

ASSESSMENT OF THE PERFORMANCE OF THE SEED SUBSECTOR REGULATORY AND INSTITUTIONAL FRAMEWORK IN UGANDA.

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List of acronyms

| | |
|-------|---|
| ACDP | Agricultural Cluster Development Project |
| ASSP | Agricultural Sector Strategic Plan |
| AU | African Union |
| CGIAR | Consultative Group for International Agricultural Research |
| DCIC | Department of Crop Inspection and Certification |
| EGS | Early Generation Seed |
| FDG | Focus Group Discussion |
| FS | Foundation Seed |
| GDP | Domestic Gross Product |
| DLG | District Local Government |
| ISSD | Integrated Seed Sector Development |
| LSB | Local Seed Business |
| MAAIF | Ministry of Agriculture Animal Industries and Fisheries |
| NARO | National Agricultural Research Organization |
| NGO | Non-Governmental Organisations |
| NSCS | National Seed Certifying Service |
| NSP | national Seed Policy |
| NSS | National Seed Strategy |
| OWC | Operation Wealth Creation |
| OPV | Open pollinated variety |
| PSM | Propensity Score Matching |
| QDS | Quality Declared Seed |
| SSA | Sub-Saharan Africa |
| SVC | Seed Value Chain |
| TASAI | The African Seed Access Index |
| UBOS | Uganda Bureau of Statistics |
| USTA | Uganda Seed Trade Association |
| WCDI | Wageningen Centre for Development Innovation, Wageningen University |
| WUR | Wageningen University & Research |

Executive Summary

This report describes the outcomes of subregional meetings to disseminate the National Seed Policy (NSP) and regulatory framework, online surveys to assess the impact of Covid-19 pandemic on access to quality seed, and performance of the functions, services and activities of the seed sector in Uganda conducted from July-September 2020. The specific objectives were to appraise the District Agricultural Officers (DAOs) and farmers' organisations/associations representatives of the NSP and regulatory frameworks; assess the impact of covid-19 pandemic on access to quality seed; assess the level performance of the seed value chain services and functions; and analyse the limitations of decentralising the implementation of the NSP. The integrated Seed Sector Development (ISSD) Plus project in Uganda, supported by the Embassy of the Kingdom of the Netherlands (EKN) funded the study.

The methodology included a literature review to provide background on the seed sector; online survey to assess the performance of the functions of the seed sector, the impact of Covid-19 pandemic on access to quality seed; and a series of sub-regional meetings. The subregional meetings used a participatory discussion approach focusing on the understanding of the NSP, related legal and regulatory frameworks; issues and challenges in the implementation of the NSP; and practical actions to address them. The questionnaires for the online surveys were guided by the seed sector analysis methodology using scores to guide the respondents. The survey was coded in Kobo toolbox and collated in a database for analysis.

The dissemination meetings revealed that by the District Local Government, in particular the DAOs and farmers representatives had information and knowledge of the NSP and regulatory frameworks. Key issues and challenges were: poor knowledge and information about new released varieties, weak linkage between research and extension services, limited supply of basic seed, multiple un coordinated seed supply chains; prevalence of poor-quality seed (poor germination and variety mixtures), quality seed perceived as expensive and continued use of home-saved seed by majority of smallholder farmers.

Government restrictions on mobility and gatherings as a result of lockdown starting from March 2020 to stop the spread of covid- 19, had a knock-on effect on key services and activities including: disruptions in variety evaluation and promotion, disruption in production and supply of basic seed; happening accrues to agricultural inputs due to scarcity and increased prices, and impeding distribution of seed at selling points.

Overall, the performance of the seed sector functions and services were rated fair but key areas of variety development and release, Early generation seed production and supply, seed quality supply and quality assurance, marketing, financing, coordination, utilisation and prevalence of fake seed on the market require more attention.

From the above findings, the following conclusions can be drawn:

Overall, a combination of approaches used in this study has enabled to bring out the main issues, challenges and practical actions to address them. This will guide seed sectors actors in setting priorities to enhance the growth of an effective and efficient seed industry in Uganda

DAOs and farmers' representatives have limited information & knowledge of the seed policy and regulatory frameworks. This partly explains the low priority accorded to seed activities at the local level. This also explains why most DAOs felt that they were not empowered to perform their functions for effective service delivery in the crop subsector.

The limited adoption of improved varieties by smallholder is largely attributed to the lack of information and knowledge about the performance and market value of newly released varieties. This is particularly critical for food and security crops, except for maize.

Shortage of quality basic seed to produce subsequent classes (certified and QDS) remains the greatest challenge hampering availability and access to quality seed by farmers. Self-pollinated (SPC) and vegetatively propagated crops (VPC) are seriously affected as they are not attractive to seed companies due to low profit margins.

There is potential of effective Public Private Partnership in development and growth of seed industry. Both MAAIF and USTA have shown enthusiasm to support the implementation of the policy and seed strategy.

The complexity of the seed supply chain and inadequate policy implementation influence performance of the seed sector. This is attributed to the involvement of multiple actors before the seed gets planted by the farmer which often compromises seed quality and variety integrity.

The prevalence of counterfeit seed indicates lack of transparency in the seed value chain and weaknesses in seed quality control system in the market place. This has led to farmers losing trust in the seed supplied from vendors.

The current centralized system of seed quality assurance is inadequate to provide the necessary inspection services to seed producers scattered in the different agroecological zones of the country. This is largely a result of limited human and financial resources available to the national Seed Certification Service (NSCS).

Smallholder farmers perceive certified seed as expensive but the use of QDS has increased due to being relatively of lower prices than certified seed. Although this is still at a low level, it shows a great potential of the Local Seed Businesses (LSBs) to fill the gap in the supply of quality seed especially for the open-pollinated crops (OPVs).

In order to effectively implement the NSP and regulatory frameworks and increase the level of performance of the seed sector functions, services and activities along the seed value chain (SVC), the following recommendations are made:

- i. In order to effectively implement the NSP at the local level, Capacity building in policy formulation is highly desirable. This include training the local leadership in formulating by laws to enable them enforce seed and plant regulations.
- ii. The seed and Plant Act of 2006 needs to be amended and aligned with the NSP approved 2018 for effective implementation and enforcement.
- iii. It is essential that all actors clearly understand their roles and responsibilities for effective implementation of the National Seed Strategy (NSS); breeders develop variety descriptors to guide farmers in variety choice; determination of market potential of new improved varieties to stimulate demand for quality seed; and above all build technical capacity of seed producers. This will go a long way in addressing challenges in the utilization of quality seed by smallholder farmers.
- iv. To ensure that farmers get quality seed it is essential to streamline the multiple seed supply chains. This can be achieved by operationalizing the digital Seed Tracking and Tracking System (STTS) recently developed by MAAIF and with financial and technical support from ISSD Uganda. This will further eliminate the sale of fake seed.
- v. In order to facilitate information exchange among seed sector stakeholders; development of a Seed Sector Integrated Information Management System (SSIIMS) is essential. This will also enable farmers to access data on seed performance and trends.
- vi. Tailored communication tools/strategies are critical. Translation of the NSP popular version into local languages to enable the key implementers (i.e. farmers who buy quality seed and DLGs who promote use of quality seed and enforce regulations) is highly desirable.

- vii. To achieve the desired vision and mission of the NSP, the DLGs must prioritize the NSS activities and allocate resources to execute them. Farmers must also buy quality seed. This will go a long way to the development of an inclusive seed sector.
- viii. Improving access to quality seed EGS is essential to enhance availability of certified and QDS. This can be achieved through a sustainable institutional framework that supports cost-effective EGS models tested by ISSD Uganda, MAAIF and NARO.
- ix. It is essential to strengthen and scaleup LSBs in the production and supply of quality seed to the last mile. These organized and trained market-oriented farmer groups have shown capacity to sustainably produce and commercialize affordable QDS, thus, filling the gap not adequately taken care of by seed companies.
- x. Coordinated actions by all stakeholders in the seed sector is essential to foster integrity and transparency which are critical in building trust in the seed industry by farmers. It is also imperative to strengthen the National Seed Board & NSCS, which are the main regulators of the seed industry in Uganda.

1. BACKGROUND TO THE STUDY

1.1 Agriculture and the role of the seed sector in Uganda

Agriculture is a core sector of the economy that provides a livelihood for approximately 65% of the population (National Seed Policy of 2018). Improving agricultural productivity in Uganda is, therefore, a key policy priority (National Agricultural Policy of 2013). Agriculture contributes 24% to Gross Domestic Product (GDP) and 52 % of exports (UBOS 2019). The Agricultural Sector Strategic Plan (ASSP) 2015/16-2019/20, which is a road map for the development of Agriculture, seeks to widen community involvement in the transformation of agriculture from subsistence to commercial farming. Statistics show that 68% of the farming households are engaged in subsistence rain-fed farming (UBOS, 2014) with minimal use of purchased agro-inputs and using rudimentary agricultural tools (mainly the hand hoe). Efforts to expand agricultural productivity in Uganda have, amongst others, focused on technological change and specifically the adoption of yield enhancing seed varieties.

While agricultural production has increased in absolute terms, this has been largely due to area expansion. Crop yields are low and declining (computed as yields per acre) due to a number of factors including use of poor-quality seed. The limitations and challenges in law enforcement have compromised seed sector regulation which has seen the sale of counterfeit/fake seed to the tune of 30-40% (Joughin, 2014; Marechera et al., 2016; Bold et al., 2017; Erenstein and Kassie, 2018) of total seed sold, causing significant losses to farmers.

1.2 Uganda's seed subsector

Development of the seed sector

Uganda's seed sector development started in 1968 with a public seed sector scheme that involved breeding, seed multiplication and marketing (MAAIF, 2010). The seed industry was liberalized in the 1990s and involves over 40 registered seed companies to date. These companies are responsible for production, processing and marketing of certified seed. Most of them also sell other agro-inputs like fertilizers, and pesticides. Thirty-five of the registered seed companies are members of the Uganda Seed Trade Association (USTA), established in 1999 to coordinate seed trade in the domestic and regional markets.

Seed companies face challenges of investing in seed production of most food crops because of the low profit margins involved (Mastenbroek and Ntare, 2016). It is costly to reach all areas in Uganda especially those hard to reach with poor market infrastructure. This has resulted in seed companies to concentrate on crops with high returns such as maize hybrids and exotic vegetables.

Due to limited capacity (human and financial resources) in the regulatory system, and inability of seed companies to supply the required quantities of certified seed of most food crops, 30-40% of seed traded in the market is counterfeit (Joughin, 2014; Marechera et al., 2016; Bold et al., 2017; Erenstein and Kassie, 2018). Systematic records on seed sector functioning are scarce and incomplete. It is estimated that 10% of maize seed is marketed through the formal system (Marechera et al., 2016) of which about half are hybrids and half are open-pollinated maize varieties (OPVs) (Erenstein and Kassie, 2018). Some varieties developed and released by the National Agricultural Research Organisation (NARO) are rarely multiplied for commercial distribution due to limited resources for facilitating the diffusion processes. Another challenge in the seed sector is that stakeholders have limited access to vital information and knowledge about where to access quality seed, of which varieties and what

the actual seed demand is. This is further exacerbated by weak linkages between research and extension.

Current seed systems

The Ugandan seed sector is characterized on the basis of the domains in which stakeholders operate (public, private, formal, informal and intermediate); the types of crops produced (food and cash crops); the types of variety used (land races, improved, exotic, and hybrids); the type of quality assurance mechanisms that are operational (informal, quality declared, truthfully labelled and certified); and the seed supply mechanisms (local exchange, agro-input dealers, and subsidized distribution) (Mastenbroek and Ntare 2016). Each seed system is further characterized by who is producing the seed, which crops and varieties, types of quality assurance and the way the seed is distributed.

The formal system is responsible for certified seed production through a structured system of variety development and release, seed multiplication, quality control, distribution, and marketing. The major players in this system are public institutions (government, international and national research) and the private sector (mainly seed companies). The National Seed Certification Services (NSCS) under the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) is responsible for seed certification in the formal system (Mastenbroek and Ntare, 2016). It is estimated that this system contributes 10-15% of certified seed use, 70% of which is maize (ISSD 2014). Certified seed is sold directly by seed companies and is also distributed through agro-input dealer shops. In addition, Government and NGO programs procure and distribute certified seed to smallholder farmers for free.

The informal seed system comprises home-saved seed, seed obtained from social networks (family and friends), informal seed multiplication groups and the local grain market. The local grain market typically provides recycled seed of unknown quality (Kansiime and Mastenbroek, 2016). Seed from farmers' own farms, social networks, and informal seed multipliers have social trust as informal quality control mechanisms because of the familiar and short supply lines (Kansiime and Mastenbroek, 2016; Hoogendoorn et al., 2018), but quality is not assured. The main actors in the informal seed systems are, farmers' associations and cooperatives), Non-Governmental Organisations (NGOs), development agencies, community-based organizations and farmers.

MAAIF formally recognized Quality Declared Seed (QDS) as a new seed class produced by trained market-oriented smallholder farmers to fill the gaps in quality seed supply of primarily food and nutrition security crops that are not sufficiently provided for by seed companies due to low profit margins (Mastenbroek and Ntare 2016). This constitutes an intermediate system that is a hybrid of the formal and informal seed systems. The Integrated Seed Sector Development (ISSD) program in Uganda supported emergence of farmer-led seed entrepreneurs under this system, generally referred to as Local Seed Businesses (LSBs). This system has a local coverage, relies on farming communities' capacities, and is able to deliver quality seed to the last mile. In a recent study to assess the contribution of LSBs in the provision of quality seed indicated that the availability QDS of crops such as beans, groundnut, soybean, rice, potato and cassava was on the increase in the last three years (ISSD, 2020, unpublished report). In the same study, 35% of the farmers are buying seed from QDS producers as they have confidence in the quality and is affordable.

Seed supply

On the supply side, there are inadequacies in both public and private sector agencies in producing sufficient quantities of the needed quality seed. The high cost and length of time required to produce new seed varieties has made it difficult for government and non-state

actors to make available the needed early generation seed (EGS) critical for production of sufficient quality seed. This has been made worse by limited support to breeding systems (with only a few qualified breeders and seed scientists in the country). At the production level, limitations in accessing affordable credit facilities; frequent drought spells and floods (due to adverse effect of climate change), declining soil fertility due to low use of yield enhancing agricultural inputs (e.g., fertilizers & pesticides); limited investment in irrigation, and poor postharvest handling infrastructure; continue to hinder growth of the seed sub-sector. On the regulatory side, there is very limited awareness of the Seed and Plant Act of 2006. This Act has clauses that are not punitive enough to discourage sale of counterfeit seeds. Public investment in the seed system is below 1% of the national budget thus, curtailing production of the much-needed seed varieties.

Seed quality assurance

Uganda has a mandatory seed inspection system that recognizes two seed classes: certified seed and quality declared seed (QDS). Certification is a process which translates unobservable levels of seed quality into observable attributes, allowing farmers to differentiate between different qualities of seed. Certified seed obtained from a formal source should theoretically guarantee high germination, and physical and genetic purity. Once the seed is certified, the seed company is issued with blue tamperproof Government labels for the seed packs. For QDS, they are issued with green tamperproof Government labels which are affixed on the seed packs.

The policy and regulatory framework

The Seed subsector in Uganda is linked to the strategies of the National Agricultural Policy of 2013 which are: i) generating, demonstrating and disseminating safe and cost-effective agricultural technologies and research services to enhance production and increase quality of produce through access to high quality agricultural technology, agribusiness and advisory services for all categories of farmers; ii) promoting the growth of a vibrant private sector-led agricultural input supply system that is responsive to the farmers and sector need; iii) strengthening certification and regulatory systems of the government to guarantee the quality of agricultural inputs at all levels; and iv) developing and implementing a policy and regulatory framework for biotechnology in Uganda.

The National Seed Policy (NSP) and regulatory frameworks in Sub-Saharan Africa (SSA) greatly influence variety development and access to and availability of quality seed and planting materials (hereafter seeds), and the resulting outcomes in agricultural productivity. The Uganda Government has put in place an enabling environment to support the growth of the seed subsector in the country. The NSP was approved in October 2018 and launched in March 2019. A regulatory framework has also been developed, through the Seed and Plant Act of 2006, the Seed and Plant Regulations of 2017, and the Seed and Plant (Quality Declared Seed) Regulations of 2020. The launch of the NSP marked a significant stage of creating an enabling environment for a vibrant, competitive and pluralistic seed subsector in Uganda. While the Seed and Plant Act is the principal law to regulate the subsector, additional laws have been enacted to support the seed policy and include: Agricultural Chemical Control Act 2006; Plant Variety Protection Act 2014, Plant Protection and Health Act 2015 and the Biotechnology Engineering Bill have been developed to regulate the seed subsector.

The strategic areas of the NSP are: i) strengthen research for development of high productive varieties to enhance agricultural productivity; ii) strengthen the capacity of the seed value chain actors to accelerate the performance of sector; iii) strengthen seed quality assurance along the entire seed value chain; and iv) enhance knowledge and information management for the seed sector. The policy also addresses crosscutting issues including: intellectual

property rights, environment and natural resource protection and conservation, gender and development and climate change.

In order to operationalize the NSP, the ISSD Plus project in Uganda provided technical and financial support to the Ministry of Agriculture Animal Industry and Fisheries (MAAIF) to formulate the 5-year comprehensive National Seed Strategy (NSS) 2018-2023 to transform the seed sub-sector into a competitive, profitable, equitable and sustainable sector. The NSS elaborates actions and plans to achieve the seed policy objectives and strategies. It provides strategic direction, outlines the activities, presents a budget and describes the implementation arrangements.

The NSP development started in 2002 was only approved in 2018. During this period many changes have occurred whereby stakeholders at all levels who participated in the formulation processes have been replaced or retired. The NSP implementation arrangements are based on a sector wide approach which includes both the public and private sector stakeholders. Emphasis is placed on creating functional linkages between MAAIF and its agencies, other Ministry Departmental Agencies (MDAs) and local governments to develop a sound and vibrant seed industry. Efficient and effective seed-subsector institutions are critical for realising the vision, mission, and objectives of the NSP.

To ensure that the NSP and strategy are well understood for effective implementation by all stakeholders, MAAIF sought technical and financial support to multiply thousands of copies of the NSP and NSS for distribution at the District Local Governments (DLGs) level. Further, MAAIF constituted a technical working group composed of commissioners and inspectors in the Department of Crop Inspection and Certification (DCIC), Directorate of Agricultural Extension Services (DAES), Policy analyst, ISSD Uganda and Uganda Seed Trade Association (USTA) to develop an illustrated abridged version (commonly known as the NSP Popular Version) tailored to nontechnical stakeholders including farmers, and extension staff. ISSD provided technical and financial support to design, print and multiply 15,00 copies.

