THE REPUBLIC OF UGANDA

Ministry of Agriculture Animal Industry and Fisheries

Uganda National Seed Strategy

2014/15 – 2019/20

Final Draft Validated by Stakeholders

February 2015

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ACRONYMS

AEATREC	Agricultural Engineering and Appropriate Technologies Centre
ARIs	Advanced Research Institutions
ASBP	African Seed and Biotechnology Program
ASSP	Agriculture Sector Strategic Plan
ATAAS	Agricultural Technology and Agribusiness Advisory Services
AU	African Union
BoU	Bank of Uganda
CAADP	Comprehensive Africa Agriculture Development Programme (AU)
CIAT	International Centre for Tropical Agriculture
CSO	Civil Society Organisation
CBD	Convention on Biological Diversity
CGB	Community Gene Bank
DAO	District Agricultural Officer
DCIC	MAAIF Department of Crop Inspection and Certification
DSIP	MAAIF Development Strategy and Investment Plan
FDI	Foreign Direct Investment
FGs	Farmers Groups
FOs	Farmers Organisations
IARCs	International Agricultural Research Centres
IPPC	International Plant Protection Convention
IPR	Intellectual Property Rights
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
LSB	Local Seed Business
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MDA	Ministries Departments Agencies
MFPED	Ministry of Finance, Planning and Economic Development
MGLSD	Ministry of Labour, Gender and Social Development
MIA	Ministry of Internal Affairs
MJCA	Ministry of Justice and Constitutional Affairs
MODP	Ministry of Disaster Preparedness
MWT	Ministry of Works and Transport
NAADS	National Agricultural Advisory Services

NARES	National Agricultural Research and Extension Systems
NARI	National Agriculture Research Institute
NARO	National Agriculture Research Organization
NEPAD	New Partnership for Africa's Development
MDGs	Millennium Development Goals
NPA	National Planning Authority
NSB	National Seed Board
NSCS	National Seed Certification Service
NVRC	National Variety Release Committee
OPM	Office of the Prime Minister
PBA	Plant Breeders' Association
PBR	Plant Breeders' Rights
PGRC	Uganda Plant Genetic Resources Centre
PGRFA	Plant Genetic Resources for Food and Agriculture
PPB	Participatory Plant Breeding
PPP	Public/Private Partnership
PPPP	Public/Private/People Partnership
PVP	Plant Variety Protection
PVPO	Uganda Plant Variety Protection Office (under MAAIF)
PVS	Participatory Variety Selection
QMS	Quality Management System
SQCC	Seed Quality Control and Certification
SMTA	Standard Material Transfer Agreement (ITPGRFA)
SSES	Single Spine Extension Services
TRIPS	Agreement on Trade-Related Aspects of Intellectual Property Rights
UNCST	Uganda National Council of Science and Technology
UBOS	Uganda Bureau of Statistics
USSIMS	Uganda Seed Sector Information Management System
USTA	Uganda Seed Trade Association.
UNADA	Uganda Agro-inputs dealers Association
ZARDI	Zonal Agricultural Research Institute

FINAL DRAFT NATIONAL SEED STRATEGY

1. INTRODUCTION

In 2014, the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) finalized the drafting of the National Seed Policy (NSP) and this was approved by the Top Policy Management (TPM) as well as the National Seed Board. The Vision and Mission of NSP are:

> **Vision:** *A competitive, profitable and sustainable seed sector where farmers access affordable quality seed and planting materials.*
>
> **Mission**: *To create a well-regulated seed sector that ensures availability of and access to safe and high quality seed and planting materials under pluralistic seed systems.*

To operationalize the NSP, MAAIF has elaborated the NSP into this National Seed Strategy (NSS) which contains detailed activities, tasks and budgets and links them to the annual and medium term national planning and budgeting processes in order to secure funding for implementation.

Based on the approved NSP draft, MAAIF embarked on the formulation of the National Seed Strategy in January/February 2015 through a series of activities which included: a) updating baseline information; b) consultations of seed sector stakeholders; c) drafting the strategy document which contains detailed activities, tasks and budget; and d) convening a national validation workshop.

1.1. Objectives of the strategy

The overall objective of this strategy is to operationalize the NSP. Specifically, the Strategy:

- Provides a clear vision of where the Government wants the seed sector to be in the short and medium term.
- Elaborates the activities and tasks that will be implemented to achieve the NSP stated objectives and strategies for each of its six components.
- Spells out the expected outputs, outcomes and impacts of implementing the NSS.
- Assigns institutions and organizations the roles and responsibilities they will play in implementing each of the activities defined.
- Provides indicative costing for the NSS.
- Defines the implementation, monitoring, evaluation and reporting mechanisms.

2. WHERE ARE WE NOW?

2.1. Policy and Regulatory Environment

In order to realize the vision and mission of the seed sector, a conductive policy and regulatory environment is a pre-requisite. This section presents and analyses the policy and regulatory environment framework for the seed sector in Uganda which comprises international, regional and national contexts and identifies key constraints and opportunities that this strategy will address.

2.1.1 Policy environment

a) International Context: Treaties and Polices

The International Plant Protection Convention, 1951: Overseen by the Food and Agriculture Organization (FAO), aims to prevent and to control the introduction and spread of pests of plants and plant products. It sets the standards for the issue of International Phytosanitary Certificates under the authority of the National Plant Protection Organisation (NPPO) of the member state. The MAAIF Department of Crop Protection is the Uganda designated NPPO for the terms of the Convention.

International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA): Implements the Convention on Biological Diversity (CBD)-Nagoya protocol for PGRFA, addressing the conservation and sustainable use of PGRFA and the fair and equitable sharing of the benefits arising out of their use. The Treaty established the multilateral System of Access and Benefit-sharing to facilitate plant germplasm exchanges and benefit sharing through Standard Material Transfer Agreement (SMTA).

The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international agreement which aims to ensure the safe handling, transport and use of living modified organisms (LMOs) resulting from modern biotechnology that may have adverse effects on biological diversity, taking also into account risks to human health.

Agreement on Trade-Related Aspects of Intellectual Property Rights, 1994 (TRIPS): Administered by the World Trade Organization (WTO), sets out minimum standards for intellectual property rights (IPR) regulations as applied to nationals of other WTO members, including IPR on new plant varieties.

b) African Context for Seed Sector Development

Comprehensive Africa Agriculture Development Programme (CAADP), 2003: Endorsed by the Africa Union (AU) Heads of States and Governments in 2003 CAADP is Africa's policy framework for agricultural transformation, wealth creation, food security and nutrition and economic growth. It is an integral part of the New Partnership for Africa's Development (NEPAD)

African Seed and Biotechnology Programme (ASBP), 2007: Endorsed by the AU Heads of States and Governments in 2007 has the overall goal to contribute to increased food security and nutrition and to poverty alleviation in Africa through the establishment of effective and efficient seed systems and enhanced application of biotechnologies and methodologies within the seed sector.

African Union Commission Communiqué on Integrated Seed Sector Development, 2011 (ISSD): Endorsed by the AU Commission as part of efforts towards the implementation of the African Seed and Biotechnology Program (ASBP)

c) National Context

Vision 2040: Envisages *a transformed Ugandan society from a peasant to a modern and prosperous country within 30 years*. The goal is to change the country from a predominantly low income to a competitive upper middle income country within 30 years. It recognizes agriculture as one of the key drivers for enhancing national development by transforming agricultural from smallholder subsistence production to commercial production.

The National Development Plan (NDP): The draft NDP (2015/16 – 2019/20 prioritizes agriculture as a vehicle for wealth creation. The main thrust during the period will be increasing agricultural production and productivity; addressing challenges in selected technical areas including seeds, mechanization, water for production and fertilizer production and application, as well as, strengthening MAAIF and its institutions and creating an enabling environment.

National Agricultural Policy (NAP) 2013: NAP was developed to guide all actors in the agricultural sector to make investments that will increase agricultural incomes, reduce poverty and improve household food and nutrition security, create employment and stimulate overall economic growth. Among the strategic thrusts for achieving these outcomes is strengthening capacity in technical areas of agriculture such as seeds, agrochemicals (including fertilizer), water for production and mechanization.

Agriculture Development Strategy and Investment Plan (DSIP): Is the key instrument for operationalizing NDP and NAP. It focuses on enhancing the performance of the agricultural sector and its contribution to the national economy in terms of poverty reduction, food and nutrition security as well as employment. The strategy also looks at the challenges to agricultural performance as well as the need to strengthen public and private institutions concerned with development of the agricultural sector. It then lays down the investment plans and development strategies. The DSIP is further elaborated into Framework Implementation Plans (FIPS) including one for seeds and planting materials. The DSIP is being reviewed and reformulated into an Agricultural Sector Strategic Plan (ASSP). NSS will be the FIP for seeds and planting materials during the period 2015/16 – 2019/20.

The Draft National Seed Policy (NSP) 2014: NSP was formulated to address concerns of the seed industry under the vision *"competitive, profitable and sustainable market-led, regulated and coordinated seed industry."* The objective of the policy is to ensure the availability of adequate, high quality and safe seed on the market in order to increase agricultural production and productivity for improved standards of living and food security. NSP supports the regulation of Quality Declared Seed Class (QDS).

2.1.2 Regulatory Environment

The Seeds and Plant Act, 2006: This law was enacted to provide for the promotion, regulation and control of variety release and multiplication, conditioning, marketing, importing and quality assurance of seeds and planting materials. It establishes the National Seed Board (NSB) and National Seed Certification Service (NSCS), under MAAIF, as the consultative and executive bodies for implementation of the Act respectively.

The draft Seeds and Plant Regulations, 2010: Directs Seed Quality Control and Certification (SQCC) under the Seeds and Plant Act.

The Plant Variety Protection Act, 2014: Provides for promotion and development of new plant varieties and their protection as a means of enhancing breeders innovations and rewards through granting of plant breeders rights and other related matters.

Plant Protection and Health Act, 2014: Consolidates and reforms the law relating to protection of plants against destructive diseases, pests and weeds, to prevent the introduction and spread of harmful organisms that may adversely affect Uganda's agriculture and regulate export and import of plants and plant products so as to protect and enhance international reputation of Uganda's agricultural products.

National ABS Regulations, 2005: The National Environment (Access to Genetic Resources and Benefit Sharing) Regulations, 2005, provides for Genetic Resources transfers under the authority of Uganda National Council of Science and Technology (UNCST).

The Biotechnology and Bio-safety Bill, 2012: The objective of the Bill is to provide a regulatory framework that facilitates the safe development and application of biotechnology.

Policy and Regulatory Environment Constraints and opportunities

Table 2.1 Constraints and Opportunities

Policy and Regulatory Instrument	Constraints	Opportunities
Seeds and Plant Act	- Not fully implemented - Lack of financial and human resources to enforce and implement the Act	- The Act provides for a regulatory instrument for the seed sector - There is new momentum arising from the inauguration of NSB - NSCS can be strengthened under the NSS - The Act provides for "delegation", allowing Public/Private Partnership (PPP) in SQCC - Partnership with Development Partners (DPs) in funding and Technical Assistance
Seeds and Plant Regulations	- Provides only for Certified seed 1st and 2nd generations for the seed market - Lack of financial and human resources to enforce the regulations - Do not provide for registration of traditional varieties	- The Seed and Plant Act provides for adoption of new seed classes as required and its regulations - NSB has the mandate to establish Technical Committees to implement NSS in terms of the requirements of the new regulations
PVP Act	- Does not provide for IPR on traditional varieties.	- A new Act should provide for IPR on traditional varieties as a tool for Benefit Sharing

2.2. Institutional Context

There are several organizations involved in the seed sector. These include central and local government institutions, farmers' umbrella bodies, district level farmers' associations and different types of farmers groups including NAADS-created groups, farmers field schools, village savings and credit associations (VSLAs), primary cooperatives, cooperative unions, savings and credit cooperatives (SACCOs), community based organisations (CBOs) engaging in different activities (including seed production) and community-driven development (CDD) groups. These organizations provide opportunities for growth and development of the seed sector. The roles and responsibilities of institutions currently involved in the seed sector are summarized in Table 2.2.1

Table 2.2 Institutions and their responsibilities

Institution	Mandate, roles and responsibilities
MAAIF	- The mandate of MAAIF is to support, promote and guide production of crops, livestock and fisheries, so as to improve quality and increased quantity of agricultural produce and products for domestic consumption, food security and export - Responsible for promoting an enabling environment for the seed sector - Coordinates its affiliated institutions including NARO, NAADS, Department of Crop production, Department of Crop Inspection and Certification, and semi-autonomous units dealing with specific crops. - Undertakes policy formulation and implementation, - Coordinates research and extension, - Advises government on the drafting of relevant laws and regulations, and enforces regulations. - Interacts with other branches of government to support agricultural education, credit, and other services to support agriculture in general and the seed industry in particular
National Agricultural Research Organization **(NARO)** Agency under MAAIF	- NARO operates through a decentralised network of seven National Agricultural Research Institutes (NARIs) and nine Zonal Agricultural Research and Development Institutes (ZARDIs). - Develops modern varieties for commercial production. - Maintains developed varieties and produces breeder seed. - NARO provides pre-basic and basic seed and works with the private sector and farmer groups in joint variety development, dissemination and technology commercialization. - Collaborates with international research institutions associated with the Consultative Group for International Agricultural Research (CGIAR)
National Plant Genetic Resources Centre **(PGRC)** under NARO	- Responsible for ensuring genetic diversity and conservation in Uganda - Oversees the Botanic Gardens activities - Undertakes agricultural research on PGR related issues - Disseminates agricultural technologies - Sensitises the population on plant diversity conservation - Promotes utilisation of indigenous PGR - Advices on PGR policy, strategy and legislation development
Single Spine Extension Services **(SSES)** Under MAAIF	- Responsible for facilitating farmers' access to knowledge, skills and information to enhance agricultural productivity throughout the country. - Support development along value chains through selected PPPs by promoting out-grower schemes and expanding access to production and marketing. - Encourages agricultural competitions among farmers in the countryside to reward best performers in production. - Enhances adoption of improved seeds and planting materials by farmers
NSCS Under MAAIF Department of Crop Inspection and Certification	- Responsible for design, establishment and enforcement of certification standards, methods and procedures - Responsible for variety testing and registration in the National List of varieties. - Carries out field inspection, testing, labelling, sealing and certification and seed factory inspection. - Responsible for accreditation and licensing, field inspection, seed sampling and laboratory seed testing;

Institution	Mandate, roles and responsibilities
NSB under MAAIF	- Advises the Minister on the National Seed Policy. - Coordinates and monitors the public and private seed sector in order to achieve the national seed industry objectives; - Responsible for establishing a system of implementing seed policies through technical committees; - Responsible for formulation and advising the Minister on seed regulations and standards.
National Variety Release Committee under NSB **NVRC**	- Reviews and maintains the National Variety List. - Approves the release of new varieties and entry into the seed multiplication programme.
Department of Crop Inspection and Certification (DCP) Under MAAIF	- Manages the Phytosanitary and Quarantine Service, and implements the Plant Variety Protection Act. - Is the lead agency within MAAIF to advise on regulatory decisions governing genetically modified organisms (GMOs) through UNCST. - Issues phytosanitary certificates for export of seeds and controls seed imports into Uganda
Uganda Coffee Development Authority **(UCDA)**	- Responsible for promoting the coffee industry. UCDA obtains plantlets of improved varieties from NARO (NaCORI) and private tissue culture laboratories for multiplication by private nursery operators and eventual distribution to farmers.
Uganda Cotton Development Organization (**CDO)**	- Has the mandate to support the cotton subsector, obtains pre-basic seed from NARO, arranges for seed production and processing, and distributes seeds to farmers
Local Government Production Department	- Responsible for about 70% of extension services to farmers - Provide technical support on seed multiplication to farmers groups
Uganda National Council of Science and Technology **(UNCST)**	- Designated Authority for matters relating to access to genetic resources: receives and facilitates the processing of all applications for access to genetic resources submitted to it; - Coordinates all activities of lead agencies relating to access to genetic resources and establishes and maintains a depository for all Material Transfer Agreements and Accessory Agreements. - Responsible for the registration of private research providers. - Under the Seeds and Plants Act, it is in charge of recommending procedures and protocols to deal with varieties developed through the use of biotechnology.
Seed Companies	- Account for all production, import, and sale of seeds for field crops and vegetables in the formal sector, with some exceptions. - Other formal organizations not registered as seed companies provide seeds and other planting materials through closed chain systems for tobacco, cotton, coffee, tea, and some other crops
Other seed-related	**Uganda Flowers Exporters Association** (**UFEA**) involved in production of flowers and export trade.

Institution	Mandate, roles and responsibilities
organizations	**Civil Society Organizations (CSO),** including NGOs and Cultural Institutions support Farmers Seed Systems in production and multiplication process of quality seed
	Uganda Seed Trade Association (USTA) mission is to expand business opportunities for member companies through awareness campaigns; production support; quality assurance; capacity building; advocating for policies that promote the development of new plant varieties and movement of seed; and collaborating with different stakeholders in the seed sector locally, regionally and internationally.
	Uganda National Farmers Federation (UNFFE) with its affiliate district associations promotes agricultural developments for its members.
	Uganda National Agro-inputs Dealers' Association (UNADA) has 1,300 members drawn from retail traders specializing in seeds and other agro-inputs distribution and marketing.
	Uganda Plant Breeders Association (**PBA)** promotes breeders' interests through information sharing, policy advocacy (e.g., urging establishment of plant breeders' rights), and other activities).
	Development Partners (DPs) assist government through funding, training and technical assistance. DPs currently involved in the seed sector include JICA, USAID, Melinda and Bill Gates Foundation through AGRA, and the Embassy of the Kingdom of Netherlands (EKN).
	International Organizations: UNDP, FAO, WFP and others complement government efforts in training, crop production and marketing systems and at times buy seed from seed companies for distribution to vulnerable communities.
	Financial institutions: extend credit to seed companies and agro-inputs dealers as well as insurance products (Insurance Companies)
	Savings and Credit Cooperative Organizations (SACCO) extend credit to their member to help them buy seeds and other inputs
	Farmers groups grow seeds for themselves or under contract for seed companies

Institutional Context Constraints and opportunities

Table 2.2.2 Institutional Context Constraints and Opportunities

Institution	Constraints	Opportunities
MAAIF	- Has not taken the necessary steps towards financial autonomy of NSCS, as stated in DSIP	- The industry is willing to pay for proper and technically sound SQCC. - Under current GoU policies, NSCS can be authorized to retain revenue from its services (authorisation, accreditation, audits, field inspection,

		seed testing and labelling).
National Seed Board	- Constituted but no fully active for the totality of its mandate.	- NSB combines the necessary functions for a proper implementation of the NSS through its mandate to set multi stakeholders Technical Committees as provided in the Seeds and Plant Act
NARO and UNCST	- Inadequate coordination on issues of acquisition of PGRFA germplasm, ex-situ conservation, biosafety border's controls etc.	- A National PGRFA Policy, Strategy and Act will be developed.
National Seed Certification Service	- Insufficient resources (human, financial, equipment, etc.) to effectively perform its mandate. - Under developed and incomplete instruments to operational NSCS functions including regulations, procedures and protocols, manuals and internal QMS.	- Depositary of the knowledge in SQCC. - Technically prepared to direct PPP SQCC, if adequate means are provided under this NSS. - Has the potential to become a self-sustaining autonomous agency. - DSIP commits MAAIF to provide NSCS with a semi-autonomous or autonomous status, this is supported by all stakeholders in the industry

2.3. Seed Systems

There are two co-existing seed systems through which seed and planting materials are availed to farmers in Uganda. These are the formal and informal systems.

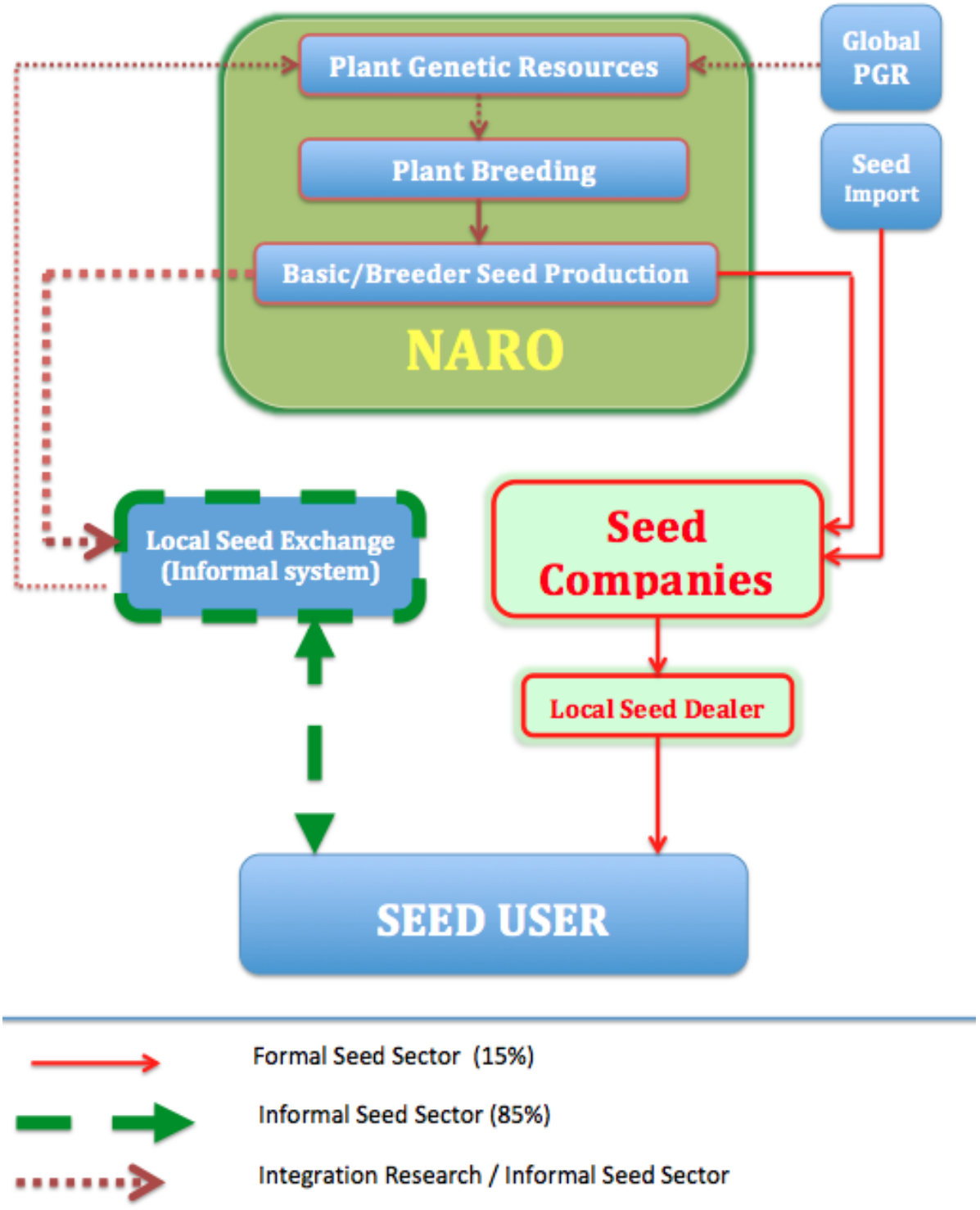

FIGURE 2.3: SEED FLOWS IN UGANDA SEED SYSTEMS 2014

2.3.1 Formal system

The formal seed system comprises registered seed merchants producing and marketing seed of improved varieties registered in the National List. The currently regulated certified seed classes, with high SQCC standards are not competitive for non-commercial crops. As a result, the formal seed system currently focuses mainly on hybrids and open pollinated crops like maize, sunflower and sorghum and to lesser extent self-pollinated crops like rice, beans and soybean (Table 2.4). The share of the formal seed is estimated at about 15% of cultivated area.

The national regulator, the NSCS, regulates the formal seed sector from variety listing through to final seed certification. Lack of financial, human and managerial capacity of NSCS results in limited seed quality control and certification. For instance, only 35% of the formal sector seed is certified. This is produced by 23 registered seed companies with total estimated production of 18,000 MT of seed. Agro-input dealers carry out seed distribution and marketing. The formal system also covers international seed trade, including imported seed such as vegetable seed for the domestic seed market, and seed exports to regional markets.

Outside of the Seeds and Plant Act SQCC regulations, semi-autonomous government bodies facilitate the production and sale of seed to smallholder farmers for selected cash crops. These include the Uganda Coffee Development Authority (UCDA) and Cotton Development Organization (CDO). The private sector is also involved in these sectors. UCDA receives plantlets from NARO's mother gardens and from both private and government tissue culture laboratories and supplies the plantlets to private nursery operations for multiplication and eventual distribution to farmers. Both NARO and UCDA have their own internal quality controls independent of NSCS. CDO gets pre-basic cotton seed from NARO, bulks it with selected farmers and seed companies, and arranges for seed to be de-linted and dressed. CDO delivers seed to farmers with quality control done internally.

