

REPUBLIC OF KENYA



MINISTRY OF AGRICULTURE

NATIONAL SEED POLICY

June, 2010



REPUBLIC OF KENYA

National Seed Policy

**Ministry of Agriculture,
Kilimo House,
Cathedral Road,
P. O. Box 30028 – 00100,
Nairobi, Kenya.**

**Tel. +254-20-718870
E-mail :psagric@kilimo.go.ke
Website:www.kilimo.go.ke**

© Government of the Republic of Kenya 2010



Foreword

Agricultural growth and development is crucial for Kenya's overall economic and social development. Agriculture contributes 24% directly to GDP and 60% of export earnings. Further, 80% of the rural population rely on agriculture as their primary source of livelihood. Agriculture therefore retains significant potential in addressing pro-poor growth and development and improving the standard of living of Kenyans by substantially reducing the number of people affected by hunger and poverty as targeted in the first Millennium Development Goal. As outlined under the Economic Pillar of Vision 2030, the nation's economy will continue to rely on agriculture as one of the six key sectors identified to contribute toward the targeted 10% economic growth rate per annum.

The Vision 2030 identifies five strategic thrust areas for agricultural growth; (i) transforming key institutions in agriculture and livestock to promote agricultural growth; (ii) increasing productivity of crops and livestock; (iii) introducing land use policies for better utilisation of high and medium potential lands; (iv) developing more irrigable areas in arid and semi-arid lands for both crops and livestock; and (v) improving market access for the smallholders through better supply chain management. The Vision aims at adding value to our farm and livestock products before they reach local and international markets.

In order to realize improved productivity in the crops and livestock sub sectors it will be necessary to ensure increased access to affordable and high quality agricultural inputs. The Ministry will, as outlined in the Vision, the Agricultural Sector Development Strategy (ASDS), and the Ministry's Strategic Plan for 2008-2012, implement a fertilizer cost reduction strategy which will culminate in the establishment of local fertilizer manufacturing plant as a key flag ship project. In addition, the Ministry will continue to implement policy and regulatory reforms in the seed and agrochemical sub sector to enhance productivity from the use of these three important inputs.

The National Seed Policy is the Ministry's outline of policy interventions to be pursued in order to address current constraints in the seed sub sector and to improve its performance and contribution towards improved agricultural productivity.

The implementation of this policy will need to be accompanied with review of supportive legal and regulatory frameworks to govern the seed sub sector. My Ministry is committed to undertaking the outlined reforms so that agriculture can satisfactorily contribute towards the nation's food security needs, be a dependable

source of livelihood for the rural population and contribute effectively to national economic growth and development.

S. Kosgei

Hon. Sally J. Kosgei, EBS, MP.
Minister for Agriculture

Date.....*16*.....*August*.....*2010*.....

Preface

One of the strategic objectives of the Ministry is to create an enabling environment for agricultural development through the review of the current policy and legal framework that would accelerate agricultural production on a sustainable basis, thereby contributing to rural incomes, employment and more importantly food security. Another strategic objective is to facilitate access to affordable credit and quality inputs by farmers. These strategic objectives informed the formulation of the National Seed Policy.

Seed is one of the most critical inputs in agricultural production. Good quality seed has significant potential of increasing on-farm productivity and enhancing food security. The seed industry has undergone dynamic changes within the country, the region and globally. These changes have come with challenges that require institutional of reforms in the seed sub sector. With the advent of liberalization, local and foreign seed companies have continued to play an increasing role in seed research, breeding, multiplication and trade. Regional integration and international trade together with scientific advances in the area of biotechnology have posed additional challenges that require the local industry to quickly adapt to the changing environment in order to remain competitive both locally and regionally. In addition the country needs to continue engaging and partnering with relevant international organizations such as the Organization for Economic Cooperation and Development (OECD) seed schemes, International Seed Trade Association (ISTA), International Union for Protection of New Varieties of Plants (UPOV) and International Plant Protection Convention (IPPC) to improved trade and exchange of seed material.

By the end of 2008, the Kenyan seed industry had developed into a vibrant regional leader with 73 registered seed merchants currently operating in the country. But the informal seed accounts for a higher proportion of the total seed planted by subsistent farmers. In 2007, the national requirement for certified seed ranged between 28,000 and 35,000 metric tones with seed maize accounting for about 80% of the total quantity. Kenya still experiences shortage of quality seed for crops like potatoes, wheat and some pulses and certain varieties of seed maize suited for arid and semi-arid areas (ASALs). In the last five years, there has been a steady increase in volume of imported seed, particularly of horticultural crops which cannot be produced locally due to environmental conditions. The increase has contributed positively towards the growth in the horticultural crop production especially for export.

The National Seed Policy addresses the above concerns in addition to outlining the intervention measures that will be pursued in research, extension, seed production, multiplication, processing, marketing and distribution.

The changes contained in this policy paper will need to be supported by an appropriate legal framework. Accordingly, the relevant acts such as the Seeds and Plant Varieties Act (Cap 326), Plant Protection Act (Cap 324), Suppression of Noxious Weeds Act (Cap 325), Pest Control Products Act (Cap 346), National Biosafety Act (2008) and a number of subsidiary legislations will be reviewed to enhance seed sector performance in line with stated policy direction.

In developing this paper, the Ministry of Agriculture benefited immensely from contributions of various stakeholders, particularly the expertise of the Seed Policy Committee members. I wish to thank individuals, groups and organizations whose invaluable input contributed to the development of this National Seed Policy.



Romano Kiome (PhD, CBS)

Permanent Secretary

TABLE OF CONTENTS

Foreword	I
Preface	III
Acronyms	VI
Executive Summary	VIII
1.0 INTRODUCTION	VIII
1.1 AGRICULTURE AND THE KENYAN ECONOMY	1
1.2 SEED INDUSTRY DEVELOPMENT	2
1.3 SEED INDUSTRY DEVELOPMENT IN KENYA	4
1.3.1 Formal Seed Sector	5
1.3.2 Informal seed sector	11
1.4 INSTITUTIONS INVOLVED IN THE SEED INDUSTRY	12
2.0 SEED INDUSTRY PROBLEMS AND OBJECTIVES OF THE POLICY.....	14
2.1 PROBLEMS	14
2.2 OBJECTIVES OF THE SEED POLICY.....	18
3. RESEARCH, DEVELOPMENT AND EXTENSION	20
3.1 CHALLENGES AND CONSTRAINTS IN RESEARCH AND EXTENSION	20
3.2 POLICY INTERVENTIONS	20
3.3 CHALLENGES AND CONSTRAINTS IN GERMPLASM CONSERVATION AND UTILIZATION	21
3.4 POLICY INTERVENTIONS	22
3.5 CHALLENGES AND CONSTRAINTS IN CAPACITY BUILDING	22
3.6 POLICY INTERVENTIONS	23
4. SEED PRODUCTION, PROCESSING AND QUALITY CONTROL	23
4.1 CHALLENGES AND CONSTRAINTS IN SEED PRODUCTION AND PROCESSING	23
4.2 POLICY INTERVENTIONS	25
4.3 CHALLENGES AND CONSTRAINTS ON SEED QUALITY	27
4.4 POLICY INTERVENTIONS	29
5.0 SEED MARKETING AND DISTRIBUTION	30
5.1 CHALLENGES AND CONSTRAINTS	30
5.2 POLICY INTERVENTIONS	31
6.0 INSTITUTIONAL AND LEGAL FRAMEWORK	32
6.1 CONSTRAINTS AND CHALLENGES IN ORGANISATIONAL SET -UP	32
6.2 POLICY INTERVENTIONS	33
6.3 CHALLENGES AND CONSTRAINTS IN LEGAL FRAMEWORK	33
6.4 POLICY INTERVENTIONS :	34
Annex 1: The Seed Policy Committee.....	36

