



KENYA FORESTRY RESEARCH INSTITUTE

STRATEGIC PLAN

2018-2022

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ACRONYMS

AIA	Appropriations in Aid
ACCPAC	Accounting Package Software
BEM	Biodiversity and Environment Management
BSC	Balanced Score Card
CA&QA	Corporate Affairs and Quality Assurance
CAMCORE	Central America and Mexico Coniferous Resources Cooperative
CBOs	Community Based Organizations
CGIAR	Consultative Group on International Agricultural Research
COMESA	Common Market of Eastern and Southern Africa
DANIDA	Danish International Development Agency
EAAFRO	East Africa Agricultural and Forestry Research Organization
EAC	East African Community
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
EMS	Environmental Management System
EU	European Union
FAO	Food and Agriculture Organization
FBOs	Faith Based Organizations
FCMA	Forest Conservation and Management Act
FINNIDA	Finnish International Development Agency
FLEGT	Forest Law Enforcement, Governance and Trade
FORNESSA	Forestry Research Network for Sub-Saharan Africa
FPD	Forest Products Development
FPI	Forest Productivity and Improvement
GDP	Gross Domestic Product
GIS	Geographical Information System
GIZ	German Society for International Cooperation
ICRAF	International Centre for Research in Agroforestry
ICT	Information Communication Technology
IFMIS	Integrated Financial Management Information System
ILRI	International Livestock Research Institute
IPM	Integrated Pest Management
ISO	International Organisation for Standardisation
JICA	Japan International Cooperation Agency
KALRO	Kenya Agricultural and Livestock Research Organization
KARI	Kenya Agricultural Research Institute
KEBS	Kenya Bureau of Standards
KENGEN	Kenya Electricity Generating Company

KFMP	Kenya Forestry Master Plan
KFS	Kenya Forest Service
KIPPRA	Kenya Institute of Public Policy and Research Institute
KIRDI	Kenya Industrial Research and Development Institute
KNBS	Kenya National Bureau of Statistics
KWS	Kenya Wildlife Service
LAN	Local Area Network
LoA	Letter of Agreement
MEA	Multilateral Environmental Agreements
M&E	Monitoring and Evaluation
MOA	Memorandum of Agreement
MoA	Ministry of Agriculture
MoE	Ministry of Education
MOU	Memorandum of Understanding
MoW	Ministry of Water
NACOSTI	National Commission for Science, Technology and Innovation
NFP	National Forest Programme
NMK	National Museums of Kenya
NGARA	Network for Gums and Resins in Africa
NGOs	Non-Governmental Organizations
NWFP	Non-Wood Forest Products
P-PESTLEG	Policy, Political, Environmental, Social, Technological, Legal, Economic, and Governance
PES	Payment for Ecosystem Services
PFM	Participatory Forest Management
PPDA	Public Procurement and Disposal Act 2016
PFMA	Public Finance Management Act 2012
PNRM	Participatory Natural Resources Management
QMS	Quality Management System
RDAs	Regional Development Authorities
RTC	Regional Training Course
SAGAs	Semi-Autonomous Government Agencies
SDG	Sustainable Development Goals
SFM	Sustainable Forest Management
SPG	Socio-economics, Policy and Governance
SIDA	Swedish International Development Agency
SLDP	Strategic Leadership and Development Programme
SMART	Specific, Measurable, Attainable, Realistic and Time-bound
SMEs	Small and Medium Enterprises
SRC	Salaries and Remuneration Committee

STI	Science, Technology and Innovation
SWOT	Strengths, Weaknesses Opportunities and Threats
TARDA	Tana and Athi Rivers Development Authority
THEPPICC	Teamwork, Healthy Environment, Professionalism, Partnership, Innovation Creativity and Customer focus
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFF	United Nations Forum on Forests
USAID	United States Agency for International Development

FOREWORD

The Kenya Vision 2030 is a development blue-print based on three pillars namely; Economic, Social and Political. Forestry falls under the Social Pillar whose main role is to contribute towards providing critical goods and services and a clean and secure environment. Forestry research has been recognized as a key enabler for accelerated economic development under Science, Technology and Innovation Act 2013. The Forest Conservation and Management Act, 2016 acknowledges that the Kenya Forestry Research Institute (KEFRI) is the lead government agency in carrying out forestry research for development in Kenya.

During the second Medium Term Plan of Vision 2030, it was noted that KEFRI plays an instrumental role in generating technologies for forestry research and development to improve forest productivity, increase forest cover, rehabilitation of water towers for water supply for domestic and industrial use, and development of forest products for improved livelihoods. KEFRI also contributes to the Economic Pillar, by increasing the resilience of Agricultural Sector through integration of trees in farming systems that support livelihood improvement, mitigation against climate change and creation of tree based industries and wealth. KEFRI will continue to play its key role in development of appropriate forestry technologies, products and services for sustainable forest and environmental management.

It is appreciated that the operating environment changed during the implementation of KEFRI's 5th Strategic Plan (2013-2018). Therefore, the experiences and the lessons learnt during the implementation of the 5th Strategic Plan were applied in the development of KEFRI's 6th Strategic Plan. This 6th Strategic Plan (2018-2022), is in line with the National Forest Programme (NFP) (2016-2030), the National Government Big Four Agenda and other strategic priorities of the National Government as outlined in various government policy documents and blue prints including: Medium Term Plan III of Vision 2030; National Mangrove Management Plan, Ministry of Environment and Forestry Strategy; all in line with the Constitution of Kenya 2010.

The KEFRI Board of Directors is committed to the full implementation of this Strategic Plan. The Board will work closely with KEFRI management, the Ministry of Environment and Forestry (MoEF) and all stakeholders to ensure that proper management frameworks are put in place for successful implementation of KEFRI 6th Strategic Plan. The Board will also ensure that the Strategic Plan is implemented through timely preparation of annual work-plans and performance contracts derived from the Plan, and through regular monitoring and evaluation through quarterly Board meetings.

On behalf of the Board of Directors, I take this opportunity to appreciate the Strategic Plan preparation team, KEFRI Management and staff for their relentless commitment to forestry research and development. With creativity and innovation, professionalism, integrity, teamwork and partnership, I am confident that the 6th KEFRI Strategic Plan (2018-2022) will be successfully implemented.

A handwritten signature in blue ink, appearing to read 'Robinson Ng'ethe', is positioned above the typed name.

Robinson Ng'ethe

For: KEFRI Board of Directors

PREFACE

This 6th Strategic Plan outlines approaches KEFRI will apply in undertaking forestry research and development in the next four years in line with the Institute's mandate and functions. The Plan will guide and steer the Institute towards contributing to realisation of Vision 2030's aspiration of a 'globally competitive and prosperous nation with a high quality of life by 2030'. This Strategic Plan has identified strategic themes, strategic results and strategic objectives to guide the Institute in contributing to actualization of national development goals. The Plan succeeds the 5th KEFRI Strategic Plan (2013-2018) that was prepared in conformity with Vision 2030 and its Second Medium Term Plan and the National Forest Programme (2016-2030).

KEFRI 5th Strategic Plan research was based on the National Forest Programme (2016-2030) which emphasizes a thematic approach for sustainable forestry development in the country. The 5th Strategic Plan was successfully implemented as reported in the Mid-term and End-of-Plan reviews. Key achievements of the 5th KEFRI Strategic Plan included; a positive contribution to increase in national forest cover from 6.9% to approximately 7.2%, generation of technologies for increasing productivity of forests, technologies for rehabilitation of the five main water towers, development of climate resilient tree species, management of Prosopis invasion through utilization, development of new forest products, and contribution to development of key legislations to improve governance of forests.

Other notable achievements include; strengthening institutional infrastructure by building farmers resource centres in Marigat and Turkana (Rift Valley Eco-region), Lamu and Taita Taveta (Coast Eco-region), Migori (Lake Victoria Basin Eco-region) as well as a modern quarantine facility at Muguga, installing Information Communication and Technology (ICT) software (ACCPAC software) in Accounts, Supply Chain Management and Human Resource Divisions to increase efficiency and effectiveness of service delivery.

To conform to international standards of environmental management, the Institute was ISO 14001:2004 EMS certified. During the implementation of the 5th Strategic Plan there was enhancement in resource mobilization from the exchequer, development partners and internal sources through establishment of Resource Mobilization and Enterprise offices.

Nevertheless, a number of challenges were noted that included; weak dissemination of forestry technologies, poor monitoring and evaluation of performance annual work plans and limited engagement with County Governments in forestry research. This 6th Strategic Plan has therefore been developed to build on gains made and lessons learnt during implementation of the 5th Strategic Plan. In order to achieve the Institute's mission; 'to

conduct research and provide information and technologies for sustainable development of forestry and allied natural resources for socio-economic development’, this Plan has been developed with the relevant flagship projects in environment and forestry under the Third Medium Term Plan of Vision 2030, the goals of the key thematic clusters of the National Forest Programme (2016-2030), Sustainable Development Goals 2016 and Forests Conservation and Management Act, 2016. Consequently, the KEFRI Strategic Plan continues to emphasize on thematic, multi-sectoral, and multidisciplinary approach to forestry research.

The 6th Strategic Plan has identified four technical thematic areas that include; Forest Productivity and Improvement (FPI), Forest Biodiversity and Environment Management (FBEM), Forest Products Development (FPD) and Socio-economics, Policy and Governance (SPG). These are supported by Forest Research Support Services (FRSS), Corporate Services (CS), Corporate Affairs and Quality Assurance (CA&QA) and the Enterprise Unit. Research will continue to be implemented in the five eco-regional research programmes namely; Coast Eco-region Research Programme (CERP), Drylands Eco-region Research Programme (DERP), Central Highlands Eco-region Research Programme (CHERP), Rift Valley Eco-region Research Programme (RVERP) and Lake Victoria Basin Eco-region Research Programme (LVBERP), and the National Forest Products Research Programme (NFPRP).

The strategic objectives of the Plan have also been aligned to the framework of annual performance contract requirements. It is also important to note that the 6th KEFRI Strategic Plan is also aligned to the National Government Big Four Agenda and the accelerated achievement of 10% tree cover by 2022 through doubling efforts in tree seed collection and distribution, and establishment and maintenance of high quality seed sources. In doing so, the Strategic Plan aims at diversifying and increasing stakeholders access to high quality forest products and services including food, feed and fibre and providing quality raw materials for cottage industries, pharmaceutical and nutraceutical industries, manufacturing and housing sectors and consequently improving livelihoods. The 6th Strategic Plan (2018-2022) was developed using the Balanced Score Card (BSC) approach as a performance management tool to ensure that monitoring and evaluation are undertaken on a timely basis in order to achieve the Plan’s objectives and initiatives.

Information Communication and Technology (ICT) is the main platform to enhance dissemination and sharing of research findings worldwide. The Institute will upgrade ICT and internet connectivity in all centres to enhance information sharing with stakeholders to increase adoption of forestry technologies and support development of commercial forestry in the country. This will be through refining and uploading Decision Support Systems (DSS) that include; species site matching, management of invasive species, forest

pests and diseases, valuation of forests and tree resources, carbon trading and markets for forest products in the Institute's website. The Institute will further integrate relevant software with Integrated Financial Management Information System (IFMIS) through the Ministry of Environment and Forestry to improve operational efficiency.

In furtherance of its mandate, the Institute will enhance establishment of strategic linkages and partnerships to increase its resource mobilization capacity. To this end the Institute will continue to establish linkages with the County Governments and establish demonstration trials and construct farmer resource centres to enhance adoption of forestry technologies on farms. In addition, the Institute will work closely with institutions of higher learning and other training institutions to recruit and build capacities of young scientists to ensure succession management in forest research.

KEFRI Management will ensure effective implementation of this Plan by utilizing resources in a prudent manner in order to maximize gains from research. We therefore appeal to all our internal and external stakeholders to support us towards being '*A world class centre of excellence in forestry and allied natural resources research for sustainable development.*'



Jane W. Njuguna (PhD)

Ag. Director, Kenya Forestry Research Institute

EXECUTIVE SUMMARY

The Kenya Forestry Research Institute (KEFRI) embraced the concept of strategic planning in 1989 to guide its research and development operations. Development of the sixth (6th) Strategic Plan 2018-2022 involved, among others; a review of the 5th KEFRI Strategic Plan 2013-2018; Kenya Vision 2030 (Medium Term Plan, MTP III); National Forest Programme (NFP, 2016-2030); Forest Conservation and Management Act, 2016; draft National Forest Policy (2016), the Kenya Constitution 2010, National Government Big Four Agenda, and other relevant national development plans outlined by the Ministry of Environment and Forestry.

In formulating this Plan, an assessment of both external and internal operating environments was undertaken. This involved analyzing Strengths, Weaknesses, Opportunities and Threats (SWOT) of the Institute to determine the possible roles of Policy, Political, Economic, Social, Technological, Legal, Environmental and Governance (P-PESTLEG) factors on the plan. A stakeholder analysis was also conducted and cross-cutting institutional issues, which might affect KEFRI's effectiveness in realizing its Mission were identified. Results of the SWOT, P-PESTLEG and stakeholder analysis facilitated the revision of KEFRI's Vision and Mandate.

The KEFRI Mandate, Vision and Mission statements and Core Values to guide implementation of the 6th Strategic Plan are:

Mandate

- i. Conduct research in forestry and allied natural resources;
- ii. Disseminate research findings to stakeholders;
- iii. Build capacity of stakeholders; and
- iv. Establish partnerships and cooperate with other research organizations and institutions of higher learning in joint research and training.

Vision

A world class centre of excellence in forestry and allied natural resources research for sustainable development.

Mission

To conduct research and provide information and technologies for sustainable development of forestry and allied natural resources for socio-economic development.

Core Values

The Institute's core values (THEPPICC) which will guide implementation of this Strategic Plan are:

- Teamwork
- Healthy Environment
- Professionalism
- Partnership
- Innovation
- Creativity
- Customer Focus

This Strategic Plan 2018-2022 will strive to achieve seven (7) strategic objectives which are to:

1. Generate technologies for establishment and management of forest plantations, trees on-farms and enhance production of superior germplasm for priority tree species for different agro-ecological zones
2. Generate rehabilitation technologies for adaptation to climate change, sustainable forest landscapes, woodlands, wetlands and riparian eco-systems
3. Develop technologies for efficient processing and utilization of wood and non-wood forest products
4. Formulate forestry policies for sustainable forest management and improved livelihoods
5. Disseminate forestry research technologies and enhance institutional research and development capacity
6. Strengthen institutional capacity for research and development
7. Enhance corporate communication and publicity

The implementation of this Strategic Plan will be guided by seven (7) Strategic Themes, i.e. five (5) in Research and Development (R&D), one (1) in Corporate Services and one (1) in Corporate Affairs and Quality Assurance. Research will be conducted under 5 Research and Development themes namely: Forest Productivity and Improvement (FPI), Forest Biodiversity and Environment Management (FBEM), Forest Products Development (FPD), Socio-economics, Policy and Governance (SPG) and Forest Research Support Services (FRSS).

KEFRI will adopt the Balanced Score Card (BSC) approach to guide, measure and report on the status of execution of this Strategic Plan. A Corporate Implementation Matrix was also developed and will form the basis for preparation of annual work-plans.

Management and coordination of Research and Development will be undertaken at various levels that include: The Board of Directors; Executive Committee, National Forestry Research Advisory Committee, and the Consultative Committee.

The Institute has an established risk management process that will be used to identify, analyze, evaluate and treat the principal risks that are likely to be faced during the implementation of the Strategic Plan. The possible risks that may affect the Institute during the implementation of the Strategic Plan are; strategic risks, operational risks, financial risks and technological risks.

In order to implement the 6th Strategic Plan, financial, human and physical resource will be required. The financial requirements for the 2018/2019 financial year are estimated at KES 2.26 billion that is projected to grow to KES 2.90 billion by 2021/2022 financial year. This budget will be financed through Government of Kenya annual allocation, internally generated funds and external funding from development partner grants as well as Public-Private Partnerships.

Monitoring and Evaluation (M&E) will be used by KEFRI to track implementation of targets outlined in the Corporate Implementation Matrix. The M&E process will be used to measure accomplishments and detect any deviations, and where there is need for adjustment, appropriate and timely action will be taken. Monitoring and Evaluation tools will include; annual implementation matrix review, annual performance contracts and work-plans, annual budget and quarterly expenditure review, and annual staff appraisal.

CHAPTER ONE

INTRODUCTION

1.1 Historical Perspective of Forestry Research

Forestry research in Kenya was started in 1934 as a unit of the then Forest Department. The unit later became a research branch focusing on applied research on forest silviculture, entomology, pathology and wood utilization. In 1948, the East Africa Agricultural and Forestry Organization (EAAFRO) was established in Muguga under the East Africa High Commission to undertake regional research including; tree breeding, forest pathology, forest entomology and catchment hydrology. In 1973, the research branch was transformed into a Research Conservancy of the Forest Department of EAAFRO.

Following the breakup of East African Community (EAC) in 1977, EAAFRO was disbanded. In 1981, the Research Division of EAAFRO and Research Conservancy of Forest Department were merged into the Forestry Research Department of the newly created Kenya Agricultural Research Institute (KARI). Kenya Forestry Research Institute (KEFRI) was established as a state corporation in 1986 under the Science and Technology Act Chapter 250 of the Laws of Kenya to focus on forestry research. The Act was repealed by the Science, Technology and Innovation Act No 28 of 2013. Kenya Forestry Research Institute is also mandated under the Forest Conservation and Management Act, 2016 to undertake forestry research.

1.2 Overview of KEFRI

KEFRI undertakes research and provides technologies and information for sustainable management, conservation and development of forests and allied natural resources. The Institute is ISO 14001:2015 Environmental Management Systems (EMS) and ISO 9001:2015 Quality Management Systems (QMS) certified and therefore conforms to international standards on environmental and quality management and relevant national legislations and its research meets international standards.