Seed sector performance

In spite of the NSP approval in 2018, the seed industry in Uganda was operating under a regulatory framework that was not guided by a policy. Thus, in addition to the dissemination of the NSP to the main implementers at the local level, it was found pertinent to simultaneously assess the current status of the seed value chain functions and activities. In the first quarter of 2021, the world was struck by covid-19 pandemic that spread rapidly in SSA countries including Uganda, threatened lives and livelihoods. A majority of the peoples in SSA survive on agriculture in which seed systems are critical to improving food and nutrition security, resilience, and livelihoods of smallholder farmers. With an emphasis on service to smallholder farmers, a successful seed system should be based on its ability to ensure availability, accessibility, affordability and quality seed seed/planting materials. (<https://tasai.org/background/>). Residence means the seed systems must be able to withstand natural (e.g., weather variability, pests and diseases) or man-made (e.g., political instability) shocks. Most government implemented drastic restrictions on movement of people resulting in a halt of economic activities. These adversely affected critical agricultural activities particularly access to inputs, transportation, and marketing. Tus to ascertain the impact of covid 19 on the seed value chain activities, a rapid scan of the seed sector was conducted between May and June 2020 to alert on current challenges and urgent action in the Uganda seed sector.

1.3 Objectives

The main objectives of the study were:

- to create awareness of the National Seed Policy and strategy and
- to assess the level of performance of the functions and activities of the seed value chain.

Specific objectives were to:

- appraise the District Agricultural Officers (DAOs) and farmers' organisations/associations representatives on their knowledge of the NSP and regulatory framework;
- rapidly assessment of the impact of Covid-19 pandemic on the seed sector analyse the limitations of decentralising the implementation of the NSP.

2. STUDY METHODS

In this study, four approaches were used. First, a review of literature was done to provide the background to the seed sector. Secondly, a series of sub-regional meetings were undertaken, targeting DAOs and representatives of farmers' organisations/associations and LSBS. Third and fourth, two online surveys using Kobo toolbox were used for a rapid assessment of the impact of Covid-19 pandemic on access to quality seed, and the performance of the functions and services of the seed sector, respectively. Details of these are described below.

2.1 Creating awareness of the NSP and strategy

Sub-regional meetings: Together with MAAIF and USTA, a team of 9 persons, two from ISSD, 6 from MAAIF and 1 from USTA was constituted to facilitate the sub-regional meetings. The 137 districts were grouped into 11 sub-regional clusters (Annex 1). Due to the limitations on holding large gatherings to minimise the spread of Covid-19, sub-clusters of 5-7 districts were formed. The one-day meetings for each sub-cluster were held in a central district in each subregion. Each district was represented by the DAO and a farmer's representative. However, for the host districts, the entire District Local Government (DLG) leadership consisting of District Production and Marketing Officer (DPMO), Chief Administrative Officer (CAO), Assistant CAO, Resident District Commissioners (RDC), and Operation Wealth Creation (OWC) coordinator. Representatives of Zonal Agricultural Research and Development Institutes (ZARDIs), LSB/Associations, and academia) based in the host district also attended. Interactive discussions on the seed policy and regulatory frameworks were held with these stakeholders.

Communication tools: Communication tools used in the discussions included: i) an abridged and illustrated version of the NSP, reprinted NSP and NSS, USTA fliers on available varieties of maize, and a short video documentary on ISSD guiding principles. A couple of copies of the Seed and Plant Act of 2006 and Seed and Plant Regulations of 2017 were also available to encourage DLGs to acquire them from the National Publishing and Printing Corporation (NPPC); the only authority to reprint the laws. Each DAO was provided with 30-50 copies each of the NSP, NSP popular version, and NSS for distribution in their respective districts.

Discussions: The host DAO moderated the discussions which were divided into sub sessions including: Vision, Mission and objectives of the NSP and strategy; objectives, and expectations from the discussions; Historical background and roadmap in the formulation of the NSP and strategy; policy and regulatory frameworks formulation process and implementation; NSP priority areas; seed supply and marketing; quality assurance; and coordination and responsibilities. In each sub session, participants were asked whether they had ever heard or seen a copy of the NSP, whether they have ever participated in the formulation of the NSP or attended stakeholder workshops in the process; whether they understood the aims of the seed policy and its implementation; what were the key issues and challenges in the implementation of the policy at the district level; what were and the possible solutions in the implementation of the NSP in their districts, and whether they understood their roles in the

implementation of the NSP. At the end of all sub session, participants were asked to write down: i) one key takeaway message on the engagement process and ii) recommendation on how to enhance future interactions with subsector actors. The facilitators and their roles are presented in Annex 2. The discussions led by the senior official from MAAIF ensured authoritative responses on issues and challenges raised by the participants. This also enabled the study team to capture the issues/challenges limiting effective delivery of seed subsector services and hampering its functions.

[illegible]

An online survey questionnaire was designed in Kobo Toolbox (<https://www.kobotoolbox.org>) to seek feedback on the government restrictions on movement of people on the following seed sector activities/services: processes of variety development and release; production of quality basic seed; access to inputs, labour, and services for quality seed production; and farmers' access to inputs and quality seed. The questionnaire was sent to key actors in the seed value chain to answer specific questions related to the level of impacts on the different activities and services. The purposefully selected respondents were: plant breeders, extension staff, seed companies, farmers' representatives, LSBs and policy makers. A sector analysis tool developed by Wageningen Centre for Development and Innovation (WC DI) (WC DI, 2020) guided the design of the questionnaire. Results from the questionnaire were summarised in a dashboard and coded as follows: 1-severe negative impact, 2-negative impact, 3-slight

negative impact, and 4-no impact/ business as usual. These facilitated identifications of topics or alerts for the Focus Group Discussions (FGD) with various stakeholders. The FDGs validated the topics with a focus on the impacts, actions required, stakeholders involved, institutions to take the initiative and drive the processes.

2.3 Assessment of the performance of the seed sector

Using the methodology used in the seed alerts, an online questionnaire was designed with specific questions under each of the various SVC services. A scoring system as presented below was used to guide the respondents. Each question related to the level of performance on seed sector functions. Responses varied on a scale of 1 through 5 and also with a possibility of indicating questions that are not currently applicable.

Table 1 Scoring scale of the online seed sector assessment survey

| Score | Description |
|-------|--|
| 1 | Very poor performance-not functioning / does not meet sector needs |
| 2 | Poor performance-low level of performance / meets sector needs to a limited extent |
| 3 | Fair level of performance / meets sector needs to some extent |
| 4 | Good level of performance / meets minimum sector needs |
| 5 | Very good level of performance / largely meets sector requirements |
| 0 | Not applicable |

The survey was coded in Kobo toolbox and the questionnaire link was sent to 80 participants. Twenty-nine (29) responses received directly to the database. The survey questionnaire was designed in such a way that only specific questions were visible to specific participants in a technique called 'skip logic'. The scores were transformed to the level of performance into for each question, and the frequency over the various scores was calculated. This was complemented with a calculation of a stakeholder weighted average score, meaning that the average score for respondents in each stakeholder group was computed and then the average over the concerned stakeholder groups was calculated. Considering that the number of respondents was not equal for each stakeholder group, it was important that each stakeholder group and not each respondent was given an equal weight in the calculation of the average. A dashboard based on the outcome of the survey was developed for the individual questions but also those linked to value chain operations and services and sector functions informed the identification of the performance scores. The results per question were colour coded in a 'heat-map' and grouped along the seed sector functions and seed value chain activities. As such, these relative weighted values could be linked to individual activities in the value chain or more general operations and services of the value chain or functions of the sector (WCDI, 2020).

1. RESULTS

Key findings are described in sections 3.1 and 3.2 whilst section 4 synthesizes and discusses the findings from the literature & document review, the sub-regional discussions and the online surveys.

3.1 Creating awareness on the NSP and strategy

The number of districts targeted, coverage as well as number of participants are presented in Table 1. A summary of key issues, challenges and suggested actions to address these are presented in Table 2. A full documentation of takeaway messages from subregions, issues and challenges as well as actions needed to address them and recommendations from the

subregions on stakeholder engagement addressing limitations in effective delivery of sector services and functions are presented in in annex 3 & 4, respectively.

Table 2. Subregions, number of districts targeted and covered, % coverage and number of participants

| Subregional clusters | No. Districts targeted | No. covered | % coverage | Total number of participants |
|-----------------------------------|------------------------|-------------|------------|------------------------------|
| Norther (Lango & Acholi) | 17 | 15 | 88 | 88 |
| North Eastern (Teso and Karamoja) | 19 | 19 | 100 | 76 |
| Eastern (Elgon and Bukedea) | 17 | 13 | 76 | 89 |
| Albertine (Bunyoro-2) | 9 | 9 | 100 | 41 |
| South Western (Ankole-2) | 13 | 13 | 199 | 89 |
| West Nile (2) | 12 | 11 | 92 | 70 |
| South Western (Kigezi) | 6 | 6 | 100 | 42 |
| Central Mityana (2) | 14 | 14 | 100 | 62 |
| Central Masaka-Kalungu-2) | 12 | 17* | 140 | 82 |
| Busoga (2) | 12 | 12 | 100 | 59 |
| Rwenzori | 9 | 8 | 89 | 51 |
| Total | 140 | 137 | 99 | 729 |

*includes districts of Karamoja, Northern region and West Nile that missed attending workshops held for their cluster due to Covid-19 restrictions on mobility in those districts. Three districts did not send participants.

Table 3. summary of key issues & challenges limiting effective functioning of the seed sector and suggested actions to address these issues & challenges

| Key issues and challenges | Needed actions to address the issues and challenges |
|--|---|
| Variety Development and release | |
| <ul style="list-style-type: none"> Plant breeders working at their respective national research institutes have (a) limited human and financial resources to produce breeder seed, (b) sufficient government funding to carry out their trials (on-station and on-farm) | <ul style="list-style-type: none"> Adequate public funding for variety development Enhance human resources for each crop Focus on demand-driven crop improvement NARIs to develop a resource mobilisation strategy to support crop improvement activities Breeders to leverage on the vast advanced breeding lines and germplasm from CGIAR centres to enrich their genetic diversity from which to select new varieties with farmer-and market-preferred traits |
| <ul style="list-style-type: none"> Farmers' limited information and knowledge of new varieties and seed systems. This is particularly critical for most crops other than maize. | <ul style="list-style-type: none"> Breeders to engage farmers in participatory plant breeding and variety selection (through ZARDIs) Develop user-friendly variety descriptors Develop national variety maps to facilitate farmers' variety choice Researchers to develop cooperation with NGOs to promote uptake of new varieties in specific areas through the extension service NARIs to institutionalise farmer visits to adaptive research trials |
| <ul style="list-style-type: none"> Lack of effective mechanism for variety testing, releases, variety maintenance | <ul style="list-style-type: none"> Breeders to develop a robust variety testing program & maintenance |
| <ul style="list-style-type: none"> The national varietal release committees do not meet frequently due to insufficient financial resources to fund/cover and organize statutory meetings and other operating costs. | <ul style="list-style-type: none"> Government to provide an annual budget to facilitate the Variety release committee to process proposals for variety release and registration. |
| <ul style="list-style-type: none"> Seed companies have insufficient physical facilities; limited access to finances & high interest rates from credit institutions to expand their seed business. | <ul style="list-style-type: none"> Government to provide an enabling environment for seed companies to access credit at affordable interest rates to invest in quality seed production infrastructure; |
| <ul style="list-style-type: none"> Lack of intellectual property rights does not motivate research institutions and the private sector to optimize their potentials in variety development, releases and marketing. | <ul style="list-style-type: none"> Implementation of the Plant variety Protection (PVP) regulations awaiting gazetting Apply best practices in authorization of access of public varieties by seed companies |
| Early Generation Seed | |
| <ul style="list-style-type: none"> Limited availability of pre- & basic seed from NARIs | <ul style="list-style-type: none"> Support breeders to enhance their capacity in availing adequate quantities of breeder seed and variety maintenance |
| <ul style="list-style-type: none"> Insufficient physical & human resources to produce sufficient quantities of EGS | <ul style="list-style-type: none"> Enhance Institutional arrangements for Early Generation Seed of Selected Crops by developing cost-effective models for institutional cooperation between the public and private sectors depending upon the demand, profitability, and public good of specific varieties. |
| <ul style="list-style-type: none"> Low profit margins from investments in EGS by seed companies | <ul style="list-style-type: none"> Develop niche product markets to stimulate demand for quality seed of low profit margin crops (especially self-pollinated crops (legumes, and small grains) |
| Seed Supply | |
| <ul style="list-style-type: none"> Lack of data on actual demand for seed at both national and local level. | <ul style="list-style-type: none"> MAAIF to develop a methodology to capture seasonal seed need for all crops Conduct regular seed demand estimates Extension staff to collect seasonal seed needs per crop at local levels |
| <ul style="list-style-type: none"> Low seed yields attributed to limited use of yield-enhancing inputs (fertilizers and pest control) & good agronomic practices | <ul style="list-style-type: none"> ZARDIs to demonstrate cost-effective yield enhancing technologies through extensive demonstrations and in collaboration with extension service |

| Key issues and challenges | Needed actions to address the issues and challenges |
|---|--|
| | <ul style="list-style-type: none"> Demonstrate in different environments the economic value of using quality seed in combination with other inputs |
| <ul style="list-style-type: none"> Multiple uncoordinated seed supply channels | <ul style="list-style-type: none"> MAAIF to streamline supply of quality seed through a well-coordinated supply mechanism DLGs to have a list of all registered seed merchant's in the country to better track and trace seed from the various suppliers |
| <ul style="list-style-type: none"> Seed companies focus on high profit maize hybrids and vegetable seed | <ul style="list-style-type: none"> MAAIF to scale up the number of LSBs to all regions of Uganda to fill the gap in the supply of quality seed especially for non-hybrid crops (cereals, legumes, and vegetatively propagated) |
| <ul style="list-style-type: none"> Inadequate supply and limited diversity of seed sources | <ul style="list-style-type: none"> Scale up the number of LSBs, farmer organisations /groups involved in seed production and marketing Strengthen LSBs in seed production of quality seed |
| <ul style="list-style-type: none"> Weak agro-input dealer network with limited technical, commercial and financial knowledge and capabilities in seed business | <ul style="list-style-type: none"> Regular training of agrodealer in quality seed management |
| <ul style="list-style-type: none"> Most agro-input dealers tend to concentrate in urban and semi-urban areas so that farmers must travel considerable distances to purchase the seeds. | <ul style="list-style-type: none"> Seed companies encouraged to set up seed sale points in rural areas to reach the last mile |
| Quality assurance | |
| <ul style="list-style-type: none"> Lack of implementation mechanism for the seed and plant regulations adopted in 2017 which hampers seed companies to market seeds regionally. | <ul style="list-style-type: none"> The NSCS to ensure enforcement of all regulations regarding seed production, storage, packaging and market place Strengthening and enforcing existing seed certification (quality control, seed testing, labelling etc) for locally produced and imported seed |
| <ul style="list-style-type: none"> Low capacity of seed entrepreneurs to multiply seed of new varieties especially hybrids | <ul style="list-style-type: none"> Support for capacity building in quality seed production including hybrids Strengthen Government to encourage registered seed companies to be members of USTA for purposes of self-regulation to ensure seed quality |
| <ul style="list-style-type: none"> Inadequate human, financial and logistics available to the centralized NSCS for effective seed inspection and certification | <ul style="list-style-type: none"> Establish procedures for accreditation of field inspectors, samplers and labelling Establish regional seed inspection and certification hubs Establish public/private partnerships for seed quality control Appoint and train para inspectors from both public and private agencies |
| <ul style="list-style-type: none"> Lack of procedures and guidelines for inspection and certification of vegetatively propagated crops (VPC) | <ul style="list-style-type: none"> Develop crop specific procedures and guidelines for field inspection, certification and movement of VPC from one region to another Full implementation of the Seed and Plant (QDS) Regulations of 2020 |
| Marketing | |
| <ul style="list-style-type: none"> Poor network of agro-input dealers; poor market infrastructure; rampant counterfeit/fake seeds | <ul style="list-style-type: none"> Support seed marketing outlet in remote area by encouraging establishment of a network of seed stockists Increase the number of LSBs operating as seed dealers Nominate village agents to collect seed demand at the village level and submit to subcounty for consolidation |
| <ul style="list-style-type: none"> Limited client-oriented seed marketing (centralized) | <ul style="list-style-type: none"> Periodic market scans for newly released varieties |

| Key issues and challenges | Needed actions to address the issues and challenges |
|---|--|
| | <ul style="list-style-type: none"> Packaging of seed in appropriate and affordable packages to promote use of certified seed by all farmers |
| <ul style="list-style-type: none"> Prevalence of adulterate/fake seed on the market. | <ul style="list-style-type: none"> Operationalise a digital seed tracking and tracing (STTS) system recently developed by MAAIF Avail a list of all registered seed producers and merchants at DLGs to enable DAOs to monitor seed sources of seed supplied to farmers |
| Financing | |
| <ul style="list-style-type: none"> Most seed related program are funded from external sources (various development partners with short-term goals) | <ul style="list-style-type: none"> MAAIF to guide development partners to focus on activities outlined in the NSS |
| <ul style="list-style-type: none"> District agricultural officers and lead farmers reported that seed related activities were given low priority at the Local government level | <ul style="list-style-type: none"> DLGs to prioritise seed activities and allocate adequate resources to execute them |
| <ul style="list-style-type: none"> Lead farmers from majority of districts believe that Government seed subsidy programs are insufficient and fuelling sale of substandard seed due to insufficient quality seed available to tender winners | <ul style="list-style-type: none"> Government subsidy programs to engage with DLGs in the procurement of inputs under subsidy Government to ensure seed procured is of the highest quality |
| <ul style="list-style-type: none"> Seed companies and other entrepreneurs contained by high interest rates from credit institutions to finance their activities | <ul style="list-style-type: none"> Government to create an opportunity for seed companies to access affordable credit for seed production and multiplication environment for affordable credit to seed entrepreneurs |
| Coordination | |
| <ul style="list-style-type: none"> Lack a Seed Sector Integrated Information Management System (SSIIMS) to support real time information sharing among stakeholders | <ul style="list-style-type: none"> Establishment of a web-based seed sector integrated information management system linked to |
| <ul style="list-style-type: none"> The National Seed board rarely meets to articulate on emerging seed sector issues and challenges | <ul style="list-style-type: none"> MAAIF to ensure an annual budget to facilitate NSB meeting Revive national Seed Stakeholders Platform to bring together public and private sector stakeholders across the seed value chain and provide a forum for regular meetings and information exchange. |
| Utilisation | |
| <ul style="list-style-type: none"> Low quality seed adoption | <ul style="list-style-type: none"> Develop Conduct extensive promotional activities including demonstrations, seed fairs etc Strengthening PVS to enhance adoption of new improved varieties. |
| <ul style="list-style-type: none"> Lack of data on actual demand for seed at both national and local levels | <ul style="list-style-type: none"> Create a mechanism for seed demand articulation Conduct regular seed demand estimates |
| <ul style="list-style-type: none"> Most smallholder farmers are not always aware of benefits of buying quality seed compared to their home-saved seed | <ul style="list-style-type: none"> Create multi-stakeholder platforms to standardise messages |
| <ul style="list-style-type: none"> A lot of seed is home saved seed, farmers find it hard to access certified seed as agro-dealers are far from concentrated in urban areas | <ul style="list-style-type: none"> Scala-up the number of LSBs who have demonstrated capacity to produce and sell quality seed of mainly food and nutrition security crops Seed companies to establish selling points in rural areas in close proximity to farmers |
| <ul style="list-style-type: none"> There is a perception at the local level that seed (especially for non-hybrid crops) is expensive | <ul style="list-style-type: none"> Demonstrate yield and economic benefits of using quality seed vs home saved seed |
| <ul style="list-style-type: none"> Farmers re-use hybrid seed leading to segregation and perceiving the seed source as of poor quality | <ul style="list-style-type: none"> Educate farmers on the use of hybrid seed |
| <ul style="list-style-type: none"> Farmers can seed of self-pollinated varieties for a number of years before they need to refresh their stock | <ul style="list-style-type: none"> Periodically inject new high-yielding varieties with preferred traits to stimulate demand for seed. |

3.2 Impact of Covid 19 on access to quality seed

Although farming activities were among the essential activities not restricted by government measures to stop the spread of covid 19; mobility restrictions and gatherings as a result of total lockdown had a knock-on effect on activities related to access to quality seed for the first crop season in the country. The following impacts were identified:

- processes of variety development and release-breeders not able to establish on station and on farm variety trials and the variety realise committee not able to meet to process proposals for release and registration of new varieties
- disrupt the production and supply of quality basic seed
- Mobility restrictions hampered access to inputs, labour, and services for quality seed
- Mobility restrictions led to increase in input prices hindering access to agro-inputs for the local production of quality seed
- Mobility restrictions and social-distancing measures hampered the promotion of seed and varieties, and impede the distribution of seed at points of sale

3.3 Performance of the seed sector

The level of performance and average percentage of the respondents are presented in Table 3. Although the number of those who responded to the questionnaire was small, they represented key sector actors including breeders, extension, farmers, policy makers, seed companies and local seed businesses. Overall, 49.4 % of the respondents rated the performance of the activities of the seed sector as fair in meeting the sector needs to some extent. Furthermore, 20.7% and 9.8% of the respondents rated the performance as good and very good, respectively. On the other hand, 25% rated the sector performance as poor. Weighted scores and number of respondents per question are presented in Table 4.

