Working Paper No. 1

“Enhancing Farmers' Access to Improved Forage Seed in Kenya”

Recommendations for policy change and operational advancement of the regulatory framework for forage seed

Nairobi, Kenya, 21 May 2024

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Abbreviations

ABC	Alliance of Bioversity International and CIAT
ASALs	Arid and Semi-Arid Lands
CGIAR	Consultative Group on International Agricultural Research
COMESA	Common Market for Eastern & Southern Africa
DUS	Distinctness, Uniformity and Stability
EAC	East African Community
EGS	Early Generation Seed
FWG	Forage Working Group
GDP	Gross Domestic Product
ILRI	International Livestock Research Institute
IP	Intellectual Property
ISTA	International Seed Testing Association
KALRO	Kenya Agricultural and Livestock Research Organization
KARI	Kenya Agricultural Research Institute
KEPHIS	Kenya Plant Health Inspectorate Services
KIT	Koninklijk Instituut voor de Tropen (Royal Institute for the Tropics)
KSC	Kenya Seed Company
MoALD	Ministry of Agriculture and Livestock Development
NCVL	National Crop Variety List
NEADAP	Netherlands East African Dairy Partnership
NPPO	National Plant Protection Organisation
NPT	National Performance Trial
NVRC	National Variety Release Committee
OIC	Orange ISTA Certificate
PIP	Plant Import Permit
PRA	Pest Risk Analysis
RVO	Netherlands Enterprise Agency
SNV	SNV Netherlands Development Organisation
STAK	Seed Trade Association of Kenya
VAT	Value Added Tax

1. Preface

This working paper reflects on the required actions for increasing availability, affordability and accessibility to certified seed of improved forages in Kenya, in relation to the regulatory framework for forage seed listing, release and commercialisation.

The **key objective** of this paper is to fast-track the release of forage crop varieties and the diversification of certified forage seed options available in Kenya. This is a necessary building block for increasing feed availability, livestock productivity, food security; while addressing environmental concerns, sustainability and resilience of livestock keeping systems - including conservation and use of Kenya's rangelands.

The recommendations relate to policy issues and operational advancements as regards to the regulatory framework for forage seeds and the regulator, the Kenya Plant Health Inspectorate Services (KEPHIS). The call for action is directed to the Ministry of Agriculture and Livestock Development through KEPHIS https://kilimo.go.ke/ https://www.kephis.go.ke/ .

Realisation of the objective can be achieved faster if the Government actively promotes, facilitates and initiates partnerships (bilateral or multilateral) between Government, donors, research institutions, development organisations, farmer organisations and KEPHIS. As such, the Government can unlock funding and expertise to strengthen KEPHIS' capacity to exercise its mandate in the forage sub-sector more effectively.

Furthermore, to complement and reinforce affirmative action at the level of the regulatory framework, it is advised that collaborations are established between Government, public and private research institutions, donors, development partners and international research organisations with private seed companies – local and international. The aim of this collaboration is to lower financial and logistical barriers for forage variety release and market development. The latter especially for demonstration of novel varieties, farmer-training on good agronomic and feeding practices, and thus for enhancing the adoption of novel forage technologies.

2. Introduction

The livestock sector in Kenya contributes up to 42% of the agricultural GDP (ILRI, 2021) and plays a significant role in the livelihoods, food and nutrition security, and incomes of rural households. However, livestock performance is constrained by lack of year-round supply of good quality and adequate quantity of feed. This results in the cyclic growth of the sector and is responsible for the high emission of greenhouse gasses per unit of livestock output (Leitner et al 2021).

Since livestock sector growth is key in supporting Kenya's GDP, there is a need for congruent growth in support systems, one of which is improved feeding. A lack of quality and quantity of forages, which form the bulk of ruminant diets, limit productivity and profitability of ruminant livestock production enterprises. Frequent lack of forage causes high mortality rates amongst livestock in Kenya's arid and semi-arid lands (ASALs) and makes pastoralist and agro-pastoralist communities economically and nutritionally vulnerable, against the backdrop of climate change and degradation of landscapes.

Feed resources account for more than 55% of cattle and other ruminant production costs kept in more intensive livestock production systems (Odero-Waitituh, 2017). The cultivation of improved forages enables livestock producers to sustainably increase milk and meat production. Reseeding and managing the degraded landscapes in ASALs offers livestock producers further opportunity to improve livestock productivity, livelihoods and enhance provision of ecosystem services. In addition, permanent grasslands and use of improved forages contribute to reduced environmental and carbon footprint.

However, for livestock producers, commercial forage producers and other relevant stakeholders, one of the most pressing challenges is access to affordable and suitable quality and sufficient quantity of forage seed for the prevailing agro-ecological conditions.

In the last few decades, forage development - which involves selection, germplasm collection, characterization, evaluation, breeding, multiplication, and adaptation - has received little attention, contrary to earlier times in the 1970-s (e.g. Boonman, 1973). Up to 2015 only 6 grass varieties were listed in the National Crop Variety List (NCVL) comprising of 3 Rhodes, 2 Setaria and 1 Panicum grasses. In addition a number of dual-purpose legumes were listed and released mainly by the Kenya Agricultural Research Institute (KARI)/Kenya Agricultural and Livestock Research Organization (KALRO), Kenya Seed Company (KSC), or Universities (e.g. Sweet potato vines, Cow peas, Dolichos lab lab). For a number of these listings Early Generation Seed (EGS) has not been maintained and/or the varieties were not taken to commercial levels.