For other cash and export crops produced on large-scale such as oil palm, sugarcane, and tobacco, companies in the sector manage seed propagation and sale along with other aspects of the value chain. This vertical integration has well-established voluntary regulatory mechanisms. Uganda's tea sub-sector has both smallholders (for which government is involved in research and seed supply) and large producers who manage their own seed supply.

Currently the formal system only deals with varieties produced by NARO. Access to foreign varieties adapted to Uganda agro-ecological conditions will be supported by this NSS through: a) granting of plant breeder's rights to nationals of other WTO states; b) ISTA accreditation of national seed laboratory; d) strengthening of NPPO; e) harmonisation of variety registration with EAC and COMESA states with

operationalization of Common Catalogues; and d) harmonisation with COMESA and EAC of seed standards and SQCC regulations.

2.3.2 Informal system

The informal system makes up 85% of the seed planted. It consists of farm-saved seed of previous season's crops and community based seed multiplication and dissemination. These are mostly self-pollinated crops such as rice, millet, legumes (cowpeas, groundnuts and green grams) for which it is easy to maintain genetic purity through successive generations and vegetative propagated crops (Irish potato, sweet potatoes, cassava, bananas and various tropical fruit trees). Access to these seeds and planting materials is through community seed exchange, sales and to a certain extent through local grain markets. Women play a pivotal role is this system, including variety selection, multiplication, seed condition and seed marketing, and contribute significantly to food security. This system is unregulated.

Public support to the Informal sector

To circumvent the weaknesses in the regulatory and institutional environment of the formal sector, MAAIF, through NARO Institutes provides improved varieties for food and nutrition security crops through NGOs and Cultural Institutions to farmers' groups for further multiplication in the informal system, where the private sector is not involved.

The informal seed system is being progressively improved through creation of seed schemes for villages and farmer groups with support from CSOs, NARO and the extension service. Farmers groups' production of seed of particular standards is largely based on local quality control and trust. These improvements also include local community activities for maintaining traditional varieties.

Various Projects through NARO, NAADS, NGOs, and other organizations also provide clean planting materials to farmers for production of seed for own use and informal exchange. ZARDI's are supporting farmers' groups, through participatory variety selection (PVS) and establishment of local seed businesses (LSBs)

Skilled and enterprising farmers involved in informal seed systems could "graduate" into the formal seed system by expanding their production, establishing a brand name, and marketing their seed if specific seed standards reflecting farmers' needs were provided by MAAIF. MAAIF is engaged is piloting with Quality Declared Seed class (QDS) and labelling as a way of transition from informal to formal seed systems.

The Agricultural Technology and Agribusiness Advisory Services (ATAAS) and other projects in collaboration with NAADS and private agencies have also promoted graduation of informal seed sector players into the formal sector.

Table 2.3 Seed Systems Constraints and Opportunities

System	Constraints	Opportunities
Formal Systems	- Official Seed SQCC not functional - Private sector lack skills in SQCC	- Seeds and Plant Act provides for PPP in SQCC - PPP in SQCC provides for training of Seed Companies staff
Informal Systems	- No SQCC. - Lack of knowledge and resources - Current seed classes not competitive for the main crops dealt with by the informal system. - NARO seed distribution to the informal system not optimally used	- Seeds and Plant Act provides for regulation of seed classes as needed - New QDS seed class to formalise current informal seed production and optimize NARO seed distribution to the informal sector. - Farmers motivated in learning and in establishing seed business

2.4. Seed production 2014

NARO is currently the sole source of Basic seed of new varieties. However, NARO does not have capacity to produce and supply adequate quantities of Basic seed due to inadequate funding and institutional policies that do not permit it to produce seed on a cost-recovery basis to satisfy the demand for basic seed. The private seed companies and all other seed producers are therefore vulnerable to challenges that NARO faces such as inadequate government funding, lack of a seed production infrastructure (post-harvest and conditioning facilities) and lack of business approach. Coffee planting materials are excluded from this NSS because they are adequately dealt with under the National Coffee Strategy.

Table 2.4.1 Seed production 2014

Crop	Estimated annual seed use	Formal system		Informal System	
	MT **(1,000 units)**	MT **(1,000 units)**	%	MT **(1,000 units)**	%
Banana	**50,978**	**0**	0	**50,978**	100
Maize OP	17,655	6,000	34	11,655	66
Maize Hybrid	8,000	8,000	100	0	0
Beans	90,368	4,000	4	86,368	96
Sweet potatoes	140,639	0	0	140,639	100
Cassava	**2,115,148**	**0**	0	**2,115,148**	100
Groundnuts	36,234	500	1	35,734	99
Sorghum OP	7,128	900	13	6,228	87
Sorghum Hybrid	0	0		0	
Sesame	2,856	50	2	2,806	98
Sunflower OP	1,053	100	9	953	91
Sunflower Hybrid	40	40	100	0	0
Millet	1,595	200	13	1,395	87
Soybeans	9,348	300	3	9,048	97
Sweet bananas	**4,163**	**0**	0	**4,163**	100
Irish potatoes	213,120	0	0	213,120	100
Pigeon peas	1,487	0	0	1,487	100
Cotton	726	0	0	726	100
Rice	8,064	2,000	25	6,064	75
Cow peas	854	5	1	849	99

Data for 17 main crops excluding Coffee. Bananas replanting each 25 year (65,000 out of 1,600,000 Ha).

SOURCES:

Estimated seed use derived from FAOSTAT, total area harvested per crop and year (2009-2011) times seed rate;

Formal system: seed produced by Ugandan registered seed companies and derived from data from USTA and NSCS: Seed Crops Planting returns 2014

Informal system is derived from deducting the formal system from the total seed use

Table 2.4.2 Basic seed production 2014

Crop	FORMAL SYSTEM						INFORMAL
	Seed Companies Basic Seed needs	Basic Seed produced by Seed Companies		Basic seed from NARO to Seed Companies		NARO **Pre-basic** Seed Production	NARO seed delivery
	MT (or 1000 units)	MT (or 1000 units)	%	MT (or 1000 units)	%	**kg** (or units)	MT (or 1000 units)
Banana	**0**	**0**	**0**	**0**	**0**	**0**	n.a.
Maize IL	1	0	0	1	n.a.	6,000	n.a.
Maize O.P.	75	50	67	25	n.a.	938	n.a.
Maize Hybrid	200	80	40	120	n.a.	0	n.a.
Beans	133	133	100	**0**	n.a.	4,444	n.a.
Sweet potatoes	0	0	0	0	n.a.	0	n.a.
Cassava	**0**	**0**	**0**	**0**	n.a.	**0**	n.a.
Groundnuts	63	14	22	49	n.a.	7,813	n.a.
Sorghum I.L.	0	0		0	n.a.	0	n.a.
Sorghum OP	9	5	56	4	n.a.	90.0	n.a.
Sesame	1	1	100	0	n.a.	8	n.a.
Sunflower I.L	1	0	0	1	n.a.	2	n.a.
Sunflower OP	1	1	100	0	n.a.	0.0	n.a.
Millet	4	2	38	3	n.a.	80	n.a.
Soybeans	2	2	100	0	n.a.	10	n.a.
Sweet bananas	**0**	**0**	**0**	**0**	n.a.	**0**	n.a.
Irish potatoes	0	0	0	0	n.a.	0	n.a.
Pigeon peas	0	0	0	0	n.a.	0	n.a.
Cotton I.L	0	0	0	0	n.a.		n.a.
Cotton OP	0	0	0	0	n.a.	0	n.a.
Rice	90	0	0	90	n.a.	4,050	n.a.
Cow peas	0	0	0	0	n.a.	1	n.a.
Total botanical seed (kg)				292,310		23,435	n.a.
Total plantlets (units)				0		0	n.a.
Total tubers(kg)				0		0	n.a.

Data:
Formal seed production from table 2.4.1.
Seed companies Basic seed production from USTA, for Certified CI seed production, corrected when in excess, For clonal varieties, Basic means true to-type virus/disease free material

Table 2.4.3 Seed production Constraints and Opportunities

System	Constraints	Opportunities
Formal System	- Only producing seed for high value commercial crops - Lack of Basic seed	- Production of CII class will reduce by 95 % the needs for Basic seed.(for a multiplication rate of 40) -Allowing marketing of Pre-Basic seeds will reduce Breeder seed demand in another 95 %, to a total of 0.001 % of the required breeder seed in 2014 - Introduction of QDS will provide opportunity to produce and market seeds of other commercial crops.
Informal system	- Highly dependent on NARO to improve seed quality - Low investment in food security crops	- Could integrate with formal system in commercial activities if adequate and competitive standards of SQCC were provided thereby reducing by 75 % the needs in Basic seed

Opportunities through new Seed Classes

In the current formal production system, NARO Basic seed is multiplied into CI class (certified seed first generation), between Basic seed and the seed used by farmers there is only one multiplication. The current draft regulations allow for another multiplication to produce CII class, (certified seed second generation) reducing the Basic seed needs by 95% (for a multiplication rate of 40 – see table below). If the futures regulations include the Classes pre-Basic and QDS, the need for NARO seed will reduce drastically, but this will require an operative NSCS to make sure that proper SQCC is implemented at every multiplication stage.

Table 2.4.4 Seed Classes Opportunities

	Scenario Basic – C (2014)	Scenario Basic, CI, CII, QDS	Scenario Pre-Basic, Basic, CI, CII, QDS
NARO	1 kg Basic seed	1 kg Basic Seed	1 kg Pre- Basic Seed
Seed Company	40 Kg Certified seed	1,600 kg CII	64,000 Kg CII
LSB	0	64,000 Kg QDS	2,560,000 Kg QDS
SEED USER	40 Kg quality controlled seed	64 MT quality controlled seed	2,560 MT quality controlled seed

2.5. Seed Uptake/Use

The level of uptake of certified seed is very low, only 5 % (corresponding to 80% of formal hybrid maize seed). The low uptake of certified seed is partly due to inadequate capacity in SQCC of the formal sector under the current regulations and regulator and partly due to low consumer confidence in certified seed.

Table 2.5.1: Seed uptake 2014

Annual Seed uptake	Total needs	Formal sector	Informal sector
Total area (ha)	5,144,917	737,861 (15%)	4,407,056 (85%)
Total area (ha) plantlets excluded	4,648,367	737,861 (16%)	3,910,506 (84%)

Data for 17 main crops excluding Coffee. Bananas replanting each 25 year (65,000 out of 1,600,000 Ha)
SOURCES: **FAOSTAT**, Total area Harvested per crop and year (2009-2011)
USTA: Formal sector seed production
NSCS: Seed Crops Planting returns 2014

35% of formal sector seed is currently certified: 5 % of total Area

Table 2.5.2: Seed uptake Constraints and opportunities.

System	Constraints	Opportunities
Certified Seed	- Availability of Certified seed is very limited due to scarcity of resources at the disposal of NSCS	- All formal seed could be certified if PPP SQCC is set up under this NSS and - New seed classes can be provided for crops where certified seed class is not competitive (CII and QDS)
Formal not Certified Seed	- Illegal under current Ugandan Law. Important source of fake seed.	- It will disappear with implementation of Seeds and Plants act by NSCS

2.6. Seed Distribution and Marketing

It is estimated and broadly accepted that counterfeit/fake seed accounts for 30-40 % of the seed offered for sale in Uganda. NSCS, which is mandated to enforce regulations against

counterfeiting/faking seed, lacks the necessary means to do so. Moreover the fines for seed counterfeiting are too low and cannot serve as a deterrent to the offenders.

Farmers' seed demand is not delivered in time, mainly due to the high cost of distribution to widely disperse small farmers and a weak network of seed dealers".

Seed price is often not competitive as the returns for seed use (outputs) are low and this is compounded by the inadequate availability and high cost of other complementary inputs such as fertilisers and pesticides.

Table 2.6: Seed distribution and marketing constraints and opportunities table

Issue	Constraints	Opportunities
Counterfeit/Fake seed	- High prevalence in the market.	- Tougher laws and regulations to make sale of counterfeit /fake seed a highly risky business. - Involve MAAIF police to mobilise, coordinate and build the capacity of local police forces to fight the vice.
Distribution networks	- Insufficient distribution networks	- Seed companies willingness to improve marketing channels, - Farmers groups willing to enter seed businesses.
Other required agricultural inputs	- Not economically/ physically available	- Current projects targeting integrated value chains will link seed uptake with availability of other inputs and market demand for crops commodities.

2.7. Seed Quality and Regulations

The current regulations on SQCC require official inspection of almost all the operations of seed production. Contracted seed growers are required, without intervention of the seed merchant (Seed Company or cooperative) to request registration under the NSCS to plant a seed crop. Official controls include testing of the harvested product, permission to transport the seed to the seed company, official order to process the seed and supervision of seed processing and conditioning. This increases transaction costs to seed companies who have to pay for these services. International standards for SQCC of the Basic and Certified seed classes only require official field inspection and seed sampling and testing. The current regulation makes the full process expensive and interferes significantly with the seed production processes and management of the seed companies. It therefore needs harmonisation with international standards such as OECD Schemes for Seed Certification.

2.8. Seed Knowledge and Science

Scientists in Uganda have received or are pursuing higher degrees, especially in plant breeding, biotechnology and crop protection. Until very recently, other disciplines such as seed sciences have not been receiving equivalent attention. For example, Makerere University has established a regional program for Masters of Science in Plant breeding and Seed systems. AGRA and RUFORUM, a consortium of 33 institutions of higher education provided the initial support. The goal of the program is to produce functional plant breeders who are able to design and efficiently conduct variety development activities with a minimum of supervision; have sufficient theoretical training to continue self-learning and; qualified to undertake a PhD programme at a world class institution.

Additionally a consortium of International Agricultural Research Centres (IARCs), Advanced Research Institutions (ARIs) and National Agricultural Research and Extension Systems (NARES) offer focused short-term courses in seed production and deliver extended online mentoring and advice.

Currently, information documentation, sharing and usage among seed sector stakeholders are limited. This needs to be addressed not only through physical improvements such as the building of advanced online data and information services, but more importantly by strengthening the information capacities of stakeholders at the production end of the value chains. This requires an operational knowledge-sharing platform.

In order to develop an efficient competitive seed industry in Uganda human resource capacity in seed science and an efficient knowledge sharing platform is indispensable. A knowledge-sharing platform facilitates the connections between multi-stakeholders innovations and makes it possible for staff to act as the managers of knowledge at their disposal. It is frequently observed that in the absence of a proper knowledge sharing mechanism, large quantities of fragmented data and information which has the potential to support the mission lie untapped. Hence, it is important to mobilize this information in formal, but easily accessible ways. This knowledge-sharing platform will enhance awareness of stakeholders including researchers and end users (consumers and farmers) thus enhancing seed sector impacts in agricultural productivity.

Table 2.8.1: Seed Science and knowledge constraints and opportunities

Issue	Constraints	Opportunities
Seed knowledge sharing	- Weak or absence of knowledge sharing among stakeholders.	- NSB can host a web based knowledge sharing platform for all stakeholders,
Training of Seed Scientists	- Seed science not emphasised in crop science courses.	- DP offer grants for post- graduate training in plant breeding and seed systems including seed sciences. - A consortium of international agricultural research centres offering short-term courses in seed science skills to existing staff at national research centres and seed companies. - Accessibility to information platforms. - Universities could offer graduate studies in Seed Science and technology
Seed Companies	- Lack of seed technologists among their staff. - Lack of connectivity to appropriate information platforms.	- Expression of urgent need for seed technologist in seed would attract support. - Linkages to an efficient information and knowledge sharing platform. - Use of emerging user-friendly ICT technology such as web to mobile smart phone information exchange.
Farmer's communities	- Lack of basic knowledge about seed issues.	- Linking farmer groups (including women and youth) to information and knowledge sharing platform. - User-friendly information pathways, short-term training in priority skills.

WHERE DO WE WANT TO BE?

2.9. Strategic vision, goals and objectives

The vision of the National Seed Policy is:

A competitive, profitable and sustainable seed sector where farmers access affordable quality seed and planting materials

And the mission is:

To create a well-regulated seed sector that ensures availability of and access to safe and high quality seed and planting materials under pluralistic seed systems

NSP strategic vision and goals are summarised in table 3.1.1.below.

Table 3.1.1: Seed Sector NSP Strategy Vision and Goals

Vision	***A competitive, profitable and sustainable seed sector where farmers access affordable quality seed and planting materials***
Strategic Goals	To guide the development of the seed sector in order to: i) avail safe and high quality seed and planting material to farmers; ii) provide a clear framework for regulation of the seed sector players; and iii) define clear roles and responsibilities for all actors under different seed systems. It also aims to harmonize all seed-related activities in one policy.

The NSS is organized under six components, 11 objectives and 66 strategies. Table 3.1.2 below presents the Components and objectives of the NSP.

This section summarises the main targets over the next 5 years which coincides with the strategic planning cycle for NDP and DSIP/ASSP.

Section 5 further below "How do we get there", presents the complete set of activities and sub activities to be implemented with expected outputs and responsible implementing bodies.

Table 3.1.2: Seed Sector NSP Strategic Components and Objectives

NSP Components					
1. Research and Development	2. Conservation of Plant Genetic Resources	3. Seed Production and Conditioning	4. Seed distribution and Marketing	5. Seed Quality Control	6. Seed Science and Knowledge
NSP Objectives					
1.1 To generate new commercial and food security varieties.	2.1 To sustainably utilise and protect Uganda's national plant genetic resources from destruction by natural and human activities and unauthorised access. 2.2 To promote the conservation of local varieties, indigenous knowledge, and practices through community genetic resource management.	3.1 To multiply and market high quality seed under the formal seed system. 3.2 To increase the availability of and access to quality seed of preferred varieties to complement those produced under the formal seed system. 3.3 To enhance the production of quality seed within the informal system.	4.1 To increase the uptake of certified and QDS seed by farmers 4.2 To enhance Uganda's competitiveness in regional and international seed trade	5.1 To ensure quality control along the formal seed value chain. 5.2 To ensure quality control along the value chain for Quality Declared Seed.	6.1 Develop human resource for the seed sector development. 6.2 To enhance participation by men, women and youth in seed marketing for Quality Declared Seed.

2.10. Targets 2020

3.2.1 Transformed and Integrated Seed System by 2020

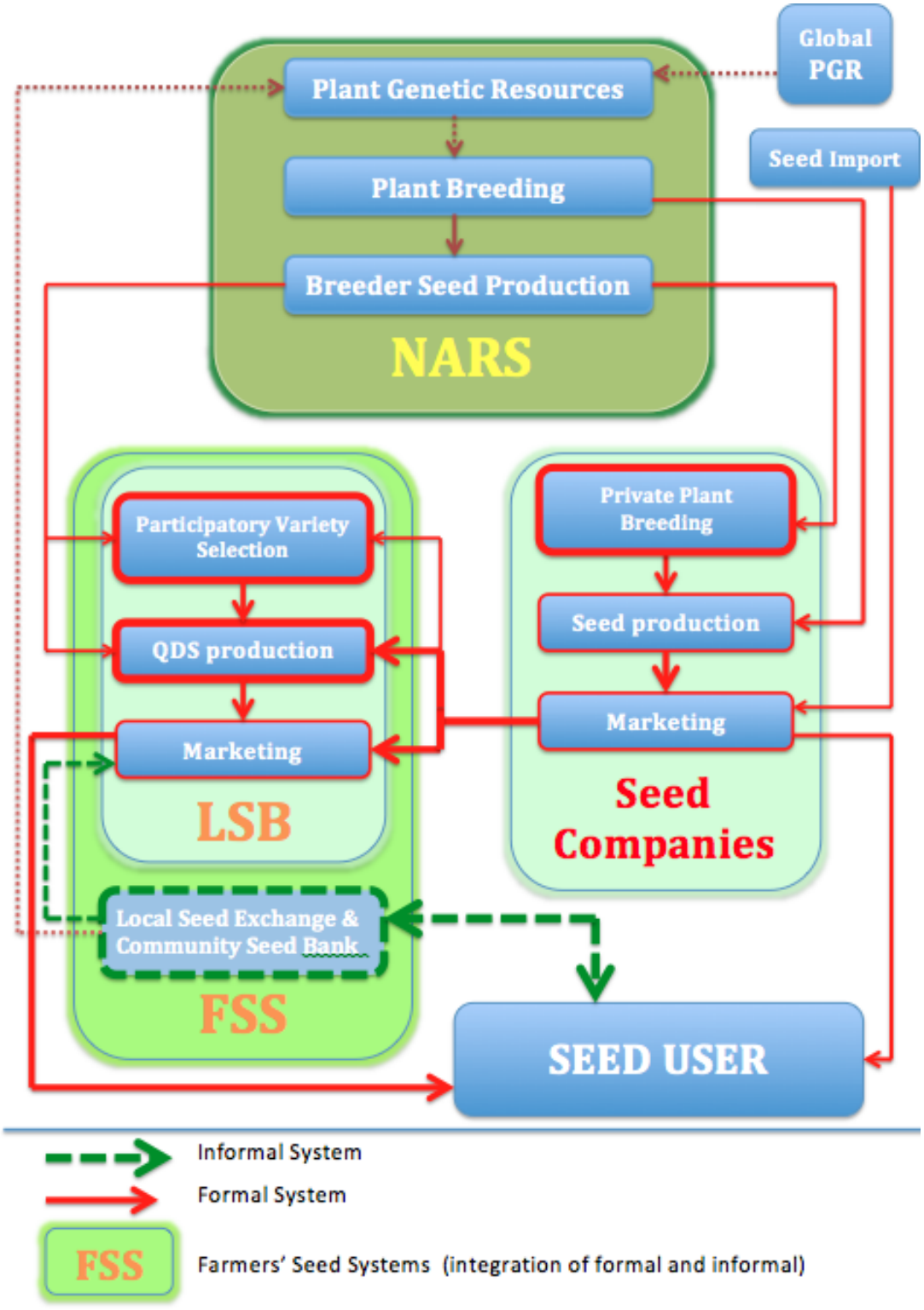

FIGURE 3.2: SEED FLOWS IN UGANDA INTEGRATED SEED SYSTEMS 2020

To solve the problem of limited availability of quality seed for all crops Government will over the next five years Government adopt an a transformed and integrated seed system that comprises the formal and informal/traditional seed systems.

The traditional seed system is well adapted to the local seed requirements for annual food crops produced under variable conditions. Its current seed supply relies on simple low costs technologies and will provide quality seed at a low price, with a low entrepreneurial risk if an adequate regulatory environment is set up. The informal system needs to be transformed and linked with national seed certification in order to function optimally.

The development of an integrated seed system will require adaptation of technology, flexible seed regulations providing for more competitive SQCC, with wise enforcement and institutional capacity. This NSS will upgrade the current Farmer's Seed Systems and integrate it within the formal system.

Figure 3.2 captures the seed flows in the integrated seed system in Uganda as provided in the different strategies of the NSP under components 1 to 4 of NSS. According to the framework, every season, the amount of seed flowing increases based on the multiplication rate for each crop, starting from NARS Basic seed to the final seed user. The arrow from community seed banks to Farmer's System marketing provides for business incentives to the custodian of the traditional varieties enabling them to market their seed. It also provides for seed companies to market their varieties through the same Farmers Systems marketing outlets. At every stage starting from NARS, the amount of seed increases exponentially under SQCC supervision. New flows include the support from NARS to the private sector to start up breeding programs and PVS under Farmers' systems. New business opportunities are also available to seed companies supplying certified seed to QDS producers for further multiplication. NARS and Seed Companies disseminate their varieties in collaboration with the Farmers Seed Systems.

3.2.2 Research and Development Targets for 2020

Public Private People Partnership (PPPP) will be the new paradigm in new variety development and dissemination.

To ensure steady flow of improved varieties for food and cash crops NSS has included relevant interventions and institutional arrangements to make it happen. This will be achieved by intensifying demand driven creation of new varieties through on-farm participatory variety selection trials/demonstrations with LSBs, farmer institutions and groups to identify farmer and market-preferred varieties. Approved and preferred varieties will be promoted through appropriate information dissemination pathways; including delivery of small seed packs samples, field days, extension brochures and pamphlets, variety descriptors, seed fairs promoted by farmer's groups and CSO, user- friendly visual material, print and electronic media. NARI Breeders will involve ZARDIs technicians to supervise trials/demonstrations.

Research and Development Targets 2020

- NARO licences seed production of its varieties for 12 crops.
- Farmer's access NARO adaptability trials twice a year.
- All NARO breeding programs strengthened with personnel and laboratories.
- PPB included in NARO Plant breeding strategies.
- 150 farmers groups participate in PVS.
- 300 Demonstration Fields established by Seed Companies and SSES
- Agricultural fairs available at each Agro-ecological Zone.
- Ten food security crops listed as next priorities for NARO breeding programs.
- 3 Private companies with breeding programmes.
- PVP Act implemented.
- 10 MOUs signed by NARO and CSO to promote new varieties of specific crops in specific areas
- 10 Seed Crop production manuals published by NARO
- 55 technology parks available with information to Seed Farmer's groups.
- 1 international forum in Plant Breeding organised in Uganda

3.2.3 Plant Genetic Resources 2020

PGRC and other NARO institutes will support local communities and CSOs to undertake In situ conservation of indigenous varieties. This is essential because Plant genetic resources are critical in the development of climate resilient high yielding competitive varieties for the present and future generations. The conservation and management of diversity will guarantee seed security and enhance livelihoods of small holder farmers who depend on them for food and nutrition. This NSS includes appropriate actions, institutional linkages, and policies to strengthen the capacity of farmers and other stakeholders in the conservation and sustainable use of these precious genetic resources sustained crop improvement and in meeting local seed security.