Table 4. Level of performance and percent of respondents

| Level of sector performance | Average % of responses (n=29) |
|--|-------------------------------|
| Very poor performance-not functioning/does not meet sector needs | 0.4 |
| Poor performance-low level of performance-meets sector needs to a limited extent | 24.5 |
| Fair level of performance/ meets sector needs to some extent | 49.4 |
| Good level of performance-meets minimum sector needs | 20.7 |
| Very good level of performance-largely meets sector requirements | 9.8 |

Table 4 and figure 2 (spider web) show the level of adequacy the seed value chain activities, sector functions and services. Variety development and release overall scored highest compared to the other key seed value chain activities, whilst financing scored lowest. The full dashboard is presented in Annex 4

Key areas that go particularly well (3.3 and above) include:

- Variety Development & release: effective conduct of multi-locational trials at NARIs and ZARDIs for variety release and registration; evaluation of new varieties in farmers' fields for variety release and registration
- EGS: the basic (foundation) seed produced of good quality
- Quality assurance: Certified seed and QDS of good quality; effective QDS field inspection for seed quality assurance; effective sampling and laboratory testing for seed quality assurance
- Marketing: Effective importing of quality seed for vegetables and hybrid crops; effective seed variety promotion activities for changing mindsets of farmers.

Key areas that need attention (score below 2.9) include:

- Variety Development & release: supporting plant breeding activities on the research stations; extent does the variety release committee process proposals for released and registration of new varieties?
- EGS: in adequate quantities of foundation seed;
- Seed supply: inadequate access to quality seed (certified seed & QDS);
- Quality assurance: ineffective post-harvest practises;
- Marketing: Inefficient transport of quality seed; ineffective export of quality seed; Inadequate access to points of quality seed sale; fake seed;
- Financing: inadequate government funding for the seed sector; inadequate government investment in government seed distribution and seed subsidy schemes;
- Coordination: Inadequate coordination of the seed sector by the government;
- Utilization: Inadequate money to buy quality seed; inadequate demand forecasting for quality seed. Fake seed on the market is the biggest problem.

Table 5. Value chain activities, questions weighted scores and number of respondents.

| Seed Value Chain activity | Question | Weighted Score | No. respondents |
|-------------------------------|---|----------------|-----------------|
| Variety Development & release | 1. To what extent are the plant breeding activities on the research station supported? | 2.80 | 5 |
| | 2. To what extent is the conduct of multi-locational trials at NARIs and ZARDIs for variety release and registration effective? | 4.00 | 5 |
| | 3 To what extent are new varieties evaluated in farmers' fields for variety release and registration? | 4.00 | 5 |
| | 4. To what extent does the variety release committee process proposals for released and registration of new varieties? | 3.44 | 9 |
| EGS | 5. To what extent is basic (foundation) seed available in sufficient quantities? | 2.92 | 13 |
| | 6. To what extent is basic (foundation) seed accessible to seed producers like seed companies, ZARDIs and LSBs? | 3.08 | 13 |
| | 7. To what extent is the basic (foundation) seed produced of good quality? | 3.47 | 17 |
| Seed supply | 8. To what extent is certified seed and QDS available to farmers in sufficient amounts? | 2.88 | 8 |
| | 9. To what extent is certified seed and QDS accessible to farmers? | 3.08 | 13 |
| | 10. To what extent is certified seed and QDS affordable by farmers? | 3.08 | 13 |
| Quality assurance | 11a. To what extent is certified seed of good quality? | 3.43 | 23 |
| | 11b. To what extent are the QDS of good quality? | 3.83 | 23 |
| | 12. To what extent are post-harvest practices in seed production (e.g. transporting for bulking, seed processing, conditioning, packaging and storage) effective? | 2.63 | 8 |
| | 13a. To what extent is field inspection for seed quality assurance effective for QDS? | 3.36 | 11 |
| | 13b. To what extent is field inspection for seed quality assurance effective? | 3.36 | 11 |
| | 14. To what extent is seed sampling and laboratory testing for seed quality assurance effective? | 3.33 | 12 |

| Seed Value Chain activity | Question | Weighted Score | No. respondents |
|---------------------------|---|----------------|-----------------|
| Marketing | 15. To what extent is transporting of quality seed to stockists, agro-dealers and LSB seed stores efficient? | 2.50 | 8 |
| | 16. To what extent is the importing of quality seed for vegetables and hybrid crops effective? | 3.63 | 8 |
| | 17. To what extent is exporting quality seed (like maize and beans) effective? | 2.63 | 8 |
| | 18. To what extent are seed and variety promotion activities (e.g. demos, field days, fairs, mass media communication) effective in changing mindsets of farmers? | 3.90 | 20 |
| | 19. To what extent are points of seed sale/Agro-dealer within reach to farmers? | 2.81 | 16 |
| | 20. To what extent is the accessibility of seed in the local/informal/traditional markets effective? | 3.08 | 12 |
| | 21. To what extent is the accessibility of seed in the informal sources (including seed saving by farmers themselves, exchange among farmers and sourced from their neighbors and relatives)? | 3.25 | 12 |
| | 22. To what extent is fake seed sold on the market? | 2.00 | 16 |
| | 23. To what extent is certified seed and QDS (especially for non-hybrid crops) sold in the market? | 3.25 | 24 |
| Financing | 24. To what extent is government funding of services in the seed sector adequate? | 2.60 | 20 |
| | 25. To what extent is government investment in government seed distribution and seed subsidy schemes adequate? | 2.50 | 16 |
| Coordination | 26. To what extent does government coordinate seed sector stakeholders? | 2.93 | 29 |
| | 27. To what extent is sharing of information, coordination of activities and alignment of existing strategies among seed sector stakeholders effective? | 3.07 | 29 |
| Utilization | 28. What is the level of farmers' economic endowment to purchase quality seed | 2.60 | 20 |
| | 29. To what extent are farmers willing to pay for quality seed (especially for non-hybrid crops)? | 3.25 | 20 |
| | 30. To what extent is demand forecasting for quality seed effective? | 2.55 | 29 |
| Gender inclusiveness | 31. To what extent are seed activities inclusive to ensure gender sensitive engagement in income generating activities? | 3.10 | 29 |
| Climate change | 32. To what extent are seed activities tailored to enhance crop diversity for purposes of mitigating effects of climate variability? | 3.28 | 29 |

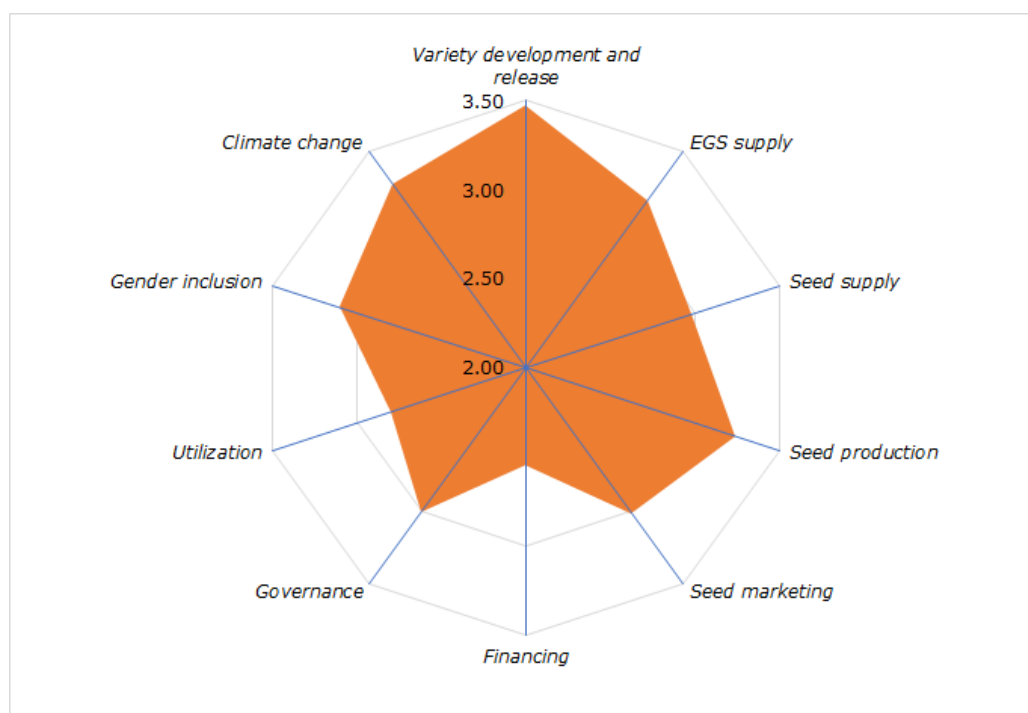


Figure 2. The level of performance of seed value chain activities

A narrative on the ratings of the level of performance of the SVC is presented in Table 5.

Table 6. Analysis of the ratings for the SVC activities

| SVC activity | Analysis of scores |
|---|---|
| Variety development and release | Good level performance (score 4.0) for variety testing in multilocation trials and in farmers' fields. However, support for breeding activities is very low. Processing of proposals for variety release was rated fair. |
| Availability of EGS (basic seed) | Availability of sufficient quantiles of basic seed is far below industry requirements although what is produced is accessible to seed companies, ZARDIs and LSBs. The quality of basic seed produced is rated fair. Over 80% of the districts in which LSB are operating indicated severe shortage of basic seed to scale up QDS production. Seed companies largely engage in maize seed production and majority produce their own basic seed. |
| Seed production | Availability of quality seed (certified and QDS) is far below industry requirement and this is consistent with feedback from the National seed dissemination workshops. Seed production infrastructure is still very inadequate to ensure efficient. Post-harvest practices (e.g., transporting for bulking, seed processing, conditioning, packaging and storage) are inadequate. |
| Quality assurance | Seed field inspections, sampling and laboratory testing were rated fair, but feedback from the districts indicated that these activities were not considered efficient by the district leaders and farmer representatives. |
| Seed Marketing | Seed and variety promotion activities (e.g., demos, field days, fairs, mass media communication); accessibility of seed in the local/informal/traditional markets; and sale of non-hybrid seed in the market were rated fair. On the other hand, transportation of seed to stockists, distribution of agro-dealer networks and exporting seed were rated poor. Sale of counterfeit or fake seed was a severe problem. Feedback from the dissemination workshops showed that, 100% of the participants considered seed marketing as very poorly organized, agro-input dealers being far away from the farming communities, and there are significant challenges of transportation of seed and sale of fake seed. |

| SVC activity | Analysis of scores |
|---------------------------------|---|
| Financing | Adequacy of government funding for seed sector services, as well as investment by the government for seed distribution and seed subsidy schemes were rated poor. This was corroborated by the district leaders where seed distributed through the Operation Wealth Creation (under NAADS) was insufficient and largely of poor quality. Similarly, the government input subsidy program under the Agricultural Cluster Development Project (ACDP) is fueling the sale of fake agro-inputs including seed. |
| Coordination | Government coordination of sector stakeholders was rated poor and this was most glaring at the District Local government level. Sharing of information, coordination of activities and alignment of existing strategies among seed sector stakeholders was rate fair. This can be attributed to the reformed single spine extension services by MAAIF, close collaboration with USTA, and ISSD catalyzing activities through the annual stakeholder workshops, government program such as OWC and ACDP, PRENOR etc. |
| Utilization | The level of farmers' economic endowment to purchase quality seed was rated poor. At the local level, there is a perception that certified seed (especially non-hybrid crops) is expensive and majority of farmers (about 80%) still mainly rely on home-saved seed or grain (potential seed) from local markets or neighbors. However, farmers are willing to pay for quality seed if economic benefits can be demonstrated. Demand forecasting for quality seed was rated poor as such information is not available at local level. |
| Gender & development | Although the extent to which seed activities are inclusive to ensure being gender sensitive in income generating activities was rated fair, nearly 50% of the districts reported marginalization of women in the sharing of benefits from seed activities. |
| Climate change | Seed activities tailored to enhance crop diversity for purposes of mitigating effects of climate variability were rated fair and at the local level, farmers use different tactics (such as plowing early, not sowing at all, or planting early maturing varieties, crop mixtures etc.) |

4. KEY RESULTS AND DISCUSSION

This section synthesizes and discusses major results from the sub-regional meetings, impact of covid 19 on access to quality seed, and performance of the seed subsector.

4.1 The policy and regulatory environment

Factors affecting the performance of the seed sector in Uganda are well known to both the public and private sectors. The sector is fully liberalized requiring an enabling environment for growth. Although it took MAAIF more than 15 years to formulate a National Seed Policy, its approval in 2018 and launch in 2019, marked a significant step to putting in place an enabling environment for the seed industry in the country. The role of development partners was critical in the accomplishment of this milestone.

The Seed and Plant Act. of 2006 established key institutions and departments such as the National Seed Board (NSB) and the National Seed Certification Service (NSCS). To implement the law, the Seed and Plant Regulations of 2017 was developed. These regulations provide details related to plant breeding, variety release, seed multiplication, seed conditioning, seed marketing, seed importation and exportation and seed quality assurance and other planting materials. With the emergence of farmer-led seed entrepreneurs, The Seed and Plant (Quality Declared Seed) Regulations of 2020 were developed to regulate production of Quality Declared seed in Uganda.

The laws and regulations enacted before a policy framework, were not effectively implemented and this created a lag in the growth of the seed subsector in Uganda. The feedback from District local Government leaders, heads of production and marketing, and also responsible for extension services; farmers representatives and researchers, revealed that over 95% of the participants were not aware of the principal law and other related laws to

support the seed industry. The majority of participants were also not aware of the existence of an NSP. This lack of knowledge about the NSP and regulatory framework limited their ability to execute their functions in support of the seed related activities at the local level. This was also why the DAOs felt powerless in implementing the provisions of the law that governs the seed subsector. Therefore, the discussions awakened the DAOs and farmers on their critical roles in the growth of the seed subsector. It was emphasized that it was essential for DLGs to procure copies of the various laws and regulations to gain confidence in executing their duties. Further, unless the DLGs included seed activities in their annual budgets as detailed in the NSS and farmers buy quality seed; the growth of the sector would remain low and not achieve the vision and mission of the seed policy. It was also essential to cascade the knowledge and information acquired to lower levels. The low level of understanding of the enabling environment for the seed industry by the local leaders and technical staff calls for concerted efforts in capacity building in the understanding of seed sector services and functions.

4.2 Variety development and release

The National Agricultural Research Organisation (NARO) is responsible for the development of new varieties. This is augmented by breeding materials and germplasm from CGIAR centers. Many varieties of principal crops in Uganda (maize, rice, sorghum, and beans are available) (TASAI 2018). Improved varieties of other important small seed crops (finger millet and sesame), legumes (groundnut, soyabean, green gram and cowpea), vegetatively propagated crops (cassava, potato and sweet potato) are also available. While government support for breeding activities is low (largely supported by development partners), variety testing on station and farmers' fields was rated fair. Information from majority of the districts indicated there was a weak linkage between research and extension services, which limits knowledge transfer about the new varieties leading to their low adoption. Farmers in Northern Uganda indicated that there were too many varieties (mainly soybean) with similar characteristics making it difficult for farmers to choose what to grow. This indicated a need for more involvement of farmers in variety evaluation for both farmer and market traits. This would also stimulate demand for seeds of such varieties. The NARO is composed of National Agricultural Research Institutes (NARIs) responsible for basic research and production of EGS at the national level, and Zonal Agricultural Research and Development Institutes (ZARDIs) for adaptive research and technology transfer in different extension services. To strengthen extension services, MAAIF has provided an extension grant to DLGs to facilitate mobility and enhance service delivery to the farmers.

4.3 Availability of Early Generation Seed (basic seed)

In the current study, availability of basic seed was rated poor from the online survey and corroborated with feedback from seed growers (LSBs and seed companies) during the the sub-regional meetings. This is also consistent with the results from a national study to unlock pathways for sustainable production and commercialization of Early Generation seed in Uganda which revealed that limited availability of and access to quality basic seed was the greatest challenge hampering availability of adequate quantities of certified seed and QDS (Mastenbroek and Ntare 2016). Most seed companies and LSBs source their basic seed (from the NARO Institutes; mainly, the National Crops Resources Research Institute (NaCRRI) and National Semi-Arid Resources Research Institute (NaSARRI). Soybean basic seed is sourced from Makerere University Agricultural Research Institute Kabanyolo (MUARIK). These are public institutions that do not produce seed on business principles. Further, due to low profit margins from basic seed of legumes and other self-pollinated crops, seed companies focus on hybrids and open-pollinate varieties (OPVs) of maize and vegetables.

To address challenges of shortage of EGS of mostly non-hybrid crops, ISSD Uganda in partnership with NARO has piloted three EGS models: LSB, ZARDI-led and establishment of foundation seed enterprise. The quality assurance system for basic seed has also been established. A digital Seed Tracking and Tracing system (STTS) is being developed by MAAIF with support from ISSD to strengthen the quality assurance for all seed classes. An institutional framework for sustainable EGS models is being worked out through the EGS component of ISSD Plus project.