Acronyms

ADC	— Agriculture Development Corporation
AFSTA	— African Seed Trade Association
APSA	— Asia Pacific Seed Association
ASAL	— Arid and Semi Arid Lands
ASARECA	— Association for Strengthening Agricultural Research in Eastern and Central Africa.
ASTA	— American Seed Trade Association
AU	— African Union
CBO	— Community Based Organization
CL & SMB	— Cotton Lint and Seed Marketing Board
COMESA	— Common Market for Eastern and Southern Africa
CRC	— Cotton Research Corporation
CRF	— Coffee Research Foundation
EAC	— East African Community
ESA	— European Seed Association
GDP	— Gross Domestic Product
GMO	— Genetically Modified Organism
HCDA	— Horticultural Crops Development Authority
IARC	— International Agricultural Research Centres
ICT	— Information Communication Technology
IPR	— Intellectual Property Rights
ISTA	— International Seed Testing Association
KARI	— Kenya Agricultural Research Institute
KEFRI	— Kenya Forestry Research Institute
KEPHIS	— Kenya Plant Health Inspectorate Service
KESREF	— Kenya Sugar Research Foundation
KSU	— KARI Seed Unit
KWS	— Kenya Wildlife Service
MIAD	— Mwea Irrigation Agricultural Development
NARS	— National Agricultural Research System
NGO	— Non-Governmental Organization
NMK	— National Museums of Kenya
NDA	— National Designated Authority
OECD	— Organization for Economic Cooperation and Development
PBAK	— Plant Breeders Association of Kenya
PBK	— Pyrethrum Board of Kenya
FELAS	— Federation of Seed Association of South America
SRC	— Seed Regulation Committee

STAK	— Seed Trade Association of Kenya
TRFK	— Tea Research Foundation of Kenya
UPOV	— International Union for Protection of New Varieties of Plants
WTO	— World Trade Organisation

Executive Summary

The National Seed Policy is the Ministry's outline of the intervention measures to be implemented in the seed sub sector in order to achieve the stated objective of availing adequate high quality seed and planting material for the country's farming and forestry needs. These is intended to be achieved through the implementation of measures geared towards exploiting the potential of improved varieties and technologies for increased agricultural and forestry productivity; building capacity and infrastructure development within the seed industry to handle research and development, quality control, technology transfer, and other emerging technologies; establishing an effective regulation, coordination and management of all activities within the sub sector and, creating an enabling environment, through policy and legal reforms for effective participation of both public and private sector.

The policy background chapter underscores the role and contribution of the agriculture sector in the nation's economy, the historical development of the seed sub sector and its critical importance in achieving improved crop productivity. The important crops and forest trees and their seed production and management systems are considered in turn together with institutions involved in their research and seed multiplication. Lastly a distinction is made on the role and contribution of the formal and informal seed sector currently operating in Kenya.

Chapter 2 of the policy paper considers the challenges constraining the industry's performance and the policy's overall and specific objectives as stated earlier above. Chapter 3 addresses challenges and constraints in research, production and extension and proposes specific policy intervention measures to address the same. Attention is given in addressing the critical area of germplasm conservation and utilization and issues relating to the building of local capacity necessary to implement and sustain the growth of the seed sub sector.

Chapter 4 discusses challenges and constraints in seed production, processing and quality control and proposes specific intervention measures to be undertaken by government, while chapter 4 does the same for marketing and distribution.

The last chapter of the policy document addresses issues that pertain to inadequacies in legal and institutional frameworks that govern the industry and proposes how to strengthen institutional frameworks and capacity and engagement between public and private partners in implementing intended provisions of the policy.

1.0 INTRODUCTION

1.1 Agriculture and the Kenyan Economy

- 1.1.1 Kenya has a total land area of 58.26 million hectares out of which only 11.6 million hectares (20%) receive medium to high rainfall (800-1200 mm per year), while the rest is arid and semi-arid (below 800 mm per year). Out of the medium to high rainfall areas, approximately 7 million hectares is used for agricultural production.
- 1.1.2 The Agricultural sector is the backbone of the national economy, contributing directly 24% of GDP and 60% of export earnings. Moreover, through links with manufacturing, distribution and service-related sectors agriculture indirectly contributes a further 27% of the country's GDP. Agricultural growth and development, therefore, is crucial for Kenya's overall economic and social development.
- 1.1.3 Approximately 80% of Kenya's population lives in the rural areas and derive their livelihood largely from agriculture. In addition, even for the urban poor, a majority of them eke out a living on agricultural-related activities. According to the Kenya Integrated Household Budget Survey of 2006, 57% of the total Kenyan population and 60% of the rural population live below the poverty line.
- 1.1.4 The Agricultural sector section of the Economic Pillar of Vision 2030, the Agriculture Sector Development Strategy 2009 – 2020 and the Ministry Strategic Plan 2008 – 2009 all underscore the importance of improving the standard of living for Kenyans by substantially reducing the number of people suffering from hunger, famine or starvation. This is in line with the Millennium Development Goal (MDG No. 1) of halving extreme poverty and hunger by the year 2015.
- 1.1.5 Increased agricultural productivity can only result from intensive utilization of high potential land; the sustainable use of arid and semi arid areas (ASAL) and the adoption of appropriate technological packages including improved seeds and other planting materials for all agro-ecological zones.

- 1.1.6 Trees have an important role to play in the general farming systems in terms of supply of tree products, improvement of the environment, soil, water and biodiversity conservation, and income generation for the farming communities. The provision and use of high quality tree seed is therefore the first and most important decisive step, towards stability and productivity of forestry and agro-forestry systems.
- 1.1.7 In Kenya, medicinal plants contribute highly to national economy but remain undomesticated. In tropical Africa, more than 4,000 out of 6,377 useful plant species are used as medicinal plants.

1.2 Seed Industry Development

- 1.2.1 Seed is one of the most critical inputs in agricultural production, in that it has the greatest potential of increasing on-farm productivity and enhancing food security. It determines the upper limit of crop yields and therefore the productivity of all other agricultural inputs in farming systems. The commercial world seed market is approximately valued at US\$ 30 billion. Out of this, Sub-Saharan Africa accounts for only US\$ 800 million representing only 3%. The key players in the African seed industry contributing to this 3% include; Republic of South Africa (US\$ 160 million), Morocco (US\$ 160 million), Egypt (US\$ 140 million), Nigeria (US\$ 120 million), Kenya (US\$ 42 million), Zambia (US\$ 15 million) and Malawi (US\$ 10 million). Other African countries contribute the balance. The USA and European Union account for US\$7.5 billion and 5.2 billion respectively. The main crop species dealt with in the international trade of seed are maize, (US\$800 million), herbage (US\$427 million), potatoes (US\$400 million), beet (US\$308 million), wheat (US\$75 million), and horticultural crops (US\$ 1,150 million). Other seeds dealt in are valued at US\$740 million. Seed, therefore, needs to be handled carefully in order to fully exploit its benefits and potential.
- 1.2.2 At the International level, there are organizations that handle various issues affecting the world seed industry such as, issuing international guidelines/standards for seed. The Organization for Economic Cooperation and Development (OECD) gives technical guidelines on field certification

standards, while the International Seed Testing Association (ISTA) provides rules and procedures for seed quality testing. The International Union for the Protection of New Varieties of Plant (UPOV) deals with plant breeders rights. Internationally, seed trade issues are articulated by the International Seed Federation (ISF), which encompasses private industry representatives of breeders and seed dealers. Currently, the following issues pose the most serious challenges to the world seed industry: protection of Intellectual Property Rights (IPR), adventitious presence of Genetically Modified (GM) seed in conventional seed, implementation of Sanitary and Phytosanitary requirements (SPS) that differ from country to country thereby affecting trade, and harmonization of seed treatment regulations among different trading nations.

- 1.2.2.1 Kenya is a signatory to, among other international treaties, the Trade Related Aspects of Intellectual Property Rights (Trips) of the World Trade Organization (WTO), which recognizes the need for protection of innovations. It is critical to have strong intellectual property rights protection to enable innovators to have incentives to continue with their noble duty of research and development. Already, trade in biotech crops is globally on the rise.
- 1.2.2.2 Between 1994 and 2004, the global value of genetically modified crops grew from US \$ 0 to 4.7 Billion, which accounted for about 16% of global seed market. The dramatic increase in use of biotechnologically engineered crops has created serious challenges of a possible mix-up between conventional seed and GM seed. Currently, there are no officially agreed upon contamination levels of tolerance for this adventitious presence of GM seed in conventional seed. This creates uncertainty in seed quality and related trade.
- 1.2.2.3 Seed treatment products and rates differ from country to country. At least 95 per cent of all seed traded in today's market is treated with one or more seed treatment products. Several of these compounds are internationally under review due to consumer safety concerns, often with no alternatives available if they are banned.