From 2015 onwards progress was made with the listing of 23 new grass varieties, including Brachiaria CV (6 in 2021) and hybrids (3 in 2016), Panicum Siambaza CV (1 in 2021), Lucerne (5 in 2015), Range grasses (4 in 2021), Fodder Sorghum (3 in 2016/2019) and Fodder Millet (1 in 2019). In addition, 2 Sweet potato dual purpose varieties (2015, 2019), 5 Cowpea dual purpose varieties (2017, 2019), 1 Oats fodder variety (2018), 1 Soya bean dual purpose variety, and 1 Triticale fodder variety (2021) got listed. See Annex 1 for the listed dual purpose and forage crops in the NCVL, 2023.

However, diversity in terms of forage species, variety maintenance and seed availability of the forage species and varieties, remain to be a problem. The latter, amongst others, due to low and fluctuating demand, high costs of importation and keeping stocks, and weak seed systems - including lack of maintenance of Early Generation Seed.

The private sector is best positioned to sustainably drive improved access to forage seeds. Considering the paucity of forage options in the market and the danger of monoculture, at least for the coming years, it is important to increase the diversity of forage options for the various livestock keeping systems and agro-ecological zones in the country. This would also enhance constructive competition in the market and allow livestock producers to make choices in terms of preferred species, varieties and suppliers.

Therefore, efforts to enhance availability and use of improved forage seeds and planting material cannot be over-emphasized, and part of the solution lies in refining the regulatory framework for forage variety release and listing. Kenya Government is currently reviewing the National Seed Policy 2010, which includes a process of public participation as enshrined in the Constitution. This working paper contributes to this process. It aims specifically to enhance the forage seed sub-sector, by sharing expert views from the research and development sectors and gaps identified by stakeholders from the public and private sector, including seed companies and livestock producers.

3. Forage seed regulatory framework

In Kenya, seed is regulated by the Kenya Plant Health Inspectorate Service (KEPHIS) through implementation of the Seed and Plant Varieties Act (CAP 326) and its implementing regulations (LN 150/December 216 and LN 220/December 2016). According to CAP 326 the specified forage species are listed in Schedules (Table 1 below).

The Regulation stipulates 14 grasses (most but not all) at the genus level and 9 legumes in Schedule 1 and eligible for release. Amongst these, 7 grasses and 7 legumes (Schedule 2) are subject to mandatory certification (Kenya Law, Legal Notice caption 220, December 2016).

Table 1. Forage species categorized under Schedules I and II according to the Seed and Plant Varieties (Seeds) Regulation 2016

All prescribed forages set out in the **First Schedule** are eligible for certification. Seeds of crops set out in the **Second Schedule** are under compulsory certification and should officially be released in accordance with the relevant Regulations.			
Prescribed forages (First Schedule)		**Forage Seed under compulsory certification (Second Schedule)**	
Grasses	**Pasture legumes**	**Grasses**	**Pasture legumes**
Blue stem grass Buffel grass Cock's foot grass Colored guinea grass Columbus grass Congo signal grass Kikuyu grass Napier grass Paspalum grass Rhodes grass Rye grass Setaria grass Sudan grass Love grass	Centrosema Clover Greenleaf Desmodium Leucaena Lucerne Lupins Silverleaf Desmodium Siratro Stylosanthes	Setaria grass Rhodes grass Sudan grass Congo signal grass Panicum spp Buffel grass Columbus grass	Centrosema Stylosanthes Desmodium Clover Lucerne Siratro Lupins

The Schedule helps to classify varieties that require official release. It has a limitative list of varieties and ought to be updated regularly based on potentially suitable novel forage seed varieties for Kenya. However, this has not been done since its publication. In practice, importation may not be denied by virtue of the variety not being included in the schedule. The general principle is for all forage crop varieties to undergo official registration or listing and release, as they are food security crops.

Before listing of forage crop varieties on the NCVL, National Performance Trials (NPTs) and Distinctness, Uniformity and Stability (DUS) tests need to be conducted, all at the cost of the applicant. However, if the variety has to be imported into the country the process is preceded by a Pest Risk Analysis (PRA), for cases where phytosanitary requirements for importation of the species from the specified source do not exist.

This process is lengthy, especially the PRA. The PRA is carried out at species level. In some cases, species within a genus share pests, even across genera, but information has to be per species. Shortening the PRA process would be crucial for fast-tracking availability of novel forages in Kenya. The PRA data are usually obtained from the National Plant Protection Organisation (NPPO) in the country of origin. Fast-tracking of PRA may be done through follow-up with relevant NPPOs, including country-to-country (bilateral) diplomatic engagements. Under the umbrella of EAC (East Africa Community) or COMESA (Common Market for East and Southern Africa), PRAs are being shared with KEPHIS by some member states, but regional harmonization is not yet (fully) institutionalised.