Plant Genetic Resources Targets 2020

- National policy and strategy for Plant Genetic Resources approved.
- 14 Community Gene Banks supported by PGRC.
- 4 medium and long-term storage facilities for ex-situ conservation.
- 13 Community Seed Banks dealing with conservation varieties.
- Diversity Fairs in all agro-ecological zones.
- IPR on tradition varieties granted by a new Act.
- Traditional varieties listed in the National List.
- National awareness in PGRFA.

3.2.4 Seed Production Targets for 2020

Table 3.2.4.1 presents MAAIF targets for seed production in 2020, and table 3.2.4.2 the corresponding one for Basic and NARO distributed seeds. During the five year period of the NSS, NARO seed which has been provided to the informal seed system will be channelled through LSB and Farmer Groups for further multiplication into QDS.

Table 3.2.4.1 – MAIIF seed production targets for 2020 by crop and sub-sector

Crop	Estimated annual seed use	Seed Companies		QDS (Farmers Groups)		Informal Sector	
	MT**(1,000 units)**	MT **(1,000 units)**	%	MT**(1,000 units)**	%	MT**(1,000 units)**	%
Banana	**50,978**	**0**	0	**2,549**	5	**48,429**	95
Maize OP	15,655	6,262	40	626	10	9,393	60
Maize Hybrid	10,000	10,000	100	0	0	0	0
Beans	90,368	4,518	5	18,074	15	67,776	75
Sweet potatoes	140,639	0	0	21,096	15	119,543	85
Cassava	**2,115,148**	**0**	0	**317,272**	15	1,797,876	85
Groundnuts	36,234	725	2	3,623	10	31,886	88
Sorghum OP	6,059	1,212	20	606	10	4,241	70
Sorghum Hybrid	1,069	1,069	100	0	0	0	0
Sesame	2,856	50	2	1,864	15	942	33
Sunflower OP	993	100	10	149	15	744	75
Sunflower Hybrid	100	100	100	0	0	0	0
Millet	1,595	200	13	239	15	1,156	72
Soybeans	9,348	600	6	935	10	7,813	84
Sweet bananas	**4,163**	**0**	0	**208**	5	**3,955**	95
Irish potatoes	213,120	4,262	2	21,312	10	187,546	88
Pigeon peas	1,487	30	2	149	10	1,309	88
Cotton	726	0	0	0	0	726	100
Rice	8,064	3,226	40	1,210	15	3,629	45
Cow peas	854	17	2	171	10	666	78

Data for 17 main crops excluding Coffee. Bananas replanting each 25 year (65,000 out of 1,600,000 Ha)
SOURCES: **FAOSTAT**, Total area Harvested per crop and year (2009-2011):
USTA: Formal sector seed production;
NSCS: Seed production targets by crop and sector 2020;
ISSD: Projections from 30 LSBs production data from 2014
2014 NARO seed into informal sector 2014 based in disperse incomplete information and rumours, proper planning of potential QDS production will need a BLS of NARO seed distribution and capacities for seed production cleaning and cleaning propagating materials.

Table 3.2 .4.2 – MAAIF Basic and Maintainer seed production targets for 2020 by crop

Crop	CERTIFIED CLASSES						QDS CLASS				
	Seed Companies Basic Seed needs	Basic Seed produced by Seed Companies		Basic seed from NARO to Seed Companies		NARO Pre-basic Seed Production	QDS mother seed needs	CII seed produced by seed companies		Maintainer Seed from NARO or custodian	
	MT (**or 1000 units**)	MT (**or 1000 units**)	%	MT (**or 1000 units**)	%	**kg (or units)**	**kg (or units)**	kg **(or units)**	%	kg **(or units)**	%
Banana	**0**	**0**	**0**	**0**	**0**	**0**	**6,372**	**0**	**0**	**6,372**	**100**
Maize IL	1	0.0	0	1	100	6,251.3	0	0		0	
Maize O.P.	1.0	1.0	100	0	0	12.2	3	3	100	0	0
Maize Hybrid	250.0	250.0	100	0.0	0	0.0	0	0		0	
Beans	5.2	5.2	100	0.0	0	172.6	200,818	140,573	70	60,246	30
Sweet potatoes	0.0	0.0	0	0.0	0	0.0	29,300	0	0	29,300	100
Cassava	**0**	**0.0**	**0**	**0**	**0**	**0.0**	**3,623**	**0**	**0**	**3,623**	**100**
Groundnuts	13.5	13.5	100	0.0	0	1,681.4	150,975	135,878	90	15,098	10
Sorghum I.L.	0.2	0.0		0.2	100	2.5	0	0		0	
Sorghum OP	0.1	0.0	0	0.1	100	1.2	2,020	1,414	70	606	30
Sesame	0.009	0.01	100	0.0	0	0.1	7,767	5,437	70	2,330	30
Sunflower I.L	1.3	0.0	0	1.3	100	15.6	0	0		0	
Sunflower OP	0.028	0.03	100	0.0	0	0.0	0	0	100	0	0
Millet	0.080	0.1	100	0.0	0	1.6	1,595	1,116	70	478	30
Soybeans	0.020	0.02	100	0.0	0	0.1	1,781	1,781	100	0	0
Sweet bananas	**0.000**	**0.00**	**0**	**0.0**	**0**	**0.0**	**372**	**0**	**0**	**372**	**100**
Irish potatoes	49.7	49.7	100	0.0		4,973	710,400	710,400	100	0	0
Pigeon peas	0.005	0.005	100	0.0		0.1	620	0	0	620	100
Rice	6.565	6.6	100	0.0	0	295.4	18,144	16,330	90	1,814	10
Cow peas	0.003	0.0	100	0.0	0	0.03	683	478.1952	70	205	30
TOTALS											
Botanical seed (kg)	328,854	326,043	99	2,811	1	8,434	417,700	303,008	73	114,691	27
total plantlets (units)	0	0	0	0	0	0	3,623	0	0	3,623	100
total tubers (kg)	49,728	49,728	100	0	0	4,973	710,400	710,400	100	0	0

SOURCES :
Formal seed production from table 3.2.1.1 times multiplication rate up to CII except hybrids (C)
Seed companies Basic seed production from USTA, corrected when in excess in red numbers. For clonal varieties, Basic means true to-type virus free material.

All formal seed crops **CII class** except hybrids. QMS to replace mother seed every 3 years Cassava QDS seed growers three years cycle from Basic to QDS seed. Tubers three cycles from basic to QDS
Banana mother trees replacement every 5 years.

Table 3.2 .4.3 – Comparison of NARO seed productions 2014 and 2020 targets

NARO SEED PRODUCTION		Pre-basic seed	Basic Seed	Maintainer seed	Delivery to Informal sector	TOTAL
Botanical seed Kg	2014	23,435	292,310	0	n.a	315,745 + n.a
	2020	8,434	2,811	114,691	0	125,936
Plantlets (units)	2014	0	0	0	n.a	0 + n.a
	2020	0	0	3,623	0	3,623
Tubers (kg)	2014	0	0	0	n.a	0+ n.a
	2020	4,973	0	0	0	4,973

3.2.5 Seed Uptake /Use targets for 2020

Table 3.2 .4.34 – Projected Seed uptake targets 2020

Annual Seed uptake	Total needs	Seed companies	QDS	Informal sector
Total Ha	5,169,966	941,390 (18%)	755,402 (15%)	3,473,174 (68%)
Total Ha excluded plantlets	4,673,415	941,390 (20%)	688,272 (15%)	3,043,753 (65%)

Data for 17 main crops excluding Coffee. Bananas re-planting each 25 year (65,000 out of 1,600,000 Ha)
SOURCES: FAOSTAT, Total area Harvested per crop and year (2009-2011)
USTA: Formal sector seed production
NSCS: Seed production targets by crop and sector 2020
ISSD: Projections from 30 LSBs production data from 2014

Seed Uptake /Use targets for 2020

- 100% of Seed Companies seed production is Certified: 18-20 % of total

- QDS seed is increasingly available: 15 % of total

- TOTAL UPTAKE OF QUALITY CONTROLLED SEED is 33-35 % in 2020

3.2.6 Seed Distribution and Marketing

With the establishment of a MAAIF police unit, cooperating with local police to complement seed market inspections by NSCS as well as enforcement of stiffer fines, the sale of fake seed will be drastically reduced.

A network of seed dealers linked to LSB, Farmers Groups and Cooperatives will offer the demanded seed in close proximity.

A network of seed agents will consolidate the village demand and link the most remote villages with the seed dealer.

Seed price, under more competitive seed classes and availability of other inputs will result in enhanced use of quality seed by households.

Local Governments will support CSO and Farmers groups in conducting seed fairs.

The targets to increase seed distribution and marketing are:

- MAAIF police in collaboration with local police will enforce seed market regulations
- Prevalence of fake seed under 5%
- Higher demand of quality seed under efficient value chains
- 5,000 villages with a seed agent
- 450 LSBs operating as seed dealers.
- 100 annual Seed Fairs held
- Quality controlled seeds widely available in small packages (down to 1 kg)

3.2.7 Seed Quality Control Targets for 2020

Achievement of all targets in Seed production, conditioning, distribution and marketing are contingent on an efficient and effective SQCC enforced and monitored by NSCS under PPP. Further, for NSCS to fulfil its mandate and functions the capacity enhancement proposed in this NSS is indispensable.

By 2020 the following are envisaged to be achieved.

- A complete QMS implemented at NSCS, including financial, accounting and budgeting procedures for self-funding.
- A new **Pre-basic seed class** in place to transfer Basic seed production from NARO to the Private sector
- A new **QDS class** in place, with appropriate seed standards to allow SQCC for crops and varieties were the certified classes are not competitive.
- CII seed produced where CI not competitive
- **Seed regulations are harmonised** with OECD Seed certification Schemes for Pre-basic, Basic and Certified Seeds, with FAO Seed Schemes for QDS and with COMESA and EAC for seed standards and Common Catalogues. (Proper seed regulations and procedures) precede any other attainable objective for seed production in this NSS)
- NSCS Standard procedures for all SQCC operations approved by NSB
- NSCS conducts regularly DUS testing and control plots.
- Clear efficient and written standard procedures are approved by NSB for all operations related to SQCC
- Specific procedures for registration in the National List of traditional varieties are in place, including DUS requirements
- 23 seed companies with internal QMS
- National Seed Laboratory ISTA accredited
- 20 official seed Inspectors
- 30 authorised field inspectors
- 20 authorised seed analysts
- 11 accredited bodies for SQCC
- 10 Accredited Laboratories
- USSIMS in place

3.2.7 Seed Knowledge and Science

Interventions under this strategy will increase the availability of breeders, seed scientists (MSc and PhD level) and seed technicians (B.Sc. Level) to manage a competitive seed industry. The NSS envisages at least two plant breeders, soil scientist and plant pathologist per crop. Seed companies and other organisations involved in seeds production will have a pool of qualified scientist from Ugandan Universities from which to recruit.

The targets for knowledge and science are as follows:

- NSB knowledge sharing platform hosted at USSIMS
- 3 tertiary institutions offer seed technology grades
- 3 tertiary institutions receive financial and technical assistance for seed related education.
- 450 LSB operate with household approach for inclusiveness.
- 450 LSB running SQCC
- 23 Seed companies running QMS and PPP SQCC

Principles for sustainable seed systems

Regardless of the legal context and type of institutional arrangements (state, private or community led seed sub-sector), there are salient principles and experiences that now set international and Uganda benchmarks for seed systems.

Old paradigm: State is the predominant player in the seed value chain right from plant breeding to production of certified seed of new varieties. Private sector involved at the last stages of seed production i.e. multiplication. Informal sector is overlooked in interventions.

New paradigm: Pluralistic and diverse Seed System, coexistence in balance of Farmers Systems (including Local Exchange and QDS production), market led private Seed Companies, with seed of new and indigenous varieties under a regulatory environment enabling public-private-people partnerships (PPPP). The characteristics of the two paradigms are further elaborated in table 3.3.

Table 3.3: Paradigms for effective Seed Systems in Uganda Experience

Seed system component	Old paradigms	New paradigms
Plant breeding and research	- State plant breeding (P)	- In all sort of modalities of Public/private/people partnership (PPPP)
Crops	- Major cereals grown as monocultures for "calorie security"	- Nitrogen-fixing leguminous crops for nutrition security and soil rehabilitation. - Major cereals grown as for "calorie security"

Seed system component	Old paradigms	New paradigms
Varieties	- New varieties targeting high yielding, input demanding agriculture	- New varieties targeting high yielding input demanding agriculture. - New climate smart varieties. - New varieties of orphaned crops - Indigenous varieties. - New high nutrition value varieties for food security
Intellectual Property Rights	- of Plant breeders on the new varieties developed by them	- of local populations on the traditional varieties bred and being bred by them through traditional plant breeding. - of Plant breeders on the new varieties developed by them. - of plant breeders and farmers on the new varieties developed through Participatory Plant Breeding (PPB)
Variety Maintenance	- Strict uniformity and stability of new varieties kept by plant breeders / appointed maintainers	- Strict uniformity and stability of new varieties kept by plant breeders / appointed maintainers -Local strains of indigenous varieties kept by custodian farmers in local communities.
Variety registration	- DUS and VCU requirements for new varieties.	- DUS and VCU requirements for new varieties. - Recognized custodians (individual o communities) and variety description for indigenous varieties.
Seed production	- Private companies producing Certified Seed of varieties for high input demanding agriculture.	- Private companies producing Certified Seed of varieties for high fertility lands. - Farmers Seed Systems production of QDS seed of all types of varieties.
SQCC	- State run	- Under Public/Private Partnership
Informal seed sector	- Not regarded as a proper player in the Seed System further than a source of germplasm for plant breeders	- Recognized as important player providing seed resilience, and strengthened in a dynamic interaction and integration with the formal system. - Getting adequate support in its role of preserving the National Heritage of Plant Genetic Resources for Food and Agriculture.

Seed system component	Old paradigms	New paradigms
Regulations	- Addressing the production of certified seed of new varieties	- Creating an enabling environment for a dynamic pluralistic, market led seed system

To efficiently move into the new paradigms, NSP contains seven guiding principles which are basis for this strategy.

- Principle 1: The Government of Uganda is pursuing a well-regulated private sector-led and market-oriented seed sector.
- Principle 2: The Government of Uganda will pursue a viable pluralistic seed sector.
- Principle 3: Transforming informal seed systems into recognised and regulated systems.
- Principle 4: Protecting plant breeders' rights to foster innovation in the seed sector.
- Principle 5: Enhancing access to breeder and basic seed.
- Principle 6: Enhancing productivity in farming systems.
- Principle 7: Providing services to seed value chain actors through a devolved and privatised system.

3. HOW DO WE GET THERE?

To realise the vision, mission, objectives and targets of NSS which are derived from NSP, wide-ranging interventions will be implemented by various actors based on their mandates, roles and responsibilities along the seed value chain and the supporting policy, regulatory and institutional environment. This is the focus of this chapter where for each strategic component and strategy activities and sub-activities have been elaborated for implementation over the next 5 years (see matrices that follow). Furthermore, the time framework for each activity is presented in the costs tables in Annex 2.

3.1. Research and Development

Activities	Output	Primary Implementing body	Secondary Implementing bodies	
Objective 1.1: To generate new commercial and food security varieties				
Strategy 1.1.1 - Supporting and promoting development and use of new varieties for production and marketing of improved varieties and quality seed;				
1.1.1.a	**- Strengthen the link between farmers and NARO through increased involvement of NARO in dissemination of its own technology.**			
1.1.1.a.1	**- Farmers visit NARO adaptability trials.**	2 annual Visits per NARI and ZARDI	ZARDIs	NARIs	LSB, FOs, FGs
1.1.1.a.2	**- Support ZARDIs to establish PVS fields**	50 PVS field at LSB per year	ZARDIs	LSB	CSO
1.1.1.a.3	**- Establish an effective communication strategy to reach all farmers**	Communication strategy in place	NARO	CSOs	
1.1.1.a.4	**- Institutionalise a framework of cooperation between NGOs and–Researchers through MOUs to promote the uptake of new varieties of crops in specific areas through the extension service)**	10 MOUs	NARO	CSOs	
1.1.1.a.5	**- Provide information on new varieties to all actors**	provided for in 5.1.10.a			
1.1.1.b	**-Increase the of demonstration fields set up by Seed Companies.**	10 per company	SEED COMPANIES		
1.1.1.c	**- Organise biannual Regional Agricultural Trade Fairs.**	2 per Agro ecological Zone	MAIFF		
1.1.1.d	**-Incorporate a budget for dissemination in every NARO project as a policy and practice.**	1 policy adopted	NARO		
1.1.1.e	**- Provide human and material support for NARO plant breeding at NARIs**				

Activities		Output	Primary Implementing body	Secondary Implementing bodies	
1.1.1.e.1	**- Enhance human resource to reach a minimum of 1 breeder per crop**	1 breeder per each for 15 crops	NARO	NARIS	
1.1.1.e.2	**- Incorporate plant pathologists and Soils Scientists in breeding teams**	2 persons at each NARI	NARO	NARIS	
1.1.1.e.3	**- provide 1 vehicle (pick up) per breeding programme**	1 per program	NARO		
1.1.1.e.4	**- Provide equipment and consumables for laboratory, plant pathology and food science**	1 per NARI	NARO	NARIs	
1.1.1.e.5	**- Establish analytical laboratory for plant health and food science**	2 per NARI	NARO	NARIs	
1.1.1.e.6	**- Construct screen houses**	1 per NARI and ZARDI	NARO	NARIs	ZARDIs
1.1.1.e.7	**- Establish weather stations at NAROS Centres**	1 per NARO Centre and satellite	MAAIF	DAO	
Strategy 1.1.2 - Providing for Plant Breeders Rights as provided for under the Plant Variety Protection Law;					
1.1.2.a	**- Support plant Breeders Association to address issues of implementing PBR rights as provided under the PVP Act.**	1 month consultancy per year	PBA		
1.1.2.b	**- Operationalize PVP Act**				
1.1.2.b.1	**- Set up institutions under PVP Act**	Set institutions	MAAIF		
1.1.2.b.2	**- Develop PVP regulations and develop procedures**	2 months consultancy in year 2	MAAIF		
1.1.2.c	**- Sign a MOU between PBA and NARO to monitor the implementation of PVP Act on a regional basis.**	1 MOU	MAAIF	PBA	
Strategy 1.1.3 - Supporting private companies to develop their own varieties;					
1.1.3.a	**- Government to concentrate on orphaned crops and start supporting the entry of private breeding in maize and other commercially profitable crops**				
1.1.3.a.1	NARO providing segregating materials of maize to private companies	Companies receiving materials	NARO	SEED COMPANIES	
1.1.3.a.2	- Authorize NARO to charge and retain royalty per kilo of Basic seed sold under exclusivity rights	NARO collects royalties	MFPED	NARO	USTA

Activities		Output	Primary Implementing body	Secondary Implementing bodies	
Strategy 1.1.4 - Monitoring of variety maintenance by NSCS					
1.1.4.a	**- Provide NSCS with land, human resources and other materials to establish post-control plots**	Under component 5			
1.1.4.b	**- Repair cold chamber at NSCS**	Under Component 5			
Strategy 1.1.5 - Supporting the development of food security crop varieties through public breeding programmes					
1.1.5 a	**MAAIF and NARO to establish list of 10 priority crops (All food security crops and review the list annually)**	10 crops identified	MAAIF	NARO	
Strategy 1.1.6 -Strengthening modalities for coordination of public and private research and extension service providers for effective transfer and dissemination of seed related technologies;					
1.1.6.a	**-Produce Seed production manuals per crop translated into the 5 main local languages and disseminate to end users.**	10 Crop Seed production manuals (400 copies each)	NARI's		
1.1.6.b	**- Establish a Resource Centre at every NARI, ZARDI and Satellite Stations, (55) for dissemination of agricultural knowledge to facilitate farmers access to extension materials**	55 Technology parks	NARO	NARIs	ZARDIs
1.1.7.c	**- Facilitate multi-stakeholders platforms for food crop seed**	Annual meeting	NARO	CSO	USTA
Strategy 1.1.7 -Reviewing variety evaluation, release and registration processes to promote regional harmonisation and effective release and popularisation of new varieties					
1.1.7.a	**- Review Release and Registration procedures**	1 review in first year	NSB	NSCS	
1.1.7.b	**- Approve procedures for variety release**	Approved in the first year	NSB	NSCS	
Strategy 1.1.8 -Promoting QDS producers' access to basic seed for crops and varieties to be subsequently multiplied for seed production					
1.1.8.a	**- Decentralise basic seed production to the ZARDIs**	ZARDIs producing basic seed	NARIs	ZARDIs	
1.1.8.b	**- Support LSB, farmers organisations and farmer groups in seed production planning (request seed 6**	LSB, Farmers Organisations and Farmers Groups with annual seed production plans	ZARDIS	CSOs	

Activities		Output	Primary Implementing body	Secondary Implementing bodies	
	months in advance)				
Strategy 1.1.9 -Supporting Ugandan breeders to source genetic materials from international breeding institutes and /or from other countries					
1.1.9.a	**- Document entry of genetic materials from international breeding institutes and /or from other countries and monitor their performance**	Documenting system	NARO	PGRC	
Strategy 1.1.10 -Enhancing the cooperation with international crop development centres including the Consultative Group for International Agricultural Research (CGIAR to access new varieties					
1.1.10.a	**- Facilitate Scientists to participate in annual international crop development fora.**	5 scientist attending international fora	NARO		
1.1.10.b	**- Organize one international development forum in Uganda during the 3rd year of NSS implementation**	1 International development forum	NARO		
Strategy 1.1.11 -Developing a system which enables different rights on public varieties through exclusive rights, shared rights or any other inclusive system that is deemed most beneficial to increase the adoption rates of new varieties by farmers					
1.1.11.a	**- Introduce limitations to exclusive licensing in case of national interest**	NARO adopts "limitation clause" in licencing agreement	NARO		
1.1.11.b	**- In addition to maize, expand to 12 the number of crops covered by the agreement (COMESA crops).**	Crops with agreements	NARO		
1.1.11.c	**- Ensure agreement on exclusivity includes compensation (one time or milestone payments)**	NARO adopts "compensation clause" in licencing agreement	NARO		

3.2. Conservation of Plant Genetic Resources

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
Objective 2.1: To sustainably utilise and protect Uganda's national plant genetic resources from destruction by natural and human activities and unauthorised access.					
Strategy 2.1.1 -Providing for exchange of germplasm for crop research and development purposes, while avoiding introduction of seed borne pests and diseases and undesirable plant genes that could affect agricultural production and productivity					
2.1.1.a	**Formulate PGRFA policy and strategy and Enact PGR Bill**				
2.1.1.a.1	Support the drafting of the PGRFA Bill	1 Stakeholder Workshop	PGRC	MAAIF	
2.1.1.a.2	Send Bill to Parliament for enactment	Bill becomes an Act	MAAIF		
2.1.1.b	**- Establish clear rules for the import and handling of GMO seed samples.**	Approved procedures in place	UNCST	NPPO	
2.1.1.c	**-Review SMTA procedures on genetic resources.**	Approved procedures in place	UNCST	PGRC	NPPO
Strategy 2.1.2 -Ensuring that the National Agricultural Research System (NARS) maintains stocks necessary for the conservation of introduced and local plant genetic material and improved varieties to provide for seed security and to mitigate against natural disasters					
2.1.2.a	**- Formulate National Policy and Strategy on Plant Genetic Resources**	Policy and Strategy for PGR in place	MAAIF	UNCST	PGRC
2.1.2.b	**- Provide storage with solar cooling to PGRC and NARIs.**	4 Solar cooling Storage	NARO	NARIs	PGRC
2.1.2.c	**- Make it mandatory for breeders to send samples of their germplasm collections to the PGRC for long conservation**	Approved procedures in place	NARO	PGRC	UNCST
Strategy 2.1.3 -Promoting and building capacity of farmer and community groups including those led by women or youth to conserve crop varieties that have a high food security value					

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
2.1.3.a	**-Link LSBs, Farmers Organisation and Farmers groups including for youth and women to Genetic Resources Centre**	PROVIDED FOR IN 2.2.1.a			
2.1.3.b	**- Link conservation to seed business and target high food security value crops**	50 LSB and 14 CGB selling conservation seed	LSB	CSO	PGRC
2.1.3.c	**- Undertake specialised training of farmers on-farm conservation aspects**	14 gene banks custodian farmers trained	PGRC		
2.1.3.d	**- Organize diversity fairs**	1 Fair per agro ecological zone	PGRC	ZARDIs	CSO
2.1.3.e	**- Facilitate farmer exchange/ cross-site visits**	1 annual cross -site visits per gene bank	PGRC	ZARDIs	CSO
2.1.3.f	**- Carry out training in participatory monitoring**	14 Community gene banks annually monitored by the communities	PGRC	CSO	
2.1.3.g	**- Undertake field trials and establish demonstration fields for conservation varieties**	1 per gene bank per year	PGRC	CSO	
Objective 2.2: To promote the conservation of local varieties, indigenous knowledge, and practices through community genetic resource management.					
Strategy 2.2.1 -Supporting the development of community seed banks					
2.2.1.a	**- Establish a network of community seed banks under the coordination and technical support of PGRC.**	Community Gen Banks at LSB at least 1 per agro ecological zone			
2.2.1.a.1	- Hold sensitisation meetings	14 Communities and DAO field staff aware of importance of conservation	PGRC	CSO	CUL.INS.
2.2.1.a.2	- Facilitate community- scientist negotiations	14 Communities supporting in situ conservation of national genetic heritage	PGRC	CSO	CUL.INS.
2.2.1.a.3	- Construct CGB facility	14 CGBs facilities built	PGRC	CSO	CUL.INS.
2.2.1.a.4	- Establish CGB management structures	14 CGBs management structures operational	PGRC	CSO	CUL.INS.
2.2.1.a.5	- Set up seed production and distribution mechanisms	14 CGBs with working seed production and distribution	PGRC	CSO	CUL.INS.

