality Seeds

| Crops grown by farmers | Crops grown whose seed is certified | Crops grown whose seed is not certified | Farmers' problems in using certified seed | Avenue for addressing the problems and feedback mechanism |
|---|--|--|--|--|
| (i) Field crops 1. Gound nut 2. Maize 4. Soybean 5. Beans 6. Upland rice, 7. Finger millet 8. Sorghum 9. Green grams 10. Cow peas 11. Fresh bean | Maize Beans Groundnuts Soya bean Cow peas Fresh beans | Maize Rice Beans Finger millet Groundnuts Sorghum Cow peas | Poor quality e.g. germination especially In ground nuts. Certified seeds do not meet their expectations in term varieties Possibility of fake seeds being sold as certified seeds. The seeds are prone pest attack Unsuitable varieties for ecological zones | Yes; Extension workers and field officers report complaints to the head office but no feedback on complaints Some of the complaints are channeled through agro-dealers but no feedback from companies |

| | | | | |
|--|--|--|---|--|
| | | | <p>Seasonal agro-dealers who leave once they have exhausted their stock leaving farmers without contact point.</p> <p>High cost and varying price</p> <p>Lack of required inputs to accompany certified seeds</p> | Some of the complaints are channeled to the Ministry of Agriculture. |
|--|--|--|---|--|

Some smallholder farmers, especially in Uganda, buy certified seed and then recycle for some generations before going back to buy. The farmers do these with even hybrids which impact negatively on the yields. Farmer awareness is needed to advise them to do this on open pollinated varieties only.

Smallholder farmers get information on new improved varieties from different sources which include agro-dealers, radio, mobile short messages, Ministry of Agriculture, seed companies, shows, field days and meetings. Most of these farmers have experienced negative impacts of climate change on their crops. The farmers shared various effects of climate change they include unexpected short droughts and sporadic heavy rains, heavy fogs, lack of rain at the time of planting. They have adopted different ways of coping with the effects of climate change, including proper timing of planting, conservation agriculture, multiple cropping, planting improved varieties (early maturing, drought tolerant) and buying food stock.

The farmers indicated that they have problems arising from crop pests and diseases. The crops commonly attacked are cow peas, beans, rice, vegetable and maize. The examples of common pests are caterpillar, aphids and mites. The farmers attempt to control the pests using ashes and pesticides. Besides disease and pest tolerance, farmers go crop traits related to early maturity, grain weight, taste, colour, nutritional value and ease of cooking. Most of the farmers have had no consultations with breeders so their input into breeding program is limited with exception of Zimbabwe and Zambia. The main motivation for farmers to use certified seeds is high yield, early maturity, and availability of produce market, availability of certified seed, to meet requirements of variety specific market (e.g. long shelf life), high vigour and quality of certified seeds, Table 2-13.

Table 2.13 Farmers Challenges and Expectations

| Farmers Challenges | Scope of challenge | Specific challenge |
|--|--|---|
| Major seed related challenges experienced by smallholder farmers | <p>a. Limited access to improved varieties/seeds</p> <p>b. Poor seed quality</p> | <p>✓ Unavailability of preferred varieties</p> <p>✓ High prices for the seeds</p> <p>✓ Distant seed stores</p> <p>✓ Poor germination, purity and seed health</p> <p>✓ Late supply of seed</p> <p>✓ Few agro-dealers</p> <p>✓ Low supply of seeds</p> <p>✓ Counterfeit and adulterated seeds</p> <p>✓ High seed prices</p> <p>✓ Limited access to finances</p> |
| Farmers' mitigation mechanism | <p>✓ Plant local seeds when certified ones are not available</p> | |

