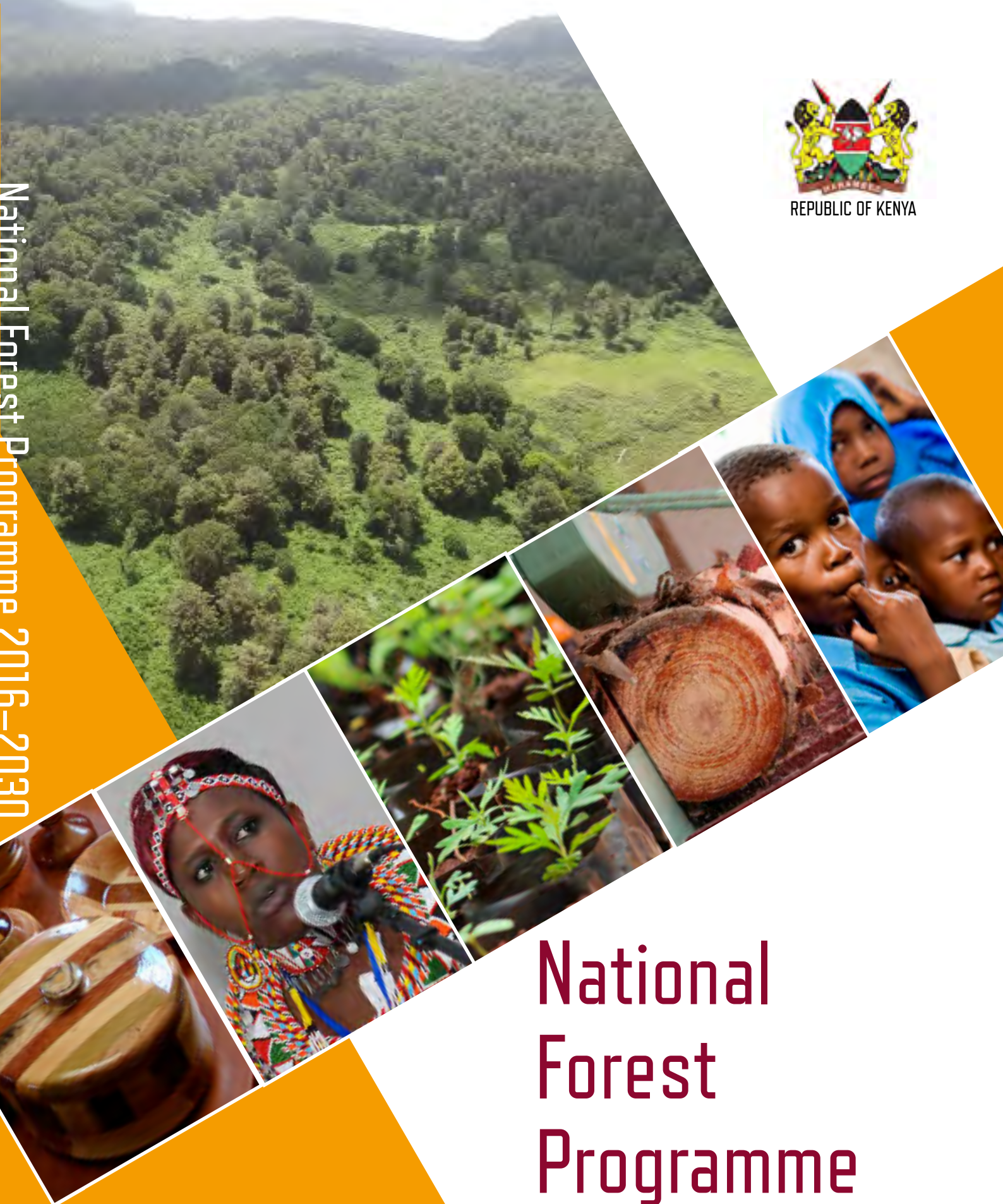

REPUBLIC OF KENYA

National Forest Programme 2016–2030

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Ministry of Environment and Natural Resources

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Disclaimer

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National Forest Programme 2016-2030

Preface

The economic development of any country centre's around its environment, natural resources and the choice of appropriate conservation and management strategies. Forest development in Kenya is dependent on the rich natural resource base especially with regard to tourism development, energy production, food security, timber production, and provision of a host of non-timber forest products that directly or indirectly contribute to the livelihoods of citizens. In addition, forests support the provision of environmental services including resilience to the impacts of climate change. However, the natural resource base is facing pressure from increased population growth and unsustainable use of forest resources.

Forests also play key roles in conserving water catchments that provide water for domestic, industrial and agricultural use, and to generate hydro electricity. Almost all water originates from forest rivers, lakes and forest-derived water tables. Appreciating their importance as wildlife habitats and biodiversity reservoirs, forests and water towers should be protected and sustainably managed at all costs.

The conservation and management of forests is viewed in the context of social and economic development, whose targets are embedded in Kenya's economic blueprint, the Vision 2030 as well as in the Constitution. To guide the forest sector's coordination and spur sustainable forest management, Kenya chose the National Forest Programme process.

The National Forest Programme (NFP) is a strategic framework for forest policy, planning and implementation to coordinate the sector's development. The NFP is designed to sustain and restore the resilience of forests in the country by ensuring that forests are able to withstand and recover from climate-related stresses and disturbances such as droughts, wildfires, and epidemics of insects and diseases while adhering to the principles of sustainable forest management. Sustainable forest management will ensure that benefits derived from forests meet current needs and still contribute to the requirements for long-term development. In view of this, investing in forestry research is critical in the development of appropriate technologies and in supporting innovations.

A participatory, inter-sectoral and interactive approach was used to develop the NFP. The NFP will be a platform for integrating constitutional principles and values as well as the aspirations of the people of Kenya as captured in Vision 2030, and will provide clear linkages with other sectors including engaging with development partners. The strength of the NFP is its inclusivity, which differentiates it from other strategic planning processes. National and county governments, the private sector, the civil society and communities were central to the formulation of the programme and are expected to play a greater role during its implementation. In addition, cooperation among stakeholders is required to improve competitiveness and productivity in the forest sector. Such cooperation will have a positive impact on the economic performance of the country and will in turn improve the livelihoods of our people. Indeed, the National Forest Programme comes at a time when Kenya's governance landscape is transitioning from a centralised to a devolved system. Such a transition offers plenty of opportunities for

citizens to participate in decision making on forest issues, and for their collective and individual rights to be respected.

The Government embraces public–private partnerships as a firm foundation for accelerated development. Partnerships between and among key stakeholders and players require strengthening as well. This is vital in the realisation of strategic objectives such as increasing tree cover and reversing forest degradation, promoting forestry as a business and increasing investments, adopting technologies, and integrating national values and governance in the forestry sector.

On behalf of the ministry, I congratulate Kenyans, partners in development and the private sector for putting in place a consensus-based national forest programme that is innovative in many aspects, forward looking and challenging. We encourage and welcome your comments to improve this document.

Prof Judi Wangalwa Wakhungu
Cabinet Secretary
Ministry of Environment and Natural Resources

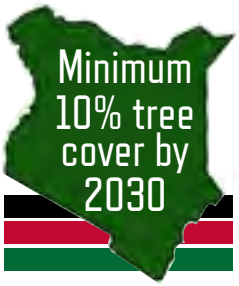
Acknowledgements

The National Forest Programme is a product of concerted efforts by the technical team in the Ministry of Environment and Natural Resources, over 600 stakeholder representatives and the 140 members of thematic working groups. I acknowledge their efforts that have ensured that the country has a framework to coordinate development in the forestry sector from 2016 to 2030.

Special appreciation to Gideon Gathaara and Hewson Kabugi for steering the process and providing guidance to the following members of the NFP Secretariat: David Mutisya and Okotti S Matendechere (MENR), Arvid Sloth (NIRAS), Gordon Sigu (KEFRI), Beatrice Atemo and Eric Nahama (KFS), and Eugene Mnyamwezi (MWI).

I also acknowledge the work of reviewers who offered invaluable feedback, notably, Hewson Kabugi (MENR), Mwaniki Ngibuini (Private Sector), Dominic Walubengo (Forest Action Network), Ephraim Muchiri, Maina Manyeki and Anthony Mugane (MENR), Wilson Kipkore (University of Eldoret), Esau Omollo, Gitonga Mathenge and Noor Hussein (KFS), Jane Njuguna and Joram Kagombe (KEFRI) as well as all those who have contributed to the formulation of this programme.

Last but not least, special thanks go to the Government of Finland for support to produce this document.



With the advent of the National Forest Programme, I believe that the people of Kenya will appreciate the government's objectives and strategies towards realising the aspiration and goals of the Kenya Vision 2030 and the constitutional requirement to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya.

Dr Margaret M Mwakima
Principal Secretary
State Department of Natural Resources

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ANALYSIS

STRATEGY

Kenya Factsheet

LAND

- Kenya, including its water bodies, covers about 582,646 km^2.
- 20% of the country is classified as arable and 80% arid and semi-arid lands.
- Kenya is classified as a water-scarce country.

POPULATION

- In 2015 projected to be 48,148,661 persons.
- Average population growth is 2.14% per annum.
- 61% of the population is between 15 and 24 years.
- High unemployment, approximately 40%.
- Christian 82.5%, muslim 11.1%, traditionalists 1.6%, others 4.8%.

FORESTS

- The national forest cover in 2010 was 6.99%.
- Protected forest areas cover about 3.2% of the total land area. However, this does not include the recent gazetting Boni Forest.

WOOD-ENERGY

- Over 80% of the national energy supply is met from fuel wood.
- Forests contribute 3.6% to the GDP excluding environmental services and contributions to other sectors.
- Current wood deficit is projected to increase from 10 million m^3 to at least 15 million m^3 per year by 2030.
- The private sector including tree farmers, communities and medium- and large-scale investors provide 90% of the wood supply.

AGREEMENTS

The Republic of Kenya is party to international agreements including those on Biodiversity, Climate change, Climate Change–Kyoto Protocol, Desertification, Endangered species, Hazardous wastes, Law of the Sea, Marine dumping, Marine life conservation, Ozone layer protection, Ship pollution, Wetlands, Whaling.

Abbreviations

ASAL	Arid and semi-arid lands
CBO	Community-based organisation
CF	Community forestry
CFAs	Community forest associations
CIFOR	Centre for International Forestry Research
CPA	Charcoal Producer Association
CSO	Civil society organisation
CSR	Corporate social responsibility
EAC	East African Community
ENCOM	Enforcement and Compliance Division
ECOSOC	United Nations Economic and Social Council
FAO	Food and Agricultural Organisation
FCC	Forest Conservation Committee
FDI	Foreign Direct Investments
FDP	Forest Dependent People
FLEGT	Forest Law Enforcement Governance and Trade
FSC	Forest Stewardship Council
GDP	Gross Domestic Product
GHG	Green House Gases
GNP	Gross National Product
GOK	Government of Kenya
IFPs	Indigenous Forest Peoples
IUCN	International Union for Conservation of Nature
IUFRO	International Union of Forest Research Organizations
JFM	Joint Forest Management
KAM	Kenya Association of Manufacturers
KEFRI	Kenya Forestry Research Institute
KEPSA	Kenya Private Sector Alliance
KFS	Kenya Forest Service
KFWG	Kenya Forest Working Group
KIFCON	Kenya Indigenous Forest Conservation Project
KNBS	Kenya National Bureau of Statistics
KWS	Kenya Wildlife Service
KWTA	Kenya Water Towers Agency
MA&ED	Market Analysis and Enterprise Development

M & E	Monitoring and evaluation
MEA	Multilateral Environmental Agreement
MENR	Ministry of Environment and Natural Resources
MENR & RDA	Ministry of Environment, Natural Resources & Regional Development Authorities
MEWNR	Ministry of Environment, Water & Natural Resources
MMMB	Miti Mingi Maisha Bora Programme
MFW	Ministry of Forestry and Wildlife
MoU	Memorandum of Understanding
NACOFA	National Alliance of Community Forest Associations
NEMA	National Environment Management Authority
NFP	National Forest Programme
NFRAM	National Forest Resources Assessment & Monitoring
NGO	Non governmental organisation
NLC	National Land Commission
NPGD	National Policy on Gender and Development
NRM	Natural resource management
NTFPs/ NWFPs	Non-timber forest products/ non-wood forest products
NWFP	Non-wood forest product
ODA	Overseas Development Assistance
PELIS	Plantation Establishment for Livelihood Improvement Scheme
PES	Payment for Ecosystem Services
PESTAL	Political, Economic, Social, Technological, Environmental & Legal aspects
PFM/JFM	Participatory Forest Management/ Joint Forest Management
PLUP	Participatory Land Use Planning
PPCPs	Private, Public and Civic sector investors through Partnerships
PPPs	Public–Private Partnerships
RBA	Rights-based approach
RDBMS	Relational Database Management System
REDD+	Reduced Emissions from Deforestation and Forest Degradation

SADC	Southern-African Development Community
SDGs	Sustainable Development Goals
SFM	Sustainable Forest Management
SMMEs	Small, micro and medium-sized enterprises
SWOT	Strengths, Weaknesses, Opportunities and Threats
TEV	Total economic value
TIES	The International Eco-tourism Society
TGA	Tea Growers Association
TMA	Timber Manufacturers Association
UNCED	United Nations Conference on Environment and Development

UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
VC/VCA	Value chain/Value chain approach
VCS	Verified Carbon Standard
WHO	World Health Organisation
WB	World Bank
WRMA	Water Resource Management Authority
WWF	World Wide Fund for Nature

Technical Forest Definitions

Forest	Forest in this NFP means a land area of more than 0.5 ha, crown cover of 10%, trees of at least 2.5 m height, which is not primarily under agricultural or other specific non-forest land use. In line with the Constitution, the NFP also operates with “tree cover”, e.g. trees on farms.
Public forest	Forest owned by the State or administrative units of the Public Administration, or by institutions or corporations owned by the Public Administration. It also refers to forests on public land under the authority of a State organ.
Community forest	Forest held by communities or held in trust by county governments and where forest management rights and responsibilities are transferred from the Public Administration to local communities through long-term leases or management agreements.
Private forest	Forest owned or managed privately by an individual, institution or corporate entity as freehold or leasehold.
Community Forest Association	A group of local persons who have registered as an association or other organisation established to engage in forest management and conservation jointly with the Kenya Forest Service (KFS) or any other forest owner.
Forest ecosystem	A dynamic complex of plant, animal, and micro-organism communities and their non-living environment interacting as a functional unit.
Forest concession	The right of use granted to an individual or organisation in respect to a specific area in public or community forest for a specified period.
Water tower	Forested area that forms the upper catchment of the rivers in Kenya.
Non-timber forest products/non-wood forest products	These include gums, resins, honey, essential oils, frankincense, myrrh, fibres, medicinal and aromatic plants, dying and tanning materials, recreational facilities, non-resident cultivation, grazing, soil and murram, asparagus fern, quarrying, grass and water. These are known locally as minor forest products.

EXECUTIVE SUMMARY

The National Forest Programme (2016–2030) is the first cross-sectoral and multi-stakeholder national framework for developing and coordinating forest development aimed at meeting the needs of Kenyans in the next 15 years. It builds on the constitutional values and principles of the Kenya Vision 2030, and advances forest development to 2030. In this way, forestry development values, principles and time targets now mirror national development goals.

Integrating forestry with other sectors within a planning framework took a comprehensive and participatory process with 600 stakeholders over a 20-month period. Meaningful participation balance was attempted between the two tiers of government (national and county), the private sector, communities and the civil society.

Justification

About 7% of Kenya's total land area is forest. These forests provide goods and services such as wildlife habitat, biological diversity, water catchment, employment opportunities and livelihood sources. Forests and trees play multiple functions in contributing to the livelihoods of communities, especially women and marginal groups, in supplying food and rural energy. However, these forests are threatened with agricultural expansion, over-exploitation and unsustainable use of forest resources; population increase and widespread youth unemployment have led to increased pressure on forest resources.

The National Forest Programme was developed to increase forest cover, boost the forest sector's contribution to the national economy, enhance resilience to climate change, and improve livelihoods. This programme will significantly enhance not only sustainable forest management but also improve the coordination of various sectors.

Goal, objectives and structure

The national forest framework aims at sustainable forest management and has the overall goal: "To develop and sustainably manage, conserve, restore and utilise forests and allied resources for socio-economic growth and climate resilience."

The strategic objectives are: i) Increase tree cover and reverse forest degradation through sustainable forest management, ii) Enhance forest-based economic, social and environmental benefits including by improving the livelihoods of forest-dependent people, iii) Enhance capacity development, research and adoption of technologies to increase value adding to forest products, iv) Create an enabling environment for mobilising resources and investment to spur forest development, and v) Inculcate good forest governance through integrating national values and principles of governance in forest development.

This document is in 3 parts divided into 10 chapters.

BACKGROUND

The Background and Descriptive Part (chapters 1–4) provides the introduction, the concept of sustainable forest management and the national forest programme, Kenya's forest resources in a national and international perspective, and the legal and policy frameworks that have a bearing on people, trees and forests. The last part describes the forest types, resources and benefits.

ANALYSIS

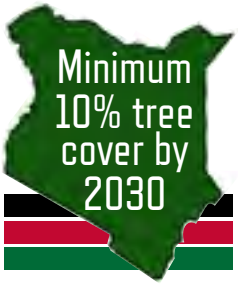
The Analytical Part (chapters 5–6) examines the nexus—people, trees and forests—in the dynamics of population and land, the drivers of deforestation and degradation as well as macro-economic factors. Ideas and opportunities are analysed for potential development and application in the demand–supply continuum of wood products, scope for value addition and commercialisation of non-wood forest products. They are also scrutinised for climate change resilience, woodland management, community forestry, outgrower schemes, forest market surge, industrial and legislative development, plantation productivity and modernisation, forestry in a green economy and finance opportunities.

STRATEGY

The Strategic Part (chapters 7–10) is organised in a results framework design; it formulates the hierarchy of objectives, envisaged outcomes, thematic clusters, programmes and strategies. The programmes are grouped under eight thematic clusters: i) Forest Productivity, ii) Forest Governance, iii) Natural Forest Management and Conservation, iv) Forest for Water, v) Forest for Energy vi) Forestry Education, Training and Research, vii) Forest and Climate Change, and viii) Forest Financing. A monitoring and evaluation model with outcomes, indicators, targets, baselines and risks supports the results framework.

NFP commitments and key messages

To meet the constitutional values and the principles of the Vision 2030, the National Forest Programme brings stakeholders across sectors to work together in partnerships striving for improved Competitiveness, Good forest governance, and Livelihoods. Other key messages:



1. Promoting sustainable forest management
2. Increasing forest cover to at least 10%
3. Increasing food, water and energy security
4. Enhancing environmental resilience to climate change
5. Creating an enabling environment for investments in forestry
6. Enhancing efficiency, effectiveness and skills throughout forest value chains
7. Promoting public–private partnerships
8. Segregating roles and responsibilities of actors and implementing institutions/agencies
9. Mainstreaming the full value of forests in the national economy
10. Promoting equitable benefit-sharing mechanisms
11. Increasing community participation in forest development
12. Making forestry information accessible to improved awareness and decision making
13. Improving forestry education and research and technical skills development
14. Ensuring broad-based economic empowerment in the private sector, gender, youth and special groups
15. Promoting alternative energy sources and efficient use
16. Advancing good governance, reducing bureaucracy and increasing transparency in forest value chains.

The programme will be updated every five years.

"You cannot protect the environment unless you empower people, you inform them, and you help them understand that these resources are their own, that they must protect them."

Wangari Maathai

1 INTRODUCTION

The National Forest Programme 2016–2030 is a multi-stakeholder, cross-sectoral framework to guide forest development in Kenya.

The programme cuts across the missions and goals of the national and county governments, communities, civil societies and the private sector.

BACKGROUND

1.1 THE KENYA NATIONAL FOREST PROGRAMME

Forest development requires a framework to coordinate its programmes. The Forestry Master Plan developed in 1995 provided an opportunity for forest sector development but encountered implementation challenges. The National Forest Programme (NFP) is therefore designed to coordinate the sector with reference to international standards and adhering to the aspirations of Kenyans.

The NFP is a national multi-stakeholder, cross-sectoral framework involving national and county governments, communities, civil societies and the private sector in promoting sustainable forest management.

The NFP integrates national values of integrity, good governance and social justice into the forestry sector. It forms a reference for forest management and aims to meet local, county, national and global needs by linking national and international partnerships.

The NFP will enhance environmental, economic and social sustainability in the Kenyan forest sector by achieving five strategic objectives:

1. Increase forest/tree cover and reverse forest degradation.
2. Enhance forest-based economic, social and environmental benefits.
3. Enhance capacity development, research and adoption of technologies.
4. Increase investments in forest development.
5. Integrate national values and principles of good governance in forest development.

The NFP forms a strategic supportive framework for implementing the principles and values of the Constitution and of Vision 2030.

It is important to reverse forest degradation and increase forest and tree cover in the country by mobilising the private sector, particularly tree farmers, investors and communities in the forests-to-markets value chain. Profitability and competitiveness in forestry and forest-based industries need to be in place to safeguard the social and environmental base for people's well-being.

Given Kenya's increasing population, the demand for food, water and other products will exert pressure on forest resources. Therefore, in targeting the national goal of increased forest cover and climate change mitigation and adaptation, solutions must be found at the nexus of agriculture and forestry.

Profitability of tree-growing and forest industries requires an enabling environment for business, access to markets and efficient value chains that provide a fair share of value addition to all key actors along the value chains. Access to credit facilities, fair-priced investment capital, transparent licensing and pricing of forest products, and the latest technical know-how are needed to use resources efficiently. For sustainable forest management to thrive, improved forest governance is mandatory. The key building blocks are participation of all relevant stakeholders, enhancement of law enforcement and compliance, zero tolerance to corruption, efficiency in service delivery, financial feasibility of business making as well as improved transparency, accountability and information provision on Kenya's forestry sector.

Kenya has a wide range of valuable forest ecosystems that can meet the increasing needs of its peoples if the resources are used in a sustainable manner. The key forest ecosystems are riverine, dryland, marine, western rainforest systems and montane forests. The montane forest ecosystems include the five major water towers: Mount Kenya, Aberdare Range, Mau Forest Complex, Mount Elgon and the Cherangani Hills. They represent the largest tracts of high-canopy forests that form the upper catchments for most of the main rivers, and are sources of essential wood and non-wood products. Dryland forests are also essential in providing the basis for energy, fodder and construction material for livelihoods in the arid and semi-arid lands (ASALs). A chronological description of the historical development of the forestry sector is presented in Appendix A.

Kenya's population of 48 million is projected to rise to 66.3 million in 2030 (WPR, 2015). This increased population will exert more pressure on forest resources due to increased demand for food.

National Forest Programme 2016–2030

GOAL

Sustainably managed forests and allied natural resources for socio-economic growth and climate resilience

The "NFP tree" has roots deep in the Constitution, the Kenya Vision 2030, and related policies and legal frameworks. It resonates with the Sustainable Development Goals and complies with international and regional agreements.

The branches represent the eight thematic clusters in the implementation of the framework.

The trunk symbolises the impact areas of the NFP: improved competitiveness, good forest governance and enhanced livelihoods.

See chapter 7 for more details of the programme design.

1.2 UNIVERSAL PRINCIPLES FOR NATIONAL FOREST PROGRAMMES

National forest programmes (NFPs) are agreed frameworks for forest policy, planning and implementation aimed at covering a wide range of implementation approaches for sustainable forest management. They are open-ended, country-driven, participatory and adaptive processes with no universal recipe for contents or outcomes.

This NFP has adopted internationally recognised principles for NFP development.

Universal Principles for NFPs

When developing and agreeing on the concept of national forest programmes, the UN Member States agreed that "national forest programme" is a generic term encompassing a wide range of approaches to sustainable forest management within different countries that can be applied at 'national and sub-national levels based on a number of principles as per the Intergovernmental Panel on Forests' Fourth Session held in 1997. Countries agreed that regardless of the approach adopted by individual countries, national forest programmes are long-term, iterative processes and should recognise the following:

- National sovereignty and country leadership;
- Consistency with national policies and international commitments, and integration with the country's sustainable development strategies;
- Partnership and participation;
- Good forest governance;
- Holistic, inter-sectoral and iterative approaches.

1.3 SUSTAINABLE FOREST MANAGEMENT

Sustainable Forest Management (SFM) is both the tool and the objective throughout this NFP. SFM is defined in the box.

> The UN General Assembly of June 1997 defined SFM as a "dynamic and evolving concept that aims to maintain and enhance the **economic, social** and **environmental** values of all types of forests, for the benefit of present and future generations".

The NFP presents a long-term framework based on principles of SFM including enhancing forest value chains, competitiveness, job creation and tapping market potential. It defines current and future intervention areas for forest and forestry development and transformation.

SFM, as recognised by FAO and UNFF, consists of core integrated elements:

- Legislation;
- Policy and institutional framework;
- Extent of forest resources;
- Socio-economic functions of forests;
- Forest biological diversity;
- Protective functions of forest resources;
- Forest health and vitality; and
- Productive functions of forest resources.

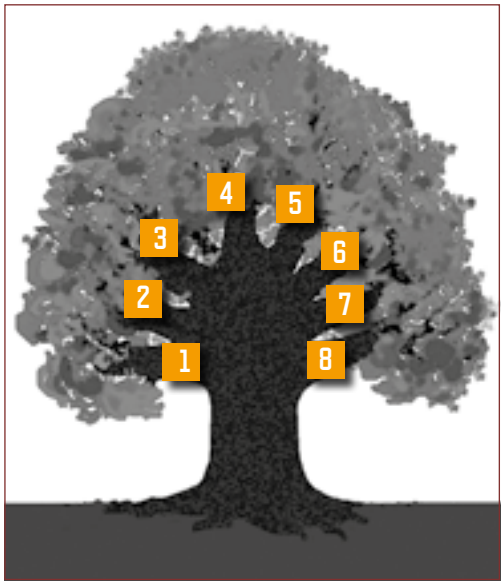
Forests around Mount Kenya form one of the country's most important water catchment areas.

BACKGROUND

1.4 THE NFP DEVELOPMENT PROCESS

Forest ecosystems and landscapes are interconnected with other sectors. They cut across county boundaries and involve multiple stakeholders, who include local communities, public institutions, the private sector and civil society. In this regard, forest development cannot be a top—down activity but requires consultation.

The NFP development started in 2012 through consultations with various stakeholders including women, youth and children's sensitisation assemblies. The private sector, state corporations, communities and civil societies were also extensively consulted. Eight thematic clusters were identified:



1. **Forest productivity**
2. **Forest governance**
3. **Natural forest management and conservation**
4. **Forest for water**
5. **Forest for energy**
6. **Forestry education, training and research**
7. **Forest and climate change**
8. **Forest financing**

Forest development is a major endeavour that requires mobilisation of multiple stakeholders and entire societies at all levels.

In 2014 the then Ministry of Environment, Water and Natural Resources (MEWNR), constituted the NFP Secretariat and a Steering Committee to drive the formulation process. This process was highly participatory and was supported jointly by the Government of Kenya and the Government of Finland.

Five regional workshops, awareness meetings, seminars, and two public hearings were undertaken. More than 700 stakeholders representing national and county governments, state corporations, communities, civil society, professional associations and the private sector were consulted and involved. Special sessions were held with disadvantaged and marginalised members of society including women, youth and forest-dependent communities.

During the regional workshops, stakeholders elected 140 representatives for continued engagement in the NFP development process in the eight thematic clusters (also referred to as thematic working groups). The thematic working groups provided the bulk of input that formed the basis for producing the NFP documents. The sequence, outcomes and details of the process are presented in Appendix A.

The Strategic Results Framework is used at all levels and is in this NFP highly focused on outcomes. The Results Framework provides the basis for identifying what type of

interventions will lead to the outcomes identified as preconditions for achieving the long-term goal. Through this approach, the precise link between the interventions and achievements is more fully understood. This leads to better planning as interventions are linked to a indepth understanding of how change actually happens. It also leads to better monitoring and evaluation as it is possible to measure progress towards the achievement of longer term goals that goes beyond identifying programme outputs. The strategic M&E framework is presented in Chapter 10.

This document was reviewed during several consultative meetings.

Over 600 representatives from the national and county governments, civil society, private sector and communities participated and contributed to the preparation of the NFP.

2 FORESTS IN ECONOMIC DEVELOPMENT AND GLOBAL DIALOGUE

Forests and trees on farms and rangelands provide economic, environmental and social benefits for economic development, as envisaged in Kenya's Vision 2030.

BACKGROUND

2.1 THE ROLE OF FORESTS IN NATIONAL DEVELOPMENT

2.1.1 Macro-economic benefits

According to the Green Economy Strategy Implementation Plan 2015 (GoK, 2015a), the natural resource-related sectors contribute about 42% of Kenya's GDP and 70% of overall employment. These sectors include agriculture, mining, forestry, fishing, tourism, water supply and energy. The Constitution provides for a robust governance framework in the management of natural resources by the two-tier government system. Specifically, the Constitution stipulates devolution, equity in benefit sharing and sets a target of a minimum 10% tree cover.

Well-managed forests have tremendous potential to contribute to sustainable development. Indeed, forestry can make a significant contribution towards meeting green economy objectives and promoting food security.

The forestry sector's contribution to the national economy is largely unrecorded as most forest products are used for subsistence or are traded in informal markets (UNEP, 2012). Available statistics show that forests contributed about 1.4% to Kenya's GDP in 2014. FAO's State of the World's Forest (2014), estimates that Kenya's forestry sector contributes USD 365 million to the GDP annually. These statistics, however, do not include forestry's contribution to household wood energy (charcoal production), non-timber products and ecosystem services.

The national study on charcoal in Kenya by ESDA (2005) estimated that annual production was 1.6 million tons. Production has since risen to 2.5 million tons, an increase of 156% within eight years (or almost 20% growth per annum). The economic value of charcoal production over the same period grew from KShs 32 billion to KShs 135 billion, representing a 422% growth. To provide efficient and effective management of charcoal production, Forests (Charcoal) Rules, 2009 have been developed and are operational.

The furniture market supplied by the informal (jua kali) sector and targeting the domestic market has an estimated production value of about KShs 23 billion whereas the formal furniture industry estimate is worth KShs 15 billion, as of 2013 (Creapo Oy, 2014).

Charcoal provides domestic energy for 82% of urban and 34% of rural households.

A survey on production and marketing of non-wood forest products carried out by Vomigal Ltd., found that NWFPs play important roles in Kenya's economy, generating about KShs 3.2 billion per year (USD 40 million per year). However, this figure is not accounted for in national statistics. Grazing and hunting of game meat account for nearly 60% of NWFPs, about KShs 510 million. Other NWFPs include fibre (KShs 149 million), honey (KShs 139 million) and others (KShs 70 million) (KFS, 2007; FAO, 2015b).

Tourism generates about USD 1 billion of foreign revenue for the nation, second to tea exports (Doya, 2015). Parks and reserves remain the main attraction for most tourists: over 70% of all foreign tourists rank wildlife as their primary attraction and undertake wildlife and nature forest-based tourism.

In conclusion, the true value of forest resources' annual contribution to the GDP is estimated at 3–3.6%, but this estimate still excludes the vast value of ecosystem services (FAO, 2014; UNEP, 2012).

2.1.2 Socio-economic benefits

Major forest products are timber, poles and fuel wood. Other products include non-timber forest products (gums, resins, honey, etc.) and fodder, and form substantial inputs to rural life and small-scale enterprises. Similarly, medicinal trees and forest plants play important roles in rural health.

The forest industry (formal and informal) employs directly **about 750,000 Kenyans** and indirectly benefits at least **4 million more citizens**.