4.4 Seed production and supply

The poor performance of seed companies to supply is largely due to low productivity, which is mainly influenced by poor weather conditions. Most seed companies use smallholder farmers on small scattered gardens that rely on rainfed production, which is highly risky. Current weather variability is characterized by an unpredictable start of rains which negatively affect cropping calendars, intermittent drought spell during the crop season, excessive rains accompanied with floods, and pests and disease outbreaks which negatively impact on quality and quantities of seed produced. For example, a soybean seed producer group in Karamoja lost 120 acres of soybean seed to drought stress as they lacked lifesaving irrigation facilities. Most seed producers lack appropriate posts-harvest handling facilities (drying, threshing, sorting, conditioning) and storage. The ISSD Plus project has provided support to LSBs to build seed stores which have greatly improved the quality of QDS. Transportation from seed fields to processing areas is also a challenge. MAAIF recognizes these infrastructural challenges. To address these challenges, there is need for opportunities from in production and post-handling infrastructure.

4.5 Seed quality assurance

While seed field inspections, seed sampling and laboratory testing activities were rated fair, the centralized nature and limited resources (human, financial, and logistics) make the service inefficient and unsustainable. The NSCS has a small number of seed inspectors (only 7) for all crops and one national laboratory for seed testing. This indicates that in most cases, many seed fields are never inspected, which compromises quality.

The bimodal rainfall pattern in most regions of the country also poses a challenge where seed certification processes for seed produced in the first season are not completed by the onset of the second season. This mismatch of seed certification and marketing forces seed producers to sell seed without official tamperproof labels that guarantee quality. To address this challenge, the NSS provides for establishment of functional regional seed quality assurance hubs. ISSD Uganda supported NARO to establish a seed testing laboratory at Ngetta ZARDI to serve the Northern region including West Nile. Unfortunately, this has remained nonoperational due to lack of manpower and official accreditation.

Certification and movement of vegetatively propagated crops, especially cassava and sweet potato were cited as a challenge in all districts where the crops are produced. The main concern is the lack of standard procedures for packaging and labeling of cuttings and vines as well as the potential to introduce dangerous diseases in areas that are still free of such pathogens. Practical solutions were proposed on how to handle such materials at the district level, including enactment of ordinances (or by-laws) regulating movement of planting materials. It is also important to develop inspections procedures and guidelines specific to each VPC and uniform packaging to guarantee quality and traceability.

4.6 Seed marketing

The greatest challenge in the marketing of seed is the prevalence of counterfeiter or 'fake' seed. The latter was cited in all of the districts as an endemic problem in Uganda. All online

survey respondents rated the sale of fake seed as a serious problem in the seed sector. The underlying cause of this is attributed to lack of transparency in the entire seed value chain. Participants defined fake seed in a number of ways, including seed of varieties that are: 1) of poor quality with low germination; 2) of poor quality with mixtures of other varieties; 3) have been altered with expired seed or grain; 4) repackaged in fake containers; 5) are sold with expired labels; and/or 6) as variety not registered in the national variety list. Key factors limiting the control of sale of fake seed include: inadequate quality assurance of the market by NSCS; insufficient awareness and education for farmers about the risks and ways to avoid fake seed; penalties and fines not stiff enough to deter fraudulent individuals from cheating farmers.

Prevalence of fake seed is also a symptom of a failure in the system of production and marketing of high-quality certified seed. Uncontrolled seed distribution in government supported programs (e.g., OWC and ACDP) has exacerbated the problem. This has led to loss of trust by farmers in seed supplied under these programs, and thus, continued reliance on home-saved seed. In districts where LSBs are operating, farmers are putting more trust in QDS as it is produced and sold in their midst. Researchers and policy makers have focused on two main explanations for this low-quality seed issue: sellers purposefully faking or adulterating seed and seed deterioration along the supply chain. However, Barriga and Fiala, (2020) tested seeds along the maize supply chain in Uganda for seed performance and genetic and physical purity. They found no evidence that the average quality of seeds deteriorates along the supply chain; and no evidence of serious seed faking or adulteration. Instead, they argued that mishandling and poor storage of seeds was a major cause of deterioration in quality. The Seed supply chain in Uganda is complex, involving multiple actors before the seed gets planted by the farmer. This indicates the need for interventions focusing on improving handling of seed along the seed value chain.

Feedback from the sub-regional meeting indicate that to eliminate sale of fake seed, seed value chain actors should improve their integrity in the seed business; provide farmers with more information on seed and seed quality; expose seed trade malpractices through media; and registration of local seed dealers. Other proposals include: strict monitoring of seed producers and sellers by providing a list of all seed companies and Agro-dealer and their products in each district; political will to enforce the law and making it highly risky for the culprits to engage in the vice; farmers' awareness on quality seed and empowering them to identify counterfeits. It is important for seed companies and other seed producers to increase production of quality seed in order to meet the demand. seed.

A major concern of the DAOs was how to handle cases of counterfeit seed under political pressure; the extent to which cases are investigated; the need for empowerment; the need for a seed data base and whether all USTA members sign and adhere to USTA's ethical code of conduct. They were, however, urged to familiarize themselves with the seed Laws and regulations that protect them from political interference while executing their enforcement duties.

Poor distribution of seed selling points is another challenge in the supply of seed. Many companies operate their selling points in towns and cities that are far away from production regions. Thus, for farmers to access such selling points, they incur additional transport costs therefore making the cost of seed to be high. This also has the risk of quality deterioration of seed in transit. The LSBs producing QDS are addressing these challenges by making quality seed more accessible within the farming communities. In a recent study to determine the contribution of LSB in availing quality seed to farmers, it was found that about 37% of farmers in areas where the LSB are found, were buying seed from the LSB membership (ISSD 202 unpublished report). Quality seed is available within in the farming communities. Seed

companies are also encouraged to set up seed selling points in remote villages. LSBs are filling the gap with QDS to get seed to the last mile, but the extent to which this is happening is still minimal. Thus, strengthening and scaling up the LSBs can address the accessibility and affordability challenges.

Inadequacy in promotional activities such as large-scale variety demonstrations, field days, other activities to stimulate demand for quality seed is largely attributed to lack of resources by the seed companies. USTA has conducted a limited number demonstrations of maize varieties in a few districts. These are expensive activities that require financial resources and manpower to supervise them. One of the practical solutions was to ensure Uptake activities are spread out in all agroecological zones to enhance adoption of new varieties and to stimulate seed demand.

4.7 Financing

Adequacy of government funding for seed sector services, as well as investments in government seed distribution and subsidy schemes was rated poor. This was clearly evident in all districts where seed activities receive low priority in funding despite the critical role agriculture plays in the economy where it contributes 26% to GDP and 52 % exports (Minister of agriculture speech at the closing of the subregional meetings. Participants indicated that seed distributed through government programs such as Operation Wealth Creation (under NAADS) was insufficient and largely of poor quality. Similarly, they indicated that government input subsidy program under the Agricultural Cluster Development Project (ACDP) is fueling s uncontrolled distribution leading to supply of substandard seed.

Although the seed sector in Uganda is fully liberalized, local seed companies have no capacity to generate their own breeder and basic seed. There is also limited investment in public research programs to generate enough EGS. Thus, one of the greatest bottlenecks in the Uganda seed sector is lack of sufficient basic seed to produce subsequent seed classes. Both breeder and foundation seed production and supply is the responsibility of NARO through its National Agricultural Research Institutes (NARIs). Private companies produce basic seed for only a few crops mainly maize. Lack of appropriate infrastructure –post-harvest handling (equipment for drying, threshing, sorting and storage) and irrigation facilities to maintain varieties and produce breeder seed reliably to meet seasonal demands for foundation seed is also a result of limited funding by government.

4.8 Utilization

Lack of data on actual demand for seed at the local level limits the level of planning for seed production and thus utilization. The level of farmers' economic endowment to purchase quality seed was rated poor. At the local level, there is a perception that certified seed (especially non-hybrid crops) is expensive and majority of farmers (about 80%) in most districts still rely on home-saved seed or grain (potential seed) from local markets or neighbors. However, farmers are willing to pay for quality seed if economic benefits can be demonstrated. The variety must be right and seed production should be vertically linked to a well-organized commodity product market. Feedback from the dissemination meetings indicated that farmers do not see the value of investing in buying quality seed when the price of the produce from quality seed is the same as that from home-saved seed. Clearly market pull factors are essential to stimulate demand for quality seed.

Evidence from recent studies suggests low country-wide adoption of certified seeds by farmers (Simtowe et al. 2019). Farmers prefer to use home-saved seeds, indicating that they did not perceive the benefits to be worth the cost. This has been linked to several reasons, including limited market information, credit constraints, low social capital, but also concerns about

quality, including potential on adulteration and contaminations of agricultural inputs in the local supply chain. For example, Bold et al. (2017) found that a random bag of fertilizer had significantly missing nutrients and, under certain circumstances, can lead to negative returns for farmers. They also looked at yields from improved maize seeds and found a similar result. In addition, farmers are information constrained which explains the low percentage of farmers buying quality seed. However, a recent study on farmers willingness to pay for maize seed in northern Uganda shows that there are also other barriers to adoption than information and awareness (Mastenbroek et al. 2020).

4.9 Coordination and implementation

This study subregional meetings were unique in that the top officials of the NSCS that regulates the seed subsector in Uganda, extension services and a policy analyst were the principal facilitators. They are cognizant of the fact that successful implementation of the NSP and the regulatory framework requires effective coordination of sector stakeholders and enforcement of regulations. The reasons underlying the poor performance of this are many but the explanation of the issues raised under this area during the sub-regional Discussions focused more on the lack a Seed Sector Integrated Information Management System (SSIIMS) than institutional challenges. The argument was that the SSIIMS can support real time information sharing with stakeholders on actual seed demand, and includes a tracking and tracing system, and can link producers with users. Some of the DAOs claimed they were not familiar with the activities of MAAIF and some also indicated that the extension were not adequate to reach every farmer.

The National Seed Board which ensures the full functionality of the National Seed System and advises the Ministry to amplify its efforts to ensure quality seed certification and regulation, rarely meets due to financial constraints. NARO which is to ensure that quality EGS is produced in sufficient quantities for multiplication by seed producers is also underfunded to deliver this service. The Directorate of Agricultural Extension services responsible for the dissemination and demonstration of the performance of quality seed to the farmers also faces structural challenges. These institutional challenges impact on the effectiveness of MAAIF to strengthen oversight of the private sector as well as NGOs and CSOs involved in seed systems. With the implementation of the NSS, the ministry can effectively play its role.

The NSP and its accompanying strategy (NSS) have put in place sufficient enforcement mechanisms to ensure that roles and responsibilities are clearly understood by all players. This demands appropriate levels of inspection at all levels of the seed sector to ensure that each player is delivering on their responsibility as laid out in the policy with performance indicators and reporting as per the arrangements spelt out. Thus, an effective monitoring and evaluation (M&E) system and strengthening of human resource capacity for seed science and technology is essential.

4.10 Gender and development

Women, men and the youth play a pivotal role in the seed subsector including; variety selection, multiplication, seed conditioning and seed marketing. While gender inclusiveness was rated fair (Fig.2), majority of districts reported a disproportionate share of benefits by women; where men take a lion's share in the marketing of seed. However, in districts where ISSD Plus is supporting LSBs; women and youth have equal opportunities; thus, fulfilling the principle of equity as defined in the NSP. In natural fact, some LSBs area headed by women and gender streaming activities have empowered women in engaging in seed business which has increased their standing in society. Women are also engaged in LSB committees for decision making.

4.11 Climate change

The fair rating of considering climate change in the seed subsector development indicates a fair awareness (Fig.2) of the impact of climate change on agricultural production. Seed producers and farmers perceive climate change in the erratic rainfall patterns, frequent drought spells, floods and occurrence of more destructive pests and diseases. While farmers use different tactics to mitigate the effect of climate change, activities under the strengthening of variety development pillar of the NSP, ensure better use of climate-smart technologies to enhance the resilience of the seed production systems.

4.12 The impact of covid 19 pandemic on farmer access to quality seed

From the rapid assessment of the impact of Covid-19 pandemic on access to quality seed; it was found that reduced mobility, as a result of lockdown to all but essential services; curfew; prohibition of gatherings; closure of public property; social distancing measures; precautionary behavior and fear, had a knock-on effect on the supply chains of seed and other inputs. Disruptions included the low availability of labour, reduced processing output, and delays in distribution, causing seed and related industry to operate at reduced capacity. Due to the increased cost of transactions and doing business during these times, the scarcity and price of inputs including early generation seed and labour for seed production, was clearly evident, especially in the first season (first quarter of 2020) when covid-19 pandemic struck the world. The assessment provided recommendation on short-term coping mechanisms for the seed sector in Uganda during the COVID-19 pandemic. The Uganda seed alerts also contributed to the African Union (AU) White paper on covid-19 crisis in Africa, a significant contribution in guiding SSA countries to respond to seed crisis during the pandemic <https://au.int/en/documents/20201111/white-paper-covid-19-crisis-and-seed-sector-africa-impact-options-actions-and>). The alerts also contributed to a journal article which advocates immediate practical, remedial and preventative action to respond to the pandemic (de Boef et. al. 2021).

5. CONCLUSIONS

Overall, a combination of approaches used in this study has enabled to bring out the main issues, challenges and practical actions to address them. This will guide seed sectors actors in setting priorities to enhance the growth of an effective and efficient seed industry in Uganda. The subregional NSP dissemination meetings targeting the primary implementers (i.e., DAOs and farmers representatives) were the first of the kind in the country and provide a model for effective engagement with key sector stakeholders; although this requires financial resources and effective mobilization. The online surveys, were a useful tool to establish a baseline for the performance of the seed sector as a whole. Conclusions on key results are presented below.

Stakeholders have limited knowledge of the seed policy and regulatory frameworks

The limited knowledge of the seed policy and regulatory framework by the target stakeholders partly explains the low priority accorded to seed activities at the local level. This also explains why most DAOs felt that they were not empowered to perform their functions for effective service delivery in the crop subsector. However, the dissemination meetings awakened the District Local Governments about their critical roles, responsibilities and coordination of seed related activities in their respective districts. In particular, the DAOs understood their core function of promoting the use of quality seed by farmers in their districts without fear of political pressures. The full attendance of all districts in each sub-regional cluster indicated great interest in understanding the enabling environment for the seed sector. to enhance their ability to fulfil their functions.

The limited adoption of improved varieties by smallholder is largely attributed to the limited knowledge about the performance and market value of newly released varieties.

Although many varieties of major crops such as maize, beans, and groundnuts have been developed, many of them are unknown to the farmers due to lack of effective variety evaluation involving farmers to select those with preferred farmer-and market traits. This is largely due to limited government investments in bar variety development and deployment. However, seed programs such as the ISSD project has enabled candleholder farmers to access new varieties of most food security crop through the LSB model.

Shortage of basic seed to produce subsequent classes (certified and QDS) remains the greatest challenge hampering access to quality seed by farmers.

The shortage of basic seed is particularly critical for self-pollinated crops, mainly legumes and VPCs that are not attractive to seed companies because the low profit margins. To address this challenge, ISSD together with NARO have piloted cost-effective EGS models to enhance production and commercialization of EGS of mainly self-pollinated crops. This will go a long way to enhance availability and access to affordable basic seed for marginalized crops.

Potential of effective Public Private Partnership in development and growth of seed industry

The full participation top officials from the NSCS, extension directorate, policy department and USTA (umbrella of seed companies)), demonstrated the potential of an effective Public Private Partnership in the development and growth of a seed industry. This also strengthened the linkage between the central government through MAAIF and its agencies with DLGs and farmers. ISSD technical and financial support demonstrated effective partnership with development partners.

Complexity of seed supply chain and inadequate policy implementation influence performance of seed subsector

The low to fair performance of the seed sector in Uganda can be attributed to the complexity of the supply chain for seed, involving multiple actors before the seed gets planted by the farmer. This is coupled with poor infrastructure for quality seed production, conditioning and storage. The numerous issues and challenges raised at the local level are a clear indication of the state of the seed sector in Uganda. Further, the formulation of the principal law and other related laws and regulations to regulate the seed subsector before a policy framework to guide their implementation has also contributed to the ineffectiveness and efficiency in the functions and services of the seed subsector in general. Nonetheless, the general laxity in the implementation of policies to support the growth of the agricultural sector is one of the underlying causes of the poor performance of its subsectors such as seed and extension services.

Prevalence of counterfeit seed indicates lack of transparency in seed value chain and weaknesses in seed quality control system in the market place.

The uncontrolled distribution of seed under government supported seed programs such as OWC and the input subsidy project of ACDP, has unfortunately been a promoter of substandard seed to farmers. Tenders for quality seed are not based on actual quantities available and unscrupulous seed merchant try to fill-up shortfall with fake seed. Political interference at the local level also contributes to the challenges in curbing the vice.

Smallholder farmers lack of trust in poor quality certified seed although trust in QDS has increased

The continued reliance of smallholder farmers on home-saved seed is a result of loss of trust in 'quality seed' that does not meet the minimum standards of genetic purity, health and germination. More trust is turning toward QDS produced by farmers themselves. This is because it is easily accessible and affordable.

The current centralized system of seed quality assurance is inadequate to the necessary inspection services to seed producers scattered in the different agroecological zones of the country

The inadequate human and financial resources available to the NSCS responsible for quality assurance severely constrains it to perform its functions and services to guarantee the quality of a diverse crop portfolio. This is exacerbated by the limited government funding.

Gender disparity

Although gender disparity in equitable sharing of proceeds from seed businesses and decision making was noted in majority of the 137 districts covered, it was less so in those where ISSD interventions on gender streaming has empowered both women and the youth to engage in seed business activities and decision making at the household level.

6. RECOMMENDATIONS

Capacity building in policy formulation at the DLG level

More than 90% of the DAOs were not conversant with key challenges of the seed production and delivery in their districts - a *raison d'être* for policy formulation and reforms. This calls for capacity building in policy formulation at the DLG level.

Target clusters of districts

There is renewed interest in enacting ordinances and bylaws to combat the sale and distribution of fake seed and planting materials in the districts. But considering the small geographical coverage of the current districts, this should target clusters of districts rather than individual districts to ensure sub regional implementation.

Review Seed and Plant Act of 2006 and align with NSP

The enactment of laws and regulations for the seed industry preceded the approval of the NSP. This has created institutional and administrative conflicts in their implementation. It is imperative that the Seed and Plant Act of 2006 is reviewed to align it with the NSP directions.

Implement NSS activities, develop variety maps, document market potential of new improved varieties and build technical capacity of seed producers

An issue raised by majority of participants in the sub-regional meetings was the limited knowledge and information about variety development and deployment. Therefore, in order to strengthen the variety development and release pillar of the seed subsector, implementation of the activities in the NSS is essential. These activities focus on engaging stakeholders to participate in variety selection for farmer-and market-preferred traits that are critical in stimulating demand for quality seed. It is also essential to develop variety maps to guide targeting for seed production and use. Further, there is need to document the market potential of new improved varieties and to build technical capacity of seed producers such

that their investments become more profitable through better yields in seed production plots. Market opportunities will also motivate farmers to buy quality seed.

Streamline the multiple seed supply chains to ensure that farmers get the quality seed they desire

Multiple actors are involved in the seed supply chain and this coupled with the poor seed production infrastructure and coordination, it is thus imperative to enhance the coordination of the various actors and monitor their activities.