| | |
|--|--|
| | <ul style="list-style-type: none"> ✓ They travel to distant agro-dealers if they cannot get their preferred variety in the nearby seed stores ✓ The farmers simply recycle the seed if they cannot afford the certified seed ✓ In case of poor germination, they replant (gap fill) if they have seed left or use farm saved seed ✓ Report cases of poor seed to authorities and seed companies |
| Farmer suggested proposals for addressing challenges | <ul style="list-style-type: none"> ✓ Seed companies, agro-dealers and Ministry of Agriculture officers to organize periodic meetings with the farmers to discuss seed related issues. ✓ Seed companies to provide varieties that could be recycled for some few seasons before they buying fresh certified seed ✓ Seed companies to have authorized stockists and share the information with farmers on a regular basis ✓ Seed companies to use van sales for promotion of new varieties ✓ Seed companies to provide training, demonstrations and information to create awareness on seed adoption and use. ✓ Seed companies to link farmers to output markets ✓ Government seed relief need to be based on appropriate varieties and seed quality ✓ Promotion of production technologies e.g. water harvesting in dry areas ✓ Prompt supply of seeds to avoid delays |
| (ii) Farmers expectations | <ul style="list-style-type: none"> ✓ Seed should be available in outlet stores all the time ✓ Mount countrywide demonstrations for new varieties to create awareness among farmers ✓ Train agro-dealers and their sales representatives so that they are able to advise the farmers on the best practices for the varieties being sold ✓ Consult the farmers or conduct participatory breeding so that farmers' varietal preferences are factored in ✓ Train lead farmers so that they can in turn train other farmers ✓ Open seed outlets in rural areas ✓ After sale service to get feedback from farmers ✓ Link farmers to produce markets |
| a. Farmers' expectations for services from seed companies | |
| b. Services currently received from companies supplying certified seed for field crops and vegetables | Radio programs Field days and demonstration plots |
| c. Do the companies meet all your expectations? If no what are the specific expectations that are not met? | <p>The farmers indicated that seed companies do not meet all their expectations and some of the specific expectations that are not being met include;</p> <ul style="list-style-type: none"> ✓ Good knowledge on new varieties ✓ Provision of adequate seed ✓ Involvement in breeding programs ✓ Seed companies to work together with Ministry of Agriculture ✓ Feedback on complaints ✓ Quality seeds |

| | |
|---|--|
| d. Additional information from farmers expectations | <p>The farmers expressed concern on a number of issues and wished something could be done by either seed companies or government. These include;</p> <ul style="list-style-type: none"> ✓ Encourage Introduce small sized packs for seed and pesticides ✓ Markets for produce with better prices ✓ Polices to control vendors exportation/enforcement ✓ Warehouses in the rural areas for collective marketing ✓ Pay seed growers in time ✓ Support farmers access to credit ✓ Clear terms of contract for seed growers ✓ Policies and regulations to control seed vendors |
|---|--|

2.6 The Perspectives of Other Key Stakeholders in the Seed Industry in the Region

Besides the seed companies and farmers, the other stakeholders in the seed sector include national regulatory authorities, seed traders association, research organization and Non-Governmental organizations. The regulatory bodies play an important role of implementing seed policies and enforcing regulations. They coordinate crop variety testing, release and seed certification. They also facilitate seed trade at national and regional levels. Their roles are geared towards ensuring seed quality and creating an enabling business environment for investors. The Index countries have regulatory organizations at different levels of growth and capacities. They are generally of the view that the Access to Seeds Index will assist companies to know their performance in the industry and that this may trigger improvement of their services to smallholders.

The Index countries also have national seed traders associations which are formed by seed companies and other stakeholders such as breeders. The associations provide a single voice for seed companies in advocacy and dialogue in addressing issues in the seed industry for creation of an enabling environment for the industry particularly with the country national governments -these include policy advocacy monitoring research, seed production and distribution in the countries local seed markets; supporting harmonization of legislation in the region, capacity building by newer seed trade associations by older ones. They are able to instil professionalism among members through codes of conduct. The associations are of the opinion that smallholder farmers can be supported through improved seed distribution through an expanded reliable agro dealer network; provision of markets for farmer produce e.g. though commodity exchange; increasing farmers access to loans; closing all gaps in the value chains of smallholder food enterprises; assisting farmer unions to organize themselves to access inputs in bulk; lobby for enforceable contracts with seed and crop produce production; creating awareness of quality seed among smallholders farmers; availing small seed packages; availing farmers with demonstration packages ; strengthen penalties on fake seed; continued monitoring of seed quality and provision of agronomic information through text messages.