Wood fuel is the major form of biomass energy in Kenya. Firewood meets over 64.5% of household energy needs while charcoal meets 7% (Weismann et al., 2014). Charcoal is the dominant fuel in urban households. It provides domestic energy for 82% of urban and 34% of rural households. The charcoal sector has acquired considerable economic importance because of increasing urbanisation (Githiomi, 2012).

Forest trees provide important food and fodder during periods when people have less time for food preparation, such as during peak agricultural seasons. Traditionally, trees have provided food and fodder during emergency periods, especially during drought and famine. Nonetheless, the decline in forest resources has led to a decline in knowledge about them.

Forests play an invaluable role in meeting cultural and spiritual needs. Forests are important as sacred sites for cultural ceremonies by local communities (e.g. Kaya Forests at the coast). Several indigenous communities have depended on forests for centuries.

Among manufacturing industries in Kenya, the forest industry is a significant employer. According to the KNBS Statistical Abstract (KNBS, 2014), the total wage employment was 26,371 persons employed in the sawmilling industry; 10,188 persons in furniture manufacturing (in addition to the 65% of the furniture production which is produced by an unknown number of jua kali artisans in the informal sector) and the pulp and paper industry employed 56,980 persons.

The charcoal industry is also part of the informal sector and is by far the largest contributor to job creation, employing approximately 700,000 people, who in turn are believed to be supporting 2.3–2.5 million dependants. In spite of its significance, the charcoal sub-sector continues to bear a negative image and remains largely informal, thus limiting its potential to attract investment (MEWNR, 2013a).

It is estimated that the formal forest sector employs 18,000–50,000 people directly and 300,000–600,000 indirectly, making it a source of employment particularly in the rural areas of Kenya (FAO, 2014; KFS 2015b). The potential to increase jobs through enhancing value chains is substantial.

Community-based tourism and ecotourism is a growing sector in Kenya. The tourism sector currently accounts for 5% of the global tourism market and is growing at a rate of 20–30% annually. In Kenya infrastructure has been prioritised and is under development. Community members are employed and trained in nature-based projects and benefit from wages, community development funds and involvement in spin-off enterprises (KTDC, 2015).

It is estimated that 80% of people in Africa use traditional medicine (FAO, 2014; WHO's Traditional Medicine Strategy, 2002) well above its use in India (65%) and China (40%). Traditional medicine therefore plays an important part in the health of people in Africa and Kenya as well. Forests provide the bulk of traditional medicines.

2.1.3 Environmental and ecological benefits

Forest ecosystem services are the foundation for the success of other productive sectors such as agriculture, tourism, infrastructure, livestock, wildlife, industry, water and energy. Forest habitats support a wide variety of ecological niches and are rich in flora with about 7,000 indigenous plant species. Forests are also reservoirs of biodiversity and critical habitats for wildlife. For example, mangrove forests are essential breeding grounds for fish and protect the coastal areas from degradation.

Ecological functions (nutrient cycling and erosion prevention) of trees in the ASALs and highland areas support pastoralism and agriculture. Dryland forests are therefore critical to human existence and drought resilience in the ASALs.

Forest development and climate change are intimately linked. Forests play an important role in carbon sequestration and in climate change mitigation and adaptation. Other benefits include provision of products and services that people depend on directly or indirectly such as nitrogen fixing, soil and water conservation, and provision of shade, fodder, fibre and materials for construction.

Forests provide wildlife habitat, biological diversity, water catchment, employment opportunities and livelihood sources. Forests and trees play multiple functions in contributing to the livelihoods of Kenyans, especially of women and marginal groups, through provision of food and energy especially in rural areas.

The forested water towers and other forested catchment areas supply most of the nation's water. They feed, filter rainwater and provide a sustained water supply to rivers and lakes as well as providing more than 15,800 million cubic meters of water per year, representing over 75% of the country's renewable surface water resources. Forests store water during the rainy seasons and release it slowly, ensuring water flow during dry periods, thus providing resilience to seasonal weather variations. They are, however, threatened by agricultural expansion, over-exploitation and unsustainable use. Between 2000 and 2010, deforestation in the water towers amounted to an estimated 50,000 hectares, leading to reduced water availability by approximately 62 million cubic meters per year (UNEP, 2012)

2.2 THE INTERNATIONAL FOREST POLICY AND THE STATE OF GLOBAL FORESTS

The development of an international forest policy has been going on since the 1980s and especially so after the Rio Summit, the United Nations Conference on Environment and Development (UNCED) in 1992.

Despite these efforts, the global natural forest cover was lost at a rate of about 13 million hectares per year between 1980 and 2010 (FAO, 2010). Currently, forest degradation and deforestation are major contributors to the total global greenhouse gas emissions. Deforestation is thus a major contributor to climate change and with it the increased frequency of natural disasters experienced globally. Some countries like Rwanda, Costa Rica, China and Vietnam have reversed the trend of national deforestation.

The loss of forests is also a major problem in many African countries including Kenya. The African Union has fully recognised this:

> "The African Union recognises forests and woodlands as important resources for uplifting the continent from poverty, especially with regard to energy, food, timber, a wide range of non-timber forest products and environmental services that underpin ecosystem functions in support of agricultural productivity and sustainability" (IIED, 2014c. p. 39).

In this regard, during the last decade Kenya has been active in taking definite steps to reduce forest degradation and deforestation. The country has increasingly participated in international forest dialogues and has embraced international approaches to enhance sustainable forest management at national and local levels.

2.3 INTERNATIONAL FRAMEWORKS

2.3.1 Approaches for setting priorities

Forestry Master Plans: The development of forestry master plans was launched in the 1960s and continued up to the 1990s. Forestry master plans were sector based and with detailed technical plans and sector projections.

Kenya Forestry Master Plan: Preparatory studies and development of the Kenya Forestry Master Plan (KFMP) took place with Finnish assistance from 1990 to 1995. The implementation of the master plan was anchored on five primary development programmes supported by other cross-cutting programmes covering policy and legislation reforms, human resources, research and development, extension and planning, monitoring and environmental assessment. An overall assessment of the implementation of the five primary programmes indicates mixed achievements due to weak stakeholder support, inadequate political goodwill and weak implementation. Nevertheless, a notable achievement was the policy review and institutional reforms which led to creation of the Kenya Forest Service, and legal provision for wider stakeholder participation in forest management (KFS/DoF, 1994).

Tropical Forestry Action Programme: Forestry master plans were largely replaced during the 1980s by initiatives to curb tropical deforestation through the Tropical Forestry Action Programme.

Forestry Sector Reviews: Forestry sector reviews were commonly launched in the 1980s, often initiated by the World Bank and integrated with the Tropical Forestry Action Programmes. The sector reviews had a focus on commercial wood production.

National Environmental Action Plans: Development of national environmental action plans was common in African countries in the late 1980s. They were linked to the creation of national environment management authorities. In Kenya, the Environment Management and Coordination Act was enacted in 1999, which created the National Environment Management Authority (NEMA). Forestry was considered part of environmental management.

National Forest Programmes (NFPs): NFPs are based on internationally recognised concepts for country processes towards the achievement of sustainable forest management. The concept originated from UNCED in 1992 and has been conceptualised through the United Nations-supported "Inter-Government Panel" and "Forum on Forests". NFPs deviate from previous strategies by building on a cross-sectoral, participatory, transparent and inclusive approach, which is a product of the new international forest agenda.

Cross-sectoral approach and broad stakeholder participation are the central principles in National Forest Programme preparation.

2.3.2 Evolution of a new international forest agenda

A series of international events have led to a new international forest agenda. Forest development is now considered an integral part of sustainable development. Some important milestones:

Rio 1992 – The Earth Summit

The need to integrate sustainable development with forest development became a central element in the United Nations Conference on Environment and Development, also known as the Earth Summit. An outcome of the conference was a recognition declared worldwide that sustainable development and forests are inter-twined dynamics. Forestry was specifically referred to in chapter 11 of Agenda 21 under "Combating Deforestation". A subsequent outcome was The Forest Principles, a set of guiding principles for SFM.

> The Forest Principles express the necessity of recognising the close and interdependent relationship between forest development, our society and human existence as a whole.

Other important developments

Between 1995 and 1997, dialogue on forests took place in the Intergovernmental Panel on Forests, which was transformed into the Intergovernmental Forum on Forests 1997–2000, and again in 2002 into the UN Forum on Forests (UNFF). In 2000, the United Nations General Assembly adopted the Millennium Development Goals. Forestry development was specifically related to Millennium Development Goal 7: Ensure Environmental Stability.

At the World Summit on Sustainable Development held in South Africa in 2002, sustainable development was recognised as the overarching goal. The MDGs were presented for implementation. In the same year, the UNFF developed the landmark **Non-Legally Binding Instrument on All Types of Forests**, commonly known as the **Forest Instrument**, entailing four Global Forest Objectives (FAO, 2013b). The intergovernmental instrument on forests consists of policies and measures to strengthen stakeholder participation within the framework of NFPs.

The four Global Forest Objectives:

1. Reverse the loss of forest;
2. Enhance forest-based economic, social and environmental benefits;
3. Increase significantly the area of sustainably managed forests, including protected forests, and increase the proportion of forest products derived from sustainably managed forests;
4. Reverse the decline in official development assistance for sustainable forest management (UNFF Secretariat, 2014).

United Nations Conference on Sustainable Development

In 2012, twenty years after the first Rio Summit, the United Nations Conference on Sustainable Development (UNCSD) was likewise held in Rio de Janeiro. A prime result was the non-binding document **The Future We Want**. In this document, Heads of States reaffirmed their commitment to the promotion of a sustainable future and, in view of the expiring Millennium Development Goals, the Sustainable Development Goals (SDGs) were set to promote sustainable development from 2015 and onwards.

2.3.3 Sustainable Development Goals

The Sustainable Development Goals succeeded the Millennium Development Goals as the international development agenda from 2015. Forests have received remarkable attention and the SDGs dialogue on multiple aspects. In the SDGs, forests are addressed directly under six SDGs:

- **SDG6**: Ensure availability and sustainable management of water and sanitation for all
- **SDG11**: Make cities and human settlements inclusive, safe, resilient and sustainable
- **SDG12**: Ensure sustainable production and consumption patterns
- **SDG13**: Take urgent action to combat climate change and its impacts
- **SDG14**: Conserve and sustainably use the oceans, seas, marine resources for sustainable development
- **SDG15**: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss.

Recognising multiple functions of forests the SDGs set out strong forest-based targets:

- By 2020, ensure conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems with their services, in particular forests, wetlands, mountains and dry lands, in line with obligations under international agreements (SDG15.1).
- By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests, and increase afforestation and reforestation (SDG15.2).
- Significantly mobilise resources from all sources and at all levels to finance sustainable forest management, and provide adequate incentives to developing countries to advance sustainable forest management including conservation and reforestation (SDG15.b).
- By 2020, protect and restore water-related ecosystems including mountains, forests, wetlands, rivers, aquifers and lakes (SDG6.6).
- By 2030, achieve the sustainable management and efficient use of natural resources (SDG12.2).

However, the SDGs do not capture the true value of forests nor tackle drivers of deforestation nor ensure more focus on social balances in the use of and benefit from forests. Such priorities must instead be refined and adopted through a national strategic forest framework, notably, national forest programmes (adapted from IIED 2014a; IIED 2014b; IIED 2014c).

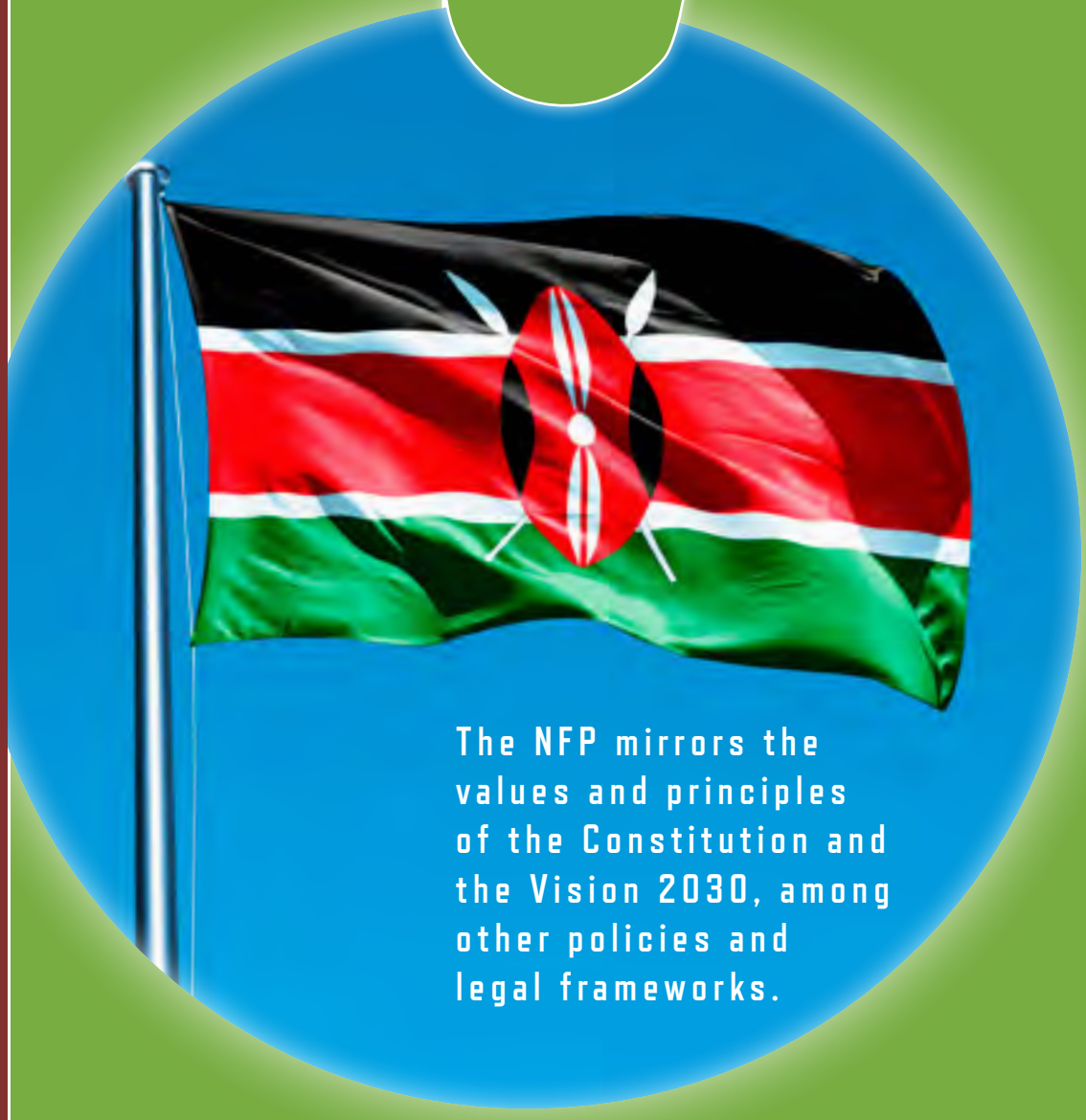
2.3.4 Other international initiatives and agreements

In line with the Constitution, any treaty or convention ratified by Kenya shall form part of the law of Kenya. This is applicable to multilateral environmental agreements (MEAs). Some of the international and regional initiatives and agreements with a bearing on forestry development in Kenya are listed in Table 2.1.

Table 2.1. International initiatives and agreements with a bearing on forestry.

Initiatives/agreements/ conventions related to international forest policy	Role and mission
African Convention on the Conservation of Nature and Natural Resources	The convention encourages individual and joint action for the conservation, utilisation and development of soil, water and fauna for the present and future.
Collaborative Partnership on Forests (CPF)	The CPF is an informal, voluntary arrangement among 14 international organisations and secretariats with substantial research or programmes on forests. The CPF mission is to promote sustainable management of all types of forests and to strengthen long-term political commitment to this end.
The Committee on Forestry	This is an intergovernmental forum linked to FAO for discussion on forests. It identifies policy and technical issues in global forestry.
The Common Market for Eastern and Southern Africa (COMESA)	COMESA is a regional economic treaty established in 1993 amongst 20 countries. COMESA has a forest management strategy that outlines key investments in the forestry sector such as payments for environmental services, combating illegal trade and capturing the full value of forestry sectors in national economies.
Convention on Biological Diversity (CBD)	CBD conserves biological diversity, promotes sustainable use of its components and encourages equitable sharing of the benefits arising from the use of genetic resources.
The Convention on Int. Trade in Endangered Species (CITES)	CITES protects endangered species.
Forest Law Enforcement, Governance and Trade (FLEGT)	The European Union adopted the Action Plan for FLEGT in 2004 and the subsequent timber law, with the ultimate goals of significantly reducing the trade and use of illegally harvested timber whilst promoting legally harvested timber in the European Union. The underlying rationale is to enshrine SFM and the rule of law in timber trade. An initiative "East African FLEGT" has prepared a shared strategy for FLEGT development in the region.
International agreements on certification of sustainable forest management and products	Various certification schemes exist. One is the FSC Principles and Criteria— the highest standards of forest management that is environmentally appropriate, socially beneficial and economically viable. Kenya has developed a draft strategy for FSC accreditation and standards. A study by MENR and KFS on Governance for East African Countries in 2007 recommended certification schemes to be developed (KFS, 2007).
Intergovernmental Authority on Development (IGAD)	In 1983, six countries in the Horn of Africa, including Kenya and Uganda, took action through the UN to establish an intergovernmental body for development and drought control in their region. In 1996, it was transformed into a new organisation with expanded mandate. It has HQs in Djibouti.
International Convention for the Protection of New Varieties of Plants	Recognises and protects the rights of breeders of new varieties of plants and their successors.
International Plant Protection Convention (IPPC)	IPPC maintains and increases international cooperation in controlling pests and diseases of plants and plant products and in preventing their production and spread across national boundaries.
International Tropical Timber Agreement 2006 (ITTA)	This is the only binding international agreement specifically covering forests. The ITTA regulates the work of the International Tropical Timber Organization and covers only tropical timber-producing forests.
Protocol for Sustainable Development of Lake Victoria Basin and the Protocol on Environment and Natural Resources for the EAC	The protocol on sustainable development of Lake Victoria Basin in Article 3 on the Scope of Co-operation — Part (d), Article 6 on Protection and Conservation of the Basin and its Ecosystems as well as Article 20 on Prevention of Pollution from Non-point Sources together with the protocol on Environment and Natural Resources, Article 11, provide for a more basin-wide collaboration in forestry.
The Ramsar Convention	Protects wetlands.
Reducing Emissions From Deforestation and Forest Degradation (REDD+ mechanisms)	The REDD+ partnerships were initiated to implement the "fast-track funding" pledges made within the context of the so-called Copenhagen Accord reached among a group of countries at UNFCCC COP-15. REDD+ serves as an interim platform for its partner countries to scale up actions and finance for REDD+ initiatives in developing countries.
United Nations Convention to Combat Desertification (UNCCD)	UNCCD combats desertification and mitigates the effects of drought in the countries affected through effective action.
United Nations Framework Convention on Climate Change (UNFCCC)	UNFCC regulates levels of greenhouse gas concentrations in the atmosphere, with the intention to prevent climate change from reaching a level that would impede sustainable economic development.

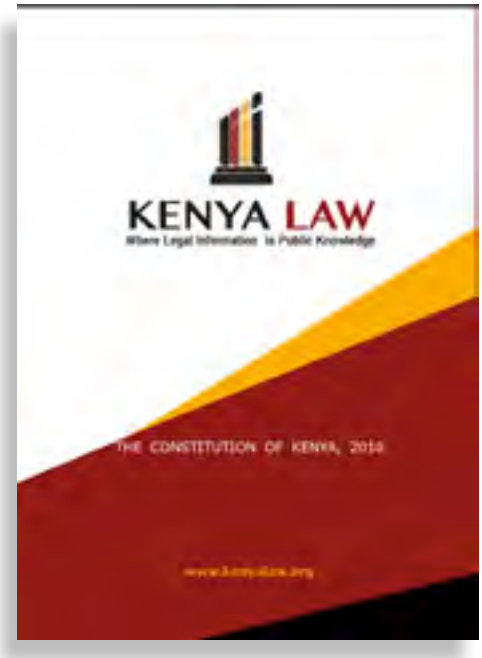
3 NATIONAL POLICIES AND LEGAL FRAMEWORKS



The NFP mirrors the values and principles of the Constitution and the Vision 2030, among other policies and legal frameworks.

3.1 THE CONSTITUTION OF KENYA, 2010

Chapter 5 of the Constitution deals with land, the environment and natural resources. Land is categorised into public, community and private land. Article 69(1) emphasises the development and management of the forestry sector through:



a) sustainable exploitation, utilisation, management and conservation of the environment and natural resources, as equitable sharing of the accruing benefits;

b) achieving and maintaining at least 10% tree cover of the land area;

c) protecting and enhancing intellectual property and indigenous knowledge;

d) public participation in the management, protection and conservation of the environment;

e) protecting genetic resources and biological diversity;

f) establishing systems of environmental impact assessment, audit and monitoring;

g) eliminating processes and activities that are likely to endanger the environment; and,

h) using the environment and natural resources for the benefit of the people of Kenya.

The Constitution further provides for concessions to natural resources including forest concessions in Article 71(1), subject to ratification by parliament. Article 174 provides for the objects of devolving national government functions while schedule 4 provides for the devolution of forestry functions.

3.2 POLICIES AND LEGISLATION

The key national policies and legislation that influence forest management, related land uses and other aspects ensuring sustainable forest management are listed in Table 3.1.

During the last 10 years, integration of good governance, transparency and accountability as well as equity and poverty reduction in the forestry sector has been introduced and is gradually making an impact. Changes such as granting of some rights to forest conservancy committees (FCCs) and community forest associations (CFAs) are achievements of the new institutional arrangements. In the Forest Conservation and Management Bill (2015), good governance, access to public information, devolution, equitable sharing of benefits and provision of incentives are key principles of the Bill yet to be enacted. The Bill provides for management of private forests and incentives to increase forest and tree cover. Additionally, it provides for collaboration among relevant ministries and stakeholders to realise the constitutional target of a national tree cover of at least 10%.

Table 3.1. Key policies and legislation affecting the forestry sector.

Draft National Forest Policy, 2015
- Introduces a number of initiatives to improve and develop the forest resource base through integration of good governance, transparency, and accountability, equity and poverty reduction in the forestry sector.

National Wildlife Conservation and Management Policy, 2012
- Supports the conservation and rehabilitation of forests and other water catchment areas that are significant wildlife habitats.
- Promotes the establishment of transboundary and/or transfrontier wildlife conservation areas.

Draft National Energy Policy, 2014
- Stresses collaboration with other relevant ministries and stakeholders to grow and sustain tree cover to above 10%.
- Proposes incentives for private sector participation in generation, exploitation, production, distribution, supply and use of biomass energy.

National Food and Nutrition Security Policy, 2011
- Emphasises strategies aimed at enabling local communities to effectively adapt to climate change and reduce impact on food and nutrition security.
- Promotes rainwater harvesting for irrigation and livestock use, more so in the ASALs.

National Policy on Gender and Development, 2000
- Focuses on nine themes: the economy and agriculture, poverty and sustainable livelihoods, law and justice, political participation, education and training, health and population, environmental sustainability, peace, security and conflict resolution as well as media and information technology.

Forests Act, 2005
- Brought major positive changes in the forestry sector and institutional reforms and a focus on improved governance; created the Kenya Forest Service as a semi-autonomous government agency and devolved levels of forest governance like the forest conservancy committees and community forest associations, thus recognising the role of forest-adjacent communities and giving them some user rights provisions. It also allowed joint forest management and forest concessions.

Forest Conservation and Management Bill (a Bill that seeks to repeal the Forests Act, 2005 once enacted)
- The Bill proposes legal provisions applicable to management of all forests on public, community and private land. Good governance, access to public information, devolution, equitable sharing of benefits and provision of incentives are key principles of the Bill.

Continues >

< Table 3.1, continued

Environmental Management and Coordination (Amendment) Act, 2015

- A framework law for the management and coordination of environment matters that has a bearing on forestry sector. Provides for protection of forests and environmental impact assessments of forestry-related developments.

The Energy Act, Cap 314, 2006

- A framework law for energy development, management and efficient use of renewable energy technologies, including biomass, bio-ethanol, charcoal, fuelwood, biogas and municipal waste, among others.

County Government Act, 2012 (revised 2013)

- Ensures environmental sustainability, strategic environmental impact assessments and protects and develops natural resources.
- Protects and promotes interests and rights of minorities, marginalised groups and communities and their access to relevant information.
- Requires meaningful engagement of citizens in the planning processes.

Wildlife Conservation and Management Act, 2013

- Improves protection, conservation, sustainable use and management of the country's wildlife resources; the conservation of forests within national parks, national reserves and sanctuaries, and of all wild animals occurring in all forests.
- Promotes effective public participation and sustainable utilisation.

Agriculture, Fisheries and Food Authority Act, 2013

- Implements the Crops and Fisheries Acts which promote soil and water conservation and prevent the destruction of vegetation; requiring, regulating or controlling the afforestation or re-afforestation of land, among other things.

The Land Act, 2012

- Consolidates and rationalises land laws in Kenya and provides for the sustainable administration and management of land and land-based resources.
- Provides for the jurisdiction of the Land and Environment Court and on public land, identifies forest land as one of the public lands that cannot be allocated to anyone.

The Water Act, 2002

- Provides for the management, conservation use and control of water resources. Establishes water resource management authorities with powers to develop principles, guidelines and procedures for allocating water resources in addition to protecting and managing water catchment areas. Provides for establishment of water resource users' associations whose mandate includes protecting water catchment areas.

National Museums and Heritage Act, 2006

- Provides for legal protection of heritage sites and establishes protected area designations including national monuments. As a consequence of this Act, to date 41 Kaya sites are exclusively gazetted as national monuments (sacred groves). Kaya forests are explicitly mentioned in the Act as important heritage areas.

Public-Private Partnerships (PPP) Act, 2013

- Provides for the participation of the private sector in the financing, construction, development, operation or maintenance of infrastructure or development projects of the government through concession or other contractual arrangements.
- Defines the structure, parties' mandates, forms of intervention and processes for establishing PPPs in Kenya.

Natural Resources Benefit Sharing Bill, 2015

- Proposes the establishment of natural resources benefit-sharing arrangements between the national and county governments and local communities.

The Timber Act, Cap. 386, 1972

- Provides for the control of the sale and export of timber by means of grading, inspection, and marking. It also provides for control of timber in transit.

Mining Act, 2015

- Proposes prospecting, mining, processing, treatment, transport and dealings in minerals, of which some activities may impact forests.

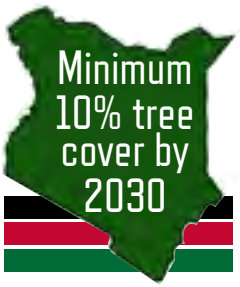
Community Land Bill, 2015

- Proposes the recognition, protection and registration of community land rights; management and administration of community land to provide for the role of county governments in relation to unregistered community land and for connected purposes.

Intergovernmental Relations (Amendment) Bill, 2014

- Proposes cooperation between the two tiers of government (national and county) for continued prosperity of the nation.

3.3 ASSOCIATED STRATEGIES AND PLANS



Increased forest cover is one of the targets of the Kenya Vision 2030.

Kenya Vision 2030: The objective of Vision 2030 is to transform Kenya into a middle-income country providing a high quality of life to all its citizens by 2030. Vision 2030 is implemented in successive five-year medium-term plans. It places the environmental sector in the social pillar and emphasises the need to conserve natural resources to support economic growth. In forestry, the goal is to increase area under forest and sustainably manage natural forest resources for environmental protection and enhanced economic growth.

National Climate Change Response Strategy (2010): This strategy emphasises the forestry sector's significant role in climate change mitigation and adaptation.

National Climate Change Action Plan (2013–2017): The National Climate Change Action Plan (2013–2017) presents actions aimed at both adaptation and mitigation of the adverse effects of climate change. The Action Plan includes several major actions related to forests and forestry. A draft Climate Change Policy has also been developed.

Kenya Green Economy Strategy and Implementation Plan (2015): The strategy addresses national development goals for "rapid economic growth in a stable macro-economic environment" and aims to contribute to the sustainable achievement of the goals of Vision 2030. Central to the strategy are policy options that enhance and exploit synergies between economic growth, environmental sustainability and social equity. The strategy outlines the policy options for a green economy in the Kenyan context and is cognizant of the several ongoing green economy initiatives, policies and activities. The conditions provided through reforestation and forest services for sustainable agriculture, water and energy are highlighted as central elements for sustainable economic and social development.

Institutional Strategies Addressing Forest Management: The NFP development process referred to some key institutional strategies including:

- Strategic plan for the MENR&RDA 2014–2017
- KFS Strategic Plan 2014–2017
- KEFRI Strategic Plan 2014–2018
- Master Plan for Conservation and Sustainable Management of the Water Catchment Areas in Kenya 2012
- Kenya Water Towers Strategic Plan 2016–2020
- the Kenya Water Strategic Plan and
- the draft National Strategy for Increasing Forest Cover 2015–2020.

All the strategies if properly implemented will mobilise resources and will enhance sustainable forest management and increase forest cover in the country.

4 KENYA'S FORESTS

This chapter addresses the characteristics and classification of Kenya's forests.

BACKGROUND

4.1 CHARACTERISTICS OF KENYA'S FORESTS

According to the last inventory undertaken in 2010 (KFS, 2013a), forests in Kenya occupy 6.99% of the land area. These forests are categorised as Montane, Western rainforest, Bamboo, Afro-montane undifferentiated forest, Coastal and Dryland forests. The montane forest and the coastal forest regions are the most forested with 18% and 10% forest cover, respectively.

Natural forests in Kenya are made up of montane forests, which occupy about 2% of the total land area (1.14 million hectares). A considerable area of 2.13 million hectares consists of bushland and mangroves. Public and private plantations constitute 220,000 hectares (FAO, 2015d). The distribution of forests in 2010 is presented in Figure 4.1.

Kenya's forests covered approximately 7% (4.4 million hectares) of the total land area in 2010. The forest cover has been increasing by 0.1% annually since 2000.