Establish Seed Sector Integrated Information Management System (SSIIMS)

There is lack of reliable data on the seed sub-sector required to plan at national, sub-national and local levels. Presently, this data is available with only a small number of NGOs who support farmers to access data on seed performance and trends. Under NSP, a Seed Sector Integrated Information Management System (SSIIMS) to address this challenge is essential. The development of a digital seed tracking and tracing (SSTS) being developed by MAAIF with support from ISSD Plus Uganda is a module of the SSIIMS that needs to be operationalized and funded to serve the seed industry.

Tailored communication tools/strategies and translation of the NSP popular version

Considering the diversity of the seed subsector stakeholder, communication tools/strategies tailored to the different actors especially at the district levels to ensure a clear understanding of their roles and responsibilities are essential. Feedback from the sub-regional discussions overwhelmingly proposed translation of the NSP popular version into the major dialects in the country. Further it is essential to develop simple variety descriptors to guide farmers in the choice of what they want to plant.

DLGs to prioritize seed production and delivery activities and allocate resources

The DLG leadership are the main implementers of the seed activities and are thus encouraged to prioritize seed production and delivery activities and to allocate resources in their annual budgets if they are to contribute to the policy of the government to transform agriculture from subsistence to commercial agriculture. Likewise, it is essential that farmers be encouraged to buy and use quality seed by demonstrating its benefits in terms of increased yields and economic values.

Improve access to EGS

Private seed companies and all other seed producers are totally dependent on NARO for EGS and are subject to challenges NARO may have, such as inadequate government funding and lack of a sustainable institutionalism framework and seed production infrastructure. Improving access to EGS requires innovative approaches including the current EGS models piloted by ISSD Plus project for sustainable production and commercialization of EGS.

Strengthen LSBs in production of quality seed

Organized farmer groups such as LSBs and associations, have shown capacity to sustainably produce quality seed at a lower cost than on public research stations. These farmer-led schemes (or LSBs) also bring seed closer to farmers, who often live in remote areas with little road access. They also significantly reduce among other things transaction costs including transport from the seed company selling outlets that are concentrated in towns and cities far away from the farming communities. Thus, the current LSBs need to be strengthened to fully

complement the traditional certified seed producers to bridge the gap in the supply of quality seed in Uganda.

Separate seed & crop production, focus on secure areas and determine seed demand

Since there is overreliance on rainfed agriculture and not considering farming as a business by smallholder farmers, it was strongly recommended that seed and crop production should be separated, whereby seed is only produced in more secure regions to minimize yield losses. Further, it is important to determine actual demand for seed at the local level to guide seed production planning.

Coordinated actions by all stakeholders in the seed sector is essential to enhance stakeholder integrity and transparency

Elimination of counterfeit seed requires all actors to fight it by ensuring that seed value chain actors improve their integrity in the seed business; farmers should be provided with more information on seed as salable product and seed quality; expose seed trade malpractices in the media; and registration of local seed dealers. Political will to enforce the law and make it highly risky for the culprits to engage in the vice. It is important for seed companies and other seed producers to increase production in order to meet the demand for quality seed. To enhance the quality assurance system, a decentralized quality assurance system is essential through establishment of sub-regional seed testing hubs to reduce transaction costs and bring services closer to the seed growers. Alternatively, the ministry should train para inspectors from both public and private sectors and formally authorize them to conduct seed quality control activities.

Enhance seed sector stakeholder coordination by strengthening the National Seed Board & National Seed Certification Service

To enhance financing to grow the seed subsector, it is imperative that the National Seed board should be operationalized and leverage on the numerous seed programs supported by development partners. This can be achieved through ensuring that all programs on seed be guided by the NSS for their entry points. Thus, strengthening coordination at both national and local levels is essential. In addition to coordination mechanisms, it is essential that DLGs budget for seed production, promotion quality assurance and marketing in their annual budgets outlined in the NSS. While the national seed policy puts in place implementation arrangements, effective coordination of the seed subsector stakeholders will remain poor unless the National Seed Board and National Seed Certification Service are strengthened and well facilitated.

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ANNEXES

Annex 1 List of districts involved in the sub regional meetings

| SN | District List1 | SN | District List2 | SN | District List 3 | SN | District List 4 |
|-----|--|-----|------------------|-----|------------------|-----|-----------------|
| 1 | Mityana | 16 | Gulu | 31 | Kole | 46 | Napak |
| 2 | Kasanda | 17 | Amuru | 32 | Otuke | 47 | Karenga |
| 3 | Mubende | 18 | Nwoya | 33 | Amuria | 48 | Moroto |
| 4 | Kiboga | 19 | Amoro | 34 | Kalaki | 49 | Nakapiripirit |
| 5 | Kyankwanzi | 20 | Amolatar | 35 | kabera maido | 50 | Amudat |
| 6 | Wakiso | 21 | Apac | 36 | katakwi | 51 | Nabilatuk |
| 7 | Mukono | 22 | Dokolo | 37 | kapelebyong | 52 | Sironko |
| 8 | Mukono ZARDI | 23 | Kwania | 38 | Kumi | 53 | Bulambuli |
| 9 | Kayunga | 24 | Kitgum | 39 | Serere | 54 | Namisindwa |
| 10 | Buikwe | 25 | Pader | 40 | Ngora | 55 | Kween |
| 11 | Luwero | 26 | Agago | 41 | Bukedia | 56 | Bukwo |
| 12 | Nakasongola | 27 | Lamwo | 42 | Soroti | 57 | Bududa |
| 13 | Nakaseke | 28 | Lira | 43 | Abim | 58 | Kapchorwa |
| 14 | Buvuma | 29 | Oyam | 44 | Kaabong | 59 | Manafa |
| 15 | Mpigi | 30 | Alebtong | 45 | Kotido | 60 | Mbale |
| SN | District List 5 | SN | District List 7 | SN | District List 8 | SN | District List 9 |
| 61 | Butebo | 76 | Namutumba | 91 | Kasanda | 106 | Madi Okollo |
| 62 | Kibuku | 77 | Kamuli | 92 | Mubende | 107 | Zombo |
| 63 | Budaka | 78 | Kalungu | 93 | Kiboga | 108 | Pakwach |
| 64 | Butaleja | 79 | Rakai | 94 | Kyankwanzi | 109 | Terego |
| 65 | Pallisa | 80 | Kyotera | 95 | Wakiso | 110 | Adjumani |
| 66 | Busia | 81 | Sembabule | 96 | Mukono | 111 | Odongi |
| 67 | Tororo | 82 | Gomba | 97 | Kayunga | 112 | Yumbe |
| 68 | Jinja | 83 | Butambala | 98 | Buikwe | 113 | Koboko |
| 69 | Buyende | 84 | Bukomansimbi | 99 | Luwero | 114 | Maracha |
| 70 | Iganga | 85 | Masaka | 100 | Nakasongola | 115 | Moyo |
| 71 | Bugiri | 86 | Lamwo | 101 | Nakaseke | 116 | Kabarole |
| 72 | Kaliro | 87 | Amuru | 102 | Buvuma | 117 | Bunyangabo |
| 73 | Luuka | 88 | Adjumani | 103 | Mpigi | 118 | Kyegegwa |
| 74 | Mayuge | 89 | Kalangala | 104 | Arua | 119 | Kyenjojo |
| 75 | Namyingo | 90 | Mityana | 105 | Nebbi | 120 | Ntoroko |
| SN | District List 10 | SN | District List 11 | SN | District List 12 | SN | District |
| 121 | Bundibugyo | 129 | Kanungu | 136 | Bunyangabu | 144 | Mbarara |
| 122 | Kamwenge | 130 | Rubanda | 137 | Kibube | 145 | Lyantonde |
| 123 | Kitagwenda | 131 | Rukiga | 138 | Kibale | 146 | Ntungamo |
| 124 | Kasese | 132 | Rukungiri | 139 | Hoima | 147 | Kiruhura |
| 125 | Kabale | 133 | Kagadi | 140 | Buliisa | 148 | Rwampara |
| 126 | Kisoro | 134 | Kakumiro | 141 | Kiryandongo | 149 | Ibanda |
| 127 | Buhwezu | 135 | Lwengo | 142 | Kazo | 150 | Sheema |
| 128 | Isingiro | 136 | Rubirizi | 143 | Mitoma | 151 | Bushenyi |
| SN | Institution List 10 | | | | | | |
| 151 | Ngetta Zonal Agricultural Research and Development Institute (Ngetta ZARDI) | | | | | | |
| 152 | Abi Zonal Agricultural Research and Development Institute (Abi ZARDI) | | | | | | |
| 153 | Buginyanya Zonal Agricultural Research and Development Institute (BugiZARDI) | | | | | | |

| | |
|-----|--|
| 154 | Mbarara Zonal Agricultural Research and Development Institute (MbaZARDI) |
| 155 | Kachwekano Zonal Agricultural Research and Development Institute (KaZARDI) |
| 156 | Rwebitaba Zonal Agricultural Research and Development Institute (RwebiZARDI) |
| 157 | Ministry of Agriculture Animal Industry and Fisheries (MAAIF) |
| 158 | Uganda Seed Trade Associations (USTA) |
| 159 | NARO Holdings Ltd. (NHL) |
| 160 | West Nile Local Seed Business Association (WENLOSBA) |
| 161 | South Western Uganda Local Seed Business Association (SUSBA) |
| 162 | Northern Uganda Local Seed Business Association (NULSBA) |
| 163 | National Semi Arid Resources Research Institute (NaSARRI) |
| 164 | National Crop Resources Research Institute (NaCRRI) |

Annex 2 Subregional Meetings facilitators

1. Mr. Paul Mwambu, Commissioner, Department of Crop Inspection and Certification (DCIC)
MAAIF - Vision, Mission and objectives of the NSP and strategy.
2. Ms. Consolata Acayo, Assistant Commissioner, Information, Directorate of Extension Services
MAAIF- Objectives and expected outcomes of the dissemination workshops
3. Mr. Joseph Bazaale, Assistant Commissioner (Rtd.), Seed inspection and Certification MAAIF- H
historical background and roadmap of the formulation of the seed policy and regulatory
frameworks seed sector development in Uganda.
4. Mr. Eric Kakoole, Assistant Commissioner, Policy Analyst, MAAIF-policy and regulatory
frameworks formulation and development processes.
5. Dr. Bonny Ntare, Consultant ISSD Uganda- NSP priority areas.
6. Mr. Nelson Masereka, Executive Secretary, Uganda Seed Trade Association (USTA)- seed
production and marketing challenges and opportunities.
7. Mr. Moses Edward Erongu, Senior Seed Inspector, MAAIF- on quality assurance along the seed
value chain and Q &A
8. Mr. Charles Sendaaza, Seed Inspector, MAAIF- mobilization of participants
9. Mr. Geoffrey Otim, Seed Systems and Policy Manager. ISSD, Uganda- roles, responsibilities and
coordination of the various seed sector stakeholders.

Annex 3. Participants takeaway messages and actions needed for the effective engagement with seed sector stakeholders

| Subregion | Take away messages | Actions needed for effective engagement of stakeholders |
|--------------------------------|--|--|
| Northern (Acholi & Lango) | <ul style="list-style-type: none"> • There was clarification on who are the rightful seed producers of commercial agriculture in the region/country. • Procedure/levels that need to be undertaken to monitor the work or operations of the seed producers in the region and country understood • The much-needed coordination with development partners to disseminate the NSP popular version • Popularizing the policy is the responsibility of all stakeholders • The NSP provided a clear framework for seed quality assurance at various levels-production and during marketing. • Important to share information and refer any case that DLGs may not be able to address to MAAIF. Sitting on issues and challenges just makes the seed sector worse, it's time for DLGs to act. • Enforcement of laws and regulations is critical for effective implementation of the NSP and DAOs should play a significant role • Farmers and other seed sector stakeholders must be sensitized about the regulatory framework for the seed sector so that they can adhere to the industry standards. • Important to review documentation of accompanying seed before acceptance in the district; authorities should not only reject bad seed but also follow up to the source to find out who produced and processed the fake seed. • It is essential to conduct regular inspections of the agro-input dealers to ensure the seed and other inputs reach the users when they are in their accepted quality standards. • Dissemination of the National Seed Policy and regulatory framework creates an enabling environment for the growth of the seeds subsector and must be disseminated to all seed sector actors. | <ul style="list-style-type: none"> • Translate the NSP popular version into various local languages for easy dissemination • Empower farmers to access more quality seed through regulation of seed traders' actions • Regular technical back stopping and equipping DAOs with necessary tools for enforcing seed quality assurance • Clear budget allocations for seed inspection is required by every DLGs and DAOs and DPMOs should ensure this is done every financial year for easy implementation of the NSP • More capacity building for all the relevant stakeholders in implementing the NSP policy priority areas. • Integrate seed policy dissemination into the District Farmers Associations (DFAs) workplans to reach the grassroots farming communities • Need to broaden the understanding of the policy areas to the leaders and members of the different cooperatives to allow them demand for quality seed and share their challenges to the regulator. • Need to integrate all activities in the farmer's institution with policy dissemination work. There is need for summarized key messages from the NSP and printed on single charts for putting on the walls. • More engagements, linkages and networking to share available options to implement the NSP at the local levels. • There is need for frequent reviews on progress on the implementation of critical areas of the policy such as quality assurance and variety development. |
| North Eastern Teso & Karamoja) | <ul style="list-style-type: none"> • It's not right to take counterfeit seeds for planting or seeds which do not conform to quality parameters • Learnt a lot on seed handling and shall share with my fellow farmers in order to use quality seed • National seed policy addresses the concerns that are vital in the whole process of ensuring that good quality seed is available and utilized by the farmers, there is need to understand the policy, make use of and popularize in our respective districts • Got to know the key regulations, the legal books and where to get them | <ul style="list-style-type: none"> • Sensitize all extension staff on NSP • Translating the NSP into the local languages • Use radio media for mass sensitization • The DLG facilitates the Extension staff to sensitize the community on the policy • Update the technical staff on the newly released varieties and their attributes for dissemination to farmers • Conduct radio talk show on NSP • Extension workers should always specify policy areas when |

| Subregion | Take away messages | Actions needed for effective engagement of stakeholders |
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| | <ul style="list-style-type: none"> • Importance of planting and maintaining the right seed variety • If the policy is well implemented, there shall be increased production and income to smallholder farmers • DAOs includes NSP activities in their work plans and budget such that council approves since its benefits smallholder farmers • Use the policy materials to develop bylaws at DLG to support the implementation of the NSP • Learnt to always plant quality seed as a farmer and this their role in implementing the NSP • Verifying the quality of seed delivered at district before distributing to the farmers • Use district farmers associations to disseminate the policy to her member farmers and the community at large • We have popular version of the NSP which is user friendly | <ul style="list-style-type: none"> • requisitioning for funds and also quote policy areas when compiling reports, the reports • Everyone should get involved in policy implementation to achieve better result • Ensure that farmers always receive quality seed • Print more copies of the NSP and avail to more stakeholders • Dissemination should target more categories of stakeholders such as the police, Judiciary, NGOs and Extension workers • USTA should strictly monitor their members • Follow up with sensitization at district level • Partnerships between the districts and USTA to demonstrate new varieties and quality seed |
| Albertine (Bunyoro) | <ul style="list-style-type: none"> • Lobby for funds to implement the policy (3) • Buy quality seed for my farming activities (• Seed policy is meant to improve quality of activities in the seed sector • It is more profitable to use improved seed than using locally saved seed • The seed sector does have a policy • The quality of seed I the first step to doing crop farming | <ul style="list-style-type: none"> • Dissemination of NSP information to other staff at DLG offices • No seed should be allowed on the market unless it has the label of certification • Agro-input dealers should be involved in subsequent meetings • Use local radios to disseminate facts that will compel farmers to demand quality seed • Government should increase the budget so as to cater for NSP activities • Dissemination of NSP information to all relevant stakeholders • Print and distribute more booklets on NSP for all other AOs and political leadership • There is need to create platforms at district level for the dissemination of NSP • Dissemination should go up to sub-county level |
| South Western (Ankole) | <ul style="list-style-type: none"> • To plan and budget for dissemination of seed policy to extension workers at sub county and farmer level • Farmers will harvest more if they used improved varieties of seed • Sensitizing fellow farmers to buy and plant quality seeds • Need to include NSP in my planning and budgeting • Use quality seed for better yields • Farmers and stakeholders in Ibanda will be organized and taught on NSP • Roles of different stakeholders in the seed sector • More sensitization on policies especially crop protection • Districts should operationalize the policy inform of bylaws and ordinances | <ul style="list-style-type: none"> • Regular backstopping of extension workers • Deliver planting materials in time especially maize and bean seed • MAAIF to organize sensitization meetings for politicians in local governments about seed policy • NSP should be aired on TVs and radios • Collaboration of different stakeholders by having regular meetings • NSP meetings to be carried down to districts involving all policy makers at that level • Districts and farmers should be given laws (booklets) to support the policy booklets given out |

| Subregion | Take away messages | Actions needed for effective engagement of stakeholders |
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| | <ul style="list-style-type: none"> • Districts to incorporate policy dissemination in their work plans and budgets • 60% of the yield comes from planting materials • Awareness creation on NSP • Implementation of NSP is a collaborative role not only for MAAIF • Support and promote use and production of quality seed | <ul style="list-style-type: none"> • Use of audio-visual aids e.g., newspapers, TVs, radios • Print more seed policy brochures • Make use of ICT opportunities • Organize radio talk shows and other mass meetings after COVID-19 • Involvement of agro-input dealers to train on quality assurance • NSP should be translated in local language • Publicity on local media such as TVs, radios • NSP booklets be translated into local language • More trainings needed to sensitize the farmers at grass root level • How is the government ready to protect farmers from fake seeds that is supplied by government organizations? • Roles of different stakeholders in the seed sector • More sensitization on policies especially crop protection • Need to take the dissemination information to the local governments • Enforcement of seed policy should be emphasized up to district level • Policy should be translated to local language to improve on up take level • Technical team to always monitor farmers • Other extension workers should be taken through seed policy • Farmer awareness by DLG team would be the best strategy to enable information flow • Use of various media channels at national and local level |
| Rwenzori | <ul style="list-style-type: none"> • Radio programs should be used regularly to disseminate the seed policy in local languages • To have quality seed • To ensure that NSP activities are incorporated in the District work plan • Increased knowledge about the seed value chain, Roles of the different stakeholders, Seed labels as the control for quality • Identification of quality seed with the help of the seed company & community prioritization • Sensitizing and informing stakeholders about NSP establishment • Informing farmers about the NSP and how to implement it. This will be done through the sub-county farmer coordinators • District extension officers should also be trained on this policy at district level and involve more farmers in such meetings • To ensure that the NSP is fully implemented by all stakeholders in the seed industry | <ul style="list-style-type: none"> • All seed transactions must be compliant with the NSP • Let the policy be implemented by relevant stakeholders • MAAIF should provide budget to the DLGs to facilitate activities related to the NSP • Establish a strong inspection on Agro-input supply especially in village centers • The NSP should be fully explained to the farmers in local seed business or it should be translated to the local language • Availing the policy to the lower participants in the value chains including political wing for proper implementation • To ensure that NSP is disseminated up to the grass roots |