Most of the NGOs focus on supporting production and availing affordable quality seed for smallholder farmers. They do so through farmer mobilization for example through the creation of cooperatives, training, extension services, advocacy for policy change and provision of credit and subsidies. They are of the opinion that the smallholder farmers' access to quality seed can be improved through weeding out unscrupulous seed dealers, supporting farmers to operate their own seed banks and informal system of sharing seed should continue and introduction of small affordable seed packages, working through farmer cooperatives to offer credit to farmers, involving smallholders in seed production, making quality and suitable varieties that are adaptable to various eco zones available, increase farmers' access to basic seed from research institutions, increased development of local seed businesses. The NGOs interviewed were of the opinion that the Access to Seeds Index is a good initiative as it will encourage the right seed of the right variety to be accessed by smallholders but they felt the Index should start with grassroots organizations except for vegetables so as to avail affordable alternatives to certified seed.

2.7 Scope and Methodology of the Regional Access to Seeds Index

Based on the information and data gathered from the index countries in the region, the scope and the methodology of the regional index were developed.

2.5.2 Scope of the Regional Access to Seeds Index

The information and data from the stakeholder engagements were used to determine the scope of the index in terms of companies and crops.

Seed companies focus 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 fall into 4 groups;

- i. International seed companies
 - Based outside the region with global coverage.
 - Mostly domiciled in regions such as Europe, USA and Asia.
 - Well-developed seed systems and their regional operations vary depending on the company.
- ii. Regional seed companies
 - Originated within the region.
 - Most of them started as national companies but have expanded their operations into other countries in the region.
 - This has been facilitated by the ongoing policy and regulatory harmonization.
- iii. National seed companies
 - Operations are limited to the national level.
 - Some are public and others are privately owned.
 - Some of them control a large portion of a national seed market.
- iv. Niche seed companies
 - Companies with special focus on addressing specific farmers, ecological and market requirements.
 - Localized in spread and fill in the gaps ignored by the above three categories of seed companies.
 - Some of them are farmer based seed enterprises that have come up in the region to fill in this gap.
 - Most of these companies depend on local varieties from public research institutions and even landraces

The regional seed companies included in the Index were selected based on set criteria and they include international, regional and national companies.

2.5.3 Selection Criteria for Seed Companies

The criteria for selection of seed companies were:

- Integrated business model (value chain steps)
 - > Based on the number of the different value chain nodes in the company's scope of operations i.e. R&D, production, sales and marketing and capacity building.
- Degree of mutual identification - peer recognition in the industry
 - > Seed companies have good judgment of their peers' position in the industry and this information should be used to provide the rating of the companies in the region.

- Seed companies with physical presence and business activity in the region
 - > Physical presence of an international seed company in the countries in the region indicates the level of investment the company is committing to the area and the level of business activity.
 - > Companies with physical presence in more countries in the region have more impact on the local farmers.
 - > Some companies access the region's seed market through agents and this reduces their impact on the market and farmers.

Table 2.14 Selected International Seed Companies for the Regional Index

| Company | A | B | C |
|---|---|-----------------------------------|--|
| East-West Seed Co. | R&D, Production, marketing, capacity building | Recognized at international level | Burundi, Kenya, Uganda, Rwanda, Burundi, Tanzania, Kenya, Zambia, Zimbabwe |
| Monsanto, Seminis & National Seed Co. of Malawi | R&D, production, marketing, capacity building | Recognized at international level | Zimbabwe, Zambia, Malawi, Tanzania, Kenya, Uganda |
| Pioneer/Pannar | R&D, production, marketing, capacity building | Recognized at international level | Ethiopia, Kenya, Malawi, Zambia, Tanzania, Zimbabwe |
| Pop Vriend | R&D, Production, marketing, capacity building | Recognized at international level | Tanzania, Kenya, Zimbabwe |
| Syngenta/MRI | R&D, production, marketing, capacity building | Recognized at international level | Kenya, Zambia, Tanzania, Uganda, Zimbabwe |
| Technisem Seed Co. | R&D, Marketing | Recognized at international level | Kenya, Tanzania, Madagascar |