- 1.2.3 At the regional level, several continental seed associations coordinate seed industry matters. These include the Asia Pacific Seed Association (APSA) for the Asian/ Far Eastern Countries; American Seed Trade Association (ASTA) for USA; Federation of Seed Association of South America (FELAS); and the European Seed Association (ESA) serving continental Europe. The African Seed Trade Association (AFSTA) to which several national seed associations and individual seed dealers are affiliated coordinates the Africa region. The Seed Trade Association of Kenya (STAK) is an affiliate of AFSTA
- 1.2.3.1 Ten countries in the Eastern and Central Africa Sub-region (Kenya, Uganda, Tanzania, Rwanda, Burundi, DRC Congo, Eritrea, Ethiopia, Sudan and Madagascar) have formed the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA). A Board comprising Directors-General of National Agricultural Research Institutes in the respective countries runs this Association. Within one of ASARECA's programs is a project on harmonization of seed policies and regulations in the region. The project identifies challenges to movement of seed in this region in the following key areas: variety evaluation, release and registration; certification; phytosanitary measures; import and export; and, plant variety protection.
- 1.2.3.2 Within the East African Community, Kenya and Uganda subscribe to OECD seed scheme but only Kenya subscribes to ISTA, the two international organizations provide guidelines and rules for seed certification. At the moment this makes cross-boarder seed trade difficult as the neighboring countries are not compliant to international seed certification standards.

1.3 Seed Industry development in Kenya

Development of the seed industry in Kenya started in the early 20th century and was supported by research on food, industrial and export crops, which supplied seeds and planting material. Kenya's seed industry comprises of the formal and informal seed sectors with the latter accounting for a higher

proportion of seed planted by subsistent farmers.

Between 1998 and 2008, area under seed production increased from 14,600 hectares. Over the same period, local seed production stagnated at 28,000 metric tonnes. At the same time, area under some seed crops has been declining. For instance, between 1998 and 2003, area under seed wheat production declined from 1,420 hectares to 249 hectares, while area under seed potato production declined from 36 hectares to 14 hectares over the same period. *(confirm the figures)*

1.3.1 Formal Seed Sector

The formal seed sector started with the establishment of Kenya Seed Company (KSC) in 1956 in Kitale to produce pasture seed for the colonial settlers. KSC continued to play a predominant role until the industry was partially liberalized in the mid 1980s. Further liberalization of the seed industry was effected in 1996. After this, several companies entered the formal sector and by 2005, there were 50 registered seed companies largely dealing in seeds of cereals, namely, maize, wheat, barley, oats, triticale and sorghum; oil crops, i.e. rapeseed, sunflower; pulses; pastures; horticultural crops and Irish potatoes. To support the sector, the Government initiated research in the following crops in order to provide seeds and planting materials.

- 1.3.1.1 **Coffee:** Coffee research in Kenya started in 1908 at the current National Agricultural Research Laboratories (NARL). Later, the Government bought the Jacaranda Estate, Ruiru in 1944 to be the centre for coffee research. After independence in 1964, the Coffee Research Foundation (CRF) was incorporated under the Companies Act (Cap 486) and guaranteed through the Coffee Board of Kenya. The Foundation is mandated to carry out all aspects of coffee research including provision of planting materials. Coffee seeds are availed by CRF to registered nurseries in various coffee growing zones. The Coffee Board of Kenya registers the nurseries. The farmers then access the seedlings either individually, or through their respective coffee cooperative societies. The Coffee Act, 2001, requires CRF to inspect and certify sites of proposed nurseries, and make recommendations to the Kenya Plant Health Inspectorate Service (KEPHIS), which in turn verifies the site, and

makes recommendations to the Coffee Board of Kenya for registration of nursery applicants. The successful applicants then receive coffee seeds from CRF to raise seedlings. KEPHIS is required to undertake inspection before the seedlings are sold to farmers but this has not been operationalized.

- 1.3.1.2 **Pyrethrum:** The Pyrethrum Advisory Board (predecessor of Pyrethrum Board of Kenya) was established in 1935 and initially catered for European settlers who started pyrethrum production in Kenya. Through the Pyrethrum Amendment Ordinance of 1938, Pyrethrum Board of Kenya (PBK) was created to replace the Pyrethrum Advisory Board. Initial research on pyrethrum was started at National Plant Breeding Station at Njoro in 1927, and at the Scott Laboratories (currently National Agricultural Research Laboratories – NARL). Breeding and agronomic research was based at Njoro while adaptive trials were at Kabete, Nairobi. All the research activities on pyrethrum were transferred to the National Pyrethrum Research Centre (NPRC) at Molo in 1944. Currently (2005), research on pyrethrum is a collaborative undertaking of the Board and the Kenya Agricultural Research Institute (KARI). However, research on entomology, biology and product development is still undertaken by PBK. The Board, through the Pyrethrum Act (Cap 340), is required to oversee all aspects of the industry. By year 2004, the Board had seven nurseries spread out in the pyrethrum growing areas to provide planting materials to growers. There is however inadequate coordination between KEPHIS and PBK with respect to certification of seedlings. The board submits own seed samples to KEPHIS for basic tests. The main challenge arises from low seed viability affecting the propagation of the crop.

- 1.3.1.3 **Tea:** Tea was introduced in Kenya from India in 1903 and planted at Limuru area. A few private farmers established small tea gardens in Limuru and Kericho, but commercial tea production started in 1924. The Tea Research Institute of East Africa undertook tea research, which was under the East African Community. After the collapse of the East African

Community in 1977, the Government established the Tea Research Foundation of Kenya (TRFK) in 1980, which took over research activities on tea in Kenya. The Tea Board of Kenya supports the Foundation. After development of tea clones and varieties by TRFK, these are supplied to private nurseries (under Kenya Tea Development Agency and estates) for multiplication and sale to farmers. TRFK works closely with KEPHIS in the testing, release and protection of new tea varieties as well as in analyses of tea for chemical residues and phytosanitary inspection of wood packages. However, coordination between the National Designated Authority and the Board is not well defined as far as certification is concerned.

- 1.3.1.4 **Sugar:** Sugarcane was first planted in Kenya in the early 1920s but commercial production started in 1923 with the construction of Miwani Sugar Company, and the Ramisi Sugar Company in 1927. Before independence the sugar industry was predominantly a private sector enterprise, which also provided the planting material. After independence, the Government started playing a key role in ownership, management and control of the industry. Five sugar factories were established, namely Muhoroni (1966), Chemelil (1968), Mumias (1973), Nzoia (1978) and South Nyanza Sugar Company (Sony) in 1979.

Nationally, coordinated sugarcane research dates back to 1964 with field experimentation on farmers' fields around Miwani Sugar Factory. Analytical work was however done at the National Agricultural Laboratories in Nairobi. The National Sugar Research Station was established at Kibos in 1969 under the Ministry of Agriculture, and later on taken over by KARI. In order to foster development of the sugar sub-sector, the Government established the Kenya Sugar Authority in March 1973.

The research station changed status to become the Kenya Sugar Research Foundation (KESREF) in January 2001, and is supported by the Kenya Sugar Board. The Foundation supplies basic seed cane to the millers who multiply it for sale to growers. KESREF and the NDA have

streamlined procedures for cane variety evaluation, release and registration. The first six cane varieties were released in August 2003. However, there is no formal coordination of certification services between KESREF and the NDA.

- 1.3.1.5 **Fruit tree crops:** The Horticultural Crops Development Authority (HCDA) was incorporated under the provisions of the Agriculture Act (Cap 318) through subsidiary legislation HCDA Order of 1967, Legal Notice No. 229. The Authority is charged with the following responsibilities among others: registration of fruit tree nurseries after inspection of sites; approval and inspection of sources of seeds and propagation materials; certification of planting materials; restriction and monitoring of planting materials in the country. The nurseries are run by public institutions, private individuals, groups, Non Governmental Organizations (NGOs) and Community Based Organizations (CBOs). As at 2008, there were about 200 registered nurseries spread out in various parts of the country. The registered nurseries are not providing enough seedlings and are complemented by the informal sector. HCDA is mandated to register nurseries then liaise with KEPHIS for inspection and certification. There is inadequate coordination between KEPHIS and HCDA on registration and certification of planting materials from these nurseries.