KEFRI embraced the concept of strategic planning in 1989. The first strategic plan (1989-2000) was discipline-based. The second (1999-2004) and the third (2005-2010) strategic plans were programme-based as outlined in the Kenya Forest Master Plan (KFMP, 1994), while the fourth (2008-2012) was also programme-based and aligned to the First Medium Term Plan (MTP I) of Vision 2030. The fifth Strategic Plan 2013-2018 adopted a thematic research approach in line with recommendations of the draft National Forest Programme (NFP) making KEFRI among the first institutions to embrace the thematic concept.

KEFRI currently undertakes its research and development activities under five thematic areas namely; Forest Productivity and Improvement (FPI), Biodiversity and Environment Management (BEM), Forest Products Development (FPD), Socio-economic Policy and Governance (SPG), and Technical Support Services (TSS). These thematic areas are supported by a Finance and Administration Department comprising Finance, Administration, Supply Chain and Human Resource Divisions; a Corporate Affairs and Quality Assurance Office; and Enterprise Office.

KEFRI research and development activities are implemented in all the agro-ecological zones of the country. The Institute has five (5) Eco-region Research Programmes: Coast Eco-region Research Programme (CERP), Drylands Eco-region Research Programme (DERP), Central Highlands Eco-region Research Programme (CHERP), Rift Valley Eco-region Research Programme (RVERP) and Lake Victoria Eco-region Research Programme (LVERP), and one National Forest Products Research Programme (NFPRP). These Eco-regional Research Programmes have their main centres in Gede, Kitui, Muguga, Londiani, Maseno and Karura respectively. KEFRI headquarters is situated at Muguga.

1.3 Major Achievements under KEFRI 5th Strategic Plan (2013 – 2018)

During implementation of the 5th Strategic Plan, KEFRI realized significant achievements in Research and Development (R&D). These achievements have contributed to science-driven management practices, utilization, rehabilitation and conservation of forests and allied resources. A total of 125 forestry technologies were developed under the technical thematic areas. The major achievements are summarized as follows:

(i) Forest Productivity and Improvement

Forest Productivity and Improvement theme focused on: increased productivity of forests, tree cover and raw materials for industries and made the following achievements:

- Produced and distributed 40,400 kg of high quality tree seeds across the country contributing to about 0.2% tree cover increase annually
- Developed twenty (20) technologies in improved tree germplasm production, conservation and management of priority tree species to increase production of tree seedlings and create green jobs
- Developed twelve (12) technologies in tree seed processing, handling and storage for improved germination and seedling establishment
- Established 330 ha of seed orchards for production of high quality seed of; *Pinus patula*, *Cupressus lusitanica*, *Eucalyptus grandis*, *Grevillea robusta*, *Gmelina arborea* and *Melia volkensii*
- Established 120 ha of seed stands for production of high quality seed of; *Eucalyptus urophylla*, *Moringa stenopetala*, *Moringa oleifera*, *Melia volkensii*,

Osyris lanceolata, *Terminalia spinosa*, *Casuarina equisetifolia*, *Grevillea robusta*, *Cupressus lusitanica*, *Pinus patula*, *Eucalyptus grandis*, *Tectona grandis*, *Milicia excelsa*, *Gmelina arborea* and *Markhamia lutea*

- Established progeny trials of various indigenous and exotic tree species including; *Melia volkensis*, *Cupressus lusitanica*, *Grevillea robusta*, *Eucalyptus grandis*, *Pinus patula* and *Gmelina arborea*
- Imported Pine species hybrid germplasm through the CAMCORE program to diversify plantation species in Kenya
- Developed fifteen (15) technologies in propagation and management of the following indigenous tree species; *Juniperus procera* (cedar), *Osyris lanceolata* (sandalwood), *Melia volkensis* (Mukau), Indigenous bamboo and *Acacia tortilis* (Acacia)
- Developed two (2) protocols on propagation of *Melia volkensis* through tissue culture and improving germination of *Melia* seed from 20% to over 90%
- Developed three (3) propagation protocols of sandalwood by seeds, cuttings and air-layering.
- Determined appropriate host species for establishment of sandalwood on farms that include; *Calliandra calothyrsus*, *Sesbania sesban*, *Croton megalocarpus* and *Acacia* species
- Developed ten (10) propagation protocols of difficult to propagate indigenous tree species that include; *Ocotea usambarensis*, indigenous bamboo, *Osyris lanceolata*, *Terminalia brownii*, *Terminalia kilimandscharica*, *Prunus africana*, *Syzygium cumini* and *Euphorbia tanaensis*
- Developed two (2) allometric equations for estimating carbon stocks in *Casuarina equisetifolia* and *Gmelina arborea* on farmlands
- Promoted domestication of five (5) high value trees for agroforestry on farms that include; Bamboo, *Melia volkensis*, *Gmelina arborea*, *Tectona grandis* and *Moringa oleifera*
- Developed three (3) technologies in management of three *Eucalyptus* pests; Blue Gum Chalcid, Winter Bronze bug and the *Eucalyptus* snout beetle
- Developed five (5) protocols for detection of tree seed pathogens, diseases of seedlings and mature trees
- Determined efficacy of various termiticides on behalf of Pest Control Products Board
- Decentralized distribution of tree seed from Muguga to the five (5) eco-region and one (1) national research programmes to increase stakeholder access to high quality tree seed
- Trained over 200 stakeholders on tree seed collection in Eastern and Southern Africa
- Operationalized a quarantine facility for forest health technologies

- Provided farmers with over 8,000 seedlings of high quality varieties of improved mango germplasm for increased farm productivity and food security

(ii) Biodiversity and Environment Management

Biodiversity and Environment Management theme focused on rehabilitation and restoration of degraded lands for enhanced provision of goods and services, and climate change resilience, and made the following achievements:

- Generated technologies for rehabilitation of degraded forests and watersheds in the Mau, Mt. Kenya, Aberdares, Cherangany Hills and Mt. Elgon forest ecosystems and other smaller hills such as Maragoli Hills, Gwasssi Hills, Homa Hills, Wire Hills and Nguriunditu Forest
- Developed Improved *Melia volkensii* and *Acacia tortilis* for adaptation to climate change
- Developed 15 nuclear microsatellite markers for characterizing 100 *Melia* candidate plus trees (CPTs) used in seed orchard establishment in Kitui and Kibwezi
- Designed and fabricated a hand operated machine for extracting *Melia* seeds
- Promoted adoption of *Melia volkensii* in Taita Taveta, Makueni, Kitui, Tharaka Nithi, Embu and Kilifi counties
- Developed three (3) indicators of dryland woodlands degradation
- Developed three (3) technologies for management and utilization of *Prosopis* biomass for livestock feeds, charcoal production and carbon sequestration in Baringo, Garissa, Tana River, Taita Taveta and Turkana counties
- Established twenty (20) demonstration plots on: management of *Prosopis*; rehabilitation of degraded mangroves in Mida Creek in Kilifi County, and Manda Island in Lamu County; rehabilitation of degraded riverine ecosystems along Saba saba River in Murang'a and River Lumi in Taita Taveta; and restoration of degraded rangelands in Kalatum and Pelekech in Turkana County, Mbeere North in Embu County, Kyuso in Kitui County and Olesharo, Mulot and Central locations in Narok County through use of micro-catchments
- Identified twenty five (25) threatened medicinal plant species of high economic value to pharmaceutical industries and established twenty three (23) demonstration plots in community conservation groves
- Established ex-situ conservation plots for some key tree species in accordance with obligations of the Convention of Biological Diversity (CBD)

(iii) Forest Products Development

Forest Products Development theme focused on development of quality products for industrial growth and improved livelihoods, and made the following achievements:

- Developed twelve (12) production protocols for processing of products from indigenous fruit tree species and plant parts that include jam, juices, food supplements, cosmetic products, wine and candies from *Adansonia digitata* (Baobab), *Tamarindus indica* (Tamarind), *Sclerocarya birrea* (Amarula), *Syzygium guinense* (Mukoe), *Mondia whytei* (Mukombero), *Vitex payos*, *Opuntia* (prickly cactus) and Aloe products among others
- Linked the developed production protocols to 500 small and medium enterprises from ten (10) counties: Kitui, Makueni, Laikipia, Meru, Embu, Baringo, Taita Taveta, Tharaka Nithi, Nairobi and Kakamega counties
- Developed three (3) production protocols for utilization of Prosopis pods to produce prosopis wine and flour for human and animal consumption
- Developed fifteen (15) production protocols for herbal products from Aloes and linked to twenty-five (25) community groups in Baringo, Laikipia, Nyeri, Embu, Meru, Makueni, Kwale, Turkana and Nairobi counties
- Trained producers of herbal products on value addition to enhance quality production and profits.
- Generated seventy six (76) technologies on anatomical properties of wood carving species, and evaluated fifty-two (52) new species with potential for wood carving
- Promoted three (3) new tree species; *Azadirachta indica* (neem), *Mangifera indica* (mango) and *Jacaranda mimosifolia* (Jacaranda) as alternative materials for the wood carving industry in Kenya
- Trained 450 stakeholders on production, processing and marketing of gums and resins leading to increase in gum arabic exports from 58.5 metric tons to 100 metric tons equivalent to an increase in revenue valued from KES 25 million to KES 50 million
- Trained 30 artisans and entrepreneurs on Bamboo; harvesting, preservation, processing round pole, product design and finishing
- Determined nutritive values of bamboo shoots of two edible species
- Demonstrated use of bamboo in construction of buildings in Kibra, Mathare in Nairobi County and Siongiroi Girls School in Bomet County
- Up-scaled three (3) briquetting technologies from forest and agricultural wastes to 5 community groups and 3 briquette producer cooperatives with annual production of 4.3 metric tonnes of briquettes
- Trained 2500 charcoal producers from 13 Charcoal Producers Associations (CPAs) in Kitui, Taita Taveta, Kwale, Narok, Marigat, Garissa, Tana River and Mbeere North on efficient charcoal production using casamance, improved

traditional earth, portable, and drum charcoal kilns

- Established Lighodho Bio-enterprise, a briquette producing facility using sugarcane bagasse, in Ndhiwa, Homa Bay County

(iv) Socio-economics, Policy and Governance

Socio-economics, Policy and Governance theme focused on improved governance of forest resources as made the following achievements:

- Facilitated establishment of 15 Prosopis based Charcoal Production Associations (CPAs) in Baringo and Tana River counties where charcoal trade has benefitted about 1000 members and 500,000 dependants. This resulted in substantial control of invasive Prosopis expansion through harvesting and utilization. Trade in Prosopis charcoal generated KES 100 million in Baringo County and KES 278 million in Tana River County annually
- Improved framed chainsaw and trained over 600 sawyers from seven counties namely; Kirinyaga, Embu, Garissa, Isiolo, Baringo, Koibatek, and Makueni on; chain saw cutter modification, operation of the framed chainsaw system, and efficient on-farm timber sawing
- Trained ten (10) micro enterprise artisans on fabricating the chainsaw frame
- Developed timber strength codes (KS 02-771) and timber grading rules and practices for *Cupressus lusitanica* and *Pinus patula*
- Produced a guideline on bamboo value chain
- Established that KEFRI forest technologies adoption rate is 36-40%
- Determined dependence rate on forest resource at 33% for natural forests and 24% for trees on farms and non-wood forest products
- Developed three (3) innovations that include: a protocol for application and implementation of Payment for Ecosystem Services (PES) in Kenya; framework for tracking timber trade in Kenya; and cost-benefit analysis on investment in tree growing in Kenya
- Developed two (2) Participatory Natural Resources Management (PNRM) training manuals
- Determined estimated total indirect use values of forests (soil functions, hydrological functions, climate regulation values) from East Mau forest ecosystem at KES 20 billion per year
- Undertook economic valuation of woodlots as an investment option in the coastal region of Kenya
- Contributed to development of the: draft National Forest Policy 2016; Forest Conservation and Management Act, 2016; and National Forest Programme 2016 - 2030

(v) Technical Support Services

The Technical Support Services theme focused on improved dissemination of forestry technologies and made the following achievements:

- Developed and operationalized three (3) digital Decision Support Systems (DSS) for: Growing of Grevillea, On-farm Tree Valuation, and Integrated Pest Management (IPM)
- Developed two (2) Knowledge Management documents namely; Knowledge Management Strategy and Knowledge Management Policy, and a Knowledge Management System for the Institute
- Developed a research portal to facilitate storage and retrieval of research data and information
- Produced 190 scientific publications including; journal papers, book chapters, guidelines, policy briefs, Technical Notes and Research Notes. These publications were distributed to various stakeholders and also availed online
- Conducted 100 capacity building courses for various stakeholders including: farmers, tree growers, tree nursery operators, extension agents and forest managers, county and national government officials in: tree seed and seedling production; bamboo value chain; Participatory Natural Resources Management (PNRM); and adaptation to climate change in Africa
- Held about 500 publicity events that included; 450 open days and field days, 50 ASK shows, various radio talks, television and print media features
- Held ten (10) trainings as follows: regional trainings in Social Forestry (5), Climate Change (2), Participatory Natural Resource Management (2) and one (1) International (IUFRO-FORNESSA) Forestry Congress
- Developed ICT policy and guidelines, re-designed the KEFRI website www.kefri.org and provided internet connectivity to all Eco-Region Research programmes
- Held the 5th KEFRI regional scientific conference in April 2018

(vi) Finance and Administration

The Finance and Administration Department focused on improved operational efficiency and made the following achievements:

- Built capacities of staff through training at certificate, diploma, graduate, Masters and PhD levels
- Recruited key staff to improve operational efficiency
- Ensured compliance with Public Service guidelines on skills development through engaging about 500 youths in internships and attachments
- Improved staff welfare through implementation of remuneration guidelines from the Salaries and Remuneration Committee (SRC)
- Invested in staff health welfare by providing appropriate medical insurance and

group life cover.

- Enhanced efficiency in procurement and finance processes by instituting a computerized Procurement and Accounting system through installation of ACCPAC
- Ensured compliance to Public Procurement and Disposal Act (PPDA) 2015 and Public Finance Management Act (PFMA) 2012 in all processes
- Continued to devolve research activities to the counties by constructing office blocks, laboratories and farmer resource centres in Lamu, Marigat, Migori, Taita-Taveta and Lodwar
- Ensured compliance and conformity with international management systems standards;
 - ISO 14001: 2004 Environmental Management System - certified in 2011
 - ISO 9001:2008 Quality Management System - certified in 2015
 - International Seed Testing Association (ISTA) and Organization for Economic Cooperation and Development (OECD)- Seeds quality standards
- Undertook Corporate Social Responsibility (CSR) activities
- Participated in all national environmental activities
- Enhanced resource mobilization from; Government of Kenya, Development Partners, National Research Fund (NRF), and internal revenue through KEFRI enterprises

1.4 Challenges Encountered during Implementation of the 5th Strategic Plan

The following challenges were encountered during implementation of the 5th Strategic Plan:

- Low funding of forestry research
- Lack of policy on land acquisition for research and development activities
- Inadequate research facilities such as greenhouses, laboratories, seed processing and storage facilities
- Inadequate staff and skills to implement research
- Low uptake of forestry technologies
- Low donor response to proposals
- Complex process of engaging with stakeholders in joint research and development
- Inadequate subsidiary legislations to mainstream forestry research and development

1.5 Lessons Learnt during Implementation of the 5th Strategic Plan

The following were lessons learnt during Implementation of the 5th Strategic Plan:

- The Plan must be owned by all stakeholders to ensure co-delivery of activities
- Targets must be SMART to enable measurement of progress
- Key initiatives should be factored in the strategic plan
- The Strategic Plan should be flexible to accommodate emerging issues during implementation
- Baseline data should be collected to enable measurement of achievements
- There is need to make prudent financial projections to facilitate delivery of set targets
- There is need for a KEFRI statute to ensure long term stability of forestry research and development in the country.
- Monitoring and Evaluation must be strengthened at all management levels

CHAPTER TWO

ROLE OF KEFRI IN IMPLEMENTATION OF GLOBAL, REGIONAL AND NATIONAL FORESTRY AGENDA

Global prosperity and human well-being largely depend on productivity and robustness of the world's forest ecosystems and the services they provide. Forests provide various products and services that include; timber, poles, posts, medicines, fibre, fruits, fodder, freshwater, clean air, biodiversity, and carbon storage. Estimates show that globally around 1.6 billion people and about 8.3 million in Kenya rely on forest products, either for subsistence or for cash income. However, forests and associated services are consistently under-valued. As the world population grows, demand for forest-based products and services is increasing, leading to over-exploitation and consequently deforestation and forest degradation.

Challenges facing forestry and allied natural resources will be partially addressed through robust research efforts across different countries, sectors and disciplines. Partnerships and collaborations are therefore important to inform technology development and policy decision making for equitable delivery of forest benefits and improved management of forested landscapes.

2.1 Global Forestry Agenda

KEFRI contributes to global forestry agenda through development of technologies, generation of information, and knowledge sharing with stakeholders. The Institute addresses relevant objectives of the 2030 agenda for sustainable development which includes seventeen (17) Sustainable Development Goals (SDGs) and one hundred and sixty nine (169) targets. The role of forestry in the 2030 agenda is recognized in SDGs 1, 2, 6, 7, 8, 9, 11, 12, 13 and more elaborated in SDG 15. Sustainable Development Goal 15 urges countries to protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss. This is in line with United Nations Convention on Combating Desertification (UNCCD) and United Nations Convention on Biological Diversity (UNCBD). In response to global obligations, Kenya has undertaken a National Forest Landscape Restoration (FLR) opportunities assessment with the ultimate objective of regaining ecological functionality of deforested or degraded landscapes and enhancement of human well-being. KEFRI will provide technologies and information to enable the country meet this obligation.

KEFRI also contributes to the global agenda through international scientific partnerships and collaborations, and active membership to various international forestry related organizations and networks including: International Union of Forest Research

Organizations (IUFRO), International Network of Bamboo and Rattans (INBAR), International Seed Testing Association (ISTA), Organisation for Economic Co-operation and Development (OECD), and Central America and Mexico Coniferous Resources Cooperative (CAMCORE).