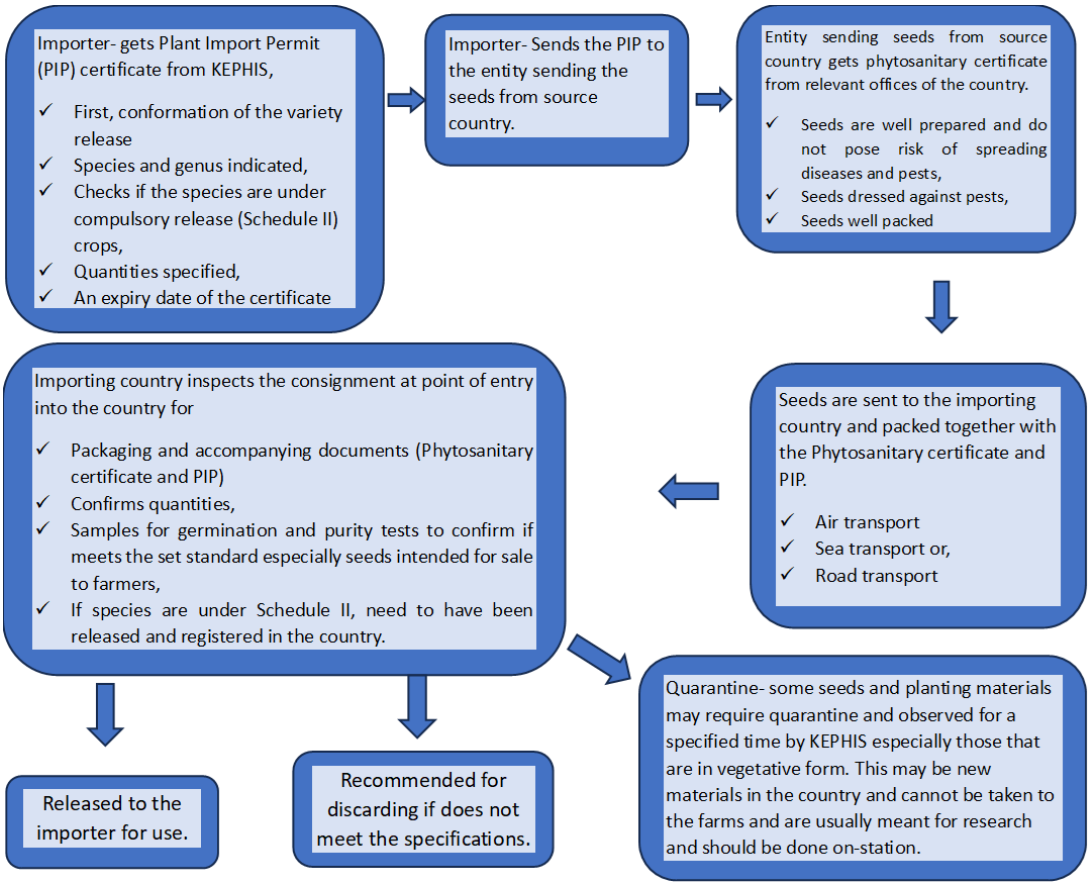
Entities aiming to register forage varieties need to apply for NPT online and this is compulsory for the Schedule II forages. The NPT data collected over two seasons from at least three different sites is usually enough to release the varieties. The NPT/DUS process may be accelerated by leveraging regional harmonization provisions on sharing of varietal data and reports. Within EAC and COMESA it is possible to share and use NPT/DUS data from one member-state to another member state, to speed up the release period. This can

shorten the release process depending on the similarity of agro-ecological zones between the source country and the importing country. The NPT is only required for one season if NPT data are available from another member state and may be exempted if the variety is released in two member states of the regional block.

This implies that the regulatory body in the importing country ought to obtain relevant data from the corresponding regulatory body in the source country, at a stipulated fee. This avenue needs to be communicated to relevant stakeholders, as it will increase efficiency by avoiding duplication and saving time and money.

Imported forage seeds need to be inspected to confirm they do not pose disease or pest risks, and a phytosanitary certificate is then provided. On application by the importer, the recipient country issues a Plant Import Permit (PIP) that specifies the importation conditions, including freedom from regulated pests and diseases, species and quantity of seeds in question, and the duration for which the permit is valid. The country of origin inspects the seeds and issues the phyto-sanitary certificate, confirming that the conditions specified in the PIP have been met. An Orange ISTA Certificate (OIC) showing seed germination and purity results of each imported batch is also required.
Reciprocally, seeds exported from Kenya follow the same procedure whereby KEPHIS, upon receipt of a PIP containing phytosanitary requirements from the recipient country, inspects/tests - as per the requirements of the importing country - the seeds that are being exported, and issues a phytosanitary certificate.

Figure 1. Steps for seed importation into Kenya



4. Perceived gaps and recommendations for improvements

During stakeholder consultations in Kenya in 2021 and 2022 (see section 7. References), key stakeholders in the forage seed sub-sector highlighted areas in the regulatory framework that are deemed challenging for the development of a vibrant forage seed sector.

These challenges or gaps (GAP 1-11) were discussed and validated by KEPHIS in the course of 2023. They are summarized in Table 2 below together with recommendations (REC 1-11) for improvements, remarks/actions and responsible entity for implementation. The recommendations in the table include both policy issues and operational advancements (cells highlighted orange refer to policy). The policy issues are also presented in a separate Policy Brief (hyperlink).

The authors of this working paper propose the formation of a Forage Working Group (FWG) to technically guide and facilitate implementation of some of the recommendations and actions referred to in Table 2. The terms of reference, mandate and composition of this working group is yet to be confirmed.