- 1.3.1.6 **Food, industrial, horticultural, pasture and fodder crops:** Research on food and industrial crops started in the early 20th century with establishment of a number of research stations and laboratories. In 1946, the first ten-year Development Plan for African areas was launched and was followed by restructuring of the agricultural research system. Regional Research Institutions such as East African Agriculture and Forestry Research Organization (EAAFRO) and the Tea Research Institute of East Africa (TRI) were also established.

At independence, the National Agricultural Research System (NARS) had expanded within the Ministry of Agriculture and continued to grow tremendously in the next fifteen years. The Government established

various research stations with specific mandates on certain crops, such as maize, horticulture, wheat, sugar and other crops.

The present KARI was created out of amalgamation of the Scientific Research Division of the Ministry of Agriculture and EAAFRD. KARI was subsequently established in 1979 under the Science and Technology Act (Cap 250) and reorganization occurred in 1989.

1.3.1.7 Over the years, KARI has developed varieties of various food crops such as cereals (maize, wheat, sorghums, and millets), pulses and legumes, root and tuber crops. The Horticulture Research Programme started in Molo and later moved to Thika in 1958. The initial focus was on pineapples. Later on, research on other fruits, nuts and vegetables came on board. For these crops, KARI provides breeders' seed and basic seed for multiplication. However, some crops such as pulses, legumes, millets and sorghums, root crops and some vegetables do not attract investment from the private sector. Consequently, KARI Seed Unit (KSU) was registered in 1999 to also provide planting materials for these crops which are important for food security especially in the arid and semi arid areas. The other function of the KSU is to maintain released varieties and produce breeders' seed that is provided to seed companies that have licensing agreements with KARI. The NDA provides seed certification service to KARI at various stages of multiplication. Seed science and technology program is not well developed in the national agricultural research systems.

1.3.1.8 **Rice:** Formal research on rice started in 1969 with the establishment of Ahero Irrigation Research Station and its sub-station, Mwea Irrigation Research Station, both under the National Irrigation Board (NIB). In 1991, rice research was further strengthened through establishment of Mwea Irrigation Agricultural Development Centre (MIAD) at Mwea. The three research stations have over the years focused on irrigation research relating to rice agronomy, entomology, irrigation and drainage, water management and farm machinery. KARI has however been undertaking research on rain-fed rice research, an area that MIAD also recently

started engaging in. Initially, rice research was mainly geared towards providing rice seed to national irrigation schemes but the seed is now available to all farmers in the country. So far, the NIB research stations have developed and released eight rice varieties to farmers. MIAD was registered as a seed dealer in 2004 and the NDA is now involved in both the certification and release of rice varieties. In 2009, 5 rainfed rice varieties were released. Efforts are however being made to transfer the rice research function to KARI following rationalization of NIB functions in 2002.

- 1.3.1.9 **Cotton:** Cotton was introduced in Kenya in 1902 coinciding with the construction of the Kenya-Uganda Railway. In the early days, the production and processing of cotton was handled by private companies, mainly the British Cotton Growers Association and later in 1940s by the British Cotton Lint Marketing Board in Kenya.

The first legal framework was set up in 1955 when the Colonial Government established the defunct Cotton Lint and Seed Marketing Board (CL & SMB) by an Act of Parliament to regulate and promote the cotton industry. The CL & SMB was established under Ordinance No. 50 of 1954, which was later passed as the Cotton Act of 1955 (Cap 335). Its objective was mainly to intervene in the activities pertaining to the processing and marketing of cotton in Kenya. Concurrently, there was also the Cotton Act, Cap 334 that governed the production of the crop. The two Acts of Parliament were repealed by the Cotton Act, No. 3 of 1988, Cap 335 thereby transforming the Cotton Lint and Seed Marketing Board into the present Cotton Board of Kenya.

In the 1940s, cotton research was undertaken by the Cotton Research Corporation (CRC), then known as Imperial Cotton Growing Corporation and operated in Tanzania, Uganda and Kenya. In Kenya, CRC in collaboration with the defunct Cotton Lint and Seed Marketing Board started research activities in several sites in Western and Coast regions, around 1950. The CRC handed over cotton research to the Ministry of Agriculture in 1975. Since 1978, the Board assumed exclusive

responsibility of buying seed cotton as well as selling lint and seed. In 1988, the Ministry of Agriculture handed over cotton research to KARI and this is undertaken at Mwea and Kibos stations. Currently, there is no organized system for production and provision of planting material to growers. For a long time, cotton farmers have been planting old varieties whose varietal purity and identity have not been maintained. Cotton Development Authority has been established to promote the production of crop. The authority is focusing on quality seed production for farmers. NDA is also facilitating stakeholders to source foreign varieties.

- 1.3.1.10 **Tree seeds:**The Kenya Forestry Research Institute (KEFRI) was established in 1986 to undertake research and development in forestry. KEFRI is the main source of high quality seeds for all types of trees. Although farmers in Kenya have good and long-standing experience in tree planting, they have over the years planted trees using seeds from their own sources. However, formal tree seed production started with the inception of the Kenya Forestry Seed Centre as a programme within KEFRI in 1986. The existing tree seed production program does not follow any certification system such as OECD or ISTA. Most of the tree planting materials are not improved and are therefore not defined to variety level.

1.3.2 Informal seed sector

The source and quality of most of the planting materials and seed purchased, multiplied and marketed by the informal seed sector may not be known, yet this is the major source of planting material for the farmers. For example, “road-side” nurseries for forest and fruit trees do not have clearly documented sources. Other informal sources of seed include farm-saved seed, farmer-to-farmer exchange, local markets, Non Governmental Organizations (NGOs) and Community Based Organizations (CBOs). Some flower companies also import and/or locally multiply planting material for their own use and sale to other local growers, yet they are not registered as seed dealers. Moreover, some Relief Agencies who supply emergency seed, do not always obtain such planting material from registered seed dealers, and so such seed may not be of known quality. However, the informal seed sector may

use KEPHIS seed testing services to determine quality status of their seed samples for own use. However as farming becomes more commercial, the focus is shifting towards formal seed. The development needs to be embraced and enhanced for higher crop production.

1.4 Institutions Involved in the Seed Industry

1.4.1 **Ministry of Agriculture:** The Ministry has the major responsibility of creating and promoting an enabling environment for the players in the seed industry through development of effective policies and strategies. It plays an important role in facilitating research, providing advisory and information services, undertakes review of policies and regulatory framework, and ensures sanitary and phytosanitary measures. It also facilitates collaboration among various stakeholders such as researchers, seed merchants, farmers, NGOs, CBOs and development partners.

1.4.2 **Research Institutions:** Research institutions involved in development of varieties include KARI for food, horticultural, industrial, pasture and fodder crops; KEFRI for tree seed development; Commodity research institutions such as CRF, PBK, KESREF, TRFK, National Museums of Kenya (NMK) and NIB; universities; seed companies and International Agricultural Research Centres (IARCs)

1.4.3 **Seed companies:** As at 2008, there were 73 registered seed companies in Kenya, who undertake any or all of the following activities:

- i) Research, production, processing and marketing of seed
- ii) Import, re-package and market seed
- iii) Import and market seed

1.4.4 Donor Agencies, CBOs and NGOs

These agencies deal in seed obtained from registered seed dealers, the informal seed sector and from imports. They are also involved in collection, multiplication and distribution of seed.

1.4.5 **The Kenya Plant Health Inspectorate Service (KEPHIS)** was established as part of Government reorganisation for effective delivery of

regulatory service. Before inception of KEPHIS, the seed industry was regulated by Kenya Inspection Service for Seeds, which was established in 1972. Later, these services were taken over by the National Seed Quality Control Service (NSQCS), the predecessor of KEPHIS. Other units whose services were taken over by KEPHIS included the Plant Quarantine Station in Muguga, the Chief Grader and Inspector at the Mombasa Port, Inspection and Grading Services (Jomo Kenyatta and Moi International Airports), and the Plant Breeders Rights Registration Office at KARI Headquarters. In an effort to consolidate the regulatory Acts and their enforcement mechanisms, KEPHIS was established in 1996 under the State Corporations Act (Cap 446) as the National Designated Authority (NDA) responsible for among others: variety evaluation, release, and registration; plant variety protection; seed certification; plant protection (Phytosanitary measures); and development and implementation of seed standards. It is also charged with the implementation of the national policy on introduction and use of genetically modified plant species, insects and microorganisms in Kenya.