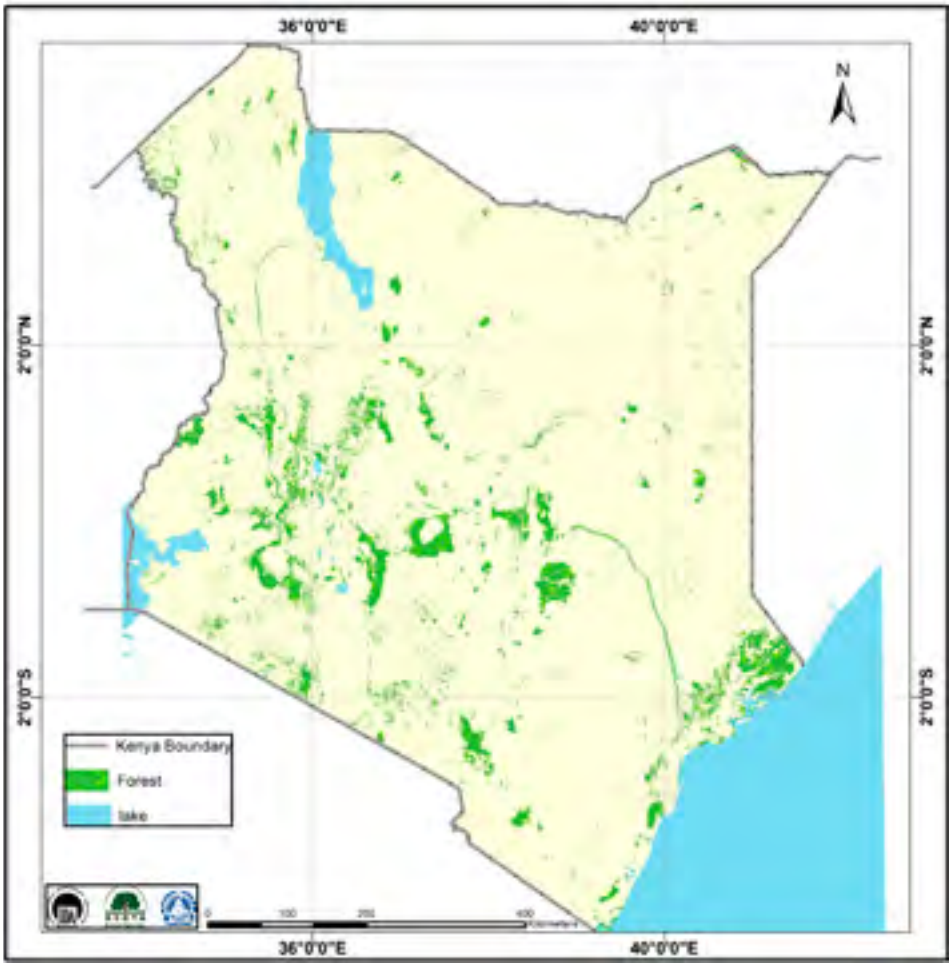


Figure 4.1. Distribution of forests in 2010. (KFS)

Table 4.1. Land-use area changes in Kenya ('000 ha), 1990–2015.

Land use	1990	2000	2005	2010	2015
Forest land	4,724	3,557	4,047	4,230	4,413
Crop land	9,258	9,661	9,868	10,072	10,276
Grassland	41,522	41,654	41,496	41,08	40,664
Settlement	57	87	109	126	143
Other lands	1,004	1,574	1,035	1,044	1,053
Wetlands	1,472	1,504	1,482	1,485	1,488
Total area	**58,037**	**58,037**	**58,037**	**58,037**	**58,037**

Source: FAO, 2015d

Analysis of change in forest cover over the last 25 years revealed improved afforestation activities. Forest land has decreased by 311,000 ha while crop land increased by 1,018,000 ha between 1990 and 2015. Between 1990 and 2000, Kenya lost approximately 1.2 million ha of forest land, equivalent to 25% of forest cover. However, there is a remarkable increase in forest cover from 6.01% in 2000 to the predicted 7.46% in 2015. This is equivalent to an annual increase of 0.1% (Table 4.2). Difference in total forest area for 2010 in Table 4.1 and Table 4.2 is attributed to different data sources.

Table 4.2. Analysis of forest cover change, 1990–2015.

Year	Forest area ('000 ha)	Percent forest cover	Annual change ('000 ha)	Annualised change (%)
1990	4,724	7.98		
2000	3,557	6.01	–1,167	–24.7
2005	4,047	6.84	490	13.8
2010	4,136	6.99	89,4	2.2
2015 (projected)	4,413	7.46	276,6	6.7

Source: KFS, 2013b

Most (77%) of the forest land in Kenya is under community and private ownership while 23% is public. Private plantations cover 47% of the total forest plantation area, which is almost equal to the area of stocked plantations under public management (53%) (Table 4.3, Figure 4.2).

Table 4.3. Comparison of public and community/private forests in Kenya.

	Natural forests (ha)	Plantations, stocked (ha)	Total (ha)
Gazetted (GoK)	842,100	98,323	940,423
Community/private	3,103,008	88,393	3,191,401
Total	**3,945,108**	**186,716**	**4,131,824**

Source: KFS, 2013b

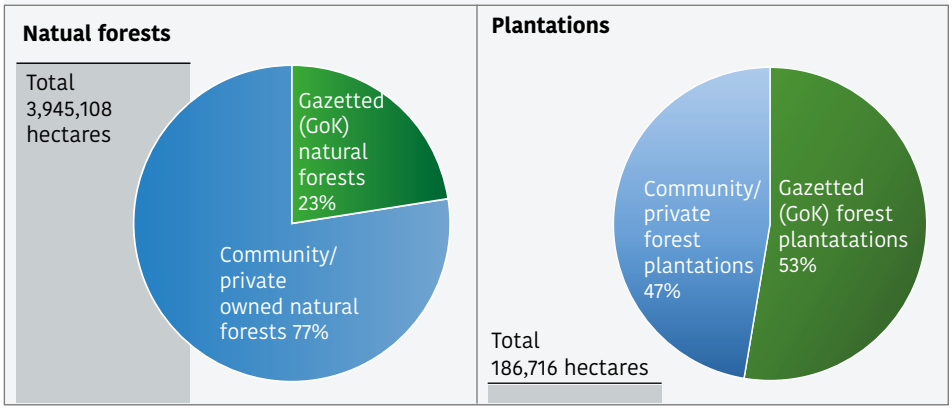


Figure 4.2. Public and community/private natural forests and plantations, % of total forest areas.

CKGROUND

4.3 FOREST TYPES

The description and classification of forests vary and efforts have been made to harmonise them. Peltorinne (2004) classified Kenya's forests into six main geographical formations:

1. The high mountains and high ranges: Elgon, Kenya, Aberdares, Cherangani and Mau
2. Western plateau: Kabarnet, Kakamega, Nandi and Trans-Mara
3. Northern mountains: Ndotos, Mathews, Leroghi, Kulal and Marsabit
4. Coastal forests: Arabuko-Sokoke, Tana, Kayas, coral rag and mangrove forests
5. Southern hills: Taita Hills, Kasigau, Shimba Hills, Chyulu Hills and Nguruman
6. Riverine forests: Tana and tributaries, Ewaso-Ngiro, Kerio, Turkwell and Galana.

Before this, White (1983) had categorised Kenya's forest types into four major groups. This classification was later modified by Van Breugel et al. (2011) (Table 4.4).

Guinea-Congolian (western) rainforest: The Guinea-Congolian rainforest is distributed from the coastal areas of West Africa to the Congo Basin. The Kakamega and Nandi forest reserves represent this type of forest (Figure 4.3). The dominant species are *Croton megalocarpus*, *Bosqueia phoberos*, *Celtis durandii*, *Aningeria altissima*, *Funtumia elastica, Antiaris toxicaria*, *Craibia brownii* and *Olea capensis.*

Afro-montane forest: The Afro-montane forest type is associated with highland forests in Africa that spread from Guinea and Liberia in the west to Ethiopia in the east and the Drakensberg Mountains in the south. There is a close relationship between plant species in these forests, although the region is sub-divided into several afro-montane systems (White, 1978). In Kenya afro-montane forest covers Mt. Kenya, the Aberdares, Karura, Mau Forest Complex, the Cherangani Hills, Mt Elgon, Mt Nyiro, Mt Kulal, Mathews Range and Mt Marsabit forest ecosystems. These forests form the catchments of the main rivers of the "water towers" in Kenya. These forest types are considered within two major sub-types: the mixed indigenous natural forest and bamboo dominated forest (Figures 4.5 and 4.6).

Table 4.4. Forest types and corresponding areas.

Forest type	Forest sub-types	Approximate area (ha)	% of total forest area
Guinea-Congolian rain forest/Western plateau	Natural forest (mixed indigenous)	144,615	3.5
Afro-montane forest	Natural forest (mixed indigenous)	1,359,860	32.9
	Bamboo	85,693	2.1
Coastal forest	Natural forest (mixed indigenous trees)	295,871	7.2
	Mangroves	48,522	1.2
Dryland forests	Natural forest (mixed indigenous trees)	1,875,316	45.4
	Riverine forest	135,231	3.3
Stocked forest plantations /planted forests	Indigenous and exotic trees	186,716	4.5

Source: KFS 2013, based on the forest cover mapping of 2013 using 2010 satellite imageries.

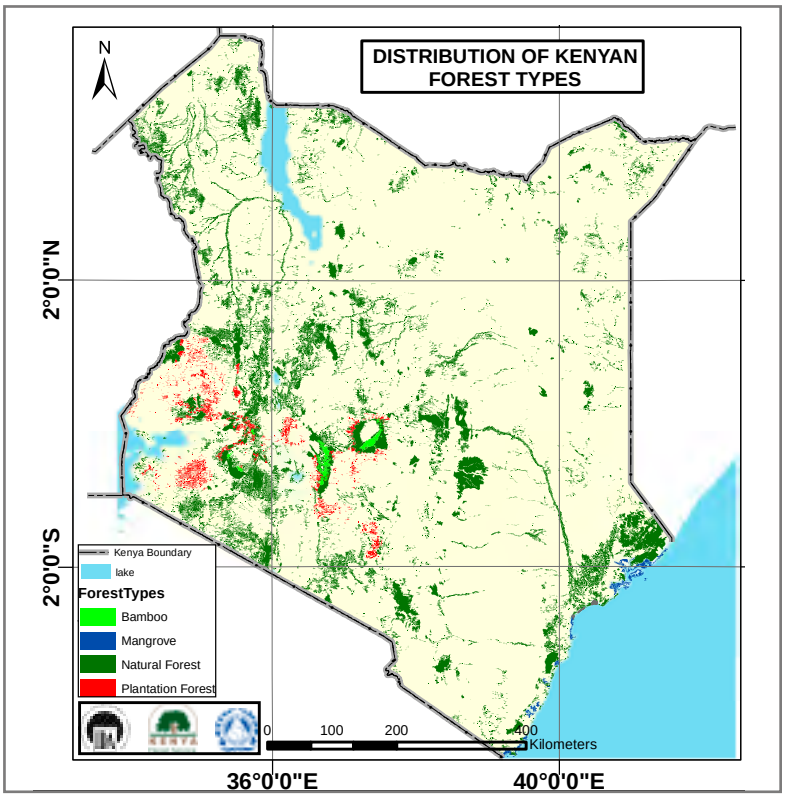


Figure 4.3. Distribution of forest types in Kenya.

Afro-montane natural forest sub-type: Afro-montane natural forest vegetation varies with altitude and rainfall.

The dominant tree species in this forest sub-type include *Syzygium guineense, Macaranga capensis, Neoboutonia macrocalyx, Xymalos monospora, Tabernaemontana stapfiana, Juniperous procera, Podocarpus* spp., *Ocotea usambarensis, Olea capensis* and *Vitex keniensis*.

On the lower parts, the dominant species are O*lea europea, Juniperous procera, Mytenus* spp., *Teclea simplicifolia and Podocarpus falcatus*. These forest types are found in high-potential areas and are under constant pressure of being converted to agricultural land use. They are rich in biodiversity and are good habitats for wildlife. The forests are also adjacent to high population density areas and therefore prone to encroachment for wood and non-wood forest products.

Bamboo forest sub-type: These forest sub-types are found in high altitude areas in montane forest regions, domi-

Figure 4.4.
Kakamega Forest.

Figure 4.5. Meru Forest, Mt. Kenya.

Figure 4.6. Bamboo forest.

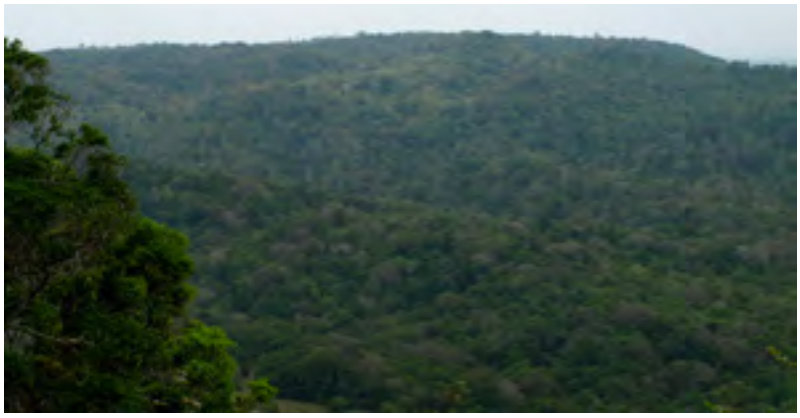


Figure 4.7. Shimba Hills, coastal natural forests.

Figure 4.8. Mangrove forest.

Figure 4.9. Dryland forest.

nated by continuous stands of highland bamboo (*Yushania alpina*).

Coastal forest: The coastal forest types (Figure 4.7) are found in a narrow coastal strip running inland approximately 30 km from the coastline and stretch from southern Somalia to northern Mozambique. The climate of these eco-regions is tropical with average temperatures above 25˚C, with little variation in day length and generally high humidity. Rainfall comes in distinct seasons. Many plant species are endemic and are confined to the remaining patches of natural forests.

Coastal natural forest sub-forest type: The coastal terrestrial forests are home to over 90 threatened species of plants and animals (Matiru, 1999). Most coastal forests (80.3%) are under various forms of protection.

Mangrove sub-forest type: Mangroves form a transitional zone between the coastal marine and coastal forest eco-regions. Mangroves in Kenya display a horizontal distribution of species or zonation. This is greatly influenced by levels of inundation, geomorphology and salinity. A typical zonation of the mangrove forest starts with *Sonneratia alba* (Mlilana) on the seaward margin, followed by large *Avicennia* and *Rhizophora mucronata*. In the creeks, *Rhizophora–Avicennia* mix is the dominant species composition (Figure 4.8).

Dryland forest type: The dry zone forests are found in the dry areas of Kitui, Machakos, Taita Hills and Northern Kenya hills among other hilltops. It also includes dense savanna acacia forests mainly found in Laikipia, Baringo and Samburu counties. Patches of dry forests are also found in the Lake Victoria region. Dryland forests are composed of trees measuring 5–15 m high with dwarf understorey. These forests occur in low-lying sandy alluvial soils. Figures 4.9 and 4.10 show dry sub-forest type and riverine sub-forest type.

Dry sub-forest type: The dry forests on the hilltops of Samburu and Marsabit are dominated by *Podocarpus, Croto,* and *Juniperus* species. The dry savanna forests in Samburu, Laikipia and Baringo are mainly dominated by *Acacia* spp. The upland woodlands provide habitats for species such as *Combretum molle, Acacia etbaica, A. nilotica, A. seyal, A. tortilis,* and *A. nubica*.

Figure 4.10. Riverine forest.

Figure 4.11. A commercial plantation.

Figure 4.12. Agroforestry in Chuka, Meru County.

Riverine sub-forest type: The riverine forests are found in floodplains covered by alluvial and fertile deposits. They form narrow strips of gallery forest creating ecologically diverse ecotones. Characteristic upper canopy trees include *Acacia elatior, Populus ilicifolia, Garcinia livingstonei, Mimusops fruticose* and *Acacia nilotica*.

Planted forest: Large-scale tree planting was started at the beginning of the 20th century by the colonial government to provide a sustainable supply of fuelwood for steam locomotives. Exotic tree species were preferred as they are fast growing compared with indigenous species.

Commercial plantations: These are systematically planted areas with both exotic and indigenous tree species. Plantations are either under State, private or community tenure. The total area under plantation is approximately 220,000 ha. The main tree species are *Cupressus lusitanica, Pinus radiata, Pinus patula, Eucalyptus* spp., *Vitex keniensis, Polyscias kikuyuensis* and *Juniperus procera*. Most plantations are found in the highland areas between altitude 1,500 to 2,500 m and with annual rainfall of between 1,000 to 1,750 mm. Figures 4.11 and 4.12 show commercial plantation and on-farm-forestry.

On-farm forestry: The 1970s and 1980s were periods of intensive on-farm tree planting promoted by various organisations. In the early 1990s, agroforestry was promoted targeting multipurpose trees and shrubs. *Grevillea robusta* was widely adopted in Central and the eastern parts of the country, and eucalyptus in western Kenya. Cypress was also commonly planted in the sub-humid areas.

5 THE NEXUS—PEOPLE, TREES AND FORESTS: KEY CHALLENGES

Forests are at the center of environmental and socio-economic development.

ANALYSIS

5.1 DRIVERS OF DEFORESTATION AND DEGRADATION

The development of forest policies and strategies requires a clear understanding of the drivers of deforestation and degradation.

Most people live in high and medium-potential agro-ecological zones suitable for agriculture and most forests with closed canopies are also located here. The causes of deforestation and forest degradation are multiple, complex and vary over geographical and social contexts. However, the general trend is that the major drivers are related to agricultural expansion and urbanisation (Kissinger, 2012). This is also true for Kenya.

Drivers of deforestation vary in magnitude and forest type. They also vary in environmental, social and economic contexts.

Mather (1992) introduced the Forest Transition concept (Figure 5.1) to explain the transition from decreasing to expanding forest cover that has taken place in many developed countries. The forest transition model, through a number of transitional phases, identifies characteristic human-induced changes in forest cover and dynamics over time at the national scale. The model has subsequently been tested and proved valid for other countries.

Kenya is now in the late transition (end of phase 3), a point of inadequate forest cover, where the needs and focus shift toward options for reforestation.

Agricultural expansion and urbanisation are the main drivers of degradation and deforestation.

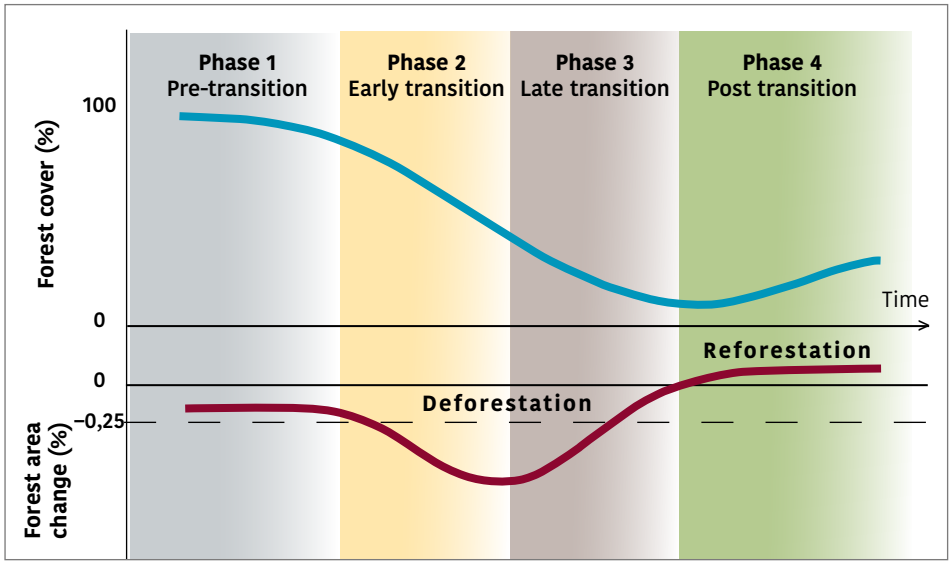


Figure 5.1 Forest transition model. (Source: Hosonuma et al., 2012).

Table 5.1. Drivers of deforestation.

Category	Direct drivers	Indirect drivers
Governance	• Inadequate application of basic silvicultural and ecological principles for forest management. • "Tragedy of the commons" resulting in conflicts over natural resources.	• Inadequate integration of the forest sector with other stakeholders. • Unclear forest responsibilities and weak conflict-management capacity. • Weak forest governance and institutions. • Corruption, illegal logging, weak enforcement. • Inadequate benefit sharing from forest resources. • Diverse perceptions of importance of forests. • Communal land tenure systems and their application. • Lack of private ownership, unclear tenure and access to forest resources.
Policy	• Overgrazing and inadequate regulation of grazing in forest reserves and community lands.	• More focus shifted to water towers, paying less attention to dryland woodlands, including the coastal and riparian forests.
Economic drivers	• Clearing of forest for agriculture. • Degradation of forest. • Charcoal and fuel wood from unsustainable production. • Infrastructure and urbanisation. • Conversion of communal forest to agriculture. • Mining within forest areas. • Illegal logging.	• Demand is higher than supply. • Heavy bureaucracy and poor efficiency obstructing competitiveness. • Limited knowledge of tree growing (and necessary silviculture) as an enterprise. • Poverty, high prices for agriculture products, subsidised fertiliser, tax exemption for certain agricultural machinery resulting in unhealthy competition for land. • Fixed timber prices at low levels. • Rapidly increasing population has heightened the demand for land. • Few or no livelihood options have created overdependence on agriculture and mounting pressure on forest lands.
Technology drivers	• Poor uptake of new technologies. • Poor awareness of deforestation impacts. • Poor knowledge of tree planting.	• Uncertain availability of timber and wood for processing enterprises. • Low investment in wood processing resulting in ineffective processing.
Cultural and environmental drivers	• Unsustainable utilisation, including overgrazing. • Conflict at multiple levels. • Fires are deliberate, accidental, poorly managed and they destroy forests. • Wildlife damage impacting regeneration.	• Traditional farming methods in a context of increased population and overstocking of animals.

ANALYSIS

5.2 THE DYNAMICS OF POPULATION ON LAND USE

The population of Kenya is currently estimated at 48 million and with a population growth rate of 2.8% (Weismann, 2014) is projected to rise to 66.3 million by 2030 (WPR, 2015) . The increased population puts pressure on natural resources, a major challenge for this country.

Kenya's rural population stood at 8 million people in 1963 and produced agricultural outputs for their own consumption, for export and to feed less than a million urban residents. In 2015, 35 million rural residents produced agricultural outputs for their consumption, for export and to feed 12 million urban residents.

It is projected that by 2050 there will be 54 million rural residents expected to produce agricultural outputs for their own consumption, for export and also to feed 43 million urban residents (Table 5.2). The implication of rural populations feeding increasing urban populations will be pressure to convert forest land to agricultural land.

The wealth gap between the rich and poor is huge in most urban areas. The level of dependency on wood and forest products also varies, with the most vulnerable households being those in the slums. For them, life is a daily struggle and the high cost of charcoal is one factor that directly impacts their lives. In addition, institutions like hospitals and hotels are big consumers of firewood and thus major stakeholders.

Table 5.2. Ratio of rural to urban residents and urban population (in millions).

Year	Rural to urban ratio	Urban population (million)
1963	8 to 1	Less than 1
2015	3 to 1	12
2050	1.25 to 1	43

Source: Owuor, 2011

ANALYSIS

5.3 FORESTRY'S POTENTIAL TO ADDRESS POVERTY AND YOUTH UNEMPLOYMENT

About 50.1% of Kenya's population is under 18 years of age, meaning that half of the population has to raise and educate the other half (KNBS, 2010).

Unemployment, especially for youth, is a growing problem, with 80% of the unemployed being between 15 and 34 years of age. The reason is believed to be a mismatch between the skills and education of job seekers and the staff skills and education that employers seek. Training of mid-level technicians and artisans is inadequate (AfDB, 2014).

Assuming that only the private sector can create sustainable job growth within forestry, thus performing a key role in creating employment, a favourable environment for private forest investments must be established for the available workforce to benefit, and to avoid social problems.

Trees and forests form the basis of livelihoods, especially in areas with high population density and youth unemployment. The forestry sector has both a potential and an obligation to contribute to the creation of job opportunities for youth.

ANALYSIS

5.4 DEMAND AND SUPPLY OF WOOD PRODUCTS

In 2013, the MEWNR studied the current and projected demand for the main wood products. The study also covered current and projected potential supply, and, hence, current and future surpluses and deficits.

The demand for wood and wood products in Kenya to 2032 was forecasted using the Global Forest Product Model — an economic model for global production, use and trade of forest products (Buongiorno et al., 2003). Supply of wood products has been forecasted taking into consideration economic growth, climate change, policies and management guidelines, forest yield and forest area, among others.

Table 5.3 presents the national projected demand for firewood, charcoal, timber and poles for 2011/12 and 2031/32.

Table 5.3. Projected demand (million m³), supply and projected surplus (+) or deficit (–) of wood products.

	Firewood	Charcoal	Timber	Poles	Total
DEMAND					
2011/12	18.7	16.3	5.3	1.4	**41.7**
2031/32	21.7	19.2	7.6	2.2	**50.7**
% change	16	18	43	58	**22**
SUPPLY					
2011/12	13.6	7.4	7.4	3.0	**31.4**
2031/32	14.9	8.1	9.0	3.7	**35.7**
% change	10	9	22	23	**14**
DEFICIT					
2011/12	–5.0	–9.0	+2.1	+1.6	**–10.3**
2031/32	–6.8	–11.1	+1.4	+1.5	**–15.0**

Summarised from MEWNR, 2013b

Based on the study (Ref Table 5.3), it can be deduced that the potential supply is insufficient to meet the demand for firewood and charcoal both now and in the forecasted future.

- In **2012**, the demand was 41.7 million cubic metres and the corresponding supply was 31.4 million cubic metres resulting in a **deficit of 10.3 million cubic metres**.
- In **2032**, the demand is projected to rise to 50.7 million cubic metres whereas the corresponding supply will rise to 35.7 million cubic metres, causing a **deficit of 15.0 million cubic metres**.

According to a study by GATSBY Charitable Fund (2014), the current wood deficit in the country was estimated at 12 million cubic metres and predicted to rise to as high as 34.4 million cubic metres by 2030.

MEWNR's (2013b) study also examined wood sources (Table 5.4). The study demonstrated that the bulk of wood products comes from land owned by private individuals. Communal lands, mainly in the ASALs, are also important sources of wood. These two categories combined provide over 90% of the total wood supplies and so are important areas of focus in the NFP.

Emerging supply challenges

It is clear from the study by the ministry (MEWNR, 2013b) that meeting the demand for forest products in the future will be a challenge. Projected deficits have to be addressed through sustainable resource management.

Table 5.4. Estimates of wood supply (million m³) potential from different sources.

	Firewood	Charcoal	Timber	Poles	Total
Natural forests in public land	0.5	0.3	-	-	**0.8**
Forest plantations on public land	0.3	0.2	1.3	0.2	**2.0**
Communal and private natural forests	1.9	1.0	1.3	0.2	**4.9**
Communal and private plantations	0.5	0.3	0.4	0.6	**1.8**
Trees on farmland	10.3	5.6	4.4	1.5	**21.8**
Total	**13.5**	**7.4**	**7.4**	**3.0**	**31.3**

Table 5.5. Estimates (%) of wood supply potential from different sources.

Source	Firewood	Charcoal	Timber	Poles	Total
Public forests	6	7	18	7	**9**
Communal and private forests	18	18	23	43	**21**
Trees on farmland	76	75	59	50	**70**

Summarised from MEWNR, 2013b.

Another challenge, but also an opportunity, is derived from observing that the bulk of supplies, especially of firewood and charcoal, come from lands owned and used by farmers and pastoralists. A major task for the government is to ensure a conducive and enabling environment—a prerequisite for farmers and pastoralists to realise the production potential that they command.

Weak market structure and organisation have so far limited an open and efficient market. Inadequate access to credible wood valuation services and market information by small-scale producers has also contributed to the distorted economic valuation of timber. Timber middlemen have exploited the ill-informed and desperate small-scale wood producers through unfair pricing.

Additionally, projected changes due to climate change may have impacts on forest growth increments, site indices and other factors influencing supply.

Illegal logging and timber trade

The increasing illegal timber trade contributes to deforestation and loss of biodiversity. Illegal timber trade revenues worth millions of dollars are lost every year.

The European Union adopted the Action Plan for Forest Law Enforcement, Governance and Trade (FLEGT) in 2003. The ultimate aim of the FLEGT is to support efforts by timber-producing countries to combat illegal logging by preventing illegal timber from entering the EU market through bilateral trade agreements called Voluntary Partnership Agreements (VPAs). The aim of the FLEGT is to improve governance and reduce illegal logging by strengthening legal forest management, improving governance and encouraging trade in legally sourced timber (EU, 2014).

Kenya is participating in FLEGT dialogues in Eastern Africa, and in September 2015, together with Tanzania, Mozambique, Uganda and Madagascar, an agreement on information sharing was signed.

According to a study done in Kenya in 2014 on 'Forest governance and timber trade flows within, to and from eastern and southern African countries', the country is a net importer of, especially, sawn timber, panel products, paper, furniture and transmission poles. In 2011 these imports were worth USD 50 million whereas timber exports were limited. Kenya is exporting such small quantities of wood-based products to the EU that scope is limited for the EU to enter into VPA negotiations with her (GoK, 2014).

5.5 FOREST VALUE CHAINS

An efficient value chain is characterised by minimum transaction costs, i.e. minimal costs are added to what the producers earn along the chain until the produce reaches the end consumer. Value chains can be either long and complex or very short and simple. For example, when firewood is traded, the value chain is typically short. Opportunities exist for adding value to forest products at different levels.

Pro-poor value chain development focuses on strengthening the livelihoods of the poor, who may be farmers and labourers at one end or poor consumers on the other end. There may also be other poor and disadvantaged stakeholders among traders, processors and transporters. Efficient value chains of products produced or used by poor people are therefore of particular importance. Some key value chains are described in the following sections.

5.5.1 Wood products value chains

Timber value chain

The timber value chain is characterised by inefficiency in processing and high transaction costs that can be attributed to policy and legal constraints, infrastructure, technology and transport costs. Due to these constraints, traders seek the services of various players along the market value chains, thereby increasing costs on the operations of timber trade.

The high transaction costs can be reduced with a favourable policy/legal environment, better technology deployment and improved road infrastructure.

Plywood and veneer

Manufacture of plywood has been the domain of large industries in the country but this is changing and medium size industries have started manufacturing this product. The country today has six plywood mills which supply mainly the domestic market with a small quantity being exported to neighbouring countries. The country imports decorative veneer and plywood from the Far East.

Production of veneer from small-diameter eucalyptus and pine logs has started. The process, which uses Chinese and Indian technology (spindle-less lathe), will allow for commercial utilisation of thinnings from plantations and farmers' woodlots. Veneer is exported to China and India while some is used in the country to manufacture plywood.

A large proportion of the plywood and veneer is used to manufacture blockboards and flush doors for the construction industry. These two products consume a sizeable

volume of low-grade timber and efforts are being made to add value to low-quality sawn wood. With many medium sawmills investing in production of blockboard and flushdoors, supply of these products to the local market has increased significantly and prices have stabilised.

Chipboard, fibre-board and MDF

These are reconstituted boards made from wood waste from other manufacturing processes and debris from logging operations. Kenya has two chipboard factories, one fibre-board mill and one new MDF factory. Production from these industries is mainly for the domestic market with surplus being exported to countries in the region.

Treated electricity distribution poles

Demand for electricity distribution poles mainly from *Eucalyptus* species has been on the rise for the last decade. This demand has been driven by the need for poles to build new power lines and to replace damaged poles.

Rural electrification has also contributed to the increased demand for treated poles. Kenya Power Ltd and the Rural Electrification Agency need about a million poles every year. A large portion of this demand is met from *Eucalyptus* grown on farmlands and private forests, but some poles are also imported from other countries such as South Africa.

The country does not produce enough poles to meet domestic demand. Introduction of concrete poles in the market will affect the treated poles business and discussions should be held with Kenya Power Ltd and the Rural Electrification Agency to agree on delineation of areas where wooden poles will be used and areas more suited for concrete poles. The poles business supports rural livelihoods of small-scale eucalyptus planters and, when used under the right conditions, conserves the environment and mitigates against climate change.

Charcoal value chain

About 90% of rural households use firewood for cooking while 80% of urban households depend on charcoal as the primary source of fuel for cooking. Estimates indicate the country has about 200,000 charcoal producers and 500,000 people are involved in the charcoal trade (Mutimba and Barasa, 2005). Nonetheless, charcoal production technologies are inefficient resulting in massive wastages during wood conversion to charcoal.

About half of the charcoal in Kenya comes from the ASAL areas. Many tree species in the drylands yield high-quality and preferred charcoal. Much of the charcoal production and transportation is however deemed illegal yet procedures to buy, use and sell charcoal are legal.