Table 2. Gaps (GAP) and recommendations (REC) for enhancing the forage seed regulatory framework

GAP/REC	RECOMMENDATION	REMARKS/ACTIONS	RESPONSIBLE
GAP 1	**There is a lack of timely and clear communication and information on the regulatory framework for forage variety listing, release and commercialization.**		
REC 1.a	Publicize on KEPHIS' website, a manual with information and guidelines for all relevant steps, procedures and protocols for forage variety listing and release, commercialisation and importation. This should include references to relevant Acts, Regulations and Registers and a visualization of the steps to be taken through a flow-diagram. Inform stakeholders timely and fully of any (proposed) changes in the forage seed regulatory framework and update the manual accordingly.	Compile document and upload.	Forage Working Group (FWG), KEPHIS.
REC 1.b	Pegged on this manual, develop a training package for sensitization and capacity building of players that are not (fully) familiar with the existing procedures and protocols.	Compile and upload.	FWG, KEPHIS.
REC 1.c	Make clear on the KEPHIS website how relevant stakeholders can obtain access to the Plant Breeders' Rights Register (PBR) and that any interested person can inspect the PBR.	Compile and upload.	KEPHIS.
REC 1.d	Publicize and keep updated a list of countries and forage species for which PRAs have been concluded and NPTs can be carried out.	Compile document and upload.	KEPHIS.
GAP 2	**The Schedules I and II are limitative and not regularly updated. Other forage varieties could be included - e.g., vetch, canavalia beans, velvet beans, radish, turnips, fodder beet, chicory, crotalaria, brachiaria and panicum hybrids. In practice, importation may not be denied by virtue of the variety not being included in the Schedules; the general principle is for all forage species to undergo official release and listing in the NCVL. The use of the Schedules is a source of confusion and misinterpretation by stakeholders.**		
REC 2.a	The Cabinet Secretary Agriculture and Livestock Development to replace the Schedules by incorporating into the Seed and Plant Varieties (Seeds) Regulation 2016 a general article or	Policy Brief.	KEPHIS, MoALD

	provision stating that all forage crop varieties need to undergo official listing and release. In case this is not desirable, the Cabinet Secretary to facilitate frequent revision of the Seed and Plant Varieties (Seeds) Regulations to include more eligible forages in Schedules I and II (see 2.b and 2.c).		
REC 2.b	To facilitate revision, make an inventory of forages (at genus and species level) that are suitable and promising for Kenya based on pre-agreed criteria. Make use of existing credible sources incl. scientific reports and feed libraries (e.g. Tropical Forages ; https://feedipedia.org).	Compile inventory.	KEPHIS, FWG.
REC 2.c	In the Schedules I and II, consistently and uniformly differentiate species listed at genus level. See example of Desmodium in Schedule I and II that leads to confusion. As much as practicable, listing should be at species level.	Include during Regulation review.	MoALD, KEPHIS, FWG.
REC 2.d	Clearly and consistently enshrine in the Seed Policy, Act, Regulations and NCVL, internationally used definitions for genus, species and varieties as well as for feed, forages, pasture, fodder and roughages.	Policy brief, include during Regulation review.	MoALD, KEPHIS, FWG.
GAP 3	**For species coming from a country not yet appraised by KEPHIS, the PRA appraisal process can take between 4-5 years. This limits access to seed technologies that have been proven to work elsewhere, and thus should also benefit livestock production in Kenya without the need of being (fully) re-evaluated.**		
REC 3.a	Increase the capacity of KEPHIS to access data from the source-NPPO and fast-track PRA-appraisal of seeds sourced from countries with suitable forages for the tropics with no history of prior importation.	Enhance capacity of KEPHIS	MoALD, KEPHIS
REC 3.b	Maximize the use of regional trade blocks (EAC, COMESA) on sharing of PRA and other data (NPT, DUS) to facilitate fast tracking for listing and release. Seek bilateral engagements with countries of interest outside these regional blocks.	Utilize relevant data from EAC, COMESA. Diplomatic/ bilateral engagements.	KEPHIS, MoALD, FWG.
REC 3.c	Based on the recommended list of novel forages as referred to under REC 2 (b) and preceding NPT applications - focus and fast-track PRAs on prioritized forages and countries of origin or interest (possibly with support from donors).	Fast-track PRAs for promising novel forage varieties.	KEPHIS, FWG.
GAP 4	**The COMESA Variety Catalogue (CVC) does not include forage crops, which prevents seed companies to make optimal use of the provision that once a crop is registered in 2 member states, it may be exempted from NPT in the new country of listing and release.**		
REC 4.a	Include forage crops in the COMESA Variety Catalogue (CVC) that are registered in 2 or more member states.	Raise with COMESA Secretariat, with justification of utilization among member states.	KEPHIS, MoALD COMESA.
REC 4.b	Similar to what is proposed for the NCVL (see REC 5 below), create in the CVC a separate section for forage crops.	Raise with COMESA Secretariat.	KEPHIS, MoALD COMESA.