- 1.4.6 **Plant Breeders Association of Kenya (PBAK):** PBAK was founded in 1994 but officially registered in 1996. PBAK brings together plant breeders to, among others, support their involvement in the pursuance of intellectual property rights; provide incentive and support to plant breeders through information, seminars and training; promote plant breeding and publication of research findings; advise the Government on matters concerning variety evaluation and release, quality control, revoking of protection, farmers' and breeders' rights, prohibition of unauthorized sale of planting materials; and promote conservation, control of exchange and use of plant genetic resources and other related biodiversity. PBAK comprises both corporate and individual members.
- 1.4.7 **Seed Trade Association of Kenya (STAK):** Registered in 1982, STAK aims to among others, provide a forum for interaction and information exchange among the members; promote development of the national seed industry for the betterment of crop production in Kenya, Africa and the entire world; interact with the national and international organizations

involved in seed activities in order to promote the interests of the seed industry; promote activities that lead to regulatory harmonisation in Kenya, Africa and other regions in order to facilitate movement of seed, promote use of improved quality seed by conforming to national and international standards; provide an organisation that promotes self regulation and liaison with the government on matters affecting the seed industry; and arbitrate in any disputes between members. Currently, STAK membership stands at 20 out of 73 registered seed merchants, and account for about 90% of the formal seed volumes in Kenya.

- 1.4.8 **Agents, Sub-agents and Stockists:** the NDA officially registers these as outlets and distributors of seed. They are usually trained by the companies and the Regulator and therefore serve as disseminators of information on seed. They also serve as an important channel through which movement of seed can be traced.

2.0 PROBLEMS OF SEED SUB SECTOR AND OBJECTIVES OF THE POLICY

2.1 Problems

- 2.1.1 **Insufficient certified seed materials** Kenya is largely self-sufficient in seed maize production but there is insufficient production of seed materials for most of the other crops such as wheat, potatoes and horticultural crops. The main constraints that have caused insufficient seed materials include low interest by seed companies in open pollinated and traditional crops, unfavourable climatic conditions for most temperate horticultural crop seed production, land sub-division and changing land use patterns arising from population pressure. The reduced acreages in the traditional seed production areas cannot allow for adequate isolation distances necessary for seed multiplication.

Between 1998 and 2008, area under seed wheat production increased from 1,560 Hectares to 2,660 Hectares while the production increased from 1.2M tons to 3.1M tons. However in 2003 there was a decline in both hectareage and production due to the use of farm saved seed by farmers and inadequate supply of breeder seed.

The area under seed potato production declined from 36 hectares to 14 hectares over the same period because of factors such as inadequate supply of breeder and basic seed as well as increased prevalence of diseases such as bacterial wilt. Seed production is currently spreading to new regions especially in areas with irrigation facilities. Seed imports have doubled over years, rising from 958 metric tonnes in 1999 to 2075 metric tonnes in 2003 this could be attributed to reliance on imported horticultural seed to support the rapidly growing sector. The horticultural crop breeding program is not strong enough besides the inability of some of them to produce seed in tropical environment.

2.1.2 Low adoption of improved seed and complementary technologies. There has been low adoption of new technologies due to several constraints, key among them being: weak research-extension-farmer linkages, low funding; inadequate field staffing levels; and inadequate promotion and marketing of the new varieties and complementary technologies by the private sector. Further, the increased cost of production, inaccessibility to credit facilities and poor marketing opportunities have discouraged farmers from adopting new technologies. However, it is notable that for seed maize, adoption rate is over 60% in medium to high potential areas but below 30% in the ASALs and other low potential areas.

2.1.3 Inconsistent legal and regulatory framework. The Seed sub sector is governed by a number of Acts key among them, the Agricultural Act (Cap 318), Plant Protection Act (Cap 324), the Noxious Weeds Act (Cap 325), the Seeds and Plant Varieties Act (Cap 326), the Pest Control Products Act (Cap 346), State Corporations Act (Cap 446) and specific commodity Acts. Different institutions enforce these Acts. This in some cases results in duplication of efforts and conflict of mandates. Furthermore, most of these Acts are out of date and inconsistent with reforms, such as liberalization of the seed industry, undertaken by government in the last two decades to spur economic growth. The legal framework has not been revised to match with these dynamic changes in the seed industry.

- 2.1.4 Inadequate suitable varieties for marginal areas.** Kenya has developed many improved crop varieties that are suited for medium to high altitude areas. However, only a few have been developed for the marginal areas yet such varieties could contribute significantly to food security in these areas. The interest of the private sector in the varieties suitable for marginal areas is still low.
- 2.1.5 Inaccessibility to affordable credit.** Inaccessibility to affordable credit for seed growers, seed dealers and seed consumers has constrained seed production, distribution and utilization. This affects adoption rates for seed and complementary technologies.
- 2.1.6 Prevalence of adulterated seed in the market.** Low quality seed continues to exist in the market due to lack of adequate monitoring, within the country and at entry points, and low penalties prescribed by the law for offenders. This situation has in some cases resulted into use of uncertified planting materials thereby posing danger to sustainable agriculture and conservation of the environment. The quality of planting materials from informal sector is not assured and therefore its productivity is not guaranteed. There are many unregistered dealers providing vegetative planting materials, of unknown source and quality to farmers. These dealers are not provided with appropriate advisory services. The use of packaging materials that are easily counterfeited enables dishonest businessmen to package fake seed. It has been difficult to deter such offenders because of low penalties prescribed by the law.
- 2.1.7 Highcostofseed** . Development of crop varieties involves a long and expensive process, for instance, the development of a new potato variety takes 12 – 15 years and currently costs Kshs 50 million to bulk the required 20 tonnes of pre-release material. The high cost of seed arise from increased cost of inputs, weak variety maintenance and seed field management, poor seed stock handling and storage which lead to low quality and rejection.

- 2.1.8 Insufficient technical skills and infrastructure for new technologies.** There are insufficient technical skills and infrastructure to handle emerging technologies such as Genetically Modified Organisms (GMOs) and Information and Communication Technologies (ICT). The potential and perceived risks of biotechnology especially genetic engineered products to human and animal health and the environment are currently not well understood. Most seed merchants do not have enough technically trained staff for efficient seed production and quality management.
- 2.1.9 Low funding of research and extension services.** Funding for research and extension in the public institutions is inadequate. In the case of public sector, the Government has mainly been financing personnel emoluments but development budget has been mainly sourced from development partners. In KARI for example, in 2000, development budget from Government was Kshs 45 million while development partners' contribution was Kshs 1.135 billion. In 2004 Government development budget was Kshs 135 Million while development partner contribution was Kshs 880 million. The inadequate funding results in some crops being ignored, yet they contribute significantly to employment, food security and nutrition. At the same time, research has in some cases not addressed farmers' needs.
- 2.1.10 Lack of harmonized seed policies and standards in the region.** There has been restricted trade in seed and planting material within the East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA) countries due to lack of harmonized seed policies, procedures and standards, and different levels of technical capacity in the region. This limits free trade and availability of planting materials to the farmers in these countries.
- 2.1.11 Lack of strategic seed reserves.** Kenya has no mechanism and infrastructure in place for strategic seed reserves in case of disasters. This may lead to emergency imports of seed

2.1.12 Lack of a centralized germplasm conservation & utilization

centre. There has been excessive degradation of plant biodiversity and over exploitation, which has led to the depletion of some species. The Government, although mandated as an ex-situ seed conservation focal point, thinly funds the current National Gene bank of Kenya under KARI. Over the years, the Gene bank has relied on development partner funding to undertake some of its obligations. Other smaller gene banks that cater for specific plant genetic resources include KEFRI, NMK and Kenya Wildlife Service (KWS). For purposes of germplasm security, duplication outside the gene bank is not adequate.

Indigenous crops and tree species also play a major role in food security, health and environment and their usage is rising. However, there is no proportionate increase in germplasm collection and utilization on these crops and plant species. There has also been pressure on these resources due to over-exploitation, bio-piracy and habitat loss, which are increasing and made worse by related rapid loss of indigenous knowledge. Domestication and commercialisation of these useful plant species remains a challenge for conservation of biodiversity.