2.2 Contribution to Continental and Regional Forestry Agenda

The African Union has initiated two programmes; the African Forest Landscape Restoration Initiative (AFR100) and Agenda 2063 as part of the collective vision and roadmap for transformation and investments in science, technology, research and innovation. AFR100 is a continent-led effort to bring 100 million hectares of deforested and degraded landscapes across Africa into restoration by 2030. Kenya has committed to rehabilitate 5.1 million hectares. KEFRI which has been recognized in the African continent as a center of excellence in forestry research and technology dissemination will provide leadership in forestry science for forest rehabilitation and development in the AFR100.

KEFRI is an active member of various continental forestry related organizations and networks including: Forestry Research Network for Sub-Saharan Africa (FORNESSA) which has membership in over 100 institutions in 36 countries in Africa; Network for Natural Gums and Resins in Africa (NGARA) which is hosted at KEFRI; and African Forest Forum (AFF).

At regional level, Kenya is a member of the East African Community (EAC) and Common Market for Eastern and Southern Africa (COMESA). The East African States established the EAC Protocol on Environment and Natural Resource Management in 2006. The Protocol reflects the spirit of cooperation in all activities relating to development, conservation, sustainable management and utilization of all types of forests, trees, and trade in forest products within the region. The EAC enacted the Forest Management and Protection Act (2015) that places obligation on members to manage and protect forests for socio-economic development and environment health and resilience. KEFRI will play its role in driving the regional forestry research agenda by generating appropriate technologies for development of forestry and allied natural resources, and also collaborate with other regional organizations to contribute to development of environmental related policies for COMESA and EAC region. KEFRI has been facilitating roundtable meetings for heads of regional research institution to discuss regional forest research and development issues including climate change challenges and resilience.

2.3 Response to National Policies and Legislations

2.3.1 *The Big Four Agenda for economic development*

The government Big Four Agenda for economic development places emphasis on: expansion of the manufacturing sector specifically the blue economy, agro-processing, leather and textile sub sectors; delivery of 500,000 affordable housing units in five years (2017-2022); secure universal health care; and food security and nutrition. KEFRI will contribute to achievement of the Big Four Agenda through development of technologies for increased forest cover to enhance provision of ecosystem services and forest products such as; clean water, medicinal and herbal products, forest food, and wood energy, and mitigation of climate change. KEFRI will produce high quality germplasm to expand acreage under forest plantations, and trees on farms. The expansion will increase production of raw materials for industrialization, construction and manufacturing. The Institute will also train youth in Small and Medium Enterprises (SMEs) to support forest based manufacturing industry, and provide internship programmes.

2.3.2 *Constitution of Kenya, 2010*

As a state corporation under Environmental Protection, Water and Natural Resources Sector, KEFRI will play a key role in implementation of the Constitution of Kenya in particular; Article 6 on Devolution, Articles 60 to 68 on Land, and Articles 42, 69 to 72 on Environment and Natural Resources. In implementation of KEFRI Strategic Plan 2018-2022, the Institute will comply with the above articles by:-

- i. Developing technologies that will contribute to increasing forest cover to at least 10% by 2030 now accelerated to 2022
- ii. Developing forest technologies to enhance efficient utilization of forest resources in a sustainable and productive manner to realize the Government of Kenya Big Four Agenda
- iii. Implementing institutional mandate at national, county and local levels in formulation and implementation of biodiversity conservation strategies in line with the National Land Policy
- iv. Developing measures to increase access to land for forestry research activities across the counties to facilitate development and dissemination of forestry technologies
- v. Disseminating forestry research findings to support restoration, conservation and protection of ecologically sensitive areas
- vi. Finalizing the strategy for engaging with the Council of Governors and County Governments

2.3.3 Kenya Vision 2030

Vision 2030 is Kenya's blueprint for economic development. KEFRI will implement relevant activities and programmes under MTP II and III of Vision 2030 that include:

- i. Generation of technologies and knowledge for development, conservation, management and sustainable utilization of forests
- ii. Enhancing tree seed and seedling production, distribution and marketing
- iii. Leverage the use of Information Communication Technology (ICT) in disseminating forestry research findings
- iv. Strengthening linkages and partnership with stakeholders for improved visibility and resource mobilization

2.3.4 Ministry of Environment and Forestry

The Ministry of Environment and Forestry (MoEF) is responsible for implementing policies, strategies and development plans for protection, conservation, and management of the environment and forestry for socio-economic development. KEFRI as one of the Semi-Autonomous Government Agencies (SAGAs) within the Ministry will continue to contribute to the implementation of relevant strategic national objectives and activities with reference to the following government policy documents:

2.3.4.1 Draft National Forest Policy

The policy recognizes that key decisions on forest management and conservation shall be informed by forestry science and knowledge derived from research and best practices. KEFRI will continue to generate technologies and information towards: formulation of favourable policies for forestry development and management; production of sufficient planting materials; conversion and processing of wood and non-wood forest products; value addition; and capacity building of stakeholders.

2.3.4.2 Forest Conservation and Management Act, 2016

The Forest Conservation and Management Act, 2016 was operationalized on 31st March 2017. Under various sections of the Act, KEFRI is obliged to:

- Advice on tree species to be protected in the country and information disseminated to the public
- Provide information and technologies for verification of sources of forest products origins including use of molecular markers
- Provide information and technologies for grading and valuation of forest products
- Provide technical support on development of rules to guide or regulate import and export of forest products
- Provide technical support in valuation of forest resources through use of scientific techniques for fair compensation for forest property loss or damage

- Provide technical support in development of rules and regulations to operationalize the Act
- Provide technologies for forestry development in national and county government
- Participate in development and monitoring of national forests standards

2.3.4.3 *National Forest Programme 2016-2030*

The National Forest Programme (NFP) 2016-2030 is a strategic medium term forestry framework to coordinate planning and implementation of forest sector activities in the country. The NFP was launched in July 2017. The NFP framework is aimed at sustaining and restoring resilience of forests to withstand and recover from climate-related stresses and disturbances such as droughts, wildfires, and epidemics of insects and diseases. The principles of sustainable forest management are the cornerstone of NFP. The principles will ensure that benefits derived from forests meet current and future needs of the country for its long-term socio-economic and environmental development. Research and innovations are critical in implementation of NFP, and thus KEFRI will play a critical role in development and dissemination of appropriate technologies for the forest sector.

2.3.4.4 *National Climate Change Response Strategy, 2010*

KEFRI will play a critical role in disseminating information for implementation of the following adaptation mechanisms identified in the National Climate Change Response Strategy (NCCRS, 2010):

- i. Promotion of afforestation and reforestation programmes
- ii. Promotion of agro-forestry
- iii. Promotion of forestry based livelihood options
- iv. Promotion of alternative energy sources, energy conservation initiatives, and efficient charcoal production and utilisation technologies
- v. Involvement of forest-dependent rural communities in management of forests

KEFRI will also play a significant role in various climate change mitigation interventions by developing technologies for; restoration of the country's forest cover, rehabilitation and restoration of degraded forests and riverine vegetation, and sustainable management and utilization of industrial forest plantations. The Institute will also build capacity of various stakeholders in adaptation and mitigation of climate change.

2.3.4.5 *Science, Technology and Innovation Act, 2013*

The Science, Technology and Innovation (STI) Act No. 28 of 2013 facilitates: the promotion, co-ordination and regulation of the progress of science, technology and innovation of the country; assigns priority to development of science, technology and innovation; and entrenches science, technology and innovation into the national production system.

Currently, KEFRI exists under STI Act No. 28 of 2013 and will be implementing its research and development activities in line with the STI Act, 2013. These activities include: development of technologies and innovations in forestry and allied natural resources; patenting of innovations; documenting, disseminating and promoting scientific information and knowledge to stakeholders; and building capacity of stakeholders in various aspects. KEFRI will report its research and development activities to National Commission for Science, Technology, and Innovation (NACOSTI) in accordance with STI Act, 2013.

2.3.4.6 *Devolved County Governments*

The Constitution of Kenya, 2010 provided the overarching legal framework for supporting devolution in the country and has been elaborated through various forestry legislations including Transitional Implementation Plans (TIPs). KEFRI as the lead national agency in forestry research for development, will play a critical role in science-led transformation of the forest sector in the counties. The Institute has developed eco-regional based research programmes to guide its service delivery to the counties. In its 4th (2008-2013) and 5th (2013-2018) strategic plans, KEFRI realigned its operations into five (5) Eco-regional Research Programmes (ERPs) spread across the country based on ecological and socio-cultural conditions. Through its countrywide offices, the Institute participates in development of County Integrated Development Plans (CIDPs) and collaborates with County Governments (CGs) in implementation of their agenda in forestry and allied natural resources through mutual engagements and technical assistance.

KEFRI has entered into memoranda of understanding (MOUs) with CGs to develop joint proposals, projects, and programmes, and to support CIDPs and other environmental projects. The Institute will strengthen working relations with CGs through prevailing frameworks of engagement between national government agencies and CGs. KEFRI is in the process of finalizing MOU with Council of Governors Secretariat to facilitate technology transfer and service delivery to the 47 counties. The Institute will continue to provide technical services, specialized training courses and use of its facilities to provide excursions and practical experiences. The Institute will also continue to develop collaborative agreements with various stakeholders in the counties to expand information exchange, identification and prioritization of research activities, enhance forestry technology transfer and improve participation of CGs in eco-regional research advisory meetings.

2.4 The Value of Forests in Kenya

Forests are of great value as they provide goods and services for domestic use and trade, and support to livelihoods in Kenya. Forests and interrelated natural resource sectors such as; agriculture, mining, fishing, tourism, water and energy are estimated to contribute about 42% of Kenya's GDP and 70% of overall employment. Forest sector contribution to the national GDP in 2014 was estimated to be about 1.4% which translates to KES 98 billion. However, these estimates exclude contribution of forestry to: domestic wood energy, ecosystem services and non-wood forest products (NWFPs) which are relied upon by many communities in the arid areas. The NWFPs which include gums, resins, honey, and fodder generate approximately KES 3.2 billion per year (National Forest Programme, 2016) compared to tourism sector, the leading foreign exchange earner that generates KES 100 billion annually. Products from medicinal plants such as *Prunus africana* bark have a potential annual export value of KES 3 billion. Medicinal trees and forest plants also play important roles in rural health and have great potential for advancing green economic activities in the country.

Forestry is an important contributor to other sectors of the country's economy as a supplier of intermediate products such as bio-chemicals for pharmaceutical, cosmetic, and food supplements (24%), wood and paper (17%), construction (26%), and agriculture (8%) as shown in Figure 2.1. The restoration of the water towers is projected to contribute: KES 2.6 billion to irrigated agriculture outputs for enhanced food security, 690 tonnes of fish equivalent to KES 86 million to fisheries.

The formal forest sector employs 18,000–50,000 people directly and 300,000–600,000 indirectly, making it an important source of employment particularly in the rural areas of Kenya. The charcoal industry is the leading forestry component in job creation with an estimated 700,000 persons employed directly and another 2.3 – 2.5 million dependants. In addition tree seedling production injects an approximately KES 2 billion into the economy and creates thousands of green jobs.

Forests offer many ecosystem services such as; carbon sequestration, climate change mitigation and adaptation, biodiversity conservation, and water catchment conservation. Kenya's water towers and other forested catchment areas supply most of the country's water. The catchments harness, feed, filter rainwater and provide a sustained water supply to rivers and lakes providing more than 15,800 million cubic meters of water per year, representing over 75% of the country's renewable surface water resources. KEFRI will continue to generate information and technologies to support policy formulation and decision making to meet the relevant targets as outlined in various environmental related agenda including attainment of the 10% forest cover in the country.

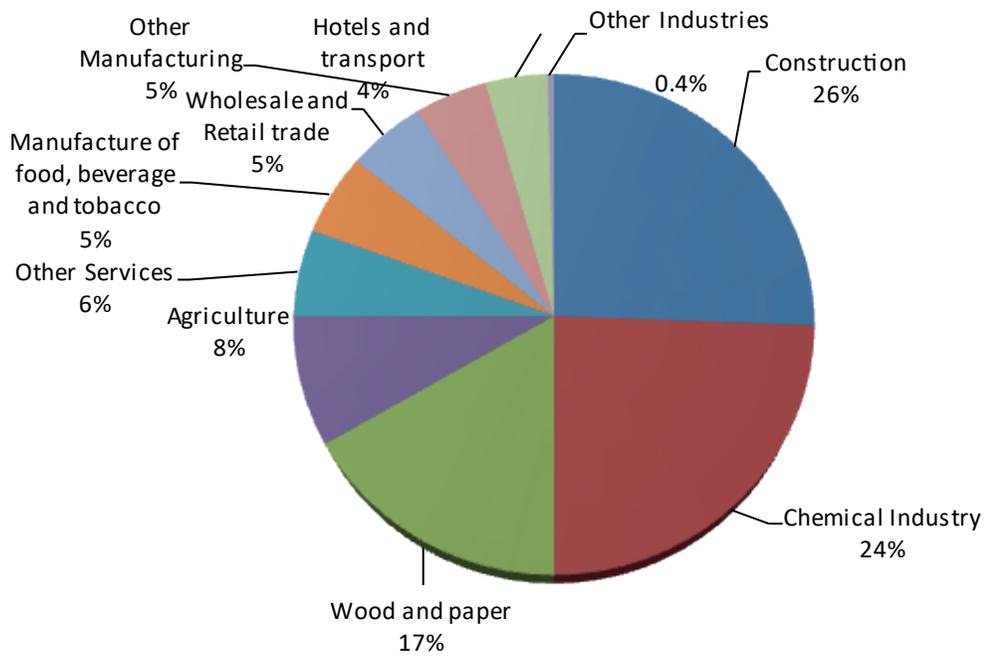


Figure 2.1: Contribution of forestry to various sectors in Kenya
 (Source, UNEP 2012)

CHAPTER THREE STRATEGIC ANALYSIS

The 6th KEFRI Strategic Plan 2018-2022 will build on past achievements and lessons learnt during the implementation of the 5th Strategic Plan 2013 - 2018.

3.1 SWOT Analysis

Achievement of a Strategic Plan objectives largely depends on how an institution enhances its internal strengths, exploits existing opportunities, and manages weaknesses in its operations while controlling factors that cause threats to its planned programmes and activities. An analysis of the internal environment of KEFRI was undertaken to identify strengths as well as the weaknesses. The Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis also identified opportunities and threats posed by external environment. The Institute will endeavour to minimize effect of the identified weaknesses and threats while maximizing on the strengths and exploiting the available opportunities. The strengths, weakness, opportunities and threats of KEFRI are shown in Table 3.1.

Table 3.1: SWOT Analysis

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> • Leading regional public forestry research institution • A pool of highly qualified scientists in forestry and allied natural resources • Availability of modern research facilities • Expertise for capacity building in forestry and allied natural resources • Strong working relationships with stakeholders • Supportive environment for research and development • A repository of forestry technologies and knowledge accessible to stakeholders • Decentralized and devolved research activities to the eco-regional research programmes • Support from key development partners • Enhanced resource mobilization capacity • Stakeholder participation in research planning 	<ul style="list-style-type: none"> • Lack of specializations in some scientific disciplines • High number of support staff in relation to researchers • Inadequate land for research • Limited automation of processes • Slow adoption of KEFRI products by SMEs and industries • Few publications are open source non-indexed journals

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> • Semi-autonomy status • Goodwill and recognition by national and international actors • High capacity to publish and disseminate research findings in various formats including indexed journals • ISO 9001:2015 QMS and ISO 14001:2015 EMS certified 	
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • Growing demand for forestry products and services • Emergence of green economy and associated incentives • Support from national and county governments • Forestry is a key source of livelihoods • Strong partnership with stakeholders • Technological advancement for enhanced dissemination of information • Favourable global campaign for environmental/ biodiversity conservation • Emerging market for carbon and Payment for Ecosystem Services (PES) • Strong collaboration with stakeholders in blue economy research • Constitutional requirements on 10% tree cover • Staff and facilities to undertake training of stakeholders in various competency courses on forestry operations • Close collaboration with universities 	<ul style="list-style-type: none"> • Increased degradation due to encroachment of forestry land • Low funding of forestry research sector • Lack of specific legislation supporting forestry research • Competition with other land uses • High poverty levels • Increasing population pressure • Weak enforcement of environmental legislations and policies • Negative effects of climate change • Insecurity in some areas of the country • Conflicts over limited natural resources • Inadequate coordination framework between the county and national government over management of

3.2 P-PESTLEG Analysis

P-PESTLEG is an analysis that takes into account macro-environmental factors that may affect implementation of a strategic plan. The factors include; policy, political, economic, socio-cultural, technological, legal, environment and governance. A P-PESTLEG analysis on this Strategic Plan identified the following:

3.2.1 Policy framework

Policies by the Government will affect operations and programmes of KEFRI as the Institute must align itself to Government policy frameworks. The dynamic environment requires the Institute to align itself to the following:

- a) Implementation of the Government Big Four Agenda on food security, manufacturing, affordable housing and universal healthcare
- b) Government policies on environment including; Constitution of Kenya 2010, Vision 2030, and NFP 2016-2030
- c) Harmonization of operations with macro-level government policy on the economy,
- d) Government policy on; science, technology and innovation
- e) Government policy on ethics and anti-corruption
- f) Changes in Government financial policies by aligning internal policies and procedures to ensure compliance,
- g) Requirement on Monitoring and Evaluation (M&E) through effective performance management in line with the government policy on results-based management
- h) Government policies on human resource.