The partly illegal status of charcoal has driven production underground, contributing to corruption and inefficient production, marginalisation of producers and little or no investment in the business. The charcoal industry is nevertheless a significant source of income and an important livelihood for many poor Kenyans. The trade is therefore a very important economic activity in the ASAL areas. The producers value, before transport and other transaction costs, can be estimated at about 2/7 of the market value, i.e. KShs 39 billion for the country (MENR&RDA, 2015).

An economic analysis of the charcoal value chain by Miti Mingi Maisha Bora (MMMB) found that profits were disproportionately shared and in favour of retailers and transporters, with the producers getting the least margins. This was partly due to weak organisational structures, ineffective implementation of charcoal laws and policies, plus corruption along the chain (KFS-MMMB, 2014).

Inadequacies along the value chain and increasing scarcity in many areas have caused charcoal prices to escalate. This development has contributed to poverty among urban residents and to fuel-switching from charcoal to fossil fuels, which is adding a burden to the national economy.

Fuelwood

There is high demand for fuelwood for domestic, institutional and industrial use especially in tea and tobacco production, vegetable oil and other agricultural manufacturing processes. Most of the fuelwood is currently unsustainably sourced, resulting in deforestation and degradation of forests and woodlands. The value chain is underdeveloped. Establishment of energy plantations of suitable species to meet this demand needs to be prioritised as using fossil oil is not only costly but has negative environmental impacts. These plantations if strategically positioned would be a source of charcoal for urban dwellers and firewood for rural communities.

5.5.2 Non-wood forest products (NWFPs) value chains

Kenyan forests and woodlands produce large varieties of non-wood forest products like gums and resins, medicinal and aromatic plants, tannins and dyeing materials, nuts, berries, honey, wax, fodder, bush meat, fibre, among others. Several of these are subsistence products providing nutrition, critical in situations of drought and famine. Traditional medicines, which depend on medicinal plants, are often the only affordable alternative available to most rural and urban populations.

NWFPs play important roles in Kenya's economy, generating about USD 40 million annually (FAO, 2015b). These figures are not included in the national economic statistics and therefore such forest income is unaccounted in the GDP computation.

Nevertheless, in the international trade in NWFPs, Kenya is a main supplier of *Bixa orellana*, a cultivated exotic plant species, exporting about 1,500 tons annually (FAO, 2012a). Exports of gum arabic collected from *Acacia senegal* in Kenya are still small relative to the resource potential and compared with exports from the main world market supplier, Sudan. Annual exports of gum are only a few hundred tons, which reached a peak of 460 tons in 1995, compared with about 60,000 tons annually exported from Sudan in recent years. The potential for gum arabic production in Kenya has been estimated at 3,000 tons annually against an average production of 400–500 tons.

For resins (myrrh, hagar, frankincense) the potential is estimated at 3,500 tons against an average annual production of around 1,000 tons. Nonetheless, Kenya is one of the major exporters of resins (myrrh and frankincense) in Africa. Export volumes reached a peak of 1,130 tons worth about USD 2.6 million in 2000 (FAO, 2012a; FAO, 2015b).

Each NWFP value chain is unique, with specific challenges and opportunities. Production, processing and marketing often do not capture the potential value of the products. Practical strategies to address such issues are not well developed. Development of NWFP value chains across counties and communities (community forestry association, forest user groups, forest-based small enterprises and associations) will inevitably bring opportunities to develop rural livelihoods.

The annual **value of non-wood products in Kenya** is estimated as USD 40 million.

Raw materials for NWFPs are often gathered from publicly owned lands. Tenure systems for these lands may be more complex and rules of access are not as clear as on private lands. When users fear they may lose access to the forest, they are less likely to invest in the resource or monitor and control harvesting. This may cause conflicts between users and may make planning for sustainable management difficult (FAO, 2012a; FAO, 2015b; Sloth, 2009). In past years, some forest-adjacent communities have benefited directly from government forests through the participatory forest management (PFM) initiative.

Honey and gums have relatively well-developed value chains, unlike many other NWFPs such as mushrooms and fruits. Currently, there are draft regulations on gums and resins. Mushrooms are often seasonal and depend on natural growth and regeneration, which makes their productivity unpredictable. Seasonality may be an advantage as many NWFPs are available during low agricultural seasons. In this way, their exploitation complements farming activities, filling gaps in household incomes (Muller, 2011). Producers of NWFPs are usually rural people and often poor or landless. NWFPs provide income to people with limited alternative employment opportunities and low incomes. Consequently, NWFPs need to be commercialised.

Local communities have the traditional skills and knowlege to exploit some of the NWFPs. However, information on processing and marketing is inadequate. Foresters are typically trained in timber management and less in management of NWFPs. Their production therefore relies on indigenous knowledge found within communities. Research has generally focused on a few products such as gum arabic that are important on the international market.

Many NWFPs have weak links to official marketing systems; they are often sold in informal markets. Information about prices, product flow, processing and marketing options is not well known when compared with major crops or timber. However, the absence of

Market analysis and enterprise development for NWFPs in ASALs

Market analysis and enterprise development (MA&ED) is an approach that could be applied to support communities and farmers in commercial development of wood and NWFPs production.

KFS (with support of MMMB Programme) and KEFRI have conducted pilot work in six ASAL counties (Kwale, Makueni, Mwingi, Garissa, Meru North and Taita Taveta) to develop selected NWFPs and wood value chains such as honey, aloe and charcoal. As a result, 30 enterprise groups have been created and 21 charcoal producers' associations across the six pilot counties have been strengthened.

The applied approach is based on a FAO MA&ED methodology that has been working in developing countries for more than a decade. A cornerstone of the approach is to systematically include and stress linkages among social and environmental concerns alongside technological, commercial and financial aspects of community enterprise development.

formal marketing channels can be an advantage since it is easier for small producers to access informal markets, and regulations are often less stringent than in government-regulated markets (FAO, 2015b; KAFU, 2000).

A major marketing constraint for NWFPs has been the exclusive control of forests rather than a community enterprise and business development approach. However, this constraint is gradually changing as forests are now more integrated into communities and smallholder livelihoods through PFM/JFM (joint forest management) and management agreements with community forestry associations as well as forest-based micro and small enterprise development.

A second constraint to the expansive development of NWFP business is lack of accessibility and structure to information on NWFPs as very limited information is available in the public domain. The often low profitability of NWFP-based enterprises can be attributed to the fact that trading is done individually, producers are unorganised and dispersed, and individuals lack the necessary information, marketing and packaging skills and information to gain leverage in the market.

Bamboo value chain

Bamboo is a fast-growing plant with great potential to conserve the environment and provide products that have many uses. In Kenya, however, the use of bamboo is still minimal and its full potential is yet to be realised. Some bamboo cottage industries have been established in the recent past in Kenya with Nairobi County having fairly developed enterprises. However, its marketing structure is informal.

Bamboos are mostly sourced as raw poles. Processing uses simple technology and if carried out at source, would add value and reduce transport costs. With improved processing technology more value adding can be achieved. The value chain has the potential to develop given the many products that the raw materials can be transformed into. These include among others construction material, tiles, mats, baskets, and food.

Development strategies is needed, starting from propagation through product processing to marketing and utilisation including sensitisation and capacity building.

5.5.3 Furniture value chain

Furniture value chains face wood deficits, inadequancies in furniture design and poor professional cooperation. Formal furniture producers also lack the necessary technology and skills for quality production at scale. The jua kali producers are fragmented entities with limited range of products.

These challenges can be overcome by establishing professional furniture producer associations to improve design and market information. Bringing the jua kali furniture production into the formal sector will also reduce import needs and promote regional trade.

5.5.4 Wood carving

Kenya's wood carving industry provides monetary income to many carvers. It is estimated that up to 60,000 people are engaged in this activity, which means that over 250,000 people economically depend on the carving industry.

Unfortunately, this creates a conservation problem because the trees preferred by these carvers are rapidly disappearing. Shortages are increasing with trees being felled at even more distant localities as nearby supplies are exhausted. There is therefore need to assess wood supply and the demand for carving in order to make the industry

sustainable. Incidentally, *Dalbergia melanoxylon* (Mpingo) is the most valuable tree in Africa, volume for volume. Its hard, heavy, black wood is not only the number one choice of wood carvers, it is also exported to Europe to manufacture clarinets and oboes. This species and others like *Brachylaena* have been harvested for carving over many decades and are now not easily available.

The remaining stocks of major wood-carving tree species need to be assessed including identifying fast-growing alternative tree species, and strategies designed to provide a continuous supply of carving timber.

5.5.5 Non-forest value chains depending on trees and forests

The existence of forests and trees is closely interlinked with the success of other sectors like livestock, agriculture, fisheries, water, wildlife, tourism and their value chains. For example, livestock production involves several value chains, notably, for milk products, meat, and hides and skins. Though these may not be regarded as forest value chains per se, their existence to a large extent depend on trees and forests. Trees provide both roughage and high protein fodder for livestock, with compositions that vary from area to area.. The livestock industry in the ASALs, which forms the backbone of the economy there, depends heavily on tree fodder.

5.5.6 Value addition constraints encountered by small-scale tree farmers

There is a big potential to increase timber production by individual farmers on their farms, but small-scale farmers without having an umbrella organisation have limited possibilities to add value to their tree growing and processing. Individual farmers working on their own have limited access to market and price information, no bargaining power to benefit from economies of scale, high transportation and other costs as well as limited access to recent technologies from forests to markets. With limited sales quantities, there is neither an incentive to go for further processing, such as sawn wood and treated poles production, nor to fully benefit from integrated logging and use of different size logs and residues.

UNIQUE's (2016) study for the Gatsby Charitable Foundation shows small-scale tree farmers have many options along the value chains, but for economies of scale an umbrella organisation is needed to provide better extension services, negotiation powers and inputs availability.

5.5.7 Medicinal plants

Medicinal plants offer great potential for commercial exploitation especially where options for income generation are limited. Bio-prospecting for these plants has not been done though it offers immense opportunities and potential if carefully done. To realise this potential, medicinal plants issues need to be included in the harmonised laws and policies, community participation in their conservation and management should be enhanced, and medicinal plants value chains, research, technology development and transfer should be promoted.

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5.6 CHALLENGES FOR PRIVATE SECTOR ENGAGEMENT

A supportive business environment is a key factor in engaging the private sector. The challenges associated with private sector engagement are addressed by KEPSA (2013) in the "Kenya National Business Agenda II 2013-2017". The challenges of engaging the private sector in forestry are discussed in this section.

Bureaucracy: In recent years, several improvements in the operating environment of companies (e.g. in licensing, registration, lender and borrower protection, credit information, transport infrastructure, taxation, regulations, transaction costs, etc.) have been realised. However, further work is needed to enable industries to modernise, diversify and expand in addition to reducing bureaucracy. More improvements are required in the business environment to make it easier for small and medium enterprises (SMEs) located in rural areas to legalise and formalise their businesses. This is necessary if SMEs are to access credit and other services necessary to modernise, diversify and expand.

Infrastructure: Good infrastructure is a key factor in the development of any country. This has been recognised in Kenya's development blueprint, Vision 2030. Kenya, as a regional economic hub and an entry point to Eastern and Central Africa, requires well-developed infrastructure to take advantage of its location and trade with neighbouring states. The current status of forest infrastructure is not adequate to spur and support development in the sector.

The private sector has increasingly become important in the forest sector. Private companies have expressed interest in establishing commercial plantations and taking concessions in public plantations, as provided for in the Forests Act, 2005 (MEWNR, 2013a). They include sawmilling companies, tea industries, bamboo growers, conservation organisations and tree farmers. Kenyan forests also have potential in this regard, given that an enabling environment is established. Industries constrained by inadequate supply of electricity and the cost of power that is higher than in competing countries.

The railway system is not running efficiently although efforts are underway to modernise the main line from Mombasa to Nairobi, Nakuru and neighbouring countries. Railway connections within the country are in a poor state. An efficient harbour is needed to support the export and import of wood products and raw materials necessary for manufacturing. Work on decongesting the Mombasa harbour is ongoing and increased efficiency is expected.

Shortage of raw materials: The current wood deficit is about 10 million cubic meters, and small and medium-sized enterprises are operating below capacity (MEWNR, 2013a). This deficit is due partly to sub-optimal plantation management. Private companies are interested in bridging this deficit through establishing commercial plantations and taking concessions in public plantations. To date, no concession arrangements have been agreed and regulations governing the same have not been finalised. There is potential for concessions given that an enabling environment has been created.

Farm forestry is the most promising source of future wood supplies. However, efforts will be needed to improve the quality of products coming from this source as well as to diversify species and inculcate best management practices among farmers to meet the demand.

ICT connectivity is being rolled out in the whole country to make communication and information transfer more efficient. The introduction of e-government makes it easier for businesses to carry out transactions with government without having to visit government offices. For example, paying taxes, renewing and obtaining licences as well as vehicle transfers can now be done online.

Licensing duration for forest industries: Forest licences for material harvested in public forests are currently issued for a period of one year, which is too short to invest in new machinery and equipment and upgrade old mills. A period of up to five years would be considered more appropriate and will help to attract funding from financial institutions. Lack of felling plans for industrial processors is a drawback in planning harvesting operations and developing supporting infrastructure.

Forestry information for investors: Investments in forestry will increase substantially if information on the state of forests and opportunities for investment are made available to potential investors. At the moment such information is not available in a form that can be used by investors. Also lacking is information on wood resources available on farmlands and private forests. Mapping and inventorying resources outside government forests and packaging the information for investors are important steps towards linking tree farmers to major markets. The establishment of the Information Centre at Kenya Forest Service is a step in the right direction.

Inadequate financial mechanisms to support forestry investment: Due to the long rotations for commercial plantations, the available financial mechanisms in local banks are not well suited for forestry investments. Although forest industries are able to access funding from local banks, interest rates charged are very high (up to 30% per annum) and the repayment period too short (12–48 months). Lack of long-term licences further complicates the matter and additional collateral is required to cover loan facilities.

More favourable terms for borrowing funds to upgrade technology and to refurbish old equipment should be discussed with the Ministry of Industrialisation, including investment incentives for forest industries. Consultations are needed between the government and banking institutions to develop mechanisms for funding commercial forestry. Pension and insurance schemes as well as youth and women funds are important and likely sources of funds for forestry investment, but strategies must be developed to access those funds.

Insufficient technical skills: As a result of the harvesting ban, many sawmills and processing plants closed down and employees with technical skills in wood processing dispersed into other livelihoods. Forestry industries are facing difficulties due to an acute shortage of qualified and experienced technicians and sawyers. The government-owned Forestry Industrial Training Centre, which offered technical courses, closed down a few years ago leaving no alternative source of training for employees in the industry.

A training facility is being built at the Kenya Forestry College, Londiani and, when completed, will offer courses for forest industry technicians. Training should emphasise health and safety for the employees as well as mill hygiene. These crucial aspects are generally neglected in the industry.

Timber manufacturers should be encouraged to partner with the Directorate of Industrial Training in organising a sponsorship programme for technicians from the industry. Most wood-processing industries contribute to the industrial training levy and hence qualify for this type of sponsorship.

Industry representation: The private sector needs to strengthen relations with government and other stakeholders. To achieve this, a strong association with active members is required. Organisations representing industry interests should be strengthened by building their capacity in management and governance issues.

Corruption: Rent seeking and corruption have been a challenge in the country. To address this challenge, a constitutional office, the Ethics and Anti-Corruption Commission (EACC), was established to spearhead the fight against corruption in collaboration with relevant arms of Government. Forestry, like any other sector, has been affected by corruption. Corruption results in higher cost of doing business and adversely affects competitiveness of products in the market. Non-trade barriers such as numerous police road checks and delays at weigh bridges affect the smooth running of business.

5.7 FORESTRY IN A DEVOLVED SYSTEM

Some forestry functions are devolved and county governments are key stakeholders in forest management and development. Forestry is a devolved function as set out in the fourth schedule of the Constitution. County governments have the responsibility of implementing specific national government policies on natural resources and environmental conservation. Gazette Supplement No. 116 dated 9 August 2013 provides for devolution of the specified forestry functions as follows: "Forestry including farm forestry extension services, forests and game reserves formerly managed by local authorities, excluding forests managed by KFS, National Water Towers Agency and private forests". The forest functions have been unbundled and transition implementation plans (TIPs) prepared for all 47 counties. Specific forest interventions could further be developed by county governments with the technical support of the national government as appropriate.

Counties have a shared responsibility in meeting the national target of 10% forest cover and are therefore expected to raise their current individual forest cover.

5.7.1 Opportunities and challenges associated with devolution

The Kenya Forest Service is a key manager of forest resources. With devolution, other institutions, especially at local levels, will increasingly be involved as partners, managers and co-managers. The creation of KFS was one of the major institutional innovations of the Forests Act, 2005. The Act also opened up a more decentralised way of managing forest resources. Many critical elements of the process, including benefits sharing, remain unsettled. Table 5.6 provides the challenges and opportunities associated with devolution.

Geta Community Forestry Association members studying business plan preparation.

Table 5.6. SWOT analysis on forest devolution.

Strengths	Weaknesses	Mitigation measures
• Involvement of community forest associations (CFAs) • Management of forest resources at the local level • Enhanced public and community participation • Increased opportunities to support counties • Potential for increased benefit-sharing. Strengthened representation of women and youth • Enhanced equity and equality • Improved possibilities for civic education on forest governance, devolution, human rights, etc. by civil society organisations (CSOs) • Existing institution for Research and Development	• Inadequate capacity and financial resources at county level • Overlapping responsibilities between KFS and county governments • Unclear roles and responsibilities among actors (KFS and KWS) • Weak flow of information between different sectors • Weak enforcement of forest sector guidelines and policies (e.g., fuel-wood and charcoal plus benefit sharing) • Scattered forest funds and inadequate information regarding them • Low cross-county cooperation due to levies on raw materials and transportation • Weak Public-Private Partnerships	• Capacity building for counties on generating income • Law enforcement, more capacity building and increased awareness on responsibilities and legislation • More information sharing and dissemination • More transparent procedures and public participation • Strengthened implementation of regulations • Enhanced coordination between sectors • Guidelines formulation for cross-county cooperation • Identification of new types of financing sources (e.g. PES), to enhance private sector investments
Opportunities	**Threats**	**Overcoming threats**
• Communities receiving more benefits and revenues • Enhancing bottom–up decision-making • Awareness raising of forestry resources • Increased information sharing and dissemination at local level • Enhancing accountability • Harmonised processes being developed for participatory forest management planning at national and county levels • Increasing collaboration opportunities in cross-border forests e.g. collaboration in Mt. Elgon Ecosystem	• Legal frameworks (e.g. county Governments Act, 2012 for rights of minorities and marginalised groups) not enforced in some cases • Devolution will not focus on forestry • Counties may convert forest land into other uses • The system promotes a sense of entitlement for resources located in a county and this may block investments from other areas. • Focus on revenue collection goals, high fees and levies may be charged which may raise the cost of raw material and affect competitiveness of products. • Climate change associated changes in forest productivity	• Framework to be developed for optimal participation of ethnic minorities • County policies should be anchored in national legislation • Allocate more resources to forest sector: Natural forests as national resources having great value.

Investment opportunities in the counties include:

- Using suitable community land to develop commercial plantations through private sector concessions or in joint ventures between a strategic partner and county government.
- Promoting efficient wood industries by providing incentives such as land to encourage setting up of new processing facilities. Too many small units operate in the country at below installed capacity. County governments should encourage amalgamation of small units to make larger enterprises that can attract financial resources for modernisation and expansion.
- Promoting farm forestry through provision of extension services. Counties could recoup some of the expenditure on extension services through a levy on wood products brought to the market from farmlands.
- Providing manufacturing facilities for wood products (industrial parks). These facilities will house furniture manufacturers, cottage industries and light sawmills. County governments will benefit from rental incomes while creating employment within the county.

- In the arid and semi-arid lands, county governments in conjunction with the private sector to map out important resources and prepare guidelines to attract investment in these areas.
- Resources in the ASALs will need improved management to increase production (gums, resins, honey). Sustainable management and trade in these resources will provide investment opportunities to investors.
- In the ASALs, counties will promote orderly trade in honey, gums and resins and develop collection centres and facilities for sorting and storing products. County governments will benefit from rental income and cess for the products brought into the collection centres.
- Counties have the opportunity to streamline land and tree tenure systems to manage and limit conflicts.

5.7.2 Institutional capacity in counties

Counties vary in their capacities to execute new responsibilities. Generally, they have inadequate capacities to provide accessible and mapped out information regarding natural resources (Agrer, 2015).

A key challenge now is to empower county governments to carry out new responsibilities in a competent and informed manner, while observing national laws and policy guidelines. The bottom line is that devolution as a concept has the potential to bring citizens and the government closer together, providing better informed and effective governance. This in turn could bring about social, economic and environmental development. These considerations are indeed valid for forestry development.

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5.8 IMPACT OF CLIMATE CHANGE ON FORESTRY

Kenya has contributed diminutively to greenhouse gas emissions but is one of the countries that is most vulnerable to the effects of climate change. Most climate change models project that the dry parts of the world will become drier, while the humid areas will become wetter and with greater and more unpredictable hydrological fluctuations. As Kenya is already a water scarce country, this is a forecast with important national implications. The ASALs as well as the flood-prone lands in western Kenya are projected to be more vulnerable. The projections generally draw negative scenarios on tree and animal health, resilience of ecosystems, water access and supply, food production and security as well as hydropower (MEWNR, 2013c; GOK, 2008; GOK, 2010b). Kenya is addressing this through the National Climate Change Response Strategy and Action Plan.

Kenya National Climate Change Response Strategy and Action Plan were launcehd in 2010 to respond to the challenges posed by climate change.

Some of the overarching climate-related issues surrounding forests include:

- Forests serve as the ultimate climate regulators including serving as a carbon "sink".
- Increased climatic hazards like floods and droughts have led to higher mortality of plants as a result of nutrient leaching and water stress.
- There is growing concern on deforestation with experts saying that deforestation is exacerbating the effects of climate change. According to the FAO Forest Resource Assessment 2015, deforestation accounts for about 20% of the world's annual greenhouse gas emissions (FAO, 2015d).

Climate change impacts on the forestry sector include:

- Affecting the growth, composition and regeneration capacity of forests, resulting in reduced biodiversity and capacity to deliver important forest goods and services. This will result in deforestation and degradation of forest and land ultimately leading to desertification, as communities strive to obtain their livelihoods from declining forest resources. This has been observed in many places including Machakos and Kitui counties, in coastal areas (e.g. Taita Taveta) and, in general, in all ASALs of Kenya.
- Existing forested areas may undergo changes in vegetation types and species' composition. In addition, more invasive species are projected to inhabit some areas. Excessive growth of some tree species has also been observed, e.g. excessive growth of acacia after the 1997 El-Niño in the north-eastern parts.
- The projected rise in temperatures and long periods of drought may lead to more frequent outbreaks and intense fires. Forest fires have in the recent past affected Kenya's major forests including Mt Kenya Forest.
- The rise in temperature is also expected to extend the range of pests and pathogens. This is likely to affect many aspects of forests such as tree growth, survival, yield and quality of wood and non-wood products. Pests may result in plantation programmes being curtailed, select tree species being abandoned, or the necessity to harvest large areas dominated by infested trees. This was witnessed in the late 1990s when the country had to clear huge tracts of cypress plantations as a result of the cypress aphid attack. There are already fears of a widespread attack on *Pinus patula* (Mexican weeping pine) plantations in South Africa, which could easily spread to Kenya.

Climate change intensifies floods, droughts, water scarcity and migration.

- Projected increase in atmospheric CO2 concentration may raise the carbon-to-nitrogen ratio and interfere with productivity of all food chains, consequently affecting carrying capacities of landscapes with cascading effects on wildlife populations and habitats.
- Changes in temperature may also lead to shifting of vegetation to higher elevations while some species could become extinct. Food and fuel for indigenous populations may be disrupted together with recreational industries that are of increasing importance. Across the country, some tree species are either extinct or their numbers have tremendously dwindled.
- Increased flooding/sedimentation and aridity. As the coastal area where mangroves occur is a low-lying land, a minor increase in sea level will mean mangroves submerging unless they can migrate to new areas mainland. Most areas where mangroves could migrate have already been occupied by human settlement and infrastructure. Death of mangroves due to climate change has been observed in several areas along the coast such as in Gazi Bay, Mwache creek, Ngomeni, Tana River delta and Dodori creek (GoK, 2010b).
- Kenya's rangelands occur in areas where rainfall is low and erratic. The soils are also highly variable and infertile, hence, not suitable for intensive agriculture. The effect of climate change will be changes in productivity of grasses and shrubs as strong winds and flash floods wash away seeds. This will place even higher demand for tree fodder.
- Climate change will throw natural rangeland ecosystems off balance by causing species' ranges to shift, altering predator–prey interactions, decoupling animals from food sources or reducing habitat.
- Droughts and less-productive pastures and fodder in the rangelands will raise human–human and wildlife–human conflicts (GoK, 2010b; Sloth, 2009).

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5.9 GOVERNANCE, COMPETITIVENESS AND LIVELIHOODS

Challenges, their respective solutions and identified outcomes of this NFP are assessed to impact particularly on forest governance, competitiveness and livelihoods.

Good forest governance

The major building blocks of good forest governance and their principal components are transparency, accountability and public participation, stability of forest institutions and conflict management, quality of forest administration, coherence of forest legislation and rule of law, economic efficiency, and equity and incentives (World Bank, 2009).

The forestry sector has experienced poor governance in the past and still faces challenges. The Constitution provides for national values and principles of good governance as a basis for improving the situation. These include:

1. Sharing and devolving power
2. The rule of law
3. Democracy and participation of the citizens
4. Equity
5. Integrity, transparency and accountability
6. Defining, recognising, protecting, and enforcing human rights;
7. Access to information
8. Objectivity and impartiality in decision making
9. Ensuring that decisions are not influenced by nepotism, favouritism, or other improper motives or corrupt practices.

The National Forest Programme's participatory process, the draft national forest policy and the REDD+ strategy process, provide an opportunity to effectively move the sector towards better and more effective governance. It is also evident that growing numbers of actors in public institutions, academia, the civil society and the private sector are aware of issues and committed to moving the reform agenda forward.

Transparency, accountability, public participation and conflict management

The main challenges relate to making information on forest resources, their use as well as related revenue streams available to the wider public in a way that ensures transparency and accountability. Availability of reliable information is fundamental for any forest investment and for community forest associations and county governments to effectively carry out forest management. There is a need to assess the roles of different actors in data collection, sharing and storing.

The need is urgent to develop the capacity of local level actors. Given the disparities in the capacities of community forestry associations and the Kenya Forest Service, it is important to ensure that the principle of free prior and informed consent is respected in forest development. Equally, it

is important to ensure that sufficient incentives are in place to benefit communities in the short term. In this regard, collaboration with civil society organisations and agricultural extension services could provide a sustainable institutional path.

Disputes and conflicts on forest management and use are likely to increase since devolution is both a process of change and a multiplication of the number of stakeholders with legitimate interests in forests (Sloth, 2009). This will call for special attention to conflict resolution, especially taking into account the power imbalances between these actors.

Economic efficiency, equity and incentives

Parallel to the establishment of a free market-based timber economy, actions need to be taken to include other forest products and services (e.g. conservation easements and ecotourism licences). To create a forest governance structure that truly allows local stakeholders to assume an increasing role requires allocating forests with resources to be managed by parties that may be outside of KFS and other government agencies, and devolving management responsibilities and benefit streams. Revenues and other benefits should be shared in a way that provides all participants with sufficient incentives to maintain their interest. These actions, together with full transparency of information, will assist in creating an enabling environment required for fresh investment in the sector.

Effective and fair enforcement of the Forest Act

Effective enforcement of the Forests Act requires addressing both internal factors within the forest sector and external ones. In this regard, progress has been made in establishing the Enforcement and Compliance (ENCOM) Division of KFS. However, more enforcement activities will need to be taken up by local level actors (e.g. community forestry associations and local authorities) through, for example, “participatory monitoring”, which will require that sufficient community incentives, be put in place.

Paying attention to disadvantaged groups

Though the Kenyan economy has been growing at a reasonable pace, poverty is still rampant. Despite being widespread, incidence of poverty is significantly higher in some rural areas than in others. Urban areas also have segregations of extreme poverty in slums and virtually no poverty in other areas.

Trees and forests form the basis of livelihoods in many areas where poverty levels are high and where a social crisis due to youth unemployment and other factors is imminent. Therefore, forestry in support of sustainable charcoal and livestock production in the ASAL areas is critical. Historical injustices have affected groups within the population in various ways. Among all Kenyans, indigenous forest people have or have had the highest level of dependence on the forests. Special consideration must therefore be given to these groups.

Competitiveness

Kenya is in a global competitive market. All business sectors have become globalised, and this requires a high degree of value chain competitiveness. A central impact will come from the creation of an enabling environment for enterprises to operate competitively and attract more enterprises to forest products value chain. Besides minimising public–private bureaucracy, competitiveness entails upgrading company organisations, management, technology, human resources, capital sourcing, etc. The development pillars of Vision 2030 contain several initiatives that directly and indirectly seek to enhance economic and industrial growth as well as downstream employment in Kenya. They also need to be applied in forestry development.

Key issues of forest products demand, industry revitalisation and competitiveness

Kenya is experiencing a boom in real estate development as well as in development of infrastructure, increasing the demand for woody construction materials (KFS-MMMB, 2013). This high demand is calling for increased investments and competitiveness in the national forestry sector processing.

In 2015, sawmilling and plywood industries are the main segments of forest industries. Indicative calculations and comparison with European productivity data suggest ample opportunities for improving the log–product ratio. The increasing net imports indicate that the Kenyan forest industries have not been able to satisfy the growing demand for forest products. In 2015, Kenya was hardly exporting timber products, leading to a negative trade balance. Vitalisation, capacity expansion and restructuring are needed to grow the industry and to meet the targets of Vision 2030.

Business environment

A favourable business and investment climate is critical for economic development, job creation and poverty reduction. The rationale is that a positive business climate and competitiveness accelerate forest investments, generate rural employment, improve overall sector competitiveness and create wealth.

The implementation of the NFP will thus boost the contribution of the forest sector to the national GDP growth target of 10% annually. This amplifies the need to promote private commercial forestry and extended value chains. Measures and incentives are needed to promote inclusion of small-scale farmers in the value chains — from sawn wood to high-value carpentry and furniture making including better use of wood waste for energy and other uses.

Forests and livelihoods

Forests play an important role as an economic safety net that can cushion especially poor rural households during periods of economic hardship. Rural households get both a diversified and a share of their income by collecting and selling forest products. However, forest products are usually not the main sources of income for rural households. They are often used as a backup when difficulties and emergencies occur. Forests also tend to be located in remote areas where market economies and technological progress are inhibited or slow. Commonly, forest-dependent people who live in or near forests tend to be politically weak or powerless (Profor, 2008).

Recent developments for reducing emissions from deforestation and forest degradation (REDD+) have the potential to provide benefits to local and indigenous communities. However, a number of conditions have to be met for these co-benefits to be achieved, including designing and implementing a national REDD+ strategy and programme complete with a benefit-sharing mechanism. Forest-dependent people are likely to benefit from REDD+ if they have secure land tenure; the principle of free, prior and informed consent concerning the use of their lands and resources is applied; and their identities recognised including participating in policy-formulation processes.

6 OPPORTUNITIES FOR FORESTRY SECTOR DEVELOPMENT

Forests have a great potential to contribute to the socio-economic well-being of the Kenyan people, thus providing an impetus for its continued development.

