KENYA FORESTRY RESEARCH INSTITUTE

STRATEGIC PLAN
2022 - 2027

Forestry Innovations for Resilient Landscapes

KENYA VISION 2030

KEFRI is ISO 14001: 2015 and 9001:2015 IMS Certified

KENYA FORESTRY RESEARCH INSTITUTE

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KENYA VISION 2030

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Captions for cover photographs:

- Investigation in pathology laboratory at KEFRI headquarters
- *Afzelia quanzensis* seed
- A drone for seed broadcasting and monitoring forest conditions
- Seedlings in the nursery at KEFRI Kitui
- Jaza-Miti app icon
- Timber: a major forest product
- Background (left)- Bamboo & Background (right)- indigenous forest at Masaai Mau

ISBN: 978-9914-723-05-2

Published by:

Kenya Forestry Research Institute

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Printed by: Quinat Agencies

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ACRONYMS

BETA	Bottom-up Economic Transformation Agenda
CA&QA	Corporate Affairs and Quality Assurance
CBOs	Community Based Organizations
CGs	County Governments
COMESA	Common Market of Eastern and Southern Africa
CS	Cabinet Secretary
DANIDA	Danish International Development Agency
EAC	East African Community
EMS	Environmental Management System
FAO	Food and Agriculture Organization
FBOs	Faith Based Organizations
FCMA	Forest Conservation and Management Act
FINNIDA	Finnish International Development Agency
FORNESSA	Forestry Research Network for Sub-Saharan Africa
GDP	Gross Domestic Product
GIZ	German Society for International Cooperation
ICRAF	International Centre for Research in Agroforestry
ILRI	International Livestock Research Institute
IPM	Integrated Pest Management
JICA	Japan International Cooperation Agency
KEBS	Kenya Bureau of Standards
KENGEN	Kenya Electricity Generating Company
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
MEAs	Multilateral Environmental Agreements

MOA	Memorandum of Association
MoA	Ministry of Agriculture
MECC&F	Ministry of Environment, Climate Change and Forestry
MoE	Ministry of Education
MOU	Memorandum of Understanding
NCTL	National and County Technical Liason
NFP	National Forest Programme
NGARA	Network for Gums and Resins in Africa
NGOs	Non-Governmental Organizations
NTZDC	Nyayo Tea Zones Development Corporation
P-PESTLEG	Policy, Political, Environmental, Social, Technological, Legal, Economic and Governance
PES	Payment for Ecosystem Services
PNRM	Participatory Natural Resources Management
PPP	Public Private Partnership
QMS	Quality Management System
SDG	Sustainable Development Goals
SIDA	Swedish International Development Agency
SMEs	Small and Medium Enterprises
MSMEs	Micro-, Small- and Medium-sized Enterprises
SCOT	Strength Challenges Opportunity Threats
TARDA	Tana and Athi Rivers Development Authority
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNFF	United Nations Forum on Forests
USAID	United States Agency for International Development

MESSAGE FROM THE CABINET SECRETARY

Forestry research in Kenya which is the key mandate of the Kenya Forestry Research Institute (KEFRI), has witnessed tremendous growth in the country since its inception in the early 1930s. Kenya Forestry Research Institute is the technical arm of the Ministry of Environment, Climate Change and Forestry (MECC&F) and therefore it gives me great pleasure to share the Institute's 7th Strategic Plan 2022-2027. This Strategic Plan adopts a thematic and programme based approach to forestry research and development and is well aligned to the Medium Term Plan IV framework of the Vision 2030, the Kenya Government's Bottom-up Economic Transformation Agenda (BETA), and the MECC&F Strategic Plan 2023-2027.

Forestry research has greatly contributed to development of the country through provision of; information, technologies, and innovations for socio-economic development across many sectors that include; construction, furniture making, energy, agriculture, agroforestry, tourism, and health. KEFRI is contributing to the National Landscape and Ecosystem Restoration Programme through production, processing and distribution of high quality tree seeds for the 15 Billion Tree Growing Strategy by 2032. To achieve objectives of the Strategy, the Government of Kenya has supported KEFRI to expand research infrastructure from six (6) to the current 21, establishment of farmers' resource centres, and the construction of eighteen (18) new seed centres in strategic locations to enhance stakeholder access to quality tree seeds to raise seedlings for the National Landscape and Ecosystem Restoration Programme.

The infrastructure will not only expand the Institute's capacity for forest genetic diversity conservation but also increase its capacity in tree seed processing, storage and distribution from 15 Metric Tonnes (MT) to over 100 MT annually making it the largest undertaking in forestry development in the continent. Decentralization of research and seed centres is part of the country's goal of enhancing technology and information transfer to the society in order to accelerate achievement of 30% tree cover by 2032 and thereby assist the country in accelerating its achievement of the Nationally Determined Contributions (NDC) targets and doubling the restoration from 5.6 million hectares to 10.6 million hectares by 2032 which will also enhance climate change mitigation and adaptation strategies.

We note that, KEFRI in collaboration with national and international partners has improved key commercial tree species that include the pines, cypress, eucalypts, *Gmelina arborea* and indigenous tree species including *Melia volkensii. Melia volkensii* has been proven to provide quality timber in 15 years, the shortest rotation period for an indigenous species. Other notable achievements include: provision of improved tree planting materials for various ecological zones; biological control of forest pests and diseases; management of the noxious *Prosopis juliflora* (mathenge) through utilization; development of high value forest products and linking to stakeholders; expert training in forestry and climate change in addition to developing and piloting innovative applications including; JazaMiti to guide the tree growing and track progress hence contributing to achieving the 30% tree cover in the country by 2032.

I believe that implementation of this KEFRI 7th Strategic Plan, shall continue to enhance the Institute's capacity in research, exchange of knowledge and capacity building of stakeholders. My Ministry shall provide the requisite support to ensure this Strategic Plan is successfully implemented and request all stakeholders to partner with KEFRI towards this noble activity to ensure our country attains 30% tree cover by 2032.

Hon. Soipan Tuya, EGH, CBS
Cabinet Secretary,
Ministry of Environment, Climate Change and Forestry

STATEMENT FROM THE PRINCIPAL SECRETARY

Strengthening forestry research is one of the key strategic objective of the State Department of Forestry (SDF) under the Ministry of Environment, Climate Change and Forestry (MECC&F). The KEFRI's 7th Strategic Plan 2022-2027 which is aligned with the MECC&F's Strategic Plan 2023-2027 provides the foundation upon which the Institute will accomplish its mandate of developing research and development programmes to provide technologies and information for sustainable development of forestry and allied natural resources. The state department of forestry will support KEFRI to implement its mandate of conducting research and development in forestry, undertake specialized trainings, and disseminate information, technologies, and innovations in forestry for sustainable development.

KEFRI is charged with the responsibility of providing quality tree germplasm to meet demands of the eleven (11) interventions as stipulated in the 15 Billion Tree Growing Strategy for accelerated achievement of 30% tree cover by 2032. The Institute has made tremendous efforts in increasing production of quality tree seeds, processing and distribution to stakeholders for commercial forest plantations, agroforestry, fruit tree production, greening urban areas, arboretums, arid and semi-arid lands and other landscape reforestation programmes. The Institute has also proposed to develop technologies for: conservation and sustainable use of bamboo, mangroves and coastal forests and allied resources, improving ecosystem productivity, biodiversity conservation and development of protocols for high value forest products and provide framework for enhancing bioprospecting and utilization of indigenous knowledge in natural resource products for socio-economic development and universal health, in addition to forest policy research and development.

Kenya Forestry Research Institute's 7th Strategic Plan 2022-2027 lays emphasis on the importance of collecting and analyzing data from various forestry related segments to increase the contribution of forestry to the country's Gross Domestic Product. At a glance, growing 15 Billion trees in ten years is expected to contribute over one hundred trillion shillings through provision of various products and services. Further, the Institute will conduct expert trainings to directly create livelihood opportunities

for the local communities in line with the Kenya Government's Bottom-up Economic Transformation Agenda (BETA) through the Institute's proven model of incubating and linking research products to Community Based Organizations (CBOs) and the Small and Medium Enterprises (SMEs) for the establishment of viable bio-enterprises and tree based solutions.

I am pleased to inform you that the Institute is in the forefront of piloting and developing technologies and innovations to enhance forest and tree productivity, enhance seedling survival in the drylands, and accelerate landscape restoration using aerial seeding through planes, drones and seed-balls, and use of artificial intelligence, machine learning and Geomatics to monitor and report forest conditions.

KEFRI will continue to undertake research in management of invasive woody weeds including; *Prosopis juliflora* (mathenge), *Lantana camara*, Cestrum species, *Ipomoea spp.,* and *Cuscuta spp,* (dodder). The State Department of Forestry will therefore continue to support the Institute to achieve its strategic role in providing quality tree germplasm, sharing information, technologies, innovations and capacity building of stakeholders for the successful implementation of the national goal of growing 15 Billion trees by 2032 for livelihood improvement and sequestering carbon to enhance climate change mitigation and adaptation.

Mr. Gitonga Mugambi, EBS
Principal Secretary,
State Department of Forestry,
Ministry of Environment, Climate Change and Forestry

FOREWORD BY THE CHAIRMAN, BOARD OF DIRECTORS

Forestry contributes about 3.6% to the GDP in Kenya but has a potential for increased growth. Various Government policies including; The Constitution of Kenya 2010, Kenya Vision 2030, and the National Forest Programme 2016-2030 underscore the importance of forestry research for environmental management and conservation. The Kenya Forestry Research Institute (KEFRI) plays a critical role in fulfilling the need for research based environmental conservation by conducting research in forestry and allied natural resources and providing information and innovations for sustainable development. In implementing its activities KEFRI has embraced the concept of Strategic Planning and has successfully implemented six (6) Strategic Plans. The Institute has now developed this 7th Strategic Plan, 2022-2027 that that will guide KEFRI in delivering its mandate.

Research outputs will be enhanced through strengthening thematic and programme based approach to research and development through a multidisciplinary approach. This will be achieved by placing emphasis on research in: tree seed science; restoration of degraded landscapes in line with the UN Decade on restoration; and climate change. To enhance delivery of its mandate, KEFRI will expand its infrastructure through development of additional physical facilities, laboratories and farmer's resource centres, and ICT facilities to improve connectivity with the world.

The Board of Directors will work closely with KEFRI management, the Ministry of Environment, Climate Change and Forestry and all stakeholders to provide a conducive environment for successful implementation of this 7th Strategic Plan. The Board will also ensure that this Strategic Plan is implemented through timely preparation of annual work plans and performance contracts, as well as regular monitoring and evaluation.

On behalf of the Board of Directors I take this opportunity to thank all stakeholders who provided invaluable input during the development of this 7th KEFRI Strategic Plan 2022-2027 and I am confident that the proposed activities will transform the Kenyan landscapes and positively impact livelihoods.

Gen (Rtd) Samson Mwathethe EGH, MBS, DCO
Chairman, KEFRI Board of Directors

PREFACE BY THE CHIEF EXECUTIVE OFFICER

Strategic planning is an important tool for organizations to guide the development of realistic goals and objectives to achieve their mandates. Kenya Forestry Research Institute (KEFRI) adopted strategic planning approach in 1989 to provide direction for the Institute in achieving the mandate of research in forestry and allied natural resources. This 7th Strategic Plan, which has adopted a thematic and programme based approach has been developed to guide the Institute's Research and Development agenda for five years from 2022 to 2027. In the development of this Strategic Plan, consideration has been given to goals and aspirations of national and International plans, specifically to strengthening research in emerging issues of climate change, biodiversity loss, and remediation of polluted forest environment, and development of appropriate tree based enterprises for livelihood improvement.

Notable achievements realized during implementation of the KEFRI 6th Strategic Plan include; development of information, technologies and innovations for increased productivity of forests and trees, increased production and distribution of quality tree germplasm including tree seeds, cuttings, tissue culture seedlings and establishment of elite breeding populations of indigenous and commercial tree species towards the attainment of 30% tree cover, use of biological agents for control of forest pests, management of *Prosopis juliflora* (mathenge) through utilisation, refinement of new forest products, contributions to forest policy development, piloting aerial seeding in Maasai Mau Forest Block and use of breakthrough digital innovations including JazaMiti; a species to site matching guide in tree growing, monitoring and recording in addition to improving research infrastructural facilities, staff skills development, and digitization of data and information which continue to be shared through various media channels.

Implementation of the 6th Strategic Plan encountered challenges that included; inadequate resources, inadequate land for research and development, lack of sufficient seed processing and storage facilities, and disruptions caused by COVID-19 pandemic which slowed down implementation of planned activities. However, we are happy to report that the Government of Kenya through a strategic intervention supported the

construction of eighteen (18) seed centres which will increase the Institute's seed production capacity from 15 Metric Tonnes (MT) to 100 MT annually to meet the targets of 15 Billion trees by 2032.

The 7th Strategic Plan adopts thematic, multi- sectoral, and multidisciplinary programme research approach for impact. This approach is in line with the National Forest Programme (NFP) 2016-2030. Strategic objectives of this Plan have also been aligned to; Kenya Vision 2030, Ministry of Environment, Climate Change and Forestry Strategic Plan 2023-2027, Bottom-up Economic Transformation Agenda (BETA), Kenya Green Economy Strategy and Implementation Plan 2016-2030, as well as regional and international strategies including the Sustainable Development Goals (SDGs), and the UN Decade of Restoration (2021-2030) Agenda. The Institute aims at; enhancing forestry technology development, capacity building of stakeholders, diversifying and improving research products and services to meet needs of the government's economic model for livelihood improvement.

This 7th Strategic Plan has incorporated necessary checks and balances to ensure that robust monitoring and evaluation is carried out to achieve the intended results. Therefore workplans and budget projections will be reviewed annually based on available funds and country needs. On resource requirements, KEFRI will count on the continued strategic support from the Kenya Government, development partners and collaborators to enhance research facilities and tree seed infrastructure and establish relevant research centres of excellence in the eco-regions to enhance farmers' and stakeholder access to information, innovations, and technologies to achieve the 15 Billion tree growing strategy by 2032. The Institute remains focused on being a centre of excellence in research in forestry and allied natural resources nationally, regionally and globally. KEFRI management will ensure effective implementation of this 7th Strategic Plan and calls upon all stakeholders to support the Institute in implementing this Plan in order to enhance environmental resilience and contribute to the country's socio-economic development.

Jane W. Njuguna (PhD)
Ag. Director, Kenya Forestry Research Institute

EXECUTIVE SUMMARY

The Kenya Forestry Research Institute (KEFRI) embraced strategic planning in 1989 to guide its research and development operations. Development of this seventh (7th) Strategic Plan 2022-2027 involved a review of the 6th KEFRI Strategic Plan 2018-2022. This Plan is in line with: the Constitution of Kenya, 2010; Kenya Vision 2030; National Forest Programme (NFP, 2016-2030); Forest Conservation and Management Act (FMCA, 2016); draft National Forest Policy (2016); Climate Change (Amendment) Act, 2023 and the Ministry of Environment, Climate Change and Forestry Strategic Plan 2023-2027. The plan takes special recognition of the need to develop appropriate technologies for livelihood improvement and climate resilience to realize the goals of the Bottom-up Economic Transformation Agenda (BETA); and Kenya Green Economy Strategy and Implementation Plan 2016-2030. The plan has laid emphasis on the Institute's national mandate of contributing to 15 Billion Tree Growing Strategy to achieve 30% tree cover by 2032 by providing quality tree seeds.

In formulating this strategic plan, an assessment of both external and internal operating environments was undertaken. This involved analyzing Strengths, Challenges, Opportunities and Threats (SCOT) 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 SCOT, 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 7th Strategic Plan are:

Mandate

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

Vision

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

Mission

To conduct research in forestry and allied natural resources for sustainable development through innovations, capacity building and technology transfer.

Core Values

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

- ***Excellence:*** Committed to high standards of professionalism
- ***Creativity and Innovation:*** Promote, support and implement new ideas, methods and products
- ***Integrity:*** Uphold honesty, high moral standards and intolerance to corruption
- ***Teamwork:*** Build cordial working relations and team spirit
- ***Inclusivity:*** Equal access to opportunities and resources
- ***Networking:*** Strive to attain sustainable networks and partnerships
- ***Customer Focus:*** Oriented to customer needs and satisfaction

This Strategic Plan 2022-2027 will achieve the following strategic objectives which are to:

i. Coordinate implementation of research and development activities
ii. Enhance forest productivity for improved livelihoods and environmental sustainability
iii. Generate technologies for management and conservation of forest landscapes and resilience to climate change for sustainable development
iv. Develop technologies for efficient processing and utilization of forest products for livelihood improvement
v. Generate information to guide development of policies, regulatory and institutional frameworks to enhance governance in the forest sector for socio- economic development
vi. Provide technical support services, conduct expert training courses and disseminate research findings to support forestry development
vii. Enhance corporate publicity for increased visibility and ensure quality of research and service delivery
viii. Enhance partnerships and linkages for implementation of joint activities and resource mobilization
ix. Enhance partnerships and linkages for joint implementation of national and county activities
x. Coordinate implementation of corporate services activities
xi. Strengthen institutional capacity for research and development

xii. Strengthen internal controls, improve operational efficiency and promote good governance and ethical behaviour
xiii. Define institutional goals and enhance ability to identify and manage risks and protect assets
xiv. Undertake management of the procurement function, offer technical advice on procurement issues and ensure compliance with procurement policies, rules and regulations
xv. Provide professional secretarial and legal support to KEFRI Board of Directors and the Institute
xvi. Enhance revenue collection
xvii. Strengthen institutional capacity in planning, monitoring, evaluation and reporting

Implementation of this Strategic Plan will be guided by five (5) Strategic Research and Development themes that include;

1. Forest Productivity, Health and Tree Improvement (FPHTI) with the following seven (7) research programmes;
   a. Forest Germplasm and Tree Seed Production
   b. Tree Seed Technology and Quality Assurance
   c. Forest Biotechnology, Tree breeding and Improvement
   d. Tree Seedling Establishment and Nursery Technologies
   e. Sivilculture of Forest Plantations and Forest Resource Assessment
   f. Forest Health and Forest Fire Technologies
   g. Agroforestry, Farm Forestry and Fruit Tree Farming
2. Forest Biodiversity, Climate Change, and Environment Management (FBCCEM) with the following ten (10) research programmes;
   a. Natural Forest and Biodiversity Conservation
   b. Mangrove Conservation and Restoration
   c. Wetlands and Watershed Conservation
   d. Bamboo Research and Development
   e. Climate Change Mitigation and Adaptation
   f. Arid and Semi arid Lands (ASALs)
   g. Nature Based Solutions Interventions in Forests and Woodlands
   h. Invasive Plant Species Management
   i. Endangered and Plant Species of National Interest
   j. Pollution Control and Rehabilitation of Polluted Land

3. Forest Products and Entrepreneurship Development (FPED) with the following seven (7) research programmes;;
    a. Timber Processing and Utilization
    b. Bamboo Processing, Utilization and Industry Development
    c. Bio-energy Technology Development
    d. Bio-prospecting and Forest Based Product Development
    e. Products and Technologies Incubation
    f. Gums and Resins Development
    g. Forest Based Entrepreneurship and MSMEs Development
4. Socio-economics, Policy and Governance (SPG) with the following six (6) research programmes;
    a. Forest Policy and Legislative Framework
    b. Commercial Forestry Innovations and Investments
    c. Gender and Livelihoods
    d. Forest Resource Valuation and Accounting
    e. Forest Extension Research
    f. Bio-cultural Heritage
5. Forest Research Support Services (FRSS) with the following eight (8) research programmes;
    a. Biometrics and Geomatics
    b. Training and Capacity Building
    c. Knowledge Management
    d. Information and Communication Technology
    e. Bio-science Research and Laboratory Coordination
    f. Artificial Intelligence and Machine Learning
    g. Space Technologies
    h. Information Dissemination and Technology Transfer

The five technical thematic areas will be supported by the following departments in order to effectively and efficiently deliver KEFRI's mandate. These are:

a. Corporate Affairs and Quality Assurance
b. Corporate Services Directorate that include
    (i) Finance
    (ii) Human Resource Management

(iii) Administration
(iv) Supply Chain Management
(v) Revenue Generation Unit
(vi) Partnerships and Resource Mobilization
(vii) National and County Technical Liaison
(viii) Planning, Strategy and Risk Management
(ix) Monitoring and Evaluation
(x) Corporation Secretary and Legal Services
(xi) Internal Audit

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 developed and will form the basis for preparation of annual work-plans.

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

The Institute has established a risk management process that will be used to identify, analyze, evaluate and mitigate the risks that are likely to be encountered during implementation of this Strategic Plan. The anticipated risks could be strategic, operational, financial and technological.

In order to implement the 7th Strategic Plan, financial, human and physical resources will be required. Financial requirements for the 2022/2023 FY are estimated at KES 3,015.8 billion that is projected to grow to KES 9,962.3 billion by 2026/2027 FY. 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 undertaken to track the implementation of the Plan. The M & E process will be used to measure accomplishments and detect deviations, and also where there may be need for adjustment for appropriate and timely action. Monitoring and Evaluation tools will include; annual implementation matrix review, annual performance contracts and work-plans, annual budget and quarterly expenditure reviews, and annual staff appraisals. A mid term review of the strategic plan will be undertaken.

Kenya Forestry Research Institute (KEFRI) Headquarters, Muguga

CHAPTER ONE
INTRODUCTION

1.0 Background

Kenya Forestry Research Institute (KEFRI) is a state corporation established in 1986, under the Science and Technology Act (Cap 250) of the Laws of Kenya. The Act has since been repealed but is accredited by the Science, Technology and Innovation (STI) Act No. 28 of 2013. The Institute's mandate is anchored in the Forest Conservation and Management Act No. 34 of 2016 as the agency to undertake research in forestry. KEFRI is certified in both ISO 14001:2015 Environmental Management Systems (EMS) and ISO 9001:2015 Quality Management Systems (QMS) and therefore conforms to international standards on environmental and quality management systems.

KEFRI embraced the concept of strategic planning from 1989 and has since implemented six (6) strategic plans. This 7th Strategic Plan 2022-2027 adopts an integrated thematic and programme based research approach in line with the National Forest Programme 2016-2030.

1.1 Mandate

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

1.2 Functions

1. Develop research and development programmes to provide information and technologies for sustainable development of forestry and allied natural resources.
2. The Institute shall, in consultation with relevant organizations -
   (a) Prepare forestry research and development strategies for the country;
   (b) Conduct expert training courses in forestry and allied natural resources;
   (c) Disseminate research findings to support forestry development in the country and counties; and
   (d) Participate in development and monitoring of national forest standards.
3. Compile and submit a report on regular basis to the Cabinet Secretary relating to forestry research and development.

4. Advice the Cabinet Secretary, to declare any tree species or family of tree species to be protected in the whole country or in specific areas thereof, and shall cause this information to be disseminated to the public by order published in a Gazette notice.
5. Advice the Cabinet Secretary to reverse the protection of any tree species or family of tree species if the protection is no longer necessary.
6. Develop regulations or guidelines for the protection and regeneration of a protected tree species.

1.3 Major Achievements under KEFRI 6th Strategic Plan 2018-2022

During the period under review KEFRI realized the following major achievements;

- Established 288 ha of seed orchards and seed stands
- Produced and distributed 158,336 kilogrammes of high quality tree seed
- Embarked on expansion of seed centres from one at Muguga to 18 seed centres in selected areas across the eco-regions and sub-centres
- Continued with advanced breeding of *Melia volkensii* and *Acacia tortilis*
- Developed 144 technologies for: establishing and managing forest plantations and trees on-farm; sustainable forest landscapes, management of wetlands and riparian ecosystems, and efficient processing and utilization of wood and non- wood forest products
- Improved management and monitoring of various tree pests including; cypress aphid, blue gum chalcid, bronze bug, red gum lerp psyllid, Eucalyptus snout beetle and diseases such as *Teratosphaeria gauchensis,* canker, and dieback
- Established permanent sample plots in forests and woodlands ecosystems for collection of data on ecological trends and dynamics in Arabuko Sokoke Forest, Buda Forest and Aberdares Forest

Melia in dryland agroforestry system

Plantation of improved Melia

- Undertook ecological studies in various forest types to secure a broad range of goods and environmental services from Aberdares Forest, Arabuko Sokoke Forest, Buda Forest, Mbeere Hills, and Taita Hills.
- Rehabilitated 3,500 ha of degraded Maasai Mau Forest through aerial seeding
- Developed bio-pesticide from *Commiphora africana* resin extract to repel *Cimex lectularius* (bed-bugs)
- Undertook chemical characterization and efficacy test for *Melia volkensii* extracts as a bio-pesticide against agricultural insect pests of economic importance
- Collaborated with Kenya Wood Preservers Association in determining the strength and treatability properties of electricity transmission poles to ensure compliance to KEBS standards
- Produced 160 scientific publications including; peer-reviewed journal papers, technical notes, research notes, guidelines, extension materials, policy briefs, book chapters, and conference proceedings. These were distributed to various stakeholders
- Conducted 115 capacity building courses to various stakeholders in: seed and seedling production; rehabilitation of natural forests; Participatory Natural Resources Management (PNRM); bamboo value chain; and adaptation to climate change in Africa
- Held the 5th KEFRI Scientific Conference themed 'Contribution of Forestry Research to Sustainable Development' in April 2018, and one Commercial Forestry Investment Conference and Expo in April 2021
- Realized eighteen (18) strategic partnerships on fundraising, and developed and signed thirty (30) Memorandum of Understanding (MoUs) with development partners
- Completed construction of office blocks, laboratories and farmers resource centres in Lamu, Marigat, Taita Taveta and Lodwar
- The Institute was certified in both ISO 9001:2015 and ISO 14001:2015 Management Systems to meet international standards as well as enhance environmental conservation, and conform to a customer focused service delivery
- Developed the 'Jaza Miti App', a species - site matching tool to enhance tree growing and enable achievement of the 30% tree cover by 2032

Bare Maasai Mau degraded forest in 2019

Delicate *Podocarpus falcatus, Croton megalocarpus, and Dombeya torrida after one year*

Prunus africana, Juniperus procera and *D. torrida* seedlings struggling with thick undergrowth September 2023

JazaMiti; the species to site matching tool for seedling resilience

1.4 Lessons learnt during implementation of KEFRI 6th Strategic Plan

- Partnerships, networks, and collaborations enhanced research and development
- Awareness creation increases adoption of technologies from research in forestry and allied natural resources
- There is need to devolve forestry research and development to the counties for impacts
- Active engagement with the private sector enhances forestry development
- There is need to intensify research in climate change and blue economy

COAST ECO-REGION RESEARCH PROGRAMME

Coast Eco-region Research Programme, Gede

Taita Taveta Sub-regional Research Centre

Lamu Sub-regional Research Centre

CHAPTER TWO
ROLE OF KEFRI IN THE IMPLEMENTATION OF GLOBAL AND NATIONAL FORESTRY AGENDA

2.0 Introduction

KEFRI contributes to global, continental, regional and national forestry agenda through development of technologies, generation of information, and knowledge sharing in forestry and allied natural resources.