3.2.2 Political factors

The prevailing political environment will affect the implementation of the Strategic Plan as follows:

- a) Political stability will favour implementation of KEFRI programmes and activities
- b) Political support, goodwill, and adequate budgetary allocation by The National Treasury will enhance forestry research
- c) Devolution of Government functions will require KEFRI to ensure its presence at county level
- d) Regional integration is likely to increase demand for KEFRI products and services hence increased demand for forestry technologies

3.2.3 Economic factors

Economic factors will affect operations of KEFRI as follows:

- a) Trends in economic growth and regional/global economic development will affect performance of KEFRI
- b) Fluctuations in foreign exchange rates are likely to affect financial resource base of the Institute
- c) Increased tree planting will increase the demand for; certified tree seeds, testing and analytical services, and uptake of technologies
- d) Growth of Kenya's economy, especially in the forestry, housing, agriculture, manufacturing and health sectors will increase demand for KEFRI products and services and subsequently impact positively on revenue base

3.2.4 Social factors

The following social factors are likely to affect KEFRI operations:

- a) Health issues including; lifestyle diseases, drug and substance abuse which may negatively affect staff
- b) Increased land fragmentation will lead to further reduction in land available for forestry and agroforestry research and development on private farms
- c) Farmers continued demand for fast growing and high-yielding tree varieties and slow adoption of indigenous varieties may undermine the Institute's effort in conservation of biodiversity
- d) The cultural practices of different communities may affect demand for KEFRI products and services

3.2.5 Technological factors

The speed and rate of technological change is likely to affect KEFRI in the following ways:

- a) Purchase of modern equipment and facilities will enhance quality of forestry research
- b) Emerging trends in the ICT will require adoption of new ICT technologies which though initially costly, will be cost effective in the long term
- b) Use of social media, mobile technology, and other ICT platforms will improve capacity of the Institute to disseminate forestry information on forest technologies to various stakeholders
- c) Increasing global demand for forest products will cause demand for technologies and higher productivity species

3.2.6 Environmental factors

Environmental factors that are likely to affect the Institute include:

- a) Environmental degradation and disturbance will negatively affect ecosystem services offered by forests and may encourage emergence of invasive species
- b) Erratic weather patterns and climate change may lead to unexpected pest outbreaks, fire incidences and low forest productivity
- c) Invasions by exotic invasive species may negatively impact on the local biodiversity resources.

3.2.7 Legal factors

The legal environment will be important in implementation of the Strategic Plan as follows:

- a) The Institute must conform to emerging laws and regulatory frameworks which may affect its research and development agenda. Such laws include: Forest Conservation and Management Act, 2016; Environment Management and Coordination Act, 2015; and Science Technology and Innovation Act 2013
- b) The Institute must align to the constitutional dispensation of devolved forestry functions though with limited resources
- c) The Institute must align to relevant international and regional conventions and treaties
- d) The proposed introduction of legislation of Tree Seed Regulation is expected to positively regulate exchange of quality of tree germplasm

3.2.8 Governance

The KEFRI Board of Directors will execute its mandate as guided by Code of Governance for State Corporations (MWONGOZO). Under the 6th Strategic Plan, KEFRI aspires to develop and operate its own statute to ensure stability in the implementation of forestry research in the country.

3.3 Stakeholder Analysis

KEFRI stakeholders include; public agencies, county governments, development partners, private sector, communities, individuals and employees. These stakeholders will continue to provide opportunities for the Institute to enhance its efficiency and effectiveness in implementation of the 6th Strategic Plan. A stakeholder analysis was undertaken to identify their roles/functions and expectations from KEFRI (Table 3.2).

Table 3.2: Stakeholder Analysis Matrix

Stakeholder	Role /Functions of the Stakeholder	Stakeholder's\ Expectations from KEFRI	What KEFRI should do to meet Stakeholder's Expectations	What the Stakeholder should do to assist KEFRI
State Corporations KFS, NACOSTI, KWS, WARA, KWTA, KENGEN, TARDA, RDAs, NMK, NEMA, KIPPRA, NRF, KENNIA	Undertake development, regulatory and service provision	Provision of technologies and information	Provide appropriate technologies and information	- Identify issues and problems for research - Support collaborative research on specific issues
National Research Institutions KALRO, KIRDI, KEWI	Research for technology development	Collaboration and information exchange /sharing	Create linkages and networks for seamless engagements	Operationalize tools of engagement e.g. MoUs, MoA, LoA
Universities and Institutions of Higher Education	Training, education and research	Joint research, staff exchange, student attachment and supervision	Provide high level of expertise, collaboration, professionalism, commitments and cooperation	Timely requests and engagements for timely actions and facilitation
National Government ministries, and departments e.g. MoEF, The National Treasury, County Governments (47)	- Provide oversight - Development and service provision	Compliance to statutory obligations, technical support and provision of information	- Undertake its mandate efficiently, account for resources and respond to enquiries timely - Rationalize its operations	- Timely funding, - Provide supervision and timely feedback - Effectively communicate the policy framework
Development partners JICA, USAID, EU, SIDA, FINNIDA, DANIDA, GIZ	Support for research and development activities	- Resources for proposals - Proper management and accountability of funds	Project implementation, reports and financial accounting	- Communicate priority development strategies - Timely response to requests - Provide expertise when required
UN Agencies: UNEP, UNDP, FAO	Provide high level technical support and joint project implementation	Collaboration, implementation and delivery of project and accountability of funds	- High level collaboration -Timely reporting of project implementation progress and financial accounting financial accounting	- Timely information on current development initiatives - Timely response to requests - Provide expertise when required

Table 3.2: Stakeholder Analysis Matrix

Stakeholder	Role /Functions of the Stakeholder	Stakeholder's\ Expectations from KEFRI	What KEFRI should do to meet Stakeholder's Expectations	What the Stakeholder should do to assist KEFRI
Consultative Group on International Agricultural Research (CGIAR) e.g. CIFOR, ILRI, ICRAF	Provide high level technical support and joint project implementation	Collaboration, implementation and delivery of project and accountability of funds	High level collaboration -Timely reporting of project implementation progress and financial accounting	- Timely information on current development - Develop and implement joint research initiatives - Timely response to requests - Provide expertise when required
Private sector communities and companies	Implement development activities	Technologies and information provision	Provide appropriate technologies and information	- Identify issues and problems for research - Provide support (financial / in-kind)
CBOs, FBOs /NGOs	Facilitate development activities, lobbying and advocacy	Technologies and information provision	Provide appropriate technologies and information	- Identify issues and problems for research - Provide support (financial / in-kind)
Service Providers	Provide quality goods and services on a timely basis	- Efficient and transparent procurement process - Timely payment	- Conform to statutory procurement requirements - Maintain efficient system for processing payment	- Provide adequate documentation - Timely delivery of quality products and services
Employees	Effectively and efficiently deliver KEFRI mandate	- Favorable terms and conditions of service	- Clear job description, motivation, policy and procedures manuals -Provision of adequate resources to facilitate execution of duties	- Commitment to service delivery, integrity, teamwork, courtesy, professionalism and reliability

CHAPTER FOUR

STRATEGIC DIRECTION

KEFRI being a centre of excellence in research for forestry and allied natural resources in Kenya, is expected to provide leadership in finding solutions to forestry related challenges within the country and collaborate with other organizations to address regional and global forestry challenges. In implementing its 6th Strategic Plan 2018-2022, KEFRI will be guided by its Mandate, Vision, Mission, Core Values and strategic framework.

4.1 Mandate

- i. Conduct research in forestry and allied natural resources;
- ii. Disseminate research findings to stakeholders;
- iii. Build capacity of stakeholders; and
- iv. Establish partnerships and cooperate with other research organizations and institutions of higher learning in joint research and training.

4.2 Vision

A world class centre of excellence in forestry and allied natural resources research for sustainable development

4.3 Mission

To conduct research and provide information and technologies for sustainable development of forestry and allied natural resources for socio-economic development

4.4 Core Values

The Institute's core values (THEPPICC) which will guide implementation of this Strategic Plan are:

- Teamwork
- Healthy Environment
- Professionalism
- Partnership
- Innovation
- Creativity
- Customer Focus

4.5 Strategic Goals

1. Effectively contribute to the national minimum tree cover of 10%
2. Improve livelihoods of communities and households through sustainable forest management

4.6. Strategic Objectives

The KEFRI Strategic Plan 2018-2022 will strive to achieve seven (7) strategic objectives which are to:

1. Generate technologies for establishment and management of forest plantations, trees on-farms and enhance production of superior germplasm for priority tree species for different agro-ecological zones
2. Generate rehabilitation technologies for adaptation to climate change, sustainable forest landscapes, woodlands, wetlands and riparian eco-systems
3. Develop technologies for efficient processing and utilization of wood and non-wood forest products
4. Formulate forestry policies for sustainable forest management and improved livelihoods
5. Disseminate forestry research technologies and enhance institutional research and development capacity
6. Strengthen institutional capacity for research and development
7. Enhance corporate communication and publicity

4.7 Strategic Themes

The KEFRI 6th Strategic Plan 2018-2022 has adopted a thematic research approach in line with recommendations of the National Forest Programme (NFP). The implementation of this Strategic Plan will be guided by seven (7) Strategic Themes, i.e. five (5) in Research and Development, one (1) in Corporate Services and one (1) in Corporate Affairs and Quality Assurance. Research will be conducted in different agro-ecological zones. The strategic focus of the themes are as follows:

1. Forest Productivity and Improvement (FPI)

Forest Productivity and Improvement (FPI) research theme will focus on generating technologies for establishment of plantations, trees on farms and sustainable management of all types of forests. The theme will also undertake research in tree improvement, conservation of forest genetic resources; integration of high value trees on farms, and production of high quality tree germplasm. In addition, the theme will undertake research and advisory services in Integrated Pest Management and control of tree diseases and management of parasitic plants. The theme will address challenges facing forestry through the following sub-themes:

- Germplasm production and conservation
- Silviculture
- Tree breeding
- Domestication and diversification of tree species
- Forest biotechnology
- Forest health management
- Forest plantation resource assessment

2. *Forest Biodiversity and Environment Management (FBEM)*

Forest Biodiversity and Environment Management (FBEM) research theme will focus on development of technologies for rehabilitation and sustainable management and utilization of all types of forests in water towers, wetlands and riparian ecosystems. The research will develop technologies for conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services. The research theme will also embrace approaches for mitigation and adaptation to climate change. Research activities will generate information necessary to integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and national resource accounts. The theme will address challenges facing forestry through the following sub-themes:

- Biodiversity conservation and sustainable use
- Forest rehabilitation and restoration of natural forests and woodlands
- Conservation and management of wetlands and riparian ecosystems
- Forest hydrology and watershed management
- Climate change mitigation and adaptation research
- Natural forest resource assessment

3. *Forest Products Development (FPD)*

Forest Products Development (FPD) research theme will contribute to sustainable forest management through development and promotion of efficient technologies for harvesting, processing and utilization of forest resources. The theme will contribute to improved livelihoods of Kenyan communities through development of wood and Non-Wood Forest Products (NWFP) as alternative sources of income. The theme will evaluate new ways of using wood in construction, bio-materials, bio-chemicals, bio-plastics, energy products and food additives. The theme will address challenges facing wood resources and non-wood forest products through the following sub-themes;

- Forest harvesting and logging operations
- Forest product processing and efficient utilization
- Forest products development, incubation and linkage to industry/small and medium enterprises (SMEs)
- Development and promotion of efficient technologies for bio-energy processing and utilization
- Characterization and standardization of wood and non-wood products
- Identification, development and commercialization of products from natural resources
- Capacity building on efficient forest products development and utilization technologies

4. *Socio-economics, Policy and Governance (SPG)*

Socio-economics, Policy and Governance (SPG) research theme will contribute to technology development through addressing cross-cutting issues that influence management of forestry and the environment in Kenya. Research output will contribute to development of forestry-related policies and legislation (governance). The research will also focus on: society interests in forests and the environment; forest resource management; valuation and benefit sharing; and markets and trade in forest products for enhanced livelihoods. In addition research will be carried out in forest investment for better understanding of forest investment profiles, and viable forest business schemes for investors to foster increased forest sector investment. The theme will address the challenges facing forestry through the following sub-themes:

- Forest policy, legislation, and governance
- Forest valuation and Payment for Ecosystem Services (PES)
- Forest land tenure and conflict resolution
- Community, gender and special interest groups in forest management
- Participatory Forest Management (PFM)
- Research in forest extension
- Forests and livelihood improvement
- Forest product value chains and trade
- Forest investment and financing

5. *Forest Research Support Services (FRSS)*

Forest Research Support Services will contribute to enhanced quality and dissemination of research results by ensuring proper; project formulation, research data management, laboratory standards, knowledge management, and capacity building for stakeholders for sustainable development of forestry and allied natural resources. The theme will address challenges facing; research data management, laboratory management, and dissemination of research results through the following sub themes:

- Biometrics, Geographical Information Systems and Remote Sensing
- Knowledge Management
- Capacity building of stakeholders and Information Dissemination
- Laboratory coordination
- Information Communication Technology

6. *Corporate Services (CS)*

Corporate Services will concentrate on supporting research and development themes by creating a conducive operational environment through upgrading and managing physical infrastructure, optimizing the utilization and performance of human, financial and other resources.

7. Corporate Affairs and Quality Assurance (CA&QA)

This theme will undertake; strategic profiling of the Institute nationally and internationally, branding, quality corporate reports, quality assurance, performance contracting, and implementation of customer service charter.

Integration of themes, strategic objectives and strategies to realise the goal under this plan is shown in Table 4.1.

Table 4.1: Linking Research Themes, Strategic Objective and Strategies

No	Themes	Strategic Objectives	Strategies
1.	Forest Productivity and Improvement	To enhance production of superior germplasm for priority tree species for different agro-ecological zones	1.1 Enhance studies in germplasm production, collection and quality control 1.2 Production of high quality germplasm to enhance tree performance in high rainfall, dryland and other areas of Kenya 1.3 Enhance tree breeding
		To generate technologies for establishing and managing forest plantations and trees on-farm	1.4 Enhance silviculture of plantations, trees on farms (agroforestry) and indigenous forests 1.5 Undertake forest resource assessment 1.6 Improve health of trees and forests through studies of entomology, pathology, forest fires and associated environmental factors
2.	Forest Biodiversity and Environment Management	To generate technologies for sustainable forest landscapes, wetlands and riparian ecosystems	2.1 Develop technologies for rehabilitation /restoration of forests, woodlands, and allied natural resources 2.2 Develop technologies for climate change mitigation and adaptation 2.3 Develop technologies for conservation and management of water catchments and wet lands ecosystems 2.4 Biodiversity monitoring and management 2.5 Develop technologies for management of alien invasive species
3.	Forest Products Development	To develop technologies for efficient processing and utilization of wood and non-wood forest products	3.1 Enhance efficiency in production and utilization of non-timber forest products (NTFPs) 3.2 Improve efficiency in harvesting, processing and utilization of timber 3.3 Improve efficiency in biomass energy processing and utilization 3.4 Enhance bio prospecting and use of indigenous knowledge on natural products
4.	Socio-Economics, Policy and Governance	To formulate policies for improved livelihoods and sustainable forest management	4.1 Contribute to improved forest governance 4.2 Enhance access to information on forest sector finance and investments 4.3 Conduct valuation of forest and allied resources 4.4 Evaluate effectiveness of forest extension methods 4.5 Undertake research on forest product markets and trade 4.6 Undertake studies on forest economics, tree property rights and land tenure

<i>No</i>	<i>Themes</i>	<i>Strategic Objectives</i>	<i>Strategies</i>
5.	Forest Research Support Services	To disseminate forestry research technologies and enhance research capacity	5.1 Enhance forest information management and dissemination 5.2 Build capacity of stakeholders 5.3 Enhance laboratory management and operations 5.4 Enhance knowledge management 5.5 Strengthen biometrics and GIS 5.6 Enhance application of Information Communication Technology
6.	Corporate Services	To strengthen institutional capacity for R&D	6.1 Enhance human resource capacity 6.2 Enhance employee satisfaction and retention 6.3 Improve infrastructure and facilities 6.4 Secure land for forestry research 6.5 Ensure prudent financial management 6.6 Expand and manage revenue base 6.7 Reducing costs 6.8 Enhance management of asset and liabilities 6.9 Enhance systems and processes of risk management and internal controls 6.10 Enhance supply chain management
7.	Corporate Affairs and Quality Assurance	To enhance communication with stakeholders and publicity of the institute	7.1 Increase communication, visibility and outreach (Corporate Affairs) 7.2 Monitoring and Evaluation 7.3 Quality assurance 7.4 Performance contracting 7.5 Customer satisfaction and feedback

CHAPTER FIVE

STRATEGIC IMPLEMENTATION AND COORDINATION

5.1 **Balanced Score Card (BSC) Based Strategic Implementation**

KEFRI will adopt the Balanced Score Card (BSC) approach to guide, measure and report on the status of execution of the Strategic Plan. The approach will identify areas that require performance improvement, and address emerging issues.

Balanced Score Card is a performance measurement and management reporting system that links organizational Vision, Mission, Goals, Strategic Objectives and Strategic Themes with operational elements, including initiatives, measurements, targets and budget as elaborated in the Corporate Implementation Matrix (Annex I). Description of parameters to be used during the implementation of this Strategic Plan using BSC is summarized as follows;

- i. **Strategic Objectives:** Is what is to be achieved for the Institute to realize its strategic goals. The Plan will be deemed successful if there is a high level of achievement of the strategic objectives.
- ii. **Initiatives/Activities:** Basic endeavours, points of action or a set of priorities that will be undertaken in order to realize the desired outcomes.
- iii. **Expected Outputs:** Immediate observable results after completion of activities
- iv. **Measures:** Units of measuring the extent, magnitude or degree of accomplishment of the desired output in order to track progress.
- v. **Targets:** Desired levels of performance and are indicators of the desired extent of fulfilment of the specific strategy. They are quantitative and qualitative in nature.
- vi. **Responsibility:** The specific office or officer to oversee the assigned activity.
- vii. **Budget Estimates:** Quantification of the cost of each activity which will aid in planning and ensuring availability of adequate resources.

5.1.1 Strategy Map

KEFRI Strategy Map for the planning period 2018-2022 is as shown in Figure 5.1. The Map illustrates how KEFRI aims at creating value to customers and stakeholders, achieving its strategic goal and pursuing its Vision. Under each BSC perspective, the Strategy Map outlines the key results areas (high impact outcomes) that will be realized after achieving one or more objective(s) as outlined in the Corporate Implementation Matrix (Annex 1).