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6.1 HIGH DEMAND FOR FOREST PRODUCTS AND SERVICES

According to MEWNR (2013b), between 2012 and 2032 the national demand for firewood, charcoal, timber and poles is projected to rise by 22% against a 14% rise in the supply of the same products. During the same period, the deficit in the supply of these products is expected to increase from 10.3 million cubic metres to 15.0 million cubic metres. This growing demand for forest products is a key incentive for forest development particularly on private and community lands.

Studies conducted around 1990 for the Kenya Forestry Master Plan, show the increasing demand for forest products provided a "pull effect" for tree planting and tree management in the high and medium-potential areas of Kenya, subsequently increasing tree cover. Similarly, a study conducted by MEWNR in 2013 on demand and supply trends of firewood, charcoal, timber and poles indicates that trees on farms are supplying 70% of the above products, communal and private forests 21% and public forests 9%.

The following strategies will not only help reduce the widening gaps between the supply and demand of forest products but also promote forestry development, particularly on private and community lands. Incentives for farm forestry will be needed to strengthen small-scale farmers' umbrella and producer organisations. In the longer term, farmers will be capable of carrying out farm forestry on their own as a self-financing profitable business while employing technical and lobbying capacities.

6.1.1. Promoting farm forestry and woodland management on community land

With the size of gazetted forest limited, farm forestry and communal woodland management are expected to provide the bulk of wood resources for domestic and industrial use. There is space to take advantage of this opportunity to intensify forestry extension services to private farmers and encourage them to integrate tree growing on farms (KFS, 2011a).

An additional and supplementary opportunity is enhanced woodland management for combined forestry and livestock production benefits, especially in the ASALs. The ASALs have sparse woodlands and thin, woody shrub vegetation, but the trees and shrubs are nonetheless providing a substantial contribution to the national forest cover. Trees in the ASALs are essential for soil conservation and for providing fodder and shade for livestock, poles and construction material as well as medicines and fruits, and are thus essential for livelihoods in the ASALs. A key factor of success is to link resource management with stakeholders with long-term interest in the productivity of ASALs. Recent studies have demonstrated that with a focus on adopting climate smart landscapes, multifunctional livelihood benefits can be preserved to simultaneously enhance climate change mitigation, disaster risk reduction and adaptation benefits for the country (Minang et al., 2015). Because of the expansive areas considered, the adoption of climate smart landscapes including farm forestry and woodland management, can have significant benefits for the country.

Focus should be on training in increased use of improved germplasm and application of good management practices, including species and site matching, to boost productivity

Community members preparing land for tree planting.

and quality of plantations. Tree planting guidelines and training materials should be produced and translated into local languages so that key messages are well understood.

There is an acute shortage of good-quality tree seed in the country. Use of inferior seed will continue to degrade the quality of plantations and woodlots. The tree seed situation should be re-assessed and a strategy developed on how current shortages can be overcome. In the short to medium term, it may be necessary to import seed from key producers such as Argentina, Brazil, Chile, Honduras, South Africa and Zimbabwe for sale to tree farmers and other planters. Imported seed is expensive and it is imperative that in the medium term, seed orchards are established to supply high quality seed. KEFRI and the private sector should establish seed stands. KEFRI has the responsibility of monitoring and regulating tree seed production and trade.

Farmers, and indeed other tree planters, depend on a narrow range of species. The main species are *Eucalyptus grandis*, *Eucalyptus saligna, Pinus patula, Cupresus lusitanica* and *Grevillea robusta*. The need is urgent to introduce new species and varieties in order to achieve higher productivity and wood quality while safeguarding against the devastating effects of disease outbreaks and attacks by insects and pests. Use of scientifically designed species trials to determine the most suitable species for different ecological zones is necessary before planting material is distributed to farmers and other planters.

Farmers learn more by observation. County governments have the responsibility to use strategically located demonstration plots to show performance of different species as this helps a farmer to justify choice of species. Demonstration plots can also be used to showcase the impact of good management practices on tree growth and, hence, future revenues.

Commercial tree nurseries should be promoted as the means for growing seedlings that farmers and institutions can purchase. The forestry extension service will link nursery owners to sources of improved seed. Only improved seed should be recommended for sowing.

Nursery operators need training in good nursery practices so that they produce high quality seedlings to be sold in the market. The KFS and Kenya Forestry Research Institute (KEFRI) should formulate a nursery certification process, and only certified nurseries will be recommended to supply seedlings to key farmers and projects. Certification will be for a period of one year and qualified nurseries will get free promotion before and during the tree planting season when nurseries recommended ny KFS are listed in the media.

Giving free seedlings to farmers is not sustainable and destroys businesses for private commercial nursery operators. People do not attach much value to free things and free seedlings are not always planted properly. Free issues create a dependency syndrome and when the facility is not available, recipients stop planting trees. As the country pro-

motes commercial tree planting, it makes good business sense for farmers to embrace the full costs of establishing a plantation including cost of seedlings.

Inventorying and mapping of wood resources on farmlands will provide useful information on species' grown, area, age distribution, quality and volumes available. This information is useful to potential investors. County governments do not have capacity to map and assess tree resources on farms and the national government will need to assist in this regard.

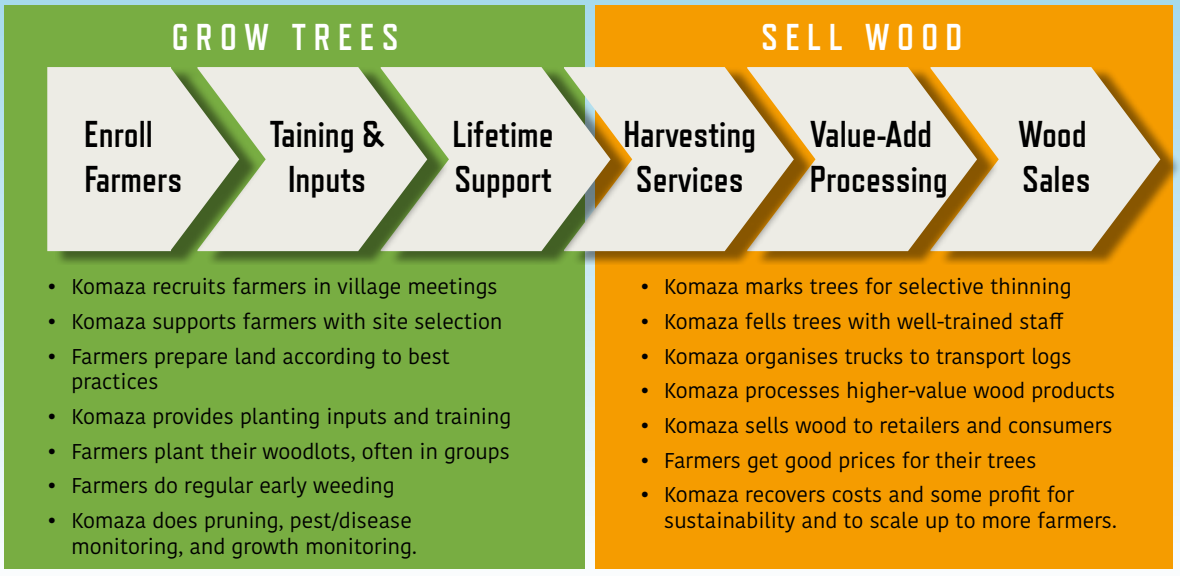
To make farm forestry commercially successful, farmers should be encouraged to add value to trees grown on farms as this increases revenues. The extension service must aim at advising farmers on products demanded by the market and provide links between farmers and buyers. In the long term, farm forestry organisations can use their own personnel to provide advice, procure inputs and negotiate powers to achieve economic scales.

Komaza Microforestry Programme

Komaza's micro forestry programme provides poor dryland farmers with know-how and market access. The idea of the programme is to link farmers' tree production with the entire value chain; right from tree seedling via value addition to markets. The programme is being implemented in regions of coastal Kenya where rainfall is low and soils infertile. The proximity of these regions to Mombasa ensures markets for different products. Today, 6000 farmers participate in the programme and about 1500 hectares of fast-growing and drought-resistant *Eucalyptus* sp. and indigenous hardwood *Melia volkensii* have been planted. When farmers enrol in Komaza's programme, they are provided with: Training covering best practices for preparing their land; Best possible planting inputs (seed/seedlings) and fertilisers; Regular on-farm and training throughout the lifetime of their tree farm; Harvest and sales support.

Komaza is organised with self-contained units of operation (rural cells). A rural sell comprises roughly 9000 farmers and has its own tree processing facilities. Thus, it is possible to reach economies of scale and minimise costs of transport and processing equipment as well as obtain an informed market insight.

Up to now, Komaza has primarily been funded through social-impact foundations. However, as forestry assets are being built and sales and value added products begin to show, the programme is becoming increasingly commercialised and self-financing.



Tree growers associations are coming up and approximately 10,000 smallholders have registered in the Farm Forestry Smallholder Producers Association — an umbrella organisation promoting farm forestry, recognising tree planting as an alternative for a safe long-term investment opportunity. About 300 medium and large size farm forest owners have an average of 3,000–15,000 ha of privately owned forests. The medium and large farm forest owners are associated through the Kenya Forest Growers Association (NFP Secretariat, 2014).

Consequently, an important avenue for forest development is through a strengthened producer organisation. Strengthening farmers and tree producers associations in commercial wood production, trade, market information access and further value chain development is a key factor in enhancing forest investments in future. The Komaza initiative is an example of a farmer programme growing trees.

6.1.2 Contract farming and outgrower schemes

The high demand for forest products offers an opportunity for contract farming and outgrower schemes. This involves a wood industry partnering with farmers to grow trees on its behalf and receive payment in return. This will benefit wood-processing companies because a scheme provides access to additional, more secure or cheaper supplies of wood and tree products, diversifies the sources of raw materials, and avoids the overheads and fixed costs usually associated with direct tree growing by companies. For tree growers/farmers and local communities, outgrower schemes provide access to financial support while trees mature, higher net returns from trees and relatively more secure markets for wood.

Such outgrower schemes systematically linking producers with markets could be explored in Kenya where demand is evident and many farmers are already growing trees.

Sappi and Mondi are key companies in the pulp and paper industry in South Africa; both have flourishing outgrower schemes. Recently, larger plantation investors in Tanzania have been keen on combining their own plantation programmes with adjacent communities or individual smallholders in the form of partnerships or outgrower schemes to expand long-term wood sup ply to their processing industries. Green Resources, Kilombero Valley Teak Company, and New Forests Company experiment with aspects of the Tree Growers Association concept.

Institutional and contractual arrangements in these partnerships and outgrower schemes enable smallholders, communities and other involved tree growers to seize economic and social benefits. In November 2014, a tree farming grant scheme was established in Tanzania to create a more conducive framework for private forestry investments through increased availability of information, public–private cooperation and institutional capacity building in pilot villages (PROFOR, 2014).

Young teak plantation in Kilombero, Tanzania.

6.1.3 Contracting system for tree planting

Many Kenyans have large tracts of land and desire to invest in forestry. However, they do not have the time or adequate knowledge of how to fulfil their financial ambitions. A critical mass of trained forest contractors who can establish and manage plantations and woodlots on behalf of potential investors should be developed. Training institutions should mount courses for contactors to sharpen their knowledge on nursery, management, choice of species, species/site matching and plantation establishment and management. Contractors must also be trained in business administration and management. The contracting business will create jobs for foresters, forest technicians and manual workers drawn from rural areas where plantations are to be established. KFS, the Forestry Society or other competent body should develop an annual competence-based certification system for forest contractors and recommend in the local press only the best contractors.

6.1.4 Community forestry potential

Forest management around the world is moving from the central top–down control of natural resources to private and community control. One well-tested and successful approach for this is community forestry. Examples demonstrate that genuine community forestry can bring about sustainable forest management and provide significant socio-economic and environmental benefits (FAO, 2012b; IUCN, 2001).

In Kenya, joint forest management has so far been executed through the management model Participatory Forest Management (PFM). PFM is a model where the management authority of a forest land invites local people to participate in certain forest management activities with various responsibilities outlined in participatory forest management plans (PFMPs). However, the implementation of PFMPs through management agreements between KFS and community forestry associations has continued to be a slow process, resulting in delayed realisation of its full potential. Community forestry can complement PFM and other existing forestry management models.

Community forestry is based on extended user rights and responsibilities handed over to the community. Usually, the managing community is entitled to all benefits from the forest, which promotes responsibility while preventing dissatisfaction with benefit sharing with the government. Counties manage significant forest and woodland areas and the devolution of authority brings about new opportunities for managing such lands.

6.1.5 Tackling impediments to tree growing

Although opportunities for tree growing are many, impediments are also present. The following impediments to tree growing should be removed:

a) Inadequate supply of good quality tree seed.
b) Non-functional forest extension system.
c) Inadequate financial mechanisms to support commercial tree growing.
d) Low recognition by government of importance of tree growing in the country leading to minimal financial incentives for the sector.
e) Under-developed market systems and lack of value adding deny tree planters full economic benefits.

Land and tree tenure is critical to this endeavour. Interest will be eroded if a person investing in trees is not sure that they will reap the benefits of harvesting the trees. Gender aspects also come into play. Women, who are keen on tree growing, may not always have an opportunity to engage in such an enterprise since, traditionally, it is the domain of men, who are also seen as owners of the land. Other impediments include restrictions through licensing or levies imposed by the formal and informal system. Yet others may be attributed to fees and other factors along value chains. For example, poor access to information on marketing restrictions appearing during road transport. The main opportunities lie in removing these impediments.

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6.2 REGIONAL ECONOMIC ASPECTS

Kenya's large, growing and relatively well-educated young labour force has skills including in ICT to efficiently produce forest products and services for local and export markets. The population is expected to double to 80 million in 2050, and an additional 800,000 people entering the work force annually. This labour force can be harnessed to develop skills for local and regional markets. This will form a strong platform for growth once the enabling environment is developed (World Bank, 2009).

The largest share of Kenya's forestry-related imports is paper products. Opportunities exist for exploiting alternative sources of raw materials such as sisal waste, bamboo, rice straw, maize straw, wheat straw and bagasse.

Kenya has good opportunities for improving the efficiency and value adding of its timber processing industries by changing the volume orientation to value orientation to exploit the competitive advantages for business. Requirements for industrial round wood are rising. The current low recovery rate of sawmilling contributes to high prices for sawn timber, which affect negatively the secondary timber processing industries (furniture and joinery) and result in sawn timber being substituted with other wood-based products—plywood, particle board, fibre board, wafer board.

The existing plywood industry is operating at a high rate of the available capacity utilisation. Industry must expand capacity by about 50,000 cubic metres per year to meet the demand in Kenya in 2020. Investors have the opportunity to increase production for both domestic and export markets. Neighbouring countries are importing about 80,000 cubic metres of plywood annually, offering export opportunities for plywood from Kenya.

Greater focus is needed in the use of small logs obtained from thinning plantations and woodlots. Traditionally, the industry capacity installed was geared to processing large logs. The situation has changed dramatically with more availability of small logs in the market. Industry must be innovative and adjust to accommodate this change. Technology available from India and China can make veneer from small diameter eucalyptus and pine logs. This technology is suitable to handle small-dimension logs from farmers' woodlots and thinnings from government and private forests, which currently have no market. A lucrative export market exists for veneer in India and China.

Opportunities also exist for production of wood chips, sawdust and charcoal briquettes for industrial use. Factories owned by the Kenya Tea Development Authority have a huge demand for bio-fuels, which can be met through using thinning and logging residue from woodlots and private plantations.

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6.3 VALUE CHAIN DEVELOPMENT

Kenya has an untapped opportunity to increase value adding of wood and non-wood forest products and to provide new forest products and services to domestic and international markets. Policies and measures have tended to focus on primary products, and the development of higher value wood (and non-wood) products is absent from the policy agenda.

Kenya is increasingly promoting and strengthening value adding of forest products and thus, the socio-economic benefits. Producing more with less will be an important component in the quest for competitiveness (FAO, 2014; KWS, 2008) especially in light of potential negative impacts on production volumes due to climate change.

Pro-poor value chain development focuses on strengthening the livelihoods of the poor such as farmers and labourers, and improving value for money at the consumer's end. The pro-poor approach is based on the belief that vulnerable populations such as smallholders can be well integrated into a market that had previously excluded or only marginally involved them. Opportunities for adding value to forest products definitely exist. It is also envisaged that more business-oriented county and community-based forestry will provide elevated income and employment opportunities as value addition becomes institutionalised.

The NWFPs sector has many active players. Most production, processing and marketing are inefficient; practical strategies to address these inefficiencies have not been developed. The development of NWFP value chains (with community forest associations, forest user groups, forest-based small enterprises, and associations) provides opportunities to develop rural livelihoods.

Zoning is a key strategy of climate smart landscapes and is in line with climate change resilience and mitigation activities. A more commercial orientation to NWFPs will likely bring about improved value chains.

County governments shall facilitate increasing productivity sustainably, value adding and links to markets as well as ensure quality control of NWFPs in order to enhance trade. Local communities have knowledge of NWFPs, their uses and benefits, but are often weak in business development skills. Inadequate market information and market access are other common constraints.

KEFRI has conducted substantial research on gums, resins, aloe and bamboo production and value chains. This research has helped improve use of known and less-known indigenous species of NWFPs and their harvesting techniques, and develop marketing systems for products, and policy issues on guidelines of harvesting, benefit sharing and commercialisation.

A prosperous investment opportunity lies in the cultivation and production of bamboo as an alternative to wood products. The high returns and diversity of products from bamboo make it a productive venture. Bamboo can also be harnessed to reverse land degradation, slow deforestation and combat climate change through carbon sequestration. The versatility of bamboo makes it a commercially and environmentally sustainable resource. Challenges facing investment in bamboo production can be addressed through awareness creation, adoption of new technologies and increased access to markets for bamboo products.

ANALYSIS

6.4 PROMOTING SMALL AND MEDIUM ENTERPRISES

Small and medium enterprise (SMEs) constitute 98% of businesses in Kenya and contribute 30% of jobs and 3% to the GDP. SMEs represent an opportunity to develop the rustic furniture production and possibly bring carpenters into formal production by developing their capacities and skills as well as supporting them to set up formal enterprises. Small and medium sawmills play a role in job creating and in manufacturing products for the market. Sawmills operate low-technology sawing systems with low timber recovery and need support to upgrade technology in order to improve production efficiency.

The annual allocation of logs from public forests to small and medium sawmills is inadequate and does not provide incentive for the mills to invest in better technologies. The mills are also in danger of being crowded out by the large wood industries currently favoured by the licensing system. The country has over 600 small and medium sawmills and not all should be in wood processing business. Reducing the number through a systematic assessment of their performance will ensure that only viable units are allowed to operate. Small sawmills should be encouraged through incentives to join and form cooperatives. Larger units formed should be ring-fenced and given special support in training, adequate allocation of raw materials and financial support to upgrade technology.

They can also be supported to set up associations that may act as forums for capacity building and marketing. These may be productive pathways to modernise the industry and a good vision for the furniture production sector.

ANALYSIS

6.5 WIDENING THE SCOPE FOR PLANTATION DEVELOPMENT

6.5.1 Future plantation management

More investors are looking towards Africa for opportunities involving industrial plantation resources. However, Kenya is not a major target for such investments. The reason is most likely related to land ownership patterns, little access to large areas of land and the overall foreign investment climate (Pöyrö, 2011). In Uganda, between 2002 and 2008 plantation investments grew four-fold, much of this investment has been accredited to domestic small-scale tree growers benefiting from the support of a specific public–private partnership incentive scheme. Outgrower schemes have been used to facilitate small-scale production.

Many individuals and families in Kenya have large tracts of land suitable for commercial tree planting. These farms can be used to develop outgrower schemes or to invest in tree growing to supply the general market. Good lessons can be learned from successful private plantations developed by Kakuzi Ltd, Unilever Tea Company, Finlay's Ltd and others.

According to Green Resources (2012), the cost of establishing plantations in East Africa is competitive, which explains their interest in expanding forest plantations in Tanzania and Mozambique.

Kakuzi company has well-balanced production inclusive of forestry plantations and processing as well as catchments with indigenous flora and fauna

Kakuzi Ltd. was formed in 1906. The company produces tea, avocado, macadamia nuts, pineapple and other horticultural crops. It also engages in livestock keeping and forestry development. Kakuzi pays special attention in managing plantations of both indigenous and exotic tree species. By employing a full-time forestry manager, the positive effect of conserving and managing indigenous forests is reflected in the number and diversity of flora and fauna in these areas. Riparian reserves are well-managed, invasive plant species removed and many areas enhanced with indigenous tree species. Plantation forests are managed and used based on a forestry management plan to ensure a steady and sustainable supply of fuel wood used in tea processing among other uses. There are 1,282 hectares of mainly *Eucalyptus grandis*, *E. saligna* and *E. camaldulensis* plantings. Of these, 905 hectares are commercial plantations and 377 hectares are non-commercial plantations. Currently, Kakuzi plants between 20 and 30 hectares of trees per year on high-yielding sites. The company has developed a wood-processing yard where timber and poles are treated. Timber is milled, pallets manufactured, "eco-friendly" charcoal produced and firewood sold, all in the same yard.

Source: www.kakuzi.co.ke

Demand for forest products is escalating and standards and area under plantations must improve. Better species/site matching, optimum stocking in plantations coupled with better quality management are needed to achieve the desired level of productivity. Due to threat of diseases and pests, new species and hybrids resistant to diseases and pests should be introduced in the plantation development programme and supported by appropriate research through establishment and monitoring of species trials. A growing number of large international forestry organisations is looking for opportunities in Africa and will bring considerable expertise and technology transfer. Parallel to this, farmers and smallholders in Kenya are establishing new plantations to respond to the increasing demand for forest products.

6.5.2 Outsourcing and concessions

The Forest Conservation and Management Bill (2015) defines various agreements for outsourcing forest management activities in public and community forests. State plantations that can be commercially used by private professional parties could be effectively managed through licensing, concessions, contracts or joint agreements. These could be issued by KFS or the county department responsible for managing a specified forest area, at a price based on valuation and bidding. Countries around the world have developed various approaches to forest concession arrangements. The preferred approach is influenced among other factors by public and government attitudes, the capabilities of the forest authority, the nature of the forest (e.g. natural or plantation) and the condition of infrastructure.

The condition of public plantations calls for a **paradigm shift for efficient operational management.**

Potential benefits of managing State plantations using concessions:

- engaging the private sector in plantation development, an activity that it has demonstrated it can do very well
- allowing public sector institutions to concentrate on what they do best, i.e. conserving essential habitats, regulatory and enforcement tasks, and supporting the development of a feasible environment for private forest management
- relieving the State of some financial and management load and ensuring sustainable commercial-oriented management
- shifting some risks and coordination challenges involved in State production of wood to the private sector
- allowing the private sector to grow species and log quality that it determines as most appropriate for its processing activities
- monitoring and comparing the overall efficiency of all concession arrangements versus public plantation management and taking necessary actions.

The government's call for private–public partnerships (PPP) and sustainability must be key requirements for any concession model. In forestry, these requirements are primarily seen to:

- carefully identify suitable forest areas for PPP to avoid environmental damage
- manage conflicts likely to arise if investors from one county are allocated forest concessions in another county
- use a transparent, well-publicised and all-inclusive method of allocating concession areas. Shortage of land and powerful individuals and groups with self-interests will often complicate the process and use their influence to their own advantage
- give incentives to the private sector to use all of its expertise and business management capacity to produce the highest quality plantation forests yielding the optimal volume of quality logs
- relieve KFS of the financial and management burden as well as of risks associated with plantation management whilst still regulating the process and generating income to be ploughed back to other forest conservation and management activities.

Concessions and increased private engagement through PPPs are all opportunities for public plantations that need to be explored, tested, evaluated and balanced in a pragmatic way and within a specific timeframe.

Alternative models for state-run plantations should be assessed to ensure the plantations are sustainably managed. Functions, legal aspects, roles and responsibilities of each partner should be clarified and agreed on.

6.5.3 Exploring tree improvement

The scope for improving selected indigenous tree resources is vast. Improving these species will reduce the economic performance gap between exotic and indigenous species in favour of indigenous species. The first breeding cycle of indigenous species may provide a 10–20% gain in improved quality and also, to some extent, increased growth. Subsequent cycles will add more gains.

The first step is to ensure gene conservation, either *in-situ* or *ex-situ,* of promising indigenous tree populations from various ecological zones. This will ensure that the original evolutionary gene pool is conserved. Next will be selecting and testing mother trees with the preferred attributes, and establishing seed stands and seed orchards in various ecological zones. To optimise matching of species/population to planting site, provenance trials of target populations must be undertaken. Finally, organised procurement of genetically and physiologically good seed combined with capacity building on germination technologies will ensure a good base for future adoption of indigenous species. Parts of such operations could also be outsourced to private tree and seed enterprises.

The scope for tree improvement involves introducing high performing and disease resistant species and hybrids into the country. This has been done in the past through a Gatsby program, which introduced nearly 20 eucalyptus clones from South Africa into the country two decades ago. Some of the introduced clones did not perform as well as expected and are now outdated while others became susceptible to diseases and pests. New and better-performing eucalyptus clones have been developed in South Africa and these should be tried and, if found suitable, introduced as new industrial plantation species. Clones are expensive and in many cases out of the reach of small-scale tree growers. Use of high quality seed of the right species is more appropriate for small-scale farmers.

Tree seed research under way at KEFRI.

One of the biggest drawbacks of establishing commercial plantations in the country is lack of adequate seed of good quality and effective inoculant. Importing seed (from South Africa, Zimbabwe, Argentina, Brazil, Uruguay, etc.) has been very expensive with some seed selling for over USD 1,000 per kilogram. To make affordable tree seed available in the country, efforts must be directed towards developing high quality seed orchards to meet domestic demand and export surplus to neighbouring countries. This task should be undertaken by KEFRI but the private sector should also be encouraged to produce high quality tree seed as a commercial undertaking.

The country needs a national strategy for tree improvement developed through participation of all key stakeholders. KEFRI should be the focal point and convenor of stakeholder meetings to develop it.

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6.6 CORPORATE SOCIAL RESPONSIBILITY IN FORESTRY DEVELOPMENT

Corporate social responsibility (CSR) is becoming increasingly associated with successful business enterprises. It was designed to ensure responsibility for corporate actions, i.e. to behave responsibly. In forestry, CSR is used to create a positive impact on the environment, employees and external stakeholders including consumers and the society as a whole. CSR therefore embraces a range of ethical and market-based instruments through which a business enterprise voluntarily addresses the social (e.g. workers' safety) and environmental issues (Reinhardt et al., 2008).

Regarding worker safety and comfort, most enterprises in the forestry sector have a long way to go. Basic safety requirements—such as hearing protection, chain saw protective gear and helmets—are often not provided. Such protective gear lifts workers' self-esteem and motivation to work. This results in higher productivity and more responsible and successful business enterprises, an opportunity that is not well used.

Many companies are actively getting involved in tree planting activities designed to establish gains, and boost consumer gratification and company branding (Cardskadden & Lober, 1998). An example is Safaricom's M-Pesa Foundation that has teamed up with the Kenya Defence Forces in a tree planting exercise at Mau in Eburu Forest. Financial sponsorship for raising awareness of the environment and tree planting are other modes through which the corporate society can engage in conservation (Mayers, 2000).

CSR activities play a big and increasingly important role in customer attraction and satisfaction, in the recruitment of the best employees and in the conservation of forests and the environment as a whole. Corporate social responsibility also helps to uphold good forest social and ethical standards. The adoption of CSR practices is therefore both an environmental and corporate opportunity when well managed.

ANALYSIS

6.7 NATURE-BASED TOURISM

Ecotourism is a promising investment opportunity for the forestry sector. Globally, it is estimated that 40–60% of all international tourists are nature tourists. Kenya is a popular destination and nature-based tourism attracts over 70% of tourists. It generated a revenue of Kshs 37.4 billion in 2013. National game parks and reserves therefore constitute the backbone of the tourism market. In the past four years, Kenya received an average of 625,205 non-resident visitors annually to the parks and reserves (Mayaka, 2012; Weismann et al., 2014; KTDC, 2015; Skift, 2015).

With the national game parks and national reserves covering about 8% of the landmass, Kenya offers ample opportunities for nature-based development in addition to safari tourism. Increasing numbers of tourists want to interact with local communities and to stay in places that impact positively on both the environment and the local population. The wildlife conservation sector has applied community conservation approaches. For example, in many areas of Laikipia and Narok counties local people carry out many important conservation and sustainable wildlife management activities in buffer zones near national parks and reserves. Community–private–public partnerships can bring incentives and benefits to communities through nature-based tourism.

Forests offer a wide range of activities for tourists such as nature trails, picnic and camping sites, canopy walks, adventure and sports tourism. A growing number of other community and private tourism projects range in scale from complete community management to partnership with an investor who provides know-how and capital to build tourist facilities. This opportunity has not been fully exploited in the forest sector and should be prioritised to encourage the same benefits that ecotourism-based conservation has delivered in the wildlife sector. Initiatives like community exposure visits and business skills training are critical in empowering communities to develop ecotourism sites.

6.8 FINANCING OPPORTUNITIES

Financing opportunities for forestry development that can be exploited in Kenya include private sector investment, the green economy and payment for ecosystem services.

6.8.1 Private sector investment

The private sector in this context includes smallholders, organised farmers and their associations, and large, small and medium-sized enterprises associated with forest products and service provision. It also includes various service providers, particularly in the financing sector. The private sector encompasses players both within the forestry sector, e.g. farmers, pastoralists, and outside, e.g. a tea industry that grows and/or uses trees. Kenya should support the private sector to establish plantations on public and private lands, as implemented in Uganda (see box).

The Sawlog Production Grant Scheme (SPGS) in Uganda has evolved into a robust model that successfully engages private tree growers in planting on a commercial scale. It was designed to meet the needs of investors who are interested in growing timber commercially. SPGS provides a grant covering 50% of the estimated establishment cost to private planters accepted into the scheme, following inspection of field operations.

Several private investors can benefit from such a scheme. Smaller farms could advantageously bundle their respective areas together and apply to be clients of the scheme. Grants and subsidies may thus be used both to encourage private investment in a national resource (timber plantations) and as a policy instrument to guide the type of forestry undertaken.

6.8.2 Forestry in a green economy

The green economy is defined as an economy that aims at reducing environmental risks and ecological scarcities for sustainable development without degrading the environment. In a green economy, the sustainable management of forests becomes a foundation for sustaining a wide range of sectors and livelihoods (UNEP, 2011). Moreover, the whole spectrum of benefits, including environmental benefits, is valued. Green economy also aims for effective carbon sequestration in climate change mitigation. The transition towards a green economy therefore requires investing in forests through conservation, rehabilitation, expansion and increased adoption of agroforestry practices (UNEP, 2011, 2014).

Various green initiatives based on the natural capital are being implemented in the country. These include, among others, efforts focused on forests and conservation of biodiversity. Clean technologies have also been established to ensure efficient production of forest products and value addition. Charcoal producers are being registered through charcoal producer associations, thus creating awareness of effective technologies in charcoal production.

Although forests are commonly considered free public goods, it is important that the public sector provides an enabling environment and incentives for the private sector to invest in sustainable forestry. This opportunity will in turn strengthen the green economy and the goals of the Kenyan Constitution for a cleaner and a more productive environment.

6.8.3 Payments for ecosystem services in forestry

Payments for Ecosystem Services (PES) is a mechanism for providing incentives to land users to sustainably manage the natural environment in order to ensure the continued availability of ecosystem services (Milder et al., 2010). Interest in PES has increased, especially with the development of the carbon credits trade (REDD+, CDM/VCC) in response to climate change.