2.1 Global Forestry Agenda

The Institute is an active member of 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), Organization for Economic Co-operation and Development (OECD), and Central America and Mexico Coniferous Resources Cooperative (CAMCORE).

KEFRI contributes to other global forestry agenda set by the United Nations Economic and Social Council (UN-ECOSOC) through the United Nations Forum on Forests (UNFF) and other Multilateral Environmental Agreements (MEAs) including; United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD), and the United Nations Convention to Combat Desertification (UNCCD).

2.2 Continental Forestry Agenda

At continental level, KEFRI ascribes to Agenda 2063 of The African Union Commission (AUC); African Forest Landscape Restoration Initiative (AFR 100) for restoring degraded landscapes and the Sustainable Forest Management Framework (SFMF) for Africa 2020-2030. Kenya has made a commitment to restore 5.1 million ha of degraded forests and landscapes by 2030 and KEFRI is a key player towards achievement of this commitment. KEFRI is a member of continental research networks including; Forestry Research Network for Sub-Saharan Africa (FORNESSA); Network for Natural Gums and Resins in Africa (NGARA) which is hosted in KEFRI; and African Forest Forum (AFF).

2.3 Regional Forestry Agenda

Regionally, Kenya is a member of the East African Community (EAC) and Common Market for Eastern and Southern Africa (COMESA) and implements The East African States Protocol on Environment and Natural Resource Management and EAC Climate Change Policy.

2.4 National Forestry Agenda

The national forestry agenda is drawn from various national legal and strategy documents which include; the Kenya Constitution 2010, Kenya Vision 2030, National Forest Programme 2016 - 2030, Forest Conservation and Management Act (FCMA, 2016), Draft National Forest Policy 2021, and Climate Change (Amendment) Act 2023. This Strategic Plan is aligned to the Ministry of Environment, Climate Change and Forestry Strategic Plan 2023 - 2027, Bottom-up Economic Transformation Agenda (BETA) and Kenya Green Economy Strategy and Implementation Plan 2016-2030. The plan has a special focus on the Institute's national mandate of contributing to 15 Billion Tree Growing Strategy to achieve 30% tree cover by 2032.

Sesbania sesban

Adenanthera pavonina

Various packaged KEFRI tree seeds

Seeds of various trees species

Tree nursery

Gmelina arborea grafts from selected mother trees

CENTRAL HIGHLANDS ECO-REGION RESEARCH FACILITIES

Central Highlands Eco-region Research Programme, Muguga

Nyeri Sub-regional Research Centre

Rumuruti Sub-regional Research Centre

CHAPTER THREE
SITUATIONAL ANALYSIS

3.0 Introduction

Development of the 7th Strategic Plan has taken into consideration; an environmental scan using SCOT and P-PESTLEG analysis that identifies factors that influence operation of the Institute during the Plan period. This chapter also includes a stakeholder analysis, their roles, expectations, and mutual areas of collaboration.

3.1 Review of 6th Strategic Plan

The 6th Strategic Plan review provided the road map for implementation of research and development strategies and initiatives to address the Institute's strategic goals namely; effective contribution to the national minimum tree cover of 10%, and improving livelihoods of communities and households through sustainable forest management.

3.2 Environmental Analysis

3.2.1 Internal situational analysis using SCOT

The Institute conducted a Strengths, Challenges, Opportunities and Threats (SCOT) analysis in order to assess internal and external factors as well as determine its current and future potential in delivering its mandate. The process was participatory and involved both internal and external stakeholders.

Strengths

The SCOT analysis established that KEFRI has strengths in various aspects including; human resources, and research and infrastructural facilities. The strengths (Table 1) give the Institute a competitive advantage to leverage on.

Table 1: KEFRI's *Competitive Strengths*

No	Strength	Strategic Implication
1	Experienced and qualified research scientists	• High quality research for impact • Generation of appropriate technologies and innovations • Potential to mobilize resources through networks, collaborations and partnerships • International recognition through indexed rankings • High expertise for capacity building in forestry and allied natural resources
2	Availability of modern research facilities	• Quality research output • Enhanced collaborations • Quality training and advisory services in forestry and allied natural resources • Potential for revenue generation
3	Strong network of national, regional, and international collaborators and partners	• National and international recognition and support for research • Increased visibility and funding
4	Established high quality seed sources	• Provision of quality tree germplasm • Support commercial forestry and restoration of landscapes
5	A repository of forestry technologies and information products	• Easy access to technologies and information • Enhanced exchange of information • Increased visibility
6	Decentralized and devolved research and development activities to the Eco-region Research Programmes	• Easy access by stakeholders • Enhanced delivery of products and services suited to local needs
7	Enhanced capacity in dissemination of research findings	• Enhanced international recognition and visibility • Increased adoption of forestry technologies
8	Leading regional public forestry research institution	• Positive image and publicity • Leadership in national and regional research and development in forestry and allied natural resources
9	ISO 14001: 2015 EMS and ISO 9001:2015 QMS certified	• Quality environmental management • Quality service delivery • International recognition • Enhanced corporate image • Confidence of development partners

Challenges

Challenges with strategic implications that KEFRI encountered in the course of implementing the 6th Strategic Plan are shown in Table 2.

Table 2: ***Challenges Encountered during Implementation of KEFRI 6th Strategic Plan***

No	Challenge	Strategic Implication
1	Inadequate funding	• Inadequate infrastructure and human resource • Inability to complete planned research and development activities • Reduced research output • Inadequate research facilities in some eco-regions
2	Inadequate staffing in emerging specializations	• Limited research output in specific disciplines
3	Inadequate access to land for research and development	• Limited implementation of research and development activities
4	Limited automation of processes	• Reduced efficiency in service delivery
5	Slow adoption of forestry technologies	• Continued environmental degradation • Low impact on livelihoods
6	New and emerging invasive plant species, tree pests and diseases	• Increased demand for development of management technologies and strategies
7	Inadequate legal framework to mainstream forestry research and development	• Inability to maximize on outputs
8	Disruption by COVID 19 pandemic	• Disruption of research implementation

Opportunities

The SCOT analysis identified the following opportunities (Table 3) to leverage on while implementing the KEFRI 7th Strategic Plan.

Table 3: ***Opportunities Identified through SCOT Analysis***

No	Opportunity	Strategic Implication
1	Climate change mitigation and adaptation	• Carbon markets • Increased uptake of forestry as an investment • Increased integration of forest and tree based mitigation and adaptation measures
2	Emergence of green and blue economies and associated incentives	• Increased availability of forestry products, services and investments • Enhanced research funding in mangroves research • Leveraging forestry development in wetlands and inland waters • Increased green jobs
3	Global forest financing	• Potential for resource mobilization
4	Favourable government plans and strategies	• Enhanced prioritization of forestry in the national development agenda • Funding for the 15 BN national tree growing programme • Increased funding from development partners • Promotion of nature based solutions • Mainstreamed environmental education in school curricula • Implementation of the national government housing agenda
5	Favorable global campaign for environmental/ biodiversity conservation and restoration such as SDGs	• Increased funding and partnerships in forestry research and development • Uptake of technologies for restoration of forests and landscapes • Demand for Payment for Ecosystem Services (PES) models
6	Technological advancement, artificial intelligence / machine learning	• Increased efficiency in service delivery • Improved visibility and corporate image
7	Recognition of indigenous traditional knowledge in forestry development	• Enhanced bio-prospecting research • Low cost solutions for forestry interventions

Threats

External factors which can impact negatively on performance of the Institute are as shown in Table 4.

Table 4: ***Threats Identified through SCOT Analysis***

No	Threat	Strategic Implication
1	Loss of seed sources through illegal activities	• Inadequate amounts of quality tree seed
2	Competition with other land uses	• Inadequate access to land for research
3	Lack of specific legislation for forestry research	• Weak legal framework for articulating KEFRI research and development role
4	Increased imports of forest products from outside the country	• Decrease in investment in forestry production and processing • Loss in foreign exchange • Loss of jobs
5	Economic instability and budget cuts	• Delayed implementation of research activities
6	Pandemics and natural calamities	• Slowed down the implementation of planned activities

3.2.2 External situational analysis using P-PESTLEG

P-PESTLEG analysis took 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 issues in seven areas (Table 5).

Table 5: ***P-PESTLEG Analysis***

Factors	Aspect	Strategic Implication	Mitigation Measure
Policy	15 Billion Tree Growing Strategy to achieve 30% tree cover by 2032 Kenya Green Economy Strategy and Implementation Plan 2016-2030 Bottom-up Economic Transformation Agenda (BETA)	• Increased funding	• Increase seed and seedling production
Political	Political goodwill from the government	• Increased funding	• Implement government strategic projects and provide advice on sector emerging issues
	Devolved governance structure	• Increased demand for forestry technologies and information, and knowledge products	• Establish or strengthen research centres in counties
	Presidential Directive	• Demand for seed and seedling to increase tree cover to 30% by 2032	• Increase seed and seedling production and nursery capacities
Economic	Anticipated economic growth	• Demand for investment in forestry products and services	• Establish forestry innovation and investment support centre
	Inflation and fluctuations in foreign exchange rates	• The fluctuations will affect projects cost	• Plan costs within acceptable margins • Hedge against currency fluctuation (Dollar/Euro accounts)

Factors	Aspect	Strategic Implication	Mitigation Measure
	Commercialization of tree growing	• Demand for tree growing as a business	• Develop technologies for commercial forestry
	Global demand for high quality wood products	• A major shift towards product based breeding	• Develop and deploy product-based breeding strategies for species of economic value • Enhance product diversification and reconstitution
Social	Land sub-division into uneconomic units	• Reduction in land available for forestry research and development	• Develop agroforestry technologies and introduce new appropriate tree species onto farmlands
	Increased urbanization	• Encroachment into forests and sensitive ecosystems	• Develop urban forestry policies, guidelines, and technologies • Introduce appropriate tree species for urban environment
	Unmet community preference on products and services	• Poor corporate image	• Diversify product development and services
	Emerging health issues including; major pandemics (Covid-19), lifestyle diseases, drug and substance abuse	• Negatively impact on staff performance	• Develop and deploy sound health policies for staff
Technological	Keeping pace with technological advancement in research and development	• Demand for modern equipment and facilities for research and development	• Deploy, service, and maintain current modern equipment and facilities • Procure modern equipment as need arises • Develop a replacement or decommissioning plan for obsolete equipment

Factors	Aspect	Strategic Implication	Mitigation Measure
	Emerging trends in the ICT operational environment	• Requirement for adoption of new ICT technologies	• Plan, budget and procure new ICT facilities
	Developments in social media and mobile technology	• Demand for social media dissemination platforms	• Enhance use of social media platforms
Legal	Constitutional requirement for achieving and maintaining a minimum of 30% tree cover	• Demand for seed and seedling to maintain and exceed tree cover of 30%	• Increase seed and seedling production and nursery capacities
	Emerging laws and regulatory frameworks	• Requirement for compliance	• Track and comply with relevant emerging laws and regulatory frameworks
	Devolved forestry functions	• Widened scope for more engagement with devolved units	• Develop working MoUs and MoAs with relevant devolved entities
	Multilateral Environmental Agreements (MEAs) relevant to forestry research	• Requirement for domestication of relevant MEAs	• Provide information to guide development and review of relevant MEAs • Develop working MOUs and MOAs to address relevant MEAs
	Tree seed regulations	• Requirement for tree seed certification	• Apply to KEPHIS for authority on self certification • Align KEFRI tree seed production with requirement of existing regulations
Environmental	Environmental degradation and disturbance	• Emergence of invasive and parasitic plant species • Emergence of tree pests and diseases	• Develop environmental management strategies • Develop rehabilitation technologies

Factors	Aspect	Strategic Implication	Mitigation Measure
	Over-reliance on exotic tree species	• Lack of improved indigenous species • Negative impact on local biodiversity	• Undertake species trials for indigenous species • Undertake tree improvement for indigenous species
	Increased interest in tree growing	• High demand for quality germplasm • Demand for capacity building • Reduced area for crop farming	• Develop species-site matching • Develop tree growing policies for farming areas • Integrate appropriate trees on farms
	Climate change	• Rise in pest and disease outbreaks, and fire incidences • Low forest productivity • Change of weather patterns • Rising waters in lakes, oceans, rivers and dams • Increased degradation	• Undertake Pest Risk Analysis • Develop pest and disease reference database • Carry out fire management studies • Monitor forest productivity • Select trees species for climate change resilience
Governance	Low compliance to laws and regulations	• Increased litigations • Increased expenditure	• Adherence and compliance to relevant policies laws and regulations • Increase awareness on key policies, laws and regulations to stakeholders
	National Forestry Programme (NFP 2016–2030)	• Requirement for adherence	• Adherence to the NFP strategic frameworks in forestry research planning and implementation
	Frequent change of policies and directives	• Diversion from core mandate	• Adapting to changes and • Undertake mid-term reviews

3.3 Stakeholders Analysis

KEFRI will work with various stakeholders drawn from public agencies, county governments, development partners, private sector, communities, individuals and employees. The roles of respective stakeholders and mutual expectations are shown in Table 6

Table 6: ***Stakeholders 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, NTZDC	Undertake development, regulatory and service	Provision of technologies and information	Develop and provide appropriate technologies and information	- Identify issues and problems for research - Support collaborative research on specific issues
National Research Institutions KALRO, KIRDI, KEMRI, KEMFRI, KWRI, KIPPRA	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

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
National Government ministries and departments eg. MECC&F, MoE, The National Treasury, County Governments (47)	- Provide oversight - Development and service provision	- Compliance to statutory obligation, - Technical support and provision of information	- Undertake its mandate efficiently, - Account for resources - Respond to enquiries timely - Rationalize its operations	- Timely funding, - Provide supervision and timely feedback - Effectively communicate the policy framework
Media	- Provide publicity	- Provision of timely, accurate and reliable information	- Enhanced awareness on environment and forestry	- Fair and response coverage and reporting
Judiciary	-Interpret and advice on legal matters	Abide by the law	- Fair and prompt dispensation on legal issues	- Fair representation on legal issues
Parliament	-Enact laws, regulations on policy framework	- Timely submission of draft policies and bills	- Timely legislation of policies and bills	- Oversight

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
Development partners: JICA, USAID, EU, SIDA, FINNIDA, DANIDA, GIZ	Support for research and development activities	- Resources for proposal development - 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 - Provide donor funds to implement projects	Collaboration, implementation and delivery of project and accountability of funds	- High level collaboration - Timely reporting of project implementation progress - Financial accounting	- Timely information on current development initiatives - Timely response to requests - Provide expertise as required
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 projects - 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

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
CBOs, FBOs /NGOs	- Facilitate development activities, - Lobbying 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 for procured services	- Conform to statutory procurement requirements - Maintain efficient system for processing payment	- Provide adequate documentation - Timely delivery of quality products and services
Private sector communities and companies	Implement development activities	Technologies and information provision	- Provide appropriate technologies and information - Sign MoA	- Identify issues and problems for research - Provide support (financial / in-kind)
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

DRYLAND ECO-REGION RESEARCH PROGRAMME

Dryland Eco-region Research Programme, Kitui

Garissa Sub-regional Research Centre

Kibwezi Sub-regional Research Centre

CHAPTER FOUR
STRATEGIC FOCUS

4.0 Introduction

This chapter presents a roadmap for the Institute's stewardship of its mandate by setting strategic direction for the five years from 2022 to 2027. KEFRI Vision, Mission, Core Values, Strategic Goals, and Strategic Objectives have been identified to guide implementation of this Strategic Plan. The strategic objectives present specific outcomes that the Institute aims to achieve towards realizing its mandate.

4.1 Vision

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

4.2 Mission

To conduct research in forestry and allied natural resources for sustainable development through innovations, capacity building and technology transfer

4.3 Core Values

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

- ***Excellence:*** Committed to high standards of professionalism
- ***Creativity and Innovation:*** Promote, support and implement new ideas, methods and products
- ***Integrity:*** Uphold honesty, high moral standards and intolerance to corruption
- ***Teamwork:*** Build cordial working relations and team spirit
- ***Inclusivity:*** Equal access to opportunities and resources
- ***Networking:*** Strive to attain sustainable networks and partnerships
- ***Customer Focus:*** Oriented to customer needs and satisfaction

4.4 Strategic Goals

1. Develop forestry technologies to contribute towards achieving and maintaining a minimum of 30% tree cover by 2032
2. Improve household livelihoods through forestry based solutions

4.5 The Strategic Objectives are to:

i. Coordinate implementation of research and development activities

ii. Enhance forest productivity for improved livelihoods and environmental sustainability

iii. Enhance stakeholder access to high quality tree germplasm in the counties through the tree seed centres
iv. Generate technologies for management and conservation of forest landscapes and resilience to climate change for sustainable development
v. Promote use of modern technologies to accelerate restoration of degraded landscapes and forests
vi. Develop technologies for efficient processing and utilization of forest products for livelihood improvement
vii. Generate information to guide development of policies, regulatory and institutional frameworks to enhance governance in the forest sector for socio-economic development
viii. Provide technical support services, conduct expert training courses and disseminate research findings to support forestry development
ix. Enhance corporate publicity for increased visibility and ensure quality of research and service delivery
x. Enhance partnerships and linkages for implementation of joint activities and resource mobilization
xi. Enhance partnerships and linkages for joint implementation of national and county activities
xii. Enhance coordination, planning and implementation of corporate services activities
xiii. Strengthen institutional capacity for research and development
xiv. Strengthen internal controls, improve operational efficieny and promote good governance and ethical behaviour
xv. Define institutional goals and enhance ability to identify and manage risks and protect assets
xvi. Undertake management of the procurement function, offer technical advice on procurement issues and ensure compliance with procurement policies, rules and regulations
xvii. Provide professional secretarial and legal support to KEFRI Board of Directors and the Institute
xviii. Enhance revenue collection
xix. Strengthen institutional capacity in planning, monitoring, evaluation and reporting
xx. Digitize and automate institute processes

4.6 Implementation Strategy

The Director KEFRI shall provide overall coordination for implementation of this 7th Strategic Plan. The Directorates of Research and Development and Corporate Services will ensure implementation of the planned activities through themes and departments as follows;

4.6.1 Research and Development Themes and Departments

Implementation of the 7th KEFRI Strategic Plan will be guided by nine (9) Strategic Research and Development Themes. Activities under these themes will be conducted in five (5) Eco-region Research Programmes, eleven (11) Sub-regional centres and five (5) research stations. The national research programme at Karura will undertake research on forest products development. Activities in centres under each research themes will be implemented through thematic programmes.

4.6.1.1 Forest Productivity, Health and Tree Improvement (FPHTI)

Forest Productivity, Health and Tree Improvement (FPHTI) research theme will focus on:

1. Research in tree breeding and improvement, biotechnology, conservation of forest genetic resources; and production of high quality forest germplasm and tree seed. The proposed interventions aim at expanding seed sources, improving protection and management of seed sources, intensifying seed production and distribution, and quality assurance of tree germplasm and tree seed.
2. Generating technologies for establishment of plantations and sustainable management of forests.
3. Agroforestry and integration of high value trees on farms including fruit trees.
4. Research and advisory services for, control of forest pests, diseases and forest fires. The theme is structured into the following seven (7) Research Programmes:
    - Forest Germplasm and Tree Seed Production
    - Tree Seed Technology and Quality Assurance
    - Forest Biotechnology, Tree breeding and Improvement
    - Tree Seedling Establishment and Nursery Technologies
    - Sivilculture of Forest Plantations and Forest Resource Assessment
    - Forest Health and Forest Fire Technologies
    - Agroforestry, Farm Forestry and Fruit Tree Farming

This thematic area will contribute to creating green jobs in seed collection and distribution, seed source maintenance, seedling production, plantation assessment, forest protection, fire management, agroforestry, fruit tree farming and timber processing.

Tissue culture seedlings of *M.volkensii* and rooting Sandalwood seedlings through marcots

Cypress aphids

Dieback of Cypress and stem canker on Eucalypts

4.6.1.2. Forest Biodiversity, Climate Change, and Environment Management (FBCCEM)

Forest Biodiversity, Climate Change, and Environment Management (FBCCEM) research theme focuses on development of technologies for improved natural forest management and landscape restoration. The theme will also undertake research on rehabilitation, sustainable conservation, management and utilization of forests in water towers, wetlands and riparian ecosystems. The theme will develop technologies and information for mitigation and adaptation to climate change; conservation, restoration and sustainable use of terrestrial, inland freshwater ecosystems and their services. The theme will address challenges facing forestry sector through the following ten (10) Research Programmes as shown below:

- Natural Forest and Biodiversity Conservation
- Mangrove Conservation and Restoration
- Wetlands and Watershed Conservation
- Bamboo Research and Development
- Climate Change Mitigation and Adaptation
- Arid and Semi Arid Lands (Asals)
- Nature Based Solutions Interventions in Forests and Woodlands
- Invasive Plant Species Management
- Endangered and Species of National Interest
- Pollution Control and Rehabilitation of Polluted Lands

This thematic area will create green jobs, enhance livelihoods and food security through conservation and restoration of degraded lands, watersheds and mangrove, bamboo utilization, nature based solutions through apiculture and aquaculture development, utilization of invasive plant species and other bio-enterprises

Riverbank stabilization using bamboo

Restoration of degraded arid and semi-arid areas

Continuous restoration of degraded mangrove areas at the Kenya Coast

Management of Prosopis by utilization using half-orange kiln for efficient charcoal production in Marigat

Long rooted seedling technology to enhance survival in the drylands

Mechanised hole drilling to break soil hard pan and enhance survival and establishment of seedlings

4.6.1.3 Forest Products and Entrepreneurship Development (FPED)

Forest Products and Entrepreneurship Development (FPED) research theme focuses on development and promotion of efficient technologies for wood and non-wood products harvesting, processing and utilization of forest and allied natural resources for improved livelihoods and sustainable forest management. The theme will evaluate new methods of using wood in construction, engineering and reconstitution of wood, bio-materials, bio-chemicals, bio-plastics, energy products and food additives. FPED is important to national security through the implementation of forest forensics and advisory services. The theme will address challenges facing wood resources and non-wood forest products through the seven (7) Research Programmes as shown below:

- Timber Processing and Utilization
- Bamboo Processing, Utilization and Industry Development
- Bio-Energy Technology Development
- Bio-Prospecting and Forest Based Product Development
- Products and Technologies Incubation
- Gums and Resins Development
- Forest Based Entrepreneurship and MSMEs Development

The theme will enhance investment and wealth creation through entrepreneurship skills development, products development and marketing and capacity building through incubation. It will contribute to achievement of food security and universal health through bio-prospecting, medicinal products development and forest based enterprises. The theme will also contribute to national security through forest forensic services.