Figure 5.1: KEFRI Strategy Map

5.1.2 *Implementation of Corporate Matrix*

The Corporate Implementation Matrix will form the basis for preparation of annual work plans, as part of the process of ensuring actualization of the Plan. Implementation will be facilitated by cascading the Corporate Implementation Matrix (Annex 1) to departmental, team and individual levels within the Institute. Regular meetings by the Board of Directors and KEFRI Management will be held to track progress and coordination of activities.

5.2 *Management and Coordination of Research and Development*

KEFRI has established a well-coordinated institutional structure that ensure strong linkage between scientists and stakeholders to facilitate development of problem oriented research programme and implementation that address key issues of interest to respective stakeholders in the country. The organization structure outlining team composition to deliver this strategic plan is shown in Annex II.

5.2.1 *The Board of Directors of KEFRI*

The Board of Directors will have overall oversight of the Strategic Plan on behalf of the Government of Kenya. The Board will meet at least once quarterly to review implementation of the Strategic Plan, research and development annual work-plans, quarterly reports and financial expenditures in accordance with public financial management circulars and legal procedures. The Board of Directors through its three sub-committees namely: Research and Development; Finance and Administration; and Audit; will receive, discuss, approve and recommend actions on reports from KEFRI Directorate during the meetings. The Board of Directors will recommend management actions and corrective measures to be taken to mitigate any challenges encountered.

5.2.2 *The Executive Committee*

The Executive Committee shall be chaired by the Director and shall meet quarterly to review progress made on implementation of the Strategic Plan. The Executive Committee has two sub-committees: one consisting of Deputy Directors under Research and Development chaired by the Senior Deputy Director Research and Development (SDDR&D); and the other consisting of Deputy Directors under Corporate Services chaired by Senior Deputy Director Corporate Services (SDDCS). The two sub-committees shall meet quarterly to review progress on implementation of the Strategic Plan under their respective Departments. Recommendations made by the two sub-committees shall be submitted to the Executive Committee for deliberations. The Executive Committee through the Director shall submit its deliberations to the Board.

5.2.3 National Forestry Research Advisory Committee

The National Forestry Research Advisory Committee shall be chaired by the Chair KEFRI Board of Directors or the representative (Chair Research & Development sub-committee of the Board) and shall meet bi-annually to review progress on implementation of the Strategic Plan together with stakeholders. Recommendations of the Committee shall inform the review of the Strategic Plan and inform the preparation of the next strategic plan taking cognizance of any emerging issues. These recommendations shall be adopted by the Executive Committee.

5.2.4 Annual Consultative Committee

The Annual Consultative Committee Meeting (CCM) shall be the planning and coordinating organ of the Institute comprising members of the Executive Committee and Regional Directors. The Consultative Committee shall meet at the beginning of every financial year to review performance of the previous year, set targets and allocate funds to prioritized activities to be implemented.

5.2.5 KEFRI/KFS Liaison Committee

The KEFRI/KFS Liaison Committee shall comprise of Policy Liaison Committee (PLC) and Technical Liaison Committee (TLC). The PLC shall consist of top management of the two institutions, as well as the executive officers of key relevant institutions. The PLC shall receive recommendations from the TLC for providing policy direction on:

- a. Forestry development
- b. Research priorities, strategies and orientation
- c. Research application and information dissemination
- d. Research monitoring and evaluation
- e. Human resource development for promotion of forestry research and management
- f. Response to issues of national, regional and international interests related to forestry development
- g. Inter-institutional collaboration in promoting forestry development.

Members of the TLC shall comprise relevant staff nominated by KFS, KEFRI, and key institutions and shall make recommendations to the PLC. KEFRI/KFS Liaison Office shall be coordinated by a Secretariat, which shall be composed of one officer each from KFS and KEFRI. The KEFRI officer shall be seconded from National Forest Products Research Programme (NFPRP) and shall report to SDDR&D. The KEFRI/KFS Liaison officers shall form joint secretaries to both PLC and TLC meetings.

5.2.6 Centre Research Advisory Committees (CRACs)

Centre Research Advisory Committees (CRACs) shall be based at Eco-regional Research Programmes. CRAC meetings shall be held annually with key stakeholders in respective eco-regions to review existing projects, identify research problems, and contribute to planned activities. Recommendations from stakeholders shall be incorporated into research proposals and be presented to the Consultative Committee Meeting (CCM) for consideration.

5.2.7 National Tree Seed Advisory Committee

The National Tree Seed Advisory Committee is mandated to identify tree seed problems and advice management on; tree seed sources, collection, handling, storage, distribution and marketing. The Committee shall also advise on implementation of tree seed certification process based on OECD Forest Seed and Plant Scheme. The Committee shall meet at least twice in a year. Membership of the National Tree Seed Advisory Committee shall include;

- a) Chief Conservator of Forests who shall be the chair
- b) Director of the Kenya Forestry Research Institute who shall be the Secretary
- c) The Chief Executive; Seed Traders Association of Kenya
- d) One representative each from the following institutions;
 - i. State Department of Agriculture
 - ii. National Museums of Kenya (NMK)
 - iii. Genetic Resources Research Institute
 - iv. Tree Biotechnology Programme Trust (TBPT)
 - v. Breeders Association of Kenya
 - vi. Kenya Plant Health Inspectorate Service (KEPHIS)

5.3 Risk Management

The Institute has an established risk management process that will be used to identify, analyze, evaluate and treat the principal risks that are likely to be faced during the implementation of the Strategic Plan. Risk management is important for the Institute to; reduce possibility of failure and ensure that the set objectives are accomplished; and identify possible opportunities that may add value to the implementation of the Strategic Plan. The Institute shall continuously identify potential risks that can have adverse impacts at varying levels and plan for mitigation strategies to manage them.

Risk management in the Institute will be undertaken guided by ISO 9001:2015, ISO 14001:2015 and ISO 31000:2018 standards, which provides guidelines for identification, assessment and mitigating risks. Possible risks that may affect the Institute during the implementation of the Strategic Plan are;

1. Strategic risks
2. Operational risks
3. Financial risks
4. Technological risks

Table 5.1 Anticipated Risks and Mitigation Strategies

<i>Type of Risk</i>	<i>Anticipated Risk</i>	<i>Mitigation Strategies</i>
Strategic risks	Political interest on the implementation of the research projects	<ul style="list-style-type: none"> • Focus on the strategic objectives of the Institute and their contribution to Vision 2030 and other national policies and initiatives • Ensure the Institute is managed professionally in all departments • Adherence to the Institute’s and public service policies and guidelines
	Possible loss of experimental sites	<ul style="list-style-type: none"> • Secure ownership of the Institute land • Collaborate with other stakeholders for long term agreement to non-institute land • Work with local community organizations in protection of experimental sites
	Environmental challenges such as prolonged drought, change of weather patterns	<ul style="list-style-type: none"> • Develop drought tolerant tree species • Maximize on rainfall seasons to undertake planting • Work with meteorology department to guide on weather changes
	Security challenges in some regions which may affect the research activities for a long period	<ul style="list-style-type: none"> • Collaborate with the local administration on security • Collaborate with KFS and KWS in areas of their jurisdiction • Sensitize staff on insecurity threats and ways to mitigate against them
	Outbreak of pests and diseases for various tree species	<ul style="list-style-type: none"> • Create awareness among stakeholders on pest and disease outbreaks • Strengthen Eco-regions with appropriate facilities to handle emergencies • Build capacity for quick response to disasters • Collaborate with disaster management organizations

<i>Type of Risk</i>	<i>Anticipated Risk</i>	<i>Mitigation Strategies</i>
Operational risks	Inadequate equipment and infrastructure	<ul style="list-style-type: none"> • Prioritize procurement of key equipment • Long term strategic planning in developing appropriate infrastructure in the Eco-regions • Optimal use of available equipment and infrastructure • Collaborate with county governments in supporting infrastructure development in respective areas
	Inadequate specialized staff	<ul style="list-style-type: none"> • Optimize staff recruitment through strategic recruitment and succession plan • Train existing staff on emerging areas of research
	Corruption	Enforcement of the Institute's anti-corruption policies
	Disclosure of classified information	Vetting of officers dealing with classified information
	Lack of land tenure	Acquire enough land with titles for experiments
	Litigation against the Institute	Adhere to government regulations and engage competent lawyers to handle suits
Financial risks	Inadequate GoK budgetary allocation and revenue collection for intended planned activities	<ul style="list-style-type: none"> • Lobby for more funding from the National Treasury and county governments • Proposal writing to access funding from National Research Funds and partners • Upscale promotion and commercialization of KEFRI products and services • Build capacity to compete for consultancies, contract research and services • Avoid financial commitments without assurance for funding
	Lengthy negotiations and unpredictability of donor funds	<ul style="list-style-type: none"> • Create suitable environment for donor negotiations • Build capacity of scientists to develop grant winning competitive research proposals • Inform donors of the legal requirements of funding and related taxes in where applicable • Initiate Public-Private Partnership for revenue generation ventures • Exercise prudent financial management
Technological risks	Rapid technological changes affect reliability	<ul style="list-style-type: none"> • Enhance human resource capacity on technology • Document processes for managing and controlling changes to ICT systems and data • Develop ICT infrastructure in all centres
	Inadequate ICT infrastructure development	<ul style="list-style-type: none"> • Planned strategic roll-out infrastructure to all centres • Establish, operationalize and maintain ICT infrastructure • Develop and implement data integration and analytics tools
	Breach of ICT security system	<ul style="list-style-type: none"> • Regular review of ICT policy to reflect the contemporary ICT needs • Strengthen institutional external data back-up for safe storage • Procurement and maintenance of appropriate software and periodical renewal
	Inadequate use of Knowledge Management	<ul style="list-style-type: none"> • Implement Knowledge Management Policy • Expand knowledge management facilities to capture all institutional knowledge • Establish support for knowledge and information management and transfer

CHAPTER SIX RESOURCE REQUIREMENTS AND MOBILIZATION

6.1 Projected Financial Requirements for the Period 2018-2022

In order to implement the 6th Strategic Plan, financial, human and physical resource will be required. The financial requirements for the 2017/2018 financial year are estimated at KES 2.17 billion that is projected to grow to KES 2.901 billion by 2021/2022 financial year (Table 6.1).

Table 6.1: Projected financial requirements for the period 2018-2022

Funding Projection (KES)					
Source	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
GOK-Grants	1,669,880,997	1,700,330,000	1,800,540,000	2,000,771,000	2,270,448,100
Internally Generated Revenue	123,282,756	125,500,000	131,775,000	135,450,000	142,222,500
Donor Grants	377,381,195	433,988,375	450,920,000	476,861,000	488,329,400
Total	<u>2,170,544,948</u>	<u>2,259,818,375</u>	<u>2,383,235,000</u>	<u>2,613,082,000</u>	<u>2,901,000,000</u>

6.2. Projected Sources of Funding

The themes and activities in this Strategic Plan will be financed mainly from; the Government of Kenya (GoK), internally generated revenue, and from development partner funds and agencies (Table 6.2).

Table 6.2: KEFRI main sources of funds for the Strategic Plan period 2018-2022

<i>Sources of Funds</i>	<i>Type of Funding</i>
Government of Kenya	<ul style="list-style-type: none"> a) Recurrent grants b) Development grants c) AIA grants
Internally Generated Funds	<ul style="list-style-type: none"> a) Sale of tree seed b) Hire of training facilities c) Consultancy services and training d) Sale of forest products e) Laboratory services
External	<ul style="list-style-type: none"> a) Development partner grants b) Public-Private Partnerships

6.2.1 Government of Kenya funding

As per the Constitution of Kenya, 2010 the Government of Kenya operates at two levels, that is, National and County Government. From 2013, KEFRI has continued to draw its funding from the National government. KEFRI has developed a devolution strategy to facilitate engagement with the 47 county governments. The Institute will explore opportunities for collaboration with county governments in co-funding various forest related activities. The Institute will continue to engage the National Government to increase funding of research and development activities. KEFRI will also lobby for introduction of a levy to be charged on all forest products and services to support research. KEFRI will adopt a proactive approach in expenditure planning and prioritization of projects. The Institute will efficiently utilize the funds to undertake; research activities, equip facilities and replace obsolete technologies.

6.2.2 Internal funding

During the strategic plan period, KEFRI intends to increase its financial resources to support research and development through internal revenue generation by Enterprise Unit. Some of the targeted internal revenue generation sources include sale of; tree seeds, produce from plantations, processed wood and non-wood forest products, and hospitality services. Other avenues for generating revenue internally will include offering consultancy services and training.

6.2.3 External sources of funds

6.2.3.1 Support from development partners

KEFRI will mobilize financial resources from its long term development partners and also explore new funding opportunities. The resource mobilization office will establish a database of possible funding partners and their funding cycles. The partners will also be matched with the strategic objectives of the plan. The Resource Mobilization Office will co-ordinate joint development of concepts, proposals, and consultancy bids with scientists. The Institute will regularly revise its resource mobilization strategies through proactive approaches such as benchmarking with similar successful local and international agencies.

6.2.3.2 Public-Private Partnerships

The government through Public-Private Partnerships (PPP) Act, 2013 and Forest Conservation and Management Act, 2016 encourages public agencies to form partnerships with private sector to facilitate enhanced public service delivery. KEFRI through the Strategic Plan 2018-2022 will continue to engage private sector players in linking forestry research to industry. The Institute collaboration with interested private companies, groups and individual entrepreneurs will pilot viable PPP business models. Some of the potential private sectors organizations that the Institute will explore contractual arrangements with include; Kenya Wood Preservers Association, Green Energy Project, Better Globe Forestry, KOMAZA, and Green Pot.

6.3 Physical Facilities

The planned infrastructural developments during the 6th Strategic Plan (2018-2022) will include; construction of Londiani Centre in Kericho County, and a Farmers Resource Centre in Rumuruti in Laikipia County. The Institute will also construct green houses and seed extraction facilities at Muguga, Kakamega, Migori, Londiani, Maseno, Nyeri, Gede and Taita Taveta. The Institute will increase water supply for research and domestic use through sinking of boreholes in Lamu and Kitui and shallow wells in Kakamega and Migori. The Institute will continue to expand water reticulation and fire hydrants installation in Lamu, Marigat and Kitui (Phase II).

6.4 Human Resource Requirements

The Institute's approved staff establishment provides for optimal staffing level of 1184 staff. The Institute currently has a total of 967 staff across various staff categories. There are 108 scientists, 95 technologists and technicians, and 25 foresters supported by 157 professional and 582 general support staff. It is anticipated that more scientists will be recruited to fill gaps in key specializations while the number of support staff is expected to decrease as non-core activities such as security and cleaning of buildings and maintenance of the grounds will be outsourced.

Variance in other staffing levels and skills required will be bridged through: recruitment to bring new talent; use of internships and students on attachment; contracted staff for some projects or short term assignments; and systematic training to equip existing staff with relevant skills, knowledge and attitudes.

A training needs assessment conducted in 2016/2017 revealed the need to improve skills, knowledge and attitudes in various fields. The Institute will continue to conduct staff capacity building as per recommendations of the training needs assessment report. Priority training areas will include: team building, public relations and customer care, skills for implementation of ISO 9001: 2015 and ISO 14001: 2015, nursery management, seed collection techniques, management development, proposal writing, data management and project management.

CHAPTER SEVEN

MONITORING AND EVALUATION

7.1 Monitoring and Evaluation Process

Monitoring and Evaluation (M&E) is an important management tool that will be used by KEFRI to track implementation of targets outlined in the Corporate Implementation Matrix. The M&E process will be used to measure accomplishments and detect any deviation, and where there is need for adjustment, appropriate and timely action will be taken. The M&E process will take into account emerging issues, and changes in the environment that may affect implementation of the Plan. The Strategic Plan will be subjected to mid-term and end-of-Plan reviews. The M&E process will be undertaken at the Board of Directors, management and functional levels. KEFRI will establish M&E offices at all levels to ensure that the Institute incorporates M&E frameworks into research implementation.

7.1.1 Monitoring and Evaluation at Board of Directors Level

Implementation of the Strategic Plan will be closely monitored quarterly by the Research and Development Committee of the Board of Directors to ensure accomplishment of the Plan. The monitoring process will ensure that performance is reviewed and analyzed on a periodic basis. During the quarterly and annual review meetings, the Board will receive and review progress reports from the Director indicating overall progress made on key strategic objectives. The nature and scope of reporting will include: (a) progress made against Strategic Plan; (b) causes of deviation from Strategic Plan; (c) areas of difficulties and suggested solutions to problems that may adversely affect implementation; and (d) suggested or corrective measures taken to mitigate the challenges encountered.

7.1.2 Monitoring and Evaluation at Management Level

Monitoring and Evaluation at management level will be carried out by the Executive Committee. The Committee will meet quarterly and review progress made in implementation of the Strategic Plan. The Executive Committee will have two sub-committees: one consisting of Deputy Directors Research and Development chaired by the Senior Deputy Director Research and Development (SDDR&D); and the other consisting of Deputy Directors under Corporate Services chaired by Senior Deputy Director Corporate Services (SDDCS). The two sub-committees will meet quarterly to review progress on implementation of the Strategic Plan under their respective Departments. Monitoring will involve routine data collection and analysis on the progress of the Strategic Plan implementation. The office of Corporate Affairs and Quality Assurance will coordinate collection of M&E data, analysis and reporting to the sub-committees. Recommendations by the two sub-committees will be submitted to the Executive Committee chaired by the Director.

The Consultative Committee chaired by the Director, will be guided by the Implementation Matrix of the Strategic Plan (Annex 1) in scheduling activities to be undertaken on annual basis (annual work-plan). Progress in implementation of the annual work-plan will be monitored quarterly by Corporate Affairs and Quality Assurance and reported once annually to the Consultative Committee with recommendations for action on any targets not met. The recommendations will be factored in developing the work-plan of the Institute in the next financial year.

7.1.3 Monitoring and Evaluation at Functional Level

Monitoring and Evaluation at functional level will involve routine data collection and analysis on progress of the Strategic Plan implementation. The thematic leaders, divisions and Eco-regional directors will monitor programmes and projects administered within their respective jurisdictions and submit quarterly and annual M&E reports to the Corporate Affairs and Quality Assurance for analysis.