Income generated from forestry-based PES schemes is unknown. Nonetheless, **forestry-based PES schemes form an untapped and possibly huge potential in Kenya.**

Forests are central in PES; the key defining factor of what constitutes a PES transaction is that the payment causes the environmental benefit to occur where it would otherwise not have occurred. In other words, the service is "additional" or, at the very least, the service can be quantified and tied to the payments made. Forest outputs are often considered tangible goods such as timber, where the quality and quantity are easily and directly used to value the good. When it comes to ecosystem services, which have no apparent "price" and are often viewed as "free" public goods, their value becomes more difficult to gauge.

The greater PES potential is in a green forestry-based economy that is centred more on services for watershed, carbon sequestration, biodiversity and landscape beauty. In Kenya, the World Wildlife Fund and CARE International have come up with a holistic approach referred to as 'Equitable Payments for Watershed Services'. The aim of the initiative is to alleviate poverty through watershed conservation and to do so with equity and social justice (FAO, 2013a). Additionally, Wildlife Works has pioneered payments for an ecosystem services project in Taita Taveta County financed on the voluntary REDD+ market through the sale of reduced emissions by avoiding deforestation (Barbier & Tesfaw, 2012; Bernard et al. 2014).

There is opportunity to apply PES schemes to protect and conserve forest ecosystems. To increase these business models, awareness should be raised of PES options in forestry so that they are prominent in bundled PES systems. However, organisations need both finances and skills in project design to be able to tap into the various PES funding options. Government institutions have a responsibility to promote PES and support partnerships as well as ensuring that an enabling legal framework is in place.

6.8.4 REDD+ forest finance

Approximately 80% of the earth's total plant biomass is contained within forests, of which roughly half of that is carbon. Forests represent the most important and efficient terrestrial carbon capture and storage system we have.

Deforestation and forest degradation are significant causes of global warming, accounting for a minimum of 20% of global greenhouse gas emissions (FAO, 2015). This makes the loss and depletion of forests a major issue for climate change mitigation and adaptation (Obersteiner et al., 2010). Eighty per cent of the Earth's above-ground terrestrial carbon and 40% of below-ground terrestrial carbon is found in forests. Consequently, combating deforestation and forest degradation has been identified as one of the most cost-effective ways to lower carbon emissions (Joosten et al., 2012). The international community is moving towards a system that will provide incentives for reducing emissions from deforestation, degradation and other forest land-use changes.

While there are several avenues for accessing REDD+ financing, market-based mechanisms have so far been the only example in Kenya. For example, the Kasigau Corridor REDD+ project in Taita Taveta County has accessed voluntary payments for REDD+ emissions reductions generated by avoiding deforestation through conserving 200,000 hectares of dryland woodland. While this operates on the voluntary market, the efficacy of providing incentives for forest conservation has been proven.

Global mechanisms for financing REDD+ at the national level are still evolving and include the World Bank's Forest Carbon Partnership Facility, the UN-REDD Programme, and the Green Climate Fund, a financial mechanism of the UNFCCC. Early contributions to establish national programmes based on grants and targeted support finance have made it possible for Kenya to set up a national structure and institutional arrangements. This will ultimately lead to a performance-driven system where Kenya's actions to mitigate climate change through a suite of REDD+ actions will result in results-based payments. In future, it is likely that REDD+ payments will be a significant source of forest-based revenue.

7 THE NFP STRATEGIC FRAMEWORK

The NFP addresses forest development for improved management and sustainability.

STRATEGY

7.1 GOAL, STRATEGIC OBJECTIVES AND OVERALL OUTCOMES

The overall goal, the five strategic objectives and overall expected outcomes of the National Forest Programme are defined as follows:

NFP Goal	**Sustainably managed forests and allied natural resources for socio-economic growth and climate resilience.**
Strategic Objectives	1. Increase forest and tree cover and reverse forest degradation. 2. Enhance forest-based economic, social and environmental benefits. 3. Enhance capacity development, research and adoption of technologies. 4. Increase investments in forest development. 5. Integrate national values and principles of good governance in forest development.
Overall Outcomes	1. Increased forest /tree cover to at least 10% on public, private and community lands. 2. Enhanced visibility and recognition of the multiple values and benefits of forests/tree resources. 3. Improved utilisation of forest resources for sustainable socio-economic development, biodiversity and environmental conservation. 4. Improved participation in planning, decision making processes and public support for sustainable forest management. 5. Developed, innovative, safer, and effective forest-based enterprises. 6. Strengthened capacity to research, generate knowledge, skills, competitive attitudes and dissemination. 7. Increased private and public investments in the forestry sector. 8. Improved forest governance and service delivery. 9. Enhanced conflict management skills at all levels.

Guiding Values and Principles

The implementation of the NFP framework will be guided by the following values and principles.

Values

- Equity
- Professionalism
- Good forest governance
- Recognition and respect for cultural identity, indigenous knowledge and intellectual property rights.

Principles

- Sustainable forest management
- Gender equity and equality
- Rights-based approach
- Public participation and representation
- Polluter and user pay
- Free, prior and informed consent.

STRATEGY 7.2

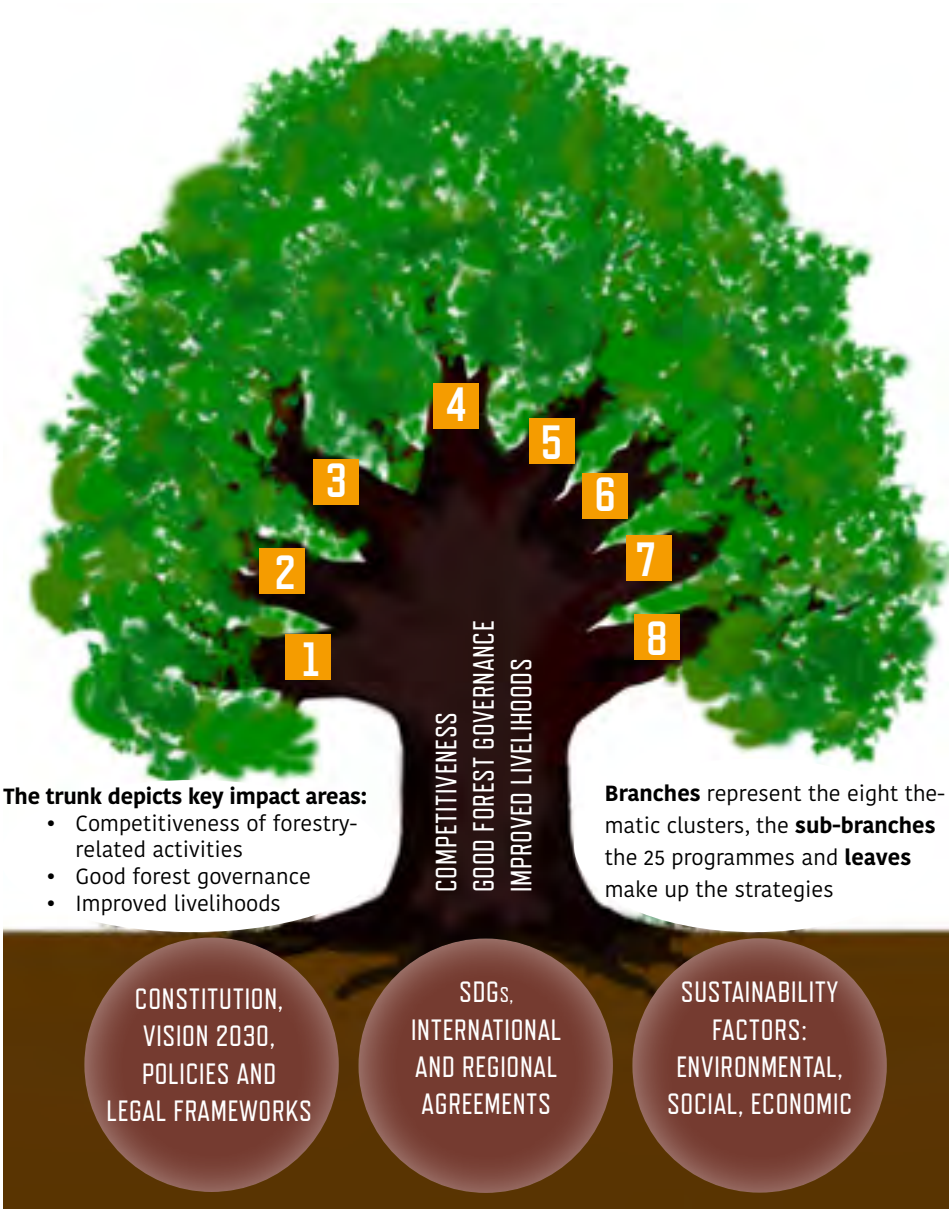
PROGRAMME DESIGN

NFP Thematic Clusters

1. FOREST PRODUCTIVITY
2. FOREST GOVERNANCE
3. NATURAL FOREST MANAGEMENT AND CONSERVATION
4. FOREST FOR WATER
5. FOREST FOR ENERGY
6. FORESTRY EDUCATION, TRAINING AND RESEARCH
7. FOREST AND CLIMATE CHANGE
8. FOREST FINANCING

7.5.1 The NFP Tree

The NFP tree shows the major components on which the programme is based and highlights its thematic clusters.



The trunk depicts key impact areas:

- Competitiveness of forestry-related activities
- Good forest governance
- Improved livelihoods

Branches represent the eight thematic clusters, the **sub-branches** the 25 programmes and **leaves** make up the strategies

The roots depict the NFP foundation that embraces:

- The Constitution, policies and legal frameworks and development blueprints including Vision 2030
- The Sustainable Development Goals and international and regional agreements
- Sustainability factors: environmental, social and economic

Sustainability factors

- **Environmental sustainability:** includes forest recovery, increased tree cover, forest ecosystem regeneration, forest health and protection, the role of forests and their functions in water catchment in addition to other environmental services.
- **Economic sustainability:** includes economic growth from forests based on extended value adding, promotion of commercial and farm forestry, more emphasis on business-oriented forest management by counties and parastatals working in close collaboration with communities, the private sector and civil society.
- **Social sustainability:** includes political goodwill, pro-poor participatory forest management and socio-cultural aspects integrating sustainable forestry management.

7.5.2 Thematic clusters and their objectives

The thematic clusters are interlinked and consist of related programmes (Table 7.1). Details are provided in Chapter 8.

7.5.3 The Programmes

Each thematic cluster has a number of programmes with objectives and intervention strategies. Programmes and their objectives are listed in Table 7.2; more details are provided in Chapter 8.

Table 7.1. NFP thematic clusters and their objectives.

Thematic clusters	Thematic objectives
1 FOREST PRODUCTIVITY	Increase forest and tree cover and optimise management of forest resources
2 FOREST GOVERNANCE	Strengthen forestry governance systems for sustainable environmental, economic and social benefits
3 NATURAL FOREST MANAGEMENT AND CONSERVATION	Sustainable management of natural forest ecosystems
4 FOREST FOR WATER	Sustainably manage water resources and their catchments
5 FOREST FOR ENERGY	Sustainably produce, manage, and utilise biomass energy
6 FORESTRY EDUCATION, TRAINING AND RESEARCH	Enhance capacity in forestry education, extension, training and research
7 FOREST AND CLIMATE CHANGE	Integrate climate change actions in forest programmes
8 FOREST FINANCING	Diversify forest financing mechanisms

Table 7.2. Thematic clusters, programmes and programme objectives.

Thematic clusters	Programmes	Programme objectives
1 FOREST PRODUCTIVITY	1. Plantation development	To increase and sustainably manage forest plantations
	2. Dryland forestry development	To sustainably manage dryland forest resources
	3. Farm forestry	To improve livelihoods and environmental resilience
	4. Forest health	To monitor and manage abiotic and biotic agents
	5. National forest resources assessment and monitoring (NFRAM)	To develop an integrated national forest assessment and monitoring system
	6. Forest products development and value addition	To increase efficiency in harvesting, processing and utilisation of forest resources
2 FOREST GOVERNANCE	7. Policy, legal and institutional reforms	To create an enabling environment and legal frameworks for good forest governance
	8. Forest information management and dissemination	To effectively manage forest information for enhanced access
	9. Community, gender and special interest groups in forest management	To improve stakeholders' participation in sustainable forest management
	10. Forest law enforcement and compliance	To ensure compliance with forest legislation
3 NATURAL FOREST MANAGEMENT AND CONSERVATION	11. Natural forest management	To manage natural forests for sustainable production of goods and services
	12. Eco-tourism	To promote nature-based tourism for enhanced conservation of natural forests and improved livelihoods
	13. Community forestry	To establish community forestry for environmental and socio-economic benefits
4 FOREST FOR WATER	14. Watershed conservation and management	To rehabilitate and manage water catchment areas
	15. Soil and water conservation	To improve soil and water conservation
5 FOREST FOR ENERGY	16. Forest energy development	To increase access to energy through increased biomass and use of efficient technologies
6 FORESTRY EDUCATION, TRAINING AND RESEARCH	17. Education	To enhance content and quality of forestry education
	18. Training	To strengthen the capacity of stakeholders through training in forestry skills
	19. Research and development	To generate knowledge, develop technologies and innovations in forestry
7 FOREST AND CLIMATE CHANGE	20. Climate change mitigation	To enhance carbon stocks within and outside public forests
	21. Climate change adaptation	To enhance resilience to climate change shocks and land productivity
	22. Disaster risk reduction	To decrease vulnerability to severe climate change impacts, and create opportunities for alternative livelihoods
8 FOREST FINANCING	23. Forest resources valuation	To determine the total value of forest resources and increase financing to the forest sector
	24. Forest resource mobilisation	To mobilise resources for forest development
	25. Forest investment	TO provide investment opportunities, profiles and incentives

8 THEMATIC CLUSTERS AND PROGRAMMES

This chapter presents eight thematic clusters which describe the 25 NFP programmes in detail. Together, the clusters and programmes form an innovative conceptual framework for interventions in forestry development.

STRATEGY

8.1 FOREST PRODUCTIVITY CLUSTER

Forest productivity addresses efficiency in production, processing and trade of forest products in Kenya. Forest products are fundamental components of modern life as they are made from renewable resources. Thematic cluster 1 covers aspects of productivity of plantation forests on government and private lands, dryland forests, farm forestry, forest health, as well as harvesting, processing and trade in wood and non-wood forest products. Additionally, technology, skills and efficiency upgrade and marketing throughout the forest products value chains are crossover strategic needs within this theme to meet the country's growing need for wood, fibres and non-wood forest products.

Tree improvement, silviculture and species site matching play major roles in the growth, survival and quality of forests. The concerns of having an appropriate management regime and sustaining a healthy and productive forest ecosystem are emphasised in this theme. Sustainable forest management could be achieved through a combination of productivity, economic, social and environmental considerations. Planning for interven tions in forest productivity must take into account impacts of climate change. In addition, innovative partnerships between private actors and government will be explored.

1 FOREST PRODUCTIVITY

Key challenges

- Inadequate knowledge of tree growing as a feasible enterprise
- Weak implementation of good practices in forest management
- Bureaucracy is limiting private sector investments
- Limited appropriate and innovative financial mechanisms to support expanded tree growing
- Inadequate financial mechanisms to support technology upgrade
- Public sector is not adequately providing necessary incentives to the private sector
- Ineffective and unrealistic management plans which are not regularly updated
- Inadequate knowledge on species site matching and forest management for exotic and native tree species
- Underutilisation of and poor approaches to tree growing in ASALs
- Inadequate availability of quality germplasm (planting material)
- Planting few commercial species. This narrow genetic variability is risky due to diseases and pests
- Effects of climate change on forests
- Excessive waste in processing and little use of waste
- Lack of market information on forest products
- Inadequate information on available opportunities in the ASALs
- Inadequate forest resource assessment data, poor access and dissemination of forest information

8.1.1 Challenges, situational analysis, and results framework

Challenges: Box 1 shows the key challenges in forest productivity.

Situational analysis: Kenya is a low forest-cover country, but despite this state forests provide a wide range of goods and services and contribute to the national economy.

Major threats to Kenyan forests include competition for land due to agricultural expansion, settlement and urban development, excessive extraction of forest products, unsustainable charcoal production and overgrazing. Most of the existing closed-canopy forests are located in high potential areas while significant woodlands occur in the drier areas. The greatest potential for increasing tree and forest cover lies on farm and to some extent in dryland areas. A strong base upon which forest productivity can be enhanced is through improved forest management and

a refurbished forest industry. Innovations in institutional and financial arrangements are needed to enhance implementation of good forest management practices.

Table 8.1 presents the key points derived from analysing the thematic challenges undertaken jointly by experts and stakeholders.

Results framework: The strategic planning framework for this thematic cluster is presented in Table 8.2.

Programmes within this thematic cluster include:

- **Plantation development**
- **Dryland forestry development**
- **Farm forestry**
- **Forest health**
- **National forest resource assessment and monitoring**
- **Forest products development and value addition.**

1 FOREST PRODUCTIVITY

Table 8.1. SWOT analysis for forest productivity cluster.

STRENGTHS	WEAKNESSES
• Availability of trained forestry personnel in KEFRI and KFS • Availability of a supportive legislation • Germplasm of a wide range of indigenous species with great potential • Potential high return on investments • Supportive stakeholders including development partners and private sectors • Availability of land mainly in the ASALs • Favourable sites and climatic conditions • Established institutions related to forestry such as KFS, KEFRI, KWS, FSK, KFTGA, KFWG and FAN • Established training and research institutions • Expanding domestic and regional markets	• Lack of commercial approach/inadequate investment in plantation development • Inadequate information on forestry and weak dissemination • Outdated technologies • Low adoption of new technologies • Inadequate technical skills in tree growing, wood production and processing • Unclear tree tenure system/ownership • Poor management of forests in ASALs • Inadequate availability of quality germplasm • Weak national tree improvement strategy • Slow development and implementation of management plans • Weak enforcement of laws and regulations • Lack of forest certification • Undervaluation of forest goods and services
OPPORTUNITIES	**THREATS**
• Demand for forest products exceeds supply • New technologies and improved management strategies • Untapped potential for forest product value addition • Dissemination strategies to public domain to increase awareness • Potential in forest certification • Species suited to different ecological zones • Private entities interested in concessions • Potential for establishing a Forest Conservation and Management Trust Fund • Commercial establishment of high value tree stands • Willingness of citizens to venture into farm forestry and urban forestry • Devolved governance and political goodwill	• Vested interests • Non-recognition or awareness of the true value of forests • Climatic changes; erratic/ unpredictable weather changes • Invasive species, animal damage, forest fires and pests and diseases outbreaks • Market failure, product substitution, cheap imports, inadequate supervision of standards • Non-competitive market • Establishment of monocultures and loss of biodiversity • Population pressure and land-use changes

Table 8.2. Thematic objectives, outcomes and indicators.

Thematic objective	Outcomes, 2016–2030	Indicators of achievement
Increase forest and tree cover and optimise management of forest resources	**Long term (2030)** Increased productivity in wood and non-wood forest industry	• % increase in the forestry sector contribution to the GDP • % increase in forest and tree cover • % increase in seed orchards supplying quality seeds
	Medium term (2025) Increased supply of forest products and services for domestic and commercial purposes	• % increase in no. of forest products value chain • Increase in household incomes
	Short term (2020) Enhanced diversification, management, processing and marketing in the forest industry	• % increase of wood and non-wood industries using improved machinery • % increase in forest plantation area, tree cover, and production per unit area

8.1.2 Plantation development

Plantation forestry is mainly established for commercial purposes; however, it plays an important role in providing social and environmental values. Forest plantations are established mainly to provide timber, pulp and fuel wood, thus reducing demand from natural forests. Most plantations in Kenya are found in the highlands between an altitude of 1,500 and 2, 500 metres. Over the years, the management of government forest plantations has not been optimal. The establishment of KFS paved the way for a more business-oriented management approach, but further steps are needed including putting the legal provisions for concessions into practice. Legal provisions for joint forest management are also applicable to plantations on public land but regulations for benefit sharing need to be developed.

The underlying causes of deteriorating plantation forest management include limited participation by strategic stakeholders in conserving and managing forests, and access to forest resources for livelihoods (Mathu, 2011). Other causes include poverty and high dependence on natural forests for livelihoods, natural disasters, unclear tree tenure systems, climate change, limited technology and expertise, inadequate incentives, limited funds and tree growing as a business.

The potential for expanding plantations within public forests is limited and plantation expansion will be through intensified plantation establishment on community and private lands. Occasionally, outgrower schemes may spur interest in forest plantation ventures. Dwindling supplies from State forests have led to increased prices of wood, thus making private plantation forestry a viable venture (Ruri Consultants, 2013).

Enhanced plantation establishment will effectively be realised through availability of high quality tree seed for seedling production. Therefore, the Tree Improvement Programme in the country should be strengthened to introduce new commercial species and to substantially increase the supply of improved seed and clones to users.

Objective: To increase and sustainably manage forest plantations.

Intervention strategies: Table 8.3 outlines the intervention strategies.

Table 8.3. Plantation development: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Use superior germplasm to establish forest plantations	• Increased production of forest plantations on public, community and private lands • Diversified species of high performance and disease resistance • Improved tree seed availed	• % change in yield • % change in quality • Tons of improved seed produced	Disease and pest outbreaks Forest fires Invasive tree species Climate change External interference Resistance to change Inadequate funding
Develop and implement of management plans for public, community and private forest plantations	• Sustainably managed forest plantations	• No. of plans developed and implemented • % reduction in soil loss and downstream siltation	
Diversify forest plantation species	• More species for forest plantations development • Diverse supply of forest products • Enhanced biodiversity	• No. of new species domesticated • No. of new forest products • % change in biodiversity index	
Promote forest plantation establishment and management on public, community and private land	• Increased production of forest plantations on public, community and private land	• % increase in area of forest plantation • % Increase in supply of forestry products	
Involve private sector in forest plantation development through concessions or contracts	• Increased production of forest plantations on public land	• % increase in forest products and services	
Develop joint plantation management principles and practices	• Joint management guidelines developed	• No. of joint management frameworks	
Enhancement of forest extension services	• Increased capacity/ skills of farmers to grow and manage trees • Improved adoption of forestry technologies	• % increase of area under trees on farms • No. of forestry technologies adopted	
Establish and improve forest infrastructure	• Motor able forest roads • Reduced fire damage	• Km of new and rehabilitated roads • Km of new and rehabilitated firebreaks	

Implementation modalities: Depending on tenure, a range of stakeholders manage forest plantations — individuals, KFS, county governments, companies, institutions and communities. The forestry extension service under county governments will provide technical advice to tree growers. Research institutions, led by KEFRI as the focal point for tree improvement, will engage in diversifying commercial species and establishing seed stands and clonal orchards. Farmers and rural communities will produce seedlings on their own nurseries using improved seed of suitable species. Farmers will also have access to improved planting material produced by commercial nurseries supported by the forest extension service. Development and use of public and private investment models in plantation establishment and management (concessions, outgrower schemes and contract tree growing) will be promoted. For government land, plantation management should be based on best practices for economic viability. Concession management of plantations is a viable model. Development and use of forest management plans for private forests is encouraged. Soil and water conservation measures as well as other environmental considerations will be applied irrespective of owner or manager.

8.1.3 Dryland forestry development

ASALs are rich in biodiversity and supply marketable forest products such as charcoal, timber, fodder and feed, gums and resins, aloe, essential and edible oils, fruits, honey and other food. However, they are frequently stressed by drought.

Dryland forests constitute 49% of Kenya's forests. They comprise 2 million hectares of open woodlands, 3.5 million hectares of bushland and 24.3 million hectares of grassland (FAO 2010; KWS, 2008).

Dryland forests play an essential role in the livelihoods of over 10 million people living in the ASALs.

Human migration from the high potential areas to the ASAL areas is noticeable. This migration has interfered with pastoral systems, causing ecological imbalances. Other challenges facing dryland forests include overgrazing, soil erosion, spread of invasive species, bush encroachment, deforestation and desertification. This has further been exacerbated by other environmental factors like climate change. These factors have led to the collapse of traditional systems of managing dryland forest resources. The dryland forest is the major source of charcoal in the country, which is produced unsustainably leading to loss of biodiversity and degradation of natural habitats particularly for wildlife and livestock.

The highest poverty levels are found in some of the ASAL areas. Livelihoods in these areas heavily depend on ecosystem goods and services related to forests and woodlands. Any improvement in forest production potential will depend on clarifying land tenure rights, developing processing technologies and markets for non-wood forest products, and providing sufficient economic incentives. Managing the vast areas based on a rangeland management approach constitutes the greatest potential for enhanced productivity of a kind that is relevant for local livestock owners and herders. Integrated rangeland management systems combined with improved forest resource governance can mitigate climate change, reduce disaster risks, and improve adaptation (Bernard et al., 2014).

Objective: To sustainably manage dryland forest resources.

Intervention strategies: Table 8.4 illustrates the intervention strategies.

Implementation modalities: County governments will be the lead implementers of this programme with technical support from national government institutions.

Table 8.4. Dryland forestry development: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Promote integrated management of dryland forests (traditional and conventional management systems)	• Improved livelihoods • Increased tree cover in dryland areas • Enhanced biodiversity • Reduced spread of invasive species, e.g. *Prosopis* sp. • Woodland management plans developed and implemented • Traditional and conventional management systems integrated	• % increase in household incomes • Area of established and rehabilitated dryland forests • Increased productive use of invasive species (e.g. *Prosopis* sp.) • No. of management plans developed and implemented	Prolonged droughts Forest fires Resource conflicts among communities
Expand commercial and fodder trees in ASALs	• Increased productivity of rangelands • Increased household incomes • Improved environmental resilience	• Increased area under tree growing • % increase in household incomes • Increase in biodiversity	
Sustainable harvesting and value addition of products derived from trees and forests	• Improved livelihoods • Increased sustainable trade flows • Diversified range of products	• % increase in household incomes • % increase in trade • Increased number of products	
Establish tree improvement programme for the drylands	• Sustained availability of superior germplasm • Species diversification	• % increase of improved germplasm used	
Promote efficient water harvesting and management technologies for tree growing	• Increased technologies • Increased tree cover • Increased biodiversity	• % Increase in tree cover • Biodiversity index • % increase of indicator species	

8.1.4 Farm forestry

Farmlands with trees or with a potential for agroforestry occupy about 10 million hectares—close to 18% of Kenya's land area. The distribution of these areas matches the densely populated areas where the majority of Kenyans live. Between 1997 and 2012, the government enforced a timber-harvesting ban in State-controlled plantations (KEFRI, 2014). During that period, industrial wood was sourced from farms and supplemented with timber imported from neighbouring countries.

Farmlands provide the greatest opportunity for expanding forests. The draft Forest Policy (2015) proposes the development of farm forestry as a way of increasing forest cover, diversifying products for subsistence use and incomes while contributing to soil and water conservation. The policy underlines the importance of supporting farmers with sound management and utilisation principles, incentives, information, better germplasm and marketing strategies. Vision 2030 and the National Climate Change Response Strategy (NCCRS) have also placed similar emphases on the farm forestry's contribution in conserving water resources.

Limited access to markets and market information are the major challenges farmers face. The farm forestry sector could exploit several opportunities including limiting public land to tree growing, increasing interest in commercial tree growing on farms, availing markets for forest products, ensuring well-designed agroforestry systems are compatible with crop and livestock production, and selling carbon credits for additional income.

Programme interventions will focus on developing fast-growing species with high market demand and their propagation and management practices, enhancing tree seed supplies at the local level, training/capacity building, developing on-farm efficient wood conversion technologies and promoting small and medium enterprises. Additionally, in lower potential areas the programme will focus on tree species that are suited to the sites to enhance resilience to climate change.

Objective: To improve livelihoods and environmental resilience.

Intervention strategies: Table 8.5 illustrates the intervention strategies.

Implementation modalities: Tree growers associations, NGOs and national and county governments will be instrumental in providing training and extension on tree growing and use to farmers. These institutions will liaise with research organisations and institutions of higher learning to source technical assistance on farm forestry technologies for dissemination. Where appropriate, support will be provided to establish tree outgrower schemes in collaboration with the private sector.

The detailed technical contents of training and extension will be developed through participatory planning at sub-county level, with support from the county government and tree growers associations.

Table 8.5. Farm forestry: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Enhance forest extension services	• Increased capacity/ skills of farmers to grow and manage trees • Improved adoption of farm forestry technologies • Establishment of demonstration plots	• % increase of area under trees on farms • No. of farm forestry technologies adopted	
Develop and implement a national strategy for farm forestry	• Increased sustainable supply of forest produce • Increased household income	• % increase in quantity of forest products from farms • % increase in household income	
Acquire and avail superior tree germplasm at local level	• Increased seedling production • Increased yields and diversified forestry products	• No. of seedlings produced • % increase in yields of diversified forestry products	
Promote sustainable landscape development approaches	• Integrated innovative landscape plans developed	• No. of plans developed and implemented	
Develop public private partnerships	• Enhanced stakeholder participation • Outgrowers schemes established	• No. of functional partnerships • No. of outgrower schemes established	
Promote linkages between farmers and markets for forest products	• Improved access to markets • Higher product prices	• % increase in income	
Strengthen tree growers associations	• Pooled resources for enhanced production and marketing	• % increase in income	
Promote climate smart silvicultural practices that enhance soil and water conservation	• Reduced erosion • Enhanced water conservation • Enhanced farm productivity	• % change in soil loss • No. of soil conservation structures • % increase in farming outputs	
Promote use of ICT to value and manage farm forests	• Better priced products • Well managed forests	• % increased income	
Promote bamboo on farms	• Uptake by farmers of bamboo as a commercial crop	• No. of ha planted with bamboo	

1 FOREST PRODUCTIVITY

8.1.5 Forest health

In Kenya, forests are occasionally threatened by unmanaged fires, pests and diseases. For example, over the last decade major fires burned Mt. Kenya Forest in 2012, 2014 and 2015. Fires have also occurred in other forests including the Aberdares, Mt. Elgon and the Mau. The frequent occurrence of droughts has compounded incidents of fires in forests. However, controlled fires may be used as a management tool to reduce the fire hazard by early burning of vegetation. Fires are also essential elements for the general ecological balance especially in dryland ecosystems. Many species in dryland forests rely on fires for pest control and even germination.

Pests and diseases cause substantial destruction to all forests. However, losses are more pronounced in monocultures and in some exotic trees on plantations and farms. Indigenous trees do not suffer serious damage from pests or diseases. It is important to monitor, prevent and control pests or diseases outbreaks if and when they occur. Woody parasites are a category of emerging challenges to forest productivity and management of trees.

Invasive species are major threats to forest productivity. Some of these species are *Lantana camara, Acacia mearnsii, A. melanoxylon* and *A. nubica*. With appropriate management techniques, some of these species can be transformed into livelihood-supporting enterprises.

Climate change may alter the balance of forest ecosystems, making forests more susceptible to pests and diseases in areas and situations where risks have so far been minimal. Increased risks are also associated with trade in wood or other plant material, in which new pests and diseases are brought in from abroad.

Objective: To monitor and manage abiotic and biotic agents.

Intervention strategies: Table 8.6 illustrates the intervention strategies.

Table 8.6. Forest health: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Develop national forest health monitoring system	• Damaging abiotic and biotic agents mapped • Better understanding of forest health • A functional monitoring and assessment unit	• Maps indicating extent of damage • Indicator species • Timely reports	Porous borders Climate change
Prevent and manage biotic and abiotic impacts on forest health	• Reduced incidents of damaging biotic and abiotic agents in forest ecosystems • Improved fire management response • Improved forest health • Increased forest productivity	• No. of pests and diseases identified and managed • No. of incidents reported and managed • % reduction in incidents of unmanaged forest fires against baseline • No. of technologies/strategies developed and adopted • % increase in growth • % increase in yield of forest products • % reduction in forest degradation	
Promote disease and pest resistant tree species and clones	• Reduced incidence of diseases and pests	• Increased growth and yield	

Implementation modalities: Implementation of this programme is multi-sectoral and multi-stakeholder in nature. Proper coordination of the players is essential. A relevant national institution will be identified to lead the establishment of the forest health monitoring and assessment unit. Firefighting capacities will be enhanced at the county levels including capacity building on how to prevent, suppress and control forest fires. Modern firefighting technology and equipment will be used to combat fires.