GAP 5	**Forage crops are merged with food crops in one National Crop Variety List (NCVL) referring to the scientific name (with the exception of a category defined as "pasture (brachiaria spp), see entry 42 *). This is not consistent and user-friendly. It may lead to misinterpretation by the user for species that have varieties specifically bred for either food or forage (e.g. sorghum, millet, maize, sweet potato vines and cow peas).** ****) In addition to Brachiaria Hybrids, this category includes Sugargraze and Nutrifeed which are not pasture grasses and cv Siambaza which is not a Brachiaria. On the other hand, Cayman, Cobra and Mulato II under entry 42, could also be listed under entry 51. National Urochloa List***		
REC 5.a	Create separate sections in the NCVL for food crops and forage crops at species level. Within the section for forage crops further differentiate between legumes, grasses, root crops and fodder shrubs/trees.	Review and revise.	KEPHIS, FWG, KEFRI
REC 5.b	Add in the NCVL the source of the material. This should be the applicant, who may be an individual or an institution. The person may/may not be the owner of the variety (ownership is handled under plant breeder's rights).	Include source column in NCVL.	KEPHIS, FWG.
REC 5.c	Give information for each variety in the NCVL on the specific attributes and characteristics used for performance appraisal in NPTs, consistently. For example drought/cold tolerant, tolerant to waterlogging or saline soils, to be primarily used as green manure or cover crop, or specifically to be used for erosion control or landscape rehabilitation. Give the rating pr score for each variety based on the results of NPTs or where applicable the measured outcome of the special attribute so that the user can compare varieties on specific attributes.	Include in/update NVCL.	KEPHIS, FWG.
REC 5.d	Stimulate seed companies through the Seed Trade Association of Kenya (STAK) and other stakeholders, i.e. KALRO, ILRI, KEFRI, etc. to develop a forage catalogue with factsheets and good agronomic practices for production, harvesting, conservation and feeding. Provide a link in the NCVL and/or on KEPHIS website to such a catalogue which is the responsibility of the seed companies/suppliers.	Promote through STAK.	STAK, Breeders, seed companies, Research organisations
GAP 6	**Standards for tropical grasses, including native grasses, are not always realistic as regards to purity thresholds, germination rates and seed dormancy. This does not stimulate the private sector to engage in registration/listing of a new variety.**		
REC 6.a	Develop species-specific standards for purity, uniformity and germination for different grass species/varieties – based on research and scientific data from Kenya or abroad - rather than applying one blanket standard for all. This may include standards for blending (and mixtures) of two or more grasses that meet the standards individually.	Review of standards to be part of review of Regulations.	KEPHIS, FWG.
REC 6.b	In doing so, focus on those forages or grasses recommended by the FWG (see REC 2.b) and develop workable models with experts from public and private sector.	As above.	KEPHIS, FWG.
REC 6.c	Government to support local seed multiplication and certification by (promoting) the establishment of targeted funding mechanisms and forging of PPPs between research and private sector, to develop and maintain EGS/vegetative planting material and upscale this to commercial quantities.	Policy brief.	MoALD.

REC 6.d	In addition to recent provisions such as authorized private sector inspectors and Standard Seed class, consider - in collaboration with relevant sector stakeholders and experts - a less costly and rigorous certification system for grasses, which are key in maintaining biodiversity and adequate cover in Kenya's rangelands, but are less interesting for most (international and national) seed companies to commercialize. Review protocols for quality assurance systems – especially for selected ecotypes and cultivars of native grasses – so they are conducive for private sector-led smallholder or other seed multiplication systems.	Develop separate certification system for range grasses.	KEPHIS, FWG.
REC 6.e	At the same time, KEPHIS can protect the interest of seed companies and suppliers that make effort and incur costs to comply with the legal requirements and to register their seed, by more actively enforcing banning of sales of (packed) uncertified seed by traders and merchants. This requires extra funding of KEPHIS and also includes sensitization of development partners that facilitate seed multiplication by local groups, without consideration of quality control issues, legal requirements and IP-rights.	Policy brief.	MoALD.
REC 6.f	As NPT applies to grass species/varieties for feed-use only, there is need to provide criteria to determine whether a grass species or variety is considered for feed or other use, and also to clarify which categories are exempted from NPT, e.g. lawn grasses, grasses for erosion control, water purification, etc. NB: Kikuyu grass is used for feed and non-feed purposes. It is sold as lawn grass and is not registered as a forage in the NCVL but seed is commercially available in the market.	Set criteria to determine whether a grass variety is for feed or non-feed-use.	KEPHIS, FWG.
GAP 7	**Knowledge of the regulatory body as regards to protocols for performance assessment of new entries (i.e. specific attributes) for NPTs and how to weigh these, can be improved.**		
REC 7.a	Inform the applicant duly and timely to declare the (measurable) attributes to be tested, cutting stage and the recommended agro-ecologies and make a protocol for testing/measuring of fixed parameters and additional parameters.	Compile and share.	KEPHIS, Breeder/seed companies.
REC 7.b	Enhance capacity (expertise) within KEPHIS and its Committees to assess the fixed and specific parameters (attributes) of forages in the NPTs.	Policy brief. Develop capacity building trajectory.	KEPHIS, FWG.
REC 7.c	Rely on wet-chemistry testing of forages for NPTs by an accredited laboratory. Near infra-red spectroscopy (NIR) can only be indicative and may not be reliable as most NIR-equipment available in Kenya use calibration lines for forages in temperate climates (except ILRI in Nairobi and other laboratories equipped with ILRI calibration lines).	Use only wet chemistry for NPTs. If using NIRs assure that calibration lines for tropical forages are used.	KEPHIS, FWG.
REC 7.d	Make available a list of laboratories for forage testing recommended by KEPHIS.	Compile and share on request	KEPHIS, FWG