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
Strategy 2.2.2 -Supporting the mapping and creation of variety registers within communities					
2.2.2.a	**Establishing Biodiversity registers at CGB**				
2.2.2.a.1	- Conduct sensitisation meetings	14 Communities aware of importance of registration of traditional varieties	PGRC	CSO	CUL.INS.
2.2.2.a.2	- Undertake capacity building and development of community Biodiversity registers	14 community registers in place	PGRC	CSO	CUL.INS.
2.2.2.a.3	- Carry out training in participatory monitoring of Biodiversity Registers	14 community Biodiversity registers yearly up to date	CSO	PGRC	
b) Supporting the mapping and creation of variety registers at national level					
2.2.2.b	**- Develop procedures for the registration of traditional varieties.**	Procedures approved by NSB	NSCS	NSB	
2.2.2.c	**- Undertake sensitisation workshops**	Stakeholder aware of traditional varieties registration	MAAIF	PGRC	NSCS
Strategy 2.2.3 -Promoting the protection and preservation of indigenous knowledge of local varieties and effectively protecting the intellectual property rights of local communities on traditional varieties and traditional breeding under a new legal framework					
2.2.3.a	**- Recognize local communities' rights and establish royalties on the use of indigenous varieties for breeding purposes.**				
2.2.3.a.1	Draft Traditional Varieties Protection Bill	1 Stakeholder Workshop	MAAIF	PGRC	
2.2.3.a.2	Send Bill to Parliament	Bill in Parliament	MAAIF		
2.2.3.a.3	Enact Traditional Varieties Protection law	Bill enacted by parliament and Assented to by the President	PARLIAMENT	MAAIF	
Strategy 2.2.4-Supporting promotion of crop diversity through custodian farmers;					
2.2.4.a	**- Identify custodians of CGB**	Custodians identified in 14 CGB (5 crops per CGB)	PGRC	CSO	CUL.INS.
2.2.4.b	**- Establish partnerships with farmers**	Partnership with farmers established in 14 CGB(5 each)	PGRC	CSO	CUL.INS.

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
2.2.4.c	**- Build Capacity of farmers as a mean of motivation**	System of partnership motivation in place	PGRC	CSO	CUL.INS.
Strategy 2.2.5 - Creating awareness on conservation varieties.					
2.2.5.a	- Carry out sensitisation at National level				
2.2.5.b.1	- Gazette a Day of National Heritage on traditional crop varieties	Organising Committee established, day gazetted	MAAIF	PGRC	CULT INST

3.3. Seed Production and Conditioning

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
Objective 3.1: To multiply and market high quality seed under the formal seed system.					
Strategy 3.1.1 -Ensuring enforcement of all regulations regarding seed production, storage processing, chemical applications and residues on the Ugandan market to create an international reputation for the country as a good source of seed; and					
3.1.1	- Review the legal framework to increase fines	Fines increased in legal framework	MOJCA	MIA	
3.1.2	- Involve police in fight against seed adulteration in public markets	44 District police trained	MIA	NSCS	
Strategy 3.1.2 -Building and strengthening existing seed certification system and quality control for seed production, conditioning, and testing for locally produced and imported seed					
3.1.2.a	**-Repair laboratory infrastructure, water supply, internet connectivity and electricity backup generator at NSCS**				
3.1.2.a.3	- Restore water supply system	Water supply working	NSCS		
3.1.2.a.4	- Establish internet connectivity	internet connectivity provided	NSCS		
3.1.2.a.5	- Provide electrical backup generator.	1 set of equipment provided	NSCS		
3.1.2.b	**-Agricultural facilities for DUS and control plots**				
3.1.2.b.1	- Establish a mini-irrigation facility for 2Ha	- Mini-irrigation facility for 2Ha procured and established	NSCS		
3.1.2.b.2	- Construct a standard screen house.	Standard screen house procured and constructed	NSCS		
3.1.2.b.3	- Provide a tractor and accessories	Tractor and accessories procured	NSCS		

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
3.1.2.b.4	- Provide consumables for field work, fertilizers, etc.	Consumables for field work, fertilizers etc. procured	NSCS		
3.1.2.c	**- IT equipment and data processing unit**				
3.1.2.c.1	**- Provide 7 laptops for inspectors**	7 laptops for inspectors procured	NSCS		
3.1.2.c.2	**- Provide 8 desktops**	8 desktops procured	NSCS		
3.1.2.c.3	**- Provide 2 centralized heavy duty printers**	2 centralized heavy duty printers procured	NSCS		
3.1.2.c.4	**- Provide 1 computer server to host USSIMS**	1 computer server to host USSIMS	NSCS		
3.1.2.c.5	**- Supply IT consumables**	IT consumables procured	NSCS		
3.1.2.d	**-NSCS Training Centre Facilities**				
3.1.2.d.1	- Provide equipment (photocopier, projector, flipcharts…)	Training equipment procured	NSCS		
3.1.2.d.2	- Develop and print workbooks and manuals (Authorisation)	Manuals and workbooks published	NSCS		
3.1.2.e	**- Field inspection equipment**				
3.1.2.e.1	-Provide 10 GPS	10 GPS procured	NSCS		
3.1.2.e.2	- Provide 5 digital cameras	5 digital cameras procured	NSCS		
3.1.2.e.3	- Provide 1 minibus	1 minibus procured	NSCS		
3.1.2.e.4	- Provide 5 double cabin pick up	5 double cabin pick up procured	NSCS		
3.1.2.e.5	- Provide 5 motorcycle	5 motorcycle procured	NSCS		
3.1.2.e.6	- Maintain NSCS equipment	Equipment properly maintained	NSCS		
3.1.2.f	**- Laboratory equipment for ISTA Accreditation**				
3.1.2.f.1	- Develop inventory and technical specifications	Inventory and procurement list	NSCS		
3.1.2.f.2	- Provide new equipment	1 set of equipment procured	NSCS		
3.1.2.f.3	- Supply lab consumable for ISTA accreditation	1 set of consumable provided	NSCS		

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
3.1.2.g	**- Increase NSCS technical staff by 10 persons**	ten more staff incorporated to NSCS	MAAIF		
3.1.2.h	**- Develop NSCS Quality Management system documentation**	NSCS QMS documentation in place	NSCS		
3.1.2.i	**- Extend tamper proof labels to 100% of certified seed (250,000) for 100,000 MT in 5Kg packages per year**	250,00O tamper proof labels available	NSCS	USTA	
Objective 3.2: To increase the availability of and access to quality seed of preferred varieties to complement those produced under the formal seed system.					
Strategy 3.2.1 -Promoting and building capacity of farmers, community groups and local seed businesses to produce and market quality seed with the focus on crops and varieties that have a high food security value;					
3.2.1.a	**- Scale up number of LSB, Farmers Organisations and Farmers Groups involved in seed production and marketing**	450 LSB, Farmers Organisations and Farmers Groups established and functional nationwide	ZARDIs	CSO	
Strategy 3.2.2 -Providing for Quality Declared Seed class					
3.2.2.a	**- Develop regulations for QDS class**	QDS Regulations approved by MAAIF	MAAIF	NSB	
Strategy 3.2.3 - Supporting and strengthening linkages between seed research and plant breeding programs and farmer groups producing and marketing food security crops					
3.2.3.a	**- Strengthen the link between farmers and NARO through increased involvement of NARO in dissemination of its own technology.**	PROVIDED FOR IN 1.1.1..a			
Strategy 3.2.4. - Promoting participatory research and variety improvement to increase productivity and market development of farmer preferred varieties					
3.2.4.a	- Strengthen support to PVS	PROVIDED FOR IN 1.1.1..a.2			
3.2.4.b	**- Introduce PPB in NARO breeding programmes.**	PROVIDED FOR IN 3.3.1.a			
Strategy 3.2.5 - Providing for emergency seed supplies in case of localised or national calamities to ensure continued availability of good quality seeds;					

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
3.2.5.a	**- Ministry of Disasters Preparedness to adopt clear guidelines to supply seed in case of calamities.**	Guidelines on emergency seed supplies adopted	MODP	MAAIF	NSB
3.2.5.b	**- Establish a MOU between GOU and USTA to build up strategic stocks**	MOU signed	MAAIF	MODP	
Strategy 3.2.6 - Promoting awareness on the different seed classes in Uganda via tools that effectively reach all actors in the informal seed system including women;					
3.2.6.a	**- Conduct national campaigns to educate farmers on use of quality seed and regulations using ICT.**	People aware of Seed Classes	MAAIF	USTA	CSO
Objective 3.3: To enhance the production of quality seed within the informal system.					
Strategy 3.3.1 - a) Promoting participatory breeding					
3.3.1.a	**- Introduce PPB in NARO breeding programmes.**	PPB included in 5 NARO breeding programmes	NARIs	LSB	CSO
b) Promoting plant variety selection					
3.3.1.b	**-Promote PVS**	PROVIDED FOR IN 1.1.1..a.2			
Strategy 3.3.2 - .Promoting the development and use of locally adapted indigenous varieties, to provide for national food and nutrition security;					
3.3.2.a	**- Set up procedures for the registration of traditional varieties.**	PROVIDED FOR IN 2.2.2.d			
3.3.2.b	**- Establish an Sub-Committee on indigenous varieties under NSB**	Sub-committee working at NSB	NSB		
Strategy 3.3.3 - Promoting local seed selection and preservation methodologies;					
3.3.3.a	**- Promote selection of indigenous varieties and include them in the national variety list.**	PROVIDED FOR IN 2.2.2.d			

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
3.3.3.b	**- Train LG Agricultural Staff and Field based staff on local seed selection and preservation methodologies**	Invite DAO to activities 2.2.1.a.1 and 2.2.1.a.1	PGRC	DAO	
Strategy 3.3.4 - Promoting the introduction of improved affordable and gender friendly technologies to support seed multiplication and post-harvest handling					
3.3.4.a	**- AEATREC to identify, develop and test seed related low cost technologies.**	Appropriate technologies identified, developed and tested	AEATREC		
3.3.4.b	**- ZARDIS to test and disseminate seed related low-cost technologies.**	Appropriate technologies disseminated	ZARDIs	AEATREC	LSB
Strategy 3.3.5 - Facilitating youth, women and other vulnerable groups to strategically intervene in enhancing availability of quality seed and ling					
3.3.5.a	**- Strengthen women and youth groups by providing labour saving technologies such as ploughing and threshing equipment and transportation on credit under a business approach.**	LSBs, Farmers Organisations, Farmers Groups equipped with appropriate labour saving technologies	ZARDIs	CSO	LSB, FOs, FGs

3.4. Seed Distribution and Marketing

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
Objective 4.1: To increase the uptake of certified and QDS seed by farmers					
Strategy 4.1.1 - Encouraging seed companies to market seed in appropriate and affordable packages to promote the use of certified seed by all farmers;					
4.1.1.a	**- Regulate packaging of certified seed down to 1 kg**	Regulations for small packaging of seeds in place	NSB		
4.1.1.b	**- Support Seed Companies to assess economic viability of small packs, link to financial sources, appropriate machinery, etc.**	Study on economic viability of small packages done	USTA		
Strategy 4.1.2 - Strengthening extension services to promote the use of quality seed.					
4.1.2.a	**-Include seed technology issues in the new Extension System**				
4.1.2.a.1	- Train LG Agricultural Staff and Field based staff on Seed matters. (Eleven workshops at ZARDIs/NARIs)	DAOs and sub-county extension workers competent in seed technology issues	NARIs	ZARDIs	DAOs
4.1.2.a.2	- USTA and MAAIF sign a MOU to collaborate on organising field days and setting up demonstration fields, starting with one per year as a pilot.	MOU signed	MAAIF	USTA	
Strategy 4.1.3 - Supporting seed marketing outlets in remote areas by encouraging establishment of network of seed stockists;					
4.1.3.a	**- Increase number of LSB operating as seed dealers.**	Provided for in 3.2.1..a			
4.1.3.b	**- Nominate village/parish agents to collect village seed demand and submit it Sub county township for consolidation.**	5,000 villages/parishes count with seed agent	SEED COMPANIES		

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
Strategy 4.1.4 - Supporting farmers' adoption and use of seed of improved varieties and guiding the transformation to increased use of these varieties with the ultimate end of adopting certified seed;					
4.1.4.a	**- Conduct regular seed demand estimation.**	Provided for in 5.10.1.a			
4.1.4.b	**- Establish multi stakeholders platforms to standardize messages**	Provided for in 1.1.7.c			
Strategy 4.1.5 - Supporting non-market seed distribution mechanisms for informal seed system including emphasis on networks for seed distribution.					
4.1.5.a	**- Promote Local Seed Exchange Fairs**	Local seed Exchange Fairs in place	CSO		
4.1.4.b	**- Scale up LSB, FOs and FGs approach country wide**	Provided for in 3.2.1..a			
Strategy 4.1 6 - a) Strengthening modalities for coordination of public and private seed extension services and other support services to the seed value chains; and					
4.1.6.a	**- Hold multi stakeholders platforms to standardise messages**	Provided for in 1.1.7.c			
b) Ensuring that relief seed supplies are sourced from registered seed producers only and that they are of known quality.					
4.1.6.b	**Sign MOU between USTA and MAAIF to supply relief seed**	MOU signed	MAAIF	USTA	
Objective 4.2: To enhance Uganda's competitiveness in regional and international seed trade					
Strategy 4.2.1 - Enhancing the capacity of National Plant Protection Organization (NPPO) to issue reputable plant health certificates;					
4.2.1.a	**- Develop a strategic plan to Build capacity of NPPO**	Strategic plan approved	MAAIF		
4.2.1.b	**Recognise private phytosanitary test results from local internationally accredited laboratories for issuing official Phytosanitary certificates**	Plant Protection and Health Act now recognise private accredited laboratory results for Phytosanitary certificates	MAAIF	NPPO	

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
Strategy 4.2.2 - Reducing processing time including providing one-stop service centres for issuance of export and import documentation and control or provision of online system for expediting the issuance of SPS certificates					
4.2.2.a	**- Develop a strategic plan to Build capacity of NPPO**	Provided for in 4.2.1.a			
Strategy 4.2.3 - Providing for harmonization of national regulations with regional and international conventions and protocols on seed production, certification and trade, including inter-agency seed certification, use of standard protocols on variety protection, common quarantine-pest list, variety catalogue, import/export documents					
4.2.3.a	**- Review Seeds and Plan regulations and harmonise them with international conventions and protocols (2 months consultancy).**	Regulations harmonised			
Strategy 4.2.4 - Enhancing capacity in terms of personnel and provide for minimum facilities at high risk entry points (laboratories, visual inspection kits, refrigerators);					
4.2.4.a	**- Develop a strategic plan to Build capacity of NPPO**	Provided for in 4.2.1.a			
Strategy 4.2.5 - Promoting awareness on regionally harmonized seed standards.					
4.2.5.a	**- Undertake outreach on regionally harmonised standards**	Stakeholders are familiar on regional seed standards	MAAIF	USTA	NSCS

3.5. Seed Quality Control

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
Objective 5.1: To ensure quality control along the formal seed value chain.					
Strategy 5.1.1 - Strengthening and enforcing existing seed certification (quality control, seed testing, labelling, etc.) for locally produced and imported seed					
PROVIDED FOR IN STRATEGY 3.1.2					
Strategy 5.1.2 -Training and supporting staff of seed companies to undertake internal quality control;					
5.1.2.a	**- Require Seed Companies to have at least 1 seed technologist among its staff for registration as seed merchants**	Regulations for registration updated	NSCS		
5.1.2.b	**- Provide external audit to Seed Companies Internal Quality Control twice a year.**	23 Seed companies audited annually	USTA		
5.1.2.c	**- Develop authorisations procedures for Field Inspectors**	Authorisations procedures approved by NSB	NSCS	NSB	
5.1.2.d	**-Develop authorisations procedures for Seed sampling and labelling**	Authorisations procedures approved by NSB	NSCS	NSB	
5.1.2.e	**-Develop authorisations procedures for Seed Analysts**	Authorisations procedures approved by NSB	NSCS	NSB	
Strategy 5.1.3 - Establishing public/private partnership for seed quality control;					
5.1.3.a	**- Accredit Private Companies and associations for Seed Quality Control and Certification.**	11 Bodies accredited	NSCS	USTA - SEED COMPANIES	
5.1.3.b	**- USTA and MAAIF sign a MOU covering accreditation**	MOU signed	USTA	MAAIF	

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
Strategy 5.1.4 - Establishing procedures of accreditation for field inspection, sampling, testing and labelling;					
5.1.4.a	**-Develop accreditation procedures for Field Inspection**	Accreditation procedures approved by NSB	NSCS	NSB	
5.1.4.b	**-Develop accreditation procedures for Seed sampling and labelling**	Accreditation procedures approved by NSB	NSCS	NSB	
5.1.4.c	**-Develop accreditation procedures for Seed Laboratory**	Accreditation procedures approved by NSB	NSCS	NSB	
5.1.4.d	**-Develop accreditation procedures for label printing**	Accreditation procedures approved by NSB	NSCS	NSB	
Strategy 5.1.5 - Strengthening a) the quality management systems of seed companies and					
5.1.5.a	**- Extend development of QMS to all companies.**	All companies with QMS in development	USTA	SEED COMPANIES	
5.1.5.b	**- Carry out 2 audits a year of companies QMS**	Provided for in 5.1.2.b			
b) national seed laboratories;					
5.1.5.c	**- Provide Technical Assistance to NSCS seed Laboratory to facilitate ISTA Accreditation**	NSCS laboratory ISTA accredited	NSCS		
5.1.5.d	**-Recruit three (3) additional seed analysts at the National Seed laboratory**	Analysts in National seed laboratory	NSCS	MAAIF	
Strategy 5.1.6 - Encouraging all registered seed companies and other seed merchants to join seed associations for purposes of self-regulation to ensure seed quality;					
5.1.6.a	**- Government to encourage all companies to be member of USTA (at registration).**	Only USTA members Seed Companies can produce seed	NSCS	NSB	
5.1.6.b	**- Government to coordinate with USTA when procuring seeds.**	Government to adopt policy	GoU	MODP	USTA

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
5.1.6.c	**- USTA to define minimum requirements for Seed company to join**	Minimum requirement defined by USTA	USTA	NSCS	NSB
Strategy 5.1.7 - Supervising and monitoring of the accredited entities by NSCS					
5.1.7.a	**- Develop procedures to audit Accredited organisations**	Accredited organisations regularly audited	NSCS	NSB	
Strategy 5.1.8 - Develop modalities for seed certification of horticultural crops, industrial crops, forestry and other plant species which have no variety maintenance;					
5.1.8.a	**- Establish procedures for quality control and certification of horticultural crops**	Quality controlled Horticultural crops seeds available	NSCS	NSB	
5.1.8.b	**- Develop procedures for quality control and certification of Industrial crops**	Quality controlled Industrial crop seeds available	NSCS	NSB	
5.1.8.c	**- Develop procedures for quality control and certification of forestry crops**	Quality controlled forestry crops seeds available	NSCS	NSB	
5.1.8.d	**- Develop procedures for quality control and certification of vegetatively propagated crops**	Quality controlled Horticultural crop seeds available	NSCS	NSB	
Strategy 5.1.9 - Setting standards for appropriate packaging materials for various crops in conformity with national and international standards;					
5.1.9.a	**- Establish a Working group under NSB to develop standards**	Working Group on packaging standards	NSB		
Strategy 5.1.10 - Establishing a Seed Sector Integrated Information Management System (SSIIMS) and web portal at NSCS to capture and share critical information relating to the seed sector for transparency and accountability					
5.1.10. a	**Develop USSIMS**				
5.1.10. a1	**- Provide a IT staff for system maintenance**	1 staff	MAAIF	NSCS	
5.1.10. a2	**- Build the skills of NSCS staff on data management and start IMS tables**	NSCS data management skills developed	NSCS		

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
5.1.10. a3	**- Provide IT equipment (server)**	1 server in place	NSCS		
5.1.10. a4	**- Develop applications and web site**	USSIMS Web site accessible to stakeholders	NSCS		
Objective 5.2: To ensure quality control along the value chain for Quality Declared Seed.					
Strategy 5.2.1 - .Providing for listing of traditional and participatory breeding varieties;					
5.2.1.a	**NSCS to develop the procedures**	Procedures developed	NSCS	NSB	
Strategy 5.2.2 - Registering community seed producers by NSCS through local authorities;					
5.2.2.a	**- NSCS develops procedures for the registration of LSB, FOs, FGs through District Production Department**	Procedures developed	NSCS	NSB	DAOs
Strategy 5.2.3 - a) Supervising and technical backstopping to community seed producers and					
5.2.3.a	**- Nominate official Seed inspectors at ZARDIs and NARI level**	13 official seed Inspector nominated	MAAIF	NARIs	ZARDIs
b) support to the development of internal seed quality control mechanisms for seed producers;					
5.2.3.b	**NARO Seed inspectors support supervision and inspection**	Provided for in 5.2.3.a			
Strategy 5.2.4 - Establishing seed traceability system for Quality Declared Seed and					
5.2.4.a	**- Include traceability requirements in QDS regulations**	Provided for in 3.2.2.a			

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
Strategy 5.2.5 - Establishing a delegated and decentralised system at zonal and/or district level for seed inspection for Quality Declared Seed.					
5.2.5.a	**- Provide Seed laboratory equipment to 9 ZARDIs plus 1 in North Substation + 3NARIs**	10 laboratories furnished	NARO	NARIs	ZARDIs
5.2.5.b	**- Accredit Seed laboratories at 9 ZARDIs plus 1 in North Substation + 3NARIs**	10 laboratories accredited	NSCS	NARIs	ZARDIs
5.2.5.c	**-Authorize 2 seed analysts per ZARDI. and NARI**	26 seed analyst authorised	NSCS	NARIs	ZARDIs
5.2.5.d	**- Nominate official seed inspectors at ZARDIs and NARIs**	Provided for in 5.2.3.a			

3.6. Seed Knowledge and Technology

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
Objective 6.1: Develop human resource for the seed sector development					
Strategy 6.1.1 - Supporting tertiary institutions to introduce and develop seed science based knowledge for building skills and human capacities;					
6.1.1.a	**- Ensure there is 1 seed technician per Seed Company**	Request included in the procedures for registration of seed merchants	NSCS	USTA	
6.1.1.b	**- Establish Seed Technology degree at Universities**	3 universities provide seed technology degree	Universities		
Strategy 6.1.2 - Supporting the development of seed science centres at public universities for seed research, training and accreditation purposes;					
6.1.2.a	**- Support tertiary institutions to develop seed technology curriculum**	Curriculums developed	NARO	NSCS	
Strategy 6.1.3 -Providing technical and financial assistance, human capacity development to seed institutions along the seed value chain;					
6.1.3.a	**-Support tertiary institutions with technical and financial assistance**	Assistance provided	DP	NSCS	USTA
6.1.3.b	**- Establishing web based NSB knowledge sharing platform**	Provided for in 5.1.10.a.4	NSB	NSCS	
6.1.3.c	**-Build the capacity of extension staff in seed knowledge**	Provided for in 3.3.3.b and 4.1.2.a.1			
Strategy 6.1.4- Training and authorising staff of seed companies to undertake quality assurance and certification					
6.1.4.a	**- Train and authorise the staff of seed companies to undertake quality assurance and certification**	Provided for in 5.1.4 and 5.1.5			

Activities		Output Assumptions	Primary Implementing body	Secondary Implementing bodies	
Objective 6.2: To enhance participation by men, women and youth in seed marketing for Quality Declared Seed.					
Strategy 6.2.1 - Promoting inclusiveness in benefit sharing and marketing through the household approach of gender equity;					
6.2.1.a	**- Upscale household approach to more districts**	Provided for in 3.2.1.a			
Strategy 6.2.2 - Promoting adult literacy and seed business skills training to enhance women participation in seed business.					
6.2.2.a	**- Provide skills through LSBs, FOs and FGs.**	Provided for in 3.2.1.a			
6.2.2.b	**- Enhance capacity of trainers using the LSB development manual**	Provide LSB development manual to all LSB	ZARDIs	CSO	

4. IMPACT

NSS is designed to achieve six strategic objectives as indicated in NSP. Given that seed is a basic and foundational input for production, the implementation of the strategies and activities will create impact in a number of areas in the agricultural sector including: (i) ensuring wealth creation and food security (ii) employment opportunities (iii) contributing to conservation of plant genetic resources and adapting to adverse impact of climate change, and (iv) contributing in gender and youth integration, among others (see NSS results chain in section 7.3.)