7.2 Monitoring and Evaluation Tools

In conducting M&E, the following tools will be applied:

- a) Annual implementation matrix review
- b) Annual performance contracts and work-plans
- c) Annual budget and quarterly expenditure review
- d) Annual and quarterly research and development reports
- e) Consultative and Executive Committee meetings
- f) Annual staff appraisal

7.3 Indicators for Measuring Performance

Measurement of performance will be carried out on the basis of the following indicators:

- a) Customer satisfaction index
- b) Increase in revenue and cost reduction
- c) Compliance to internal processes based on indicators outlined in implementation matrix
- d) Institutional capacity development process based on indicators outlined in implementation matrix

ANNEXES
ANNEX I: CORPORATE IMPLEMENTATION MATRIX

THEME 1: FOREST PRODUCTIVITY AND IMPROVEMENT
STRATEGIC OBJECTIVE: TO GENERATE TECHNOLOGIES FOR ESTABLISHING AND MANAGING FOREST PLANTATIONS AND TREES ON-FARM

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
1.1	Enhance silviculture of forest plantations and trees on farm	Review and develop silvicultural management for key indigenous and exotic tree species	DDFPI RDs	Silvicultural management for key species reviewed and developed	No. of reports	4	0.3	0.3	0.3	0.3	1.2
		Develop nursery standards, technologies and procedures for raising seedlings	DDFPI RDs	Nursery standards, technologies and procedures for raising seedlings developed	No. of reports	12	1.3	1.3	1.3	1.3	5.3
		Diversify tree species for plantations and on farm growing	DDFPI RDs	New tree species identified and promoted	No. of species	8	0.5	0.5	0.5	0.5	2
		Establish, maintain and secure experimental plots	DDFPI RDs	Experimental plots established, maintained and secured	No. of plots	100	10	10	10	10	40
		Establish, maintain and assess sample plots for evaluation of productivity	DDFPI RDs	Sample plots established, experimental data and assessment reports	No. of plots, and assessment reports	100	10	10	10	10	10
1.2	Enhance health of trees and forests through studies on entomology, pathology and associated environmental factors	Undertake tree physiology studies on tree, water and soil interaction	DDFPI RDs	Reports on physiology of tree, water and soil interaction	No. of reports	20	0.5	0.5	0.5	0.5	2
		Monitor and manage tree pests and diseases	DDFPI RDs	Quarterly reports on pests, diseases and management options	No. of reports	16	0.5	0.5	0.5	0.5	2
		Develop and implement national health research strategy	DDFPI RDs	National health strategy developed and implemented	No. of strategies	1	0.1	0.2	0.5	0.2	1
					No. of reports						4

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				Total Budget
							Y1	Y2	Y3	Y4	
1.3	Undertake forest resource assessment	Develop fire prediction models and control procedures	DDFPI RDs	Prediction models and control procedures developed	No. of publications	7	0.2	0.4	0.4	0.4	1.4
		Monitor hazards, vulnerability and level of exposure of plantations and trees on farm to diverse biotic and abiotic agents	DDFPI RDs	Reports on hazards, vulnerability and level of exposure of plantations and trees on farm to diverse biotic and abiotic agents	No. of reports	2	0.4	0.1	0.4	0.1	1
		Undertake studies on causative agent responses to climate change	DDFPI RDs	Reports on causative agent responses to climate change	No. of reports	4	0.2	0.2	0.2	0.4	1
		Monitor the introduction, spread and impacts of alien invasive species and plant parasites and develop management options	DDFPI RDs	Reports on introduction and impacts of alien invasive species and plant parasites and management options	No. of reports	4	0.8	0.8	0.8	0.8	3.2
		Quantify impact of pests and diseases on forest health	DDFPI RDs	Reports on impact of pests and diseases on forest health undertaken	No. of publications	8	0.5	0.5	0.5	0.5	2
		Monitor shifts in pest and host species relationships	DDFPI RDs	Reports on shifts in pest and host species relationships	No. of annual reports	4	0.4	0.4	0.4	0.4	1.6
		Undertake forest mensuration and modeling studies	DDFPI RDs	Studies on forest mensuration and modeling undertaken	No. of publications	3	1	1	1	1	4
		Undertake forest resource inventory and monitoring through remote sensing and GIS application	DDFPI RDs	Reports on forest resource inventory and monitoring through remote sensing and GIS application	No. of reports	2	1	1	1	1	4
		Develop integrated national forest assessment monitoring and reporting system	DDFPI RDs	Forest resources data bases and functional monitoring and systems developed	No. of data bases	2	1	1.2	1.2	1.2	4.6

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				Total Budget
							Y1	Y2	Y3	Y4	
1.4	Production of high quality germplasm to increase tree cover	Develop and implement a tree improvement strategy	DDFPI RDs	Tree improvement strategy developed and implemented	No. of strategies	1	1.5	0.3	0.2	0.2	2.2
					No. of reports	4					
		Produce pine and eucalyptus hybrids	DDFPI RDs	Pine and eucalyptus hybrids produced	No. of pine and eucalyptus hybrids produced	80	1	1	1	1	4
		Undertake selection of superior trees for key species	DDFPI RDs	Superior trees for key species selected	No. of selected superior trees	120	3	3	3	3	12
		Establish and maintain species, provenance and progeny trials	DDFPI RDs	Species, provenance and progeny trials established and maintained	No. of trials	20	3	3	3	3	12
		Establish and maintain seed orchards	DDFPI RDs	Seed orchards established and maintained	No. of hectares	100	3	3	3	3	12
		Establish and maintain seed stands to increase seed sources	DDFPI RDs	Seed stands established and maintained	No. of hectares	120	3	3.2	3.4	3.6	13.2
		Produce tree seed to increase forest cover	DDFPI RDs	Tree seed produced	Weight of seeds in tonnes	53	20	20	20	20	80
		Raise seedlings of selected difficult to propagate tree species	DDFPI RDs	200,000 seedlings raised	No. of seedlings raised in 1,000s	2	3	3	3.5	3.5	13
		Raise high quality seedlings for different ecological zones to increase tree cover	DDFPI RDs	High quality seedlings produced	No. of seedlings (millions)	4	10	10	10	10	40

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
1.5	Enhance seed research and quality control	Undertake studies on seed science	DDFPI RDs	Studies on seed science undertaken	No. of publications	62	2.5	2.5	2.5	2.0	9.5
		Establish seed testing and certification laboratory	DDFPI RDs	Seed testing and certification laboratory established	No. of laboratories	15	-	1	1	1	3
		Undertake molecular markers for finger printing priority tree species	DDFPI RDs	Molecular markers for different priority species identified and documented	No. of reports	6	6	3	3	3	15
		Develop tissue culture protocols for mass propagation of selected species	DDFPI RDs	Tissue culture protocols developed	No. of protocols	3	1	1	1	1	4
TOTAL BUDGET (MILLIONS)											336.2

**THEME 2: FOREST BIODIVERSITY AND ENVIRONMENT MANAGEMENT (FBEM)
STRATEGIC OBJECTIVE: TO GENERATE TECHNOLOGIES FOR SUSTAINABLE FOREST LANDSCAPES, WETLANDS AND RIPARIAN ECOSYSTEMS**

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				Total Budget
							Y1	Y2	Y3	Y4	
2.1	Develop technologies for rehabilitation /restoration of forests and allied natural resources	Develop guidelines on rehabilitation / restoration technologies and train stakeholders	DDFBEM	Rehabilitation / restoration guidelines developed and stakeholder trained	No. of guidelines	2	2	0		4	
		Establish permanent sample plots in forests and woodlands ecosystems for collection of data on ecological trends and dynamics	DDFBEM	Permanent sample plots (PSPs) in forests and woodlands ecosystems established	No. of PSPs	6	3	7	7	20	
		Develop strategies for <i>in-situ</i> and <i>ex-situ</i> conservation for threatened and endangered species	DDFBEM	Conservation strategies for endangered and threatened species developed	No. of strategies	8	2	5	7	6	20
		Undertake ecological studies for various forest types to secure a broad range of goods and environmental services	DDFBEM	Ecological studies on drylands and highlands forest ecosystems status and resilience undertaken	No. of study reports	4	4	4	6	6	20
		Develop technologies for sustainable natural forest and woodland management	DDFBEM	Technologies on sustainable natural forests and woodland developed	No. of technologies	2	2	2	0	0	4
		Quantify impact of animal damage on forest ecosystems	DDFBEM	Impact of animal damage on forest ecosystems quantified	No. of reports	8	2	4	4	12	

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
2.2	Develop climate change adaptation technologies	Develop and promote climate change resilient tree species	DDFBEM	Climate change resilient tree species developed and promoted	No. of tree species	2	2	3	1	8	
		Develop scenario models for different species in regard to climate change	DDFBEM	Climate change scenario models developed	No. of scenario models	2	2	2	2	8	
		Review carbon emission reduction technologies for forestry sector	DDFBEM	Carbon emission reduction technologies for forest sector reviewed	No. of technologies	2	3	2	1	0	6
		Develop methods and procedures for monitoring and estimating carbon stocks (MIRVS) for various forest types	DDFBEM	Carbon estimation procedure for highlands and drylands forest developed	No. of models	2	2	1	1	0	4
		Develop technologies for mitigating climate change shock	DDFBEM	Technologies for mitigating climate change shock developed	No. of technologies	2	2	2	3	1	8
2.3	Develop technologies for conservation of water catchments and wet lands ecosystems management	Develop technologies for mitigating climate change impacts	DDFBEM	Technologies for mitigating climate change impacts initiated	No. of technologies	2	1	2	3	8	
		Develop tree species suitability maps for soil and water conservation and biomass production	DDFBEM	Species suitability maps for soil and water conservation and biomass production developed	No. of maps	2	2	3	2	3	10
		Develop technologies for conservation of catchments and riparian ecosystems	DDFBEM	Technologies for conservation of catchments and riparian ecosystems developed	No. of technologies	3	1	3	3	3	10
		Undertake studies on forest soils and roles of trees in nutrient cycling	DDFBEM	Studies on role of trees in nutrient cycling in forests and farms undertaken	No. of reports	2	0	2	3	1	6

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				Total Budget
							Y1	Y2	Y3	Y4	
		Conduct long-term hydrological study on riparian, wet lands and coastal ecosystems	DDFBEM	Long-term hydrological studies initiated	No. of reports	4	2	3	2	10	
		Undertake research on hydrological processes and watershed management	DDFBEM	Studies on hydrological processes and watershed management undertaken	No. of reports	1	1	3	4	2	10
2.4	Biodiversity monitoring and management	Assess extinction threats of endangered tree species	DDFBEM	Extinction threats of endangered tree species assessed	No. of reports	2	2	0	0	4	
		Implement conservation strategy with stakeholders for threatened and endangered species	DDFBEM	Conservation gardens/ gene banks for threatened and endangered species established	No of gardens/ gene banks	2	-	2	2	1	5
2.5	Develop technologies for management of alien invasive species	Develop and implement protection strategy for threatened species	DDFBEM	Strategy for protection of threatened species developed	No. of strategies	1	0	2	2	6	
		Identify potential invasive species in forest ecosystems	DDFBEM	A list of potential invasive species in forest ecosystems published	No. of reports	1	2	3	1	0	6
		Develop a national strategy for management of invasive species	DDFBEM	National management strategies developed	No. of strategies	3	2	4	3	3	12
TOTAL BUDGET (MILLIONS)										209	

THEME 3: FOREST PRODUCTS DEVELOPMENT (FPD)
STRATEGIC OBJECTIVE: TO DEVELOP TECHNOLOGIES FOR EFFICIENT PROCESSING AND UTILIZATION OF WOOD AND NON-WOOD FOREST PRODUCTS

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				Total Budget	
							Y1	Y2	Y3	Y4		
3.1	Enhance efficiency in production and utilization of Non-Timber Forest Products (NTFPs)	Carry out resource assessment and mapping of prioritized NTFPs	FPD RDs	NTFP resources assessed and mapped	No. of reports	4	1	1	1	1	4	
		Develop a value chain for prioritized NTFPs	FPD RDs	Value chains developed for NTFPs	No. of reports	4	2	2	1	1	6	
		Build capacity of key actors in value chains of prioritized NTFPs	FPD RDs	Capacity of value chain actors enhanced	No. of key actors trained	12	5	5	5	5	20	
		Pilot incubation and linking products to SMEs/industries	DDFPD RDs	Products incubated and linked to relevant SMEs/industries	No. of products incubated and linked to industry	4	3	3	3	3	12	
3.2	Improve efficiency in processing and utilization of timber products	Develop strategy for incubating and linking products to SMEs/industries	DDFPD RDs	Strategy for incubation and linking products to SMEs/industries developed	No. of strategies	1	-	1	-	-	1	
		Develop and share policy briefs on NTFPs	DDFPD DDSPG	Policy briefs on NTFPs developed and shared	No. of policy briefs	2	-	0.5	-	0.5	1	
		Determine efficiency of timber processing and utilization technologies used in Kenya	DDFPD RDs	Efficiency of timber processing and utilization technologies determined	No. of reports % of recovery rates	3	1	1	1	1	4	4
		Package and disseminate information on efficient timber processing and utilization technologies	DDFPD RDs	Packaged information on efficient timber processing and utilization technologies disseminated to stakeholders	No. of packaged information distributed to stakeholders	4	1	1	1	1	4	

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
3.3	Improve biomass energy efficiency and utilization	Undertake studies on production of composites and reconstituted wood	DDFPD RDs	Studies on production of composites and reconstituted wood undertaken	stakeholders No. of reports	2	-	1	1	-	2
		Undertake studies on efficacy of wood preservatives	DDFPD RDs	Efficacy tests of wood preservatives undertaken	No. reports	2	-	1	-	1	2
		Determine wood and charcoal properties of prioritized species	DDFPD RDs	Wood and charcoal properties of prioritized species determined	Database on wood and charcoal properties	2	1	1	1	1	4
		Undertake a baseline survey on current biomass energy production and utilization technologies	DDFPD RDs KFS County governments	Survey on biomass energy technologies conducted	No. of reports	1	-	1.5	-	-	1.5
3.3	Improve biomass energy efficiency and utilization	Develop/adapt and promote eco-efficient technologies for biomass production and utilization	DDFPD RDs KFS County governments	Eco-efficient technologies on biomass production and utilization developed and promoted	No. of eco-efficient technologies for biomass production	3	2	2	2	2	8
		Evaluate impact of charcoal production, brick making, use of traditional cook stoves to environmental degradation and climate change	DDFPD DDSPG RDs KFS	Impact of biomass energy technologies to environmental degradation and climate change evaluated	1 report 1 journal paper	2	-	1	1	-	2
		Test briquette binders that are readily available and environmental friendly	DDFPD RDs	Briquette binders identified and tested	No. of reports	2	-	-	1	1	2
		Promote briquette production enterprises using wood and agricultural waste	DDFPD RDs	Briquette enterprises using wood and agricultural waste operationalized	No. of enterprises	5	1	1	1	1	4

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
3.4	Enhancing bio prospecting and use of indigenous knowledge on natural products	Document indigenous knowledge on various uses of natural products	DDFPD RDs	Various indigenous knowledge on uses of natural products documented	No. of reports	4	1	1	1	1	4
		Undertake bio-physical characterization of prioritized natural products	DDFPD RDs	Biophysical elements of prioritized natural products characterized	No. of reports	2	1	1	1	1	4
		Promote commercialization of viable natural products	DDFPD RDs	Viable natural products promoted	No. of products	1	-	-	-	1	1
TOTAL BUDGET (MILLIONS)											90.5

**THEME 4: SOCIO-ECONOMICS, POLICY AND GOVERNANCE (SPG)
STRATEGIC OBJECTIVE: TO FORMULATE POLICIES FOR IMPROVED LIVELIHOODS AND SUSTAINABLE FOREST MANAGEMENT**

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				Total Budget
							Y1	Y2	Y3	Y4	
4.1	Improve forest governance	Evaluate policy and legal frameworks for enhanced forestry sector development	DDSPG	Forest sector policy and legal framework for forest development evaluated	No. of reports	2	0.5	0.6	0.8	1	2.9
		Contribute to review and development of subsidiary legislations to operationalize Forest Act, 2016	DDSPG	Contribution to subsidiary legislations development	No. of meetings attended	10	0.5	0.6	0.8	1	2.9
		Evaluate viable models for stakeholder participation in forest management and equitable sharing of costs and benefits	DDSPG	Models for forest management and equitable sharing of cost and benefit evaluated	No. of reports	3	1.2	1.5	1.8	2	5.5
		Evaluate roles of national government and county governments in sustainable management of forests resources	DDSPG	Roles of national and county government in forest management evaluated	No. of reports	2	0.8	1	1.2	1.5	4.5
		Evaluate opportunities for sustainable forest recreation and ecotourism	DDSPG	Recreation and ecotourism opportunities evaluated	No. of reports	2	0.8	1	1.2	1.5	5.5
		Evaluate potential of urban forestry for safe, resilient and sustainable cities	DDSPG	Potential of urban forestry evaluated	No. of reports	2	1.2	1.2	1.2	1.2	4.8
		Undertake studies on gender and forest value chains	DDSPG	Gender and forest value chains studies undertaken	No. of reports	2	0.5	0.6	0.8	1	2.9
		Undertake studies on forest history, indigenous forest communities and indigenous knowledge in management of forest resources Conduct studies on investment	DDSPG	Studies on forest history, indigenous forest communities and indigenous knowledge on management of forest resources conducted	No. of reports	3	0.5	0.6	0.8	1	2.9