2.2 Objectives of the Seed Policy

- 2.2.1 To address the above problems, it is prudent that a review of research and development, plant germplasm conservation/preservation, seed production, processing and quality control, marketing and distribution, institutional and legal framework to which the problems relate be undertaken in the seed industry to spur agricultural growth. Indeed the Government through the Agriculture Sector Development Strategy recognises the importance of accessibility and affordability of farm inputs, including seed, for sustainable agricultural development. Seed has the greatest potential of increasing on-farm productivity and enhancing food security.
- 2.2.2 This Policy, therefore, aims at giving clear direction for the seed sub sector development in order to sustainably avail adequate high quality seed and planting material to the users. It also aims at harmonizing all seed-related activities. The policy underscores the principle and recognizes that both

private and public sector offer invaluable potential to accelerate development within the agricultural and forestry sectors. It is geared towards achieving increased agricultural productivity, food security, and conservation of biodiversity, employment creation and poverty alleviation through good governance, transparency and accountability.

2.2.3 The industry activities will be guided by the following specific policy objectives:

- i) To fully exploit the potential of improved varieties and technologies for increased agricultural and forestry productivity. This will be supported through provision of a sustainable financing system for research and development, germplasm conservation, extension, quality control and capacity building.
- ii) To facilitate an effective regulation, coordination and management of all activities within the seed sub sector in order to tap synergies and maximise on resources and enhance efficiency, including eradicating the prevalence of adulterated seed.
- iii) To build capacity and infrastructure within the seed sub sector to handle research and development, quality control, technology transfer, conservation\preservation of germplasm and other emerging technologies such as GMOs, and (ICT).
- iv) To create an enabling environment, through legal and policy reforms, for effective participation of both public and private sectors in the production of quality planting materials. This will include self-regulation and promote sustainable access to affordable credit.
- v) To harmonise regional seed policies and regulations to enhance cross border trade in seed.
- vi) To monitor seed supply and demand situation in order to ensure adequate strategic seed reserves.

3. RESEARCH, DEVELOPMENT AND EXTENSION

3.1 Challenges and Constraints in Research and Extension

- 3.1.1 Strong research and extension support is indispensable for seed industry development and increased agricultural productivity. Research, development and extension in Kenya are largely undertaken by the public sector, with KARI being predominant in food crops research whilst CRF, TRFK, KESREF, KEFRI, undertake commodity research. Other institutions, which undertake research, include universities and international agricultural research centres working with NARS in the country. Seed companies are also involved in research on the food crops they market. The institutions involved in research are however poorly coordinated and this has in some cases resulted in conflicts in mandate and duplication of efforts.
- 3.1.2 Over the years, Kenya has developed many improved crop and plant species, which are adapted to the various agro-ecological zones. Despite this achievement, technology transfer to the farmer has remained a major challenge. The modalities of technology transfer both in the research institutions and in the extension systems are weak and not adequately funded. At the same time, the quality of research and extension messages passed on by some NGOs and other private service providers lack merit and are not well coordinated.
- 3.1.3 3.1.3 Public research institutions have developed many varieties but there has been no clear policy on access to these varieties by interested parties. The variety maintenance program is not sufficiently developed.
- 3.1.4 Resources allocated to the agricultural sector have declined over the years thus affecting the services rendered by both research and extension services. Domestic funding for research remains low and sometimes this has translated to low focus on seed science and technology development.

3.2 Policy Interventions

To address the above challenges under 3.1 the Government will:

- i) *Increase financial support to research, extension, variety and species development and technology transfer by both private and public sectors commensurate with the sector's importance to the economy.*
- ii) *Strengthen modalities for coordination of public and private research and extension service providers for effective transfer and dissemination of seed-related technologies; quality and relevance of extension messages.*
- iii) *Continue to review variety evaluation, release and registration processes.*
- iv) *Put in place clear and transparent procedures for accessing publicly bred varieties and plant species*

3.3 Challenges and Constraints in Germplasm conservation and utilization

- 3.3.1 Viable and effective germplasm acquisition, collection, multiplication, conservation and utilization support sustainable research and development. However, there has been excessive degradation of plant biodiversity and over exploitation, which has led to depletion of some species and narrowed genetic base. The current National Gene bank of Kenya under KARI is mandated as an *ex-situ* seed conservation focal point. Other smaller gene banks that cater for specific plant genetic resources include KEFRI, NMK and Kenya Wildlife Service (KWS). These gene banks are thinly funded by the Government and are not duplicated. This compromises germplasm security. Moreover, the country lacks a centralized germplasm and utilization centre.
- 3.3.2 Indigenous crops and tree species also play a major role in food security, health and environment and their usage is rising. However, there is no proportionate increase in germplasm collection and utilization on these crops and plant species. There has also been pressure on these resources due to over-exploitation, bio-piracy and habitat loss, which are increasing

and made worse by related rapid loss of indigenous knowledge. Domestication and commercialisation of these useful plant species also remains a challenge.

- 3.3.3 For many years, national agricultural research institutions have been collaborating with IARCs in variety development, among other areas of research. In some cases, varieties developed in these programmes have been availed to other institutions and breeders without reference to the collaborative institutions. This denies the breeders and collaborating institutions their rights of ownership.

3.4 Policy Interventions

To address the challenges under 3.3, the Government will:

- i) *Encourage breeders to continue sourcing and developing variable germplasm to broaden the genetic base of various crops and plant species, and support domestication and conservation of biodiversity.*
- ii) *Ensure that there are clear guidelines on ownership and transfer of varieties developed through collaborative programmes with IARCs.*
- iii) *Encourage access of germplasm from IARCs by both public and private seed research institutions through transparent Material Transfer Agreements (MTAs) and mutually agreed contracts between contracting parties.*
- iv) *Restructure and strengthen the National Gene bank into a semi-autonomous National Biodiversity Conservation Centre.*

3.5 Challenges and Constraints in Capacity building

- 3.5.1 Biotechnology is vital in contributing to agricultural productivity and food security. The potential and perceived risks of biotechnology, especially genetically engineered products, to human and animal health and the environment are not currently well understood. Appropriate mechanisms and capacity to address commercialisation of these materials have not been put in place.

- 3.5.2 In Kenya, issues on seed science and technology are not adequately addressed and coordinated. There is for instance lack of information on viability and longevity of seed under different storage conditions, and this causes conflicts between the regulator and the seed merchants on re-sampling frequency.
- 3.5.3 Kenya is a signatory to several international treaties and conventions affecting the seed industry. However, the capacity to negotiate in these international fora and relevant representation for the benefit of the country is inadequate.

3.6 Policy Interventions

To address the challenges under 3.5 the Government will:

- i) Identify and support national seed science and technology research and training centres to boost capacity and provide services to the seed industry.*
- ii) Support biotechnology research and development and together with stakeholders, build capacity in respective institutions and create awareness on bio safety and other related issues.*
- iii) Build capacity within the industry for negotiations in international treaties and conventions.*

4. SEED PRODUCTION, PROCESSING AND QUALITY CONTROL

4.1 Challenges and Constraints in Seed production and processing

- 4.1.1 The seed industry in Kenya is made up of the formal and informal seed sector with subsistent farmers sourcing most their seed from the informal sector. The formal sector deals largely with varieties that are under certification and whose source is known, whereas for the informal sector, the parental seed source is often not known. Seed production is undertaken by both the public and private sectors. Seed merchants contract the growers who must be registered by the NDA . Although the seed industry is liberalized, the Seeds and Plant Varieties Act (Cap 326) has not been revised

to reflect the current changes in the seed sub sector. The Act requires that NDA undertake a systematic seed certification scheme for registered crops. The certification includes field inspection, inspection of machinery before harvest, supervision of delivery of the seed crop, seed processing, labelling, and monitoring at the distribution points.