REC 7.e	Clarify/agree when entering a crop variety for NPTs, protocols for sample collection (e.g. cutting stage, stubble height) for feed testing, the parameters to be tested, weighing of parameters.	Review existing procedures and protocols for sample and data collection. Review breeder's proposal when applying for NPT.	KEPHIS, FWG.
GAP 8	**The maintenance of Early Generation Seed (EGS) is the responsibility of the breeder. However, many breeders do not maintain EGS resulting in varieties listed in the NCVL that cannot be commercialized, or seed being produced from low quality EGS. Such seed is of poor quality which can lead to reduced purity, uniformity, germination rates, yield and forage quality.**		
REC 8.a	KEPHIS to strictly audit that marketed forage seed conforms with EGS standards and that sufficient quantity of EGS is maintained by the seed company who owns the seed. Seed companies should only market C1 and C2 certified seed generations (or the newly proposed class of Standard Seed).	Ensure that sufficient quantity of EGS is maintained.	KEPHIS, Breeders/seed companies.
REC 8.b	For vegetative material of unknown origin KALRO or other research organisations (e.g. ILRI) could characterize and register them, e.g. Super Napier grass.	Characterize and register vegetative material of unknown origin.	KALRO, MoALD, ILRI
GAP 9	**The lack of regulations for vegetatively propagated materials creates a risk for spread of diseases and pests, while for distributed vegetative planting material it is not easy to identify if the material is original and genuine. This is not supportive to a sector that wishes to grow and prosper.**		
REC 9.a	KEPHIS to follow through the process of public participation and enactment for the development of regulations for vegetatively propagated materials and implement effectively, see: The Seeds and Plant Varieties Act (Cap 326); The Seeds and Plant Varieties Act (Vegetatively Propagating Seeds) Regulations 2023.	Regulations are at and advanced stage, public participation process underway.	KEPHIS, MoALD
REC 9.b	Develop/refine, disseminate, implement and enforce standards and protocols on the propagation of vegetative materials (splits, cuttings and seedlings) and clarify the release procedures to reduce risk of disease-spreads and planting material of different genetics than claimed by the seller.	Develop or refine standards and protocols.	KEPHIS, MoALD, FWG.
GAP 10	**The need to clarify and enhance adherence to the Law by seed sector stakeholders as regards Intellectual Property (IP) rights.**		
REC 10.a	The genetic material currently brought (legally) into Kenya through NPTs is often "old" (but new to Kenya and most of Africa), meaning it was developed more than 15-20 years ago and it is therefore unlikely that the material can still claim IP rights. To encourage private sector investments, it is however important to maintain an updated inventory of already-registered forage species, with clear indications of which are public goods and those which are not. It is also important to provide clear guidance if there is IP-protection and whether royalties are required to be paid.	Update and avail IP protection information.	KEPHIS, Breeders/seed companies.

REC 10.b	In addition, there is need to have a mechanism of ensuring the entity that introduced the 'free' variety and took it through NPTs is compensated for this effort.	Develop compen-sations mechanism	NVRC/KEPHIS, FWG
REC 10.c	For materials under IP there is a need for clear communication who can import, produce and commercialize. This needs to align with international agreements in which Kenya is a signatory, i.e. UPOV - the international Union for the Protection of New Varieties of Plants.	See above.	KEPHIS, Breeders/seed companies.
REC 10.d	The reference in the NCVL to ownership should be reviewed and corrected. It has no legal basis in respect to property rights, but merely indicates who applied for NPT. Ownership should refer to the initial breeder or that entity that has been given the responsibility to maintain stock.	Proposals to be forwarded to the National Variety Release Committee (NVRC).	KEPHIS, FWG, NVRC, Breeders/seed companies.
REC 10.e	Materials eligible for intellectual property (IP) protection relate to those bred, e.g. forage hybrids. Those that fall under public good exist naturally with no breeding effort e.g. accessions, ecotypes, cultivars. Within a single species, there could be materials under IP as well as those under public good categories and regulation should help to discern this to interested parties without difficulty, by providing a catalogue that is updated as changes happen. This could be the case e.g. for hybrid grasses that can also be vegetatively propagated (although they will lose hybrid vigour over time). It is common to exempt smallholder farmers from IP-protection and royalties if they propagate vegetative planting materials for own use and this can be formalized by law.	See above.	KEPHIS, NVRC, FWG.
GAP 11	**VAT / levies on forage seed, payment for business licenses of seed companies in every County, cess on bulked seed, hay, and silage have a negative impact on growth of the forage seed market and on forage commercialisation.**		
REC 11.a	The forage seed sector is still an emerging yet critical market for (increased) livestock production, food, income and employment. Government (national and counties) should consider reducing or waving VAT and levies on forage seeds, and on sales of commercial conserved forages such as hay and silage. This will stimulate growth of the forage seed sector and forage supply chains and helps to address current challenges of access and cost of forage seeds, encountered by livestock and commercial forage producers.	Policy	MoALD

5. Acknowledgments

We recognize and appreciate the contributions from farmers, seed companies, research institutions, development partners, the Kenya Plant Health Inspectorate Service (KEPHIS), and the Ministry of Agriculture and Livestock Development, through participations in workshops and other fora. Their deliberations have contributed immensely to the compilation of this working paper.

Through several rounds of consultation and validation, KEPHIS made various corrections in earlier versions of the working paper and gave important insights in the process of forage seed certification. It also contributed to the remarks and actions in Table 2 and gave suggestions as to which relevant actors should implement. In particular we appreciate the support by KEPHIS Department of Seed Certification and Plant Variety Protection, represented by its Acting Director Mr Simon Maina.
We also appreciate the support from CGIAR through the Sustainable Animal Productivity initiative.