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				Total Budget
							Y1	Y2	Y3	Y4	
4.2	Enhance forest investment opportunities including Public Private Partnerships	opportunities, profiles and incentives to promote forest sector development	DDSPG	Studies on investment opportunities, profiles and incentives to promote forest sector development conducted	No. of reports	2	0.3	0.35	0.4	0.4	1.45
		Conduct studies on potential role of public-private partnerships (PPPs) in forest development	DDSPG	Studies on potential role of public-private partnerships (PPPs) in forest development conducted	No. of reports	2	1.1	1.2	1.4	1.6	5.2
		Evaluate technical and financing opportunities for forest investment at national, regional and international levels to support forest development	DDSPG	Technical and financial opportunities to support forest sector development evaluated	No. of reports	2	0.5	0.5	0.6	0.6	2.2
		Evaluate viable concessions, leaseholds and permitting models for public and community forestlands	DDSPG	Viable concessions, leaseholds and permitting models for public and community forestlands evaluated	No. of reports	1	0.4	0.4	0.4	0.4	1.6
4.3	Strengthen forest resources valuation	Determine impacts of forest technologies on socio-economic, cultural and environmental resilience	DDSPG	Impacts of forest technologies on socio-economic, cultural and environmental resilience determined	No. of reports	4	0.8	1	1.2	1.5	4.5
		Undertake studies on factors that motivate community and special interest groups to participate in PFM activities	DDSPG	Studies on factors that motivate community and special interest groups to participate in PFM activities conducted	No. of reports	2	0.6	0.6	1	1.2	3.4
		Undertake total forest ecosystems valuation	DDSPG	Total forest ecosystems valuation undertaken	No. of reports	2	2	2.2	3	3	10.2

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
		Develop guidelines for planning and implementation of Payment of Ecosystem Services	DDSPG	Guidelines for planning and implementation of Payment of Ecosystem Services developed and shared with stakeholders	No. of guidelines	1	0.4	0.4	0.4	0.4	1.6
4.4	Pilot payment for ecosystem services	Develop frame works for piloting and implementation of Payment of Ecosystem Services (PES) schemes	DDSPG	Frameworks for piloting PES developed and shared with stakeholders	No. of reports	1	0.4	0.4	0.4	0.4	1.6
		Participate in piloting of PES schemes	DDSPG	PES schemes piloted	No. of pilot schemes	1	4	5	6	7	22
		Evaluate the performance of PES schemes	DDSPG	PES schemes evaluated	No. of reports	2	0.5	0.6	0.8	1	2.9
		Undertake studies on incentives for sustainable land management for enhanced flow of ecosystem services	DDSPG	Studies on incentive packages for sustainable land management for enhanced flow of ecosystem services undertaken and shared	No. of reports	1	0.4	0.5	0.6	0.8	2.3
4.5	Evaluate effectiveness of forest extension methods	Evaluate extension methods for effective dissemination of forest technologies	DDSPG	Extension methods for effective dissemination of forest technologies evaluated	No. of reports	3	1.5	1.8	2	2.2	7.5
		Assess effective technology transfer and information platforms	DDSPG	Effective technology transfer and information platforms evaluated	No. of reports	3	1	1	1	1	4
		Evaluate the factors that influence technology adoption	DDSPG	Factors that influence adoption of technologies evaluated	No. of reports	3	1.2	1.4	1.5	1.8	5.9
4.6	Undertake research on forest products markets and trade	Collect data and information on forest products markets and trade at national and regional levels	DDSPG	Data and information on markets and trade collected and shared with stakeholders	No. of reports	4	2	2.2	2.4	2.5	9.1

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
		Evaluate compliance of regional trade in tree products on forest law enforcement, governance and trade requirements (FLEGT)	DDSPG	Regional trade in tree products compliance with FLEGT evaluated	No. of reports	1	1.2	1.4	1.5	5.1	
		Undertake capacity building of stakeholders in forest product trade surveillance and negotiations	DDSPG	Capacity building of stakeholders in forest product trade surveillance and negotiations undertaken	No. of workshops	1	0.2	1.2	0.2	2.8	
		Participate in bilateral and multilateral trade negotiations for tree products trade	DDSPG	Participated in bilateral and multilateral trade negotiations for tree products	No. of forums	1	0.8	1	1.2	4.4	
		Hold stakeholder meeting to evaluate supply and demand projections for various forest products in the country	DDSPG	Stakeholder meetings to evaluate supply and demand projections held	No. of workshops	1	0.3	0.3	2	2.8	
		Conduct comparative studies and cost benefit analysis of forest based enterprises	DDSPG	Comparative studies and cost benefit analysis of forest based enterprises conducted	No. of reports	1	1.2	1.4	1.5	5.1	
		Undertake forest products demand and supply analysis and projections	DDSPG	Forest products demand and supply analysis and projections undertaken	No. of reports	1	1	1	1	4	
		Undertake valuation of ecosystem goods, services and carbon markets	DDSPG	Ecosystem goods, services and carbon markets valued	No. of reports	1	0.4	0.6	0.8	2.6	
		Conduct studies on the influence of forest land tenure and property rights on forest development	DDSPG	Studies influence of forest land tenure and property rights on forest development conducted	No. of reports	2	0.6	0.8	0.8	3	
TOTAL BUDGET (MILLIONS)											
113.6											

4.7 Undertake economics studies on forest enterprises

**THEME 5: FOREST RESEARCH SUPPORT SERVICES (FRSS)
STRATEGIC OBJECTIVE: TO DISSEMINATE FORESTRY RESEARCH TECHNOLOGIES AND ENHANCE RESEARCH CAPACITY**

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				Total Budget
							Y1	Y2	Y3	Y4	
5.1	Strengthen biometrics and GIS	Develop a data management policy	DDFRSS	Data management policy developed	No. of policies	1	0.1	0.1	0.1	0.1	0.4
		Upload research data onto the data portal	DDFRSS	Research data uploaded onto the portal	No. of data sets	16	0.1	0.1	0.1	0.1	0.4
		Hold consultation on use of statistics, RS and GIS tools in implementing research projects	DDFRSS DDs RDs	Consultations on use of statistics, RS and GIS tools held	No. of consultations	800	8.3	5.7	5.7	5.7	25.4
5.2	Improve staff skills and capacity	Develop GIS and RS based model to predict forest degradation in terms of areas and species	DDFBEM DDFRSS RDs	GIS and RS based model to predict forest degradation developed	No. of models	3	1	1	0.1	1	3.1
		Train technical staff on the research data portal	DDFRSS DDs RDs	Technical staff trained on the research data portal	No. of trainees	80	1	0.1	0.1	0.1	1.3
		Conduct refresher courses on biometrics and GIS/RS	DDFRSS DDs RDs	Refresher training on Biometrics and GIS/RS conducted	No. of trainings	80	0.1	1	1	1	3.1
		Train Biometrics and GIS/RS staff on emerging statistical and GIS/RS analysis techniques and software	DDFRSS DDs RDs	Biometrics and GIS/RS staff trained on emerging analysis techniques and software	No. of trainings	10	0.1	0.6	0.1	0.6	1.4
		Install Intranet and Private cloud at KEFRI Headquarters	DDFRSS	Intranet and Private cloud at KEFRI Headquarters installed	No. of installations	1	0.1	5	0.1	0.1	5.3
		Establish GIS/RS laboratory with computer room	DDFRSS	GIS/RS laboratory established	% of implementation	100%	0.2	2	0.2	0.2	2.6

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
5.3	Enhance application of Information Communication Technology	Develop interactive and dynamic platforms on social media, websites, digital repository platforms, and mobile computing	DDFRSS DDs RDs	Interactive and dynamic online platforms developed	No. of platforms	3	1.5	1.5	1.5	1.5	6
		Establish and operationalize ERP on human resource and financial management system in the headquarters and eco-regions	DDFRSS DDs RDs	Operational ERP	% modules operational	100%	10	10	10	10	40
		Develop and implement Decision Support Systems, data integration and analytical tools	DDFRSS DDs RDs	Decision Support Systems, data integration and analytical tools developed and implemented	No. of DSS systems	2	1.5	1.5	0.1	0.1	3.2
		Upgrade internet connectivity at the centres and sub centres to facilitate research data access	DDFRSS RDs	LAN in eco-regional centres and sub centres procured and installed	No. of centres	8	10	10	10	10	40
		Maintain and repair ICT equipment at headquarters, eco-regional centres and sub-centres	DDFRSS RDs	ICT equipment at HQ, Eco-regional centres and sub-centres maintained and repaired	Maintenance coverage in %	100%	2	2	2	2	8
		Review and implement ICT strategy	DDFRSS RDs	ICT strategy reviewed and implemented	ICT strategy	1	0.5	.05	0.5	0.5	2
		Develop a framework to facilitate access to information and improve service delivery via mobile applications	DDFRSS	Mobile applications developed and installed	No. of applications	2	1	0.1	1	0.1	2.2
		Develop partnerships with relevant ICT Authorities (KENET, ICTA, CSK)	DDFRSS PRMO H-ICT	ICT partnerships developed	No. of ICT partnerships	3	0.3	0.3	0.3	0.1	1

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
5.4	Enhance laboratory management and operations	Purchase, install and commission laboratory equipment at Maseno, Kitui, Gede and Karura centres	DDFRSS LC RDs	Laboratory equipment purchased and purchased, installed and commissioned	No. of equipment	20	30	35	27	30	142
		Purchase, install and commission equipment at sub-centres: Taita – Taveta, Lamu, Migori, Marigat, Kakamega, Turkana, Garissa, Rumuruti	DDFRSS RDs ARDs	Laboratory equipment for sub-centres purchased, installed, and commissioned	No. of equipment	20	25	25	25	25	100
		Implement preventive maintenance of laboratory equipment management system	DDFRSS RDs	Preventive maintenance of laboratory equipment management system implemented	% of implementation	100%	19	19	19	19	76
		Install safety facilities and gadgets to meet statutory and regulatory requirement for Occupational Safety and Health Act requirements (OSHA)	DDFRSS RDs ARDs	Safety facilities and gadgets installed	No. of facilities	85	2.5	2.9	1	1	7.4
5.5	Improve operational efficiency and improve staff skill and capacity	Purchase, install and commission effluent neutralization system at L/VERP and CERRP	DDFRSS	Effluent neutralization system purchased, installed and commissioned	No. of system	2	0.1	0.1	1.5	1.5	3.2
		Purchase laboratory reagents and consumables	DDFRSS RDs LC, LHs	Laboratory reagents and consumables purchased	No. of consumables	320	3.5	3.5	3.5	3.5	14
		Dispose hazardous waste to meet EMCA waste management regulatory requirements	DDFRSS RDs ARDs	Generated hazardous waste safely disposed	Weight in kilograms	160	0.3	0.3	0.3	0.3	1.2

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
		Undertake annual medical examination of laboratory personnel by a DOSH approved health practitioner	DDFRSS RDs ARDs LC, LHs	Annual medical examination of laboratory personnel undertaken	No. of examinations	320	0.8	0.8	0.8	0.8	3.2
		Carry out air quality monitoring and measurements and safety audits	DDFRSS RDs LC	Air quality monitoring and measurements and safety audit conducted	No. of audit reports	4	1	1	1	1	4
		Review laboratory safety manual	DDFRSS	Laboratory safety manual reviewed	No. of manuals	1	0.1	0.5	0.1	0.1	0.8
		Train laboratory staff on commercialization of laboratory operations	DDFRSS RDs ARDs	Staff trained on commercialization of laboratory operations	No. of trained staff	60	5	5	5	5	20
5.6	Enhance forest information management and dissemination	Develop structures and platforms for increased forest information flow to stakeholders	DDFRSS Head KM Training Manager	Structures and platforms for information sharing developed	Coverage in % usage	70%	12	15	15	15	57
		Develop and avail appropriate information to stakeholders	DDFRSS Head KM	Information developed and availed	No. of publications	100	2	2.5	2.5	3	10
		Identify information dissemination pathways	DDFRSS Head KM Training Manager	Information dissemination pathways identified	No. of pathways identified	2	5	0.1	0.1	0.1	5.3
		Hold a scientific conference	DDFRSS	Scientific conference held	No. of Proceedings	1	0.2	0.2	11.5	11.5	13.4
		Build capacity of technical staff in scientific writing	DDFRSS	Capacity building to technical staff undertaken	No. of staff trainings	2	0.1	4	0.1	5	9.2

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
5.7	Enhance linkages & partnerships with stakeholders	Increase partnership for joint research and resource mobilization	SDDR&D DDs RDs PRMO	Partnership for joint research and resource mobilization increased	No. of MoUs signed	12	10	10	10	10	40
		Operationalize engagement with strategic partners at the national and regional level for joint research and resource mobilization	DDs RDs PRMO	Strategic partnerships operationalised	No. of joint projects conducted	8	3	3	3	3	12
		Coordinate KEFRI-KFS Research and Management Liaison activities	SDDR&D RLO	TLC, PLC and Field liaison meetings held	No. of meetings and field visits	8	1.5	1.5	1.5	1.5	6
		Strengthen uptake of forest technologies through Public Private Partnerships (PPP)	DDs RDs PRMO	KEFRI technologies adopted through PPP	No. of technologies adopted	4	5	5	5	5	20
5.8	Increase revenue	Coordinate activities of various networks hosted by KEFRI.	SDDR&D PRMO	KEFRI hosted networks coordinated	No. of coordination meetings held	16	5	5	5	5	20
		Develop and update KEFRI consultancy profile	SDDR&D DDs PRMO	KEFRI Consultancy profile developed	No. of consultancy profiles	1	0.1	-	-	-	0.4
		Identify and submit consultancy bids in forestry R&D/NRM	SDDR&D DDs PRMO	KEFRI Consultancy profile updated	No. of reports	3	0.1	0.1	0.1	0.1	0.4
				No. of identified and submitted bids	No. consultancy bids	8	2	2	2	2	8

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Total Budget	
		Coordinate identification and development of project proposals for national and international competitive grants	PRMO SDDR&D DDs	Developed proposals	No. of proposals developed and submitted	40	5	5	5	5	20	
					% of funded proposals	80%						
5.9	Improve resource mobilization strategies	Review external resource mobilization strategy	PRMO Scientists	Reviewed strategy	No. of reviewed strategies	1	3	0.1	0.1	0.1	3.3	
		Implement external resource mobilization strategy	DDs RDs PRMO	External resource mobilisation strategy implemented	No. of annual reports	4	1.5	1.5	1.5	1.5	6	
5.10	Enhance knowledge management	Review and implement Knowledge Management Strategy	DDFRSS Head KM	Knowledge Management strategy reviewed and implemented	% of strategy implemented	100%	0.5	0.1	0.1	0.1	0.8	
		Automate Library services	DDFRSS Head KM	Library services automated	% of automation	70%	70%	4	4	4	16	
		Develop record management structure	DDFRSS Head KM	Record management structure developed	% of implementation	55%	55%	3.5	5	5	17.5	
		Build capacity of KEFRI partners	DDFRSS Head KM	Increased dissemination of technologies	No. of capacity building events	12	12	10	10	10	40	
		Implement regional cooperation activities	DDFRSS Head KM	Increased dissemination of technology	No. of regional cooperation events	3	3	8	10	10	38	
		Implement Regional Training Course (RTC) on Social Forestry	DD FRSS	Regional Training course implemented	No. of training reports	1	1	15	15	15	60	
TOTAL BUDGET (MILLIONS)												920.4

**THEME 6: CORPORATE SERVICES
STRATEGIC OBJECTIVE: TO STRENGTHEN INSTITUTIONAL CAPACITY FOR RESEARCH AND DEVELOPMENT**

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				Total Budget
							Y1	Y2	Y3	Y4	
6.1	Enhance institutional capacity in human resource management	Rationalize existing staff to optimal staffing level through redeployment, exits, developing and resourcing	DDHR&ADM	Optimal staffing level	Level of staffing	100%	7	7	7	7	28
					Training needs assessment report	1	10.5	10.5	10.5	10.5	42
		Undertake periodic training needs assessment, train and develop staff, and evaluate training effectiveness	DDHR&ADM	Training and development implemented	4	4					
				Training effectiveness evaluated	4	4					
Develop and implement succession policy and plan	DDHR&ADM	KEFRI succession policy and plan developed and implemented	Succession policy and plan	1	1.15	1.0	1.0	1.0	1.0	4.15	
			Annual implementation progress report	4							
Develop and implement coaching & mentorship policy and programme	DDHR&ADM	KEFRI coaching & mentorship Policy and Programme developed	Coaching and mentorship policy and programme	1	1.75	1.0	1.0	1.0	1.0	4.75	
			Annual implementation progress report	4							
Automate employee recruitment and selection	DDHR&ADM	Functional automated recruitment & selection module	Level of module implementation	100%	0.35	0.075	0.075	0.075	0.075	0.58	

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Total Budget	
		Implement science leadership and management policy	DDHR&ADM	Science leadership and management policy implemented	Level of implementation	100%	0.1	0.1	0.1	0.1	0.4	
		Improve gender, ethnic, regional, age and persons living with disability balance in all human resource activities	DDHR&ADM	Balanced human resources in all activities	Level of diversity representation	100%	0.1	0.1	0.1	0.1	0.4	
		Review and implement the human resource manual and career progression guidelines	DDHR&ADM	Human resource manual and career progression guidelines reviewed	Reviewed Human Resource manual	1	2.2	0.6	0.1	0.1	3.05	
					Reviewed career progression guidelines	1						
					Level of implementation of the manual and guideline	100%						
		Strengthen employee health and wellness	DDHR&ADM	Medical premium increased by 10% per annum with commensurate benefits	Enhanced medical premiums and entitlements	120%	56	61.6	67.6	70	255.36	
6.2	Enhance employee satisfaction and retention	Develop and operationalize effective and efficient institutional corporate and legal system	DDHR&ADM	Institutional corporate and legal system developed and implemented	Level of operationalization of the institutional corporate and legal system	100%	1.5	1	1	1	4.5	