Phytosanitary inspection of all imported planting and woody materials will be enhanced in collaboration with the relevant authorities. Field hygiene will be observed at all times to avoid pathogens breeding. Tree breeding will be carried out to propagate tree species that are resistant to attack by pests and diseases.

8.1.6 National forest resources assessment and monitoring

Sustainable forest management requires accurate information on forest and tree resources. Comprehensive and representative information provides a basis for national-level analysis and strategic planning, and enables knowledge-based decision-making. Statistical information on forest cover and status provided over time increases knowledge of trends in forest development and understanding of interactions between forests and other land uses.

Kenya's commitment to international conventions and processes has further expanded information needs on forest resources. In these processes and in other international reports, such as FAO's Global Forest Resources Assessment (FAO, 2010, 2015d), consistent and representative information on forest resources, products and services are required. The country has already committed to participate in REDD+ as a climate change mitigation mechanism, a process that requires significant investment in the country's capability to assess forest resources. To meet future need for forest investment, information on forest resources will be availed including their extent; productive, protective and socio-economic functions; biological diversity; and health and vitality.

Currently, gaps exist in information on forest resources in terms of quantity, quality, growth and yields. A national forest assessment and monitoring system will be established to fill in the information gap on forest and tree resources. Information from this programme will be used to package information to be used to prepare investment guides for potential investors and other interested parties. These guides will assist in attracting new investment in the forestry sector.

Objective: To develop an integrated national forest assessment and monitoring system.

Intervention strategies: Table 8.7 illustrates the intervention strategies.

Implementation modalities: The programme is multi-sectoral and will therefore require participation of relevant organisations with adequate capacity and resources. For effective implementation, the programme must at all levels be fully transparent and will require effective and efficient co-ordination from the ministry responsible for forestry affairs. The counties will take responsibility for assessment and monitoring in areas under their jurisdiction.

Table 8.7. National forest resources assessment and monitoring: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Establish national forest assessment and monitoring system	• Forest management decisions informed by accurate scientific data	• National forest inventory and monitoring reports	Conflicts amongst implementers
Undertake regular data collection, analysis and dissemination	• Accurate forest resoure data available • Improved national forest inventory	• Functional forest resource databases • Functional data management systems	Forest resource conflicts
Build capacity for assessing and monitoring forests	• Improved capacity in forest inventory • A functioning forest assessment unit	• Permanent staff working for the NFRAM unit • Long-term data collection ensured	

1 FOREST PRODUCTIVITY

8.1.7 Forest products development and value addition

A favourable business and investment climate is critical for economic development, job creation and poverty reduction. This also applies in the development of the forestry sector, from tree growing to wood processing and product marketing—focusing on the whole forest value chain. The rationale is that a positive business climate accelerates forest investments, promotes good governance, generates rural employment, fosters wealth creation, and improves overall sector competitiveness and potentially creates wealth.

The key to viable and profitable forest and wood production in Kenya lies in the existing huge demand for wood and other products derived from trees and forests. This programme intendeds to support sustainable harvesting and processing to derive most value from forests.

International competitiveness depends on productivity and its evolution. Productivity depends on continuous investment and enhanced operating conditions. Kenya is disadvantaged as institutions handling taxes, trading across borders, starting and registering new business and enforcing contracts are weak (World Economic Forum, 2013, 2014).

Investment in improved technology for post-harvest handling, management and processing and value addition will be promoted. Forest products will be standardised and certified to ensure that quality is not compromised. A competitive improvement programme will be launched including reforms to improve the business environment, with the aim to take the industry to a growth path. Use of appropriate technology will be promoted through training and technology development. Forest industrial training institutions will be revived so that they supply highly qualified personnel, attractive for employment in the private sector.

Objective: To increase efficiency in harvesting, processing and use of forest resources.

Intervention strategies: Table 8.8 illustrates the intervention strategies.

Implementation modalities: The government, tree growers, private sector and other relevant stakeholders will collaborate in reviewing marketing and other issues affecting forest industries. Log supply from public forests and licensing will be reviewed in a transparent and inclusive manner.

Innovation centres will be established by relevant institutions in collaboration with the private sector and other stakeholders through research and incubation to encourage creativity. The formation of joint venture programmes between tree growers and forest industries will be supported.

Table 8.8. Forest products development and value addition: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Improve forest resource value chain development	• Increased availability of quality forest products • Diversified and commercialised non-wood forest products, including bamboo • Increased incomes	• No. of value added forest products • Increase in number of non-wood forest-based enterprises • % change in household income	Market failure Currency fluctuation Unstable power supply Policy changes Products substitution Illegal importation of forest products Non-compliance with standards
Develop efficient forest industries	• Improved efficiency and conversion rate	• % recovery rate • % increase in investment in forest industry • % increase in number of skilled labour force	
Revitalise and modernise vocational training	• Increased number of skilled personnel • Improved productivity	• No. of trained individuals • % increase in supply of forest products	
Strengthen forestry processors and trade associations and cooperatives	• Increased trade in forest products and services • Increased investment opportunities and networking • Competitive pricing of forest products	• Increased access to markets • No. of product-based marketing associations • % change in traded products and services	
Increase use of improved technology	• Efficient processing technologies for wood and non-wood forest products • Diversified products in the market	• No. of improved technologies • No. of new forest products in the market	
Develop appropriate and innovative financial mechanisms and linkages to other suppliers	• Faster refurbishment and upgrading of the industrial capacity	• Higher recovery, better quality and higher volume of production	
Promote use of indigenous tree species	• Diversified species -based products	• No. of indigenous species being used commercially	

STRATEGY

8.2 FOREST GOVERNANCE CLUSTER

Forestry sector governance is defined as the *modus operandi* by which people, stakeholder groups and organisations acquire and exercise rights and authority in the management of forest resources. Good forest governance is characterised by the prevalence of the rule of law, low levels of corruption, transparency in operations and financial matters, accountability, robust institutions, high competence of officials and other functionaries who implement rules, willingness and effectiveness to address forestry sector issues, sanctity of critical legal elements such as enforcement of property rights and agreements, etc. (Dixit, 2004; World Bank, 2009).

Good forest governance is a central component in forest ecosystem management without which sustainable forest management cannot be attained. In the Kenyan context, good forest governance should be derived from the governance values expressed in the Constitution of Kenya (2010) and Vision 2030. The Forests Act, 2005 provided room for improved good governance that was further enhanced by the Constitution.

Key areas proposed for intervention for enhanced good forest governance:

- Aligning forest legislation with the Constitution and providing for policy, legal and institutional reforms that address emerging forestry issues, including climate change, while taking into account good practices at global, regional and national levels

- Establishing and strengthening forest governance structures and enhancing access to forestry information to ensure accountability, transparency and meaningful citizen participation
- Strengthening capacity of forest institutions to deliver on their mandates
- Reducing conflicts between industry, communities and governments at both national and county levels over resource management and benefit sharing
- Providing for the active involvement of vulnerable and marginalised groups in the society
- Enhancing forest law enforcement and compliance
- In conjunction with the development of the national REDD+ strategy developing a system for information on status of environmental and social safeguards.

Special attention will be paid to public participation where participatory approaches to forest conservation and management will be enhanced to ensure that the relevant government agencies, county governments, private sector, civil society and communities are involved in planning, implementing and decision-making processes. Emphasis will be in the involvement in all levels of forest management of women, youth, people living with disabilities and marginalised groups in society.

8.2.1 Challenges, situational analysis, and results framework

Challenges: The thematic working group identified and grouped the challenges related to forest governance as shown in box 2.

Situational analysis: Stakeholders carried out an assessment of stakeholders, identified thematic challenges and undertook a comprehensive problem and situational analyses to assess possible risks and opportunities, causes, effects and strategic directions for forest governance. The SWOT analysis in Table 8.9 is a result of participatory stakeholder consultations.

A results-based framework approach guided the formulation of detailed programmes and strategies for addressing forest governance challenges and implementation modalities.

Results framework: Table 8.10 presents the strategic planning framework for this thematic cluster.

Programmes within this thematic cluster:

- **Policy, legal and institutional reforms**
- **Forest information management and dissemination**
- **Community, gender and special interest groups in forest management**
- **Forest law enforcement and compliance.**

2 FOREST GOVERNANCE

Key challenges in forest governance

- Overlapping policies and institutional and implementation mandates and efforts resulting in conflicts in use of forest resources
- Weak adherence to policies on titling of forest land and unclear user rights
- Challenges of devolution bring on board more forest stakeholders with more and divergent interests in forests and forest land
- Weak dissemination strategies for forestry matters among lead agencies and all stakeholders
- Lack of a stakeholders' forum that meets regularly to discuss issues affecting the forestry sector
- Inadequate investment and funding capacities to manage forestry
- Weak forest governance mechanisms to address issues related to poverty, climate change and natural resource-based conflicts
- Weak compliance and enforcement regimes that accelerate encroachment, forest degradation and general noncompliance with regulatory requirements
- Inadequate mechanisms for involving the private sector, gender, youth, forest-dependent communities in the use of forest resources and sharing of benefits
- Vested interests, rent seeking and patronage.

Table 8.9. SWOT analysis for the forest governance cluster.

STRENGTHS	WEAKNESSES
• Supportive Constitution and other legal frameworks for arbitration and legal redress • The Kenya Vision 2030 recognises forestry development as one of its flagship projects • The legal framework supports stakeholder participation in forest management • Kenya has ratified and is party to several MEAs on forestry and climate change • Forestry sector reforms under the devolved government framework are supportive of good forest governance • The existence of supportive civil society (NGOs, community-based organisations and faith-based organisations).	• Weak coordination and synergy of institutions, programmes and projects in managing forest ecosystems • Lack or unclear forest boundary demarcations and titling of forest land, and unclear land tenure rights for forest-dependent communities • Weak compliance and enforcement regimes that accelerate encroachment, deforestation and general non-compliance with regulatory requirements • Unclear mechanisms for involving the private sector, gender, youth, forest-dependent communities, and in sharing costs and benefits • Overlapping and conflicting laws, roles and responsibilities amongst natural resource based institutions (jurisdictions) • Inadequate information dissemination strategies • Undervaluation of the forestry sector's contribution to national economic development • No forum for stakeholders to discuss issues.
OPPORTUNITIES	**THREATS**
• Ongoing alignment and formulation of laws and policies under the Constitution of Kenya • Investment opportunities and involvement in forestry by NGOs, CBOs and private enterprises • Existence of the East African Community as a platform to champion development of transboundary resource management • Existence of PPP principles in forestry development, product harvesting and processing • Synergy of programmes with other existing NRM governance structures strengthening the ecosystem approach to forestry management • Recognition and application of indigenous knowledge systems for forestry management • Harmonisation of policy frameworks at national and county levels.	• Vested interests, interference and patronage • Existence of conflicts in management of forests • Deliberate forest fires (arson) • Limited livelihood streams creating pressure on forests • Regional disparities in the management strategies of transboundary forest resources • Insecurity limiting management and access to forest resources • Illegal exploitation and trade in forest resources.

Table 8.10. Thematic objectives, outcomes and indicators.

Thematic objective	Outcomes, 2016–2030	Indicators of achievement
Strengthen forestry governance systems for sustainable environmental, economic and social benefits	**Long term (2030)** Strengthened policy, legal and institutional frameworks that include gender mainstreaming, equity, stakeholder participation and address emerging issues for effective forestry development	• % change in ecological, economic and social benefits accruing from good forest governance • Evidence of mainstreaming gender and cross-cutting issues in all activities of the forest sector
	Medium term (2025) Operational frameworks for forest development, investment, access rights, equity, accountable leadership; participatory forest management that includes forest-dependent communities	• Access rights to forest resources recognised and regularised
	Short term (2020) Formulated, aligned and harmonised policy, legal and institutional frameworks on forestry matters in national and county governments	• A functional framework for engagement between county and national governments on forestry matters

8.2.2 Policy, legal and institutional reforms

The Constitution of Kenya has catalysed the realignment of policies with legal legislations. This in turn has led to the revision of the national Forest Policy, 1968 and the Forests Act, 2005, and culminated in the development of the draft Forest Policy (2015) and the Forests Conservation and Management Bill, 2015.

Several challenges encountered in forest resource management are linked to weaknesses in institutional arrangements in the forestry sector. In terms of mandates, some forests in the country are under dual and tripple gazettement. Furthermore, a non-participatory planning process for urban and infrastructure development, mining, agriculture and settlements has resulted in loss of forest cover.

The devolution of some forestry functions from national to county governments calls for the design of effective and harmonised forest governance structures at both levels. Illicit timber trade within and across borders including management of transboundary forest resources remains a challenge.

The policy, legal and institutional reforms programme has been designed to create or enhance an enabling environment which is a prerequisite for implementing several other programmes under the NFP.

Important issues requiring attention under this programme to facilitate other NFP programmes:

- Development of the forest policy and legal framework (Forest Act, Forest Policy and Forest Bill).
- Assessment of the roles of KFS to clarify and separate regulatory, implementation and law enforcement roles.
- Creation of an enhanced enabling environment for commercial tree growing, including providing incentives for farm forestry and private sector engagement in plantation enterprise development.
- Addressing resource issues in the ASALs with the aim of clearly linking local resource rights to resource users.
- County governments are currently developing county-specific laws.
- Further legalisation and enhanced regulation of the charcoal industry to pave the way for development of technology and efficient value chains.
- Benefit sharing procedures and principles applied in joint forest management.
- Constraints facing potential investors in forest industry.
- Restrictions that are occasionally applied on the use of forest resources.

In institutional reforms, a key development area is designing and operationalising institutional arrangements that can shoulder the mandates devolved to counties. Urgent action is needed to specify the division of responsibilities between the national and county governments and their respective institutions.

Objective: To create an enabling environment and legal frameworks for good forest governance.

Intervention strategies: Table 8.11 illustrates the intervention strategies.

Implementation modalities: The strategies identified will be implemented by forest stakeholders in accordance with the Constitution of Kenya. The review of existing policies and laws will be informed by needs assessment and enhancement to fill gaps identified by stakeholders — politicians, opinion leaders, county government and the general public. Capacity building of the county governments to take up the devolved roles will be given priority; this will require the concerted efforts of government agencies, the civil society and development partners.

Table 8.11. Policy, legal and institutional reforms: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Review and harmonise existing policies and legislation	• Roles of national, county governments and institutions clarified, including segregation of duties	• No. of harmonised laws and policies.	Changing priorities with changes in governments Politicisation of forest governance
Develop and strengthen natural resource conflict resolution/ management mechanisms	• Reduced conflicts in the forestry sector • Formalised structure and division of mandates in conflict management both at county and national levels. • Public complaints mechanisms operational at county and national levels	• No. of documented conflicts and interventions • No. of platforms to address conflicts in county and national levels	
Domesticate international commitments and obligations into forest laws as well as emerging issues in forestry [1])	• Forest laws consistent with relevant international commitments and emerging issues in forestry	• Increase in the no. of international commitments and obligations mainstreamed into Kenyan laws	
Develop capacity to support enforcement of the rule of law and reduce corruption	• Reduced corruption in the forestry sector • Robust national and county institutional governance structures that deter corruption and mismanagement • Improved infrastructure at national and county levels • Zero tolerance to corruption	• % increase in performance of forest administration institutions • % work environment satisfaction • % public satisfaction • % efficiency in service delivery	

[1]) These include (i) Recognition of gender, rights of vulnerable, marginalised and indigenous forest people in the society, (ii) Community forestry, (iii) REDD+ implementation, (iv) Green/bio-economy development, (v) Enhancing forestry competitiveness (vi) Cost/Benefit sharing in the forest sector and (vii) Integration of indigenous knowledge in forest conservation and management.

8.2.3 Forest information management and dissemination

Sustainable forest management can be achieved only if forest decisions are informed by high quality forestry-related information. Access to and provision of quality forestry information therefore is a priority. Information management involves the acquisition, synthesis and sharing of insights and experiences, and their systematic integration with factual statistical information and analyses.

Kenya is signatory to a number of multilateral environmental agreements and treaties and is therefore obliged to report on the status of its forest resources. This implies developing strategies to generate and manage forest information and dissemination in the open national and global domains.

The devolved government structure working through national and county institutions will generate more information and knowledge on managing forest resources. This is in addition to information generated by communities, research and institutions of higher learning as well as projects. Strategies for disclosing of public information on forest resources and their use, including related financial flows, will be developed to ensure that all actors in the forestry sector have sufficient information to fully play their roles. In addition, knowledge management embracing information technology will be of utmost priority. Relevant policy and guidelines for inter-institutional data sharing will be developed with clear directions on the nature of information and the manner in which it is shared. Of critical importance is the adoption of ICT for efficiency and widened scope of information sharing.

2 FOREST GOVERNANCE

Objective: To effectively manage forest information for enhanced access.

Intervention strategies: Table 8.12 illustrates the intervention strategies.

Implementation modalities: Implementation of the programme will require a participatory approach, recognising that different stakeholders generate different datasets on either similar or different parameters. County governments' information units will be linked to the national information unit at the Kenya Forest Service headquarters. The various entities generating data will be managed in a manner that ensures information is generated and easily accessible. Therefore setting up an information collection and public disclosure mechanism will be built on principles of good governance, and with support from major stakeholder segments and have long-term funding. The information management unit or a credible entity will play the coordinating role.

Table 8.12. Forest information management and dissemination: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Develop broad-based forestry information management systems and dissemination networks	• Increased disclosure of forest information to stakeholders • Functional platforms for information sharing nationally and at county level • Clearly mapped information flow structure • Forest information accessible at forest information centres in all the counties	• % increase in the no. of stakeholders accessing forestry information • No. of information sharing platforms in place • No. of men and women accessing and using information centres and platforms • Functional county forest information centres	Some stakeholders may be unwilling to share knowledge and information they know or generate Cyber-crime, information hacking
Enhance forestry knowledge management and reporting system	• Developed models/tools of information management and dissemination • Transparent information sharing between regions, counties and forest stations	• Increase in stakeholder satisfaction in information sharing • No. of models developed • No. of validated tools developed	
Establish and implement a policy and mechanisms for geo-referenced data and information sharing including intellectual property rights	• Operational national and county communication strategies for enhanced stakeholder participation in decision making • Enhanced access to accurate, up to date and timely information for informed decision making • Enhanced registration of intellectual property rights	• % increase in number of stakeholders accessing forestry information • % increase in number of registered intellectual property rights	

8.2.4 Community, gender and special interest groups in forest management

Public participation is a major component of good governance and it goes hand in hand with accountability and transparency. The Constitution of Kenya, Article 69(1) (d) states: "the State shall encourage public participation in the management, protection and conservation of the environment." In the Fourth Schedule part 2, the Constitution mandates county governments to ensure and coordinate the participation of communities in governance at the local level. Further, under the Bill of Rights, Article 21 (3) provides that: "All State organs and all public officers have the duty to address the needs of vulnerable groups within society, including women, older members of society, persons with disabilities, children, youth, members of minority or marginalised communities and members of particular ethnic, religious or cultural communities".

Pursuant to these provisions, programmes and activities that support forestry stakeholders' participation in forest management will be developed under this programme.

Forest management in Kenya was highly centralised between the pre-independence period up to 2007 when the Forests Act, 2005 came into force. This Act puts in place a more devolved forest governance structure. At regional level (conservancies), forest conservation committees (FCCs) have been established in 10 conservancies and community forest associations (CFAs) formed in the existing 150 forest stations countrywide.

However, stakeholder participation has not reached the levels envisaged in the Constitution. Community and county institutions involved in forest management still need their capacities built and a benefit-sharing framework has not been developed. These critical elements of forest governance will have to be pursued to conclusion. The progress and a general rolling out of PFM is also hampered by the slow progress in preparing a management plan. The focus and disagreements on benefit sharing and lack of alternatives to the PFM are threatening this system's success and the wider forest development.

In the context of this NFP, participation refers to community participation in the management and utilisation of national gazetted forests.

Objective: To improve stakeholders' participation in sustainable forest management.

Intervention strategies: Table 8.13 illustrates the intervention strategies.

Implementation modalities: The strategies will be implemented through a multi-stakeholder process with the national government, county governments and civil society playing a major role in creating awareness and building capacity of the public and special interest groups. Development of standards for good forest management, criteria and indicators for SFM, and tools to monitor implementation of forest management plans will require genuine participation of civil society, private sector, communities, national and county governments.

Table 8.13. Community, gender and special interest groups in forest management: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Improve community and special interest groups' participation in decision making in the forestry sector	• Improved decision making and better managed forests • Reduced conflicts between communities and other stakeholders • Communities exercising their rights and obligations • Benefit sharing generates community ownership	• % reduction in conflicts between communities and other stakeholders	Vested interests Unwillingness by special interest groups to participate
Develop mechanisms for forest incentives to boost private forestry and enhancement of stakeholder participation	• Public-private partnerships formalised and strengthened to leverage community and special interest group participation in private forestry • Enhanced ease of doing business in the forestry sector • Increased area of commercial private forests • System established for REDD+ payments	• % increase in the number of PPPs involving communities in private forestry • % increase in investments in private forestry • % increase in the area of commercial private forests • Amount of income generated	
Capacity and business development for CFAs, special interest groups and other forestry based associations	• Participatory Forest Management Plans effectively implemented in all forest areas • Community institutions capacity to deliver on their mandates enhanced	• % increase in CFAs and other community groups fulfilling their mandates under the forest management agreements signed with forest administration institutions	
Support and promote forest related community livelihood options.	• Increased nature-based community enterprises • Reduced pressure on forests for supply of forest products and services	• % increase in household income from forest related activities • % increase in the number of nature-based community enterprises	
Affirmative action by forest administration institutions on special interest groups' participation in forestry	• Increased forestry programmes targeting women, youth and marginalised groups • Increased number of women, youth and marginalised groups actively and continuously engaged in forestry	• No. of programmes implemented by women, youth and the marginalised groups • Proportion of women, youth and marginalised groups in the total labour force engaged in forestry activities	
Develop mechanisms to support human rights in forestry development	• Increased level of human rights awareness among duty bearers and rights holders • Rights-based approach institutionalised in the forestry sector	• Level of human rights awareness • Evidence of institutionalised consultations between authorities with responsibilities for access to forest resources and communities • Reduced conflicts between duty bearers and rights holders	

8.2.5 Forest law enforcement and compliance

Though the legislative framework guiding the management and use of forest resources is adequate, violations continue due to the following implementation challenges:

- Weak forest administration institutions in forest law enforcement and compliance
- Poor infrastructure
- Low level of stakeholder participation in decision-making processes and forest monitoring
- Inadequate information on illegal activities in the forest
- Low levels of awareness of the impacts of forest destruction

Once these concerns are addressed, it is envisaged that there will be near full compliance with the forest law.

Objective: To ensure compliance with forest legislation.

Intervention strategies: Table 8.14 illustrates the intervention strategies.

Implementation modalities: The Constitution will be the reference document guiding all compliance and enforcement strategies and mechanisms developed and implemented by forest governance stakeholders. Existing compliance and strategy implementation will be reviewed through capacity needs assessment and enhancement to fill the gaps identified in the diverse enforcement and compliance entities (units) with stakeholders (State and non-state actors) actively involved. Successful implementation of this programme will require sustained resources. While this is a government-driven programme, resources from development partners will complement agency and government funding particularly for cross-border illegal activities and community policing.

Table 8.14. Enforcement and compliance: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Improve public awareness of the impacts of illegal forestry activities	• Increased public support for forest protection • Enhanced forest productivity and integrity	• % decrease in the number of illegal forest activities reported by the public • % reduction in degraded forest areas	Cyber crime Unsupportive regional partners Blacklisted firms will go to court
Build capacity of institutions in law enforcement and compliance	• Enhanced compliance with forest laws and regulations • Reduced opportunities for committing illegal forestry acts • Timely and effective control of illegal forest activities • Reduced forest-related crime rates	• % reduction in number of forest-related offences reported • Reduction in time taken to institute remedial measures	
Improve data and knowledge about the extent, location and nature of legal and illegal activities in the forestry sector	• Enhanced real time data capture for decision making • Forest protection priority areas mapped and inform planning • Precise and rapid response by institutions to reported cases of forest offences	• % decrease in occurrence of illegal activities • Reduction in time taken between committing the offense and the response by enforcers	
Develop regional partnerships to control transboundary forest crimes	• Strengthened cross-border protocols on law enforcement and compliance • Cross-border illegal activities minimised	• % reduction in illegal cross-border activities	
Develop a regulatory framework (e.g. FLEGT) for international trade in forest produce	• Regulated international trade in forest products (FLEGT) • Increased access to forest products in the global market	• Existence of a regulatory framework • Volume of traded forest products internationally	
Develop national criteria and indicators for sustainable forest management and embrace forest certification	• Enhanced sustainable forest management • Increased market for forest products • Reduced deforestation and forest degradation	• % reduction in degraded forest areas • Proof of chain of custody and traceability	
Promote and support community forest policing	• Reduced cases of forest destruction • Enhanced ownership and protection of forests	• No. of cases reported by community members	
Develop partnerships between the public forest administration and civil society or private sector to monitor law compliance with the forest sector	• Increased transparency and accountability • Acknowledgement of whistle blowers	• % reduction in number of offences reported	Unsupportive civil society
Blacklist firms engaged in illegal activities	• Increased transparency and accountability in the forest industry	• % reduction in number of offences recorded among forest industry players	

STRATEGY

8.3 NATURAL FOREST MANAGEMENT AND CONSERVATION CLUSTER

This thematic cluster addresses sustainable management and conservation of natural forests and allied resources for socio-economic development and provision of environmental services.

Natural forests provide a wide range of economic, environmental and social products and services such as raw materials for wood-based industries, employment, soil stabilisation, carbon sinks and water catchments. Forests regulate the rate of flow and quality of water discharged by rivers draining from these catchments. Forests play a key role in supporting other productive sectors including agriculture, tourism and energy. They also enhance the environment's ability to withstand disasters such as floods, landslides and droughts.

Nonetheless, population growth and other socio-economic factors have put enormous pressure on the limited productive land, subsequently leading to rural poor households encroaching on forest land. Land-use changes, mainly settlement and illegal cultivation, charcoal making, overgrazing and over-exploitation of some plant species, have further resulted in forest degradation (KFS, 2009).

3 NATURAL FOREST MANAGEMENT AND CONSERVATION

Key challenges in natural forest management and conservation

- Forest ecosystem degradation resulting in low provision of goods and services
- Overgrazing and forest fires
- Loss of endangered/threatened species, also within protected areas
- Encroachment on natural forests
- Preference for agriculture vis-à-vis forestry or nature conservation
- Rise in poverty levels
- Lack of community incentives for conservation efforts
- Cultural erosion of the value of forests including indigenous knowledge of plant use
- Inadequate knowledge of the role of forests in climate change mitigation
- Increasing need for energy (wood fuel and charcoal production) is challenging conservation
- Uncoordinated sectoral implementation approaches
- Conflicts of interest on the management of forest ecosystems
- Weak administration structures and institutional framework for conservation.

Other contributing factors include loss of indigenous knowledge on plant use, lack of appropriate conflict-resolution mechanisms, inadequate knowledge of the role of forests in climate change, value of forests not well understood and appreciated, weak administrative structures and institutional framework for conservation. In cases where forests are located across international boundaries, no clear and appropriate guidelines are in place to promote joint management mechanisms.

Selective harvesting methods in our indigenous forests will be used to improve or maintain overall biodiversity while increasing site productivity. Selective harvesting will be designed to ensure that natural regeneration occurs. Some natural forests will be excluded from timber harvesting as other values, like water catchment protection that is more important than the potential timber output, could be jeopardised should logging be allowed.

Other forms of utilisation like collecting non-wood products are usually compatible with even strong conservation objectives.

Forest conservation requires holistic approaches, good conservation strategies and implementation mechanisms.

8.3.1 Challenges, situational analysis and results framework

Challenges: The thematic working group analysed and grouped the challenges presented in box 3.

Situational analysis: Further analysis of the theme resulted in a SWOT analysis presented in Table 8.15.

Results framework: Table 8.16 presents the strategic planning framework for this thematic cluster.

Effective protection, conservation and sustainable management of natural forest ecosystems will be addressed through the following programmes within this cluster:

- **Natural forest management**
- **Ecotourism**
- **Community forestry.**

Table 8.15. SWOT analysis for natural forest management and conservation cluster.

STRENGTHS	WEAKNESSES
• Documented indigenous knowledge on sustainable forest management is available • Willingness to adopt new technology • Existing renewable energy sector reducing pressure on forest resources • An applicable legal framework that demands sustainability, participation and transparency • Competent technical and professional human resource in forest conservation and management • Existing natural forest reserves • More institutions to protect natural forests • Improved surveillance and management capacity for natural forests	• Inadequate infrastructure and facilitation for forest management • Inadequate public participation in forest conservation • Inadequate law enforcement • Weak implementation of existing policies and guidelines • Low understanding of consequences of forest destruction • Poor appreciation of the links between conservation, biodiversity, heritage and livelihood
OPPORTUNITIES	**THREATS**
• Existence of forest areas for conservation • Global attention on sustainable energy use and forest conservation • Research information available • MOUs, conventions/treaties for ecosystems • Vision 2030 and Constitution supporting sustainable forest conservation and management • Development of scientific knowledge on yield and quality of indigenous tree species • Existing technological innovations on ICT • Increased recognition of government policies of natural forests for environmental benefits • Available modern technologies that improve natural forest management • Community goodwill for conservation • Existing agreements on transboundary forests • Legal structure for community participation • Opportunity for carbon credit schemes.	• Climate change • Negative political influence • Forest fires, diseases and pests • Conflicts arising from over-riding interests • Over-dependence on natural forest resources and agriculture expansion • High increase in human population, thus increased demand for land • Fragmented forest ecosystems.

Table 8.16. Thematic objectives, outcomes and indicators.

Thematic objective	Outcomes, 2016–2030	Indicators of achievement
Sustainable management of natural forest ecosystems	**Long term (2030)** Sustainably managed natural forest and woodland resources	• % change of natural forest area managed and conserved • Change in Biodiversity index • Change in number of visitors to ecotourism facilities
	Medium term (2025) Increased total natural forest area and tree cover	• % change in natural forest area and tree cover • % increase in carbon stocks in natural forests
	Short term (2020) Reduced degraded natural forest areas	• Proportion of degraded forest area rehabilitated

Urban forestry offers a forest development model that could benefit the increased urban population through developing the aesthetics of towns and cities as well as promoting urban recreational values.

3 NATURAL FOREST MANAGEMENT AND CONSERVATION

8.3.2 Natural forest management

Natural closed-canopy forests occur mainly in water catchment areas and are habitats for wildlife, which support the tourism industry, and provide useful commercial timber and non-timber products. Forest cover in Kenya has decreased rapidly in the last 20 years due to population pressure and development-related activities such as agricultural expansion (KEFRI, 2014). This has reduced the ability of these forests to supply products and serve as water catchments, biodiversity conservation reservoirs, wildlife habitats and carbon sinks. Natural forest management and conservation activities will synergise well with Kenya's national approaches to addressing projected climate change impacts.

The programme focuses on developing and applying methods to restore forests, monitor regeneration and growth of natural forests, and enhance biodiversity conservation. Conceptually, this programme applies to over 800,000 hectares of gazetted natural forests.

Objective: To manage natural forests for sustainable production of goods and services.

Intervention strategies: Table 8.17 illustrates the intervention strategies.