On-farm framed chain saw for higher timber recovery

Bamboo furniture

Promoting circular economy: Using waste wood to make high value timber products

Gums

Myrrh

Frankincense

Aloe and Baobab products

4.6.1.4 Socio-economics, Policy and Governance (SPG)

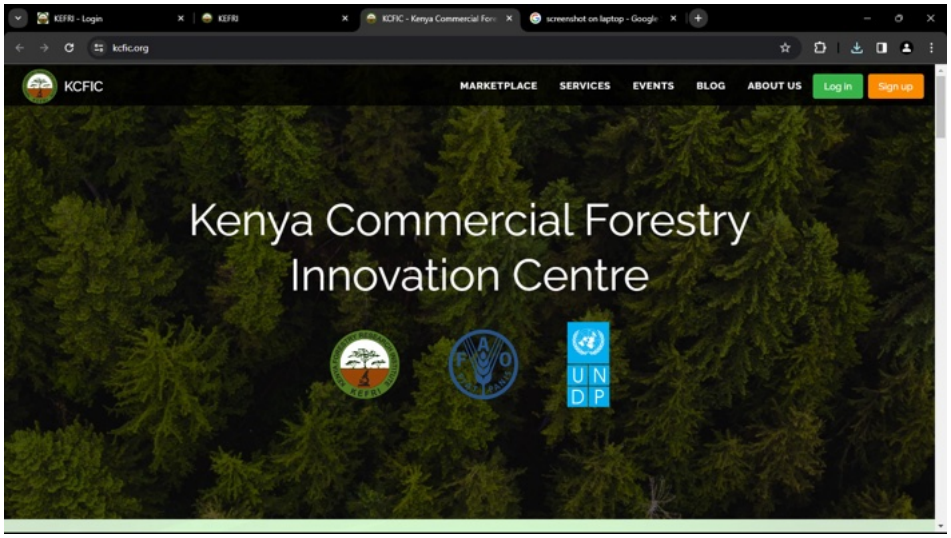
Socio-economics, Policy and Governance (SPG) research theme will focus on governance, community and stakeholder interests in forests and associated goods and services. It will contribute to formulation of policies and legislation on management of forestry and the environment. The theme will undertake research on marketing and trade in forestry products for enhanced livelihoods and wealth creation. The research will; address issues related to gender and people's interests in forests, undertake total forests and environmental valuation and natural capital accounting to inform policy, and resource allocation to the forest sector. Research will be carried out to guide forest investment, trade and sector development. This will be achieved by addressing goals and objectives of the six (6) Research Programmes as follows:

- Forest Policy and Legislative Framework
- Commercial Forestry and Investment
- Gender and Livelihoods
- Forest Resource Valuation and Accounting
- Forest Extension Research
- Bio-cultural Heritage

This thematic area will contribute to improved governance in the forest sector, commercial forestry development and private sector investment leading to increased job opportunities and incomes, resource evaluation by stakeholders and increased opportunities for Payment of Eco-system Services (PES) and carbon markets. It will also contribute to better understanding of the actual contribution of forests to the national economy and increased resource allocation to the sector

KEFRI Contribution to forest sector policy development

- Ammendment of the Forest Conservation Management Act 2016
- Seeds and plant varieties (Forest Tree Seed) Regulations 2023
- The Forests (Participation in Sustainable forest management) Regulations 2023 (draft)
- The Forests (Incentives and Benefits Sharing) Regulations 2023 (draft)
- KEFRI Bill to be a chapter in the proposed ammendment of the Forest Conservation and Management Act 2023
- Several other regulations in the sector
- Publications and dissemination materials

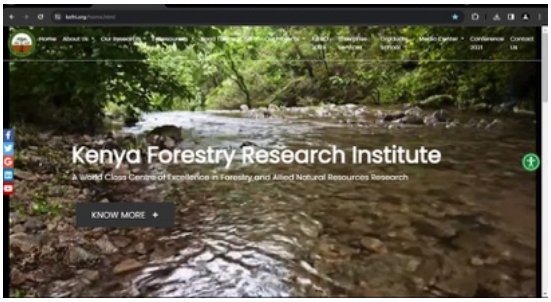


4.6.1.5 Forest Research Support Services (FRSS)

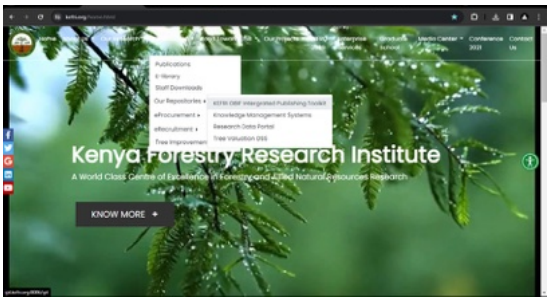
Forest Research Support Services is a critical theme to the Institute as it occupies the interface between researchers and stakeholders through provision of various services including; dissemination of research findings and knowledge products, research data management, laboratory services, and capacity building of stakeholders in sustainable development of forestry and allied natural resources. Establishment of a specialized forestry training school at postgraduate level will improve the practice of professional forestry. The ICT section is a major enabler to research and development and management of the Institute through internet connectivity, knowledge and data management systems and Enterprise Resource Planning (ERP). The theme will achieve these through goals and objectives set out in;

- Biometrics and Geomatics
- Training and Capacity Building
- Knowledge Management
- Information and Communication Technology
- Bio-science Research and Laboratory Coordination
- Artificial Intelligence and Machine Learning
- Space Technologies
- Information Dissemination and Technology Transfer

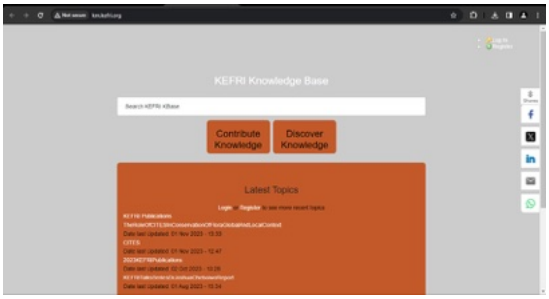
The theme will create entrepreneurs through capacity building in tree seed and seedling production and nursery management. It will provide information and knowledge products that will contribute to increased investment in the forestry sector.



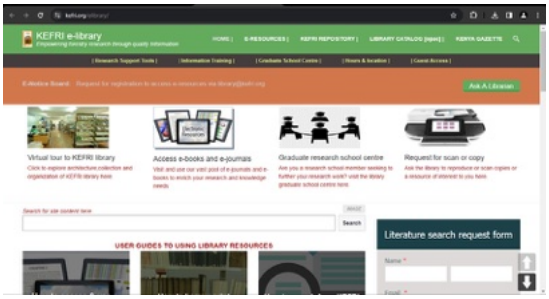
KEFRI Website



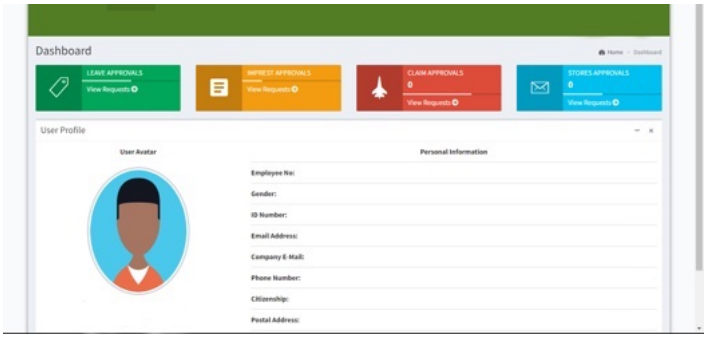
KEFRI e-resources



Knowledge management system



KEFRI e-library



KEFRI ERP

KEFRI eCitizen portal

4.6.2 Departments under Research and Development Directorate

All the research and development activities will be managed and coordinated by Senior Deputy Director - Research and Development (SDD-R&D). The following departments will also be domiciled under the SDD-R&D;

- Resource Mobilization, Partnerships and International Relations
- National and County Technical Liaison
- Monitoring, Evaluation and Reporting

The departments will; enhance resource mobilization, technology transfer to Counties and Ministries, Departments and Agencies (MDAs) and monitor evaluate and report the Institute's activities.

4.6.3 Departments under Director's Office

The following departments will be domiciled under the Director's office;

- Corporate Affairs and Quality Assurance (CA&QA)
- Supply Chain Management
- Internal Audit
- Corporation Secretary/Legal Services
- Revenue Generation Unit

4.6.4 Departments under Corporate Services (CS) Directorate

This Directorate will provide a supporting role to research and development by creating a conducive operational environment through upgrading and managing physical infrastructure, as well as optimizing utilization and performance of human, financial and other resources. The departments are:

- Human Resource Management
- Finance and Accounts
- Administration
- Planning and Risk Management

Integration of themes, strategic objectives and strategies to realize the goals under this Strategic Plan is shown in Table 7.

Table 7: ***Linking Research Themes/Departments, Strategic Objective and Strategies***

No.	Directorate/ Theme/ Department	Strategic Objectives	Strategies/Activities
1	**Director's Office**	Provide strategic leadership to achieve the institutes mandate	1.1 Develop the Institute strategic plan 1.2 Develop and recommend to the board the Institute strategies and plans 1.3 Develop clear policies for the management of the Institutes assets and liabilites 1.4 Ensure compliance with the Institute's policies and other legal instruments 1.5 Management of potential risks 1.6 Ensuring succession planning and adherence to human resource management strategies 1.7 Monitoring and evaluation of perfomance contracts 1.8 Mobilise resources for the Institute activities 1.9 Advising the cabinet secretary on gazettment and degazettment of protected tree species
2	**Research and Development Directorate**	To coordinate implementation of research and development activities	2.1 Provide strategic leadership in coordination and planning of research and development programmes 2.2 Oversee monitoring and evaluation of implementation of research and development activities 2.3 Linking between the board and management 2.4 Coordinate development of the workplan and perfomance contracting 2.5 Promote outreach of forest programs 2.6 Development of policies for forestry development 2.7 Coordinate publicity of the Institution 2.8 Organise for national and international conferences for scientific exchange 2.9 Provide oversight on dissemination of research findings for impact 2.10 Coordinate mobilization of resources for research and development 2.11 Create linkages and networks between KEFRI and other relevant organizations

No.	Directorate/ Theme/ Department	Strategic Objectives	Strategies/Activities
3	**Forest Productivity, Health and Tree Improvement**	To enhance forest productivity for improved livelihoods and environmental sustainability	3.1 Improve tree germplasm 3.2 Enhance forest germplasm and tree seed production 3.3 Enhance forest germplasm and tree seed distribution and conservation 3.4 Enhance forest germplasm and tree seed research 3.5 Enhance tree seed quality control and certification 3.6 Enhance tree production 3.7 Enhance nursery research 3.8 Improve forest plantation inventory methods 3.9 Establish forest productivity and tree improvement database 3.10 Enhance silvicultural methods in plantations and trees on farm 3.11 Surveillance and management of tree pests and diseases 3.12 Forest fire impact assessment 3.13 Enhance development and uptake of agroforestry technologies in rural and urban areas 3.14 Incorporate trees in agro-pastoral systems
4	**Forest Biodiversity, Climate Change and Environment Management**	To generate technologies for management and conservation of forest landscapes and resilience to climate change for sustainable development	4.1 Strengthen biodiversity conservation and sustainable use of natural forests 4.2 Enhance forest landscapes restoration and rehabilitation 4.3 Strengthen conservation and sustainable use of mangroves 4.4 Enhance conservation of wetlands and riparian ecosystems 4.5 Strengthen forest hydrology research 4.6 Enhance soil and water conservation 4.7 Enhance bamboo production 4.8 Enhance contribution in Inter-governmental Panel on Climate Change (IPCC) 4.9 Strengthen implementation of REDD+ strategy

No.	Directorate/ Theme/ Department	Strategic Objectives	Strategies/Activities
			4.10 Strengthen capacity and skills of stakeholders in climate change 4.11 Enhance biodiversity conservation and sustainable use of woodlands and rangelands 4.12 Improve forest and livestock management in natural forests and woodlands 4.13 Enhance livelihoods through agro-ecology 4.14 Enhance control and management of invasive species 4.15 Develop and implement National Strategy for Management and Control of Invasive *Prosopis juliflora* 4.16 Enhance conservation and sustainable use of endangered plant species 4.17 Enhance rehabilitation of wastelands
5	**Forest Products and Entrepreneurship Development**	To develop technologies for efficient processing and utilization of forest products for livelihood improvement	5.1 Improve quality of wood products 5.2 Improve timber harvesting and logging technologies 5.3 Optimise utilization of timber products 5.4 Enhance bamboo technologies for product diversification, efficient utilization and technology adoption by SMEs 5.5 Mitigate climate change through enhanced processing and utilization of biomass energy 5.6 Bio-prospecting and utilization of indigenous knowledge in tree natural products development and utilization 5.7 Enhance non-timber forest products development and standardization for uptake by SMEs 5.8 Enhance incubation of forest products 5.9 Enhance gums and resins utilisation and conservation 5.10 Enhance forest products and technology incubation

No.	Directorate/ Theme/ Department	Strategic Objectives	Strategies/Activities
6	**Socio-economics, Policy and Governance**	To generate information to guide development of policies, regulatory and institutional frameworks to improve governance in the forest sector for socio-economic development	6.1 Contribute to development and review of policies and legal framework in forestry 6.2 Contribute information to enhance the country's role in global forestry and environmental processes 6.3 Enhance forest investment opportunities for livelihood improvement 6.4 Strengthen information exchange on commercial forestry investments and innovations 6.5 Enhance information on national and trans-boundary trade in forest products 6.6 Improve forest governance for forestry development in Kenya 6.7 Gender mainstreaming in forestry 6.8 Develop forestry financing schemes and models 6.9 Enhance forest resource valuation 6.10 Enhance research in forestry extension 6.11 Enhance Indigenous Technical Knowledge in forestry
7	**Forest Research Support Services**	To provide technical support services, conduct expert training courses, and disseminate research findings to support forestry development	7.1 Develop and implement research data management framework for forest biometrics 7.2 Develop and implement research data management framework in GIS & RS 7.3 Strengthen capacity and improve skills of staff and other stakeholders in forest biometrics 7.4 Strengthen capacity and improve skills of staff and other stakeholders in GIS & RS 7.5 Enhance training in social forestry 7.6 Operationalize KEFRI Graduate Research School 7.7 Strengthen Knowledge Management 7.8 Enhance information sharing 7.9 Enhance Institute visibility and ranking 7.10 Enhance business applications 7.11 Enhance Information Security Management Systems 7.12 Improve ICT infrastructure and connectivity 7.13 Strengthen Bio-science research 7.14 Build Bio-science partnerships

No.	Directorate/ Theme/ Department	Strategic Objectives	Strategies/Activities
			7.15 Strengthen laboratory coordination 7.16 Enhance forest management and conservation using artificial intelligence 7.17 Enhance forest management and conservation using space technologies 7.18 Enhance forestry information management and dissemination
8	**Corporate Affairs and Quality Assurance**	To enhance corporate publicity for increased visibility and ensure quality of research and service delivery	8.1 Increase publicity to enhance visibility 8.2 Enhance customer satisfaction and retention 8.3 Improve operational standards in research and service delivery 8.4 Enhance corporate communication 8.5 Develop institute branding policy 8.6 Review standard operating procedures 8.7 Improve operational efficiency in research and service delivery 8.8 Comply with ISO standards and undertake regular ISO audits 8.9 Monitor and report on corporate perfomance as given in PC guidelines
9	**Resource Mobilization Partnerships and International Relations Department**	To enhance partnerships and linkages for implementation of joint activities and resource mobilization	9.1 Establish linkages to increase funding opportunities 9.2 Operationalize engagement with strategic partners at the National and Regional level for joint research 9.3 Cordinate various activities co-hosted by KEFRI 9.4 Update KEFRI consultancy profile 9.5 Cordinate identification of national and international projects 9.6 Secure new and additional resources 9.7 Establish an international relation office 9.8 Maintaining funder intelligence and data bases 9.9 Review and implement external resource mobilization strategy

No.	Directorate/ Theme/ Department	Strategic Objectives	Strategies/Activities
10	**National and County Technical Liaison**	To enhance partnerships and linkages for joint implementation of national and county activities	10.1 Strengthen national and county research partnerships 10.2 Coordinate KEFRI, county and multi-institutional activities 10.3 Formulate technical approaches and recommend responses to issues of national or international interests 10.4 Review and identify research and management problems, and provide guidance to researchers, field management staff and other interested parties through relevant heads of institutions. 10.5 Evaluate research needs and proposals and set priorities, strategies, direction and scope, taking into account targeted problems, beneficiaries and users, resources constraints, and timeframe 10.6 Formulate collaborative strategies for training, manpower development and sharing of expertise and information 10.7 Give advice to KEFRI and KFSand other stakeholders on sourcing, allocation and use of shared resources 10.8 Develop forestry research and management policy recommendations to PLC for consideration
11	**Corporate Services Directorate**	To coordinate implementation of corporate services activities	11.1 Provide strategic leadership in coordination and planning of corporate services 11.2 Oversee monitoring and evaluation of implementation of corporate services activities in the Institute 11.3 Coordinate mobilization of resources for research and development and corporate services functions
12	**Corporate Services Departments**	To strengthen institutional capacity for research and development	12.1 Enhance human resource capacity 12.2 Enhance efficiency and effectiveness in service delivery 12.3 Enhance employee satisfaction and retention 12.4 Promote positive and conducive work environment 12.5 Foster institutional culture 12.6 Ensure prudent and sound financial management 12.7 Enhance asset and liabilities management

No.	Directorate/ Theme/ Department	Strategic Objectives	Strategies/Activities
			12.8 Improve infrastructure and facilities 12.9 Secure land for forestry research
13	**Internal Audit**	To strengthen internal controls, improve operational efficiency, and promote good governance and ethical behaviour	13.1 Enhance systems and process of internal controls 13.2 Enhance risk assesment control and governance of the institute systems 13.3 Enhance timeliness of internal audit reports 13.4 Automate internal audit processes 13.5 Implement whistle blowing policy 13.6 Modernise and introduce new data analytical tools 13.7 Strengthen audit quality assuarance and improvement programmes
14	**Planning, Strategy and Risk Management**	To define institutional goals and enhance ability to identify and manage risks and protect assets	14.1 Enhance planning process systems and internal controls 14.2 Develop and implement systems and processes of risk management and internal controls 14.3 Develop institutional risk management plans and strategies 14.4 Develop risk registers for the institute 14.5 Develop response planning and mitigation 14.6 Ensure allocation of resources for the risk management processes
15	**Supply Chain Management**	To undertake management of the procurement function, offer technical advice on procurement issues, and ensure compliance with procurement policies, rules and regulations	15.1 Carry out the procurement function in line with PPADA 2015 15.2 Enhance operational efficiency 15.3 Develop an annual management procurement plan 15.4 Timely constitute relevant procurement committees to facilitate procurement of goods and services 15.5 Ensure procurement of goods 15.6 Automate supply chain processes 15.7 Ensure continous pre-qualification and perfomance evaluation of suppliers 15.8 Submit timely mandatory reports to various government agencies as provided in PPDA 2015

No.	Directorate/ Theme/ Department	Strategic Objectives	Strategies/Activities
16	**Corporation Secretary and Legal Services Department**	To provide professional secretarial and legal support to the Board of Directors and the Institute	16.1 Provide board secretarial and coordination services 16.2 Provide legal services to the institution 16.3 Monitor the progress of cases against the institution and give prompt update to management 16.4 Ensure development review of legal framework for the institute 16.5 Drafting and reviewing of contracts, service level agreements, MoUs, Leases and other legal documents 16.6 Liase with the office of the Attoney general, law enforcement agencies on legal matters 16.7 Ensure legal compliance when audit is carried out to confirm compliance 16.8 Coordinate board evaluation and compliance to mwongozo code of conduct 16.9 Custodian of the Institute seal
17	**Revenue Generation Unit**	To enhance revenue generation	17.1 Expand and manage revenue base 17.2 Commercialize tree and forest products 17.3 Develop policies and strategies to enhance Institute business capacity 17.4 Develop business control systems for the Institute 17.5 Undertake market research and service 17.6 Ensure branding, pricing of Instiute products and services 17.7 Establishing and maintain a product base for the Institute 17.8 Coordinate the booking and management of Institute hospitality services
18	**Monitoring and Evaluation**	To strengthen institutional capacity in planning, monitoring, evaluation and reporting	18.1 Strengthen institutional capacity to undertake M&E 18.2 Undertake monitoring and evaluation of the strategic plan through perfomance contracting 18.3 Monitor and evaluate the Institutes profile 18.4 Timely reporting on proccesses and impacts on research and development

RIFT VALLEY ECO-REGION RESEARCH PROGRAMME

Rift Valley Eco-region Research Programme, Londiani

Marigat Sub-regional Research Centre

Turbo Sub-regional Research Centre

Turkana Sub-regional Research Centre

CHAPTER FIVE
IMPLEMENTATION AND COORDINATION

5.0 Introduction

This chapter provides a framework for implementation and coordination of planned activities to achieve the set targets during the Strategic Plan period 2022 - 2027. The Balanced Scorecard (BSC) approach will be adopted in assessing performance as it lays emphasis on; customer, financial, internal processes, learning and growth perspectives. To ensure efficiency in service delivery, Enterprise Resource Planning (ERP) system will be used to improve efficiency in implementation of the planned activities.

5.1 Strategic Implementation of Corporate Matrix

The corporate implementation matrix will be used to track implementation of the planned activities. The matrix will be applied by cascading activities/initiatives to departments, themes, programmes, teams, and individuals to achieve respective strategic objectives.

5.2 Strategy Map

KEFRI Strategy Map for the plan period 2022-2027 is shown in Figure 1. Under each Balanced Score Card (BSC) approach, the Strategy Map outlines the Key Result Areas (high impact outcomes) that will be realized after achieving one or more objective(s) as outlined in the Corporate Implementation Matrix (Annex 2).

VISION

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

STRATEGIC GOALS

1. Develop forestry technologies to contribute towards achieving and maintaining a minimum of 30% tree cover by 2032
2. Improve household livelihoods through forestry based solutions

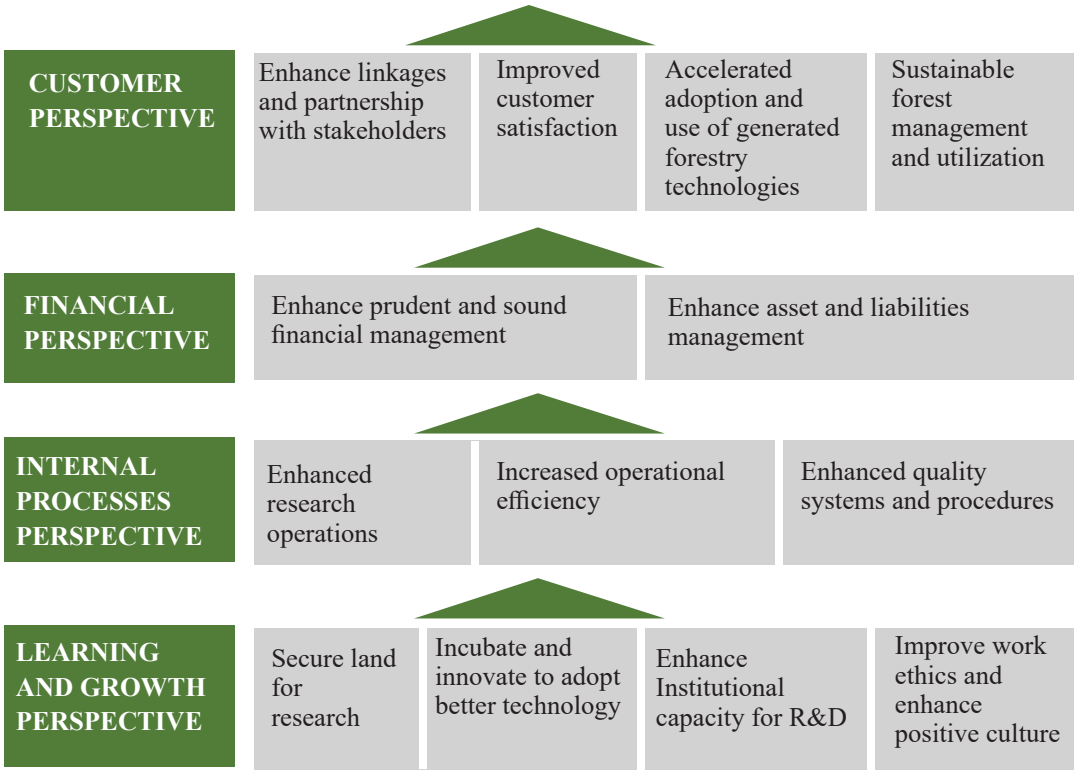


Figure 1: KEFRI Strategy Map

5.3 Coordination and Management of Research and Development activities

Coordination and management of research and development activities is through the KEFRI organizational structure (Annex 1). Research and development coordination will be as shown in Figure 2

Figure 2: Research and Development Implementation Flow Chart

5.3.1 The Board of Directors of KEFRI

The Board of Directors, on behalf of the Government of Kenya will have overall oversight of the Strategic Plan. The Board will meet at least once quarterly to review status of implementation of the Strategic Plan through quarterly reports of the annual work plans which are drawn from the Strategic Plan.

5.3.2 The Director

The Director bears the Vision of the Institute and provides strategic direction and reports to the Board of Directors.

5.3.3 Research and Development and Corporate Services Directorates

KEFRI operations are divided into two directorates; Research and Development and Corporate Services. Each directorate is headed by a Senior Deputy Director who reports to the Director. Research and Development Directorate implements the Institute's core mandate supported by the Corporate Services Directorate.

5.3.4 Executive Committee

The Executive Committee shall be chaired by the Director and shall meet quarterly to receive and report progress made on implementation of the Strategic Plan. The Executive Committee shall have two sub-committees: one consisting of Thematic Deputy Directors under Research and Development chaired by the Senior Deputy Director Research and Development (SDD-R&D); and the other consisting of Deputy Directors under Corporate Services chaired by Senior Deputy Director Corporate Services (SDD-CS). The two sub-committees shall meet quarterly to review progress on implementation of the Strategic Plan under their respective departments and their recommendations shall be submitted to the Executive Committee for consideration before submitting to the Board of Directors for deliberation.

5.3.5 Annual Consultative Committee

The Annual Consultative Committee Meeting (CCM) shall be the planning and resource allocation committee of the Institute. It comprises members of the Executive Committee and Regional Directors. The Consultative Committee shall meet at the end of every financial year to review performance of the year, set targets and allocate funds to prioritized activities to be implemented in the subsequent year.