- 4.1.2 The maintenance programme and breeder seed production are undertaken by the breeders, while the basic and certified seed multiplication are undertaken by both the public and private sectors that in some cases, have Licensing Agreements with the breeders. However, the maintenance and breeder seed schemes are constrained by lack of sufficient funds, a situation that has occasionally led to inconsistent and inadequate supply of breeders' seed to the private sector on timely basis for some crops.
- 4.1.3 The methods of maintenance and production of breeders' seed used by different breeders differ even for similar crops and other plant species. In some cases, these methods do not conform to the requirements of the NDA, a situation that causes delay in transfer of technologies to the farmer. In the informal seed sector, farmers use their farm saved seed and seed from local sources. In other cases, some NGOs and CBOs supply seed of unknown source and quality to farmers thereby compromising productivity and food security.
- 4.1.4 It is difficult to attain the recommended isolation distances for hybrid seed production due to population pressure on land in some seed production regions. This leads to out-crossing and results in poor quality seed. At the same time, with the emerging issues relating to GMOs, recommended isolation distances for this new technology are not yet in place. Although irrigation can be used for seed production either during off-season or in less densely populated areas (e.g. ASALs) for purposes of ensuring seed security, very little area under irrigation is currently utilized for seed production purposes.
- 4.1.5 There are no consistent and sustainable modalities for production of certified seeds of open pollinated varieties mostly adapted to drought prone

areas. In addition, certification procedures and standards for crops that are not under compulsory certification are not clearly defined. This causes conflict between the NDA and the seed dealers and restricts access of clean planting material to farmers.

- 4.1.7 In the informal seed sector, source of the planting material is farm saved seed, farmer-to-farmer exchange and local markets.
- 4.1.8 Seeds of forestry trees and other plant species are collected from natural populations, plantations and on-farm sources. Most of these sources are registered, maintained and protected by KEFRI under the Forestry Act (Cap 385) as official seed sources. However, protocols of processing and handling seeds of some indigenous forestry species and those with special attributes, including medicinal and aromatic plants, have not been developed. Forest tree seed production in Kenya has not adopted OECD or ISTA seed certification guidelines leading to doubt on the quality. Moreover, productions of forestry tree seeds of plant species in the ASALs are threatened by over-exploitation by local communities for various uses and deteriorating environmental conditions.
- 4.1.9 Seed growers are contracted by seed companies to produce seeds. Most of them do not have access to sustainable credit schemes for purchase of farm inputs and services. Similarly, some seed merchants do not have access to affordable credit for doing business.
- 4.1.10 Some companies use inappropriate seed processing and handling technologies, which are inefficient and lead to low seed quality, in addition to increasing the cost of seed. Moreover, not all seed companies have adequate capacity and competence to undertake quality management systems.

4.2 Policy Interventions

To address the challenges in 4.1, the Government will:

- i) *Review and harmonise the Laws and Regulations governing the seed sub sector to facilitate self-regulation and to conform to the*

current changes in the liberalized seed industry while maintaining international standards.

- ii) *In collaboration with other stakeholders, support and encourage variety maintenance programmes and production of breeder seed.*
- iii) *Continue to support public breeding institutions to maintain varieties and produce seed of those varieties not attractive to the private sector.*
- iv) *Develop modalities for seed certification of horticultural crops, industrial crops, forestry and other plant species which have no variety maintenance programmes.*
- v) *Develop guidelines and protocols for management of genetically modified planting materials including isolation distances from non-genetically modified food crops.*
- vi) *Promote development of irrigated seed production.*
- vii) *In collaboration with the private sector, strengthen farmers' institutions and establish mechanisms for provision of credit facilities to seed growers. The Government will also hasten the enactment of the Micro-Finance Bill to facilitate provision of credit to seed dealers.*
- viii) *The Government, in partnership with the private sector, will seek to build capacity of the informal seed sector through provision of advisory services with a view to transforming it to the formal sector.*
- ix) *Develop and define modalities of seed production and handling protocols of forestry and other plant species exhibiting special attributes.*
- x) *Promote sustainable mechanisms for conservation and management of shrubs and tree seeds.*

- xi) *Encourage seed sub sector players to develop and sustain quality management systems, including acquiring or leasing appropriate processing equipments, to enhance efficiency and seed quality.*

4.3 Challenges and Constraints on Seed Quality

- 4.3.1 In order to realise the genetic potential inherent in improved plant varieties for sustainable agriculture, the element of quality control is critical to the process. Seed quality control is essential in providing consumer protection in regard to safety, purity, germination capacity, genetic integrity and freedom from diseases. It also aims at ensuring provision of high quality seeds to users. However, monitoring of seed quality for vegetable seeds, flowers, tree seeds and vegetatively propagated planting material and other plant species is weak within the country and at entry points. This situation has in some cases resulted into increased use of uncertified planting materials thereby posing danger to sustainable agriculture and conservation of the environment.
- 4.3.2 Seed quality control is effected through certification. Seed certification ensures that seed conforms to the required standards set by the law and regulations. Certification involves the following: registration of seed merchants, seed growers and seed crops and, in the case of tree species, seed sources. It also involves field inspection, processing, sampling, laboratory testing, sealing and labelling, lot examination, and pre and post control testing. However, certification standards for tree seeds and some plant species are not clearly defined.
- 4.3.3 To ensure quality assurance, the NDA, specialized commodity institutions, and seed merchants provide advisory and educational services to seed producers/nurseries, seed traders and farmers. However, there are many unregistered dealers providing vegetative planting materials, of unknown source and quality to farmers. These dealers are not provided with appropriate advisory services. Moreover, most of these dealers do not have quality management systems in place.

- 4.3.4 Some seed merchants extensively use inappropriate packaging materials, which may not maintain the quality of seed during storage. The use of packaging materials that are easily counterfeited also enables dishonest businessmen to package fake seed. It has been difficult to deter such offenders because of low penalties prescribed by the law. Moreover there are no clear provisions for compensating farmers or other end users for any losses incurred after being sold poor quality seed.
- 4.3.5 At least 95 per cent of all seed traded in today's market is treated with one or more seed treatment products. Several of these compounds are internationally under review due to consumer safety concerns, often with no alternatives available if they are banned. Currently there is limited specific research addressing this challenge. In addition, virtually all of these products fall under the minor use category when applied as seed treatment. This dramatically limits the amount of data provided to the regulatory agencies involved. It is critical to act quickly and decisively to meet these challenges.
- 4.3.6 Due to the increasing number of players in the industry, increased geographical coverage and inadequate funding, the capacity of the regulatory bodies in terms of infrastructure and personnel will continue to be a challenge. At the same time, the law does not provide for self-regulation and promotion of truthful labelling, hence the private sector is not playing its role in quality assurance as expected in a liberalized market environment.
- 4.3.7 National certification regulations and procedures are in line with international protocols, which include those of Organization for Economic Cooperation and Development (OECD) Seed Schemes and International Seed Testing Association (ISTA) rules. This aspect enables Kenyan certified seed an opportunity to be marketed competitively in foreign markets. However, majority of Kenya's trading partners in Africa are not members of either ISTA or OECD.

4.4 Policy Interventions

To address the challenges in 4.3, the Government will:

- i) *Strengthen the NDA so as to be vigilant and ensure that farmers are availed good quality seed and also to enforce truthful labelling of seed products.*
- ii) *Invest in strengthening the capacity of the regulatory bodies including Phytosanitary services for efficient and effective service delivery.*
- iii) *Review the laws to allow the authorization and registration of private seed inspectors and seed testing services that will complement the services offered by the Regulator and therefore encourage self-regulation.*
- iv) *Review the law to prescribe stiffer penalties to those who offer poor quality seed to farmers or any other end users. The law will also be reviewed to allow for compensation of aggrieved parties.*
- v) *Set standards for appropriate packaging materials for various crop species in conformity with local and international standards.*
- vi) *Develop certification guidelines for tree seeds and other plant species of commercial interest in consultation with stakeholders.*
- vii) *Ensure that relief seed supplies are sourced only from registered seed enterprises and that they are of known quality. The Government will provide guidelines on seed supply in cases of emergency.*
- viii) *Ensure that any material packaged and offered for sale as seed is sourced only from registered seed enterprises and that they are of known quality.*
- ix) *Strengthen extension/advisory services to farmers and in order to understand and appreciate the benefits of using good quality seed.*

- x) *Hasten harmonization of seed laws, regulations and procedures with trading partners to facilitate seed trade.*
- xi) *Encourage seed enterprises to adopt quality management systems to ensure quality assurance in a liberalized environment.*
- xii) *Support research and development of safe and effective seed treatment alternatives and or products.*

5.0 SEED MARKETING AND DISTRIBUTION

5.1 Challenges and Constraints

Registered seed merchants undertake marketing of seeds. As at 2008, there were 70 registered seed merchants dealing in formal seed business. The seed regulations require every seed merchant to appoint agents, sub-agents and stockists with knowledge, ability and appropriate facilities to maintain the quality and viability of the seed offered for sale. In addition, the appointed stockist must apply and be licensed under the regulations. Consistent with the regulations, all seed merchants are required to submit the names of their appointed stockists to the NDA. These marketing requirements and procedures are not in tune with a liberalized market environment and increase the cost of seed.