DSIP and CAADP target 6% annual growth in agriculture and propose that half of this growth should come from better technology, including new varieties. With the implementation of the NSS, it is envisaged that in 2020, the percentage of total area of annual crops planted with quality controlled seed will increase from 15% to 40%. It is also projected that quality controlled planting material (QDPM) for perennial crops will be more available. Improved varieties will reach an additional 16% of planted area by 2019/20 and will boost yields by 20% wherever they reach. This will result in a 3% (15% of cropped area x 20% higher yield) increase in crop production due to better varieties, which is in addition to any increase due to the use of other productivity enhancing inputs such as fertilizer, pesticides, etc. The projected increase in crop production is worth UShs 280 billion (US$100 million) per year by 2019/20, and similar or higher increases thereafter. Although some of this gain must be credited to research and extension in other agro inputs, these calculations suggest satisfactory returns to the estimated Ushs 82 billion investment.

It is also estimated that informal farmer-to-farmer seed exchange will extend improved varieties to an additional 15% of planted area. With these estimates, new and existing improved varieties will reach an additional 20% of planted area. Assuming that with new varieties (from quality controlled seed and farmer-to-farmer exchange) farmers realize a 20% yield increase due to better genetics (this is separate from other yield increases due to use of more fertilizer or other inputs), genetic improvement through expanded sales of improved seeds will add 4% (=20% x 20%) to yields over 5 years, or 0.8% per year

4.1. Wealth creation and food and nutrition security

Implementation of the National Seed Strategy will enhance use of new varieties which will contribute significantly to: increased output for home consumption; improved food and nutrition security; increased household incomes; increased supply and reduced food prices that will increase real incomes and make food more affordable to the poor. Increase in sales of quality seed will contribute significantly to poverty reduction. Women will have more time engage in livelihood activities as they use labour saving technologies. As of 2011, Uganda's seed industry sold an estimated $25 million in seeds and planting materials. The volume of seeds produced expanded by 25% per year in the past decade. We project an increase in seed sales of at least 20% per year amounting to $60 million by 2019/20, which will make Uganda's seed industry one of the most competitive in Africa.

4.2. Employment generation

An effective seed sector will largely depend on more efficient value chains involving lower marketing margin, increased fulltime employment and income will arise from increased post-harvest storage, processing, value addition, marketing, transportation, packaging and handling. This will provide incentives or a competitive agro-based industry. These agro industries will produce diversified food products, thus improving nutrition security. Additionally as youth and women get involved in strategic activities, it will create employment.

4.3. Biodiversity conservation and climate change

The rich agro-biodiversity of Uganda is vital to the development of new farmer-and market-preferred varieties to sustain a competitive seed sector. Continuous use of traditional and other genetic resources for the development of diverse varieties in different regions by public, private and community sectors will contribute to the on-farm maintenance of local diversity. The strengthened support to Uganda PGRC and its collaboration with international organizations involved in implementation of FAO Global Plan of Action for PGRFA Biodiversity will reinforce the position of Uganda as a Global Hot Spot for PGRFA with Uganda wealth in the field mapped, evaluated, risk assessed and annually reported. Development and promotion of small-scale and local seed businesses in each agro ecological zone as envisaged under NSS will contribute to reducing genetic erosion and external dependence. In the context of climate variability, NSS focus on developing and promoting "climate smart" crop varieties (pests, drought, flood and heat tolerant, etc.). The promotion of "climate smart" seed varieties will encourage farming communities to adopt productivity enhancing technologies such as integrated pest management to better adapt to adverse effects of climate change and variability. This will have impact on stabilizing food production and reducing risks of farming communities. Farmers' ability to adapt to climate change depends in part on their access to alternate crops and varieties. Relaxing controls on variety introduction and enhancing the capacity of Uganda's seed industry can help farmers' access suitable crops and varieties from other countries with comparable climates.

4.4. Gender and youth integration

The NSS envisages Gender and youth integration, empowering them as members of farmer groups and/or local seed businesses. Most members of these groups are female and male youths (18-35 years of age). An efficient seed sector will encourage groups to benefit from improving production methods using improved technologies and inputs. Youth farmers may also select other income generating activities (seed multiplication, oxen-ploughing, providing contract agricultural services such as crop protection, marketing, transport, processing, etc.). This will improve efficiency along the entire seed value chain. The employment generated as a multiplier effect will also provide additional employment opportunities to women particularly in post-harvest handling and marketing. Many program

activities, such as demonstrations, some training, and agro-inputs dealer recruitment, will benefit from 20% to 40% for women and youth respectively, depending on the activity.

5. IMPLEMENTATION

5.1. Implementation Mechanism

Efficient and effective seed sector institutions are critical for realising the vision, mission and objectives of the seed policy. To this end, Government will put in place appropriate organizations and strengthen existing ones with strong mandates and ensure that they are adequately resourced to fulfil their roles and responsibilities as envisaged under this policy (see table 6.1 below).

Government will ensure full implementation of the Seeds and Plant Act (2006) to allow the development of the Ugandan Seed sector and propose amendments where needed. The roles of the key public sector organisations in NSS implementation are elaborated below.

MAAIF as the government ministry responsible for agriculture shall be responsible for operationalization of the National Seed Policy (NSP) and enforcement of seed and plant related laws and regulations in the seed industry. The Directorate of Crop Resources with three of its departments (Crop Production and Marketing, Crop Protection, and Crop Inspection and Certification - where NSCS falls) will be responsible for the implementation of the NSS.

The department of **Crop production and Marketing** will indicate strategic crop commodities to focus in and coordinate the needs for seed and other agricultural inputs.

The DCIC, because of its involvement in regulating the commercial activity (seed production and trade), will be responsible for the implementation of the National Seed Policy. The NSCS will be allowed to retain revenue from its services under a complete QMS including financial and accounting procedures, and independent annual budgetary planning inside DCIC. In the medium to long term NSCS will transition into a semi-autonomous status as provided under NSP.

The National Seed Board (NSB) main functions are advising the Ministry on Seed Policy issues and supervising Seed Policy implementation through technical sub-committees. NSB overriding function is to provide regulatory mechanisms to the seed industry. The National Seed Board membership will be reviewed considering the broadened scope of the seed policy compared to the Seed and Plant Act.

National Agricultural Research System (NARS). NARS shall develop new seed technologies. Both public and private institutions will undertake the research and development agenda in a harmonized manner. NARO will continue to be the main supplier of breeder and basic seed to seed merchants. NARO will also be the main maintainer of varieties, backstopping and providing technical advice to extension service and QDS producers. In keeping with the principle of decentralising the delivery of seed sub-sector services, Government will decentralise SQCC services from NSCS Headquarters to zonal

centres and districts and accredit laboratories at Zonal Agricultural Research Institutes (ZARDIs) and NARIs.

Public Institutions with agricultural lands, as police, prisons and army will support NARO efforts in seed production, providing land, agricultural workers and facilities.

Agency Responsible for Extension Services. The Agency responsible for extension (The Single Spine Extension System) once operationalized will be responsible for the promotion and dissemination of the technologies to the farming community. The Agency and NARO's decentralised structures will play an important role in the support to QDS producers, providing required accredited seed testing facilities and technical support in SQCC. As provided under NSP SSES will supports farmer´s groups, including those led by women and youth, and village seed schemes to register as producers of QDS. ZARDIs will continue supporting farmer's groups to constitute small LSBs to produce QDS seed of specific crops for surrounding communities and lead the integration of formal and informal seed systems. The LSBs will lead transformation of the informal seed system.

Uganda National Council of Science and Technology (UNCST). The Uganda National Council for Science and Technology has, within its portfolio, the mandate to encourage Agricultural Research and Development in the country. UNCST is responsible for the registration of private research providers and serves as a forum for discussion of agricultural research related issues, and also provides competitive grants for scientists willing to undertake research programmes. UNSCT is the competent Authority for matters relating to access to genetic resources: processing of all applications for access to genetic resources submitted to it; coordinating all activities of lead agencies relating to access to genetic resources; and establishing and maintaining a depository for all SMTA and Accessory Agreements. Under the Seeds and Plants Act, it is in charge of recommending procedures and protocols to deal with varieties developed through the use of biotechnology.

Universities and Other Academic Institutes. Universities and other institutions that train seed scientists and technologists will play an important role in variety development under the NARS framework and training of seed scientists. They will also continue to play their role in research and plant breeding.

The **Private Seed Companies** plays a critical role in the seed sector and shall continue to do so in promotion of the technologies developed by public institutions through commercial seed production, marketing and distribution. Where they have capacity, and as provided for under the NARS Act, the private sector will also develop new varieties. Private seed companies associations will ensure their members sign up to and practice a code of conduct for self-regulation. The private sector institutions representation in the National Seed Board and ad-hoc committees shall be increased for a bigger involvement in the implementation and monitoring of the National Seed Policy through NSS. Coordination and inclusiveness will be promoted through seed related forums whereby a broad range of stakeholders is able to interact and recommend areas of attention to NSB. Seed companies demonstration fields

will integrate new varieties and associated cropping systems, including other required agricultural inputs for optimum results in the use of quality controlled seed.

CSO and Cultural Institutions will play an important role by supporting the establishment of LSBs and Community Seed Banks, conservation and use of traditional varieties and related traditional knowledge. They will have a primary role in extension of certain seed crops in certain areas through MOU's with NARO. They will participate in competitive grant schemes and multi-stakeholders platforms for the dissemination of Seed technologies. They will also support in-situ conservation of indigenous varieties and the distribution of relief seed. They will be supported in all these tasks through competitive grants that will prioritize CSOs with seed technologist among their staff.

The respective entities will be responsible for the implementation of and reporting on activities in their mandate, as indicated in section 4. For each entity, the first step in implementing the Strategy will involve planning for the activities they are responsible for through their respective plans and strategies. For public institutions, the next step will involve incorporating the plans into the Medium Term Expenditure Framework and annual work plans and budgets to make plain what they are intending to do and as a way of securing funds.

The private sector will be encouraged to invest along the lines identified under this Strategy identifying new business opportunities and supporting stakeholder initiatives. In the case of PPP and PPPP-type implementation arrangements, the relevant public and private parties will agree on the modalities (MOUs and procedures) and steps necessary to undertake a PPP or PPPP including feasibility studies, detailed investment planning, financing arrangements and implementation.

5.2. Implementation Roles and Responsibility

Effective implementation of Seed Sector development requires a sector-wide approach in which the Ministries Departments Agencies (MDA), Cultural Institutions, Civil Society Organisations, Development Partners and the private sector will each have distinct roles to play. Mandates and roles that different institutions will play in the implementation of the National Seed Strategy are summarised in Table 6.2 below.

Table 6.2 Entities roles in NSS activities implementation

Entity	ROLE IN NSS IMPLEMENTATION
Parliament	Enacting proposed Bills - Oversight and amendment of laws
MFPED	- Enable NARO to collect royalties and payments from variety licensing.
OPM	- General Coordination, monitoring and evaluation of the implementation of the NSP through NSS

Entity	ROLE IN NSS IMPLEMENTATION
MAAIF	- MAIIF is the main Institution involved in NSS though its different agencies and Departments - Provide human and material resources to its Departments and Agencies involved in NSS implementation. - Constitute, inaugurate and ensure a functional NSB - Provide platform for involvement of stakeholders in NSS implementation - Seed procurement policies - Coordinate agricultural extension with NARO and CSOs - Organize National and Regional Agricultural Trade Fairs and National Days.
MIA	- Involving local police in fight against fake seed in local markets
MODP	- adopt clear guidelines to supply seed in case of calamities. - MOU between GOU and USTA to build up strategic stocks
MOJCA	- Set up legal framework to raise fines for fake seed marketing
NARO	- Strengthening breeding programs in human and equipment means. - Extending breeding programs to food/nutrition security crops - Adopting policies concerning licensing of new varieties. - Providing staff and facilities for accredited field inspection, seed inspection and seed testing. - MOUs with CSO for extension of seed technologies.
NARIs	- Development of new food security varieties - Production of Basic Seed
ZARDIs	- Supporting NARIs in Basic Seed production - Supporting startups of LSBs, using ISSD methodologies - Accredited for SQCC. - Supporting NARIs in PVS and PPB - Disseminating low cost seed technologies
NPPO	- Checking quality of Seed for international trade.
MAAIF Department of Crop Production and Marketing	- Promoting production of seeds through estimation of demand and preparing of manuals to guide extension workers and farmers
NSB	- Oversight and coordination seed sector - Advising MAAIF in seed Policy matters and NSS implementation - Monitoring the implementation of NSS - Propose seed regulation to MAAIF - Approve procedures for SQCC - Establishing Technical working groups under its technical committee as required in the NSS
NSCS	- Competent in all matters concerning seed production and trade - One of the main institution implementing NSS activities, including training, authorization and accreditation in SQCC; development of regulations and procedures and management of all quantitative and qualitative information pertaining to the seed sector. - It will build capacity of stakeholders in quality seed production, processing and inspection. - It will create awareness on seed policy, seed act, plant variety protection acts and all related regulations.

Entity	ROLE IN NSS IMPLEMENTATION
SSES	- Promoting and disseminating seed related technologies to the farming community - Provide support to LSBs - Support to farmers' groups and village seed schemes to register as producers of QDS. - Support adoption of the use of low cost appropriate seed technologies - Encourage interested farmers to form LSBs
PBA	- Facilitating and controlling PBR royalties payments
PGRC	- Assuring ex-situ and in-situ conservation of PGRFA
SEED COMPANIES	- Upgrading their SQCC skills - Up scaling seed distribution networks - Breeding for new commercial varieties. - Extension of new varieties and cropping systems in Demonstration Fields. - Adopting internal QMS. - Marketing seeds in small packages
UNCST	- Establish clear rules for the import and handling of GMO seed samples - Review procedures on SMTA on genetic resources.
Universities	- Establish Seed Technology degree at Universities
USTA	- Adopting and supervising code of conduct for Seed Companies. - MOUs with MAAIF for cooperation in PP partnership in SQCC. - Supporting development of QMS in Seed Companies
AEATREC	- Developing appropriate seed production technologies
CSO	- Extension Services in coordination with NARO - Support to farmer's groups in LSBs, Community Seed Banks, Conservation varieties and distribution of relief seed. - Integration of women and youth in seed related activities - Promote Local Seed Exchange Fairs
CULTURAL INSTITUTIONS	- Support to farmer's groups in LSBs, Community Seed Banks, and preservation and use of indigenous varieties. - Preservation of traditional knowledge on plant breeding and use of traditional varieties.
DAO (Local Government)	- Extension of seed technologies - Support to CSB and CGB - Support to Local Seed Fairs - Cooperation with NARIs and ZARDIs at local level - Registration of LSBs, FOs, FGs in NSCS as seed merchants and seed dealers
DP	- Financial and technical support through CSO and public Institutions - Participating in joint monitoring and reviews
GoU	- Government Seed procurement policies

Entity	ROLE IN NSS IMPLEMENTATION
LSB	- PVS and PPB - Production of QDS. - Seed marketing of other Certified Classes. As registered seed dealers they will join UNADA to optimize seed distribution. - Marketing of indigenous varieties

6. MONITORING AND EVALUATION

The implementation of this policy will be monitored at various levels. The Ministry level will track broad high-level indicators and performance issues. National Seed Board will have the primary mandate for monitoring and evaluation of the national seed policy while the National Seed Certification Service will deal with strategies and activities. Other stakeholders will monitor and report on activities under their mandates. To guide the monitoring and evaluation of the policy, indicators have been developed and agreed for each level. Periodically the NSB will bring stakeholders together to reflect on the implementation of the policy and make input for improvements. Another important tool to aid monitoring will be the Uganda Seed Sector Integrated Information Management System (USIIMS) and web portal that will be established by the NSCS.

Given the dynamic policy environment both within and outside the country, region and globally, it is imperative to be responsive to this wider policy context. This will be addressed through periodic review of the policy. As the policy is implemented through a seed strategy, issues that arise will be dealt with by revising the strategy, which has a 5-year cycle. The policy as a whole shall be reviewed on a cycle of 10 years.

6.1. Monitoring

Monitoring, Evaluation and Supervision Roles

The Development Strategy and Investment Plan (DSIP) 2010-2015 (currently due for review) was developed, approved and launched by Government of Uganda (GoU) and the Development Partners as the flagship for the agricultural sector to operationalize the NDP I (there is currently a draft NDP II).

The Comprehensive Africa Agriculture Development Programme (CAADP), to which Uganda is a signatory, the country is committed to work towards investment in agriculture at the targeted level of 10% of national budget, to achieve a targeted growth rate of 6% in agriculture and to reduce poverty and hunger through agriculture. Agriculture is expected to contribute to these commitments through DSIP implementation. Hence it is necessary to continuously monitor the contribution and progress towards achieving the objectives and targets in those commitments. In this regard, M&E system and plan for the NSS will be important in providing the policy makers and implementers and other information users with the basis for making informed choices in NSP priorities, allocation of resources against many competing priorities.

One of the mandates of MAAIF is that of monitoring and evaluation the implementation of interventions in the agricultural sector. This requires an efficient and effective mechanism for monitoring and evaluation to be in place at the ministry headquarters, its agencies, programmes and projects. This NSS M&E plan builds on the overall MAAIF M&E capacity that was spelt out in the M&E Framework Implementation Plan for operationalizing the DSIP. MAAIF will fully implemented the M&E FIP to ensure that the sector and sub-sector strategies are effectively monitored and evaluated.

Monitoring and Reporting

A Base Line Survey (BLS) will be done immediately after approval of the NSS by the NSCS. Annual M&E work plans and budgets will be produced by NSCS in conjunction with

departments and agencies involved in the implementation of the NSS. The implementation of the work plans will provide the basis for the M&E Plan to be assessed comprehensively as an important component during the reviews and evaluation of NSS which will be aligned with those of the new DSIP (ASSP) and NDP II. The review of the NSS will be overseen by MAAIF but will involve other actors/stakeholders in a participatory process.

Gender and Youth: In characterizing the indicators in the M&E plan, provision has been made for disaggregation of the data by gender and age for those indicators that relate to people. This requires that all implementing organizations will perceive gender disaggregation as an important way of revealing and understanding the social dimensions of the achievements made taking cognizance of differences that may exist between the gender of farmers, age, farm household heads and beneficiates of NSS in general.

6.2. Evaluation

The NSS will be evaluated at mid-term and final evaluation will be carried out at the end. Joint evaluation involving the implementers and independent external evaluators will conduct both evaluations. The recommendations of the end of NSS evaluation will be used to design the NSS II. Annual joint reviews will be conducted by MAAIF and the information will be used to improve implementation of NSS.

Table 7.1: NSS High level Indicators

Long Term Results 2025					
% of farmers with access to high quality seed and planting materials % of farmers using certified seed % of farmers reporting increased Farm productivity through use of quality seed in the informal system % of farmers producing big surpluses					
Component Indicators					
Component 1: Research and Development	**Component 2: Conservation of Plant Genetic Resources**	**Component 3: Seed Production and Conditioning**	**Component 4: Seed Distribution and marketing**	**Component 5: Seed Quality Control**	**Component 6: Seed Science and Knowledge**
Number of developed new varieties in use	Number of accessions protected, either in-situ or ex-situ	Area planted with quality controlled seed	Number of seed dealers Number of seed agents	- number of official and authorised seed inspectors actively working - number of official and authorised seed analysts actively working	Number of seed scientists and technicians operating in Uganda Number of seed companies with functional QMS

Strategic Objectives Indicators					
Component 1: Research and Development	**Component 2: Conservation of Plant Genetic Resources**	**Component 3: Seed Production and Conditioning**	**Component 4: Seed Distribution and marketing**	**Component 5: Seed Quality Control**	**Component 6: Seed Science and Knowledge**
Number of new varieties under seed production and marketing Number of varieties protected under PBR. Number of private companies supported to develop own varieties Number of food security crop varieties developed through public breeding programs Number of environmentally friendly (climate smart) crop varieties developed Number and type of seed related technologies effectively transferred, disseminated and finally adopted through public and private research and extension service Number of new varieties in regional Common Catalogues being offered for sale in Uganda Replacement rate with breeder/basic seed of QDS production per crop Number of Ugandan breeders that have	Number Community seed banks established and operational Number of Community gen banks established and operational. Number of traditional varieties with IPR Number and % of germplasm accessions controlled at border for Phytosanitary certificate Number of accessions conserved by PGRC Number of high food security value crop varieties conserved by community groups Number of custodian farmers Percent of farmers aware of the need for conservation of varieties	Number of regulations regarding seed production, storage processing, chemical treatment and residues on the Ugandan market that are enforced out of the total approved. Control plots results in term of % of compliant lots as measure of effectiveness of SQCS. -% of formal seed sown by crop Amount of certified seed produced by registered companies by crop Amount of quality seed with high food security value that are produced and marketed by farmers, community groups and local seed businesses Number of new improved environmentally friendly (climate smart) varieties produced. Number of seed classes in Uganda Number of PPB programs initiated Amount of seed adequately stored for emergency in case of localized or national calamities to ensure continued availability of good quality seed Percent of actors in the informal seed system that are aware of the different seed classes in Uganda Percent of farmers using locally adapted indigenous varieties to provide for national food and	Number of seed companies marketing seed in appropriate and affordable packages to promote the use of certified seed by all farmers; Number of seed producers engaged in extension services Number of seed stockists (seed dealers) operating in remote areas Percent of farmers that adopted and are using improved seed varieties Percent of farmers that adopted and are using certified seeds Number of agro-input dealers selling seed Number and type of seeds distributed through non-market mechanisms Number and type of relief seed supplies that are sourced from registered seed producers only and they are of known quality. Number of reputable plant health certificates issued by NPPO	Number of locally produced and imported seeds certified Number of Ugandan crops ISTA certified for regional trade Number of seed companies undertaking internal quality control Number of seed companies in public/private partnership with government for seed quality control Number of functional (ISTA NSCS accredited) centres for field inspection, sampling, testing and labelling Number of seed companies accredited to perform certain certification functions (field inspection, sampling, testing and labelling) Number of national seed laboratories with complete quality management systems as per ISTA standards Number of seed companies with complete quality management Number of registered seed associations Number of registered seed companies and other seed merchants operating under seed associations for purposes of self-regulation to ensure seed quality; Number of accredited entities supervised and monitored by NSCS Number and type of horticultural crops, industrial crops, forestry and other plant species which have no variety maintenance	% Women and youth engaged in Seed business as a profitable enterprise Number of tertiary institutions participating in building skills and human resources in seed science and knowledge Number of diploma and degree graduates of agricultural science trained in seed science Number of graduates of seed science from participating tertiary institutions Percent of graduates of seed science from participating tertiary institutions that are retained at NARO , Seed Companies and CSO Number of public institutions with functional centres for seed research, training and accreditation Percent of households where women and youth derive equal benefit from sharing of household income

Strategic Objectives Indicators					
Component 1: Research and Development	**Component 2: Conservation of Plant Genetic Resources**	**Component 3: Seed Production and Conditioning**	**Component 4: Seed Distribution and marketing**	**Component 5: Seed Quality Control**	**Component 6: Seed Science and Knowledge**
acquired genetic materials from international breeding sources Number of genetic materials acquired through cooperation with international crop development centres Number of seed merchants producing seed of NARO varieties under license		nutrition security; Number of local seed selection and preservation methodologies in use Number of improved affordable and gender friendly technologies in use to support seed multiplication and post-harvest handling; Percent of youth strategically intervening in enhancing availability of quality seed. Percent of women strategically intervening in enhancing availability of quality seed. Percent of other vulnerable groups strategically intervening in enhancing availability of quality seed.	Average time taken to process and issue SPS certificates Number of national regulations harmonized with regional and conventions and protocols on seed production, certification and trade Percent of seed dealers aware of regionally harmonized seed standards	that have been seed certified Number and types of crops with standards for appropriate packaging materials that are in conformity with national and international standards A functional Seed Sector Integrated Information Management System (USSIIMS) and web portal exists at NSCS Type and quality of information relating to the seed sector captured and shared for transparency and accountability by NSCS USSIIMS. Number of traditional and participatory breeding varieties in the National Variety List by crops Number of community seed producers registered by NSCS through local authorities; Number of community seed producers backstopped and supported to develop internal seed quality control mechanisms Number of varieties certified under Quality Declared Seed (QDS) scheme Number of functional zonal centres and/or districts operating delegated and decentralized system for seed inspection for Quality Declared Seed.	Percent of households engaged in seed business Percent of women with agribusiness skills Percent of youth with agribusiness skills Percent of women participating in seed businesses Percent of youth participating in seed businesses

6.3. Results framework

The matrix below presents the results framework for the NSS by component

NSS Results Chain

Components	Intermediate Outcomes	Wider Impact	Assumptions
Component 1: Research and development	• New varieties developed for the market and suitable and safe varieties for food security	- Improved food security and income in farming communities	- All seed regulations approved - NARO breeding programs reviewed
NSS Component 5: Quality Control	• High quality seed availed to farmers • Clear regulations and enforcement systems in place • Increased uptake of improved seeds by farmers • Quality products developed for regional and international markets • Seed users confidence and satisfaction increased	- Increased income of farming households from crop related activities	- Enforcement will be effected by a transformed NSCS
Component 3: Seed Production and conditioning; and component 4: Seed Distribution and marketing	• Quality seed class (QDS) established and seed quality standards set and enforced • Farm productivity increased through use of quality seed • Small holders produce big surpluses—increased yields • Small holders save and accumulate • Small holders increase their scale of household economic production	- Subsistence agriculture households transformed to commercial agriculture - Improved food and nutrition security in Uganda	- Farmers groups interested and supported to establish small local seed business. - Seed companies reinforce their distribution channels and integrate with Farmers Seed systems
NSS Component 6: seed Science and knowledge	• Adequate seed scientists and technicians available to enhance development of seed sub-sector • Skills transferred to all seed systems • Farmer organizations encouraged to market their seeds under QDS • Women and youth engaged in Seed business as a profitable enterprise	- Improved seed security - Employment generation - Quality Seed available.	- NSCS request seed technicians for seed production -CSO contract seed technologies for their seed activities - DP continue support to Universities
NSS Component 2: Conservation of PGR	• Required germplasm exchange takes place • Stocks of genetic plant materials maintained by NARS • Local varieties, indigenous knowledge and practices preserved through community genetic resource management	- National genetic resources preserved for future generations - Climate smart and nutrition security varieties available	- PGR policy strategy and Act adopted

NSS Management (policy and coordination, monitoring and supervision). Capacity building	• A functional NSB • NSCS made a semi-autonomous agency under current legal provisions • Seed regulations finalized and enforced • Stakeholders involved in seed strategy development, and review of seed acts and regulations • Main policy actors in the agricultural sector create sufficient ownership and keep the key actors 'on board' • Improved processes for the formulation and implementation of agricultural policies, strategies, programs, and projects • More cost-effective interventions • Increase in the efficiency of public expenditure		
Monitoring and evaluation (M&E) capacity building of MAAIF by donors	• USIIS functional (up and running) and well maintained. • NSS monitored and evaluated • Increased use of evidence from program evaluations to formulate, refine, adopt, and implement evidence-based policy. • USIIS generates data for public use		

During NSS implementation period, this M&E framework will assist the sector, government and other stakeholders/partners in monitoring and evaluating the performance against agreed NSP goals, objectives and targets as well as GoU commitments to the CAADP and MDG1 goals and identify the factors which contribute positively or negatively to the agricultural service delivery outcomes. Thus, through analysis and interpretation of M&E data and information, the sector will be able to discern the patterns in trends of the tracked indicators on DSIP inputs, activities, outputs, outcomes and impact so that policy makers and key stakeholders can take timely corrective actions in implementation targets, processes, techniques and approaches.