5.3.6 Eco-Region Research Consultative Committee

The Eco-Region Research Consultative Committee (ERCC) is a public participation forum held annually at the Eco-Region Research Programmes by engaging stakeholders to identify research problems and review existing ongoing activities. Recommendations from stakeholders shall be incorporated into research proposals and presented to the CCM for funding consideration in the subsequent financial year.

5.4 Risk Management

Risk management is a critical process that identifies, analyzes, evaluates and mitigates against risks that the Institute may encounter during implementation of the Strategic Plan. It helps to ensure business continuity. The Institute has developed a risk management procedure in line with the Integrated Management System of ISO 9001:2015 on

Quality Management Systems, 14001:2015 on Environmental Management System and ERP. The risks can be categorized as: Strategic, Operational, Financial and Technological risks. The anticipated risks and their mitigation strategies are detailed in Table 8.

Table 8: ***Anticipated Risks and Mitigation Strategies***

Risk Category	Probable Risk	Mitigation Strategies
Strategic risks	Possible loss of research trials	• Secure land ownership documents • Obtain long term land lease agreements with stakeholders • Fence research land and engage local community organizations in protection of the sites • Maintain fire management protocols • Develop and implement a Business Continuity Plan (BCP)
	Effects of climate change and environmental challenges	• Breed tree species for drought tolerance • Use of technologies for water retention and conservation • Adhere and invest in climate change impact • data • Advice on tree species-site matching
	Insecurity	• Collaborate with the local administration, KFS and KWS on security matters • Sensitize staff on insecurity threats and ways to mitigate against them • Sensitize local communities on importance of KEFRI activities
	Tree pests and diseases outbreak	• Develop a database for tree pests and diseases for information dissemination • Establish a surveillance and IPM systems for identified pests, diseases and plant parasites • Establish and build capacity of response teams at Eco-region levels and create awareness among stakeholders on pest and disease outbreaks • Collaborate with disaster management organizations to respond to pest and disease outbreaks

Risk Category	Probable Risk	Mitigation Strategies
Operational risks	Breakdown of equipment and infrastructure	• Optimal use of available equipment and infrastructure
	Corruption	• Enforcement of the Institute's anti-corruption policies
	Disclosure of classified information	• Vet officers dealing with classified information
	Litigation against the Institute	• Compliance to law and regulations • Prudent management at the Institute
Financial risks	Budget cuts	• Lobby for more funding from the National • Treasury • Seek alternative sources of funds • Map financial risk areas and mitigating • measures • Undertake periodical audits
Technological risk	Cyber insecurity	• Enhance capacity of human resource in cyber security • Install and maintain cyber security systems
	Loss of data and information	• Enforce Knowledge Management Policy • Invest in secondary data back-up storage • Comply with data management regulations • Invest in cloud backup storage

LAKE BASIN ECO-REGION RESEARCH PROGRAMME

Lake Basin Eco-region Research Programme, Maseno

Migori Sub-regional Research Centre

Kakamega Sub-regional Research Centre

Ramogi Sub-regional Research Centre

CHAPTER SIX
RESOURCE REQUIREMENTS AND MOBILIZATION

6.0 Introduction

Implementation of the 7th KEFRI Strategic Plan will require adequate financial, infrastructural, and human resources. The Institute will endeavour to mobilize resources to finance its Research and Development activities.

6.1 Financial Resources Required for Implementation of the 7th Strategic Plan

Implementation of the KEFRI 7th Strategic Plan is estimated to cost KES 34,849 billion. This will be mobilized from both internal and external sources that include:

- The Exchequer;
- Grants from development partners;
- Internally generated revenue; and
- Public Private Partnerships.

6.1.1 Strategies for resource mobilization

Resources required to implement Institute mandate has always been inadequate. In order to bridge the resource gap, the Institute will lobby and mobilize financial resources for its activities as follows:

(i) Negotiate for increased funding from the exchequer
(ii) Enhance strategic partnerships and collaborations with development partners for technical and financial assistance
(iii) Enhance partnership with county governments in joint implementation of projects
(iv) Enhance Public Private Partnerships
(v) Enhance international relations
(vi) Enhance revenue generation from internal sources

6.1.2 Financial projections

The total amount of funds required to implement this 7th Strategic Plan is KES 34,849 billion. Financial requirements for the 2022/2023 FY are estimated at KES 3,015.8 billion that is projected to grow to KES 9,962.3 billion by 2026/2027 FY as shown in Table 9.

Table 9: ***Projected Financial Requirements for the Period FY 2022/2023 - 2026/2027***

	Funding Projection (KES "000 000")						
Source	**Base YR**	**2022/ 2023**	**2023/ 2024**	**2024/ 2025**	**2025/ 2026**	**2026/ 2027**	**Total**
GOK-Grants	1,803	2,722.80	3,430.30	8,564.30	8,645	9,379.30	32,742.00
Tree seed infrastracture and research facility development*	(362.5)	(1,273)	(1,859)	(3,551)	(3,564)	(3,890)	(14,137)
Internally generated revenue	129	134	140	145	151	157	727
Donor Grants	122	159	203	260	333	426	1,380
Total	**2,054**	**3,015.80**	**3,773.30**	**8,969.30**	**9,129.30**	**9,962.30**	**34,849.00**

*** These funds are part of the GoK grants**

6.2 Physical and Research Infrastructure Requirements

Infrastructural developments planned during implementation of the 7th Strategic Plan (2022-2027) will include: construction and equipping of office blocks, farmers resource centres and laboratories in Rumuruti, Migori, Narok, Maua, Marsabit, Hola and Londiani centres; and construction of a forestry training and capacity building centre at KEFRI Muguga. The Institute will also construct; a tree seed certification unit, a tree seed gene bank in Muguga, and automated green houses in Nyeri, Migori, Gede, Rumuruti, Lamu, Garissa, Wajir and Kibwezi sub-centres. The Institute will complete ongoing construction and equip 18 seed facilities in various Eco-region Research Programmes.

In addition, the Institute will continue to expand water reticulation and fire hydrants installation in Lamu, Lodwar, Maseno and Gede centres. The Institute will construct boreholes and install solar power systems in all centres with priority for Muguga, Lamu, Kitui, Tiva, Rumuruti, Garissa and Wajir.

6.3 Human Resource Requirements

The Institute endeavors to attract, motivate, and retain specialized and competent employees through use of various retention strategies aimed at; minimizing the staffing gap, enhancing staff capacity, improving efficiency and effectiveness in service delivery, increasing employee satisfaction, promoting a positive work culture, and providing a conducive working environment.

NATIONAL FOREST PRODUCTS RESEARCH PROGRAMME

Fancy furniture items from reconstituted wood

Bio-prospecting products

Wood-mizer at KEFRI-Karura

CHAPTER SEVEN
MONITORING, EVALUATION AND REPORTING

7.0 Overview

Monitoring, evaluation, and reporting is an important management tool that KEFRI will use to track achievements against the set targets outlined in this 7th Strategic Plan. Through monitoring and evaluation (M&E) activities and reports, the Institute will track achieved outputs, detect any deviations, and take appropriate actions. The M&E process will take into account emerging issues and changes in the environment that may affect implementation of this Plan and where necessary, appropriate and timely adjustments taken.

7.1 Monitoring, Evaluation and Reporting Framework

KEFRI will use a Results-based Monitoring, Evaluation and Reporting (ME&R) framework to track and evaluate progress in implementation of the Strategic Plan.

7.2 Monitoring, Evaluation and Reporting Tools

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

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

7.3 Indicators for Measuring Performance

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

a) Customer satisfaction index
b) Increase in revenue and cost reduction
c) Compliance to internal processes and regulatory frameworks
d) Institutional capacity development
e) Corporate visibility and ranking

7.4 Review of the Strategic Plan Implementation

Given the dynamic nature of research, implementation of the Plan will require comprehensive reviews to capture any emerging issues. Reviews will be done as follows;

7.4.1 Mid-Term Review

A mid-term review will be undertaken to assess the level of implementation of this Strategic Plan. The review will inform any need for changes.

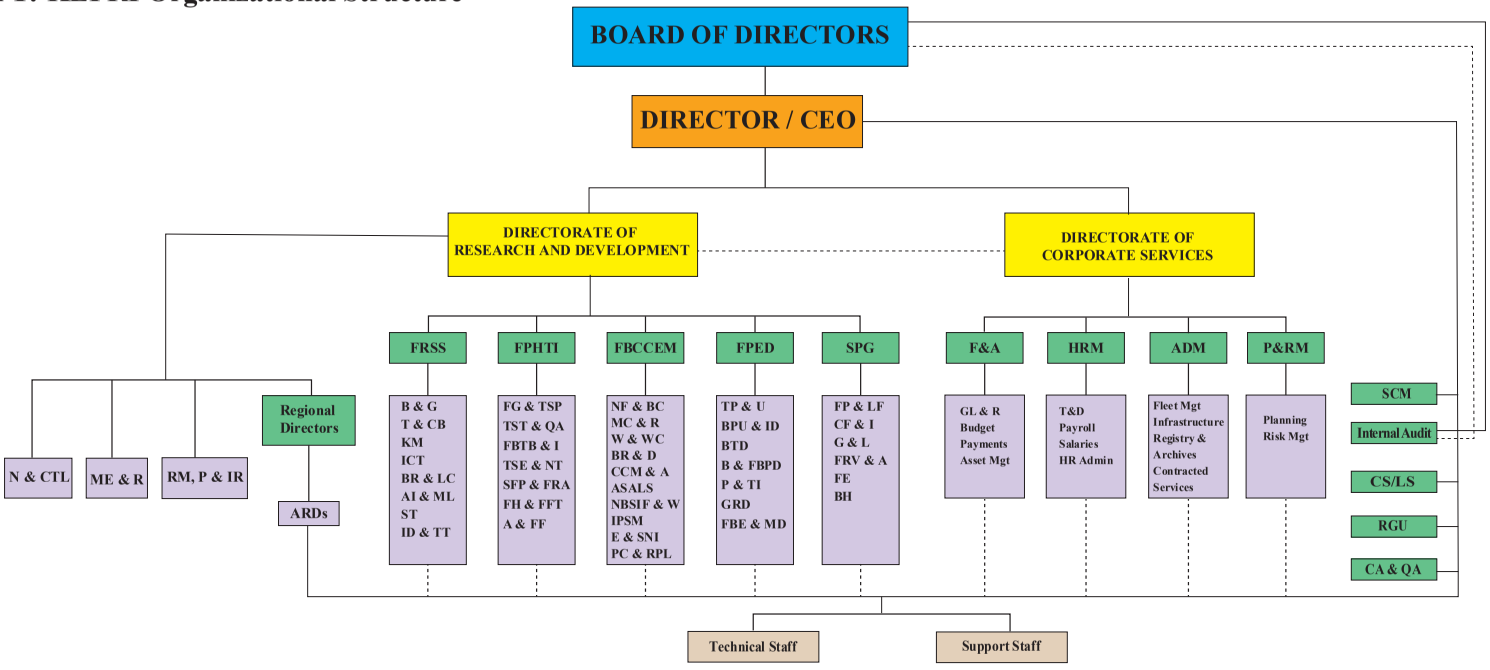
7.4.2 End-Term Review

Final evaluation of the Plan will be carried out at least six months before the end of the Strategic Plan. The evaluation will entail:

i. Measuring actual performance against set targets.
ii. Identifying challenges encountered and lessons learnt.
iii Recommendations to inform the subsequent strategic planning process.

ANNEXES

Annex 1: KEFRI Organizational Structure



KEY

ADM Administration
A & FF Agroforestry and Farm forestry
AI & ML Artificial Intelligence and Machine Learning
ARDs Assistant Regional Directors
ASALS Arid and Semi Arid Lands
B & G Biometrics and Geomatics
BH Biocultural Heritage
BR & LC Bioscience Research and Laboratory Coordination
B & FBPD Bio-prospecting and Forest Based Product Development
BR & D Bamboo Research and Development
BRPU & ID Bamboo Research, Processing, Utilization and Industry Development
BTD Bio-energy Technology Development
CA & QA Corporate Affairs and Quality Assurance
CCM & A Climate Change Mitigation and Adaptation
CF & I Commercial Forestry and Investment
CS/LS Corporation Secretary/ Legal Services
E & SNI Endagered and Species of National Interest
F & A Finance and Accounting
FBCCEM Forest Biodiversity, Climate Change and Environment Management
FBE & MD Forest Based Entrepreneurship and MSMEs Development
FBTB & I Forest Biotechnology, Tree Breeding and Improvement
FE Forest Extension
FG & TSP Forest Germplasm and Tree Seed Production
FH & FFT Forest Health and Forest Fire Technologies
FPED Forest Products and Enterpreneurship Development
FPHTI Forest Productivity, Health and Tree Improvement
FRSS Forest Research Support Services
FRV & A Forest Resource Valuation and Accounting
G & L Gender and Livelihoods
GL & R General Ledger and Reconciliation
GRD Gums and Resins Development
HRM Human Resource Management
ICT Information and Communication Technology
ID & TT Information Dissemination and Technology Transfer
IPSM Invasive Plant Species Management
KM Knowledge Management
MC & R Mangrove Conservation and Restoration
ME & R Monitoring, Evaluation and Reporting
NBSIF & W Nature Based Solutions Interventions in Forests and Woodlands
N & CTL National and County Technical Liason
NF & BC Natural Forest and Biodiversity Conservation
PC & RPL Pollution Control and Rehabilitation of Polluted Lands
FP & LF Forest Policy and Legislative Framework
P & RM Planning and Risk Management
P & TI Products and Technologies Incubation
RGU Revenue Generation Unit
RM, P & IR Resource Mobilization, Partnerships and International Relations
SCM Supply Chain Management
SFP & FRA Siviculture of Forest Plantations and Forest Resource Assessment
SPG Socio-Economics Policy and Governance
ST Space Technologies
T & CB Training and Capacity Building
T & D Training and Development
TP & U Timber Processing and Utilization
TSE & NT Tree Seed establishment and Nursery technologies
TST & QA Tree Seed Technology and Quality Assurance
W & WC Wetlands and Watershed Conservation

Annex 2: Corporate Implementation Matrix

1: RESEARCH AND DEVELOPMENT DIRECTORATE

STRATEGIC OBJECTIVE: TO OVERSEE THE IMPLEMENTATION OF RESEARCH AND DEVELOPMENT ACTIVITIES

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
1.1	**Provide strategic leadership in coordination and planning of research and development programmes**	Ensure development of R&D policies and strategies	SDD-R&D	R&D policies and strategies developed	No. of policies	5	3	3	3	3	3	**15**
					No. of strategies	5	3	3	3	3	3	**15**
		Ensure R&D activities address national and global needs	SDD-R&D	Work plans developed	No. of work plans	5	2	2	2	2	2	**10**
		Organize institutional scientific and external meetings	SDD-R&D	Scientific and external meetings organized	No. of scientific meetings	20	15	15	15	15	15	**75**
					No. of conferences	2	-	15	-	15	-	**30**
		Coordinate research and development activities and emerging issues under the thematic areas and eco-regions	SDD-R&D	Minutes for technical executive committee meetings	No. of minutes	20	1.5	1.5	1.5	1.5	1.5	**7.5**
		Ensure appropriate capacity is developed and established to deliver R&D	SDD-R&D	Appropriate capacity developed and established	No. of reports	5	2	2	2	2	2	**10**
		Coordinate development of the R&D work plans	SDD-R&D	R&D work plans development coordinated	Approved work plans	5	3.5	3.5	3.5	4.5	4.5	**18.5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Coordinate capacity building of stakeholders (internal and external) and outreach programmes in forestry research and development	SDD-R&D	Capacity building meetings coordinated	No. of meetings	18	30	30	30	40	40	**170**
		Enhance capacity of research infrastructure	SDD-R&D	Research infrastructure enhanced	No. of research infrastructures build	5	100	100	100	100	100	**500**
		Ensure provision of adequate research land	SDD-R&D	Survey of forest land from KFS and County governments	No. of Ha	5000	15	15	15	15	15	**75**
1.2	**Oversee monitoring and evaluation of implementation of activities in the Institute**	Coordinate M&E implementation	SDD-R&D	M&E implementation coordinated	No. of reports	20	2	2	2	2	2	**10**
		Coordinate quality control of research	SDD-R&D	Research coordinated	No. of reports	20	1	1	1	1	1	**5**
		Coordinate planning and implementation of performance contract activities	SDD-R&D	Performance contract activities coordinated	No. of Performance Contracts	5	2	2	2	2	2	**10**
1.3	**Provide oversight in dissemination of research findings for impact**	Ensure quality and standards of accreditation of labs	SDD-R&D	Approval form	No. of labs accredited	2	30	30	30	30	30	**150**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
1.4	**Coordinate Mobilization of resources for research and development**	Participate in resource mobilization for donor funded activities	SDD-R&D	Projects funded	No. of projects	10	1	1	1	1	1	**5**
		Organize development partners consortium meetings	SDD-R&D	Development partners consortium meetings organized	No. of meetings	5	5	5	5	5	5	**25**
1.5	**Create linkages and networks between KEFRI and other relevant organizations**	Ensure participation in strategic expos and global events	SDD-R&D	Expos and global events attended	No. of expos	10	4	4	4	4	4	**20**
					No. of global events	10	4	4	4	4	4	**20**
		Enhance collaboration with renown international centres of excellence	SDD-R&D	Collaboration with renown international centres of excellence enhanced	No. of collaborations	2	4	4	4	4	4	**20**
		Coordinate national and county research and management liaison activities	SDD-R&D	National and county research and management liaison activities held	No. of meetings	40	5	5	5	5	5	**25**
GRAND TOTAL							**233**	**248**	**233**	**259**	**244**	**1,217**

RESEARCH AND DEVELOPMENT THEMES AND DEPARTMENTS

2: FOREST PRODUCTIVITY, HEALTH AND TREE IMPROVEMENT (FPHTI) THEME

STRATEGIC OBJECTIVE: TO ENHANCE FOREST PRODUCTIVITY FOR IMPROVED LIVELIHOODS AND ENVIRONMENTAL SUSTAINABILITY

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
FOREST GERMPLASM AND TREE SEED PRODUCTION RESEARCH PROGRAMME												
2.1	**Enhance forest germplasm and improvement**	Maintain existing seed sources, demonstration and experimental plots	DD-FPHTI RDs	Maintained seed sources, demonstration and experimental plots	No. of hectares	100	4	4	4	4	4	**20**
		Undertake selection of superior trees of key species	DD-FPHTI RDs	Selected superior trees for key species	No. of selected tree of key species	150	4	4	4	4	4	**20**
		Establish and maintain species, provenance and progeny trials	DD-FPHTI RDs	Species, provenance and progeny trials established and maintained	No. of trials	20	20	20	20	20	20	**100**
		Establish and maintain seed orchards and other sources of key species	DD-FPHTI RDs	Seed orchards of key tree species established and maintained	No. of hectares	100	20	20	20	20	20	**100**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
2.2	**Enhance forest germplasm and tree seed production**	Expand and maintain production of high quality tree seed sources	DD-FPHTI RDs	Tree seed produced	Seeds in tonnes	270	100	100	100	110	110	**520**
				Seed sources established	No. of Hectares	1000	25	30	35	40	45	**175**
				Seed production map updated	No. of maps	2	1	-	-	1	-	**2**
				Seed sources secured	No. of seed sources	20	8	8	8	8	8	**40**
				Seed sources digitized and automated	No. of data sets	50	2	2	2	2	2	**10**
		Build capacity for enhanced forest germplasm and tree seed production	DD-FPHTI RDs	Tree germplasm production capacity enhanced	No. of training reports	25	2	2	2	2	2	**10**
		Establish Tree breeding and Bio-technology centre	Directorate DD-FPHTI	Centre established	No. of centres established	1	5	100	100	100	100	**405**
2.3	**Enhance forest germplasm and tree seed distribution and conservation**	Distribute high quality tree seeds	DD-FPHTI RDs	Seed distributed	No. of tonnes	200	70	70	70	70	70	**350**
		Mass production and distribution of tissue culture seedlings	DD-FPHTI RDs	Forest germplasm distributed	No. of seedlings in billions	2	50	50	50	50	50	**250**
		Maintain adequate seed stock to meet stakeholders demand	DD-FPHTI RDs	Seed quantity maintained in stores	No. of tonnes	200	5	5	5	5	5	**25**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Establish a forest trees seed bank/ centre	DD-FPHTI RDs	Seed bank	No. of seed banks	1	2	10	500	500	10	**1,022**
		Appoint/recruit tree seed stockists	DD-FPHTI RDs	Stockists recruited	No. of stockists	30	1	1	1	1	1	**5**
		Expand and equip seed storage facilities	DD-FPHTI RDs	Seed storage facilities expanded and equipped	No. of seed storage facilities	18	380	280	800	600	600	**2,660**
2.4	**Enhance forest germplasm and tree seed research**	Conduct baseline survey on forest germplasm and tree seed supply and demand	DD-FPHTI RDs	Baseline survey undertaken	No. of reports	2	2	-	-	-	2	**4**
		Undertake seed science/testing and technology research on key tree species	DD-FPHTI RDs	Technical reports on studies on seed science undertaken	No. of technical reports	65	20	20	20	20	20	**100**
SUB TOTAL							**721**	**726**	**1741**	**1557**	**1073**	**5818**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
TREE SEED TECHNOLOGY AND QUALITY ASSURANCE RESEARCH PROGRAMME												
2.5	**Enhance tree seed quality control and certification**	Maintain sanitary and phytosanitary measures in seed stores	DD-FPHTI RDs	Sanitary and phytosanitary standards maintained	No. of reports	10	1	1	1	1	1	**5**
		Develop tree seed certification process	DD-FPHTI RDs	Protocols for selected tree species developed	No. of protocols	15	2.5	2.5	2.5	2.5	2.5	**12.5**
		Attain accreditation for tree seed certification	DD-FPHTI RDs	Tree seed certification unit established	No. of units/ certificates	1	20	20	20	20	20	**100**
		Digitize seed processes	DD-FPHTI RDs	Seed processes electronic database	No. of databases	1	3	3	3	3	3	**15**
SUB TOTAL							**26.5**	**26.5**	**26.5**	**26.5**	**26.5**	**132.5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
FOREST BIOTECHNOLOGY, TREE BREEDING AND IMPROVEMENT RESEARCH PROGRAMME												
2.6	**Enhance tree production**	Develop and implement strategy for tree improvement	DD-FPHTI RDs	Tree breeding strategy developed	No. of strategies	1	-	3	-	-	-	**3**
				Tree breeding strategy implemented	No. of strategies	1	-	-	4	4	4	**12**
		Develop protocals for difficult to propagate tree species	DD-FPHTI RDs	Propagation protocols for difficult to propagate tree species developed	No. of protocols	5	3	3	3	3	3	**15**
			SUB TOTAL				**3**	**6**	**7**	**7**	**7**	**30**
TREE SEEDLING ESTABLISHMENT AND NURSERY TECHNOLOGIES RESEARCH PROGRAMME												
2.7	**Enhance nursery research**	Undertake research on propagation of tree and fruit germplasm, potting materials and germination media	DD-FPHTI RDs	Studies undertaken	No. of studies	10	2	2	2	2	2	**10**
				A nursery manual developed	No. of manuals	10	1	1	1	1	1	**5**
		Undertake research in seedling management	DD-FPHTI RDs	Seedling production studies undertaken	No. of studies	10	1	1	1	1	1	**5**
		Develop protocols for tree seedling certification	DD-FPHTI RDs	Seedling production protocols developed	No. of protocols	2	1	1	1	1	1	**5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Review and implement tree nursery certification protocols	DD-FPHTI RDs	Certification protocols refined	No. of protocols	1	1	1	1	1	1	**5**
				Tree nurseries certified	No. of tree nurseries	100	3	3	3	3	3	**15**
		Raise seedlings of selected difficult to propagate tree species	DD-FPHTI RDs	Difficult to propagate tree species propagated	No. of tree species	10	4	4	4	4	4	**20**
		Undertake phenology studies for key tree species	DD-FPHTI RDs	Key tree species phenology documented	No. of studies	10	2	2	2	2	2	**10**
SUB TOTAL							**15**	**15**	**15**	**15**	**15**	**75**
SILVICULTURE OF FOREST PLANTATIONS AND FOREST RESOURCE ASSESSMENT RESEARCH PROGRAMME												
2.8	**Improve silvicultural methods in plantations and trees on farm**	Review existing silvicultural protocols for emerging tree species	DD-FPHTI RDs	Silvicultural protocols for emerging tree species reviewed	No. of protocols and technical standards	5	1.5	1.5	1.5	1.5	1.5	**7.5**
		Develop silvicultural protocols for emerging tree species	DD-FPHTI RDs	Silvicultural protocols for emerging tree species developed	No. of protocols and technical standards	5	1.5	1.5	1.5	1.5	1.5	**7.5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Undertake survey on Cost-Benefit analysis on plantation establishment methods	DD-FPHTI, DD-SPG RDs	Cost-Benefit analysis conducted	No. of reports	4	5	5	5	5	5	**25**
		Establish, maintain and secure demonstration plots	DD-FPHTI RDs	Demonstration plots established, maintained and secured	No. of plots	100	10	10	10	10	10	**50**
		Establish, maintain and assess permanent sample plots in plantations	DD-FPHTI RDs	Plantations productivity evaluated	No. of plots	50	5	5	5	5	5	**25**
					Assessment reports	50	2	2	2	2	2	**10**
		Undertake tree physiology studies	DD-FPHTI RDs	Physiology studies undertaken	No. of reports	10	1.5	1.5	1.5	1.5	1.5	**7.5**
		Undertake species establishment trials	DD-FPHTI RDs	Species site matching reviewed/ developed	No. of reports	10	3.5	3.5	3.5	3.5	3.5	**17.5**
		Undertake research on mixed species plantations	DD-FPHTI RDs	Protocols on mixed species plantations developed	No. of protocols	2	3.5	3.5	3.5	3.5	3.5	**17.5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
2.9	**Improve Forest plantation inventory methods**	Review existing forest plantation species mensuration models	DD-FPHTI RDs	Forest mensuration models reviewed	No. of technical reports	3	1	1	1	1	1	**5**
		Develop forest plantation mensuration models for emerging tree species	DD-FPHTI RDs	Forest mensuration models for emerging tree species developed	No. of technical reports	3	1	1	1	1	1	**5**
2.10	**Establish Forest Productivity tree and Improvement database**	Digitize and automate records of forest productivity and improvement	DD-FPHTI DD-FRSS RDs	A Forest Productivity and Improvement Database	Database report	1	1.8	1.8	1.8	1.8	1.8	**9**
SUB TOTAL							**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**186.5**
FOREST HEALTH AND FOREST FIRE TECHNOLOGIES RESEARCH PROGRAMME												
2.11	**Surveillance and management of tree pests and diseases**	Undertake a baseline survey on the status of pests and diseases	DD-FPHTI RDs	Baseline survey undertaken	No. of reports	2	4	4	4	4	4	**20**
		Undertake research on forest pests and disease epidemiology	DD-FPHTI RDs	Research on forest pests and disease epidemiology undertaken	No. of reports	2	-	3	-	3	-	**6**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Undertake phytosanitary studies in forestry	DD-FPHTI RDs	Phytosanitary studies in forestry undertaken	No. of reports	1	2	2	2	2	2	**10**
		Undertake monitoring of pests and diseases	DD-FPHTI RDs	Pests and diseases monitoring done	No. of reports	34	2.5	2.5	2.5	2.5	2.5	**12.5**
				Regular warning alerts issued	No. of alerts	10						
		Upgrade insect and pest disease database into an inventory	DD-FPHTI RDs	A compendium published	No. of compendia	1	3	3	4	4	4	**18**
				Fact sheets developed	No. of factsheets	20						
		Develop global research Factsheets and Compendium on Kenyan pests and disease	DD-FPHTI RDs	Fact sheets and compendia developed	No. of factsheets	25	1	1	1	1	1	**5**
					No. of compendia	1	1.5	1.5	1.5	1.5	1.5	**7.5**
		Quantify loses due pests and diseases	DD-FPHTI DD-SPG RDs	Quantitative loses ascertained	No. of reports	5	5	5	5	5	5	**25**
2.12	**Forest fire impact assessment**	Undertake studies on forest fires	DD-FPHTI DD-FBCCEM RDs	Biodiversity, economic and cultural studies undertaken	No. of studies	4	3	3	3	-	-	**9**
				Regular alerts issued	No. of alerts	10						