- 5.1.2 A properly functioning seed system ought to guarantee farmers good quality seed. However, low quality and/or fake seed has continued to be marketed, largely due to inadequate monitoring, making farmers lose confidence in the seed industry. This has led to increased use of uncertified seeds thus compromising food security and agricultural productivity.
- 5.1.3 Currently, adoption of improved seed and complementary technologies is low although for certified seed maize, the adoption is over 60 % in medium to high potential areas. A major contributing factor to this situation is inadequate promotion and marketing of improved seed varieties and complementary technologies. Another contributing factor is affordability of certified seed. Moreover, some seed is usually packaged in large quantities, which may not be appropriate for smallholder farmers.

- 5.1.4 There is limited affordable credit for seed dealers and farmers. Generally, the financial institutions provide credit at very high interest rates and consider agriculture as high-risk enterprise. The Cooperatives that previously mobilised rural savings have significantly reduced their lending services to farmers and traders. This has consequently constrained seed trade and consumption.
- 5.1.5 The seed industry in Kenya is liberalized. However the market is mainly dominated by a few players largely dealing in only a few crops and has a disproportionate influence on the pricing of seed. With imperfect markets, this situation could lead to high seed prices, which could discourage farmers from using certified seed.
- 5.1.6 The perceived low value of some tree seeds has discouraged private seed dealers to undertake marketing of the seeds. This reduces accessibility of tree seeds to the growers.
- 5.1.7 Appropriate storage is necessary for maintenance of seed quality. However, some seed stockists have poor storage facilities and may not be conversant with seed storage regulations. This results in rapid deterioration in seed quality.

5.2 Policy Interventions

To address the challenges in 5.1, the Government will:

- i) *Review the law and regulations relating to seed distribution and marketing in line with the current liberalized market environment to facilitate the development of a vibrant and competitive seed market.*
- ii) *Encourage all registered seed merchants to join seed associations, for purposes of self-regulation to assure seed quality.*
- iii) *Encourage seed merchants to market seed in smaller packages to promote use of certified seed by smallholder farmers.*

- 6.1.3 The research-extension-farmer linkage is weak. Thus, although research institutions have developed many new technologies, their adoption by farmers has remained low. The low funding and staffing levels in extension have contributed to this scenario. The overall performance of the seed sub - sector therefore, has not been performing as expected.

6.2 Policy interventions

In order to address the challenges in 6.1 the Government will:

- i) *Re-evaluate key actors in the seed sub sector with a view to developing linkages between the NDA and the actors in the industry.*
- ii) *Redefine the role of the NDA in view of the liberalized seed sector. This will be accompanied by institutional reforms, including changes in regulations and procedures, which promote private sector participation in the seed industry.*
- iii) *Facilitate self-regulation of the seed industry through authorization of institutions with expert knowledge and appropriate facilities to undertake seed certification services.*
- iv) *Review coordination of provision of extension services by public institutions, NGOs, CBOs and other service providers. The Government will also review funding and staffing levels of public extension services to improve overall performance.*
- v) *Establish a mechanism and capacity for monitoring the performance of the informal seed sector.*

6.3 Challenges and Constraints in Legal Framework

- 6.3.1 The Seed industry is governed by a number of Acts among them, the Plant Protection Act (Cap 324), the Noxious Weeds Act (Cap 325), the Seeds and Plant Varieties Act (Cap 326), the Pest Control Products Act (Cap 346), and specific commodity Acts. These Acts are enforced by different institutions hence coordination has been a challenge.

- iv) *Require seed enterprises to provide seed information, including data on trade, to KEPHIS for purposes of planning.*
- v) *Strengthen credit institutions and establish mechanisms for provision of credit facilities to seed users. The Government will also hasten the enactment of the Micro-Finance Bill to facilitate provision of credit to among others, seed dealers.*
- vi) *Encourage stakeholders in the seed sector to build capacity for seed agents, sub-agents, stockists and farmers on quality maintenance of seed.*
- xii) *Continue to encourage commercialisation of technologies developed by both private and public sectors.*

6.0 INSTITUTIONAL AND LEGAL FRAMEWORK

6.1 Constraints and challenges in organisational set-up

- 6.1.1 There are many organizations involved in the seed industry in the country. These organizations include the Ministry in charge of agricultural affairs, other government ministries, state corporations, research institutions, universities, international research centres, private organizations and farmers. Most of the public institutions are governed by different Acts of Parliament and these institutions are not properly coordinated. Even though KEPHIS (NDA) is the designated regulator for overseeing the seed industry, no formal linkages exist between the organization and some of the other organizations supplying planting materials. The lack of coordination results in duplication and conflict of mandate.
- 6.1.2 The linkage between the NDA and the informal sector is almost non-existent, where for instance, some NGOs deal in seed whose quality is not known. There are also other private individuals who acquire seed from research institutions, multiply and supply the same to farmers without having the seed certified or registering as seed merchants.

6.3.2 The Seeds and Plant Varieties Act (Cap 326) is central to the seed industry. However, with the dynamic changes following liberalization of the seed industry, there are many areas and issues that are not adequately addressed by this Act. These include: authorization of seed certification and testing services; regional harmonization of seed laws, policies and regulations; and review of the legal framework.

6.4 Policy interventions:

To address the challenges identified in this Policy, the Government will:

- i) *Review the relevant Acts and Regulations to conform to a liberalized seed industry.*
- ii) *Harmonize the seed laws and regulations within the EAC and other regional and international trading blocs to increase seed trade.*

6.5 Specific changes identified for legal and regulatory review

- i) *Review the Seeds and Plant Varieties Act (Cap 326) to comprehensively address all legislative issues relating to seeds and plant varieties and harmonize it with other existing related Acts and international agreements where Kenya is signatory . The Act will be amended to provide for authorisation of private sector and commodity institutions to undertake certain aspects of seed certification and testing services in order to promote self-regulation in the industry.*
- ii) *Review Subsidiary Legislation of the Seeds and Plant Varieties Act (Cap 326) to make provisions for:*
 - ☐ *Revision of crops under compulsory certification, seed classes and standards to comply with international requirements.*
 - ☐ *Domestication and operationalization of International Conventions that affect the seed sub sector for which Kenya is a party*
 - ☐ *Payment of royalties to plant breeders*

- *Amendments to allow for compensation of aggrieved farmers*
- *Ensuring that seed supplied for relief purposes is of acceptable quality and obtained from registered seed dealers*
- *Incorporation of regulations governing forestry seeds and other species including domestication of wild plants, and*
- *Review of membership of the committees created by the Seeds and Plant Varieties Act to include stakeholder representation. The committee will also be strengthened and operationalized to address registration and de-registration of seed merchants and dispute settlement among other stipulated functions.*

Annex 1: The Seed Policy Committee

Ministry of Agriculture

1. Charles M. Kange,
2. Joel K. Ng'eno,
3. Paul K. Chepkwony,
4. Francis K. Rimberia,
5. Elizabeth W. Kimenyi,
6. Sarah Injairu,
7. Beatrice King'ori,
8. Jane Otadoh,
9. Virginia Mwai
10. Anne Onyango
11. Paul Obunde
12. S.C. Ondieki
13. Musoti Andama
14. Ombalo, D. O.

Kenya Agriculture Research Institute

15. Joseph A.W. Ochieng
16. Lawrence M'Ragwa

Kenya plant Health Inspectorate Service

17. Evans Sikinyi
18. Joseph Ahenda

Seed Traders Association Kenya

19. Obongo Nyachae

Kenya Institute Public Policy Research Analysis

20. Nicholas N. Waiyaki

Kenya Forestry Research Institute

21. William Omondi

Plant Breeders Association of Kenya

22. Francis Ndambuki

Kenya National Federation of Agricultural Producers

23. Lucy Mwangi

Consumer Information Network

24. Dorcas Mwangi,.