There is large number of diverse stakeholders, programmes, and interventions involved in the implementation of the NSS at national and sub-national levels and this requires a harmonized M&E approach that can ensure that not only similar data are collected on the same indicators and parameters and processed and analysed in a systematic and coordinated manner, but also reporting is streamlined in order to reduce on duplication of efforts, fatigue in reporting and publication of conflicting information. This results framework is prepared to address this.

The purpose of M&E in the implementation of NSS is to facilitate the use of timely, relevant and comprehensive information for supporting coordination and policy, strategic and programme related decision making at policy and programme management and implementation levels. The objectives are to (I) enhance the production of quality monitoring and evaluation data and information on NSP implementation and (ii) promote

increased access, utilization and learning from monitoring and evaluation data and information for coordination and policy, strategic and programmatic decision making.

7. STRATEGY COST

The total budget for the proposed five-year strategy is Uganda Shillings 82 billion to be funded from government appropriation and internally generated resources, private sector and development partners' contributions. The activities are designed according to an implementation matrix, for which budget estimates are generated, based on past experience and estimates of current costs.

The strategy is anticipated to start on July 1, 2015 and close on June 30, 2020. Based on the evidence generated through this strategy and the increased capacity for collective learning for policy process formulation and program design and implementation, it is envisaged that by the end of the strategy, MAAIF will have built a credible case for a sustained increase in annual budget support from the Ministry of Finance, Planning and Economic Development (MoFPED) to implement programs under the NSP and to provide the public services required transform Uganda's agricultural sector from subsistence to commercial.

Table 8.1 summarises the additional funding required to implement the strategy on the top of already existing budget and resources for the implementing state bodies

Table 8.1: Summary of cost by year and component (000 UGX)

STRATEGY COMPONENT	TOTAL 5 Years (000) UGX	Total Year 1 (000) UGX	Total Year 2 (000) UGX	Total Year 3 (000) UGX	Total year 4 (000) UGX	Total Year 5 (000)UGX
COMPONENT 1: RESEARCH AND DEVELOPMENT	24,020,560	10,867,560	4,112,400	3,379,800	2,859,800	2,801,000
COMPONENT 2: CONSERVATION OF PLANT GENETIC RESOURCES	2,349,040	221,600	634,480	577,220	662,620	253,120
COMPONENT 3: SEED PRODUCTION AND CONDITIONNIG	36,730,900	16,013,900	10,495,500	8,500,500	860,500	860,500
COMPONENT 4: SEED DISTRIBUTION AND MARKETING	11,319,560	2,719,560	2,600,000	2,000,000	2,000,000	2,000,000
COMPONENT 5: SEED QUALITY CONTROL	7,046,520	1,344,720	2,194,440	2,124,560	1,089,400	293,400
COMPONENT 6 SEED SCIENCE AND KNOWLEDGE	539,200	186,400	176,400	176,400	0	0
MONITORING AND EVALUATION (3%of the total activity budget) Lump sum	2,460,173					
TOTAL	82,005,780	31,353,740	20,213,220	16,758,480	7,472,320	6,208,020

ANNEX 1: COMPONENT RESULTS FRAMEWORKS

NATIONAL SEED POLICY COMPONENT 1: RESEARCH AND DEVELOPMENT (R&D)

NSP Objectives and Strategies Outcome Indicators	**Unit of measure**	**Baseline**	**Cumulative target value**					Frequency of data collection	**Data sources/ methodology**	**Responsibility for data collection**	**Remarks**
			Year 1	Year 2	Year 3	Year 4	Year 5				
Objective 1.1: To generate new commercial and food security varieties.											
Strategy 1.1.1: Supporting and promoting development and use of new varieties for production and marketing of improved varieties and quality seed											
Number of new varieties developed	Variety	BLS						Annually	NARO reports	NARO	Data disaggregated by crop
Number of new developed varieties released and registered in the National List	Variety	175						Annually	National Variety List	NSCS	
Number of registered new varieties in use	Variety	?						Annually	NSCS SQCC data (USSIMS)	N SCS	
Amount of national funds allocated to plant breeding	UGX	BLS						Annually	MAAIF reports	MAAIF	
Strategy 1.1.2: Providing for Plant Breeders Rights as provided for under the Plant Variety Protection Law											
Number of Varieties protected for PBR	Variety	0						Annually	PVPO	Registrar of PVPO	Data disaggregated by crop
Strategy 1.1.3: Supporting private companies to develop their own varieties											
Number of private companies supported by NARO to develop own varieties	Company	0						Annually	NARO reports	NARO	Data disaggregated by crop
Strategy 1.1.4: Monitoring of variety maintenance by NSCS											
Number of control plots	Control plot	0						Seasonally	NSCS control plots report	NSCS	Data disaggregated by crop
Strategy 1.1.5: Supporting the development of food security crop varieties through public breeding programmes											
Number of food security crop varieties developed through public breeding programs	Variety	BLS						Annually	NARO reports	NARO	Data disaggregated by crop
Number of environmentally friendly (climate smart) plant genetic resources developed	Plant genetic resources	BLS						Annually	NARO Reports	NARO	
Strategy 1.1.6: Strengthening modalities for coordination of public and private research and extension service providers for effective transfer and dissemination of seed related technologies											

NSP Objectives and Strategies Outcome Indicators	Unit of measure	Baseline	Cumulative target value					Frequency of data collection	Data sources/ methodology	Responsibility for data collection	Remarks
			Year 1	Year 2	Year 3	Year 4	Year 5				
Number and type of seed related technologies effectively transferred and disseminated through public and private research and extension service	Technology	BLS						Annually	AEATREC Reports	SSES	
Strategy 1.1.7: Reviewing variety evaluation, release and registration processes to promote regional harmonisation and effective release and popularisation of new varieties											
Number of new varieties released under regionally harmonized procedures and effectively popularized through regional processes	Variety	0						Annually	NSB audit	NSCS	
Strategy 1.1.8: Promoting QDS producers' access to basic seed for crops and varieties to be subsequently multiplied for seed production											
Number of QDS producers with sufficient quantities of basic seed for crops and varieties	QDS producer	0						Annually	NSCS SQCC data	NSCS	
Strategy 1.1.9: Supporting Ugandan breeders to source genetic materials from international breeding institutes and /or from other countries											
Number of Ugandan breeders that have acquired genetic materials from international breeding sources	Ugandan breeder	BLS						Annually	NARO reports	PGRC	
Strategy 1.1.10: Enhancing the cooperation with international crop development centres including the Consultative Group for International Agricultural Research (CGIAR to access new varieties											
Number of new varieties acquired through cooperation with international crop development centres	Variety	BLS						Annually	NARO reports	PGRC	
Strategy 1.1.11: Developing a system, which enables different rights on public varieties through exclusive rights, shared rights, or any other inclusive system that is deemed most beneficial to increase the adoption rates of new varieties by farmers?											
Number of seed merchants with different rights on public varieties to increase the adoption rates of new varieties by farmers.	Seed merchant	BLS						Annually	NARO reports	NARO	

NATIONAL SEED POLICY COMPONENT 2: CONSERVATION OF PLANT GENETIC RESOURCES

NSP Objectives and Strategies Outcome Indicators	**Unit of measure**	**Baseline**	**Cumulative target value**					Frequency of data collection	**Data sources/ methodology**	**Responsibility for data collection**	**Remarks**
			Year 1	Year 2	Year 3	Year 4	Year 5				
Objective 2.1: To sustainably utilise and protect Uganda's national plant genetic resources from destruction by natural and human activities and unauthorised access.											
Strategy 2.1.1: Providing for exchange of germplasm for crop research and development purposes, while avoiding introduction of seed borne pests and diseases and undesirable plant genes that could affect agricultural production and productivity;											
Number of acquired germplasm that are free from seed borne pests and diseases and undesirable plant genes that could affect agricultural production and productivity;	Germplasm accession	BLS						Annually	NARO reports NPPO reports	NPPO	
Strategy 2.1.2: Ensuring that the National Agricultural Research System (NARS) maintains stocks necessary for the conservation of introduced and local plant genetic material and improved varieties to provide for seed security and to mitigate against natural disasters											
Number of stocks of introduced and local plant genetic material and improved varieties maintained by NARS for conservation, seed security and to mitigate against natural disasters	Stock	BLS						Annually	NARO reports	NARO	
Strategy 2.1.3: Promoting and building capacity of farmer and community groups including those led by women or youth to conserve crop varieties that have a high food security value.											
Number of high food security value crop varieties conserved by community groups	Variety	BLS						Annually	NARO and PGRC reports and NSCS SQCC data	NSCS	Data disaggregated by crop
Objective 2.2: To promote the conservation of local varieties, indigenous knowledge, and practices through community genetic resource management.											
Strategy 2.2.1: Supporting the development of community seed banks;											
Number of functional community seed banks	Community seed bank	BLS						Annually	NARO	ZARDIS	Data disaggregated by crop and agro-ecological zone
Strategy 2.2.2: Supporting the mapping and creation of variety registers within communities and at national level;											
Number of up to date variety registers at: a) community level	Register of varieties	BLS						Annually	PGRC reports	PGRC	Data disaggregated by agro-ecological zones
b) national level	National List of	N									

NSP Objectives and Strategies Outcome Indicators	**Unit of measure**	**Baseline**	**Cumulative target value**					Frequency of data collection	**Data sources/ methodology**	**Responsibility for data collection**	**Remarks**
			Year 1	Year 2	Year 3	Year 4	Year 5				
	traditional varieties										
Strategy 2.2.3: Promoting the protection and preservation of indigenous knowledge of local varieties and effectively protecting the intellectual property rights of local communities on traditional varieties and traditional breeding under a new legal framework;											
Number of local varieties protected and preserved through intellectual property rights	Variety	0						Annually	PVPO	Registrar PVPO	Data disaggregated by crop
Strategy 2.2.4: Supporting promotion of crop diversity through custodian farmers;											
Number of custodian farmers	Custodian farmer	BLS						Annually	PGRC NSCS National List	PGRC ZARDIs NSCS	Data disaggregated by agro-ecological zones
Strategy 2.2.5: Creating awareness on conservation varieties.											
Percent of farmers aware of the need for conservation of varieties	% farmer							At evaluation	NSB survey	NSCS and consultant	Data disaggregated by agro-ecological zones

NATIONAL SEED POLICY COMPONENT 3: SEED PRODUCTION AND CONDITIONING

NSP Objectives and Strategies Outcome Indicators	**Unit of measure**	**Baseline**	**Cumulative target value**					Frequency of data collection	**Data sources/ methodology**	**Responsibility for data collection**	**Remarks**
			Year 1	Year 2	Year 3	Year 4	Year 5				
Objective 3.1: To multiply and market high quality seed under the formal seed system.											
Strategy 3.1.1: Ensuring enforcement of all regulations regarding seed production, storage processing, chemical applications and residues on the Ugandan market to create an international reputation for the country as a good source of seed.											
Number of regulations regarding seed production, storage processing, chemical applications and residues on the Ugandan market that are enforced	Regulation	BLS						Annually	NSB audit	NSCS NPPO	
Strategy 3.1.2: Building and strengthening existing seed certification system and quality control for seed production, conditioning, and testing for locally produced and imported seed.											
Effective seed certification system and quality control in place for seed production, conditioning, and testing for locally produced and imported seed.	Y/N	N						Annually	NSCS database	NSCS	
Number and type of locally produced and imported seed that are produced, conditioned and tested through the NSCS	MT	6,400 (Certified Maize hybrid)						Annually	NSCS database	NSCS	Disaggregated by crop, class , origin and total
Objective3. 2: To increase the availability of and access to quality seed of preferred varieties to complement those produced under the formal seed system.											
Strategy 3.2.1: Promoting and building capacity of farmers, community groups and local seed businesses to produce and market quality seed with the focus on crops and varieties that have a high food security value;											
Amount of quality seed with high food security value that are produced and marketed by farmers, community groups and local seed businesses	MT	BLS						Annually	NARO for varieties NSCS informal system data	NSCS NARO	Disaggregated by crop and total
Number of new improved environmentally friendly (climate smart) varieties produced	Variety	BLS						Annually	NSCS database	NSCS	
Strategy 3.2.2: Providing for Quality Declared Seed class											
QDS class certified in Uganda	Y/N	N						Annually	NSCS database	NSCS	
QDS produced	MT	0						Seasonally	NSCS database	NSCS	Disagregation by crop and producer
Strategy 3.2.3: Supporting and strengthening linkages between seed research and plant breeding programs and farmer groups producing and marketing food security crops;											

NSP Objectives and Strategies Outcome Indicators	**Unit of measure**	**Baseline**	**Cumulative target value**					Frequency of data collection	**Data sources/ methodology**	**Responsibility for data collection**	**Remarks**
			Year 1	Year 2	Year 3	Year 4	Year 5				
Number of seed research and plant breeding programs linked with farmer groups producing and marketing food security crops;	Programme	BLS						Annually	NARO reports	NARIs	
Strategy 3.2.4: Promoting participatory research and variety improvement to increase productivity and market development of farmer preferred varieties											
Number of farmer preferred varieties produced and marketed through participatory research and variety improvement	Variety	BLS						Annually	NSCS database	NSCS	
Strategy 3.2.5: Providing for emergency seed supplies in case of localised or national calamities to ensure continued availability of good quality seeds											
Amount of seed adequately stored for emergency in case of localized or national calamities to ensure continued availability of good quality seed	MT	BLS						Annually	MODP data	MODP	Data disaggregated by crop and district
Strategy 3.2.6: Promoting awareness on the different seed classes in Uganda via tools that effectively reach all actors in the informal seed system including women											
Percent of actors in the informal seed system that are aware of the different seed classes in Uganda	% actor	BLS						At evaluation	NSB Survey	NSCS and External Consultant	Data disaggregated by stakeholder group
Objective 3.3: To enhance the production of quality seed within the informal system.											
Strategy 3.3.1: Promoting participatory breeding and plant variety selection;											
Number and type of seed varieties bred and selected through participatory processes	Variety	0						Annually	NARO reports	NARIs	Data disaggregated by crop
Strategy 3.3.2: Promoting the development and use of locally adapted indigenous varieties, to provide for national food and nutrition security											
Percent of farmers using locally adapted indigenous varieties to provide for national food and nutrition security;	% farmer	BLS						At evaluation	NSCS	NSCS and External Consultant	Data disaggregated by crop
Strategy 3.3.3: Promoting local seed selection and preservation methodologies											
Number of local seed selection and preservation methodologies in use	methodology	BLS						Annually	PGRC and NARO reports	PGRC and ZARDIs	Data disaggregated by crop
Strategy 3.3.4: Promoting the introduction of improved affordable and gender friendly technologies to support seed multiplication and post-harvest handling											
Number of improved affordable and gender	Technolog	BLS						Annually	AEATREC	ZARDIs	

NSP Objectives and Strategies Outcome Indicators	**Unit of measure**	**Baseline**	**Cumulative target value**					Frequency of data collection	**Data sources/ methodology**	**Responsibility for data collection**	**Remarks**
			Year 1	Year 2	Year 3	Year 4	Year 5				
friendly technologies in use to support seed multiplication and post-harvest handling;	y								reports	SSES	
Strategy 3.3.5: Facilitating youth, women and other vulnerable groups to strategically intervene in enhancing availability of quality seed.											
Per cent of youth strategically intervening in enhancing availability of quality seed.	% youth							At evaluation	NSB Survey	NSCS and External Consultant	
Percent of women strategically intervening in enhancing availability of quality seed.	% women							At evaluation	NSB Survey	NSCS and External Consultant	
Percent of other vulnerable groups strategically intervening in enhancing availability of quality seed.	% group							At evaluation	NSB Survey	NSCS and External Consultant	

NATIONAL SEED POLICY COMPONENT 4: SEED DISTRIBUTION AND MARKETING

NSP Objectives and Strategies Outcome Indicators	**Unit of measure**	**Baseline**	**Cumulative target value**					Frequency of data collection	**Data sources/ methodology**	**Responsibility for data collection**	**Remarks**
			Year 1	Year 2	Year 3	Year 4	Year 5				
Objective 4.1: To increase the uptake of certified and QDS seed by farmers											
Strategy 4.1.1: Encouraging seed companies to market seed in appropriate and affordable packages to promote the use of certified seed by all farmers											
Number of seed companies marketing seed in appropriate and affordable packages to promote the use of certified seed by all farmers;	Seed company	BLS						Quarterly	NSCS database	NSCS	
Strategy 4.1.2: Strengthening extension services to promote the use of quality seed											
Number of seed producers engaged in extension services	Seed producers	BLS						Annually	USTA survey	USTA	
Strategy 4.1.3: Supporting seed marketing outlets in remote areas by encouraging establishment of network of seed stockists											
Number of seed stockists operating in remote areas	Seed stockists	BLS						Annually	USTA survey	USTA	
Strategy 4.1.4: Supporting farmers' adoption and use of seed of improved varieties and guiding the transformation to increased use of these varieties with the ultimate end of adopting certified seed;											
Percent of farmers that adopted and are using improved varieties	% farmer	BLS						At evaluation	NSCS	NSCS and External Consultant	Data disaggregated by crop
Percent of farmers that adopted and are using certified seeds	% farmer	BLS						At evaluation	NSCS	NSCS and External Consultant	Data disaggregated by crop
Strategy 4.1.5: Supporting non-market seed distribution mechanisms for informal seed system including emphasis on networks for seed distribution											
Number of seed dealers	Seed dealers	BLS						Annually	NSCS database	NSCS	Data disaggregated by district and agro ecological zone
Number and type of seeds distributed through non-market mechanisms	MT	BLS						Annually	NSCS database	NSCS	Data disaggregated by crop
Strategy 4.1.6: Strengthening modalities for coordination of public and private seed extension services and other support services to the seed value chains;											
Seed merchants receiving extension and other support services	Seed merchants	BLS						Annually	USTA survey	USTA	

NSP Objectives and Strategies Outcome Indicators	**Unit of measure**	**Baseline**	**Cumulative target value**					Frequency of data collection	**Data sources/ methodology**	**Responsibility for data collection**	**Remarks**
			Year 1	Year 2	Year 3	Year 4	Year 5				
Strategy 4.1.7: Ensuring that relief seed supplies are sourced from registered seed producers only and that they are of known quality.											
Amount of relief seed supplies that are sourced from registered seed producers only and they are of known quality.	MT							Quarterly	MODP reports	MODP	Data disaggregated by crop
Objective 4. 2: To enhance Uganda's competitiveness in regional and international seed trade											
Strategy 4.2.1: Enhancing the capacity of National Plant Protection Organization (NPPO) to issue reputable plant health certificates;											
Number of reputable plant health certificates issued by NPPO	Certificate	BLS						Annually	NPPO database	NPPO	
Strategy 4.2.2: Reducing processing time including providing one-stop service centres for issuance of export and import documentation and control or provision of online system for expediting the issuance of SPS certificates;											
Average time taken to process and issue SPS certificates	day	BLS						Annually	NSCS database	NPPO	
Strategy 4.2.3: Providing for harmonization of national regulations with regional and international conventions and protocols on seed production, certification and trade, including inter-agency seed certification, use of standard protocols on variety protection, common quarantine-pest list, variety catalogue, import/export documents											
Number of national regulations harmonized with regional and conventions and protocols on seed production, certification and trade	Regulation	BLS						Annually	NSB audit	NSCS	
Strategy 4.2.4: Enhancing capacity in terms of personnel and provide for minimum facilities at high risk entry points (laboratories, visual inspection kits, refrigerators);											
Number of high risk entry points operating with minimum facilities and personnel	NPPO	BLS						Annually	NSCS database	NPPO	
Strategy 4.2.5: Promoting awareness on regionally harmonized seed standards.											
Percent of seed dealers aware of regionally harmonized seed standards	% Seed dealers	BLS						At evaluation	NSB survey	NSCS and external consultant	

National Seed Policy Component 5: Seed Quality Control

NSP Objectives and Strategies Outcome Indicators	**Unit of measure**	**Baseline**	**Cumulative target value**					Frequency of data collection	**Data sources/ methodology**	**Responsibility for data collection**	**Remarks**
			Year 1	Year 2	Year 3	Year 4	Year 5				
Objective 5. 1: To ensure quality control along the formal seed value chain.											
Strategy 5.1.1: Strengthening and enforcing existing seed certification (quality control, seed testing, labelling, etc.) for locally produced and imported seed;											
Number of locally produced certified seed	MT	6,400						Annually	NSCS database	NSCS	Data disaggregated by crop
Number of imported seed with OECD and ISTA certificates.	MT	BLS						Annually	NSCS database	NSCS	
Strategy 5.1.2: Training and supporting staff of seed companies to undertake internal quality control;											
Number of seed companies seed company staff trained for internal quality control	Person	BLS						Annually	USTA data	USTA	
Strategy 5.1.3: Establishing public/private partnership for seed quality control											
Number of seed companies in public/private partnership with government for seed quality control	Seed company	0						Annually	NSCS database	NSCS	
Strategy 5.1.4: Establishing procedures of accreditation for field inspection, sampling, testing and labelling;											
Number of functional NSCS accredited entities field inspection,	Entity	0						Annually	NSCS database	NSCS	Data disaggregated by crop group
Number of functional NSCS accredited entities for seed testing and sampling	Entity	0						Annually	NSCS database	NSCS	
Number of functional NSCS accredited entities for labelling	Entity	0						Annually	NSCS database	NSCS	
Strategy 5.1.5: Strengthening the quality management systems of seed companies and national seed laboratories;											
Number of seed laboratories with ISTA quality management system	Seed testing laboratory	1						Annually	NSCS database	NSCS	
Number of seed companies with quality management system	Seed companies	BLS						Annually	USTA data	USTA	
Strategy 5.1.6: Encouraging all registered seed companies and other seed merchants to join seed associations for purposes of self-regulation to ensure seed quality;											
Number of registered seed associations	Seed association	1						Annually	NSCS database	NSCS	
Number of registered seed companies and other	Seed	BLS						Annually	USTA/NSCS	USTA/NSCS	