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Develop and disseminate forest fire prevention and management strategy	DD-FPHTI RDs	National forest fire prevention and management strategy developed and disseminated	No. of strategies	1	6	6	6	6	6	**30**
SUB TOTAL							**28**	**31**	**29**	**29**	**26**	**143**
AGROFORESTRY, FARM FORESTRY AND FRUIT TREE FARMING RESEARCH PROGRAMME												
2.13	**Enhance development and uptake of agroforestry technologies in rural and urban areas**	Identify and promote appropriate agroforestry technologies	DD-FPHTI DD-FRSS DD-SPG RDs	Agroforestry technologies identified and promoted	No. of technologies	3	1	-	-	1	1	**3**
		Promote diversification and management of multipurpose trees	DD-FPHTI DDSPG RDs	Multipurpose trees species identified and promoted	No. of reports	4	1	5.5	5.5	6.5	7.5	**25**
		Production of fruit tree seedlings	DD-FPHTI RDs	Fruit trees produced	No. of fruit tree in millions	2	50	50	50	50	50	**250**
		Undertake survey on adoption levels of agroforestry systems	DD-FPHTI DDSPG RDs	Survey undertaken	No. of reports	2	2	1.5	1.5	2	2.5	**9.5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Develop urban forestry guidelines for safe, resilient and sustainable cities	DD-FPHTI DDSPG RDs	Urban forestry guidelines developed	No. of reports	2	2.5	2	1.5	1.5	1.5	**9**
					No. of databases	2	3	3	3	3	3	**15**
2.14	**Incorporate trees in agro-pastoral systems**	Undertake studies to select high priority tree fodder species	DD-FPHTI RDs	Studies undertaken	No. of reports	4	1.5	-	1.5	1	1	**5**
		Determine the interactions between trees and pasture production	DD-FPHTI RDs	Studies undertaken	No. of reports	1	1.5	-	-	1.5	-	**3**
		Determine the interactions between trees and bee forage production	DD-FPHTI RDs	Studies undertaken	No. of reports	2	2	2	2	2	2	**10**
		Enrich sivilpastural system with aerial seeding	DD-FPHTI RDs	Aerial seeding undertaken	No. of reports	5	5	5	5	5	5	**25**
SUB TOTAL							**69.5**	**69**	**70**	**73.5**	**73.5**	**354.5**
GRAND TOTAL							**900.3**	**910.8**	**1925.8**	**1745.3**	**1258.3**	**6739.5**

3: FOREST BIODIVERSITY, CLIMATE CHANGE AND ENVIRONMENT MANAGEMENT (FBCCEM) THEME

STRATEGIC OBJECTIVE: TO GENERATE TECHNOLOGIES FOR MANAGEMENT AND CONSERVATION OF FOREST LANDSCAPES AND RESILIENCE TO CLIMATE CHANGE FOR SUSTAINABLE DEVELOPMENT

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
NATURAL FOREST AND BIODIVERSITY CONSERVATION RESEARCH PROGRAMME												
3.1	**Strengthen biodiversity conservation and sustainable use of natural forests**	Undertake ecological studies for conservation and management of natural forests	DD-FBCCEM RDs	Ecological ecosystem dynamics determined	No. of studies	6	4	4	4	4	4	**20**
		Establish permanent sample plots (PSPs) for ecological studies	DD-FBCCEM RDs	Permanent sample plots (PSPs) established	No. of PSPs	18	2	2	2	2	2	**10**
				Baseline surveys	No. surveys	5	2	2	2	2	2	**10**
				Periodic assessment undertaken	No. of assessments	5	1.5	1.5	1.5	1.5	1.5	**7.5**
		Undertake studies on livestock carrying capacity	DD-FBCCEM RDs	Studies undertaken	No. of reports	4	2	-	2	2	2	**8**
				Awareness created	No. of platforms	10	1	1	1	1	1	**5**
3.2	**Enhance forest landscapes restoration and rehabilitation**	Map out new hotspots of degraded forest landscapes	DD-FBCCEM DD-FRSS RDs	New hotspots of degraded forest landscape mapped	No. of forest landscapes	6	2	1.5	1.5	1.5	1.5	**8**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Evaluate level of implementation of restoration and rehabilitation	DD-FBCCEM RDs	Evaluation report	No. of reports	5	1.5	1.5	1.5	1.5	1.5	**7.5**
		Develop and promote technologies for sustainable woodlands and rangelands management	DD-FBCCEM RDs	Technologies developed	No. of technologies	6	4	4	4	4	4	**20**
					No. of guidelines	6	-	2	-	2	-	**4**
				Technologies validated and promoted	No. of sites for technologies	6	1.5	-	-	-	1.5	**3**
					No. of best practices up-scaled	7	2	2	2	2	2	**10**
		Determine succession dynamics of rehabilitated landscapes	DD-FBCCEM RDs	Rehabilitated forest landscapes monitored and reported	No. of reports	5	3	3	3	3	3	**15**
		Build capacity of stakeholders in forest landscape restoration (FLR)	DD-FBCCEM RDs	Stakeholders trained in FLR	No. of stakeholders	200	3	3	3	3	3	**15**
		Develop a national forest landscape restoration portal	DD-FBCCEM DD-FRSS RDs	FLR portal developed	No. of FLR portals	1	1	4	1	1	1	**8**
SUB TOTAL							**30.5**	**31.5**	**28.5**	**30.5**	**30**	**151**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
MANGROVE CONSERVATION AND RESTORATION RESEARCH PROGRAMME												
3.3	**Strengthen conservation and sustainable use of mangroves**	Undertake baseline ecological studies	DD-FBCCEM RDs	Studies undertaken	No. of studies	5	5	5	5	5	5	**25**
				Rehabilitation technologies developed	No. of technologies	2						
		Establish and monitor permanent sample plots (PSPs)	DD-FBCCEM RDs	Permanent sample plots (PSPs) established	No. of PSPs	5	2	2	2	2	2	**10**
		Develop a mangrove research and rehabilitation strategy	DD-FBCCEM RDs	Mangrove research strategy developed	No. of strategies	1	2	2	-	-	-	**4**
				Mangrove rehabilitation strategy developed	No. of strategies	1	2	2	1	1	2	**8**
		Determine carbon sequestration potential of mangrove	DD-FBCCEM RDs	Carbon sequestration potential determined	No. of reports	2	1.5	1.5	1.5	1.5	1.5	**7.5**
SUB TOTAL							**12.5**	**12.5**	**9.5**	**9.5**	**10.5**	**54.5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
WETLANDS AND WATERSHED CONSERVATION RESEARCH PROGRAMME												
3.4	**Enhance conservation of wetlands and riparian ecosystems**	Develop technologies and guidelines for management of wetlands and riparian ecosystems	DD-FBCCEM RDs	Technologies and guidelines developed	No. of technologies	3	3	3	3	3	3	**15**
					No. of guidelines	3	-	2	-	-	2	**4**
		Establish demonstration plots for management of wetlands and riparian ecosystems	DD-FBCCEM RDs	Guidelines in selected sites demonstrated	No. of sites for demonstration	5	2	2	2	2	2	**10**
				Stakeholders trained	No. of stakeholders	100	4	4	4	4	4	**20**
3.5	**Strengthen forest hydrology research**	Undertake long term hydrological studies in forest landscapes	DD-FBCCEM RDs	Hydrological studies undertaken	No. of studies	5	2	2	2	2	2	**10**
3.6	**Enhance soil and water conservation**	Develop tree species suitability maps	DD-FBCCEM DD-FPHTI DD-FRSS RDs	Tree species suitability maps developed	No. of maps	5	5	5	5	5	5	**25**
				List of tree species suitable for conservation of wetlands identified	No. of check lists	20	2	2	2	2	2	**10**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Undertake studies on forest soil nutrients cycling	DD-FBCCEM RDs	Studies undertaken	No. of studies	2	2	2	2	2	2	**10**
		Refine techniques for water harvesting and soil management for tree growing	DD-FBCCEM RDs	Techniques refined	No. of techniques	3	3	3	3	3	3	**15**
				Technologies for tree planting promoted	No. of technologies	4	2	2	2	2	2	**10**
SUB TOTAL							**25**	**27**	**25**	**25**	**27**	**129**
BAMBOO RESEARCH AND DEVELOPMENT RESEARCH PROGRAMME												
3.7	**Enhance bamboo production**	Undertake baseline survey on bamboo stock on public forests and farms	DD-FBCCEM RDs	Baseline survey undertaken	No. of reports	1	1.5	-	-	-	1.5	**3**
		Conduct studies on bamboo germination through seed and tissue culture	DD-FBCCEM RDs	Germination and tissue culture studies undertaken	No. of reports	2	1.5	1.5	1.5	1.5	1.5	**7.5**
		Undertake studies on bamboo growing and management	DD-FBCCEM RDs	Growing and management studies undertaken	No. of reports	1	1.5	1.5	1.5	1.5	1.5	**7.5**
				Bamboo adoption studies undertaken	No. of reports	1	1.5	1.5	1.5	1.5	1.5	**7.5**
				Harvesting protocols done	No. of protocols	1	1.5	1.5	1.5	1.5	1.5	**7.5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Centre of excellence for bamboo research and development	DD-FBCCEM DD-FPED RDs	Bamboo centre of excellence established	No. of products	10	5	5	5	5	5	**25**
		Develop National Bamboo Development Strategy	DD-FBCCEM DD-FPED RDs	National Bamboo strategy developed	No. of strategies	1	2	5	-	-	-	**7**
		Develop bamboo suitability maps	DD-FBCCEM DD-FPED RDs	Bamboo suitability maps developed	No. of maps	1	3	3	3	3	3	**15**
SUB TOTAL							**17.5**	**19**	**14**	**14**	**15.5**	**80**
CLIMATE CHANGE MITIGATION AND ADAPTATION RESEARCH PROGRAMME												
3.8	**Enhance contribution in Inter-governmental Panel on Climate Change (IPCC)**	Develop scenario models for carbon emissions under different Representative Concentration Pathways (RCPs)	DD-FBCCEM RDs	Scenario models developed	No. of studies	5	4	4	4	4	4	**20**
					No. of models	5	1	1	1	1	1	**5**
		Present scenario models for carbon emissions for review at global level	DD-FBCCEM DD-FPHTI DD-SPG RDs	Scenario models presented	No. of models	1	1	1	1	1	1	**5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Undertake studies on vulnerability of forests and people to climate change	DD-FBCCEM DD-SPG RDs	Vulnerability studies on forests and people undertaken	No. of studies	5	2	2	2	2	2	**10**
		Develop biomass allometric equations for selected key tree species	DD-FBCCEM DD-FPHTI RDs	Biomass allometric equations developed	No. of equations	5	3	3	3	3	3	**15**
		Ensure review of allometric equations by IPCC and other global bodies	DD-FBCCEM DD-FPHTI RDs	Allometric equations reviewed	No. of equations	3	2	2	2	2	2	**10**
		Develop forest landscape climate change mitigation technologies	DD-FBCCEM DD-FPHTI RDs	Technologies developed and promoted	No. of technologies	3	2	2	2	2	2	**10**
		Profile forest landscape climate change adaptation	DD-FBCCEM DD-FPHTI DD-SPG RDs	Climate change adaptation profiles developed	No. of profiles	5	2	2	2	2	2	**10**
		Develop scientific technologies to inform COPs and Subsidiary Body for Scientific and Technological Advice (SBSTA)	DD-FBCCEM DD-FPHTI DD-SPG RDs	Technologies (equations, formulae, policy information etc.)	No. of reports	2	2	2	2	2	2	**10**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Evaluate forest landscapes policies, regulations and institutional frameworks	DD-FBCCEM DD-SPG RDs	Evaluation undertaken	No. of studies	5	1	-	1	-	1	**3**
3.9	**Strengthen implementation of REDD+ strategy**	Undertake studies on appropriate REDD+ implementation models in different landscapes	DD-FBCCEM DD-FPHTI DD-SPG RDs	Studies undertaken	No. of studies	5	3	1	1	3	1	**9**
		Appraise methods, safeguards and standards for REDD+ architecture implementation, measurements, reporting and verification (MRV) systems	DD-FBCCEM DD-FPHTI DD-SPG RDs	Methods, safeguards and standards appraised	No. of reports	5	1	1	1	1	1	**5**
3.10	**Strengthen capacity and skills of stakeholders in climate change**	Pursue accreditation for KEFRI in audit and validation of forest carbon credits	DD-FBCCEM RDs	Initiated accreditation and registration as auditor and validator	No. of reports	12	1	5	5	5	5	**21**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Achieve accreditation of KEFRI as National Implementing Entity (NIE) and Accredited Entity (AE) in climate change financing	DD-FBCCEM DD-FRSS RDs	Initiated accreditation as NIE and AE	No. of reports	12	2	2	2	2	2	**10**
		Train scientists in climate change research, negotiation, GHG inventory, review for IPCC and safeguards	DD-FBCCEM DD-SPG DD-FRSS	Scientists trained	No. of scientists	15	2	2	2	2	2	**10**
		Design and implement expert courses in forest and tree-based climate change mitigation and adaptation, carbon markets and global processes	DD-FBCCEM DD-FRSS	Experts trained	No. of experts	100	10	10	10	10	10	**50**
		Strengthen access to financing mechanisms for climate financing	SDD-R&D DD-FBCCEM	Financing systems enhanced	No. of financing mechanisms	2	2	2	2	2	2	**10**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Establish a centre of excellence for combating desertification	DD-FBCCEM DD-FPHTI RDs	A centre of excellence for combating desertification	No. of centres	1	-	50	500	500	1000	**2050**
		Develop technologies for climate change mitigation	DD-FBCCEM DD-FPHTI RDs	Research on climate change done	No. of reports	10	-	10	10	10	10	**40**
		Develop and promote technologies for combating desertification	DD-FBCCEM DD-FPHTI RDs	Technologies for combating desertification developed and promoted	No. of technologies	2	-	20	20	20	20	**80**
		Develop technologies for disaster management	DD-FBCCEM DD-FPHTI RDs	Species for extreme conditions identified	No. of species and technologies developed	2	-	5	5	5	5	**20**
SUB TOTAL							**41**	**127**	**578**	**579**	**1,078**	**2,403**
ARID AND SEMI ARID LANDS (ASALs) RESEARCH PROGRAMME												
3.11	**Enhance biodiversity conservation and sustainable use of woodlands and rangelands**	Undertake baseline ecological studies on key woodlands ecosystems and mist forests	DD-FBCCEM RDs	Baseline ecological studies undertaken	No. of reports	5	4	4	4	4	4	**20**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Undertake selection and breeding of high value tree species for greening ASALs	DD-FBCCEM RDs	High value species selected for breeding	No. of species	4	4	4	4	4	4	**20**
		Develop and promote technologies for sustainable woodlands and rangelands management	DD-FBCCEM RDs	Technologies developed	No. of centres	4	3	3	3	3	3	**15**
		Establish a Centre of excellence in dryland forestry research at TIVA	DD-FBCCEM RDs	Centre of excellence in drylands forestry established	No. of centres	1	5	100	100	100	100	**405**
SUB TOTAL							**16**	**111**	**111**	**111**	**111**	**460**
NATURE BASED SOLUTIONS INTERVENTIONS IN FORESTS AND WOODLANDS RESEARCH PROGRAMME												
3.12	**Improve forest and livestock management in natural forests and woodlands**	Undertake studies on livestock and human carrying capacities on forest ecosystems and silvipastoral systems in ASALs	DD-FBCCEM DD-SPG RDs	Studies undertaken	No. of studies	15	3	1.5	1.5	3	1.5	**10.5**
				Carrying capacities (K) determined	No. of carrying capacities	15						

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Undertake selection of candidate fodder tree species	DD-FBCCEM DD-SPG RDs	Fodder yield studies for different tree species undertaken	No. of studies	4	2	-	-	-	1	**3**
3.13	**Enhance livelihoods through agro-ecology**	Develop and validate indigenous fruit tree species for food security and nutrition	DD-FBCCEM DD-SPG RDs	Indigenous fruit tree developed and validated	No. of species	4	2	2	2	2	2	**10**
		Develop and validate various tree species for bio-enterprise development	DD-FBCCEM DD-SPG DD-FPED RDs	Species for bio-enterprise developed and validated	No. of tree species	4	2	2	2	2	2	**10**
SUB TOTAL							**9**	**5.5**	**5.5**	**7**	**6.5**	**33.5**
INVASIVE PLANT SPECIES MANAGEMENT RESEARCH PROGRAMME												
3.14	**Enhance control and management of invasive species**	Develop a database for existing and potential invasive species	DD-FBCCEM RDs	Database developed	No. of databases	1	1	4	1	1	1	**8**
		Conduct studies on ecological impact of invasive species on forest regeneration and biodiversity	DD-FBCCEM RDs	Studies designed and implemented	No. of reports	6	3	3	3	3	3	**15**
				Invasive species identified	No. of species	4	2	2	2	2	2	**10**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
				Extent and impact on forest regeneration and biodiversity determined	No. of reports	6	1.5	1.5	1.5	1.5	1.5	**7.5**
		Develop and implement a national strategy for management and control of invasive and weed species	DD-FBCCEM RDs	Strategies developed for selected invasive and weed species	No. of strategies	3	3	3	3	3	3	**15**
3.15	**Implement national strategy for management and control of prosopis**	Implement 'National Strategy for Management and Control of Invasive *Prosopis juliflora* Tree Species'	DD-FBCCEM RDs	Strategy developed	No. of strategies	1	4	4	4	4	4	**20**
				Piloted and upscaled technologies	No. of sites	10	3	3	3	3	3	**15**
		Develop predictive growth models for prosopis	DD-FBCCEM	Prosopis growth models developed	No. of models	2	1	1	1	1	1	**5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Develop appropriate control protocols for *Prosopis juliflora*	DD-FBCCEM RDs	Appropriate control protocols developed	No. of protocols	5	1.5	1.5	1.5	1.5	1.5	**7.5**
		Raise awareness on the prosopis strategy	DD-FBCCEM RDs	Public awareness meetings held	No. of public meetings	5	5	5	5	5	5	**25**
		Centre of excellence for *Prosopis juliflora*	Directorate	Centre of excellence established	No. of centres	1	5	100	100	100	100	**405**
SUB TOTAL							**30**	**128**	**125**	**125**	**125**	**533**
ENDANGERED AND SPECIES OF NATIONAL INTEREST RESEARCH PROGRAMME												
3.16	**Enhance conservation and sustainable use of endangered plant species**	Identify tree species/family of tree species to be protected	DD-FBCCEM RDs	Key tree/family of tree species identified	No. of species	2	2	2	2	2	2	**10**
		Develop conservation strategies for endangered species	DD-FBCCEM RDs	Conservation strategies developed	No. of strategies	1	5	2	1	1	1	**10**
				Awareness on conservation measures created	No. of platforms	5	1.5	1.5	1.5	1.5	1.5	**7.5**
SUB TOTAL							**8.5**	**5.5**	**4.5**	**4.5**	**4.5**	**27.5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
POLLUTION CONTROL AND REHABILITATION OF POLLUTED LANDS RESEARCH PROGRAMME												
3.17	**Enhance rehabilitation of wastelands**	Develop and validate technologies for rehabilitation and restoration of wastelands (mined and dump sites)	DD-FBCCEM RDs	Different wastelands mapped	No. of maps produced	3	3	3	3	3	3	**15**
				Levels of pollution determined	No. of reports produced	1	2	2	-	-	-	**4**
				Appropriate tree species for phytoremediation identified for different wastelands	No. of tree species identified	4	3	3	3	3	3	**15**
SUB TOTAL							**8**	**8**	**6**	**6**	**6**	**34**
GRAND TOTAL							**198**	**475**	**907**	**911.5**	**1414**	**3905.5**

4: FOREST PRODUCTS AND ENTERPRENEURSHIP DEVELOPMENT (FPED) THEME

STRATEGIC OBJECTIVE: TO DEVELOP TECHNOLOGIES FOR EFFICIENT PROCESSING AND UTILIZATION OF FOREST PRODUCTS FOR LIVELIHOOD IMPROVEMENT