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
6.3	Implement recommendations of the employee satisfaction survey for 2017/2018 as follows	Establish and implement mechanism for handling litigation matters and management of the Institute's contracts	DDHR&ADM	Report on legal matters	Annual legal reports	4	2.5	2.5	2.5	2.5	10
		Develop and implement an all-inclusive and comprehensive induction programme to support the onboarding process	DDHR&ADM	Comprehensive induction and on boarding policy and programme developed and implemented	Induction and on boarding policy and programme Annual implementation progress report	1 4	1.15	1	1	1	4.15
6.4	Ensure prudent financial management	Review and implement performance management system	DDHR&ADM	Performance appraisal system implemented	Reviewed performance appraisal system Level of implementation	1 100%	0.75	0.1	0.1	0.1	1.05
		Communicate the remuneration package and any salary reviews to staff and sensitize them on how this relates to their performance	DDHR&ADM	Staff sensitized on performance and rewards	Level of attendance of staff during sensitization on performance and rewards	100%	0.75	0.5	0.5	0.5	2.25
		Implement the existing organization structure	DDHR&ADM	Existing organization structure implemented	Level of reporting relationships	100%	0.1	0.1	0.1	0.1	0.4
		Strengthen financial internal control systems by reviewing and implementing existing Financial Manuals	DDF	Existing financial manual reviewed and implemented	No. of reports	1	0.8	0.4	0.1	0.1	1.2

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
		Implement accounting standards, reporting and guidelines	DDF	Accounting standards, reporting and guidelines implemented	% implementation	100 %	1.0	1.0	1.0	1.0	4.0
		Promote transparency, effective management and accountability of funds	DDF	Publicizing financial reports	No. reports	4	1.2	1.2	1.2	1.2	4.8
		Establish and operationalize budgetary control systems to conform with Public Finance Management Act, 2012	DDF	Public Finance Management Act, 2012 Budgetary control systems implemented	No. of systems	100%	1.0	1.0	1.0	1.0	4.0
		Timely prepare and submit quarterly and annual financial reports to relevant committees of the board, government agencies and donor partners	DDF	Quarterly and annual financial reports submitted to relevant committees of the board, government agencies and donor partners	No. of reports	20	1.5	1.5	1.5	1.5	6
		Timely remittance of statutory deductions	DDF	Statutory deductions remitted on time	% of compliance to statutory remittance	100%	0.2	0.2	0.2	0.2	0.8
		Automate financial management systems at the HQs and 6 Regional Centres	DDF	Financial management system automated	% of automation	100%	4.0	4.0	2.0	2.0	12.0
		Integrate KEFRI Financial Management System with HR system	DDF	Financial management and HR systems integrated	No. of reports generated	1	0.5	0.7	0.3	0.3	1.8
		Review and implement KEFRI finance manual	DDF	Finance manual reviewed and implemented	Reviewed finance manual	1	0.4	0.1	0.1	1.2	0.8
		Facilitate budget making and implementation	DDF	Budgets prepared and implemented	No. of annual budget reports	4	0.5	0.5	0.5	0.5	2

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
6.5	Expand and manage revenue base	Conduct baseline survey of sources of funding to identify funding gaps	DDF	Baseline survey of funding established and funding gaps identified.	No. of reports	4	0.4	0.6	0.7	0.3	2.0
		Identify and leverage new sources of internally generated revenue	DDF GME	New revenue sources identified	No. of revenue sources	5	0.3	0.3	0.3	0.3	1.2
		Lobby and advocate for increased budgetary allocation by National Government	SDDCS	Increased Government Grant	% increase in Government grant	7%	0.1	0.1	0.1	0.1	0.4
6.6	Enhance asset and liabilities management	Develop and implement asset management policy	DDF	Asset management policy developed and implemented	% of implementation	100%	0.6	0.5	0.4	-	1.5
		Develop and implement a credit management policy	SDDCS DDF GME	Credit management policy developed and implemented	% of implementation	100%	1.0	0.8	0.5	0.4	2.7
		Develop and implement guidelines and procedures for asset management	SDDCS DDF	Asset guidelines and procedures developed and implemented	No. of guidelines	1	1	-	-	-	1
		Update the Institute's physical and digital asset registers	DDF	Institute's physical and digital asset registers updated	No. of assets registered annually	4	0.5	0.6	0.7	0.8	2.6
6.7	Enhance systems of risk management and internal controls	Keep custody of an inventory of KEFRI assets and liabilities	SDDCS DDF	Asset and Liabilities Register	No. of annual reports	4	0.1	0.1	0.2	0.3	0.7
		Establish an institutional risk management framework	CIA	Risk management framework established	Risk management framework	1	1.1	0.6	0.2	0.2	2.1
		Undertake risk assessment and develop a risk register for the Institute	CIA	Risk assessment undertaken and register developed	Risk register	1	0.1	0.5	0.5	0.5	1.6

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
		Develop and implement internal audit policies and procedures manual	CIA	Internal audit policies and procedures manual developed	Internal audit policies and procedures manual	1	0.1	0.1	1	0.1	1.3
		Develop and implement internal audit strategy	CIA	Internal audit strategy developed and implemented	Internal Audit Strategy	1	0.1	0.5	0.1	0.1	0.5
		Develop and implement risk based annual internal audit plan	CIA	Annual internal audit plan developed and implemented	No. of Audit plans	4	0.1	0.1	0.1	0.1	0.4
		Undertake external assessment of Internal Audit unit	CIA	External assessment of Internal Audit unit undertaken	Quality assurance improvement report	1	0.6	0.6	0.6	0.6	2.4
		Develop and implement debt management policy	SDDCS	Debt management policy developed and implemented	No. of policies	1	0.2	0.2	0.2	0.2	0.8
		Undertake sensitization of the Board and staff on risk management	CIA	Capacity of the Board and staff enhanced	No of Board members and staff trained	100%	0.1	0.1	0.1	0.1	0.4
		Undertake corruption perception surveys	SDDCS	Bi-annual corruption perception surveys undertaken	No. of surveys	2	2	0.1	2.5	0.1	4.7
		Develop an annual procurement management plan	DDSCM	Annual procurement management plan developed	No. of plans	4	0.1	0.1	0.1	0.1	0.4
		Timely submit to Director, professional opinion on all intended procurement of goods and services	DDSCM	Professional opinion on all intended procurement of goods and services are submitted on time	% of submissions	100%	-	-	-	-	-
		Timely advertisement of tenders and other requirements of the Institute	DDSCM	Tenders and other requirements of the Institute advertised	% coverage	100%	1.5	1.5	1.5	1.5	6
6.8	Enhance supply chain management										

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Total Budget	
		Timely constitute relevant procurement committees to facilitate procurement of goods and services	DDSCM	Relevant procurement committees constituted on time	% coverage	100 %	0.1	0.1	0.1	0.1	0.4	
		Undertake timely competitive procurement of works, goods and services	DDSCM	Competitive procurement of works, goods and services are undertaken on time	Coverage in %	100 %	0.5	0.5	0.5	0.5	2	
		Undertake annual stock taking of assets	DDSCM	Annual stock taking of assets undertaken	No. of stock taking	100 %	0.5	0.5	0.5	0.5	2	
		Ensure timely disposal of unserviceable and obsolete assets	DDSCM	Unserviceable and obsolete assets timely disposed	No. of disposals	100 %	0.5	0.5	0.5	0.5	2	
		Maintain accurate records of stores and asset tracking	DDSCM	Records of stores and asset tracking accurately maintained	% coverage	100 %	1.5	0.1	0.1	1.0	2.7	
		Implement Public Procurement and Asset Disposal Act 2015	DDSCM	Public Procurement and Asset Disposal Act, 2015 implemented	% coverage	100 %	0.5	0.5	0.5	0.5	2	
		Ensure procurement of goods and services include the vulnerable groups (youth, women and people living with disability)	DDSCM	Vulnerable groups included in procurement of goods and services	% coverage	100 %	0.5	0.5	0.5	0.5	2	
		Timely submit mandatory reports to various government agencies as provided in Public Procurement and Asset Disposal Act 2015	DDSCM	Mandatory reports submitted as per Public Procurement and Asset Disposal Act 2015	% coverage	100%	0.1	0.1	0.1	0.1	0.4	
		Operationalize KEFRI procurement manual	DDSCM	KEFRI procurement manual operationalized	% operationalization	100%	0.5	0.5	0.5	0.5	2	
		Automate supply chain processes	DDSCM	Supply chain processes automated	% automation	100%	5.0	1.5	1.5	1.5	9.5	

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
6.9	Improve infrastructure and facilities	Ensure continuous pre-qualification and performance evaluation of suppliers	DDSCM	Pre-qualification and performance evaluation of suppliers continuously undertaken	% coverage	100%	0.5	0.5	0.5	0.5	2
		Enhance cleanliness, safety and conducive work environment	DDHR&ADM RDs	Clean, safe and conducive work environment created	% coverage	100%	2	2	2	2	8
		Undertake a gap analysis on existing facilities	DDHR&ADM RDs	Gaps on existing facilities identified	No. of report detailing the gaps on existing facilities	1	2	0.1	0.1	0.1	2.3
		Acquire and maintain appropriate equipment, plant and motor vehicles	DDHR&ADM RDs	Well maintained equipment, plant and motor vehicles	% coverage	100%	10	10	10	10	40
		Construct office blocks, farmers resource centres and laboratories in Rumuruti, Londiani and Narok	DDHR&ADM RDs ARD	Office blocks, laboratories, farmers resource centres and hostel constructed	No. of complete constructions	3	100	100	100	100	400
		Construct facilities in Turkana sub-centre and a Science Complex at KEFRI Muguga	DDHR&ADM RDs ARDs	Complete hostel and science complex	No. of blocks	2	0.1	0.1	80	150	230
		Construct green houses for Muguga, Nyeri, Migori, Kakamega and Gede	DDHR&ADM RDs ARDs	Completed green houses	No. of green houses	5	20	30	30	30	110
		Improve water supply by sinking of boreholes in Lamu, Kitui, Taita Taveta and shallow wells in Kakamega, Ramogi and Migori	DDHR&ADM RDs ARDs	Operational boreholes drilled	No. of boreholes	6	5	5	5	5	20

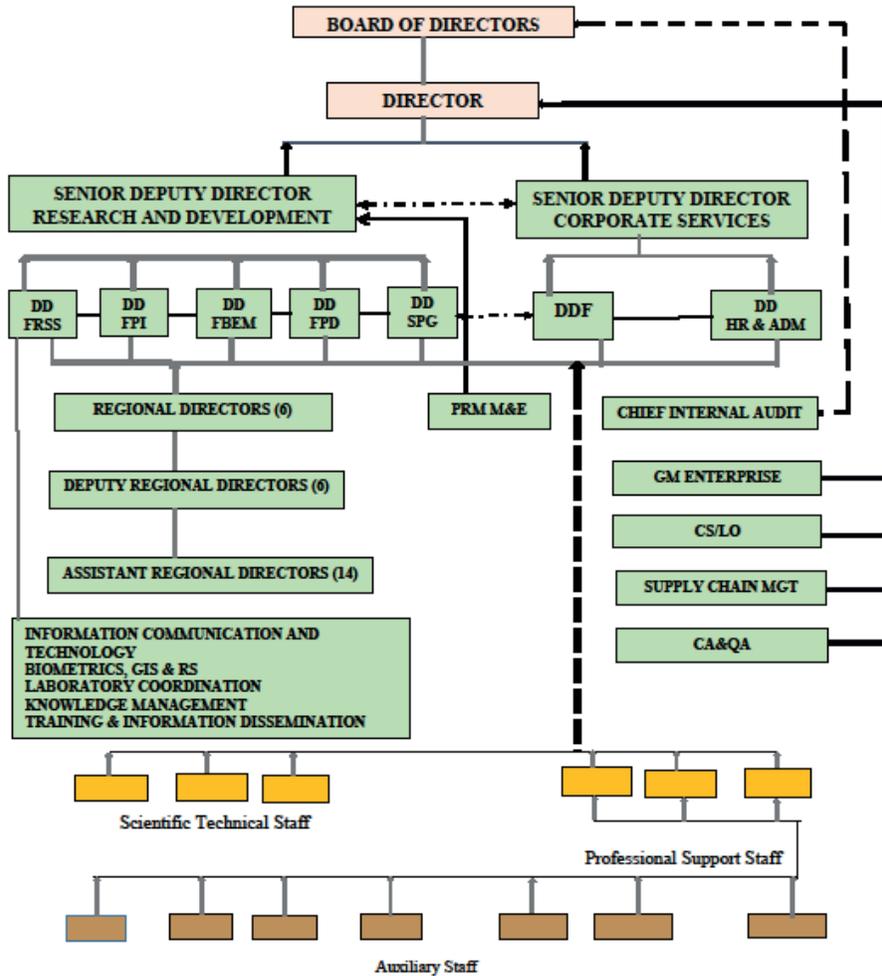
No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
6.10	Secure land for forestry research	Undertake water reticulation and fire hydrant in Kitui, Lamu, Lodwar and Marigat	DDHR&ADM RDs ARDs	Water reticulation and working fire fighting equipment completed	No. of reticulations	4	15	15	20	20	70
		Remodel KEFRI Karura office block- addition two floors	DDR&AD RDs	KEFRI Karura office block remodelled to create 2 more floor	No. of floors	2	-	-	-	120	120
		Develop and implement a policy for acquisition of land for research	DDHR&ADM RDs ARDs	Policy document for acquisition of land for research developed	No. of policies	2	0.1	0.1	1	0.1	1.3
		Acquire additional land for forestry research in Londiani, Turbo, Gede, Nyeri, Muguga, HQs, Kakamega, Migori and Narok county	DDHR&ADM RDs ARDs	Additional land for research and development acquired	No. of hectares	11,800	3	3	3	3	12
		Acquire title deeds for Turkana, Lamu, Baringo, Migori, TaitaTaveta and Rumuruti	DDHR&ADM RDs ARDs	Title deeds acquired	No. of title deeds	6	2	2	2	2	8
		TOTAL BUDGET (MILLIONS)							1,479.74		

**THEME 7: CORPORATE AFFAIRS AND QUALITY ASSURANCE
STRATEGIC OBJECTIVE: TO ENHANCE COMMUNICATION WITH STAKEHOLDERS AND PUBLICITY OF THE INSTITUTE**

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				Total Budget
							Y1	Y2	Y3	Y4	
7.1	Improve operational efficiency and service delivery	Integrate both ISO 9001:2015 and ISO 14001:2015 in all KEFRI centres	DDCA&QA	ISO 9001:2015 and ISO 14001:2015 Integrated in all KEFRI centres	Audits and Compliance reports	8	7	8	7	30	
		Improve service delivery through Implementing service charter	DDCA&QA	Service delivery charters implemented	No. of charters	10	2	1.5	1.5	2	7
		Ensure environmental sustainability and safety in the work environment (OSHA)	DDCA&QA	Safe and health enhanced in work environment maintained	No. of audit compliance reports	4	1	0.7	1	0.7	4.4
		Undertake customer satisfaction surveys	DDCA&QA	Established customer satisfaction index	No. of survey reports	2	1	-	1	-	2
7.2	Enhance customers satisfaction and retention	Implement surveys recommendations	DDCA&QA	Survey implementation recommendation report	No. of annual Reports	4	1	0.5	0.7	1	3.2
		Develop and implement policy on communication and customer relations	DDCA&QA	Policy on communication and customer relations developed	No. of policies	2	1	0.5	0.5	0.5	2.5
		Establish a customer complaint desk in all Eco-regions	DDCA&QA	Customer complaints desk established	No. of complaint desks	7	1	0.5	1	0.1	2.6
		Resolve stakeholder complaints	DDCA&QA	Stakeholder complaints resolved	No. of stakeholder complaints resolved	4	0.5	0.5	0.5	0.5	2

No.	Strategies	Initiative/Activities	Responsible Person	Expected Outputs	Measure	4 year Target	Period/Budget (KES Millions)				
							Y1	Y2	Y3	Y4	Total Budget
7.3	Increase Communication, Visibility and Outreach (Corporate Image)	Develop and implement communication and publicity materials for internal and external communication including use of innovative tools and technologies	DDCA&QA	Communication & publicity materials developed and implementation	No. of brochures	4	2	2	2	3	9
		Undertake publicity for enhanced wide outreach through newspapers, TV shows and Radio talks	DDCA&QA	Newspapers features, TV shows and radio talks undertaken	No. of publicity events	22	6	6	6	7	25
		Publicize exhibitions of forest technologies, institutional events, and information	DD CA&QA	Forest technologies, information, and institutional events publicised	No. of exhibitions and shows	80	1.5	2	2	1.5	7
		Implement corporate branding policy	DDCA&QA	Branding policy of KEFRI implemented	No. of branded products	25	2	2	3	2.5	9.5
		Implement Public Complaint Policy through CAJ and Committees	DDCA&QA	Public complaints implemented	No. of CAJ reports	4	0.5	0.5	0.5	0.5	2
		Undertake Corporate Social Responsibility (CSR)	DDCA&QA	CSR undertaken	No. of CSR reports	8	0.7	0.6	0.6	0.6	2.5
		Monitor implementation of the Strategic Plan through Performance Contracting as required under Public Service annual Performance Contract guidelines	DDCA&QA	Strategic plan implementation monitored quarterly	No. of quarterly reports	16	1	1	1	1	4
		Monitor and evaluate the corporate image profile through implementation of Mwongozo and other institutional policies and strategies	DDCA&QA	Corporate image monitored and evaluated	No. of M&E reports	2	1	0.1	0.1	1	2.2
TOTAL BUDGET (MILLIONS)											114.9

ANNEX II: KEFRI ORGANOGRAM



KEY:

CA & QA	Corporate Affairs and Quality Assurance	GM	General Manager
CS/LO	Corporate Secretary/Legal Officer	GIS	Geographical Information System
DD	Deputy Director	HR & ADM	Human Resource & Administration
F	Finance	M&E	Monitoring and Evaluation
FRSS	Forest Research Support Services	PRM	Partnership and Resource Mobilization
FPD	Forest Products Development	RS	Remote Sensing
FPI	Forest Productivity and Improvement	SPG	Socio-economics, Policy and Governance
FBEM	Forest Biodiversity and Environment Management		

**ANNEX III:
MAP OF KENYA SHOWING KEFRI ECO-REGION FORESTRY RESEARCH
PROGRAMMES, SUB-CENTRES AND FIELD CENTRES**