| Subregion | Take away messages | Actions needed for effective engagement of stakeholders |
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| | <ul style="list-style-type: none"> • If I don't put the seed policy in my work plan, nothing I will implement and will keep losing out from the seed value chain • I have also identified my role and responsibility towards the implementation of the seed policy anticipating other roles • Seed is the basic unit in production • Got to know that the country has an NSP in place • To ensure that seed quality and policy activities are incorporated in district budgets and work plans for effective implementation • Our role as local Government is fully explained and catered for in the policy • Enforcement of the seed perpetrators is now catered for • Every stakeholder has a role to play in implementing the NSP • Commitment leads to achievement of goals. Development of the policy took more than a decade therefore development is a process • Seed is the most important starting ingredient of maximizing crop production and productivity • Seed accounts for 60% of yield. Quality seed will lead to high yield | <ul style="list-style-type: none"> • MAAIF should influence policy makers at National level to make sure that seed related issues are addressed • More seed multipliers should be encouraged • You need to involve the politicians as well as routine interface with the Local Government staff • Seed is cross cutting in any agricultural value chain and therefore every department in crop must budget for seed activities • Dissemination needs to move to the grass roots through; Translation of the NSP into local languages • Conduct radio talk shows • Organize District and sub-county level dissemination meetings through agricultural forums • The meetings should be taken down to the Local District Councils • Use of local radio programs about the NSP • We need to cascade the dissemination to district level to bring on board local politicians, farmer representatives and extension workers at the lower level • MAAIF always to inspect inputs supplied to farmers and to always give movement permits and inspection bar codes • MAAIF should implement agriculture policy such as to avoid poor seeds to the farmers • They should bring movement permits • Put in more effort in seed sampling |
| West Nile | <ul style="list-style-type: none"> • Use of quality and certified seeds gives more than 60% success in farming, it gives more yield than the local or farmer saved seeds • Use of quality seed is a key determinant of success in farming • Relevant seed policy is in place with its attendant acts, the policy regulations need to be enforced at district local government level • Relevant stakeholders should be sensitized at the districts to ensure that National seed policy is enforced in the districts • Technical staff need to advocate for budgets to implement National seed policy in their various districts • All stakeholders should play their roles well in order to implement the seed policy • As a District Agricultural Officer, one needs to know the needs of people and understand the laws and regulations governing the seed industry • The key pillars that help one to know that quality control can be done | <ul style="list-style-type: none"> • Next time, the NSP handouts that can be used as references during discussions when needed should be distributed for follow-up of discussions • Politicians like the secretaries for production in the district council need to be brought on board next time during dissemination workshop so that allocation of resources to implement National seed policy is made easier • Next step of national seed policy dissemination campaign should target farmers • Deliver enough copies of National seed policy popular version to be distributed to farmers • Provide enough copies of the national seed policy popular version to all sub counties so that all extension workers can have copies to use |

| Subregion | Take away messages | Actions needed for effective engagement of stakeholders |
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| | <ul style="list-style-type: none"> • Farmers need to plant properly certified seeds bought from genuine input dealers • I have learnt the roles of the various stakeholders in the seed industry and the key policy issues and laws applicable to the seed sector • I now have knowledge on the legal framework and regulation of the national seed policy • Meeting has helped me to know where and how to get good seeds for planting in our fields to avoid fake seeds that are coming up in Uganda • National seed policy and related Acts are very important in our work and we need to read them from page to page • I must sensitize farmers around my farm to know how to detect quality seed • As a farmer, I will deliver the message on NSP to farmers so that we implement it on ground so as to promote use of quality seed for higher yields and higher prices for our produce. | <ul style="list-style-type: none"> • Make effort to translate the national seed policy popular version in ten (10) popular languages in Uganda to benefit farmers • Ministry of Agriculture Animal Industry and Fisheries (MAAIF) should start funding local governments to disseminate National Seed Policy to farmers in the grass roots so that quality seed production and use can be increased • More farmers need to be involved in this dissemination campaign so that they understand what it means to them and their livelihood • Media houses need to be involved in such campaigns about policies like seed policy because farmers and the population get information through media like radio stations, these run many government programs in West Nile region • The ministry (MAAIF) should tell districts where to find copies of the National Seed Policy documents when needed • Ministry of Agriculture Animal Industry and Fisheries (MAAIF) should continuously enforce seed quality standards through the local governments • Empowerment of the sub county-based extension staff on national seed policy issues to allow them implement at grass roots • DAOs need to be fully trained and equipped with tools for inspection so as to realize full implementation of the National seed policy, this applies more to newly recruited DAOs • MAAIF should support and fund researchers so that they produce enough quality seed that farmers can be able to access easily for production |
| Kigezi | <ul style="list-style-type: none"> • The NSP tool is being taken back per district for more dissemination • While implementing the NSP, there is need to understand more Laws related to quality seed • There are many more stakeholders to involve in the implementation of the NSP, so engage them accordingly. • It has created the awareness since we have been buying see on an open market without knowing the right or authorised seed companies. • To work hard and plant good quality seed at the right time • I have a role to play as a DAO in ensuring availability of quality seed in Uganda for improvement of agricultural production and productivity in my district and Uganda | <ul style="list-style-type: none"> • MAAIF should facilitate the dissemination of the process up to lower local government which will include all stakeholders. • MAAIF should at least provide one copy of the relevant Acts to every district agriculture officer. • Farmer groups engaged in agriculture should be sensitized about NSP • The seed policy needs to be disseminated to many stakeholders (farmers and agro input dealers) • Engage more stakeholders like Agro input dealers and district marketing officer for quality assurance. • Invite all the sub county extension officers and sensitize them on the |

| Subregion | Take away messages | Actions needed for effective engagement of stakeholders |
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| | <ul style="list-style-type: none"> As farmers we must buy quality seed of improved varieties for better yields not waiting to be given by government. This will improve agribusiness. Now we can control the quality of seed in the market for better yields with the laws which have been put in place Quality seed is the basis for improved/increased production and productivity The NSP pillars understood Farmers to invest in quality input such as quality seed for maximum yield Teamwork and participation of the stakeholders in the seed value chain is very critical to achieve the objectives of the NSP. | <ul style="list-style-type: none"> NSP, Popular version and the National Seed strategy 2018-2023. Also provide a report to the DPO on the NSP development for further discussion in the TPC meeting Local government should prioritise seed value chain development activities in their budgetary allocations |
| Masaka-Kalungu | <ul style="list-style-type: none"> Policy framework and seed value chain from the research station to the farmer well understood The role of DAOs in seed and other inputs monitoring and inspection Farmers role to report incidents of fake seed As a farmer I should always seek guidance from technical people before buying seed/inputs and buy from reputable dealers Have learnt how to identify improved seed. A clear understanding of the roles and responsibilities of farmers and DAOs. It is important to promote use of good quality seed by farmers to increase yields. It is essential to have copies of all the laws and regulations related to the seed policy so that they can be protected while performing them dirties Learnt that seed inspection and quality assurance at the district level is partially by the DAOs Implementation of the NSP is a responsibility of all stakeholders The NSP dissemination had been very good. It has highlighted the roles of key stakeholders which when well-coordinated can cause a great impact and success on the policy. NSP, strategy and popular version provide useful information for dissemination all the grassroot about good quality seed | <ul style="list-style-type: none"> Organize more training workshops to for different actors on seed breeding DAOs and lead farmers who attended the workshop should be facilitated to cascade dissemination to lower levels Refresher training of agricultural staff should be put int consideration Such workshops should be taken to farmers since they are the direct beneficiaries Inclusion of more stakeholders in the dissemination of the policy. Use radio talk shows to disseminate the policy Need to demonstrate the value of using quality seed in terms of yield and economics Strengthen ZARDIs to better serve expose farmers to new agricultural technologies and innovations to farmers. Local governments should work as a team in the mobilization of the communities and also come out with government shops where good seeds are available to farmers. Training of DLGs and guidance on how to implement certain regulations is essential Continuous follow-up on the implementation, yearly refresher meeting on NSPs Strengthening and capacity building of the local seed businesses for open pollinated varieties. Disseminate NSP during all the meetings we have in the districts Create more awareness through more quality seed demos to enhance adoption; encourage the use of farmer field schools |
| Central-Mityana | <ul style="list-style-type: none"> For improved crop yields, farmers must plant quality seed All farmers should know the key messages of the NSP and with that information all will | <ul style="list-style-type: none"> Districts should include seed policy information dissemination in the budgeting process |

| Subregion | Take away messages | Actions needed for effective engagement of stakeholders |
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| | <p>be willing to spread the use of improved varieties and quality input</p> <ul style="list-style-type: none"> • The cost of quality input/improved seed is 60% of total production costs and quality seed contribute to up to 60% yield potential • Understood the seed value chain and the responsibilities of the different stakeholders within the chain • Government has finally heard farmer's plea to protect them from seed impersonator. We should help government as well to implement the policy • Farmers can play a big role in the National Seed policy implementation through buying and planting quality seed only. • As farmer leaders I have a role to sensitise my fellow farmers on quality seed • The stakeholders should play their part for the successful implementation and this is same for all policies • For increased production and productivity, we should go in for improved and certified seed/planning materials • Emphasize and ensure that farmers use/access quality seed every planting season • Laws and bylaws must be on an inspector's and low enforcers fingertips before arresting anyone dealing in fake seed or agro input • NSP dissemination will improve farmers knowledge on their rights and roles in changing productivity using quality inputs • Integration of the seed policy into the district budget and plans • Involve more farmers • District local government should incorporate the policy activities in their workplans and allocate budgets to them if we are to benefit from the National Seed Policy • The cardinal role of a farmers, as a key stakeholder along the seed value chain is to buy and plant quality seed • Integration of the seed policy into the district development plan • The NSP is a government dream house it has to be supported by different players and systems; but its content should be well explained and understood by all stakeholders so that the policy achieves its intended objectives • Seed (improved & quality seed) is key in agricultural production improvement • A good policy is in place and need to be popularized • Now that the seed policy is out, district local government should integrate the implementation strategies into production workplans and ensure implementation • Seed production value chain is made easy with the popular version handbook • Seed policy should be integrated in the district development plan | <ul style="list-style-type: none"> • Involve extension workers since they work directly with farmers • During the dissemination process, more stakeholders should be involved. i.e., NGOs, like district farmers Organisations, religious leaders like Caritas, leaders of input dealers' Organisations, CBOs, youth (under young farmers Organisations). • The policy should be translated into commonly used languages like the case with COVID-19 pandemic. i.e., at least six regional languages. • Dissemination of seed policy should be a continuous ad gradual process • Explore radios communication for dissemination of the seed policy • Demo establishment in the district with the seed company; contact the USTA executive secretary. • Dissemination of the seed policy should be a continuous and gradual process • Bring all key actors of seed production value chain together • Local government should be supported to disseminate the policy to lower levels of its structures • The workshop required more time to reach more stakeholders including political leaders (this person could be proposing DGL high-level round table meetings to tiger the recommendations) • Everything and the dissemination messages for the policy was perfect • The participants (stakeholders) should be given enough time to share their experiences regarding seed handling in their different capacities • Involvement of politicians within the local government • Next sensitization should be done at levels if you can divide up your team • I would recommend that all the stakeholders should be involved to attend such meetings • Dissemination meeting should involve all seed value chain actors so their they know the critical role they play in a well-coordinated manner. • Printing of more copies of the NSP in different languages for quicker understanding by all the low-level stakeholders involved with seed • The government should implement on the system of fundamental supervision on their farmer's input and supply proper advisory messages to the farmers and this |

| Subregion | Take away messages | Actions needed for effective engagement of stakeholders |
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| | <ul style="list-style-type: none"> • NSP be reproduce in the local languages for easy understanding by a wider community • Seed policy should be integrated in the district development plan • Everybody has a role to play along the seed value chain; thus, blame games should not arise. • There is need to disseminate seed policy information to farmers for profitability and regulations • Agriculture is the back born of our economy since ¾ of the households derive their livelihoods from it; therefore, the focus of the national agricultural policy is to transform subsistence production into a more profitable commercial farming where high quality seed and other inputs are critical. So, we have to take it seriously. | <ul style="list-style-type: none"> • should mainly be done by extension workers to the local communities. • Include other stakeholders e.g. seed companies since they have key in the supply of quality seed. • Downscale the meetings to DLGs targeting councils for planning purpose (integration into DLGs plans) awareness. Note, production department & CAO alone may be too weak to influence awareness process • There is need to involve at least politicians as key stakeholders in such meetings • Next time invite the CAOs of districts to hear for themselves and be able to guide integration of the policy activities into the district budget • Translate the popular version of the policy into local languages for farmers to adopt • The exercise should be given more time; at least a full day instead of half day and should also invite secretary for production at district levels. • Empower extension workers at district levels and the farmers associations, skill them and let them do itinerary to disseminate the policy at all levels. They can reach all parts of the district where farmers are |
| Busoga | <ul style="list-style-type: none"> • Farmers should value investing in quality seed of improved varieties • The farmers should get all information necessary about the NSP and should implement the policies in order to improve on production and productivity • It takes long (7-12yrs) to develop a seed variety and government spends a lot of money in it that's why farmers should not complain about the high costs of quality seed • My first responsibility as a farmer is to buy quality seed and plant it timely using the rightful knowledge • Quality seed accounts to up to 60% of the yield potential, and therefore it is important for all farmers to start with quality seed for better results. • I need to play my role as a DAO in the implementation of the NSP • It is critical for every stakeholder to play their roles in order to achieve the intended goal for the NSP • Every stakeholder involved in the NSP should strengthen their roles so that the chain can operate successfully. This can be achieved through better coordination. • Quality of seed is the most important aspect of crop production as it accounts for up to 60% of crop yield. | <ul style="list-style-type: none"> • DLGs and their extension staff should sensitize the entire communities district wide about the importance of using quality seed. • MAAIF to intensify monitoring work and take lead in enforcing necessary Laws related to counterfeit seed. • To move down to local government to disseminate further the policies to the district leaderships more especially the RDC, Chairman LCV and CAOs and the relevant executives. • I recommend that the NSP be translated into local languages for clear understanding of the policy to the local farmers. • It has been a well-organized activity but hope these good presentations will be emailed to participants • Involvement of all stakeholders is necessary in the dissemination of the NSP • There is need for more district Districts and sub counties level dissemination meetings and this can be organized by each DLGs. • A god number of stakeholders were left out, they need also to be brought |

| Subregion | Take away messages | Actions needed for effective engagement of stakeholders |
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| | <ul style="list-style-type: none"> • Ensuring that NSP is clearly sensitized to our community • I will disseminate the policy information to my sub county staff and also ensure that the policy works. • Need for coordination and continuous engagement of the relevant stakeholders for monitoring progress and reviewing strategies as we implement the NSP | <ul style="list-style-type: none"> • onboard for a wider dissemination of the NSP. • NSP activities can be better disseminated through TV, Radio and farmer groups |

Annex 4. Subregional Issues, challenges and from actions to address them

| Subregion | Issues and challenges | Needed actions to address the challenges |
|---------------------------|--|--|
| Northern (Lango & Acholi) | <ul style="list-style-type: none"> There are glaring weaknesses in the deployment of new varieties as many of the them are no known by the farming community. There is a serious shortage of foundation seed for most of the crops especially legumes (soybean, ground nut and beans), and rice There are too many varieties that cannot easily be distinguished from one another morphologically, coupled with limited involvement of farmers in variety selection. Most of the seed from agro-dealer is of poor quality (variety mixtures and poor germination) There was a recognition that implementers of the seed policy should be farmers, farmers' associations, Civil Society Organisations, DLGs and development partners. Farmer-leaders feel that the DLGs should mobilize farmers to use quality seed to enhance crop productivity, food security and nutrition; ensure seed quality assurance through inspections in the field and markets; sharing the right information and coordination of stakeholders. The main concern of farmers is the prevalence of poor quality supplied characterized by mixtures, impurities and poor or no germination at all. Farmers feel that they need more knowledge about soil health to guide them in the application of both organic and inorganic fertilizers. There are limited promotional activities to stimulate demand for quality seed. Late submission of planting returns by the LSBs affect planning for field inspection by DAOs Lack of variety descriptors to facilitate field inspections Lack of trust in certified seed by farmers due to prevalence of fake seed on the market There is limited information flow in a user-friendly manner Seed production is not linked to commodity product markets The Agricultural Extension Services Directorate (AESD) has allocated vehicles to all DAOs, and motorcycles to Subcounty Agricultural Officers (AOs) to ease their mobility and enhance their efficiency in educating farmers to use good agricultural practices for increased productivity AESD has also allocated to all districts an extension grants, but in most part, the grant is allocated to none extension activities | <ul style="list-style-type: none"> Need for market differentiation of released varieties to guide farmers in their choice Need for engaging farmers in variety selection trials to ensure they meet farmer requirements as well as the market Need for clear variety descriptors to aid in field inspection and seed testing Need for information tailored to each stakeholder to enhance NSP implementation Training of more DAOs and AOs in field inspection MAAIF to formalize the role of DAOs in seed field inspections through official certificates Strengthen LSB sources of seed which is more trusted than other sources by farmers There is a need for soil health testing to guide farmers in better use of fertilizers (organic and inorganic) MAAIF to disseminate the policy as widely as possible in local languages, ensure periodic review to align with emerging issues of the seed sector and coordinate stakeholders. In order to control fake seeds, there must be an effective mechanism of tracing the seed source, determine the acreage planted, seed quantiles produced and certified, ensure availability of records of production and sales, use of prison farms to produce specific classes of seed for easy tracking and tracing. DLGs to ensure that seed activities are well coordinated, prioritized and included in the annual budget. Allocate a portion of extension grants to seed activities or delegated functions DAOs need training in understanding key issues affecting use of quality seed in their districts to enable them understand the policy formulation processes and reforms as new challenges emerge. DAOs to leverage on airtime allocated to Resident District Commissioners (RDCs) for information dissemination of government programs on radios and televisions. |