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
TIMBER PROCESSING AND UTILIZATION RESEARCH PROGRAMME												
4.1	**Improve quality of wood products**	Undertake studies on the anatomical, physical and mechanical properties for prioritized wood species	DD-FPED RDs	Database on wood properties enhanced	No. of species studied	10	1	4	1	1	1	**8**
				Protocols on wood engineering and reconstitution developed	No. of protocols	5	1	1	1	1	1	**5**
		Undertake research on performance of preservatives for wood durability	DD-FPED RDs	Efficacy of wood preservatives determined	No. of reports	3	1	2	1	2	2	**8**
		Develop seasoning schedules and methods for emerging timber species	DD-FPED RDs	Seasoning schedules and methods for emerging timber species developed	No. of reports	2	2	1	2	-	-	**4**
4.2	**Improve Timber harvesting and logging technologies**	Evaluate efficiency of timber harvesting and logging technologies	DD-FPED RDs	Efficiency of new timber harvesting and logging technologies evaluated	No. of reports	2	2	2.5	2	2	1	**9.5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
4.3	**Optimise utilization of timber products**	Diversify timber products	DD-FPED RDs	New timber products developed	No. of species studied	5	5	5	5	5	5	**25**
				New reconstituted wood products developed	No. of reconstituted products	2	4	4	4	4	4	**20**
		Determine the performance of adhesives and finishes for timber and bamboo	DD-FPED RDs	Performance of adhesives and finishes determined	No. of reports	2	2	2	2	2	2	**10**
SUB TOTAL							**18**	**21.5**	**18**	**17**	**16**	**89.5**
BAMBOO PROCESSING, UTILIZATION AND INDUSTRY DEVELOPMENT RESEARCH PROGRAMME												
4.4	**Enhance Bamboo technologies for product diversification, efficient utilization and technology adoption by SMEs**	Develop a Bamboo Utilization Strategy	DD-FPED RDs	Bamboo utilization strategy developed	No. of strategies	1	2	4	-	-	-	**6**
		Promote efficient bamboo harvesting technologies	DD-FPED RDs	Trainings on bamboo harvesting technologies	No of training courses	25	5	5	5	5	5	**25**
		Determine anatomical, physical and mechanical properties of bamboo species	DD-FPED NFPRP	Properties of bamboo species determined	No of species studied	10	2	2	2	2	2	**10**
				Journal Papers	No. of journal papers	5	3	3	3	3	3	**15**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Diversify bamboo product development	DD-FPED RDs	New bamboo products developed	No. of products developed	5	3	3	3	3	3	**15**
		Determine the performance of adhesives and finishes for bamboo	DD-FPED RDs	Performance of adhesives and finishes for timber and bamboo determined	No. of reports	1	2	2	2	2	2	**10**
				Journal paper produced	No. of journal papers	1	-	-	-	1	-	**1**
		Undertake efficacy trials on bamboo preservatives	DD-FPED RDs	Bamboo preservatives tested	No. of preservatives tested	2	2	2	2	2	2	**10**
		Develop and test bamboo structures in construction	DD-FPED RDs	Bamboo structures for construction developed and tested	No. of construction structures developed and tested	4	2	2	2	2	2	**10**
SUB TOTAL							**21**	**23**	**19**	**20**	**19**	**102**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
BIOENERGY TECHNOLOGY DEVELOPMENT RESEARCH PROGRAMME												
4.5	**Mitigate climate change through enhanced processing and utilization of biomass energy**	Optimize biomass energy conversion and utilisation technologies	DD-FPED RDs	Biomass conversion and utilization technologies optimized	No. of reports	3	2	2	2	2	2	**10**
		Determine the combustible matter in the different biomass feedstock	DD-FPED RDs	Proximate and ultimate properties of feedstock determined	No. of reports	1	2	2	2	2	2	**10**
SUB TOTAL							**4**	**4**	**4**	**4**	**4**	**20**
BIO-PROSPECTING AND FOREST BASED PRODUCT DEVELOPMENT RESEARCH PROGRAMME												
4.6	**Bio-prospecting and utilization of indigenous knowledge in tree natural products development and utilization**	Develop a framework for enhancing bioprospecting and utilisation of indigenous knowledge in natural resource products	DD-FPED RDs	Framework for bioprospecting and utilisation of IK in natural resource products developed	No. of reports	1	3	3	3	3	3	**15**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Document indigenous traditional knowledge on natural products and candidate species	DD-FPED RDs	Candidate species identified	No. of reports	1	2	2	2	2	2	**10**
				Indigenous traditional knowledge on natural products and candidate species documented								
		Determine the bio-active component from candidate species for further development	DD-FPED RDs	Bio-active component from candidate species identified	No. of reports	1	1	-	1.5	-	2	**4.5**
4.7	**Enhance Non-Timber Forest products development and standardization for uptake by SMEs**	Review past work on NTFPs (Aloe, IFTs)	DD-FPED RDs	Past work on NTFPs reviewed and gaps identified	No. of reports	1	2	2	-	-	-	**4**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Identify and prioritize new NTFPs in the 5 eco-regions and undertake resource assessment and mapping	DD-FPED RDs	Key NTFPs identified and prioritized in each region and resource assessment and mapping done	No. of reports	5	4	4	4	4	4	**20**
		Develop standardized products from prioritized tree species	DD-FPED RDs	Products from prioritized tree species developed and standardized	No. of products	20	5	5	5	5	5	**25**
		Undertake value chain analysis of the products	DD-FPED RDs	Value chains developed for potential NTFPs	No. of value chains	5	10	10	10	10	10	**50**
SUB TOTAL							**27**	**26**	**25.5**	**24**	**26**	**128.5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
PRODUCTS AND TECHNOLOGIES INCUBATION RESEARCH PROGRAMME												
4.8	**Enhance incubation of forest products**	Establish centre of excellence in forest and tree based bio-enterprises	SDD-R&D DD-FPED RDs	Incubation centre established and operationalized	No. of centres	1	5	100	100	100	100	**405**
SUB TOTAL							**5**	**100**	**100**	**100**	**100**	**405**
GUMS AND RESINS DEVELOPMENT RESEARCH PROGRAMME												
4.9	**Enhance gums and resins utilization and conservation**	Review past work on gums and resins	DD-FPED RDs	Past work on gums and resins reviewed and gaps identified	No. of reports	1	2	2	-	-	-	4
		Undertake resource assessment and mapping of gums and resins for unmapped counties	DD-FPED RDs	Status of gums and resins assessed and mapped	No. of counties with gums and resins mapped	3	2	-	2	-	2	6
SUB TOTAL							**4**	**2**	**2**	**-**	**2**	**10**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
FOREST BASED ENTREPRENEURSHIP AND MSMEs DEVELOPMENT RESEARCH PROGRAMME												
4.10	**Enhance forest products and technology incubation**	Build capacity of innovators and MSMEs	DD-FPED RDs	Capacity of innovators and MSMEs built	No. of innovators /MSMEs	75	10	10	10	10	10	**50**
		Conduct expert training in forest products development	DD-FPED DD-FRSS RDs	Trainings conducted	No. of trainings	5	5	5	5	5	5	**25**
		Link and promote developed products and technologies to MSMEs	DD-FPED RDs	Developed products and technologies linked to MSMEs	No. of products linked	5	10	10	10	10	10	**50**
		Review Forest Products Training curriculum and manuals in line with TVETA guidelines	DD-FPED RDs	Forest Products training materials reviewed in line with TVETA guidelines	No. of training curricula	2	-	4	4	-	-	**8**
					No. of manuals	2	1	1	1	1	1	**5.0**
SUB TOTAL							**26**	**30**	**30**	**26**	**26**	**138**
GRAND TOTAL							**105**	**206.5**	**198.5**	**191**	**193**	**893**

5: SOCIO-ECONOMICS, POLICY AND GOVERNANCE (SPG) THEME

STRATEGIC OBECTIVE: TO GENERATE INFORMATION TO GUIDE DEVELOPMENT OF POLICIES, REGULATORY AND INSTITUTIONAL FRAMEWORKS TO IMPROVE GOVERNANCE IN THE FOREST SECTOR FOR SOCIO-ECONOMIC DEVELOPMENT

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
FOREST POLICY AND LEGISLATIVE FRAMEWORK RESEARCH PROGRAMME												
5.1	**Contribute to development and review of policies and legal framework in forestry**	Participate in reviews of all policies in forest sector	DD-SPG RDs	Policy and legal instruments reviewed	No. of reports	3	3	3	3	3	3	**15**
		Participate in the development of internal policies and strategies	DD-SPG SLO RDs	Internal policies and strategies developed	No. of policies	5	2	2	2	2	2	**10**
					No. of strategies	5	2	2	2	2	2	**10**
		Undertake analysis on implementation of policies and legislations	DD-SPG RDs	Analysis undertaken	No. of reports	5	2	2	2	2	2	**10**
		Develop National Forest Research Strategy and incorporate KEFRI legal status in FCMA ammendment Bill 2023	DD-SPG RDs	KEFRI National Forest research Strategy developed	No. of documents	2	5	5	5	5	5	**25**
				KEFRI legal status entrenched in FCMA ammendment Bill 2023	No. of documents							

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Undertake studies on the impact of land tenure on forestry development	DD-SPG RDs	Land tenure impact determined	No. of studies	1	0.5	0.5	0.5	0.5	0.5	**2.5**
5.2	**Contribute information to enhance the country's contribution to global forestry and environmental processes**	Undertake studies to inform the IPCC Subsidiary Body for Scientific and Technological Advice (SBSTA)	DD-SPG RDs	Studies on climate change undertaken	No. of Studies	5	2	2	2	2	2	**10**
		Undertake studies on the implementation levels of country's commitments under MEAs	SDD-R&D DDSPG RDs	Studies undertaken on MEAs mainstreaming into sector policies and legislations	No. of Reports	3	2	1	0.5	0.5	1	**5**
		Build capacity of KEFRI staff to participate in IPCC and Subsidiary Body for Scientific and Technological Advice (SBSTA)	SDD-R&D DD-SPG	Lobby for Scientists to participate and nomination in global bodies	No. of officers	2	2	2.5	2.5	2.5	2.5	**12**
SUB TOTAL							**20.5**	**20**	**19.5**	**19.5**	**20**	**99.5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
COMMERCIAL FORESTRY, INNOVATIONS AND INVESTMENT RESEARCH PROGRAMME												
5.3	**Enhance forest investment opportunities for livelihood improvement**	Undertake studies on cost benefit analysis (CBA) of Nature based enterprises	DD-SPG RDs	CBA studies undertaken	No. of reports	5	2	2	2	2	2	**10**
		Undertake studies on viability of nature-based enterprises	DD-SPG RDs	Viability studies undertaken	No. of reports	1	2	2	2	2	-	**8**
5.4	**Strengthen information exchange on commercial forestry innovations centre**	Develop a strategy for commercial forestry and innovation centre	DD-SPG RDs	Commercial forestry innovation and advisory centre	No. of strategies	1	2	4	3	2	1	**12**
				Commercial forestry innovation and advisory centre established	No. of reports	4	2	2	2	2	2	**10**
				Technology transfer and exchange meetings	No. of meetings, webinars and conferences	20	3	3	3	3	3	**15**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
5.5	**Enhance information on national and trans-boundary trade in forest products**	Monitor forest products trends at national, regional and global levels	DD-SPG RDs	Data and information on market and trade collected and shared	No. of reports	5	2	2	2	2	2	**10**
				Advisory briefs provided	No. of briefs	5	1	1	1	1	1	**5**
SUB TOTAL							**14**	**16**	**15**	**14**	**11**	**70**
GENDER AND LIVELIHOOD RESEARCH PROGRAMME												
5.6	**Improve forest governance for forestry development in Kenya**	Undertake studies of governance models in forestry and evaluate their contribution to forest management and improved livelihood	DD-SPG RDs	Governance models and impact studies undertaken	No. of reports	2	2	2	2	2	2	**10**
		Undertake studies on Indigenous People and Local Community (IPLC) and their role on forest management	DD-SPG RDs	Evolution of IPLC documented	No. of reports	2	2	2	2	2	2	**10**
				Role of IPLC and ITK in forest conservation in Kenya documented								

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Undertake research on impact of extreme events (including weather) on people and forests	DD-SPG RDs	Impacts of extreme events determined	No. of reports	2	2	2	2	2	2	**10**
				Impacts of disaster determined	No. of reports	5	2	2	2	2	2	**10**
		Undertake research on appropriate tree crop interaction in plantation establishment	DD-SPG DD-FPI RDs	Studies on appropriate tree crop interaction in plantation establishment undertaken	No. of studies	2	2	2	2	2	2	**10**
5.7	**Gender mainstreaming in forestry**	Develop a strategy on mainstreaming gender in forestry	DD-SPG RDs	Strategy developed	No. of strategies	1	2	2	2	2	2	**10**
		Undertake studies on the nexus of gender, forestry and climate change	DD-SPG RDs	Nexus of gender, forestry and climate change determined	No. of studies	2	2	2	2	2	2	**10**
SUB TOTAL							**14**	**14**	**14**	**14**	**14**	**70**
FOREST RESOURCE VALUATION AND ACCOUNTING RESEARCH PROGRAMME												
5.8	**Develop forestry financing schemes and models**	Undertake studies on financing schemes for forestry development	DD-SPG DD-FPI DD-FPD RDs	Financing schemes developed	No. of Reports	3	2	2	2	2	2	**10**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Develop Payment for Environmental Services (PES)	DD-SPG RDs	PES schemes developed	No. of schemes	2	2	2	2	2	2	**10**
		Undertake review of Payment for Environmental Services (PES) schemes	DD-SPG RDs	Payment for Environmental Services (PES) schemes reviewed	No. of Reports	1	2	2	2	-	-	**6**
		Undertake studies on PPP models in forest management	DD-SPG DD-FPI RDs	Legal frameworks for PPPs in forest land concession determined	No. of reports	2	3	3	3	3	3	**15**
		Build capacity of stakeholders on potential financing and trade options	DD-SPG DD-FRSS	Trainings undertaken	No. of trainings	5	2	2	2	2	2	**10**
5.9	**Enhance forest resource valuation**	Undertake total forest resource and woodland valuation	DD-SPG RDs	Economic value of selected forest ecosystems determined	No. of Reports	2	3	3	3	3	3	**15**
		Undertake studies on forest and nature-based livelihood options	DD-SPG RDs	Livelihood options determined	No. of Reports	5	3	3	3	3	3	**15**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Determine the contribution of forest to the green and blue economy	DD-SPG RDs	Designed and implemented studies	No. of studies	5	3	3	3	3	3	**15**
		Undertake economic analysis of forest restoration options	DD-SPG RDs	Cost benefit analysis for different restoration options determined per hectare	No. of Reports	1	3	3	3	3	3	**15**
SUB TOTAL							**23**	**23**	**23**	**21**	**21**	**111**
FOREST EXTENSION RESEARCH PROGRAMME												
5.10	**Enhance research in forestry extension**	Undertake studies on investment opportunities and models in forestry	DD-SPG RDs	Studies on investment opportunities and models in forestry undertaken per region	No. of reports	8	2	2	2	2	2	**10**
		Evaluate forest extension methods and dissemination	DD-SPG RDs	Extension methods evaluated	No. of reports	3	2	2	2	2	2	**10**
		Develop dissemination and extension applications	DD-SPG RDs	ICT decision support systems developed	No. of systems	3	2	2	2	2	2	**10**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Undertake studies on appropriate forest certification models	DD-SPG RDs	Certification for forestry management and chain of custody models reviewed	No. of reports	2	2	2	2	1	1	**8**
SUB TOTAL							**8**	**8**	**8**	**7**	**7**	**38**
BIO-CULTURAL HERITAGE RESEARCH PROGRAMME												
5.11	**Enhance Indigenous Technical Knowledge in forestry**	Undertake survey on traditional forest management practices	DD-SPG RDs	Tradition forest management practices documented	No. of Reports	3	3	3	3	3	3	**15**
		Undertake survey on forest based tourism	DD-SPG RDs	Cultural based tourism documented	No. of Reports	3	2	2	2	2	2	**10**
		Undertake forest sacred sites and cultural sites conservation	DD-SPG RDs	Forest sacred sites and cultural sites conserved	No. of Reports	3	2	2	2	2	2	**10**
SUB TOTAL							**7**	**7**	**7**	**7**	**7**	**35**
GRAND TOTAL							**86.5**	**88**	**86.5**	**82.5**	**80**	**423.5**

6: FORESTRY RESEARCH SUPPORT SERVICES (FRSS) THEME

STRATEGIC OBJECTIVE: TO PROVIDE TECHNICAL SUPPORT SERVICES, CONDUCT EXPERT TRAINING COURSES AND DISSEMINATE RESEARCH FINDINGS TO SUPPORT FORESTRY DEVELOPMENT

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
BIOMETRICS AND GEOMATICS PROGRAMME												
6.1	**Develop and implement research data management framework for forest biometrics**	Design, customize and operationalize data collection tools and systems	DD-FRSS	Data collection tools and systems developed	No. of tools/ system	4	3	3	3	3	3	**15**
		Review and upgrade research data portal	DD-FRSS	Upgraded research data portal	No. of data portals	1	3	3	3	3	3	**15**
		Design and validate data science methods	DD-FRSS	Data science methods developed	No. of methods	4	3	3	3	3	3	**15**
6.2	**Develop and implement research data management framework in GIS & RS**	Map forest and allied natural resources using GIS/RS applications	DD-FRSS	Forest and allied natural resources mapped	No. of resources	10	4	4	4	4	4	**20**
		Establish and operationalize a GIS/RS laboratory	DD-FRSS	Operational GIS/ RS lab established	No. of laboratories	1	5	50	50	50	50	**205**
6.3	**Strengthen capacity and improve skills of staff and other**	Build capacity of stakeholders in forest biometrics	DD-FRSS	Trainings undertaken	No. of trainings	4	5	5	5	5	5	**25**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
	stakeholders in forest biometrics	Develop Biometrics applications	DD-FRSS	Biometrics applications developed	No. of applications	4	3	3	3	3	3	**15**
6.4	**Strengthen capacity and improve skills of staff and other stakeholders in GIS&RS**	Build capacity of stakeholders in GIS and RS	DD-FRSS	Trainings undertaken	No. of trainings	4	5	5	5	5	5	**25**
		Develop GIS/RS applications	DD-FRSS	GIS/RS applications developed	No. of applications	4	3	3	3	3	3	**15**
SUB TOTAL							**34**	**79**	**79**	**79**	**79**	**350**
TRAINING AND CAPACITY BUILDING PROGRAMME												
6.5	**Enhance training in social forestry**	Undertake training needs assessment in forestry and allied natural resources at national and regional levels	DD-FRSS	Training needs assessment undertaken	No. of training needs assessment reports	3	2	2	2	2	2	**10**
		Develop, validate and implement expert training modules	DD-FRSS	Expert training modules developed	No. of modules	3	8	10	10	10	-	**38**
					No. of trainings	10						
		Provide technical experts in the sub-Saharan African countries	DD-FRSS	Experts dispatched	No. of experts	20	4	4	4	4	4	**20**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Implement regional cooperation activities for knowledge sharing and networking	DD-FRSS	Increased dissemination of technology	No. of regional cooperation events	3	4	4	4	4	4	**20**
		Conduct impact assessment of training in social forestry	DD-FRSS	Impact assessment undertaken	No. of assessments	2	2	2	2	2	2	**10**
		Centre of excellence on training and capacity building	DD-FRSS	Training and capacity building centre established	No. of centres	1	5	100	100	100	100	**405**
6.6	**Operationalize KEFRI Graduate Research School**	Develop management systems	DD-FRSS	Governance systems developed	No. of systems	5	2	2	2	2	2	**10**
		Establish partnership with universities for incubation	DD-FRSS	Partnership established	No. of signed MoUs	3	2	2	2	2	2	**10**
		Undertake joint training and supervision	DD-FRSS	Joint training protocols developed	No. of protocols	3	3	3	3	3	3	**15**
		Apply for a letter of interim authority	DD-FRSS	Charter awarded	No. of charters	1	1	1	5	4	4	**15**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Undertake resource mobilization	DD-FRSS	Proposals	No. of developed proposals	2	2	2	2	2	2	**10**
				Networks	No. of established networks	4						
		Develop accreditation road map	SDD-R&D DD-FRSS	Accreditation road map developed	No. of reports	2	3	3	3	3	3	**15**
		Design postgraduate training programmes for accreditation	DD-FRSS	Postgraduate research training programme designed and accredited	No. of programmes	5	3	3	3	3	3	**15**
SUB TOTAL							**41**	**138**	**142**	**141**	**131**	**593**
KNOWLEDGE MANAGEMENT PROGRAMME												
6.7	**Strengthen Knowledge Management**	Review and implement Knowledge Management Strategy	DD-FRSS	KM strategy reviewed and implemented	% of strategy implemented	100%	2	2	2	-	-	**6**
		Capture, store and share knowledge products	DD-FRSS	Knowledge products captured and shared	No. of products	20	3	3	3	3	3	**15**
		Enhance automation of library services	DD-FRSS	Operational and automated library	% automation	75%	2	2	2	2	2	**10**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
6.8	**Enhance information sharing**	Disseminate scientific information through various platforms	DD-FRSS	Information sharing platforms used	No. of platforms	30	5	5	5	5	5	**25**
		Develop, package and avail appropriate information products to stakeholders	DD-FRSS	Information products developed, packaged and availed	No. of information products	500	5	5	5	5	5	**25**
6.9	**Enhance Institute visibility and ranking**	Promote dissemination	DD-FRSS DD-CA&QA	Dissemination protocols developed	No. of protocols	5	2	2	2	2	2	**10**
				Dissemination activities undertaken	No. of reports	200	10	10	10	10	10	**50**
				Upgraded KEFRI website	No. of upgrades	10	4	4	4	4	4	**20**
				Rebranded Institute and its products	No. of brands	13	10	10	10	10	10	**50**
		Improve the Institute's ranking	SDD-R&D DD-FRSS RDs	Linking information sharing systems with centres of excellence	No. of links	2	2	2	2	2	2	**10**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
				Visibility events held	No. of events	10	5	5	5	5	5	**25**
				Publish in high index journals	No. of publications	200	10	10	10	10	10	**50**
		Maintain collaboration with renown international centres of excellence	SDDs DD-FRSS DD-CA&QA	Collaboration with renown international centres of excellence maintained	No. of collaborations	2	2	2	2	2	2	**10**
SUB TOTAL							**62**	**62**	**62**	**60**	**60**	**306**
INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) PROGRAMME												
6.10	**Enhance business applications**	Implement ERP and automate key processes and digitize existing records	DD-FRSS	ERP implemented and institutionalized	% of implementation	100%	50	30	35	50	10	**175**
				Institute's process automated	% automation	100%	1	1	1	1	1	**5**
				Institutes Records digitized	% digitization	100%	5	5	5	5	5	**25**
		Develop applications to support research and development	DD-FRSS	Applications developed	No. of applications	4	5	5	5	5	5	**25**
		Upgrade the website	DD-FRSS	Website upgraded	No. of upgrades	5	2	2	2	2	2	**10**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Develop and implement ICT plan	DD-FRSS	ICT plan developed	No. of plans	1	2	2	2	2	2	**10**
6.11	**Enhance Information Security Management Systems**	Review and implement mitigation measures identified in the risk register	DD-FRSS	Reviewed risk register	No. of reviews	5	25	20	25	30	-	**100**
				Cyber-security policy developed	No. of policies	1	2	2	2	2	2	**10**
6.12	**Improve ICT infrastructure and connectivity**	Review and upgrade KEFRI Centres connectivity	DD-FRSS	Centres connected	No. of centers	5	5	5	5	5	5	**25**
		Implement conferencing solutions	DD-FRSS	Conference solutions implemented	No. of solutions	5	1	1	50	-	-	**52**
		Establish digital resource centres	DD-FRSS	Data centers established	No. of data centres	2	-	40	-	40	-	**80**
		Develop and implement an ICT business continuity plan	DD-FRSS	Offsite data backup facilities acquired	No. of facilities	1	-	20	4	4	4	**32**
SUB TOTAL							**98**	**133**	**136**	**146**	**36**	**549**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
BIO-SCIENCE RESEARCH AND LABORATORY COORDINATION PROGRAMME												
6.13	**Strengthen Bio-science research**	Coordinate the development and implement standardized laboratory protocols	DD-FRSS	Protocols developed	No. of protocols	3	2	2	2	2	2	**10**
		Enhance provision of forensic services for tree products	DD-FRSS	Forensic services offered	No. of services	3	2	4	4	4	4	**20**
		Develop protocols for accreditation of forensic laboratories	DD-FRSS	Protocols developed	No. of protocols	2	2	2	2	2	2	**10**
		Conduct expert training of laboratory analysts and technologists	DD-FRSS	Trainings conducted	No. of trainings	5	5	5	5	5	5	**25**
6.14	**Build Bio-science Partnerships**	Link KEFRI to national and global institutes of excellence	DD-FRSS	National and global links established	No. of links	2	3	3	3	3	3	**15**
6.15	**Strengthen laboratory coordination**	Ensure maintenance and calibration of laboratories equipment	DD-FRSS	Servicing and calibration of laboratories equipment done	No. of maintenance schedules	5	15	15	15	15	15	**75**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
					No. of service contracts	5	1	1	1	1	1	**5**
					No. of reports	5	1	1	1	1	1	**5**
		Accredit soils and forensic laboratories	DD-FRSS	Soils and forensic laboratories accredited	No. of accreditation certificates	2	3	3	3	3	3	**15**
		Develop Laboratory Policy and Manual for improved service delivery	DD-FRSS	A policy and manual for laboratory developed	No. of policies and manuals	2	1.5	1.5	-	-	-	**3**
SUB TOTAL							**35.5**	**37.5**	**36**	**36**	**36**	**183**
ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING PROGRAMME												
6.16	**Enhance forest management and conservation using Artificial Intelligence and Machine Learning**	Identify key application of Artificial Intelligence (AI) and Machine Learning (ML) in forestry	DD-FRSS	Key application of AI and ML identified	No. of applications	2	1	1	1	1	1	5
		Install and use key applications of AI and ML	DD-FRSS	Key applications of AI and ML installed	No. of applications	2	-	10	10	10	10	40
SUB TOTAL							**1**	**11**	**11**	**11**	**11**	**45**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
SPACE TECHNOLOGIES PROGRAMME												
6.17	**Enhance forest management and conservation using space technologies**	Identify key space technologies in forestry	DD-FRSS	Key space technologies	No. of technologies	2	2	2	2	2	2	**10**
		Apply key space technologies in forestry research	DD-FRSS	Key space technologies applied	No. of technologies	2	5	5	5	20	5	**40**
SUB TOTAL							**7**	**7**	**7**	**22**	**7**	**50**
INFORMATION DISSEMINATION AND TECHNOLOGY TRANSFER PROGRAMME												
6.18	**Enhance forestry information management and dissemination**	Undertake dissemination of research finding through various fora	DD-FRSS	Key application of AI and ML identified	No. of applications	10	15	15	15	15	15	75
		Develop and avail appropriate information to stakeholders	DD-FRSS	Key applications of AI and ML installed	No. of applications	200	5	5	5	5	5	25
		Hold a scientific conference	DD-FRSS	Scientific conference held	No. of proceedings	1	2	2	15	2	15	36
SUB TOTAL							**22**	**22**	**35**	**22**	**35**	**136**
GRAND TOTAL							**300.5**	**489.5**	**508**	**517**	**395**	**2,212**

7: CORPORATE AFFAIRS AND QUALITY ASSURANCE THEME

STRATEGIC OBJECTIVE: TO ENHANCE CORPORATE PUBLICITY FOR INCREASED VISIBILITY AND ENSURE QUALITY OF RESEARCH AND SERVICE DELIVERY