Table 2.15 Selected Regional Seed Companies for the Regional Index

| Company | A | B |
|-----------------------|---|------------------------------|
| Seed Co. | R&D, production, marketing, capacity building | Recognized at regional level |
| East African Seed Co. | R&D, production, marketing, capacity building | Recognized at regional level |
| FICA Seed Co. | R&D, production, marketing, capacity building | Recognized at regional level |
| Hygrotech Seed Co. | R&D, Marketing, capacity building | Recognized at regional level |

| | | | |
|----------------|--|---|------------------------------|
| Kenya Seed Co. | | R&D, production, marketing, capacity building | Recognized at regional level |
| NASECO | | R&D, Production, marketing, capacity building | Recognized at regional level |

Table 2-16 Selected National Seed Companies for the Regional Index

| Company | A | B | C |
|---------------------------|---|------------------------------|---|
| Demeter Seed Co. | R&D, production, marketing, capacity building | Recognized at national level | Malawi - 20% of national market |
| Ethiopian Seed Enterprise | Production, marketing, capacity building | Recognized at national level | Ethiopia - 85% of national market |
| Kenya Highlands Seed Co. | Marketing, capacity building | Recognized at national level | 3 rd in vegetable seed market in Kenya |
| ZAMSEED Co. | Production, marketing, capacity building | Recognized at national level | 4 th largest seed company in Zambia |

Information included in the tables is based on output gathered from interviews, this may cause incompleteness and slight inaccuracy of information.

The region has a wide range of crops being grown by farmers for food and other uses. The regional index focused on food crops and the crops were selected based on the following criteria;

- Food crops in the region that are important to smallholder farmers
- Regional or national staple food crops
- Food crop occurring in most countries in the region
- Crops raised from true seeds

For consistency, the Regional Access to Seeds Index for Eastern Africa assessed the same crops and vegetables as the Global Index. Based on stakeholder consultations and the farmers' focus group discussions, a list of 5 priority local field crops and vegetables were added in the regional list. Table 2-23 presents all crops included in the Regional Access to Seeds Index.

Table 2.17 List of Crops in the Regional Access to Seeds Index

| No | Crop common name | Botanical name | Area harvested (ha) |
|---------------------------|--|--|---------------------|
| Global Field Crops | | | |
| 1 | Rice, paddy | <i>Oryza sativa</i> | 2,877,488 |
| 2 | Maize | <i>Zea mays</i> | 15,326,327 |
| 3 | Wheat | <i>Triticum aestivum</i> | 2,010,120 |
| 4 | Millets Finger millet Pearl millet Foxtail millet | <i>Eleusine coracana</i> <i>Pennisetum americanum</i> <i>Setaria italica</i> | 1,416,155 |
| 5 | Sorghum | <i>Sorghum bicolor</i> | 481,321 |
| 6 | Beans, dry | <i>Phaseolus vulgaris</i> | 5,868,875 |
| 7 | Soybean | <i>Glycine max</i> | 481,321 |
| 8 | Potato | <i>Solanum tuberosum</i> | 977,984 |