| Subregion | Issues and challenges | Needed actions to address the challenges |
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| | <ul style="list-style-type: none"> Most DAOs were not conversant with seed related issues in their districts as well as their core functions | |
| North Eastern (Teso and Karamoja) | <ul style="list-style-type: none"> The seed policy making has taken a long journey following the enactment of the Seed and Plant Act 2006 Recognized the need for a competitive seed industry at domestic, regional and international levels leading to the liberalization of seed production and supply to be private-sector led. There has been a significant negative impact of the Covid19 pandemic especially on markets for food crops and fruits Cattle markets closed leading to reduced income for farmers to purchase inputs There is limited access to extension services Lack of markets largely attributed to lack of information on the commodity end use Agricultural input shops only found in towns that are far away from the production areas There is concern about the poor quality of seed (poor germination and variety mixtures) of officially labeled seed Seed is sold without variety descriptions and end-use to guide farmers in the choice of using quality or vs home-saved seed The CAO emphasized i) the need to disseminate the NSP in local languages to enable everyone understand their roles; ii) empowering subcounty chiefs in the dissemination of the policy at the lowest level for effectiveness; iii) District Farmers Associations can be on the frontline in engaging with farmers with farmers to internalize the policy The District Council speaker on behalf of the RDC noted: i) need to tighten seed quality control; ii) the extension system is generally weak; iii) changes in variety performance discourages farmers from buy quality seed (e.g., groundnut) Seed is generally unavailable and inaccessible and in the Karamoja sub region largely due to lack of agro-input dealers as well as seed Stuckists Seed and other inputs delivered late especially that those supplied through government programs and largely attributed to poor coordination DAOs face challenges of handling seed and planting materials of unknow quality and origin (especially cassava) DAOs not familiar with the laws that empower them to fulfil their mandates | <ul style="list-style-type: none"> NARO should develop national crop variety maps to guide in the choice of varieties both for seed and general crop production based on agro-ecological zones The National Seed Certification Service (NSCS) to enhance capacity in field inspections, post-harvest handling and lab testing Variety promotion should be accompanied by appropriate variety descriptors so that farmers know what they are buying Highly desirable to translate the NSP popular version into local languages to enhance its understanding and implementation Desirable to enhance farmers knowledge about new varieties by emphasizing that quality seed alone contributes 60% to the total crop yield while 40% is from good agricultural practices (good agronomic practices, use of fertilizers, and crop protection) Seed companies should establish agro-input dealers' networks to facilitate access to essential inputs to the last mile DAOs to be engaged in the coordination and streamlining of agro-inputs supply to curb sale of fake inputs DAOs must be familiar with the policy and its strategy in order to better guide farmers in the choice of crop enterprises Essential for DAOs to have hard copies of the Seed and Plant Act, Plant Protection and Health Act as well as the Plant Variety Protection Act as tools to guide them in taking the necessary decisions |
| Eastern (Elgon & Bukedi) | <ul style="list-style-type: none"> There are poor linkages between research and Extension Services resulting in lack of knowledge about new technologies especially seed leaving farmers to fend for themselves and accessing better quality seed from neighboring Kenya (especially maize) | <ul style="list-style-type: none"> Need to strengthen linkages between research and extension services in for farmers to better benefit from new high yielding and resilient varieties. DAOs encouraged to put in their budgets funds to purchase hard copies of the laws and regulations from the government printer or bookshops |

| Subregion | Issues and challenges | Needed actions to address the challenges |
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| | <ul style="list-style-type: none"> The geographical terrain of the Elgon region makes it difficult for the seed companies to reach the last mile. DAOs not familiar with the regulatory framework for effective implementation of the NSP | <ul style="list-style-type: none"> It is essential to make copies of laws and regulations related to seed available to DAOs. DAOs should appraise the seed policy, strategy and regulatory framework to the District Council leaders to guide them in appropriating funds for agricultural activities It is essential for MAAIF to put in place a clear seed/inputs distribution framework to minimize availing substandard seed and planting materials to farmers. |
| Albertine (Bunyoro) | <p>In his opening remarks, the Senior Assistant CAO Noted:</p> <ul style="list-style-type: none"> The NSP from MAAIF is timely and a significant milestone Fake of seed is still a big challenge in the district despite being a hub seed production in the country The issue of quality seed should be taken seriously as it spurs agricultural development It is the first time to know that there is a NSP DAOs must be the custodians of all the seed laws and regulations governing seed and agriculture in general I'm sure none of the DAOs in this subregion had heard of or seen the NSP Convinced that the NSP will be a game changer Quality seed must be supplemented by good agronomic practices The DLG leadership highly supportive of the NSP and ready to support its implementation <p>Key concerns from the districts:</p> <ul style="list-style-type: none"> The inability to distinguish certified seed from grain all sold at the same price discourages investment on buying quality seed. Locals perceive certified seed to be of poorer quality than farmer- saved seed The seed production cycle is very long which creates a mismatch between when farmers are ready to plant and seed availability The seed certification cycle not in sync with the crop seasons leading farmers to resort to home-saved seed Farmers concerned about germination rate of seed being supplied by Agricultural Cluster Development Project (ACDP) and yet the packaging doesn't allow for inspection before it is delivered to the beneficiaries DAOs also challenged by the requirement to test seed supplied through (ACDP) Poor germination of seed with official labels leads to mistrust of certified seed Farmers still unable to distinguish between local seed and good quality seed | <ul style="list-style-type: none"> MAAIF must closely monitor seed companies to eliminate sale of fake seeds Farmers should be helped to access seed and other technologies using new innovations such as digital Apps. To increase efficiency in the sector. The DLGS must cascade the dissemination to lower level and leverage support from the NGOs supporting farmers to include them in their messages. As implementers of the NSP, DAOs must be familiar with the laws and regulations by acquiring hard copies to protect them from political pressure There is an urgent need to extends seed Local Seed business in the subregion to fill the gap in knowledge about the use of quality seed as opposed to farmer saved seed Demonstration of the superiority of using quality seed over home saved seed in terms of yield gains and economic benefits is paramount The NSCS to enhance capacity in seed inspection and certification through creation of regional seed certification hubs and/or authorizing more par inspectors (both public and private) Supply of free seed and Agric inputs should stopped and instead strengthen the input inspection to eliminate fake agro-inputs. The NSCS must increase farmers' trust in certified seed by putting in place more deterrent measures against sale of fake seed. Alternatively, DLGs should be associated to develop bylaws and ordinances to curb vices in the seed value chain. |

| Subregion | Issues and challenges | Needed actions to address the challenges |
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| | <ul style="list-style-type: none"> • There is mistrust of varieties promoted by seed companies in favor of traditional varieties. • All the DAOs were unaware of the policy and regulatory framework for the seed subsector. • The NSP addresses all the concerns raised by each DAO and guided by the implementation plan • MAAIF addressed all issues raised by participants but clearly indicated that they have been operating without the guidance of the current seed sector regulatory framework put in place before the passing of the NSP. | |
| South Western (Ankole) | <ul style="list-style-type: none"> • In his opening remarks the Senior Assistant CAO Mbarara: <ul style="list-style-type: none"> ◦ urged DAOs and farmers' representatives to cascade the knowledge from the dissemination meeting to their clients ◦ promised to participate in the dissemination process ◦ urged DAOs to ensure that the extension staff are always on the ground guiding farmers in good agricultural practices to boost crop production • It was noted that over 95% of seed use in the greater Mbarara was home-saved seed and some DAOs still believe it is cheaper than certified seed. • Only two sub counties were using quality declared seed (QDS) • In Isingiro there are 11 LSB but still with limited capacity to supply sufficient quality seed to meet needs • Seed companies such as NASECO and Victoria Seed often buy QDS • Farmers are knowledgeable about quality agro-inputs but still low on quality seed in most districts • There is generally loss of trust in the use of certified seed due to the frequent poor germination of officially labeled seed. • It was noted that establishment of regional seed quality control hubs would enhance the quality of seed in the markets. • Some participants still question whether the policy addresses GMO seed Other issues raised <ul style="list-style-type: none"> • Can a seed produce be accredited to a seed company? • How can districts be assisted to reduce fake seeds? • Inputs from NAADS especially cassava curcuma to cassava mosaic and strip ...What went wrong? - There still gaps in quality assurance. • What are the punitive measures for those who sell fake seeds? • Need to use radio and print media to advise farmers on where to obtain quality seed | <ul style="list-style-type: none"> • The DAOs generally not aware of the policy and regulatory framework • There is still limited use of quality seed in greater Mbarara districts except in Isingiro • Seed companies purchasing QDS to package it as certified seed is fraudulent • The distinction between quality seed and grain has not yet been demonstrated to attract farmers to buy quality seed. • Poor germination of officially labeled seed has dampened farmers' trust in the use of quality seed • Need to look into how seed is handled during transportation, storage and planting conditions that all affect the viability of seed. Otherwise in most part, the labeled seed is of good quality, especially maize. • Distribution of free seed and planting materials from NAADS has created a dependency syndrome thus dispossessing farmers of their ability to make choices • Sale of fake seed is still rampant largely arising largely for the unmet procurement quantities for free distribution through government programs. • The glaring gaps in quality assurance can be filled by increasing capacity of the NSCS to effectively play its role. • More investments still needed in developing communication appropriate communication strategies tailored to the different stakeholder to ensure a clear understanding of the roles, responsibility of the various stakeholders in the seed sector. • There is an urgent need to sensitize the DLG leaders to appreciate the value of educating themselves about the current regulatory frameworks to support use of quality agro-inputs to protect farmers from unscrupulous traders |

| Subregion | Issues and challenges | Needed actions to address the challenges |
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| | <ul style="list-style-type: none"> Uncontrolled movement of vegetatively propagated planting materials especially cassava cuttings and sweet potato vines introducing diseases in areas where they do not exist. None of the DAOs and farmer representative in the greater Bushenyi had ever heard about the NSP The policy analyst questioned why the districts in this cluster were not doing well in seed? The responses were: <ul style="list-style-type: none"> Profitability not demonstrated Scarcity of seed as there were no stockists leading farmers to resort to home saved seed Loss of trust in certified seed due to poor germination and presumed productivity Low productivity due to poor quality inputs Challenges of climate variability Lack of information on variety performance and not meeting farmer- and market requirements Soils not tested to determine fertility levels to guide the use of fertilizers The superiority of quality seed vs grain (as seed) not demonstrated From Q & A session, the following were highlighted: <ul style="list-style-type: none"> How MAAIF controls seed produced by seed companies Most seed dealers are concentrated in Kampala, far away from production regions leading to seed being inaccessible! The Ministry trying to encourage seed companies to increase their agro-input networks to all regions | <ul style="list-style-type: none"> The core role of farmers in implementing the seed policy is to buy and plant quality seed, otherwise it will be of no use DAOs must be familiar with the laws and regulations related to seed that empower them to fight vices in the seed supply chains There is need for increased surveillance of diseases of vegetatively propagated planting materials by the entomologist in NARO and share the information through the research and extension linkages mechanisms. Especially in vegetatively propagated crops (Cassava and sweet potato) DAOs must not accept deliveries of seed and planting material they deem to be of low quality especially from other areas if already available in their districts. The key role of DLGs should be to incorporate seed activities detailed in the seed strategy in their annual work plans and budgets and its onus on the DAOs to present these plans to district councils for approval The seed law and regulations stipulate punitive measure for faking seed There is need to follow up on the dissemination process Need to enhanced accessibility of quality seed to the last mile through a combination of seed stockiest and LS B selling points Need to demonstrate economic benefits of using quality seed by smallholder farmers Soil testing is critical to guide in the use of fertilizers |
| Rwenzori | <ul style="list-style-type: none"> The entire leadership of Kabarole district (CAO, Assistant CAO, and LC5 chairman) attained the meeting indicating strong support from the DLG to implement the NSP. None of the participants had participated in the formulation of the NSP and only 5 had heard about it. Political pressure is put on DAOs to sign off for seed and planting materials of unknown origin and quality From the Q & A session, the following arose: <ul style="list-style-type: none"> The process of checking the quality of inputs to farmers is not clear DAOs are forced to receive seed and planting material of unknown origin and quality How to enhance adoption of improved varieties and use of quality seed How can farmers know that the seed being distributed is of good | <ul style="list-style-type: none"> DAOs need to be familiar with the policy and regulatory framework that empowers them to implement all agricultural activities in their districts without political interference. Protection of farmers from poor quality agro-inputs is enshrined in ed in the various laws and regulations Any requisition by the DAOs must make reference to the NSP. There is need to rectify weaknesses on the movement of seed and planting material from one region to the other There is a need to intensify deployment of new varieties with full participation of farmers to ensure that they meet their food/nutrition and market requirements There is a need to educate farmers to identify fake seeds through appropriate digital applications |

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| | <p>quality and how can they be compensated if it turns out to be of low standard quality></p> <ul style="list-style-type: none"> How is GMO seed checked? Who signs for seed/planting material | <ul style="list-style-type: none"> There is need to train DAOs in the seed quality assurance Information and knowledge about seed quality assurance is vital for DAOs |
| West Nile | <ul style="list-style-type: none"> In his opening remarks, the RDC Arua: reiterated the importance of food security and role of quality seed in enhancing crop productivity <ul style="list-style-type: none"> noted the prevalence of poor-quality seed as big challenge that needs to be tackled very seriously welcomed the national seed policy that will guide the stakeholders in playing their part in its implementation in order to feed the ever-increasing local population compounded by influx of refugees from the neighboring countries (RDC and S. Sudan) encouraged the DAOs to guide farmers in adopting good agriculture practices to increase productivity that will ensure food and nutrition security as well a livelihood. The commissioner Department of Crop Inspecting and Certification (DCIC), gave a background to the formulation of the NSP to support a vibrant and pluralistic seed subsector to guarantee food and nutrition security; provide an enabling environment for a competitive seed subsector meeting regional and international standards. emphasized the need to intensify rather than extension of factors of production (land, human capita, labor etc.) in offer to transform from subsistence to commercial agriculture Agriculture needs to be segmented into crop and seed production. highlighted key challenges facing the seed subsector to ensure adequate supplies of quality seed of all crops in Uganda. Among these were: <ul style="list-style-type: none"> Limited seed infrastructure for seed production, quality assurance and distribution Limited knowledge and information by stakeholders on where to access quality seed Weak linkages between Research and extension services Joseph Bazaale in a highlighting the historical background of the NSP reiterated three key milestones in the implementation of the NSP vis: Vibrant, Pluralistic and competitive emphasized the supporting policies (National Agricultura Policy 2013, National Extension Policy 2016 and National Fertilizer policy 2017); laws including, the Seed and | <ul style="list-style-type: none"> Need to understand the major causes of loss of seed viability; but in most part due to poor seed handling Important for DAOs to be knowledgeable about the policies laws and regulations governing the functions and services of the seed sector as they are the frontline officers at the local level Seed companies lack capital to invest in adequate seed production infrastructure to supply sufficient quantizes of quality seed. There is a need to amend the Seed and Plant Act 2006 to align it with the missions of a vibrant, competitive and competitive seed Subsidy program are confounding the seed quality challenges leading to farmers lose trust in certified seed. The Extension Services Directorate has enhanced mobility of DAOs with vehicles at the District level and AOs with motorcycles at the subcounty level. Need to develop commodity clusters to enhance vertical linkage of seed growers to product markets Need to increase volumes of quality seed to meet actual demand Strengthening technology transfer to farmers through a strong research-extension linkage interface Need to ensure quality of relief seed Essential to strengthen seed quality control mechanisms by involving para inspectors from public and private sector Essential to unlock opportunities to eliminate fake seed in the Uganda seed market through policy implementation and enforcement of laws and regulations. MAAIF should rectify institutional and administrative gaps in the implementation of the laws and regulations for effective implementation of the NSP. MAAI through its agencies and MDAs should strengthen linkages between research and extension services to enhance adoption of new varieties and associated technologies to stimulate use of quality seed by stallholder farmers. MAAIF through DLGs should continue to create awareness of the policy and |

| Subregion | Issues and challenges | Needed actions to address the challenges |
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| | <p>Plant Act, The Agric Chemical control Act, The Plant Variety Protection Act and the Plant protection and Health Act. Along with their regulations constitute a National Seed Policy and Regulatory framework that the government has put in place to support the seed industry in Uganda.</p> <p>From the Q & A arising from the presentation of the policy framework were on the first day:</p> <ul style="list-style-type: none"> ○ Who is responsible for quality assurance of relief seed? ○ Poor germination of seed a recurrent issue! ○ Concern about the distortions created by OWC ○ Need for soil testing to guide choice of fertilizers to use ○ Forged signatures of Seed impactors ○ Supplies not reaching remote areas due to impasse roads ○ DAOs and farmers not aware of seed companies and agro-dealers and the crops they specialize in ○ Any contradictions and gaps in the seed law should be identified and appropriate amendments produced for parliamentary approval ○ Price Harmonisation in subsidy programs such as ACDP ○ What is the fate of authorization letters for DAOs to conduct field inspections? ○ How are seed companies licensed to produce certain varieties? ○ How is seed controlled across borders? ○ What is the fate of the PGRFA policy? <ul style="list-style-type: none"> • On the second day, the CAO in his closing remarks reiterated the dangers of poor-quality seed in compromising food and nutrition security; and encouraged the DAOs to be conversant with the regulatory framework to facilitate their work. | <p>regulatory framework to ensure that the implementers clearly understand their roles and responsibilities through periodic strategic implementation plans.</p> <ul style="list-style-type: none"> • NSCS should formally designate DAOs as para inspectors to facilitate seed field inspections • DAOs must endeavor to indent for copies of the laws and regulations to enable them perform their functions more effectively • DLGs should to identify distortions in the supply of agro-inputs created by the government program such OWC and ACDP and rectify them • Train the agricultural police to in seed issues and principal vices and penalties against vices in the seed industry • There is need for create agro-input shops in hard-to-reach areas to facilitate access to these vital inputs by farmers. • Need to avail a list of registered seed companies and Agro-dealer to facilitate coordination and control of fake seeds |
| South Western (Kigezi) | <ul style="list-style-type: none"> • In his opening remarks, the CAO, Kabale district: <ul style="list-style-type: none"> ○ reiterated the importance of quality seed in enhancing crop productivity by contributing 60% of the yield ○ hailed inclusion of lead farmers in the dissemination workshop through whom farmers can be reached ○ reiterated the need to eliminate sale of fake seed in Uganda ○ DLGs are key in reaching stakeholders with messages about the national seed Policy. ○ hailed ISSD support to Kitoba Bahingi Bemondi Local seed business in their capacity to engage in seed potato | <ul style="list-style-type: none"> • There is a strong desire to translate the popular NSP in local languages. • Field monitoring by the CAO's is critical to ensure that extension staff are supporting farmers to enhance use of quality seed to improve yields and productivity • The need for MAAIF to follow-up on the implementation of the NSP is critical by ensuring the DLGs include key seed activities and their annual budgets • The seed potato value chain is distorted by numerous actors including involving farmers in |

| Subregion | Issues and challenges | Needed actions to address the challenges |
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| | <p>business that will go a long way to boost potato production in the zone,</p> <ul style="list-style-type: none"> ○ unscrupulous traders are frustrating farmers by distributing substandard/fake seed. ○ Quality of seed distributed through the ACDP subsidy program leaves a lot to be desired and not helping farmers to access quality seed leading farmers to lose trust in certified seed. ○ encouraged DAOs to empower farmers in the production of quality seed <p>■</p> <ul style="list-style-type: none"> ○ appreciated the three documents of NSP, NSS and NSP popular version that will guide the District leadership to appreciate the need to prioritize, allocate resources to support seed activities and formulation of bylaws to facilitate implementation ○ Distribution of counterfeit seed remains a challenge and hampers smallholder farmers to invest in quality seed. <ul style="list-style-type: none"> • The seed potato value chain is completely distorted and need to understand the regulations. <p>Issues arising from the Q & A sessions included:</p> <ul style="list-style-type: none"> • Need to understand the issues of Intellectual Property Rights especially with seed potato of Dutch varieties • DLGs to be assisted to develop ordinances and bylaws • How to reduce use of farmer saved seed • How to handle seed without labels distributed by government • Farmers engaged in multiplying cuttings are face with challenges of producing disease free mini-tubers leading to rejection by MAAIF inspectors. | <p>rapid multiplication of EGS that requires science.</p> <ul style="list-style-type: none"> • Demonstrating the value of quality seed is essential to stimulate demand. • There is need to support farmers to apply good agronomic practices to enhance yields and productivity |
| Central - Mityana | <ul style="list-style-type: none"> • Mityana District hosted the central regional workshop • In her opening remarks the Deputy CAO • hailed MAAIF for making their work easy in the implementation of the NSP • emphasized the need to know the value of quality seed indicating that poor quality seed was a disaster for agriculture • encouraged farmers to do agriculture as a business and strive for a competitive seed subsector • encouraged DAOs to follow-up and spot checks as M & E is a critical activity to ensure everyone is playing his/her role. • Ordinances are critical in the implementation of the NSP and especially enforcement of regulations. • A private sector-led seed industry requires a strong policy and regulatory framework for inclusiveness and equity | <ul style="list-style-type: none"> • There is a need to demonstrate economic benefits of using agro-inputs including quality seed to stimulate and encourage small older farmers to practice agriculture as a business • There is a dire need to scale up variety demos to stimulate demand for quality seed rather than imposing seed on farmers • There is a clear need for a streamlined input distribution system to facilitate traceability, encourage customer-seller interface and curb sale of substandard/fake products • There is a need to cluster seed systems especially for VPCs and certification manuals developed by MAAIF. The NSP if fully implemented can mitigate the |