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
7.1	**Increase publicity to enhance visibility**	Develop publicity materials for different media	DD-CA&QA	Publicity materials for different media developed	No. of print articles, posts and clips	350	5	5	5	5	5	**25**
		Develop a media engagement strategy	DD-CA&QA	Media engagement strategy developed	No. of strategies	1	3	3	3	3	3	**15**
		Increase visibility by showcasing products and services	DD-CA&QA	Products distributed	Types of shared products	6	3	3	3	4	3	**16**
		Ensure branding of institutes facilities, equipment, products and materials	DD-CA&QA	Items branded	No. of items	5	5	5	5	5	5	**25**
		Develop communication strategy	DD-CA&QA	Communication strategy developed	No. of strategies	1	2	2	-	-	2	**6**
		Undertake training in communication	DD-CA&QA	Training programme developed	No. of programmes	1	2	1	-	-	-	**3**
				Training undertaken	No. of officers	60	3	3	3	3	3	**15**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
7.2	**Enhance customers satisfaction and retention**	Undertake customer satisfaction surveys	DD-CA&QA	Customer satisfaction surveys conducted	No. of reports	2	3	3	3	3	3	**15**
		Implement Corporate Social Responsibility	DD-CA&QA	CSR activities implemented	No. of CSR initiatives	6	20	20	20	20	20	**100**
7.3	**Improve operational standards in research and service delivery**	Review SOPs and undertake ISO systems audits	DD-CA&QA	SOPs reviewed	No. of SOPs	54	3	3	3	3	3	**15**
				ISO system audits undertaken	No. of system Audits	10	3	3	3	3	3	**15**
		Review and upload service delivery charters	DD-CA&QA	Reviewed and uploaded service delivery charters	No. of service charters	13	1	1	1	1	1	**5**
		Undertake work environment survey and ensure workplace registration	DD-CA&QA	Work environment survey undertaken registration certificate obtained	No. of reports	5	2	2	2	2	2	**10**
					No. of certificates	18	1	1	1	1	1	**5**
		Consolidate performance contracting targets and monitor implementation	DD-CA&QA	Annual performance targets developed and implemented	No. of PC reports	5	1	1	1	1	1	**5**
GRAND TOTAL							**57**	**56**	**53**	**54**	**55**	**275**

8: RESOURCE MOBILIZATION, PARTNERSHIPS AND INTERNATIONAL RELATIONS DEPARTMENT

STRATEGIC OBJECTIVE: TO ENHANCE PARTNERSHIPS AND LINKAGES FOR IMPLEMENTATION OF JOINT ACTIVITIES AND RESOURCE MOBILIZATION

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
8.1	**Establish linkages to increase funding opportunities**	Develop and implement 2022-2027 resource mobilization strategy	PRMO	Resource mobilization strategy developed	No. of strategies	1	3	2	2	2	-	**9**
		Increase partnership for joint research and resource mobilization	SDD-R&D PRMO DDs &RDs	New and renewed partnerships increased	No. of MOUs signed	15	3	3	3	3	3	**15**
				Increased funding opportunities	Annual % increase	30%	3	3	3	3	3	**15**
				Developed proposals	No. of proposals	20	5	5	5	5	5	**25**
		Develop donor engagement with strategic partners at national and regional level for joint research and resource mobilization	SDD-R&D PRMO DDs RDs	Increase in MOU/ MOA joint research and resource mobilization activities	No. of joint activities and projects	10	3	3	3	3	3	**15**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Hold briefing events/forums with government departments	SDD-R&D PRMO DDs RDs	Publicity events held	No. of events	5	2	2	2	2	2	**10**
		Secure new and additional resources	SDD-R&D PRMO DDs RDs	Developed proposals and established partnerships	No. of proposals developed and submitted	25	5	5	5	5	5	**25**
		Maintain active engagement with development partners and stakeholders	SDD-R&D PRMO DDs RDs	Acknowledgement notes/cards	No. of meetings	8	1	1	1	1	-	**4**
				Donor meeting minutes	List of partners	40						
		Establish an international linkage for resource mobilization	SDD-R&D PRMO DDs RDs	Donor mapped	No. of maps	1	1	1	1	1	1	**5**
				International Linkages established	No. of links	5	2	2	2	2	2	**10**
				Development partners consortium meetings organized	No. of meetings	5	1	1	1	1	1	**5**
		Undertake capacity building in international relations	SDD-R&D PRMO DDs RDs	Staff trained in international relations	No. of staff	20	1	1	1	1	1	**5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Subscribe to funding networks	SDD-R&D PRMO DDs RDs	Networks established and documented	No. of networks	6	1	1	1	1	1	**5**
GRAND TOTAL							**31**	**30**	**30**	**30**	**27**	**148**

9: NATIONAL AND COUNTY TECHNICAL LIAISON DEPARTMENT

STRATEGIC OBJECTIVE: TO ENHANCE PARTNERSHIPS AND LINKAGES FOR JOINT IMPLEMENTATION OF NATIONAL AND COUNTY ACTIVITIES

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
9.1	**Strengthen national and county research partnerships**	Hold national and county research and management liaison activities	SDD-R&D TLO DDs RDs	national and county research and management liaison activities held	No. of meetings	40	5	5	5	5	5	**25**
		Establish national research funding partners	SDD-R&D TLO DDs RDs	National research funding partners established	No. of fora	52	5	5	5	5	5	25
GRAND TOTAL							**10**	**10**	**10**	**10**	**10**	**50**

10: CORPORATE SERVICES DIRECTORATE

STRATEGIC OBJECTIVE: TO COORDINATE IMPLEMENTATION OF CORPORATE SERVICES ACTIVITIES

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
10.1	**Provide strategic leadership in coordination and planning of corporate services**	Provide leadership in reviewing of governance instruments to guide the Institute	SDD-CS	Governance instruments reviewed	No. of instruments	5	1	1	1	1	1	**5**
		Ensure preparation and submission of annual budget, to the relevant government organizations	SDD-CS	Budgets, quarterly and annual financial statements prepared and submitted	No. of reports	30	2	2	2	2	2	**10**
		Overseeing the human capital management practices in the Institute.	SDD-CS	Human capital management practices implemented	No. of reports	25	1	1	1	1	1	**5**
		Ensure overall provision of administrative services in the Institute	SDD-CS	Administrative services provided	No. of reports	25	1	1	1	1	1	**5**
		Coordinate the development of the CS work plans	SDD-CS	CS work plans development coordinated	Approved work plans	5	1	1	1	1	1	**5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
10.2	**Oversee monitoring and evaluation of implementation of corporate services activities in the Institute**	Coordinate M&E implementation	SDD-CS	M&E implementation coordinated	No. of Reports	20	2	2	2	2	2	**10**
		Coordinate quality control of CS activities	SDD-CS	CS activities coordinated	No. of Reports	20	1	1	1	1	1	**5**
		Coordinate planning and implementation of performance contract activities	SDD-CS	Performance contract activities coordinated	No. of Performance Contract	5	1	1	1	1	1	**5**
10.3	**Coordinate mobilization of resources for research and development and corporate services functions**	Participate in resource mobilization for donor funded activities	SDD-CS	Projects funded	No. of projects	10	1	1	1	1	1	**5**
		Lobby for increased core funding with exchequer	SDD-CS	Increased funding	% annual increase	25%	1	1	1	1	1	**5**
		Participate in development partners consortium meetings	SDD-CS	Development partners consortium meetings organized	No. of meetings	5	2	2	2	2	2	**10**
GRAND TOTAL							**14**	**14**	**14**	**14**	**14**	**70**

11: CORPORATE SERVICES DEPARTMENTS

STRATEGIC OBJECTIVE: TO STRENGTHEN INSTITUTIONAL CAPACITY FOR RESEARCH AND DEVELOPMENT

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
HUMAN RESOURCE MANAGEMENT DEPARTMENT												
11.1	**Enhance human resource capacity**	Undertake employee resourcing to replace identified skill gaps	SDD-CS DDHRM	77% of staff replacement attained	% level of replacement	100%	53	32.5	32.5	32.5	32.5	**183**
		Build staff capacity and competence	DD-HRM	Training needs assessment undertaken	No. of reports	2	2	-	2	-	2	**6**
				Annual training plans approved	No. of plans	5	1	1	1	1	1	**5**
				Training impact assessment undertaken	No. of reports	2	-	-	2	-	2	**4**
				Staff trained	No. of staff	400	7	7	7	7	7	**35**
		Develop and implement Talent Management policy in the Institute	DD-HRM	Policy developed and implemented	No. of policies	1	2	2	2	2	2	**10**
11.2	**Enhance efficiency and effectiveness in service delivery**	Review performance tools	SDD-CS DD-HRM	Reviewed and im-plemented policies	No. of policies	4	3	3	3	3	3	**15**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Foster culture of enhanced performance and improvement	DD-HRM	Staff trained and sensitized on change management	% of staff	100%	3	3	3	3	3	**15**
11.3	**Enhance employee satisfaction and retention**	Operationalize and review human resource instruments	SDD-CS DD-HRM	HR instruments implemented	No. of reports	4	48	20	20	20	20	**128**
		Strengthen employee wellness	DD-HRM	Increased premium and commensurate benefits	% annual premium increase	5%	5	5	5	5	5	**25**
		Undertake and implement employee satisfaction survey findings	DD-HRM	Employee satisfaction survey undertaken	No. of surveys	2	2	2	2	2	2	**10**
				Customer satisfaction index determined and recommendations implemented	% rate	75%	1	1	1	1	1	**5**
					No. of reports	2						
11.4	**Promote positive and conducive working environment**	Strengthen employee relations and team building	DD-HRM	Interpersonal relations trainings undertaken	No. of trainings	5	2	2	2	2	2	**10**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
				Team building activities undertaken	No. of activities	5	2	2	2	2	2	**10**
		Enhance provision of psycho-social support to staff	DD-HRM	Managers trained in psycho-social support	No. of managers	30	2	2	2	2	2	**10**
				Staff/groups identified and supported	% level of staff	100%	2	2	2	2	2	**10**
		Promote diversity and equity through development and implementation of Diversity Management Policy	DD-HRM	Policy developed	No. of policies	1	2	2	1	1	1	**7**
				Annual implementation reports	No. of reports	4						
11.5	**Foster institutional culture**	Develop and nurture positive institutional culture	DD-HRM	Positive culture promoted	Positivity index	2	2	2	2	2	2	**10**
		Promote core values	DD-HRM	Excellence and productivity rewarded	Excellence index	2	2	2	2	2	2	**10**
				Awareness created	No. of reports	20	3	3	3	3	3	**15**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Enhance interactions between supervisors and staff	DD-HRM	Interactions among staff enhanced	Interaction index	2	2	2	2	2	2	**10**
		Enhance staff mentorship and coaching	DD-HRM	Mentorship and coaching programmes developed	No. of programmes	2	1	1	1	-	-	**3**
		Undertake mentorship and coaching	DD-HRM	Staff mentorship and coaching done	No. of mentors	50	1	1	1	1	1	**5**
					No. of mentees	100	2	2	2	2	2	**10**
SUB TOTAL							**150**	**99.5**	**102.5**	**97.5**	**101.5**	**551**
FINANCE AND ACCOUNTS DEPARTMENT												
11.6	**Ensure prudent and sound financial management**	Implement Accounting Standards and Reporting guidelines	DD-F	Accounting standards and reporting guidelines implemented	% compliance	100%	1	1	1	1	1	**5**
		Promote transparency through effective management and accountability of funds	DD-F	Financial reports published	No. of reports	25	3	3	3	3	3	**15**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Undertake cost reduction and waste elimination measures	SDD-CS DD-F	Bi-annual financial verification/checks done	No. of reports	10	5	5	5	5	5	**25**
				Timely release of funds done	% compliance	100%	1	1	1	1	1	**5**
		Enhance budgetary processes and controls	DD-F	Budgets prepared, approved, implemented and reviewed	% budget compliance	100%	2	2	2	2	2	**10**
				Budgetary controls done	No. of reports	20	1	1	1	1	1	**5**
		Develop and review financial management policy and manuals	SDD-CS DD-F	Developed, reviewed and implemented policies and manuals	No. of policies and manuals	2	2	2	2	2	2	**10**
		Facilitate budget making and its implementation	DD-F	Annual budget plans prepared and implemented	No. of reports	5	1	1	1	1	1	**5**
		Develop and implement financial management risk plan	DD-F	Financial management risk plan developed and implemented	No. of reports	5	1	1	1	1	1	**5**
		Lobby for increased core funding with exchequer	SDD-CS DD-F	Increased funding	% annual increase	25%	1	1	1	1	1	**5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
11.7	**Enhance asset and liabilities management**	Update and maintain custody of the Institute's asset and liabilities registers	DD-F MSCM	Updated asset and liabilities registers	No. of registers	5	1	1	1	1	1	**5**
		Undertake assets tagging	DD-F MSCM	Assets tagged	No. of reports	5	1	1	1	1	1	**5**
SUB TOTAL							**20**	**20**	**20**	**20**	**20**	**100**
ADMINISTRATION DEPARTMENT												
11.8	**Improve infrastructure and facilities**	Undertake a gap analysis on existing facilities	DD-A RDs	Gap analysis on facilities undertaken	No. of reports	1	1	1	1	1	1	**5**
		Provide clean, safe and conducive work environment	DD-A RDs	Clean and safe work environment provided	No. of DOSH certificates	18	30	30	30	30	30	**150**
		Adoption of green energy in KEFRI facilities	DD-A RDs	Wellness facilities established	No. of facilities	3	5	30	5	2	2	**44**
				Green energy systems installed	No. of centres	3	10	20	20	20	20	**90**
		Construct and equip office blocks, research centres and laboratories	DD-A RDs	Research centres in Rumuruti, Wajir and Mau constructed and equipped	No. of centres	3	100	232	400	500	800	**2,032**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Coordinate construction and equipping of seed storage facilities	SDD-CS DD-FPHTI DD-A RDs	Seed storage facilities constructed and equipped	No. of seed storage facilities	18	5	5	5	5	5	**25**
		Construct and equip office block and laboratories in Londiani	DD-A RDs	Construction completed	No. of centres	1	50	70	75	80	100	**375**
		Construct and equip a Science Complex at KEFRI Muguga	DD-A	Construction completed	No. of centres	1	100	150	189	204	225	**868**
		Construct and equip a desert combating centre of excellence	SDD-CS DD-A	Construction completed	No. of centres	1	-	-	1000	1000	1500	**3500**
		Construct and equip office and learning facilities for KEFRI Graduate Research School	SDD-CS DD-A	Construction completed	No. of offices and learning facilities	1	-	-	2500	2500	2500	**7500**
		Construct and equip office block at HQ for SCM, Pension and Archives	SDD-CS DD-A	Construction completed	No. of Office blocks and equipment	1	-	-	5	50	100	**155**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Construct centre for nature based solutions and incubation centres	DD-A RDs	Incubation centres constructed and equipped	No. of centres	4	40	30	40	50	50	**210**
		Establish lactating and baby care centres	DD-A RDs	Lactating and baby care centres operationalized	No. of centres	6	5	20	23	40	20	**108**
		Repair and maintain buildings and staff houses	DD-A RDs	Buildings and staff houses maintained	No. of buildings	10	20	20	20	20	20	**100**
					No. of houses	10	8	8	8	8	8	**40**
		Acquire motor vehicles	DD-A RDs	Vehicles purchased	No. of vehicles	10	16	16	16	16	0	**64**
		Maintain fleet of vehicles	DD-A RDs	Motor vehicles maintained	No. of vehicles	150	30	35	37	80	80	**262**
				Fleet management system enhanced	No. of reports	5						
		Improve water supply in centres	DD-A RDs	Completed boreholes in Tiva and Kitui	No. of boreholes	2	15	10	-	-	-	**25**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
11.9	**Secure land for forestry research**	Acquire/source for additional land for establishment of forestry research stations in Meru and Narok	DD-A RDs	Land acquired	No. of hectares	60	2	2	2	2	2	**10**
		Survey all KEFRI land	DD-A RDs	Land surveyed	No. of maps	60	4	4	4	4	4	20
		Acquire title deeds for KEFRI land	DD-A RDs	Title deeds acquired	No. of title deeds	9	3	3	3	3	3	15
		Fencing of KEFRI Rumuruti, Tiva, Maseno and UON-Kibwezi	DD-A RDs	Fencing completed	No. of kilometers	32.6	80	6	6	19	-	111
		Undertake valuation of KEFRI assets	DD-A	Assets valuation undertaken	No. of reports	1	5	-	-	-	8	13
SUB TOTAL							**529**	**692**	**4,389**	**4,634**	**5,478**	**15,722**
GRAND TOTAL							**699**	**811.5**	**4,511.5**	**4,751.5**	**5,599.5**	**16,373**

12: INTERNAL AUDIT DEPARTMENT

STRATEGIC OBJECTIVE: TO STRENGTHEN INTERNAL CONTROLS, IMPROVE OPERATIONAL EFFICIENY, AND PROMOTE GOOD GOVERNANCE AND ETHICAL BEHAVIOUR

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
12.1	**Enhance systems and process of internal controls**	Carry out external quality assessment of the Internal Audit in all KEFRI centres	MIA	External quality assessment carried out	No. of reports	1	-	5	-	-	-	**5**
		Develop and implement annual internal audit work plan	MIA	Work plans developed and implemented	No. of work plans	5	5	5	5	5	5	**25**
		Hold exit meeting between the Board audit committee and external auditors	MIA	Exit meetings held	No. of meetings	5	1	1	1	1	1	**5**
		Develop and implement internal audit strategy	MIA	Audit strategy developed and implemented	No. of strategies	1	1	1	1	1	1	**5**
		Review internal audit & audit committee charters	MIA	Reviewed audit and audit committee charters	No. of charters	2	1	1	1	1	1	**5**
		Automate internal audit processes	MIA	Audit processes automated	% of automation	100%	1	1	1	1	1	**5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Implement whistle blowing practice	MIA	Cases reported	% implementation	100%	1	1	1	1	1	**5**
GRAND TOTAL							**10**	**15**	**10**	**10**	**10**	**55**

13: PLANNING, STRATEGY AND RISK MANAGEMENT DEPARTMENT

STRATEGIC OBJECTIVE: TO DEFINE THE INSTITUTIONAL GOALS AND ENHANCE ABILITY TO IDENTIFY AND MANAGE RISKS AND PROTECT ASSETS

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
13.1	**Enhance planning process systems and internal controls**	Undertake long term and medium term planning	PSRMO	Long term and medium term plans developed	No. of plans	5	3	3	3	3	3	**15**
		Undertake capital/ infrastructure needs assessment	PSRMO	Assessment report	No. of reports	1	3	3	3	3	3	**15**
		Undertake risk management and review	PSRMO	Risk management report	No. of reports	100%	6	6	6	6	6	**30**
		Develop risk management strategy	PSRMO	Risk management strategy developed	No. of strategies	25	1	1	1	1	1	**5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Implement and monitor the risk management strategy	PSRMO	Risk management strategy monitored	No. of reports	5	2	2	2	2	2	**10**
		Identify risks	PSRMO	Risks identified	No. of reports	5	-	3	-	-	3	**6**
		Monitor level of risk exposure	PSRMO	Risk level exposure monitored	No. of reports	5	2	2	2	2	2	**10**
GRAND TOTAL							**17**	**20**	**17**	**17**	**20**	**91**

14: SUPPLY CHAIN MANAGEMENT DEPARTMENT

STRATEGIC OBJECTIVE: TO UNDERTAKE MANAGEMENT OF THE PROCUREMENT FUNCTION, OFFER TECHNICAL ADVICE ON PROCUREMENT ISSUES AND ENSURE COMPLIANCE WITH PROCUREMENT POLICIES, RULES AND REGULATIONS

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
14.1	**Carry out the procurement function in line with PPADA**	Preparation and implementation of annual procurement and disposal plans	MSCM	Annual procurement plans prepared and approved	No. of plans	5	3	3	3	3	3	**15**
				Disposal plans prepared and approved	No. of reports	20						
				Implementation status reports	No. of reports	20						
		Undertake inventory control, stores management and distribution	MSCM	Updated inventory stores managed and distributed	No. of reports	1	3	3	3	3	3	**15**
					No. of reports	20						
				Stock take undertaken	No. of reports	25						
		Undertake acquisition of works, goods and services	MSCM	Works, goods and services procured	% compliance	100%	6	6	6	6	6	**30**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Ensure compliance with PPAD Act and its regulations, government directives and guidelines	MSCM	Quarterly and annual reports on compliance	No. of reports	25	1	1	1	1	1	**5**
		Review and implement Procurement Manual & Policy	MSCM	Reviewed manual	No. of manuals	1	1.5	3.5	-	-	-	**5**
				Reviewed policy	No. of policies	1						
14.2	**Enhance transparent and accountable procurement processes**	Automation of supply chain management processes	MSCM	Automated services	% automation	100%	1	1	1	1	1	**5**
		Develop contract management System	MSCM CS/PLO	Contract management system developed	No. of systems	1	-	-	-	-	-	**-**
GRAND TOTAL							**15.5**	**17.5**	**14**	**14**	**14**	**75**

15: CORPORATION SECRETARY AND LEGAL SERVICES DEPARTMENT

STRATEGIC OBJECTIVE: TO PROVIDE PROFESSIONAL SECRETARIAL AND LEGAL SUPPORT TO THE BOARD OF DIRECTORS AND THE INSTITUTE

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
15.1	**Provide board secretarial and coordination services**	Develop and implement annual board work plan and budget	CS/PLO	Board annual work plan and budget developed and implemented	No. of annual work plans and budgets	5	3	3	3	3	3	**15**
		Organize and actualize governance audits	CS/PLO	Governance Audit organized and actualized	No. of Audit Reports	2	2	-	2	-	2	**6**
		Institute an e-Board system	CS/PLO	Functional e-Board system	% implementation	100%	3	-	-	-	-	**3**
		Organize training and induction of board members	CS/PLO	Trainings organized	No. of trainings	5	2	2	2	2	2	**10**
15.2	**Provide legal services**	Develop and implement a legal services charter	CS/PLO	Legal service charter developed and implemented	No. of service charters	1	1	-	-	-	-	**2**
					% implementation	100%						
		Develop and implement a case tracker dashboard	CS/PLO	Case tracker dashboard developed and implemented	No. of dashboard	1	1	1	1	1	1	**5**
					% implementation	100%						

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
		Provide quality legal advice	CS/PLO updates on legislation & case law provided	Legal opinions	% provision	0.5	1	1	1	1	1	**5**
		Establish a legal sub-registry	CS/PLO	Legal sub-registry established in the sub-registry	% of case files	0.5	1	1	1	1	1	**5**
		Develop and implement alternative dispute resolution management system	CS/PLO	Alternative dispute resolution management system established	% of cases resolved	0.3	-	-	-	-	1	**1**
		Liaise with the AG chambers	CS/PLO	Case briefs shared with AG	% of briefs	0.2	1	1	1	1	1	**5**
		Create awareness and sensitization on new legislation & emerging case law	CS/PLO	Awareness undertaken	No. of sensitization events	0.2	1	1	1	1	1	**5**
GRAND TOTAL							**16**	**10**	**12**	**10**	**13**	**62**

16: REVENUE GENERATION UNIT

STRATEGIC OBJECTIVE: TO ENHANCE REVENUE GENERATION

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
16.1	**Expand and manage revenue base**	Undertake benchmarking and review prices of revenue products and services	GM, RDs DD-F	Benchmarking undertaken Catalogues of prices for products and services reviewed	No. of reports	2	1	1	1	1	1	**5**
					No. of catalogues	2	1	1	1	1	1	**5**
		Identify and leverage new sources of internally generated revenue	GM, RDs DD-F	New revenue sources identified	No. of new sources	5	1.5	1.5	1.5	1.5	1.5	**7.5**
		Undertake marketing of products/services to enhance visibility	GM, RDs DD-F	Marketing of products/ services undertaken	No. of adverts and exhibition events	20	2	2	2	2	2	**10**
		Automate the delivery and payment for services and products through online interaction interface	GM, RDs DD-F	Online system interface in use	No. of systems	1	1	1	1	1	1	**5**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
16.2	**Commercialize tree and forest products**	Commercialize tree seeds	GM DD-FPHTI RDs DD-F	Marketing and sale of tree seed undertaken	Reports	5	2	2	2	2	2	**10**
		Commercialize forest products	GM DD-FPED RD-Karura	Marketing and sale of forest products undertaken	Reports	5	2	2	2	2	2	**10**
GRAND TOTAL							**10.5**	**10.5**	**10.5**	**10.5**	**10.5**	**52.5**

17: MONITORING, EVALUATION AND REPORTING DEPARTMENT

STRATEGIC OBJECTIVE: TO STRENGTHEN INSTITUTIONAL CAPACITY IN PLANNING, MONITORING, EVALUATION AND REPORTING

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
17.1	**Strengthen institutional capacity to undertake M&E**	Develop and implement M&E protocols	SDD-R&D Head M&E	M&E Protocols developed and implemented	No. of protocols	1	6	6	6	6	6	**30**
		Enhance capacity of M&E staff	SDD-R&D Head M&E	Staff trained on M&E	No. of staff	10	1.5	-	1.5	-	-	**3**
		Sensitize staff on the importance of M& E	SDD-R&D Head M&E	Staff sensitized	No. of reports	5	1	1	1	1	1	**5**
17.2	**Undertake Monitoring and Evaluation**	Monitor and evaluate implementation of annual work plans	SDD-R&D Head M&E	Workload analysis report Periodic M&E undertaken	No. of reports	20	2	2	2	2	2	**10**
		Undertake M&E on project implementation	SDD-R&D Head M&E	M&E on projects undertaken	No. of reports	20	5	5	5	5	5	**25**
		Carry out mid-term and end-term review of the strategic plan	SDD-R&D Head M&E	Strategic plan reviews undertaken	No. of reports	2	-	-	4	-	4	**8**
		Assess effectiveness of staff appraisal tools	SDD-R&D Head M&E	Tools on staff performance assessed	No. of tools	1	2	2	2	2	2	**10**