NSP Objectives and Strategies Outcome Indicators	Unit of measure	Baseline	Cumulative target value					Frequency of data collection	Data sources/ methodology	Responsibility for data collection	Remarks
			Year 1	Year 2	Year 3	Year 4	Year 5				
Seed merchants operating under seed associations for purposes of self-regulation to ensure seed quality;	merchant										
Strategy 5.1.7: Supervising and monitoring of the accredited entities by NSCS;											
Number of accreditation audits performed by NSCS	Entity	0						Annually	NSCS database	NSCS	
Strategy 5.1.8: Develop modalities for seed certification of horticultural crops, industrial crops, forestry and other plant species which have no variety maintenance											
Number of seed certified for horticultural crops, industrial crops, forestry and other plant species, which have no variety maintenance.	MT	0						Annually	NSCS database	NSCS	Disaggregate data by crop group
Strategy 5.1.9: Setting standards for appropriate packaging materials for various crops in conformity with national and international standards											
Number and types of crops with standards for appropriate packaging materials that are in conformity with national and international standards	Crop	0						Annually	NSCS database	NSCS	
Strategy 5.1.10: Establishing a Seed Sector Integrated Information Management System (SSIIMS) and web portal at NSCS to capture and share critical information relating to the seed sector for transparency and accountability.											
A functional Seed Sector Integrated Information Management System (SSIIMS) and web portal exists at NSCS	Y/N	N						In year 2	NSCS reports	NSCS	
All seed regulated information available on line	Y/N	N						Annually	USSIMS	NSCS	
Number of times site is visited monthly by public for information	Visit	0						Daily	USSIMS	NSCS	
Objective 5. 2: To ensure quality control along the value chain for Quality Declared Seed.											
Strategy 5.2.1: Providing for listing of traditional and participatory breeding varieties											
Number and type of traditional and participatory breeding varieties listed	Variety	0						Annually	NSCS database	NSCS	
Strategy 5.2.2: Registering community seed producers by NSCS through local authorities											
Number of community seed producers registered by NSCS through local authorities;	Seed merchant	0						Annually	NSCS database	DAOs	
Strategy 5.2.3: Supervising and technical backstopping to community seed producers and support to the development of internal seed quality control mechanisms for seed producers											

NSP Objectives and Strategies Outcome Indicators	**Unit of measure**	**Baseline**	**Cumulative target value**					Frequency of data collection	**Data sources/ methodology**	**Responsibility for data collection**	**Remarks**
			Year 1	Year 2	Year 3	Year 4	Year 5				
Number of community seed producers backstopped and supported to develop internal seed quality control mechanisms;	Community seed producers	BLS						Quarterly	NARO reports	ZARDIs	
Strategy 5.2.4: Establishing seed traceability system for Quality Declared Seed											
Regulations for Quality Declared Seed	Y/N	N						Annually	Seed regulations	NSCS	
Strategy 5.2.5: Establishing a delegated and decentralised system at zonal and/or district level for seed inspection for Quality Declared Seed.											
Number of functional zonal centres and/or districts operating delegated and decentralized system for seed inspection for Quality Declared Seed.	Zonal centres	0						Annually	NSCS database	NARO	

National Seed Policy Component 6: Seed Science and Knowledge

NSP Objectives and Strategies Outcome Indicators	**Unit of measure**	**Baseline**	**Cumulative target value**					Frequency of data collection	**Data sources/ methodology**	**Responsibility for data collection**	**Remarks**
			Year 1	Year 2	Year 3	Year 4	Year 5				
Objective 6.1: Develop human resource for the seed sector development.											
Strategy 6.1.1: Supporting tertiary institutions to introduce and develop seed science based knowledge for building skills and human capacities;											
Number of tertiary institutions participating in building skills and human resources in seed science and knowledge	Tertiary institution	1						Annually	MAAIF /AGRA Reports	MAAIF	
Number of diploma and degree graduates of agricultural science trained in seed science	Graduate	BLS						Annually	MAAIF reports	MAAIF/DLG	
Number of graduates of seed science from participating tertiary institutions	Graduate	BLS						Annually	MAAIF /AGRA Reports	MAAIF	Data disaggregated by degree type
Percent of graduates of seed science from participating tertiary institutions that are retained at NARO	Graduate	BLS						Annually	MAAIF /NARO Reports	MAAIF/NARO	
Percent of graduates of seed science from participating tertiary institutions that are retained at Seed Companies	Graduate	BLS						Annually	USTA survey	USTA	
Percent of graduates of seed science from participating tertiary institutions that are retained at CSO	Graduate	BLS						Annually	NSB survey	NARO-CSO	
Strategy 6.1.2: Supporting the development of seed science centres at public universities for seed research, training and accreditation purposes;											
Number of public universities with functional centres for seed research, training and accreditation	University	1						Annually	Public Universities offer	NSSWG	
Strategy 6.1.3: Providing technical and financial assistance, human capacity development to seed institutions along the seed value chain;											
Number of seed institutions along the seed value chain with adequate financial and human capacity	Institution	BLS						Annually	NSB survey	NSSWG	
Strategy 6.1.4: Training and authorising staff of seed companies to undertake quality assurance and certification											
Number of seed companies undertaking quality assurance and certification	Seed companies	0						Annually	NSCS database	NSCS	
Objective 6.2: To enhance participation by men, women and youth in seed marketing for Quality Declared Seed.											

NSP Objectives and Strategies Outcome Indicators	**Unit of measure**	**Baseline**	**Cumulative target value**					Frequency of data collection	**Data sources/ methodology**	**Responsibility for data collection**	**Remarks**
			Year 1	Year 2	Year 3	Year 4	Year 5				
Strategy 6.2.1: Promoting inclusiveness in benefit sharing and marketing through the household approach of gender equity;											
Percent of households where women and youth derive equal benefit from sharing of household income	% household							At evaluation	NSB survey	NSCS and consultant	
Strategy 6.2.2: Promoting agricultural extension in agri-business skills and enterprise development for seed business and ensuring women and youth derive equal benefits from this service provision											
Percent of households engaged in seed business	% household							At evaluation	NSB survey	NSCS and consultant	
Percent of women with agribusiness skills	% women							At evaluation	NSB survey	NSCS and consultant	
Percent of youth with agribusiness skills	% youth							At evaluation	NSB survey	NSCS and consultant	
Strategy 6.2.3: Promoting adult literacy and seed business skills training to enhance women participation in seed business.											
Percent of women participating in seed businesses	% women							At evaluation	NSB survey	NSCS and consultant	
Percent of youth participating in seed businesses	% youth							At evaluation	NSB survey	NSCS and consultant	

ANNEX 2: DETAILED COSTING (000 UGX)

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
COMPONENT 1: RESEARCH AND DEVELOPMENT								
Objective 1.1: To generate new commercial and food security varieties								
Strategy 1.1.1 - Supporting and promoting development and use of new varieties for production and marketing of improved varieties and quality seed;								
1.1.1.a	**- Strengthen the link between farmers and NARO through increased involvement of NARO in dissemination of its own technology.**							
1.1.1.a.1	- Farmers visit NARO adaptability trials.	2 annual Visits per NARI and ZARDI	240,000	48,000	48,000	48,000	48,000	48,000
1.1.1.a.2	- Support ZARDIs to establish PVS fields	50 PVS field at LSB per year	0	0	0		0	0
1.1.1.a.3	- Establish an effective communication strategy to reach all farmers	Communication strategy in place	1,960	1,960	0	0	0	0
1.1.1.a.4	- Institutionalize a framework of cooperation between NGOs and–Researchers through MOUs to promote the uptake of new varieties of crops in specific areas through the extension service)	10 MOUs	0	0	0	0	0	0
1.1.1.a.5	- Provide information on new varieties to all actors	provided for in 5.1.10.A						
1.1.1.b	**-Increase the of demonstration fields set up by Seed Companies.**	10 per company	600,000	120,000	120,000	120,000	120,000	120,000
1.1.1.c	**- Organise biannual Regional Agricultural Trade Fairs.**	2 per Agro ecological Zone	1,400,000	0	350,000	350,000	350,000	350,000

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
1.1.1.d	**-Incorporate a budget for dissemination in every NARO project as a policy and practice.**	1 policy adopted	0	0	0	0	0	0
1.1.1.e	**- Provide human and material support for NARO plant breeding at NARIs**							
1.1.1.e.1	**- Enhance human resource to reach a minimum of 1 breeder per crop**	1 breeder per each for 15 crops	9,000,000	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000
1.1.1.e.2	**- Incorporate plant pathologists and Soils Scientists in breeding teams**	2 persons at each NARI	1,080,000	216,000	216,000	216,000	216,000	216,000
1.1.1.e.3	**- provide 1 vehicle (pick up) per breeding programme**	1 per program	1,400,000	1,400,000	0	0	0	0
1.1.1.e.4	**- Provide equipment and consumables for laboratory, plant pathology and food science**	1 per NARI	5,250,000	5,250,000	0	0	0	0
1.1.1.e.5	**- Hire laboratory analysts for plant health and food science**	2 per NARI	720,000	144,000	144,000	144,000	144,000	144,000
1.1.1.e.6	**- Construct screen houses**	1 per NARI and ZARDI	1,008,000	1,008,000	0	0	0	0
1.1.1.e.7	**- Establish weather stations at NAROS Centres**	1 per NARO Centre and satellite	72,800	37,800	35,000	0	0	0
Sub-total strategy 1.1.1			20,772,760	10,025,760	2,713,000	2,678,000	2,678,000	2,678,000
Strategy 1.1.2 - Providing for Plant Breeders Rights as provided for under the Plant Variety Protection Law;								
1.1.2.a	**- Support plant Breeders Association to address issues of implementing PBR rights as provided under the PVP Act.**	1 month consultancy per year	235,200	58,800	58,800	58,800	58,800	0
1.1.2.b	**- Operationalize PVP Act**							
1.1.2.b.1	**- Set up institutions under PVP Act**	Set institutions	0	0	0	0	0	0
1.1.2.b.2	**- Develop PVP regulations and develop procedures**	2 months consultancy in year 2	117,600	0	117,600	0	0	0
1.1.2.c	**- Sign a MOU between PBA and NARO to monitor the implementation of PVP Act on a regional basis.**	1 MOU	0	0	0	0	0	0
Sub-total strategy 1.1.2			352,800	58,800	176,400	58,800	58,800	0

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
Strategy 1.1.3 - Supporting private companies to develop their own varieties;								
1.1.3.a	**- Government to concentrate on orphaned crops and start supporting the entry of private breeding in maize and other commercially profitable crops**							
1.1.3.a.1	NARO providing segregating materials of maize to private companies	Companies receiving materials	0	0	0	0	0	0
1.1.3.a.2	- Authorize NARO to charge and retain royalty per kilo of Basic seed sold under exclusivity rights	NARO collects royalties	0	0	0	0	0	0
Sub-total strategy 1.1.3			0	0	0	0	0	0
Strategy 1.1.4 - Monitoring of variety maintenance by NSCS								
1.1.4.a	**Provide NSCS with land, human resources and other materials to establish post-control plots**	Under component 5						
1.1.4.b	**- Repair cold chamber at NSCS**	Under Component 5						
Sub-total strategy 1.1.4			0	0	0	0	0	0
Strategy 1.1.5 - Supporting the development of food security crop varieties through public breeding programmes								
1.1.5 a	**MAAIF and NARO to establish list of 10 priority crops (ALL FOOD SECURITY CROPS and review the list annually**	10 crops identified	0	0	0	0	0	0
Sub-total strategy 1.1.5			0	0	0	0	0	0
Strategy 1.1.6 -Strengthening modalities for coordination of public and private research and extension service providers for effective transfer and dissemination of seed related technologies;								
1.1.6.a	**-Produce Seed production manuals per crop translated into the 5 main local languages and disseminate to end users.**	10 Crop Seed production manuals (400 copies each)	200,000	40,000	40,000	40,000	40,000	40,000
1.1.6.b	**- Establish a Resource Centre at every NARI, ZARDI and Satellite Stations, (55) for dissemination of agricultural knowledge to facilitate farmers access to extension materials**	55 Technology parks	1,100,000	300,000	800,000	0	0	0

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
1.1.6.c	**- Facilitate Multi stakeholders platforms for food crop seed**	Annual meeting	100,000	20,000	20,000	20,000	20,000	20,000
Sub-total strategy 1.1.6			1,400,000	360,000	860,000	60,000	60,000	60,000
Strategy 1.1.7 -Reviewing variety evaluation, release and registration processes to promote regional harmonization and effective release and popularization of new varieties								
1.1.7.a	**- Review Release and Registration procedures**	1 review in first year	0	0	0	0	0	0
1.1.7.b	**- Approve procedures for variety release**	Approve in first year	0	0	0	0	0	0
Sub-total strategy 1.1.7			0	0	0	0	0	0
Strategy 1.1.8 -Promoting QDS producers' access to basic seed for crops and varieties to be subsequently multiplied for seed production								
1.1.8.a	**- Decentralize basic seed production to the ZARDIs**	ZARDIs producing basic seed	0	0	0	0	0	0
1.1.8.b	**- Support LSB, farmers organizations and farmer groups in seed production planning (request seed 6 months in advance)**	LSB, Farmers Organizations and Farmers Groups with annual seed production plans	900,000	360,000	300,000	240,000	0	0
Sub-total strategy 1.1.8			900,000	360,000	300,000	240,000	0	0
Strategy 1.1.9 -Supporting Ugandan breeders to source genetic materials from international breeding institutes and /or from other countries								
1.1.9.a	**- Document entry of genetic materials from international breeding institutes and /or from other countries to monitor possible constraints**	Documenting system	0	0	0	0	0	0
Sub-total strategy 1.1.9			0	0	0	0	0	0
Strategy 1.1.10 -Enhancing the cooperation with international crop development centres including the Consultative Group for International Agricultural Research (CGIAR to access new varieties								
1.1.10.a	**- Facilitate scientist to participate in annual international crop development fora.**	5 scientist attending international fora	315,000	63,000	63,000	63,000	63,000	63,000
1.1.10.b	**- Organize one international development forum in Uganda during the 3rd year of NSS implementation**	1 International development forum	280,000	0	0	280,000	0	0
Sub-total strategy 1.1.10			595,000	63,000	63,000	343,000	63,000	63,000

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
Strategy 1.1.11 -Developing a system which enables different rights on public varieties through exclusive rights, shared rights or any other inclusive system that is deemed most beneficial to increase the adoption rates of new varieties by farmers								
1.1.11.a	**- Introduce limitations to exclusive licensing in case of national interest**	NARO adopts "limitation clause" in licensing agreement	0	0	0	0	0	0
1.1.11.b	**- In addition to maize, expand to 12 the number of crops covered by the agreement (COMESA crops).**	Crops with agreements	0	0	0	0	0	0
1.1.11.c	**- Ensure agreement on exclusivity includes compensation (one time or milestone payments)**	NARO adopts "compensation clause" in licensing agreement	0	0	0	0	0	0
Sub-total strategy 1.1.11			0	0	0	0	0	0
TOTAL COMPONENT 1			24,020,560	10,867,560	4,112,400	3,379,800	2,859,800	2,801,000
COMPONENT 2: CONSERVATION OF PLANT GENETIC RESOURCES								
Objective 2.1: To sustainably utilize and protect Uganda's national plant genetic resources from destruction by natural and human activities and unauthorized access.								
Strategy 2.1.1 -Providing for exchange of germplasm for crop research and development purposes, while avoiding introduction of seed borne pests and diseases and undesirable plant genes that could affect agricultural production and productivity								
2.1.1.a	**Enact PGR Bill**	Following National PGR policy and strategy, provided for under 2.1.1.a						
2.1.1.a.1	Support the drafting of the PGRFA Bill	1 Stakeholder Workshop	20,000	20,000	0	0	0	0
2.1.1.a.2	Send Bill to Parliament for enactment	Bill becomes an Act	0		0	0	0	0
2.1.1.b	**- Establish clear rules for the import and handling of GMO seed samples.**	Approved procedures in place	0	0	0	0	0	0
2.1.1.c	**-Review SMTA procedures on genetic resources.**	Approved procedures in place	0	0	0	0	0	0
Sub-total strategy 2.1.1			20,000	20,000	0	0	0	0

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
Strategy 2.1.2 -Ensuring that the National Agricultural Research System (NARS) maintains stocks necessary for the conservation of introduced and local plant genetic material and improved varieties to provide for seed security and to mitigate against natural disasters								
2.1.2.a	**- Formulate National Policy and Strategy for Plant Genetic Resources**	National Policy and Strategy for PGR in place	0	0	0	0	0	0
2.1.2.b	**- Provide storage with solar cooling to PGRC and NARIs.**	4 Solar cooling Storage	44,800	44,800	0	0	0	0
2.1.2.c	**- Make it mandatory for breeders to send samples of their germplasm collections to the PGRC for long conservation**	Approved procedures in place	0	0	0	0	0	0
Sub-total strategy 2.1.2			44,800	44,800	0	0	0	0
Strategy 2.1.3 -Promoting and building capacity of farmer and community groups including those led by women or youth to conserve crop varieties that have a high food security value								
2.1.3.a	**-Link LSBs, Farmers Organization and Farmers groups including for youth and women to Genetic Resources Centre**	provided for in 2.2.1.a						
2.1.3.b	**- Link conservation to seed business and target high food security value crops**	50 LSB and 14 CGB selling conservation seed	81,200	16,800	16,800	16,800	16,800	14,000
2.1.3.c	**- Undertake specialized training of farmers on-farm conservation aspects**	14 gene banks custodian farmers trained	241,080	0	23,520	52,920	82,320	82,320
2.1.3.d	**- Organize diversity fairs**	1 Fair per agro ecological zone	54,880	0	15,680	19,600	19,600	
2.1.3.e	**- Facilitate farmer exchange/ cross-site visits**	1 annual cross -site visits per gene bank	57,400	0	5,600	12,600	19,600	19,600
2.1.3.f	**- Carry out training in participatory monitoring**	14 Community gene banks annually monitored by the communities	45,920	0	4,480	10,080	15,680	15,680
2.1.3.g	**- Undertake field trials and establish demonstration fields for conservation varieties**	1 per gene bank per year	114,800	0	11,200	25,200	39,200	39,200
Sub-total strategy 2.1.3			595,280	16,800	77,280	137,200	193,200	170,800

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
Objective 2.2 : To promote the conservation of local varieties, indigenous knowledge, and practices through community genetic resource management..								
Strategy 2.2.1 -Supporting the development of community seed banks								
2.2.1.a	**- Establish a network of community seed banks under the coordination and technical support of PGRC.**	Community Gene Banks at LSB at least 1 per agro ecological zone						
2.2.1.a.1	- Hold sensitization meetings	14 Communities and district field staff aware of importance of conservation	82,320	0	23,520	29,400	29,400	0
2.2.1.a.2	- Facilitate community- scientist negotiations	14 Communities supporting in situ conservation of national genetic heritage	54,880	0	15,680	19,600	19,600	0
2.2.1.a.3	- Construct CGB facility	14 CGBs facilities built	274,400	0	78,400	98,000	98,000	0
2.2.1.a.4	- Establish CGB management structures	14 CGBs management structures operational	109,760	0	31,360	39,200	39,200	0
2.2.1.a.5	- Set up seed production and distribution mechanisms	14 CGBs with working seed production and distribution	141,120	0	40,320	50,400	50,400	0
Sub-total strategy 2.2.1			662,480	0	189,280	236,600	236,600	0
Strategy 2.2.2 -Supporting the mapping and creation of variety registers a) within communities and								
2.2.2.a	**Establishing Biodiversity registers at CGB**							
2.2.2.a.1	- Conduct sensitization meetings	14 Communities aware of importance of registration of traditional varieties	82,320	0	23,520	29,400	29,400	0
2.2.2.a.2	- Undertake capacity building and development of community Biodiversity registers	14 community registers in place	113,680	0	32,480	40,600	40,600	0
2.2.2.a.3	- Carry out training in participatory monitoring of Biodiversity Registers	14 community Biodiversity registers yearly up to date	241,080	0	23,520	52,920	82,320	82,320
b) at national level								

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
2.2.2.b	**- Develop procedures for the registration of traditional varieties.**	Procedures approved by NSB	0	0	0	0	0	0
2.2.2.c	**- Undertake sensitization workshops**	Stakeholder aware of traditional varieties registration	140,000	0	140,000	0	0	0
Sub-total strategy 2.2.2			577,080	0	219,520	122,920	152,320	82,320
Strategy 2.2.3 -Promoting the protection and preservation of indigenous knowledge of local varieties and effectively protecting the intellectual property rights of local communities on traditional varieties and traditional breeding under a new legal framework								
2.2.3.a	**- Recognize local communities' rights and establish royalties on the use of indigenous varieties for breeding purposes.**							
2.2.3.a.1	Draft Traditional Varieties Protection Bill	1 Stakeholder Workshop	84,000	0	84,000	0	0	0
2.2.3.a.2	Send Bill to Parliament	Bill in Parliament	0	0	0	0	0	0
2.2.3.a.3	Enact Traditional Varieties Protection law	Bill enacted by parliament and Assented to by the President	0	0	0	0	0	0
Sub-total strategy 2.2.3			84,000	0	84,000	0	0	0
Strategy 2.2.4-Supporting promotion of crop diversity through custodian farmers;								
2.2.4.a	**- Identify custodians of CGB**	Custodians identified in 14 CGB (5 crops per CGB)	56,840	0	16,240	20,300	20,300	0
2.2.4.b	**- Establish partnerships with farmers**	Partnership with farmers established in 14 CGB(5 each)	56,840	0	16,240	20,300	20,300	0
2.2.4.c	**- Build Capacity of farmers as a mean motivation**	System of partnership motivation in place	111,720	0	31,920	39,900	39,900	0
Sub-total strategy 2.2.4			225,400	0	64,400	80,500	80,500	0
Strategy 2.2.5 - Creating awareness on conservation varieties.								
2.2.5.a	**- Carry out sensitization at National level**							

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
2.2.5.a.1	- Gazette a Day of National Heritage on traditional crop varieties	Organizing Committee established, day gazetted	140,000	140,000	0	0	0	0
Sub-total strategy 2.2.5			140,000	140,000	0	0	0	0
TOTAL COMPONENT 2			2,349,040	221,600	634,480	577,220	662,620	253,120
COMPONENT 3: SEED PRODUCTION AND CONDITIONING								
Objective 3.1: To multiply and market high quality seed under the formal seed system.								
Strategy 3.1.1 -Ensuring enforcement of all regulations regarding seed production, storage processing, chemical applications and residues on the Ugandan market to create an international reputation for the country as a good source of seed; and								
3.1.1.a	**- Review the legal framework to increase fines**	Fines increased in legal framework	0	0	0	0	0	0
3.1.1.b	**- Involve police in fight against seed adulteration in public markets**	44 District police trained	880,000	0	220,000	220,000	220,000	220,000
Sub-total strategy 3.1.1			880,000	0	220,000	220,000	220,000	220,000
Strategy 3.1.2 -Building and strengthening existing seed certification system and quality control for seed production, conditioning, and testing for locally produced and imported seed								
3.1.2.a	**-Repair laboratory infrastructure, internet connectivity and electricity backup generator at NSCS**	NSCS Headquarters at Kawanda						
3.1.2.a.1	- Establish internet connectivity	internet connectivity provided	56,000	56,000	0	0	0	0
3.1.2.a.2	- Provide electrical backup generator.	1 set of equipment provided	280,000	280,000	0	0	0	0
3.1.2.b	**-Agricultural facilities for DUS and control plots**							