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| | <ul style="list-style-type: none"> It was noted that majority of farmers in Wakiso district (70%) still rely on their home saved seed. And farmers are not taking farming as a business which explains the preponderance of home saved seed and grain (potential) Demonstration of economic benefits of using ag seed. In Mubende conservatism among farmers and prevalence of poor quality seed partly explain limited adoption of quality seed The focus on production and less on marketing is also a factor hampering farming as a business. Lack of demonstrated economic benefits of using quality seed is another factor. It was noted that in Mityana, farmers buy maize and clonal coffee and seed companies have Agro-dealer outlets creating a need to differentiate product markets to stimulate demand for quality seed USTA thinks that one of the sources of poor-quality seed could be from the unsold stocks that are often mixed with new seed leading to mixtures and poor germination USTA is lobbying government to move agri. Insurances from the Ministry of finance to that of Agriculture There is a perception that seed companies impose varieties on farmers without adequate information about them. During the Q&A session the following were noted: <ul style="list-style-type: none"> How does the policy communicate with the laws? Critical that DAOs have copies of the laws to guide them in their decisions There are serious challenges of enforcement of regulations at the district level There are challenges of quality of vegetatively propagated crops especially cassava and sweet potato planting materials Demonstrate the economic value of using inputs Need for seed price subsidy How to handle sale of expired seed There is still insufficient number of extension services at the subcounty level considering the diversity of farming activities <p>On the second day,</p> <ul style="list-style-type: none"> While outlining the objectives of the dissemination workshop, the Assistant commissioner Information reiterated the need for streamlining the functions and services of the seed subsector through an effective policy and regulatory framework A better understanding of government intentions on how the seed industry should operate is paramount | <p>challenges the seed subsector faces</p> <ul style="list-style-type: none"> especially women who lack transport to access input shops far away from their homes. There is a need for para inspectors for both public and private sector to support the seed inspection activities <p>The need for clear standards for all seed multipliers</p> <ul style="list-style-type: none"> important gender gaps in land ownership, access to inputs, and management and control over outputs remain. Women's lack of access to extension leads to gender gaps in information about new technologies and how women adopt those. Full participation of women in seed activities and decision making is critical as they are major players in seed selection, production activities and yet are marginalized when it comes to marketing and benefit sharing at the household level. There is a need for variety demos to enable farmers have a choice on what they want to grow as opposed to imposing varieties on them It is essential to involve technical teams in the procurement of seed and planting materials for distribution under government supported subsidy programs Devise other means of disseminating the NSP (electronic and print media) The DAOs must be equipped with knowledge of the enabling environment to ensure that they play their roles. Need for a register of all seed companies and their products to facilitate input quality control Need to consider community-based extension workers |

| Subregion | Issues and challenges | Needed actions to address the challenges |
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| | <ul style="list-style-type: none"> • The CAO reiterated the importance of all communities accessing quality seed and that the NSP popular version was meant for non-technical people to understand government intentions • The germination of seed supplied through government programs is as low as 20% and the ministry should step up to resolve this problem. • In some districts like Buikwe, farmers especially women do not know where to access quality seed and rush for seed at the beginning of the planting season; and limited knowledge sharing • Women also face challenges of being largely illiterate, not owning land and overreliance on men who in most cases do not allow them to engage in revenue-activities • In the Q&A session the following were noted: • Challenges of quality seed of vegetable crops, certification of VPCs, registration of agro-dealers perceived cumbersome, inadequate inspection of seed companies (Kasese), need for increasing the number of seed inspectors, training of internal controllers in seed companies and other registered seed growers in field inspection. • While analyzing the facts of quality seed, the issue of poor-quality seed continues to be evoked, non-participation of woman in the choice of quality seed to grow and market, inappropriate varieties not meeting farmer preferences, cost of seed perceived to be high, Agro-dealer shops being far from production zones, lack of storage facilities to preserve the integrity of seed, overreliance on middlemen who cheat farmers | |
| Busoga | <ul style="list-style-type: none"> • The CAO lamented on the lack of walking the talk when implementing government policies • Hoped that the knowledge the DAOs and lead farmers acquire in the dissemination workshop will be cascaded to lower levels • Proposed inter district benchmarking to learn from each other on new innovations in their districts • Poor quality seed and counterfeits are a real challenge in all districts and needs a bold approach to tackle the vices. • Farmers gardens close to the district headquarters should an indication of your presence or absence. • DAOs are the champions of policy implementation • It is imperative to have minimum qualifications for agro-input dealers as a one way of minimizing use of counterfeits • Farmers tend to be discouraged from using quality seed when the final product i.e., not remunerative | <ul style="list-style-type: none"> • The DLG leadership needs to understand the need to implement government policies for effective service delivery • DAOs are encouraged to cascade knowledge acquired in the workshop to lower levels • Periodic interfacing of central and Local governments critical for effective implementation of the NSP • DLGs are at different levels of development and inter-district experience sharing through benchmark visits can enhance knowledge and information exchange • Efforts need to make farmer gardens closer to the district headquarters as models for other districts and farmer learning • There is need to develop SOPs for agro-input dealers to minimize sale of substandard products |

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| | <ul style="list-style-type: none"> Gender-based violence effects of HIV and now COVID-19 impact negatively on agricultural labor and productivity Farmers main concerns revolve around prevalence of poor-quality seed (poorer germination and variety mixtures), limited role of UNADA, safeguards against GMO seeds, how to curb the counterfeits issues, unclear messages about production and commercialization of QDS, farmers not aware of the official labels on seed packets, need for quality assessment of the messages aired on TVs and FM radios. | <ul style="list-style-type: none"> DAOs need to be conversant with key factors that affect farmers' productivity More sensitization of farmers to ensure accessing quality seed from reliable sources MAAIF must periodically interface with DLGs on what they do and provide the necessary guidance. |
| Central-Masaka-Kalungu | <ul style="list-style-type: none"> The border districts of Karamoja Northern Uganda and West Nile joined the first cluster of Masaka district hosted by Kalungu district. For effective implementation of the single spine extension services; the directorate of Extension services has empowered the DAOs and AOs with vehicles and motorcycles, respectively to ease mobility. The DLGs have also been granted extension grants to enhance service delivery A policy is a framework to guide implementation of associated laws, regulations and guidelines Farmers perceive seed as expensive (e.g., Price of 1 kg of DK 89 maize variety at UGX 10,000 is unaffordable) Perception that DAOs are not empowered to enforce regulations regarding quality seed The DLG leadership focused more on politics than implementing policies and enforcing regulations Maize yields low due to poor quality seed, pests (Fall army worm) In the Q&A session the following were highlighted: <ul style="list-style-type: none"> The role of UNADA in the distribution of agrochemicals Need for effective traceability systems Formulation of ordinances and bylaws to curb vices in the supply and distribution of Agro-input Need for a list of recommended agrochemicals to guide farmers and inspection of Agro-dealer premises The minister of Agriculture (Vincent Ssempijja) graced the meeting. In his opening remarks, he reiterated the contribution of the agriculture sector contribution to GDP (26%) and export (52%) as well as the critical role of quality seed in Agric productivity. He highlighted the role of government agencies such as NARO in the provision of EGS and NSCS for quality control and assurance. MAAF has developed the policy to guide the laws enacted by the pertinent to regulate the seed subsector and interventions at each node of the seed value chain. The seed | <ul style="list-style-type: none"> Despite the enhancement of the extension staff with mobility and finds, the general impression is that farmers are not getting the essential services to improve their knowledge about good agricultural practices. Need to demonstrate value (yield increase) of varieties on the market through demonstrations and economic benefits Need to engage DLG leadership and train them in policy making and implementation The District production and marketing officer who coordinate all crop production activities require strengthening to perform their functions Districts need support to develop the necessary ordinances and bylaws to minimize vices in the seed subsector. This requires a clear understanding of the laws by the DLG leadership. A digital Seed tracking and tracing system under development is an example Department of Crop Inspection and Certification (DCIC) to provide the list DAOs have the power to reject substandard seed deliveries Need for mindset change of farmers to buy quality seed Strengthening extension services critical. Production departments must use the NSS and present their budgets to the district council for allocation of need resources to implement the policy. More sensitization of seed producers that seed is never expensive considering the potential benefits of starting with high quality source seed. MAAIF to roll out the LSBs to other regions where ISSD is not operating but needs a concept note on the QDS systems (its advantages and business cases) and lessons learnt. |

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| | <p>policy is enshrined in the vision, mission and goal and elaborates interventions to address the challenges in the seed subsector.</p> <ul style="list-style-type: none"> • Hailed the digitization of the STTS that will eliminate malpractices in the seed industry • The efforts put in the formulation of the NSP should be the same in its implementation by the various stakeholders. The minister asked OWC and DAOs to cascade the dissemination to lower levels. It is essential to give farmers demand-driven information to farmers to enable them make the right choices and also encouraged farmers to demand knowledge and information instead of being at the receiving end. He assured the DAOs that the ministry will conduct regular M&E to ensure that extension staff are doing their work. He hailed progressive farmers who are providing extension services other farmers in their communities • The speech touched on all issues that the DLGs need to be familiar with in order to deliver Agric extension services in their districts. He promised technical support and appreciated the support development partners like ISSD Model/progressive farmers need to be incentivized to provide extension services to their communities and a reward system developed. This is already happening with support from ACDP. • • Commissioner Kakoole highlighted key issues that are across all districts being: • DAOs feel not empowered, have limited knowledge about seed issues, and limited participation of women in decision making. He reiterated fundamental requirements need in policy formulation and conditions of empowerment. • Issues of cross border trade in seed such as maize and seed potato from Kenya and how NARO can develop similar varieties suitable for highland areas. • Production Departments operate on conditional grants. Can MAAIF provide grants for implementation of the NSP? <ul style="list-style-type: none"> ◦ There is a need to subsidize foundation seed which is perceived expensive and need to extends LSBs to other districts | |

Annex 5. Main dashboard from the analysis of the online survey

| | | | Scores based on Respondent category | | | | | | | No of respondents responding to the question | Distribution of responses | | | | |
|----------------------|---------------------------------|---|-------------------------------------|-----------|-----------------------|---------------------------|---------------|--------------|----------------------|--|--|---|---|--|--|
| Seed Sector Function | Seed Value chain Activity | Questions | Weighted Score | Extension | Farmer representative | Local Seed Business (LSB) | Plant breeder | Seed Company | Seed quality control | | Very poor performance-not functioning/does not meet sector needs | Poor performance-low level of performance-meets sector need to a limited extent | Fair level of performance-meets sector needs to some extent | Good level of performance-meets minimum sector needs | Very good level of performance-largely meets sector requirements |
| Services | Variety development and release | 1. To what extent are the plant breeding activities on the research station supported? | 2.80 | | | | 2.8 | | | 5 | 0% | 20% | 80% | 0% | 0% |
| | | 2. To what extent is the conduct of multi-locational trials at NARIs and ZARDIs for variety release and registration effective? | 4.00 | | | | 4.0 | | | 5 | 0% | 0% | 40% | 20% | 40% |
| | | 3. To what extent are new varieties evaluated in farmers' fields for variety release and registration? | 4.00 | | | | 4.0 | | | 5 | 0% | 0% | 40% | 20% | 40% |
| | | 4. To what extent does the variety release committee process proposals for released and registration of new varieties? | 3.44 | | | | 3.6 | 3.3 | | 9 | 0% | 0% | 67% | 22% | 11% |
| | | 13a. To what extent is field inspection for seed quality assurance effective for QDS? | 3.36 | | | 3.5 | | 3.3 | 2.0 | 11 | 0% | 0% | 73% | 18% | 9% |
| | | 13b. To what extent is field inspection for seed quality assurance effective certified seed? | 3.36 | | | 3.5 | | 3.3 | 2.0 | 11 | 0% | 0% | 73% | 18% | 9% |
| | | 14. To what extent is seed sampling and laboratory testing for seed quality assurance effective? | 3.33 | | | 2.8 | | 3.3 | 3.2 | 12 | 0% | 17% | 50% | 17% | 17% |
| | EGS supply | 5. To what extent is basic (foundation) seed available in sufficient quantities? | 2.92 | | | 3.0 | 2.6 | | 2.6 | 13 | 0% | 23% | 62% | 15% | 0% |
| | | 6. To what extent is basic (foundation) seed accessible to seed producers like seed companies, ZARDIs and LSBs? | 3.08 | | | 3.0 | 2.8 | 3.5 | | 13 | 0% | 8% | 77% | 15% | 0% |
| | Seed supply | 7. To what extent is the basic (foundation) seed produced of good quality? | 3.47 | | | 3.5 | 4.0 | 3.3 | 2.4 | 17 | 0% | 0% | 71% | 12% | 18% |
| | | 8. To what extent is certified seed and QDS available to farmers in sufficient amounts? | 2.88 | | | 2.8 | | 3.0 | | 8 | 0% | 25% | 63% | 13% | 0% |
| | | 9. To what extent is certified seed and QDS accessible to farmers? | 3.08 | | | 3.5 | 3.2 | 2.5 | | 13 | 0% | 15% | 62% | 23% | 0% |
| Production | Seed production | 10. To what extent is certified seed and QDS affordable by farmers? | 3.08 | | | 3.5 | 3.0 | 2.8 | | 13 | 0% | 23% | 62% | 0% | 15% |
| | | 11a. To what extent is certified seed of good quality? | 3.43 | 4.0 | 2.0 | 3.0 | | 3.0 | 2.0 | 23 | 0% | 22% | 30% | 30% | 17% |
| | | 11b. To what extent are the QDS of good quality? | 3.83 | 4.0 | 4.0 | 3.8 | | 3.5 | 2.4 | 23 | 0% | 0% | 35% | 48% | 17% |
| | | 12. To what extent are post-harvest practices in seed production (e.g. transporting for bulking, seed processing, conditioning, packaging and storage) effective? | 2.63 | | | 2.8 | | 2.5 | | 8 | 0% | 50% | 38% | 13% | 0% |
| Markets | Seed marketing | 15. To what extent is transporting of quality seed to stockists, agro-dealers and LSB seed stores efficient? | 2.50 | | | 2.5 | | 2.5 | | 8 | 0% | 63% | 25% | 13% | 0% |
| | | 16. To what extent is the importing of quality seed for vegetables and hybrid crops effective? | 3.63 | | | | | 3.3 | 3.2 | 8 | 0% | 0% | 50% | 38% | 13% |
| | | 17. To what extent is exporting quality seed (like maize and beans) effective? | 2.63 | | | | | 2.5 | 2.2 | 8 | 0% | 63% | 13% | 25% | 0% |
| | | 18. To what extent are seed and variety promotion activities (e.g. demos, field days, fairs, mass media | 3.90 | 4.5 | 4.0 | 3.0 | | 3.3 | | 20 | 0% | 10% | 30% | 20% | 40% |

| | | | Scores based on Respondent category | | | | | | | No of respondents responding to the question | Distribution of responses | | | | |
|--------------------------|------------------|--|-------------------------------------|-----|-----|-----|-----|-----|-----|--|---------------------------|-----|-----|-----|-----|
| | | communication) effective in changing mindsets of farmers? | | | | | | | | | | | | | |
| | | 19. To what extent are points of seed sale/agrodealer within reach to farmers? | 2.81 | 3.0 | 2.0 | | | 2.5 | | 16 | 0% | 44% | 38% | 13% | 6% |
| | | 20. To what extent is the accessibility of seed in the local/informal/traditional markets effective? | 3.08 | 4.0 | 3.0 | | | | | 12 | 0% | 25% | 42% | 33% | 0% |
| | | 21. To what extent is the accessibility of seed in the informal sources (including seed saving by farmers themselves, exchange among farmers and sourced from their neighbours and relatives)? | 3.25 | 3.3 | 3.0 | | | | | 12 | 8% | 17% | 33% | 25% | 17% |
| | | 22. To what extent is fake seed sold on the market? | 2.00 | 2.2 | 1.0 | | | | 1.4 | 16 | 19% | 50% | 19% | 6% | 0% |
| | | 23. To what extent is certified seed and QDS (especially for non hybrid crops) sold in the market? | 3.25 | 3.4 | 3.0 | 3.3 | | 3.0 | 2.6 | 24 | 0% | 4% | 71% | 21% | 4% |
| Revenue and reinvestment | Financing | 24. To what extent is government funding of services in the seed sector adequate? | 2.60 | 3.0 | | | 1.8 | | 2.2 | 20 | 5% | 45% | 35% | 15% | 0% |
| | | 25. To what extent is government investment in government seed distribution and seed subsidy schemes adequate? | 2.50 | 2.7 | 1.0 | | | | 1.8 | 16 | 13% | 38% | 38% | 13% | 0% |
| Co-ordination | Governance | 26. To what extent does government coordinate seed sector stakeholders? | 2.93 | 3.0 | 2.0 | 3.0 | 2.6 | 3.0 | 2.8 | 29 | 3% | 21% | 59% | 14% | 3% |
| | | 27. To what extent is sharing of information, coordination of activities and alignment of existing strategies among seed sector stakeholders effective? | 3.07 | 3.4 | 4.0 | 2.5 | 3.2 | 2.5 | 2.4 | 29 | 0% | 34% | 31% | 28% | 7% |
| Farmer level | Utilization | 28. What is the level of farmers' economic endowment to purchase quality seed | 2.60 | 2.7 | 3.0 | 2.8 | | 2.0 | | 20 | 0% | 50% | 40% | 10% | 0% |
| | | 29. To what extent are farmers willing to pay for quality seed (especially for non-hybrid crops)? | 3.25 | 3.4 | 4.0 | 3.0 | | 3.0 | | 20 | 0% | 15% | 55% | 20% | 10% |
| | | 30. To what extent is demand forecasting for quality seed effective? | 2.55 | 3.2 | 3.0 | 2.5 | 2.4 | 1.5 | 1.6 | 29 | 14% | 48% | 10% | 24% | 3% |
| Landscap e | Gender inclusion | 31. To what extent are seed activities inclusive to ensure gender sensitive engagement in income generating activities? | 3.10 | 3.4 | 4.0 | 2.8 | 3.2 | 2.5 | 2.4 | 29 | 0% | 31% | 38% | 21% | 10% |
| | Climate change | 32. To what extent are seed activities tailored to enhance crop diversity for purposes of mitigating effects of climate variability? | 3.28 | 3.6 | 2.0 | 3.0 | 3.2 | 3.0 | 2.6 | 29 | 0% | 24% | 31% | 38% | 7% |