No.	Strategy	Initiative/ Activity	Responsible person	Expected output	Measure	5 year Target	Budget (KES Millions)					
							Y1	Y2	Y3	Y4	Y5	Total Budget
				Productivity of staff undertaken	No. of reports	5	1	1	1	1	1	**5**
				Staff workload analysis undertaken	No. of reports	5	1	1	1	1	1	**5**
GRAND TOTAL							**19.5**	**18**	**23.5**	**18**	**22**	**101**

Annex 3: Research Implementation in the Eco-regions

1: Coast Eco-Region Research Programme (CERP)

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
1.	Coast	Coast Eco Regional Research Programme undertakes research into the challenges facing coastal natural forestry ecosystems and blue economy along the Kenyan coast line that include, lowland mountain and mangrove forests; coastal forests of Arabuko-Sokoke, Diani, Kaya Ribe; Shimba Hills, Lower Tana River forests, Witu Forest Reserve, Madunguni, Marafa Brachystegia, Boni/Lungi forests, Kilibasi Woodlands, Taita Hills, agroforestry and farm forestry; and woodlots and forest plantations. They also include problems facing inland lowland forests within 100 km from the coast line specifically in generating technologies. The Eco-region will focus on • Restoring degraded coastal forests, mangroves, drylands and woodlands; • Monitoring biodiversity loss; • Development of woodlots for provision of biomass energy; • Management of pests, diseases and invasive species; • Establishing Permanent Sample Plotss in mangrove forests to determine offtake levels, effects of land use changes; pests and diseases • Developing strategies for sustainable management of Kaya Forests for livelihoods and biodiversity conservation	Kilifi (Gede Regional Headquarters)	Kilifi, Kwale, Lamu, Mombasa, Taita Taveta and Tana River Counties	1. Mangroves research. Key areas include: • Understanding the influence of socio-environmental parameters on mangroves survival/ establishment.. • Establishing PSPs for coastal forest resource monitoring • Monitoring land use land cover changes on mangrove forests • Establishing mangroves offtake levels • Mangrove wood value chain analysis 2. Kaya Forests focusing on establishing strategies for sustainable management through: • Resource status assessment • Developing management strategies • Evaluating opportunities for development of recreation facilities and ecotourism in kayas • Understanding the influence of traditional institutional systems on kaya forest development

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
		• Sustainable management and rehabilitation of tropical lowland forests and woodlands • Development of strategies to catalyze tree farming on-farms • Strengthening research on soils; tree physiology & nutrient use; tree seed research and bioprospecting of NTFPs • Development of high quality germplasm for coconuts, cashew nuts etc for agroforestry • Remediation of degraded mined areas • Fruit tree farming			3. Tropical lowland forests and woodlands. These include the Arabuko Sokoke, Boni/Witu Forests, Tana Delta forest fragments and the montane forests of the Eastern Arch Mountains. Key issues include: • Developing strategies/technologies for woodlands management including the Miombo woodlands • Documentation of indigenous Knowledge on various uses of ecological resources within the forests and woodlands • Resource assessment and mapping of prioritized products • Develop PSPs for data collection on ecological trends and dynamics of Miombo woodlands • Assessment of invasive species including dodder, prosopis etc
					4. Tree farming. Key areas of focus will include: • Soil and water management for enhanced tree productivity in both humid and marginal areas of the coast. The focus will also be on usage of fertilizers and irrigated tree farming • Silvicultural practices • Tree/crop interactions

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
					• Establishing forestry investment opportunities including Public Private Partnerships (PPPs), financing including social investment, and access to top notch inputs and technologies • Value chain analyses • Marketing and trade • Urban forestry • Tree seed production • Key issues on tree breeding/ improvement in the coast include; • Development of F1 *Gmelina arborea* materials • Establishing improved Casuarina materials including plus tree selection, orchard establishment and introduction of improved materials from outside • Improvement of *Eucalyptus camaldulensis* for biomass production in marginal areas
			Lamu (Mokowe)	Lamu, and Tana River Counties	The sub-centre implements activities in the North Coast comprised of Lamu and Tana River Counties. Flagship projects to focus on: • Assessment of mangrove and development of mangrove guidelines, strategies and plans for sustainable utilization, management, and conservation

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
					• Development of restoration and conservation strategies of endangered tree species including Euphorbia tanaensis • Development of strategies for management, conservation & rehabilitation of riparian ecosystems and watersheds e.g. Lake Kenyatta, Shela sand dunes, Lake Moa • Tree farming • Seed collection
			Taita Taveta (Ngerenyi)	Kwale and Taita Taveta Counties	The sub-centre implements activities in the South Coast composed of Taita Taveta and Kwale Counties. Flagship projects to focus on: • Developing landscape-based conservation models to protect biodiversity hotspots such as Kaya forests and Afromontane forests of Taita Hills • Enhancing protection and conservation of threatened native tree species. • Promoting community led approaches in the conservation of natural resources in light of climate change. • Tree farming • Management of trans-boundary water catchments and riparian areas Woodlands management • Tree seed development

2. Central Highlands Eco-Region Research Programme (CHERP)

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
2.	CHERP	Undertake forestry research mainly within Mt. Kenya and Aberdare forest ecosystems. The programme develops forestry technologies for; Forest Productivity Health and Tree Improvement, Forest Biodiversity, Climate Change and Environment Management, and Socio-economics, Policy and Governance studies. The programme also provides technical forestry research and development in the following key areas • Diversification and domestication of selected high value tree species on-farm • Genetic improvement of selected tree species • Development of technologies for predicting and managing tree pests and diseases • Development of macro and micro-propagation techniques for key tree species such as bamboo • Development of technologies for rehabilitation and management of degraded natural forests • Development of technologies for management of invasive plant species in forest eco-systems • Development of technologies for sustainable management of natural forests and woodlands • Development of technologies for conservation and management of water catchment areas, hilltops and wetlands • Soil and water management for forestry development • Forest resource valuation • Development of policy guidelines on forest benefit sharing, through Participatory Forest Management	Muguga	Kiambu, Nairobi, Murang'a, Nyandarua, Eastern Nakuru, Northern Kajiado and Upper Machakos.	• Develop predictive tools for forest resource assessment • Develop guidelines for on-farm tree products valuation and markets • Develop macro and micro-propagation techniques for key tree species such as bamboo, sandal wood, *Waburgia ugandensis, Vitex keniensis, Grevillea robusta* and *Melia volkensii* • Develop guidelines for growing tree species on farms (site matching and spacing guidelines). • Develop mechanisms for prediction of occurrences and management of forest fires within Abardere and Mt. Kenya ecosystems. • Establish and manage tree seed sources (seed stands and orchards) for commercial and indigenous tree species • Produce tree seeds/germplasm for the 15 billion tree planting strategy • Provide advisory services for management of forest pest and diseases • Develop appropriate bio-remediation technologies for polluted forest environments and damping sites such as Dandora.

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
		• Dissemination of various technologies and information on forestry through open and field days, agricultural shows, conferences and workshops, print and electronic media • Train stakeholders in various aspects of forestry such as: rehabilitation of degraded natural forests, rangelands and woodlands; tree nursery establishment and management; and Participatory Forest Management (PFM)			• Develop long-term strategies for conservation of water catchments and riparian areas incorporating traditional cropping patterns (Lake Olbolosat, Ondiri swamp, Thiba dam and Ndakaini dam). • Undertake genetic improvement of *Eucalyptus grandis, Vitex keniensis, Cupresuss lusitanica and Pinus patula* and hybrids for plantation establishment • Establish monitoring system for vegetation changes in relation to climate change in Aberdares and Mt. Kenya ecosystems • Develop and pilot framework for PES within Aberdares and Mt. Kenya ecosystems • Tran stakeholders on tree nursery establishment and management for achieving the 15 billion campaign • Dissemination of forest technologies to eco-region stakeholders Management of Ipomoea in the range lands of Kajiado county
			Rumuruti	Laikipia, Lower Samburu, Northern Nyandarua	• Restoration of silvo-pastoral systems

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
					• Management of invasive plant species such as Opuntia, *Lantana camara* and Leleshwa in the range land system • Collection of tree seeds of dryland tree species, • Promote adoption of *Melia volkensii* and sandalwood as commercial plantation species • Establishment and expansion of high quality *Grevillea robusta* germplasm
			Nyeri	Nyeri, Kirinyaga and Embu,	• Collection seeds of highland commercial and indigenous tree species, • Restoration of rangelands and woodlands of Mukogodo • Rehabilitation of degraded forest ecosystems of Tanyai and Karima forests • Diversification of species on-farm for Agroforestry • Genetic improvement of highland tree species such as *Vitex keniensis* • Build capacities of local farmers and Community Forest Associaitions (CFAs) on sustainable forest management • Establishment and expansion of seed sources of commercial tree species suitable for the highlands

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
			Meru	Meru and Isiolo	• Collection seeds of highland indigenous tree species, • Diversification of species on-farm for Agroforestry • Promote fruit tree farming in aforestry systems • Develop and promote technologies for natural forests conservation and management
			Wamba	Isiolo	• Seed collection of rangeland tree species • Restoration of silvo-pastoral systems • Promote technologies for growing acacia species for gum Arabic production
			Mitunguu Outpost	Tharaka Nithi	• Restoration of silvo-pastoral systems • Promote commercial production of *Tamarindus indica'* • Promote technologies for commercial dryland and irrigated forestry • Dryland fruit tree farming

3. Dryland Eco region Research Programme (DERP)

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
3.	DERP	The Dryland Eco region Research Programme undertakes research and develops forestry technologies within the following thematic areas; Forest Productivity Health and Tree Improvement, Forest Biodiversity, Climate Change and Environment Management and Socio-economics, Policy and Governance studies. The programme promotes and generate technologies in dryland forestry and allied natural resources. The Eco-region will focus on: • Diversification and domestication of selected high valued indigenous tree species • Selection, breeding and genetic improvement of selected tree species • Identification and development of technologies for sustainable management of tree pests and diseases • Development of protocols on the propagation techniques for key difficult to propagate tree species such as bamboo, *Sclerocarya birrea, Vitex payos, Terminalia brownie, Melia volkensii, Dalbarifgia melanoxylon, Osyris lanceolate,* etc. • Development of technologies for rehabilitation and restoration of degraded landscapes and forests • Development of technologies for management of invasive plant species such as *Prospois juliflora* and Ipomea • Development of technologies for conservation and management of water catchment areas, hilltops, riparian and wetlands ecosystem	Kitui Centre	Kitui, Machakos, Makueni, Embu, Tharaka Nithi, Isiolo, Marsabit, Mandera, Wajir, Garissa, Tana River, Samburu, Taita Taveta, Kajiado	• Undertake priority forest and woodlands resource assessment and mapping • Develop protocols and guidelines for priority dryland species such as *Melia volkensii, Terminalia brownie, Osyris lanceolate, Vitex payos, Dalbergia melanoxylon, Gmelina arborea,* etc. • Establish and manage tree seed sources (seed stands and orchards) for exotic and indigenous tree species in the drylands • Produce and distribute priority dryland tree seeds/germplasm towards the attainment of the 15 billion tree planting strategy • Provide surveillance and provide advisory services for management of dryland forest pest and diseases • Promote sustainable and efficient technologies in the conversion of bioenergy • Ensure short-term and long-term strategies for conservation of water catchments and riparian ecosystem using bamboo, Acacia species.

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
		• Development and promotion of soil and water technologies for dryland forestry development • Dryland Forest /Ecosystem resource valuation • Disseminating of various technologies and information on forestry through open and field days, agricultural shows, conferences and workshops, print and electronic media • Training stakeholders in various aspects of forestry such as: rehabilitation of degraded natural forests on hill tops, rangelands and woodlands; and tree nursery establishment and management • Undertaking research on alternative seedling raising methods with the long rooted experiments with stakeholders including JIFPRO and others			• Undertake genetic improvement of *Melia volkensii* and *Acacia tortilis* for dryland forestry plantation establishment • Train individuals, groups and other stakeholders on tree nursery establishment and management for achieving the 15 billion campaign • Partner, collaborate and disseminate research findings with farmers and other stakeholders • Ensure the management and control of invasive species such Ipomoea in the range lands of Kajiado county and *Prosopis juliflora* in Garissa and Tana River Counties
			Kibwezi	Makueni, Machakos, Kajiado and Taita Taveta	• Produce and distribute priority dryland tree seeds/germplasm towards the attainment of the 15 billion tree planting strategy • Undertake priority forest resource assessment and mapping. • Ensure the management and control of invasive species such Ipomoea in the range lands of Kajiado county • Ensure the restoration and rehabilitation of degraded sites under the silvo-pastoral land-use systems

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
					• Promote adoption dryland commercial species such as *Melia volkensii, Terminalia brownii* and *Osyris lanceolata* as commercial plantation dryland species • Establish, maintain, protect and manage *Melia volkensii, Acacia tortilis, Terminalia brownie* and other superior seed sources and provenance trials, • On-farm assessment of research and farmer established trials of priority dryland tree species, • Diversification of species on-farm for Agroforestry including fruit trees • Assessment of woodland forests and grasslands, • Providing advisory services on control and management of diseases and pests in drylands, • Training of stakeholders in tree seed collection, handling and best nursery practices, • Disseminate dryland research findings, • Support Makueni and Kajiado County Governments in forestry related activities,

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
					• Train stakeholders on bamboo propagation, use for restoration of degraded river catchments and utilization. • Domesticate sweet Tamarind propagation, establish trials and bridge gaps in its value chain to promote its uptake as alternative business model in drylands,
			Garissa (Proposed for upgrading to an Eco-region research Centre)	Garissa, Wajir, Mandera and Tana River	• Identification, select and domesticate high valued indigenous tree species • Produce and distribute priority and high quality dryland tree seeds/ germplasm and seedlings towards the attainment of the 15 billion tree planting strategy • Sustainable management and control of invasive species such as *Prosopis juliflora* • Rehabilitation and restoration of rangelands and woodlands under silvo-pastoral land • Promote the sustainable utilization of non-timber forest products such as gums and resins, honey, indigenous fruits, medicinal plants, etc. • Build the capacities of farmers and other stakeholders on sustainable dryland forest management

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
					• Disseminate research finding to the general public and other stakeholders • Establish and expand high quality seed sources of highly valued dryland tree species
			Tiva	Tiva Woodland, Machakos, Embu, Tharaka Nithi	• A Centre of excellence in the development and demonstration of dryland forestry technologies • Collection of priority high quality seeds of both indigenous and exotic tree species • Produce and distribute priority and high quality dryland tree seeds/ germplasm and seedlings towards the attainment of the 15 billion tree planting strategy • Establishment, assessment and management of seed orchards, progeny trials, seed stand, experimental plots and demonstration plots • Train individuals, groups and other stakeholders on tree nursery establishment and management for achieving the 15 billion campaign • Dissemination of forest technologies to eco-region stakeholders

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
			Hola	Tana River, and some parts of Garissa and Kitui Counties	• Collection priority high quality seeds of both indigenous and exotic tree species • Train individuals, groups and other stakeholders on tree nursery establishment and management for achieving the 15 billion campaign • Dissemination of forest technologies to eco-region stakeholders • Management and control of invasive species such *Prosopis juliflora* in Garissa and Tana River Counties
			Wajir	Wajir, Mandera, Marsabit	• Produce and distribute priority and high quality dryland tree seeds/ germplasm and seedlings towards the attainment of the 15 billion tree planting strategy • Sustainable management and control of invasive species such as *Prosopis juliflora* in Garissa and Tana River Counties • Train individuals, groups and other stakeholders on tree nursery establishment and management for achieving the 15 billion campaign • Dissemination of forest technologies to eco-region stakeholders

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
					• Management and control of invasive species such Produce and distribute priority and high quality dryland tree seeds/germplasm and seedlings towards the attainment of the 15 billion tree planting strategy • Rehabilitation and restoration of rangelands and woodlands under silvo-pastoral land use systems • Promote technologies for sustainable production of fodder and gums and resins yielding species
			Laisamis (Proposed Sub Centre)	Marsabit, Isiolo and Samburu	• Proposed Centre of excellence in desert forestry research • Produce and distribute priority and high quality dryland tree seeds/ germplasm and seedlings towards the attainment of the 15 billion tree planting strategy • Sustainable management and control of invasive species such as *Prosopis juliflora* • Rehabilitation and restoration of rangelands and woodlands under silvo-pastoral land use systems • Train individuals, groups and other stakeholders on tree nursery establishment and management for achieving the 15 billion campaign

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
					• Promote technologies for sustainable production of fodder and gums and resins • Dissemination of forest technologies to eco-region stakeholders

4. Lake Victoria Basin Eco-region Research Programme (LVBERP)

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
			Chebororwa /Talket / Kaptagat		
4.	LBVERP	Lake Victoria Basin Eco-region Research Programme (LVBERP) was established in 1989 to serve as a centre of excellence in agroforestry research. In the last decade, it has also taken up research in forest restoration, tree health, forest governance, green economy development and carbon offset as its key areas of focus. The eco-region is located in a zone with approximately 200,000 ha of natural forest (Mt. Elgon, Kakamega Forest, Malava Forest, Funyula hills, Ilkerin-Lolgorian, Gwassi hills, Wire, Kodera, Lambwe Valley, Homa hills and Got Ramogi hill) which constitute about 20% of the land area; woody resources on-farm (mostly Eucalyptus spp, *Grevillea robusta, Markhamia lutea, Maesopsis eminii,* Acacia spp, Croton and Bamboo to a small extent) which account for close to 80% of the land area; and a few plantation forest resources which comprise *Pinus patula, Cupressus lusitanica* and Eucalyptus spp. **Key forestry related challenges in the Lake Victoria Basin include:** • High human population density, which exerts pressure on natural forest resources • Low forest and tree cover due to poor adoption of tree planting as a culture by local communities	Maseno	Kisumu, Vihiga, Siaya, Busia, Bungoma and Trans Nzoia, Kakamega, Migori, Homa bay, Kisii, Nyamira,	• Agroforestry research • Forest restoration studies • Tree species – site matching • Management of invasive plant species e.g., Cestrum, and parasitic plants e.g., Dodder • Phytoremediation of degraded mine lands • Soil science • Green and blue economy development • Management of wild fruits for enhanced production • Climate change research • Tree pests and diseases • Bamboo research • Forest governance studies • Information dissemination and technology transfer and capacity building • Support to get it correctly

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
		• Small land holdings causing competition between trees and crops • Eucalyptus in riparian zones • Emergence of invasive plant species and parasitic plants • Emergence of tree pests and diseases	Kakamega	Kakamega, Busia and Bungoma	• Equatorial Rainforest research • Management of invasive plant species and parasitic plants • Bamboo research • Socio-economic policy and governance studies • Tree seed collection • Management of seed sources • Information dissemination and technology transfer and capacity building • Support for Mission 15B
		Under KEFRI's 7th Strategic Plan, LVBERP will focus its research on: 1. Tree species-site suitability matching to various agro-ecological zones 2. Restoration of degraded forests, hilltops and water sources 3. Sustainable management and restoration of wetlands and riparian zones 4. Valuation of forest resources and ecosystem services 5. Water use dynamics of fast growing tree species, such as Eucalyptus. 6. Management of tree pests and diseases and invasive plants 7. Tree-crop integration in mixed farming systems 8. Promoting value chains for multipurpose trees species e.g., fitos, round poles, transmission poles, timber, firewood and tree seed	Ramogi	Siaya	• Tree seed collection • Management of seed sources • Information dissemination and technology transfer and capacity building • Support for Mission 15B
			Migori	Migori, Kisii, Nyamira and Transmara	• Tree pests and diseases • Bamboo research • Management of invasive plant species and parasitic plants • Tree seed collection • Management of seed sources • Information dissemination and technology transfer and capacity building • Support for Mission 15B

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
		9. Exploring blue and green economy development opportunities 10. Development of improved tree seed sources 11. Enhancing tree seed collection to avail quality seeds for the 15B tree growing programme 12. Production of quality planting materials towards achieving Mission 15B 13. Developing technologies for raising difficult to propagate indigenous tree species 14. Phytoremediation of degraded mines lands 15. Publishing and publicising forestry technologies	Rongo	Homa Bay and Nyamira	• Tree seed collection • Management of seed sources • Information dissemination and technology transfer and capacity building • Support for Mission 15B

5. Rift Valley Eco-region Research Programme (RVERP)

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
5.	RVERP	The Region has unique diversity in natural resources endowment, economic, cultural and political conditions with vast area of 173,854ks sq cutting across 7 agro-ecological zones. The region has over 1 million Ha. of gazetted forests that include key water towers of Mau, Cherangany and Mt. Elgon and about 200,000ha of communal and private forests. RVERRP covers 13 counties namely: Baringo, Nakuru, Bomet, Narok,Kajiado, Kericho, Nandi, Uasin gishu, Trans Nzoia, West Pokot, Elgeyo Marakwet, Samburu and Turkana. The specific objectives are: Technologies into the conservation, management and restoration of the diverse forest systems in seven (7) • Development and provision of high quality forest and tree germplasm- seed orchards, seeds -development and management • Development of technologies for establishment and management of forest plantations, agroforestry and trees on farm • Development of improved nursery and plantation management techniques • Diversification of commercial tree species • Development of integrated pest management strategies for commercial tree and plant species • Development of forest and landscape restoration and rehabilitation technologies of degraded forests, woodlands and riparian areas for adaptation and mitigation to climate change	Londiani-Regional office	Nakuru, Kericho, Bomet, Narok, Uasin	• Commercial Plantation Forestry development • Commercial tree seed orchard development • Farm forestry • Agroforestry in the tea plantations • Studies on the tree-tea buffer zones • Natural Forest Management • Valuation of ecosystem services and piloting of PES • Forest governance and gender dynamics • Extension and dissemination research
			Turbo sub-centre	Uasin Gishu, Trasnzoia, Nandi and Part of Kakamega	• Commercial Forestry development • Seed source development and management • Fruit tree farming • Demonstration of commercial forestry
			Turkana Sub-centre	Turkana and West Pokot	• Technologies for rehabilitation of degraded woodlands • Integrated silvopastoral system for pastoral economy • Irrigated forestry • Agroforestry with date palms

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
		• Development of habitat restoration technologies/ practices for invasive species • Establish the viability of forest -based enterprises • Contribute to formulation of forestry policies for sustainable forest management, governance and best practices in forest resources use and management • Promotion of livelihood opportunities for local communities through development of NTPS natural forests and in drylands • Dissemination of forestry technologies and capacity building of stakeholders • Undertake total forest valuation for various purposes including; products, services and Payment for Eco-System Services (PES)	Baringo sub-Center	Baringo , E. Marakwet and Samburu	• Invasive species Management • Non-wood Forest Products-Aloes management and value addition
			Maasai Mau/ Narok (Mau-Serengeti Eco-system)	Narok, Bomet, Kajiado	• Promotion of farm forestry • Human wildlife interactions • Woodlands conservation • Dryland forestry • Bamboo development • Hydrological studies of the Mau-Mara-Serengeti ecosystem in the region • Invasive species management
			Cheptongei/ Kaptagat	Elgeyo Marakwet and part of Uasin Gishu	- Forestry and landslides - Commercial seed orchards

6. National Forest Products Research Programme (NFPRP)

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
6.	NFPRP	The Programme has national mandate for research and development in forest products through the following strategic objectives: • Conduct basic and applied research in forest products in collaboration with relevant institutions. • Promote commercialization of forest products through incubation and linkage of forest products to industries/SMEs. • Disseminate research findings in forest products. • Strengthen linkages and partnership with stakeholders. • Build capacity of stakeholders in production, processing and marketing of forest products	Karura	National focus / All Counties	1. Research in timber processing and utilisation • Determining physical and mechanical properties of prioritized wood species • Determining performance of preservatives for wood durability - undertake efficacy trials of test preservatives • Developing seasoning schedules for emerging timber species • Evaluating the efficiency of new timber harvesting and logging technologies 2. Research in bamboo processing, utilisation and industrial development • Developing a bamboo utilisation strategy • Promoting efficient bamboo harvesting technologies • Determining anatomical, physical and mechanical properties of bamboo species • Developing new reconstituted wood and bamboo products • Determining the performance of adhesives and finishes for timber and bamboo

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
					• Evaluating efficacy of bamboo preservatives • Developing and testing bamboo structures in construction 3. Research in developing technologies in bioenergy • Optimising biomass energy conversion and utilisation technologies • Determining the combustible matter in different biomass feedstock 4. Research in bio-prospecting and forest based product development • Developing a framework for enhancing bio-prospecting and utilisation of indigenous knowledge (IK) in products from natural resource • Documenting ITK on natural products and candidate species in all Eco Regions • Identifying the bio-active components from candidate species for development • Identifying and prioritize new Non Timber Forest Products (NTFPs) in the 5 eco-regions and undertake resource assessment and mapping

No	Eco-region	Flagship objective	Centre/ sub-centre location	Area of jurisdiction / counties	Flagship focus
					• Developing standardized products from prioritized tree species • Undertake value chain analysis of the products 5. Research in enhancing gums and resins utilization and conservation 6. Research in enhancing incubation of forest products • Building capacity of innovators and MSMEs • Conducting trainings in forest products development • Linking and promoting developed products and technologies to MSMEs • Disseminating forest technologies to stakeholders in all Eco Regions • Provision of forensic services for National security

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ISBN: 978-9914-723-05-2