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
3.1.2.b.1	- Establish a mini-irrigation facility for 2Ha	- Mini-irrigation facility for 2Ha procured and established	224,000	224,000	0	0	0	0
3.1.2.b.2	- Construct a standard screen house.	Standard screen house procured and constructed	84,000	84,000	0	0	0	0
3.1.2.b.3	- Provide a tractor and accessories	Tractor and accessories procured	210,000	210,000	0	0	0	0
3.1.2.b.4	- Provide consumables for field work, fertilizers,…	Consumables for field work, fertilizers etc. procured	70,000	14,000	14,000	14,000	14,000	14,000
3.1.2.c	**- IT equipment and data processing unit**							
3.1.2.c.1	**- Provide 7 laptops for inspectors**	7 laptops for inspectors procured	15,680	15,680	0	0	0	0
3.1.2.c.2	**- Provide 8 desktops**	8 desktops procured	11,200	11,200	0	0	0	0
3.1.2.c.3	**- Provide 2 centralized heavy duty printers**	2 centralized heavy duty printers procured	11,200	11,200	0	0	0	0
3.1.2.c.4	**- Provide 1 computer server to host USSIMS**	1 computer server to host USSIMS	14,000	14,000	0	0	0	0
3.1.2.c.5	**- Supply IT consumables**	IT consumables procured	360,000	72,000	72,000	72,000	72,000	72,000
3.1.2.d	**-NSCCS Training Centre Facilities**							
3.1.2.d.1	- Provide equipment (photocopier, projector, flipcharts…)	Training equipment procured	14,000	14,000	0	0	0	0
3.1.2.d.2	- Develop and print workbooks and manuals (Authorization)	Manuals and workbooks published	100,000	20,000	20,000	20,000	20,000	20,000
3.1.2.e	**- Field inspection equipment**							
3.1.2.e.1	-Provide 10 GPS	10 GPS procured	5,600	5,600	0	0	0	0
3.1.2.e.2	- Provide 5 digital cameras	5 digital cameras procured	14,000	14,000	0	0	0	0
3.1.2.e.3	- Provide 1 minibus	1 minibus procured	140,000	140,000	0	0	0	0
3.1.2.e.4	- Provide 5 double cabin pick up	5 double cabin pick up procured	700,000	700,000	0	0	0	0
3.1.2.e.5	- Provide 5 motorcycle	5 motorcycle procured	70,000	70,000	0	0	0	0

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
3.1.2.e.6	- Maintain NSCS equipment	Equipment properly maintained	360,000	72,000	72,000	72,000	72,000	72,000
3.1.2.f	**- Laboratory equipment for ISTA Accreditation**							
3.1.2.f.1	- Develop inventory and technical specifications	Inventory and procurement list	11,760	11,760			0	
3.1.2.f.2	- Provide new equipment	1 set of equipment procured	350,000	350,000	0	0	0	0
3.1.2.f.3	- Supply lab consumable for ISTA accreditation	1 set of consumable provided	262,500	52,500	52,500	52,500	52,500	52,500
3.1.2.g	**- Increase NSCS technical staff by 10 persons**	ten more staff incorporated to NSCS	1,440,000	360,000	0	360,000	360,000	360,000
3.1.2.h	**- Develop NSCS Quality Management system documentation**	NSCS QMS documentation in place	1,960	1,960	0	0	0	0
3.1.2.i	**- Extend tamper proof labels to 100% of certified seed (250,000) for 100,000 MT in 5Kg packages per year**	250,00O tamper proof labels available	185,000	10,000	25,000	50,000	50,000	50,000
Sub-total 3.1.2			4,990,900	2,813,900	255,500	640,500	640,500	640,500
Objective 3.2: To increase the availability of and access to quality seed of preferred varieties to complement those produced under the formal seed system.								
Strategy 3.2.1 -Promoting and building capacity of farmers, community groups and local seed businesses to produce and market quality seed with the focus on crops and varieties that have a high food security value;								
3.2.1.a	**- Scale up number of LSB, Farmers Organizations and Farmers Groups involved in seed production and marketing**	450 LSB, Farmers Organizations and Farmers Groups established and functional nationwide	21,000,000	7,500,000	7,500,000	6,000,000	0	0
Sub-total 3.2.1			21,000,000	7,500,000	7,500,000	6,000,000	0	0
Strategy 3.2.2 -Providing for Quality Declared Seed class								
3.2.2.a	**- Develop regulations for QDS class**	QDS Regulations approved by MAAIF	0	0	0	0	0	0
Sub-total 3.2.2			0	0	0	0	0	0

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
Strategy 3.2.3 - Supporting and strengthening linkages between seed research and plant breeding programs and farmer groups producing and marketing food security crops								
3.2.3.a	**- Strengthen the link between farmers and NARO through increased involvement of NARO in dissemination of its own technology.**	provided for in 1.1.1..a						
Sub-total 3.2.3			0	0	0	0		
Strategy 3.2.4. - Promoting participatory research and variety improvement to increase productivity and market development of farmer preferred varieties								
3.2.4.a	**- Strengthen support to PVS**	provided for in 1.1.1..a.2						
3.2.4.b	**- Introduce PPB in NARO breeding programmes.**	provided for in 3.3.1.a						
Sub-total 3.2.4			0	0	0	0	0	0
Strategy 3.2.5 - Providing for emergency seed supplies in case of localized or national calamities to ensure continued availability of good quality seeds;								
3.2.5.a	**- Ministry of Disasters Preparedness to adopt clear guidelines to supply seed in case of calamities.**	Guidelines on emergency seed supplies adopted	0	0	0	0	0	0
3.2.5.b	**- Establish a MOU between GOU and USTA to build up strategic stocks**	MOU signed	0	0	0	0	0	0
Sub-total 3.2.5			0	0	0	0	0	0
Strategy 3.2.6 - Promoting awareness on the different seed classes in Uganda via tools that effectively reach all actors in the informal seed system including women;								
3.2.6.a	**- Conduct national campaigns to educate farmers on use of quality seed and regulations using ICT.**	People aware of Seed Classes	200,000	100,000	0	100,000	0	0
Sub-total 3.2.6			200,000	100,000	0	100,000	0	0
Objective 3.3: To enhance the production of quality seed within the informal system.								
Strategy 3.3.1 - a) Promoting participatory breeding and								
3.3.1.a	**- Introduce PPB in NARO breeding programmes.**	PPB included in 5 NARO breeding programmes	0	0	0	0	0	0
b) plant variety selection								
3.3.1.b	**-Promote PVS**	provided for in 1.1.1..a.2						

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
Sub-total 3.3.1			0	0	0	0	0	0
Strategy 3.3.2 - .Promoting the development and use of locally adapted indigenous varieties, to provide for national food and nutrition security;								
3.3.2.a	**- Set up procedures for the registration of traditional varieties.**	provided for in 2.2.2.d						
3.3.2.b	**- Establish an Sub-Committee on indigenous varieties under NSB**	Sub-committee working at NSB	0	0	0	0	0	0
Sub-total 3.3.2			0	0	0	0	0	0
Strategy 3.3.3 - Promoting local seed selection and preservation methodologies;								
3.3.3.a	**- Promote selection of indigenous varieties and include them in the national variety list.**	provided for in 2.2.2.d						
3.3.3.b	**- Train LG Agricultural Staff and Field based staff on local seed selection and preservation methodologies**	Invite DAO to activities 2.2.1.a.1 and 2.2.1.a.1	0	0	0	0	0	0
Sub-total strategy 3.3.3			0	0	0	0	0	0
Strategy 3.3.4 - Promoting the introduction of improved affordable and gender friendly technologies to support seed multiplication and post-harvest handling								
3.3.4.a	**- AEATREC to identify, develop and test seed related low cost technologies.**	Appropriate technologies identified, developed and tested	840,000	0	560,000	280,000	0	0
3.3.4.b	**- ZARDIS to test and disseminate seed related low-cost technologies.**	Appropriate technologies disseminated	420,000	0	280,000	140,000	0	0
Sub-total strategy 3.3.4			1,260,000	0	840,000	420,000	0	0
Strategy 3.3.5 - Facilitating youth, women and other vulnerable groups to strategically intervene in enhancing availability of quality seed and seedling								
3.3.5.a	**- Strengthen women and youth groups by providing labour saving technologies such as ploughing and threshing equipment and transportation on credit under a business approach.**	LSBs equipped with appropriate labour saving technologies	8,400,000	5,600,000	1,680,000	1,120,000	0	0
Sub-total strategy 3.3.5			8,400,000	5,600,000	1,680,000	1,120,000	0	0

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
TOTAL COMPONENT 3			36,730,900	16,013,900	10,495,500	8,500,500	860,500	860,500
COMPONENT 4: SEED DISTRIBUTION AND MARKETING								
Objective 4.1: To increase the uptake of certified and QDS seed by farmers								
Strategy 4.1.1 - Encouraging seed companies to market seed in appropriate and affordable packages to promote the use of certified seed by all farmers;								
4.1.1.a	**- Regulate packaging of certified seed down to 1 kg**	Regulations for small packaging of seeds in place	0	0	0	0	0	0
4.1.1.b	**- Support Seed Companies to assess econ viability of small packs, link to financial sources, appropriate machinery, etc.**	Study on Economic viability of small packages done	1,960	1,960	0	0	0	0
Sub-total strategy 4.1.1			1,960	1,960	0	0	0	0
Strategy 4.1.2 - Strengthening extension services to promote the use of quality seed.								
4.1.2.a	**-Include seed technology issues in the new Extension System**							
4.1.2.a.1	- Train DAOs and Field based staff on Seed matters. (Eleven workshops at ZARDIs/NARIs)	DAOs and sub-county extension workers competent in seed technology issues	1,100,000	500,000	600,000	0	0	0
4.1.2.a.2	- - USTA and MAAIF sign a MOU to collaborate on organizing field days and setting up demonstration fields, starting with one per year as a pilot.	MOU signed	0	0	0	0	0	0
Sub-total strategy 4.1.2			1,100,000	500,000	600,000	0	0	0
Strategy 4.1.3 - Supporting seed marketing outlets in remote areas by encouraging establishment of network of seed stockists;								
4.1.3.a	**- Increase number of LSB seed dealers.**	provided for in 3.2.1..a						

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
4.1.3.b	**- Nominate village/parish agents to collect village seed demand and submit it to Sub county township.**	5,000 villages/parishes count with seed agent	0	0	0	0	0	0
Sub-total strategy 4.1.3			0	0	0	0	0	0
Strategy 4.1.4 - Supporting farmers' adoption and use of seed of improved varieties and guiding the transformation to increased use of these varieties with the ultimate end of adopting certified seed;								
4.1.4.a	**- Conduct regular seed demand estimation.**	provided for in 5.10.1.a						
4.1.4.b	**- Establish multi stakeholders platforms to standardize messages**	provided for in 1.1.7.c.						
Sub-total strategy 4.1.4			0	0	0	0	0	0
Strategy 4.1.5 - Supporting non-market seed distribution mechanisms for informal seed system including emphasis on networks for seed distribution.								
4.1.5.a	**- Promote Local Seed Exchange Fairs**	Local seed Exchange Fairs in place	10,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
4.1.5.b	**- Scale up LSB, FOs and FGs approach country wide**	provided for in 3.2.1..a						
Sub-total strategy 4.1.5			10,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Strategy 4.1 6 - a) Strengthening modalities for coordination of public and private seed extension services and other support services to the seed value chains; and								
4.1.6.a	**- Hold multi stakeholders platforms to standardize messages**	provided for in 1.1.7.c						
b) Ensuring that relief seed supplies are sourced from registered seed producers only and that they are of known quality.								
4.1.6.b	**Sign MOU between USTA and MAAIF to supply relief seed**	MOU signed	0	0	0	0	0	0
Sub-total strategy 4.1.6			0	0	0	0	0	0
Objective 4.2: To enhance Uganda's competitiveness in regional and international seed trade								
Strategy 4.2.1 - Enhancing the capacity of National Plant Protection Organization (NPPO) to issue reputable plant health certificates;								
4.2.1.a	**- Develop a strategic plan to Build capacity of NPPO**	Strategic plan approved	58,800	58,800	0	0	0	0

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
4.2.1.b	**Recognize private phytosanitary test results from local internationally accredited labs for issuing official Phytosanitary certificates**	Plant Protection and Health Act now recognizes private accredited laboratory results for Phytosanitary certificates	0	0	0	0	0	0
Sub-total strategy 4.2.1			58,800	58,800	0	0	0	0
Strategy 4.2.2 - Reducing processing time including providing one-stop service centres for issuance of export and import documentation and control or provision of online system for expediting the issuance of SPS certificates								
4.2.2.a	**- Develop a strategic plan to Build capacity of NPPO**	provided for in 4.2.1.a						
Sub-total strategy 4.2.2			0	0	0	0	0	0
Strategy 4.2.3 - Providing for harmonization of national regulations with regional and international conventions and protocols on seed production, certification and trade, including inter-agency seed certification, use of standard protocols on variety protection, common quarantine-pest list, variety catalogue, import/export documents								
4.2.3.a	**- Review Seeds and Plan regulations and harmonize them with international conventions and protocols (2 months consultancy) .**	Regulations harmonized	58,800	58,800	0	0	0	0
Sub-total strategy 4.2.3			58,800	58,800	0	0	0	0
Strategy 4.2.4 - Enhancing capacity in terms of personnel and provide for minimum facilities at high risk entry points (laboratories, visual inspection kits, refrigerators);								
4.2.4.a	**- Develop a strategic plan to Build capacity of NPPO**	provided for in 4.2.1.a						
Sub-total strategy 4.2.4			0	0	0	0	0	0
Strategy 4.2.5 - Promoting awareness on regionally harmonized seed standards.								
4.2.5.a	**- Undertake outreach on regionally harmonized standards**	Stakeholders are familiar on regional seed standards	100,000	100,000	0	0	0	0
Sub-total strategy 4.2.5			100,000	100,000	0	0	0	0
TOTAL COMPONENT 4			11,319,560	2,719,560	2,600,000	2,000,000	2,000,000	2,000,000
COMPONENT 5: SEED QUALITY CONTROL								

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
Objective 5.1: To ensure quality control along the formal seed value chain.								
Strategy 5.1.1 - Strengthening and enforcing existing seed certification (quality control, seed testing, labelling, etc.) for locally produced and imported seed								
provided for in strategy 3.1.2								
Sub-total strategy 5.1.1			0	0	0	0	0	0
Strategy 5.1.2 -Training and supporting staff of seed companies to undertake internal quality control;								
5.1.2.a	**- Require Seed Companies to have at least 1 seed technologist among its staff for registration as seed merchants**	Regulations for registration updated	0	0	0	0	0	0
5.1.2.b	**- Provide external audit to Seed Companies Internal Quality Control twice a year**	32 Seed companies audited annually	1,110,000	150,000	320,000	320,000	320,000	0
5.1.2.c	**- Develop authorizations procedures for Field Inspectors**	Authorizations procedures approved by NSB	19,600	19,600	0	0	0	0
5.1.2.d	**-Develop authorizations procedures for Seed sampling and labelling**	Authorizations procedures approved by NSB	19,600	19,600	0	0	0	0
5.1.2.e	**-Develop authorizations procedures for Seed Analysts**	Authorizations procedures approved by NSB	19,600	19,600	0	0	0	0
Sub-total strategy 5.1.2			1,168,800	208,800	320,000	320,000	320,000	0
Strategy 5.1.3 - Establishing public/private partnership for seed quality control;								
5.1.3.a	**- Accredit Private Companies and associations for Seed Quality Control and Certification.**	11 Bodies accredited	308,000	0	84,000	84,000	140,000	0
5.1.3.b	**- USTA and MAAIF sign a MOU covering accreditation**	MOU signed	0	0	0	0	0	0
Sub-total strategy 5.1.3			308,000	0	84,000	84,000	140,000	
Strategy 5.1.4 - Establishing procedures of accreditation for field inspection, sampling, testing and labelling;								
5.1.4.a	**-Develop accreditation procedures for Field Inspection**	Accreditation procedures approved by NSB	19,600	19,600	0	0	0	0

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
5.1.4.b	**-Develop accreditation procedures for Seed sampling and labelling**	Accreditation procedures approved by NSB	19,600	19,600	0	0	0	0
5.1.4.c	**-Develop accreditation procedures for Seed Laboratory**	Accreditation procedures approved by NSB	19,600	19,600	0	0	0	0
5.1.4.d	**-Develop accreditation procedures for label printing**	Accreditation procedures approved by NSB	19,600	19,600	0	0	0	0
Sub-total strategy 5.1.4			78,400	78,400	0	0	0	0
Strategy 5.1.5 - Strengthening a) the quality management systems of seed companies and								
5.1.5.a	**- Extend development of QMS to all companies.**	All companies with QMS in development	343,000	68,600	137,200	137,200	0	0
5.1.5.b	**- Carry out 2 audits a year of companies QMS**	provided for in 5.1.2.b						
b) national seed laboratories;								
5.1.5.c	**- Provide Technical Assistance to NSCS seed Laboratory to facilitate ISTA Accreditation**	NSCS laboratory ISTA accredited	23,520	11,760	11,760	0	0	0
5.1.5.d	**-Recruit three (3) additional seed analysts at the National Seed laboratory**	Analysts in National seed laboratory	360,000	72,000	72,000	72,000	72,000	72,000
Sub-total strategy 5.1.5			726,520	152,360	220,960	209,200	72,000	72,000
Strategy 5.1.6 - Encouraging all registered seed companies and other seed merchants to join seed associations for purposes of self-regulation to ensure seed quality;								
5.1.6.a	**- Government to encourage all companies to be member of USTA (at registration).**	Only USTA members Seed Companies can produce seed	0	0	0	0	0	0
5.1.6.b	**- Government to coordinate with USTA for procuring seeds.**	Government to adopt policy	0	0	0	0	0	0
5.1.6.c	**- USTA to define minimum requirements for Seed company to join**	Minimum requirement defined by USTA	0	0	0	0	0	0
Sub-total strategy 5.1.6			0	0	0	0	0	0
Strategy 5.1.7 - Supervising and monitoring of the accredited entities by NSCS								

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
5.1.7.a	**- Develop procedures to audit Accredited organizations**	Accredited organizations regularly audited	58,800	0	58,800	0	0	0
Sub-total strategy 5.1.7			58,800	0	58,800	0	0	0
Strategy 5.1.8 - Develop modalities for seed certification of horticultural crops, industrial crops, forestry and other plant species which have no variety maintenance;								
5.1.8.a	**- Establish procedures for quality control and certification of horticultural crops**	Quality controlled Horticultural crops seeds available	29,400	0	0	29,400	0	0
5.1.8.b	**- Develop procedures for quality control and certification of Industrial crops**	Quality controlled Industrial crop seeds available	31,360	0	1,960	0	29,400	0
5.1.8.c	**- Develop procedures for quality control and certification of forestry crops**	Quality controlled forestry crops seeds available	29,400	0	0	0	0	29,400
5.1.8.d	**- Develop procedures for quality control and certification of vegetatively propagated crops**	Quality controlled Horticultural crop seeds available	29,400	0	29,400	0	0	0
Sub-total strategy 5.1.8			119,560	0	31,360	29,400	29,400	29,400
Strategy 5.1.9 - Setting standards for appropriate packaging materials for various crops in conformity with national and international standards;								
5.1.9.a	**- Establish a Working group under NSB to develop standards**	Working Group on packaging standards	0	0	0	0	0	0
Sub-total strategy 5.1.9			0	0	0	0	0	0
Strategy 5.1.10 - Establishing a Seed Sector Integrated Information Management System (SSIIMS) and web portal at NSCS to capture and share critical information relating to the seed sector for transparency and accountability								
5.1.10. a	**Develop USSIMS**	NSCS SQCC data base and web portal						
5.1.10. a1	**- Provide a IT staff for system maintenance**	1 staff	180,000	36,000	36,000	36,000	36,000	36,000
5.1.10. a2	**- Build the skills of NSCS staff on data management and start IMS tables**	NSCS data management skills developed	29,400	29,400	0	0	0	0
5.1.10. a3	**- Provide IT equipment (server)**	1 server in place	14,000	0	14,000	0	0	0

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
5.1.10. a4	**- Develop applications and web site**	USSIMS Web site accessible to stakeholders	5,880	0	3,920	1,960	0	0
Sub-total strategy 5.1.10			229,280	65,400	53,920	37,960	36,000	36,000
Objective 5.2: To ensure quality control along the value chain for Quality Declared Seed.								
Strategy 5.2.1 - .Providing for listing of traditional and participatory breeding varieties;								
5.2.1.a	**NSCS to develop the procedures**	Procedures developed	29,400	0	29,400	0	0	0
Sub-total strategy 5.2.1			258,680	65,400	83,320	37,960	36,000	36,000
Strategy 5.2.2 - Registering community seed producers by NSCS through local authorities;								
5.2.2.a	**- NSCS develops procedures for the registration of LSB, FOs, FGs through DAO**	Procedures developed	11,760	11,760	0	0	0	0
Sub-total strategy 5.2.2			11,760	11,760	0	0	0	0
Strategy 5.2.3 - a) Supervising and technical backstopping to community seed producers and								
5.2.3.a	**- Nominate official Seed inspectors at ZARDIs and NARI level**	13 official seed Inspector nominated (field expenses per month)	780,000	156,000	156,000	156,000	156,000	156,000
b) support to the development of internal seed quality control mechanisms for seed producers;								
5.2.3.b	**NARO Seed inspectors support through supervision and inspection**	provided for in 5.2.3.a						
Sub-total strategy 5.2.3			780,000	156,000	156,000	156,000	156,000	156,000
Strategy 5.2.4 - Establishing seed traceability system for Quality Declared Seed and								
5.2.4.a	**- Include traceability requirements in QDS regulations**	provided for in 3.2.2.a						
Sub-total strategy 5.2.4			0	0	0	0	0	0
Strategy 5.2.5 - Establishing a delegated and decentralized system at zonal and/or district level for seed inspection for Quality Declared Seed.								

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
5.2.5.a	**- Provide Seed laboratory equipment to 9 ZARDIs plus 1 in North Substation + 3NARIs**	13 laboratories furnished	2,184,000	336,000	840,000	1,008,000	0	0
5.2.5.b	**- Accredit Seed laboratories at 9 ZARDIs plus 1 in North Substation + 3NARIs**	13 laboratories accredited	728,000	0	112,000	280,000	336,000	0
5.2.5.c	**- Authorize, 2 seed analysts per ZARDI. and NARI**	26 seed analyst authorized	624,000	336,000	288,000	0	0	0
5.2.5.d	**- Nominate official seed inspectors at ZARDIs and NARIs**	provided for in 5.2.3.a						
Sub-total strategy 5.2.5			3,536,000	672,000	1,240,000	1,288,000	336,000	0
TOTAL COMPONENT 5			7,046,520	1,344,720	2,194,440	2,124,560	1,089,400	293,400
COMPONENT 6: SEED SCIENCE AND KNOWLEDGE								
Objective 6.1: Develop human resource for the seed sector development								
Strategy 6.1.1 - Supporting tertiary institutions to introduce and develop seed science based knowledge for building skills and human capacities;								
6.1.1.a	**- Ensure there is 1 seed technician per Seed Company**	Request included in the NSCS procedures for registration of seed merchants	0	0	0	0	0	0
6.1.1.b	**- Establish Seed Technology degree at Universities**	3 universities provide seed technology degree	176,400	58,800	58,800	58,800	0	0
Sub-total strategy 6.1.1			176,400	58,800	58,800	58,800	0	0
Strategy 6.1.2 - Supporting the development of seed science centres at public universities for seed research, training and accreditation purposes;								
6.1.2.a	**- Support tertiary institutions to develop seed technology curriculum**	Curriculums developed	176,400	58,800	58,800	58,800	0	0
Sub-total strategy 6.1.2			176,400	58,800	58,800	58,800	0	0
Strategy 6.1.3 -Providing technical and financial assistance, human capacity development to seed institutions along the seed value chain;								

ACTIVITY /SUB ACTICITY		OUTPUT ASSUMPTIONS	TOTAL 5 years (000) UGX	total year 1 (000) UGX	total year 2 (000) UGX	total year 3 (000) UGX	total year 4 (000) UGX	total year 5 (000)UGX
6.1.3.a	**Support tertiary institutions with technical and financial assistance**	Assistance provided	176,400	58,800	58,800	58,800	0	0
6.1.3.b	**- Establishing web based NSB knowledge sharing platform**	Provided for in 5.1.10.a.4						
6.1.3.c	**-Capacity building of extension staff**	Provided for in 3.3.3.b and 4.1.2.a.1						
Sub-total strategy 6.1.3			176,400	58,800	58,800	58,800	0	0
Strategy 6.1.4- Training and authorizing staff of seed companies to undertake quality assurance and certification								
6.1.4.a	**- Training and authorizing staff of seed companies to undertake quality assurance and certification**	provided for in 5.1.4 and 5.1.5						
Sub-total strategy 6.1.4			0	0	0	0	0	0
Objective 6.2: To enhance participation by men, women and youth in seed marketing for Quality Declared Seed.								
Strategy 6.2.1 - Promoting inclusiveness in benefit sharing and marketing through the household approach of gender equity;								
6.2.1.a	**- Upscale household LSB approach to more districts-**	provided for in 3.2.1.a						
Sub-total strategy 6.2.1			0	0	0	0	0	0
Strategy 6.2.2 - Promoting adult literacy and seed business skills training to enhance women participation in seed business.								
6.2.2.a	**- Provide skills through LSBs, FOs and FGs.**	provided for in 3.2.1.a						
6.2.2.b	**- Enhance capacity of trainers using the LSB development manual**	Provide LSB development manual to all LSB	10,000	10,000	0	0	0	0
Sub-total strategy 6.2.2			10,000	10,000	0	0	0	0
TOTAL COMPONENT 6			539,200	186,400	176,400	176,400	0	0
MONITORING AND EVALUATION (3%of the total activity budget) Lumpsum			2,460,173					
GRAND TOTAL			82,005,780	31,353,740	20,213,220	16,758,480	7,472,320	6,208,020