A final draft of the Working Paper was presented during a stakeholder workshop at KEPHIS on 23 April 2024 for a last round of consultation and relevant feedback was included.

6. About the authors

The Alliance of Bioversity International and CIAT (ABC), ILRI (International Livestock Research Centre) and KIT (Royal Tropical Institute), contributed to this working paper through the project "Improving access to quality feed and forage seeds for the dairy sector in Kenya and Uganda." The project is part of the NWO Dutch Research Council/Netherlands Government funded NL-CGIAR research programme "Seed systems development: Enabling and scaling genetic improvement and propagation materials." ILRI and ABC also collaborate in the initiative Sustainable Animal Productivity for Livelihoods, Nutrition and Gender Inclusion (SAPLING). Dr Solomon Mwendia and Dr Ben Lukuyu are the main contributors on behalf of respectively ABC and ILRI.

SNV Kenya/Netherlands Development Organisation (SNV) contributed to this paper through the project "Integrated & Climate Smart Innovations for Agro-Pastoralist Economies and Landscapes in Kenya ASALs" (ICSIAPL), funded by the European Union and the Netherlands Government.

Dr Simon Kuria and Dr David Miano contributed on behalf of the Kenya Agricultural and Livestock Research Organization (KALRO) which is a partner in ICSIAPL. KALRO is the institute responsible in Kenya for promotion, streamlining, coordination and regulation of national research in crops, livestock, genetic resources, and biotechnology, and to expedite equitable access to research, information, resources, and technology, and to promote the application of the research findings and technologies in the field of agriculture.

Contributions were also made through the project "Netherlands East Africa Dairy Partnership" (NEADAP-2), funded by the Netherlands Government, in which SNV and ProDairy EA (led by Mr Jozef Creemers) are two of the partners that gave input to this working paper. Besides, inputs were received from the Netherlands Government funded RVO-project of Wageningen University and Research (WUR), Agriterra, ProDairy EA and Barenbrug Seed for farmer-field-trails for improved forages in Kenya, gave input (RVO stands for Netherlands Enterprise Agency).

https://ciat.cgiar.org/ https://alliancebioversityciat.org/alliance-accelerated-change-preserve-and-protect-our-environment
https://www.kit.nl/ https://www.ilri.org/ https://snv.org/ https://www.kalro.org/ https://english.rvo.nl/

7. References

Boonman J.G., (1993) East Africa's Grasses and Fodders: Their Ecology and Husbandry, Kluwer Academic Publishers pp 343.

Creemers J., Maina D., Opinya F., Maosa S.; Report of a Scan of Forage Seed Suppliers in Kenya (Private Companies & Research Institutions), ICSIAPL project, SNV Kenya/KALRO, Nairobi, August 2021.

Creemers J.J.H.M, Opinya F.A; "Report on Forage Seed Commercialisation, Distribution and Adoption by Farmers", ICSIAPL /NEADAP, SNV Kenya/KALRO, Nairobi, December 2023.

Dey B., Notenbaert A., Makkar, H., Mwendia S., Sahlu Y., Peters M.; Realizing economic and environmental gains from cultivated forages and feed reserves in Ethiopia, CABI Reviews 2022-17, 010.

ILRI (2021) https://www.ilri.org/news/kenya-livestock-master-plan-process-initiated-enhance-sustainable-development-and-investment (Accessed 5th December, 2022) Kenya Law, Legal Notice Caption 215 (2016) published in December 2016 Kenya Law http://kenyalaw.org/kl/Seeds and Plant Varieties Act Cap 326 - Legal Notice.pdf (infotradekenya.go.ke)

KEPHIS/SNV ICSIAPL (2022) proceedings of the Forage Seed Registration and Commercialization Sensitization Workshop 30th August 2022, Nairobi, Kenya.

Leitner, S., Ring, D., Wanyama, G.N., Korir, D., Pelster, D.E., Goopy, J.P. Butterbach-Bahl, K. and Marbold, L. 2021. Waste Management 126:209-220.

Mwendia S., Amuhuza R., Waluse K., Misoi S., Odhiambo R., Dhamankar M. and Mourik T. van (2021), Forage Seed Systems Stakeholders' Workshop in Kenya.

NCVL, 2023, National Crops Variety List, Kenya.

Odero-Waitituh J.A. 2017. Smallholder dairy production in Kenya: A review. Livestock Research for Rural Development. 29, Article #139 accessed on 3rd July 2017 from http://www.lrrd.org/lrrd29/7/atiw29139.html

Report, Alliance of Bioversity International and CIAT, ICIPE Duduville Campus, 23-24 November 2021: https://cgspace.cgiar.org/bitstream/handle/10568/119952/Forage%20Seed%20Workshop%20Report%20Kenya%20November%202021.pdf?sequence=1&isAllowed=y#:~:text=The%20workshop%20on%20seed%20systems,forage%20production%20in%20the%20country

Annex 1. Abstract from the National Crop Variety List, 2023 - Listed dual purpose crops and forage crops

Listed in green >= 2015

4. National Sweet Potato Variety List
Species: Ipomea batatas - 32 varieties (all KARI/KALRO)
Sweet potato vines (dual purpose)
11. KAP0084, 2010, KARI
13. Mwavuli-1, 2011, KARI
25. NASPOT-1, Double Double, 2015, KALRO
30c.Shock 5, Shock 5, 2019, KALRO