| | | | |
|-------------------------------|-------------------|--|---------------------|
| 9 | Barley | <i>Hordeum vulgare</i> | 1,062,080 |
| Local Field Crops | | | |
| 1 | Chickpea | <i>Cicer arietinum</i> | 482,952 |
| 2 | Cowpea | <i>Vigna unguiculata</i> | 928,579 |
| 3 | Tef | <i>Eragrostis tef</i> | n/a |
| 4 | Pigeon pea | <i>Cajanus cajan</i> | 742,935 |
| 5 | Lablab (Dolichos) | <i>Lablab purpureus</i> | n/a |
| No | Crop common name | Botanical name | Area harvested (ha) |
| Global Vegetable Crops | | | |
| 1 | Onion | <i>Allium cepa</i> | 139,910 |
| 2 | Chili pepper | <i>Capsicum annuum</i> | 372,550 |
| 3 | Tomato | <i>Solanum esculentum</i> | 114,387 |
| 4 | Okra | <i>Abelmoschus esculentus</i> | 437 |
| 5 | Eggplant | <i>Solanum melongena</i> | 6400 |
| 6 | Pumpkin | <i>Cucurbita maxima</i> | 46600 |
| 7 | Squash | <i>Cucurbita pepo</i> | |
| 8 | Gourd | <i>Cucurbita pepo</i> | |
| 9 | Cabbage | <i>Brassica oleracea</i> | 74,700 |
| 10 | Green bean | <i>Phaseolus vulgaris</i> | 7,979 |
| 11 | Sweet pepper | <i>Capsicum annuum</i> | 148,512 |
| 12 | Cauliflower | <i>Brassica oleracea var. botrytis</i> | 148 |
| 13 | Broccoli | <i>Brassica oleracea var. italic</i> | |
| 14 | Green pea | <i>Pisum sativum</i> | 21,488 |
| 15 | Garlic | <i>Allium sativum</i> | 22,573 |
| 16 | Watermelon | <i>Citrullus lanatus</i> | 4,600 |
| 17 | Lettuce | <i>Lactuca sativa</i> | 1,450 |
| 18 | Chicory | <i>Cichorium intybus</i> | |
| 19 | Melon | <i>Cucumis melo</i> | 30 |
| 20 | Cucumber | <i>Cucumis sativus</i> | 916 |

| No | Crop common name | Botanical name | Area harvested (ha) |
|------------------------------|------------------|---|---------------------|
| 21 | Gherkins | <i>Cucumis sativus</i> | 916 |
| 22 | Carrot | <i>Daucus carota</i> | 9,233 |
| 23 | Turnip | <i>Brassica napus subsp. napus</i> | |
| 24 | Leek | <i>Allium porrum</i> | 15,630 |
| 25 | Spinach | <i>Spinacia oleracea</i> | 4,241 |
| Local Vegetable Crops | | | |
| 1 | Amaranth | <i>Amaranthus spp.</i> | n/a |
| 2 | Black nightshade | <i>Solanum nigrum</i> | n/a |
| 3 | Spider plant | <i>Cleome gynandra</i> | n/a |
| 4 | Jew's mallow | <i>Corchorus olitorius</i> | n/a |
| 5 | Crotolaria | <i>Crotolaria ochroleuca & C. brevidens</i> | n/a |

3.0 References

1. Wiggins, S. 2009. Can the Smallholder Model Deliver Poverty Reduction and Food Security for a Rapidly Growing Population in Africa? Paper for the Expert Meeting on How to Feed the World in 2050, Rome.
2. World Bank, 2009. Awakening Africa's Sleeping Giant - Prospects for Commercial Agriculture in the Guinea Savannah Zone and Beyond. World Bank, Washington DC.

Appendix 1: Focal Points for the Index Countries

| N° | Name | Country |
|----|-----------------------|-------------|
| 1 | Abraham Berkele Yonis | Ethiopia |
| 2 | Cirino Oketayot | South Sudan |
| 3 | Claid Mujaju | Zimbabwe |
| 4 | Donatien Bigirimana | Burundi |
| 5 | Elsa Timane | Mozambique |
| 6 | Emmanuel Mubangizi | Uganda |
| 7 | Francis Maideni | Malawi |
| 8 | Gabriel Nkulyimana | Rwanda |
| 9 | Henri Tsimisanda | Madagascar |
| 10 | Jedidah Gachanja | Kenya |
| 11 | Mable M. Simwanza | Zambia |
| 12 | Patrick Ngwediagi | Tanzania |

Appendix 2: Regional Expert Review Committee Members

| Name | Positions & Organizations |
|--------------------|--|
| Stephen Mugo | Principal Scientist – Maize Breeder & CYMMIT – Kenya Country Representative |
| Dominic Gitau | Former General Manager, Simlaw Seed Company |
| Essau Mwendo Phiri | Chairman, National Small Scale Farmers' Association, Malawi |
| Flora Mpanju | Senior Examiner, African Regional Intellectual Property Organization (ARIPO) |
| Dawit Alemu | Ethiopian Agricultural Research Institute |