9. National Maize Variety List
Species: Zea Mays. 421 varieties no specific forage varieties

16. National Sorghum Variety List
Species: Sorghum bicolor - 46 varieties.
Dual purpose (6) forage variety (1):
3. BJ28, 1978, KARI
8. Ikinyaluka, 1996 (fodder only), KARI
12. E1291, 2000, KARI
14. Sila, 2006, AgriSeedCo Ltd, SeedCo Zambia
18. Karia SH 12, 2008, KARI
19. Kibuyu, 2011, Leldet
34. KS Sweet Sorg 14, 2016, ICRISAT/Kenya Seed Company
38. EUSS10, 2016, Egerton University

24. National Cow Pea Variety List
Species: Vigna Ungulculata L. Walps - 19 varieties (KALRO and Simlaw, 1 for Western Seed)
Dual purpose varieties (9):
2. 27-1, 1989, KARI
6. Machakos66, 1998, KARI **(promoted by KALRO as forage crop)**
7. K80, 2000, KARI
10. Kunde 1, ND, Western Seed Co
13. 1002/1005/3 Kunde Faulu, 2017, KALRO
14. 1005/1002/1, Kunde Tamuu, 2017, KALRO
15. 1005/1003/3, Kunde KAT, 2017, KALRO
16. 1005/1002/1/1/1, Kunde Soho, 2017, KALRO
17. 1005/1004/3, Kunde Timaini, 2019, KALRO

25. National Dolichos Bean Variety List
Species: Dolichos pupureum - 7 varieties (4 University of Eldoret and 3 KARI)
Dolichos Lab lab (dual purpose, promoted as forage)
3. KAT/DL-3 1995, KARI

27. National Rhodes Grass Variety List
Species: Chloris guyana - 3 varieties
1. Mbarara Rhodes, 1960), KARI/KSC, maintainer seed source KSC
2. Boma Rhodes, 1975, KARI/KSC
3. Elmba Rhodes, 1976, KARI/KSC

28. National Setaria Grass Variety List
Species: Setaria sphacelata – 2 varieties
1. Nandi setaria (1956) KARI/KSC
2. Nasiwa setaria (ND) KARI/KSC (KSC maintainer)

29. National Pannicum Grass Variety List
Species: Pannicum spp – 1 variety
1. Coloured Guinea (1955) KARI/KSC
(KSC maintainer)

30. National Soya Bean Variety List
Species: Glycine max – 12 varieties (2 dual purpose)
6. DPSB 19, 2010, KARI/ITTA
7. DPSB 8, 2020 KARI/ITTA

36. National Lucerne Variety List
Species: Lucerne (*Medicago sativa*) – 5 varieties
(all KALRO of which 2 brought in by Forage Genetics)
1. WL625HQ, 2015, KALRO; 2. WL414, 2015, KALRO
3. KKS9595,2015,KALRO; 4. SA Standard,2015,KALRO
5. KKS 3864, 2015, KALRO

42. National Pasture Variety List
Species: Pasture (Brachiaria spp) – 6 varieties

Variety name/code	Release name	Year release	Owner	Maintainer/Seed Source
1 Cayman hybrid	Cayman	2016	Advantage Seeds	ACL /Tropical Seeds LLC
2 Cobra hybrid	Cobra	2016	Advantage Seeds	ACL /Tropical Seeds LLC
3 Mulato II hybrid	Mulato II	2016	Advantage Seeds	ACL /Tropical Seeds LLC
4 Forage Sorghum (Sugargraze)	Sugargraze	2019	Advanta Seeds	Advanta Seed Internat.
5 Forage Pearl Millet (Nutrifeed)	Nutrifeed	2019	Advanta Seeds	Advanta Seed Internat.
6 Mombasa (Panicum maximum)	Siambasa	2021	Advantage Seeds	ACL//Tropical Seeds LLC

49. National Oat List
Species: Oat (*Aven sativa)* – 2 varieties (of which one dual purpose)
1. 011 A06, KS Oat16B, 2018, Kenya Seed Company

50. National Triticale List
Species: Triticale (*Triticosecale)* 1 variety
1. Foddatriticale, 2021, suitable for silage and grazing

51. National Urochloa List
Species Urochloa (Urochloa sp.) – 6 varieties

Variety name/code	Release name	Year release	Owner	Maintainer & Seed Source
1. Urochloa Decumbus cv	Basilisk	2021	KALRO	KALRO
2. Urochloa Brizantha cv	Piata	2021	KALRO	KALRO
3. Urochloa Xaraes cv	Toledo	2021	KALRO	KALRO
4. Urochloa Brizantha cv	MG4	2021	KALRO	KALRO
5. Brachiaria Brizantha cv KISII	KS1	2021	KALRO	KALRO Lanet
6. Bracharia Brizantha cv BUSIA	BS1	2021	KALRO	KALRO Lanet

52. National Horsetail grass list
1. Horse grass (Chloris roxburghiana), 2021, KALRO

53. National Bushrye grass list
1. Bushrye grass (Enteropogon macrostachyus), 2021, KALRO

54. National Buffel grass list Buffel grass
1. Buffel grass (Cenchrus ciliaris, MGD-1), 2021, KALRO
2. Buffel grass (Cenchrus ciliaris, TVT-3), 2021, KALRO