Implementation modalities: Communities, the private sector and other stakeholders in natural forest management and conservation will be encouraged to participate to conserve water catchment areas, exploit the potential to sequester carbon, create employment, reduce poverty and ensure sustainability of the forest resources.

Table 8.17. Natural forest management: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Forest conservation, restoration and management based on best practice	• Increased carbon stocks • Reduced degraded natural forest areas • Increased provision of forest-related services • Increased biodiversity, including wildlife, and value of the forest • Database on natural forest established and updated regularly • Well conserved public forests	• % change in natural forest area managed and conserved • Change in biodiversity index • % change in natural forest area and tree cover • % increase in carbon stocks	Forest fires Pests and diseases Non-conducive political environment
Promote participatory forest management through CFAs	• Increased carbon stocks • Reduced degraded natural forest areas • Increased provision of forest related services • Increased biodiversity • Well-conserved public forests • Increased income and living standards for the local communities	• Proportion of degraded forest area rehabilitated • Increased carbon stocks	
Sustainable conservation and management of wetland forests (including mangroves)	• Enhanced conservation and sustainable use of mangrove forests	• Area under sustainable utilisation • Area rehabilitated/planted	
Sustainable management of bamboo	• Improved supply of bamboo materials	• No. of bamboo products • Area under sustainable utilisation	
Promote development of urban forestry in collaboration with county governments	• Developed urban forests • Enhanced aesthetic value of urban areas • Urban forestry integrated into county forest programmes	• % change in urban tree cover	

8.3.3 Ecotourism

Ecotourism is a potential investment opportunity for the forestry sector. Increasing numbers of tourists want to interact with local communities and to stay in places that positively impact on both the environment and the local population. Public–private partnerships (PPPs) can bring incentives and benefits to communities through nature-based tourism. Forests offer a wide range of activities for tourists such as nature trails, picnic and camping sites, heritage and cultural sites. Creating specific areas with unique features within forest areas as national forest parks for ecotourism will be encouraged.

Objective: To promote nature-based tourism for enhanced conservation of natural forests and improved livelihoods.

Intervention strategies: Table 8.18 illustrates the intervention strategies.

Implementation modalities: Ecotourism will be promoted through public–private partnerships including communities or private initiatives.

Table 8.18. Ecotourism: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Develop ecotourism in natural forests	• Increased and diversified tourist attraction sites	• No. of ecotourism facilities	Political instability
Develop tourism facilities in designated natural forests through PPP	• Improved infrastructure in ecotourism areas	• No. of ecotourism facilities established	Terrorism
		• No. of ecotourism PPPs established	Economic recession
Promote ecotourism investments in natural forests	• More visitors to natural forest parks in addition to regular tourists	• % increase in income from domestic and international tourists	

8.3.4 Community forestry

Globally, forest management on government and community lands is implemented through the State such as through a joint forest management system like Participatory Forest Management (PFM) or through community management regimes such as community forestry. The rolling out of PFM has been successful in some places, but has been hampered in others by minimal revenue streams, disagreements on benefit sharing and lack of alternatives, among others reasons.

While PFM is still developing, community forestry offers a viable and well-tested alternative to existing forestry models applied in Kenya. Community forestry could be an alternative forest development model for equitable and sustainable forest management whilst strengthening community rights and livelihoods.

Policy and regulatory framework on community forestry should be in place and should provide for long-term equal rights, responsibilities for all actors, fair benefit sharing mechanisms, base for good governance, participatory principles and institutional support.

Advantages of community forestry

- Creates employment, improves forest access and livelihood
- Allows increased capacity for local decision making
- Provides increased community ability to handle forest conflicts due to increased empowerment in community forestry rules
- Catalyses long-term community economic development resulting in increased self-reliance
- Provides better protection of forest ecosystems and plantations
- Is more inclusive as it provides a forest management plan that is made and understood by the community
- Leads to improved community cohesion and awareness of forest management.

Objective: To establish community forestry for environmental and socio-economic benefits.

Intervention strategies: Table 8.19 illustrates the intervention strategies.

Implementation modalities: Most areas with potential for community forestry are natural forests, woodlands outside gazetted forests, and forest sites in need of rehabilitation or reforestation. In the devolved governance system, community forestry may open up new opportunities for introducing successful forest development models. Community forestry will be facilitated by county governments, KFS, KEFRI and other government lead agencies. NGOs will facilitate and provide technical assistance.

Table 8.19. Community forestry: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Development of community forestry through a participatory process	• Developed community forests • Increased benefits to communities • Better managed forests • Enhanced ecosystem products and services	• No. of community forests developed • % household income from community forestry • Community appreciation of the scheme	
A plan stating the criteria, sequence and priorities for rolling out and implementing community forestry	• Sustainable forest management in those sites where community forestry is recognised as the most promising approach to sustainable forest management	• No. of hectares under community forestry in 2020, 2025 and 2030	

STRATEGY

8.4 FOREST FOR WATER CLUSTER

Well-managed forests guarantee the availability of good quality and sustainable supply of water. Forested water catchments ("the water towers") are part of the global water cycle that guarantees supply of water for industrial, agricultural and domestic use. Forests play important roles of generating and purifying in the water cycle and its component processes. However, human activities in forest areas have continued to pose major threats to water availability and quality due to forest degradation, pollution, poor farming practices, and misuse and overuse of water resources. These and other challenges are identified here together with possible strategies for collective intervention to safeguard water security. Better understanding and management of biophysical linkages (interaction of trees, forests and water) is essential for developing intervention measures to address the identified challenges, including formulation of forest policies relating to water.

This thematic cluster complements and is closely linked to the natural forest management and conservation thematic cluster. However, the Forest for Water theme focuses on management of water sources and their immediate surroundings.

Monitoring trends in water quantity and quality from forests is a key activity to identify impacts of anthropogenic interferences as well as climate-induced changes. The latter include impacts of deforestation, which generally increase flash floods while decreasing minimal flows during dry seasons. Dialogue between water users, forest users and managers is therefore critically important for informed decision-making in source development, management and water security.

4 FOREST FOR WATER

Key challenges

- Uncontrolled human activity leading to disturbance in forest water cycles and ecosystem services
- High demand for water due to rising population
- Conflicting laws, policies and sector roles and mandates on water and forest
- Interference in forest and water management
- Inadequate data on water quality and quantity from water towers
- Inadequate data on water supply and demand under a climate change regime
- Encroachment into some forest and water catchment areas
- Inadequate cost and benefit sharing mechanisms for water usage (payment for ecosystem services)
- Insufficient application of soil and water conservation measures in farming, logging and road construction
- Limited use of new technologies.

8.4.1 Challenges, situational analysis and results framework

Challenges: The thematic working group identified and analysed challenges presented in box 4.

Situational analysis: The SWOT analysis in Table 8.20 presents further analyses of the thematic challenges.

Results framework: Table 8.21 presents the strategic planning framework for this thematic cluster.

This theme is addressed through two programmes:

- **Watershed conservation and management**
- **Soil and water conservation.**

Table 8.20. SWOT analysis for the forest for water cluster.

STRENGTHS	WEAKNESSES
• Supportive constitution and other legislative frameworks • Existence of relevant institutions governing forest and water resource use • Availability of a knowledgeable human resource base • Water sources available (water towers) • Goodwill from the government and development partners • Indigenous knowledge on water and forest management.	• Inadequate knowledge of interactions between forests and water • Inadequate resources • Uncoordinated efforts among actors • Weak law enforcement, non-compliance • Poor governance • Conflicting laws, policies and sector mandate • Inadequate data on water quality, quantity and distribution • Lack of cost and benefit sharing mechanism.
OPPORTUNITIES	**THREATS**
• Increased interest by government agencies, private sector and donors in water management • Awareness of the linkages between forest and water availability • Improved management of quality and quantity of water • Increased adoption of water management technologies • Improved technologies on hydrological survey.	• Inter- and intra-community conflicts over water • Unpredictable impacts of climate change • High population growth rate • Unsustainable exploitation and uncontrolled human activities in water catchment areas • Water over-abstraction • Land use change in forest and water catchment areas.

Table 8.21. Thematic objective, outcomes and indicators.

Thematic objective	Outcomes, 2016–2030	Indicators of achievement
Sustainably manage water resources and their catchments	**Long term (2030)** Increased water quantity and quality from catchment areas Improved management of catchment areas	• % increase in proportion of forest area managed primarily for water protection • % increase water quality and quantity from catchments
	Medium term (2025) Reduced cases of forest destruction and degradation in catchments Enhanced data acquisition and management on forest and water resources	• % increase in areas declared fragile under water-related Acts • % reduction in grazing in sensitive catchment areas • % adoption of water harvesting facilities by forest-adjacent communities
	Short term (2020) Framework for collecting and archiving information established	• Increase in no. of stations measuring water quality and quantity

8.4.2 Watershed conservation and management

Degradation of water catchment areas has caused increased run-off, flash flooding, reduced infiltration, and erosion and siltation, which in turn degrade water resources. These factors threaten the hydrological functioning of forest–water interactions. Lack of an integrated approach and appreciation that forests and water are closely linked adversely affects life support systems, diminishing water availability and volume and causing receding of water bodies.

This situation is compounded by inadequate information, knowledge and understanding of the sustainable use of forests and water resources. Inventorying, assessing and establishing an information management system will help define the current status of these resources and also lead to a better understanding of the factors, both internal and external, that contribute to negative trends.

This programme will address the importance of protecting watersheds and the immediate surroundings. It will also focus on watershed studies to establish the status of catchment areas in terms of extent, composition and water discharge. Moreover, the programme will prioritise local challenges and implement actions for to improve them.

Objective: To rehabilitate and manage water catchment areas.

Intervention strategies: The intervention strategies are illustrated in Table 8.22.

Implementation modalities: This programme will be implemented in collaboration with the relevant lead agencies and with the participation of other stakeholders. Water resource users associations (WRUAs), which are capacitated to handle the day-to-day issues arising in any water supply scheme, will also be one of the implementing actors.

Table 8.22. Water source conservation, protection and management: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Watershed management	• Reduced destruction of catchment areas • Improved flow, quantities and quality of water from catchments	• % increase in water flow and recharge per unit time • Number of reported incidents of forest degradation and destruction • % increase in acreage of protected areas	Inter and intra-community conflicts Climate change impacts, e.g. desertification, diminishing water sources, drought, flooding
Enhance water availability and accessibility	• Reduced water shortages and conflicts over water • Improved livelihoods • Reduced distance to water points	• No. of water resource users associations (WRUAs) established • No. of income-generating activities established • No. of men and women benefitting from better quality and quantity water supply	
Enhance water quality and surveillance for improved health and cleaner environment	• Reduced incidents of water-related diseases	• % decrease in cost of producing drinking water • % decrease in frequency and severity of water-related diseases	

8.4.3 Soil and water conservation

Clearing of forest cover, encroachment, poor agricultural practices and poorly designed roads aggravate soil erosion. Eroded material from cleared land surfaces is transported to downstream water bodies and deposited as sediment and silt.

Silt and sediment reduce storage volume and life span of reservoirs, destroy and clog water supply facilities, reduce fertility of upstream farms and scour river beds. Degraded catchments tend to attenuate flood waters downstream faster than undegraded catchments thereby intensifying flooding and water logging in floodplains and river valleys. The quality of receiving waters is lowered due to increased turbidity and with it increased sediment loads. Increased turbidity increases water treatment costs for water supplies.

Best practices such as on-farm soil and water conservation linked to farm forestry practices will be promoted. Gully erosion check dams and gabions will be construction on eroded river banks to trap silt and sediment that end up in reservoirs. The capacity of communities will be built through extension services, training and applying knowhow. Those in ASAL areas will be trained in animal husbandry and land carrying capacity as well as in the added value of growing fodder near river banks and modern methods of range management.

Objective: To improve soil and water conservation.

Intervention strategies: Table 8.23 illustrates the intervention strategies.

Implementation modalities: This programme will be implemented with the collaboration of relevant lead agencies and the participation of other stakeholders.

Erosion at Lake Bogoria.

Table 8.23. Soil and water conservation: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Implement soil and water conservation technologies	• Increased base flow and improved water quality • Increased land productivity per unit area • Water and soil conservation structures constructed • Increased water volume • Formation of/strengthened water management institutions • Reduced distance to water points • Improved household income	• % reduction in the ratio between peak and minimum flows • % reduction in sediment load in streams and rivers • % increase in yields per unit area • No. of water harvesting facilities • No. of forest and water conservation groups established	Resource use Conflicts Climate change Natural disasters, e.g. earthquakes

STRATEGY

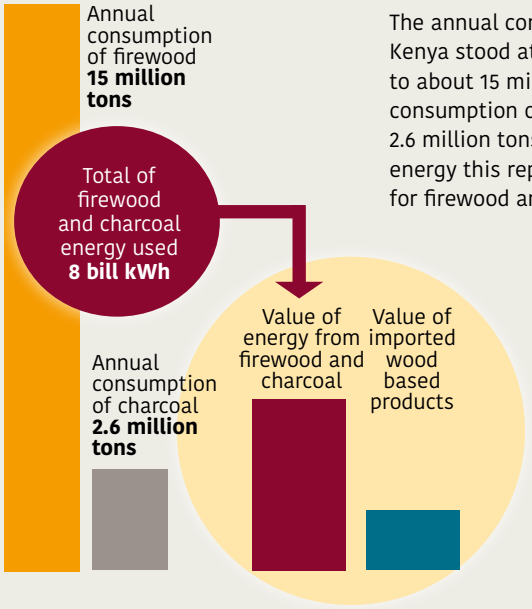
8.5 FOREST FOR ENERGY CLUSTER

Forest biomass is the main source of energy for most rural communities, food processing industries and urban households in Kenya. Forest energy is critically important to the Kenyan economy in general and to the household economy in rural and urban areas.

Firewood is used mainly for cooking and heating and is sourced locally. Other alternative sources such as electricity, liquid petroleum gas (LPG) and kerosene are costly and the supply is irregular. This makes firewood the only viable source of energy for local communities. The overdependence and growing demand call for sustainable management of forest resources and efficient use of firewood.

The NFP considers the sustainable development goal on right of access to energy as a basic human right and proposes strategies for meeting the demand through commercialising tree growing and adopting energy saving technologies.

The NFP will focus on addressing challenges in the charcoal industry, including conversion efficiencies, by adopting efficient technologies in production and use of charcoal. This programme will enhance community participation and promote charcoal production and trade as a formal enterprise. Currently, charcoal is produced from unsustainable sources, mainly community lands, where use and management responsibilities are poorly defined and enforced. The programme will promote sustainable management and use of forest resources on community land, under secure land and tree tenure arrangements. To augment wood supplies from community land, establishment of energy plantations will be promoted either by county government or through joint ventures with the private sector.



The annual consumption of firewood in Kenya stood at 18.7 million m^3 (corresponding to about 15 million tons) and the annual consumption of charcoal stood at around 2.6 million tons (MEWNR, 2013b). In terms of energy this represents about 60 billion kWh for firewood and around 20 billion kWh for charcoal. Taking into account the different efficiencies in cooking, firewood and charcoal combined may represent around 8 billion kWh effectively used.

Analysis shows that the use of woody fuel "saved" the national economy 250% more than the total import value of all products derived from wood, paper included.

The policy environment must be reformed with an aim of recognising charcoal production and trade as a legal and extremely valuable activity in Kenya. One key element is to link the resource tenure in ASALs to people who have a genuine interest in sustained production of not only charcoal but also fodder, bee forage and valuable timber in these areas. Such policy changes are a prerequisite for success of other charcoal-related interventions.

8.5.1 Challenges, situational analysis and results framework

5 FOREST FOR ENERGY

Challenges

- Over-dependence on and exploitation of wood resource as bio-energy
- Inability of men and women to exploit other sources of energy due to poverty
- Increasing demand for bio-energies by households, institutions and industries
- Inadequate incentives for establishing forests for energy
- Inadequate focus on production of wood for bio-energy
- Low capacity of the county government to manage bio-energy supply
- Lack of standards in packaging and pricing of bio-energy products
- High cost of initial investment to establish alternative energy sources.

Challenges: The thematic working group identified and analysed challenges presented in box 5.

Situational analysis: Analyses of the thematic challenges and their strategies combined with the results of comprehensive problem analyses (problem trees) undertaken by the forest for energy thematic working group and in consultation with selected experts and other stakeholders, resulted in the SWOT analysis in Table 8.24.

Results framework: The strategic planning framework for this thematic cluster is presented in Table 8.25.

The theme is addressed through one programme: **Forest energy development**.

Table 8.24. SWOT analysis for forest for energy cluster.

STRENGTHS	WEAKNESSES
• Easily available and accessible wood sources • Availability of several energy sources • Existence of organised community structures (charcoal producer groups) • Many tree species available for good wood fuel • Wood fuel is the cheapest source of energy • Wood fuel provides employment to many • Wood fuel is an essential commodity in the economy	• Forest ecosystems take long to recover and regenerate making them hard to sustain for energy harvesting • Poor enforcement of laws and regulations • Low uptake of improved stove technology • Inadequate research work on fast growing, dense species suitable for charcoal and firewood • Lack of incentives to produce biomass for energy • County governments' lack of capacity to manage bio-energy • Weak awareness and weak emphasis on alternative sources of energy • Lack of standards and poor value chain development (markets, pricing, packaging and branding)
OPPORTUNITIES	**THREATS**
• Large market for wood fuel • Availability of land for tree plantations or biomass production • Availability of technical expertise • Local and international stakeholder support and goodwill • Technology for efficient production and utilisation of wood fuel constantly being improved • Favourable growth conditions for bio-energy • Low taxation on wood and alternative environmentally friendly technologies • Existence of fast growing species (*Acacia xanthophloea* and *Acacia polyacantha*, *Bamboo*, *Eucalyptus* spp.) • Promotion of alternative sources of energy (biogas) • Agroforestry schemes to promote wood production	• Vested interests • High cost of initial investment to establish an alternative energy source • Unsustainable exploitation of wood resources • Land fragmentation • Conflicting land-use policies • Climate change • Bureaucracy and corruption • Low financial investment in bio-energy

Table 8.25. Thematic objective, outcomes and indicators.

Thematic objective	Outcomes, 2016–2030	Indicators of achievement
Sustainably produce, manage and utilise biomass energy	**Long term (2030)** Increased availability of wood biomass from sustainable sources Efficient use of bio-energy promoted	• % contribution by biomass energy sub-sector to the GDP • % increase in supply of and access to biomass for energy
	Medium term (2025) Efficient biomass production and utilisation	• % increase in adoption of efficient technologies for production and using biomass energy
	Short term (2020) Regulatory structures for best practices in producing biomass energy adopted Charcoal standards formulated and implemented in all counties	• % increase in penetration of quality standards in production of biomass energy developed and adopted

8.5.2 Forest energy development

An estimated 7.2 million households use wood fuel as their main source of energy for cooking. Over 80% of Kenyan rural households rely on wood fuel either as firewood or charcoal. Firewood meets over 64.5% of household energy needs whilst charcoal meets 17% (Weismann et al., 2014). For subsistence, firewood is more important than charcoal, but much less traded and valued in monetary terms.

Charcoal is an important and simple means of earning cash income; in the charcoal production areas this income is more important than income from alternatives such as agriculture. The industry is however one of the most pressing environmental problems faced in Kenya, especially in the ASALs, due to its potential to reduce natural resources on which the poor depend and to degrade land, which in turn contribute to the downward spiral of poverty.

The unsustainable use of trees for charcoal production also exacerbates climate change effects. However, sustainable charcoal use has the potential to reduce Kenya's contribution to climate change compared with an alternative scenario of substituting wood fuel with fossil fuel. Wood for charcoal production should be obtained from a sustainably grown biomass resource and harvested using efficient techniques to ensure minimum biomass waste is generated. Wood should then be converted into charcoal using efficient kilns; properly handled during packaging, storage and transportation to minimise waste; and, finally, consumed using improved cook stoves. This calls for improvements on the charcoal value chain.

Although it is imperative to appreciate the charcoal industry as a legal and sound trade that deserves support, this thematic cluster recognises that governance, policy and regulatory aspects should be followed as addressed in the Governance and cross cutting issues thematic cluster. The two thematic clusters complement each other. Forest industries in Kenya are characterised by low efficiency resulting in high volumes of waste, which can easily be converted to bio-energy for industrial, domestic and institutional use.

The interventions suggested in this programme will go a long way in enhancing the livelihoods of rural and urban communities, and improving efficiency in use of current biomass through value chain development, sound technological transfer and mitigation of climate change.

Objective: To increase access to energy through increased biomass and use of efficient technologies.

Intervention strategies: Table 8.26 illustrates the intervention strategies.

Table 8.26. Forest energy development: Intervention strategies and outcomes

Programme strategies	Programme outcomes	Key indicators	Risks
Develop and implement policy reforms on charcoal value chains	• Charcoal value chain policy developed and implemented	• Competitive prices	Forest fires Natural disasters and catastrophes Climate change
Promote of sustainable production and efficient utilisation of biomass energy	• Contribution of biomass energy sub-sector into the national accounting systems • Improved livelihoods at household level • Enhanced energy efficiency in production and use of bio-energy • Employment opportunities created	• % change in contribution of biomass energy subsector into the GDP • No. of households with disposable income, number of persons with increased quality of life • No. of quality standards and best practices developed and effected • No. of men and women employed in biomass energy sub-sector • No. of energy efficient technologies disseminated and adopted	
Diversify alternative energy sources	• Reduced dependency on charcoal, firewood and fossil fuels • Reduced greenhouse gas emissions	• % increase in the number of alternative energy sources • No. of men and women using alternative energy sources • % increase in production of bio-energy from wood waste	
Integrate forest energy production into county land use plans	• Reduced degradation of natural resources • Reduced dependence on public forests for energy	• No. of county integrated land-use plans addressing biomass energy issues	
Promote commercial tree growing for biomass energy production	• Increased income for commercial tree growers	• % increase in area under commercial tree production for fuel wood	
Develop charcoal value chain and standards	• Increased income and livelihoods • improved charcoal enterprises.	• Price ratio of producer/ consumer	
Use waste from wood industries to produce wood chips, sawdust and charcoal briquettes	• Increased revenues for mills	• Volume of products produced from waste	

Implementation modalities: This programme will be implemented in collaboration with the relevant lead agencies and the participation of other stakeholders. County governments will be strengthened to promote sustainable bio-energy production. A national forest energy coordinating unit will be established with a fund to promote forest energy initiatives (trees' research, forest energy financing, technology assessment and adaptation and adoption, information dissemination, training in technology and business). County governments will support and promote establishment of on-farm commercial tree nurseries with suitable species for charcoal and firewood. To increase the forest cover, county governments will offer incentives to communities to plant more trees and support them with quality extension services. Counties will particularly spearhead allocation of land and establishment of biomass energy plantations and woodlots through own funds and PPP arrangements in order to provide sustainable sources of firewood and charcoal to urban and rural households.

STRATEGY 8.6

FORESTRY EDUCATION, TRAINING AND RESEARCH CLUSTER

This thematic cluster focuses on the need for systematic and structured education, training and research on environment, natural resources and emerging issues. It addresses the development of specialised skills, knowledge, technologies and change of attitudes towards forests and natural resources. Basic and applied researches are fundamental to developing forestry education curricula and enhancing the human resource capacity. Information generation, sharing and dissemination are important for forestry development. Other important issues covered under this thematic cluster include intellectual property rights and entrepreneurship.

8.6.1 Challenges, situational analysis and results framework

Challenges: Box 6 highlights the challenges facing forest education, research and training.

Situational analysis: The SWOT (Table 8.27) provides results of the analyses of challenges in this thematic cluster.

6 FORESTRY EDUCATION, TRAINING AND RESEARCH

Challenges

- Inadequate integration of forestry education in school curriculum
- Lack of harmonised curriculum between training institutions and industry
- Inadequate technical professionals in practical aspects of the curriculum
- Non-participatory review of training curricula
- Non-recognition of emerging issues such as climate change in curriculum development
- Inadequate entrepreneurial training in most forestry training institutions
- Inadequate resource mobilisation for forest and NRM education
- Inadequate capacity for forest research and development
- Weak linkages and cooperation between training and educational institutions, researchers and industry
- Poor dissemination strategies for research findings
- Inadequate communication platforms between communities, county and central governments and other stakeholders to discuss forestry matters.

Results framework: Table 8.28 presents the strategic planning framework for this thematic cluster.

Programmes within this cluster:

- **Education**
- **Training**
- **Research and development.**

6 FORESTRY EDUCATION, TRAINING AND RESEARCH

Table 8.27. SWOT analysis for the forestry education, training and research cluster.

STRENGTHS	WEAKNESSES
• Education and research structures are in place • Existence of guiding policies on education and research, e.g. Vision 2013 • English language is widely spoken in Kenya and allows easy access to international literature • Capacity-building institutions are recognised by the government • Human resource is available for education and forest research • Capacity is available to generate relevant technologies • General understanding of the needs of rural communities for forest products and services • Positive public attitudes towards management of forest ecosystems and production of forests.	• Inadequate dissemination of research results • Inadequate innovation and entrepreneurial skills • Negative perception towards forestry • Unwillingness of institutions to share information • Inadequate and outdated curricula • Inadequate funding for forestry education • Weak linkage between the relevant government institutions, industry and researchers • Disconnect between training institutions and practical work in the field • Low technology adoption.
OPPORTUNITIES	**THREATS**
• Untapped educational linkages • Liberalised education system has expanded universities • Available and ongoing expansion of ICT technologies, e.g. remote sensing and GIS • Existing collaborative research and partnerships between research institutes/ universities and other stakeholders • Existing and expanding communication platforms linking community, government and stakeholders • Youthful population (60%).	• Vested interests • Limited opportunities for career progression • High poverty levels.

Table 8.28. Thematic objective, outcomes and indicators.

Thematic objective	Outcomes, 2016–2030	Indicators of achievement
Enhance capacity in forestry education, extension, training and research	**Long term (2030)** Improved research and adoption of new technologies in forestry	• % increase in funding for forest research • % increase in new forestry technologies developed • % increase in research findings adopted and integrated in planning processes
	Medium term (2025) Enhanced coordination and synergy in research, training and education	• % increase in partnerships among research/ training/educations institutions • Increase in no. of public and private institutions offering updated and modern curricula • Increase in no. of developed M&E web-based enabled tools
	Short term (2020) Improved capacity for forestry education, research, training and information dissemination	• % increase in no. of forestry publications in peer-reviewed international journals

8.6.2 Education

Today's education and training systems are influenced by local and global trends. Education and training curricula should be upgraded to meet present and future development needs of a changing society. An updated and harmonised curriculum that incorporates entrepreneurial skills will form the foundation for strengthening the forestry education system. In this regard, forest education will positively influence adoption of new strategies, framework, policies and socio-economic challenges.

Developing the forest education curriculum programme will involve relevant stakeholders and will establish a clear feedback mechanism between training institutions and industry to ease future revisions of the curriculum.

Objective: To enhance content and quality of forestry education.

Intervention strategies: Table 8.29 illustrates the intervention strategies in Education.

Implementation modalities: Curriculum development will involve many stakeholders, and will provide the conceptual framework for forestry education and capacity building in the sector. The relevant national government agency will provide policy guidelines while training institutions will be the lead implementers.

Table 8.29. Education: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Forest education curriculum review in education, training and research institutions	• Updated curricula	• No. of reviewed and updated curricula • No. of institutions with reviewed curricula	Resistance to change in the targeted institutions
Develop capacity for requisite human personnel	• Personnel trained to implement updated curricula • Entrepreneurship skills integrated	• No. of men and women trained to implement updated curricula	
Improve delivery of forest education	• Greater impact of forest education in the sector	• No. of male and female graduates employed -% increase in adoption of forestry technologies	

8.6.3 Training

Training in forestry will impart knowledge to forestry personnel to manage forests sustainably. Training will focus on harnessing human skills and forestry resources in the various sectors for socio-economic transformation. To fill existing gaps in individual institutions, collaboration and partnerships (local and international) and strengthening resource mobilisation through partnerships will be necessary. Training will also emphasise the importance of creating awareness to industry of the importance of conserving the environment and a clean environment to spur investments and partnerships in the sector.

Objective: To strengthen the capacity of stakeholders through training in forestry skills.

Intervention strategies: Table 8.30 illustrates the intervention strategies.

Implementation modalities: Forestry training institutions and other relevant stakeholders with appropriate cooperation with private sector will implement the forestry training.

Table 8.30. Training: Intervention strategies and outcomes

Programme strategies	Programme outcomes	Key indicators	Risks
Review and implement training programmes for the forestry training institutions	• Relevant training programmes updated and more stakeholders enrolled	• No. of trainees enrolled in programmes	Inadequate resources available
Link training skills to market demands	• Market and demand driven trainings undertaken	• No. of trainees absorbed in industry	
Strengthen vocational training centres	• Vocational centres functional and equipped	• No. of trainees in vocational centres	
Offer in-service courses on emerging issues	• Emerging issues and challenges adequately addressed	• No. of personnel trained • No. of emerging issues addressed	
Implement outreach training programmes	• More stakeholders and audience reached	• No. of stakeholders involved in forestry-related activities	

8.6.4 Research and development

Forest research and development are important for generating knowledge, innovations and technologies for natural resource management. In that regard research objectives need to be aligned with national priorities such as poverty reduction, conservation and sustainable development, and improved livelihoods. Research will need to focus on integrating tree planting for commercial purposes and other non-timber forest products with crop production to ensure food security. Stakeholder participation in research is important to improve adoptability of research findings and technologies.

Research projects should aim at increasing environmental stability, forest productivity and production of wood and other forest products for sustainable development, as envisaged in the draft national Forest Policy, 2015. Through research, modern scientific technologies are developed and applied to enhance production of wood and other non-wood forest products.

Objective: To generate knowledge and develop technologies and innovations in forestry.

Intervention strategies: Table 8.31 illustrates the intervention strategies.

Implementation modalities: Research is a multi-stakeholder and multidisciplinary process that will require generation of knowledge, technological development, and information and innovation dissemination. It will also need the requisite capacity, resources and expert skills. Research will be implemented by the relevant lead national government agencies.

Table 8.31. Research and development: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Mainstream research in forestry and national development	• Uptake of innovations/ technologies • Implemented technology development • Enlightened/informed stakeholders	• No. of technological innovations • Value of environmental services reflected in national accounts	Inadequate funding Lack of cooperation between stakeholders
Develop forest technologies	• Forest technologies developed	• No. of technologies developed	
Build capacities in research	• Improved quality of research	• No. of new research projects	
Disseminate research and outputs	• Better understanding of forestry and the environment by stakeholders	• No. of technologies adopted	
Enhance research on indigenous tree species	• Sustainable supply of indigenous forest products and services	• No. of projects related to indigenous tree species • No. of reports on improved management and conservation of indigenous forests	
Strengthen the National Tree Improvement Programme in collaboration with stakeholders	• New tree species domesticated and adopted by stakeholders	• No. of new tree species introduced on plantations and farms	
Partnership and networking	• Multidisciplinary research • Improved collaboration among stakeholders	• No. of partnerships established • No. of joint research initiatives	

STRATEGY

8.7 FOREST AND CLIMATE CHANGE CLUSTER

This thematic cluster focuses on the complex interconnection between climate change, forests and people. Climate change impacts cut across various sectors; however, forests hold a unique position in the climate change dialogue because of their ability to reduce greenhouse gases through sequestration. In this regard, adoption of innovative and transformative approaches to climate change response needs to be integrated in the sector. Kenya supports and is committed to international initiatives and dialogues—UNFCCC, INDC, UNFF, CBD, AFR100, BONN—to meet the climate change and forestry objectives outlined by the Social Development Goals. Consequently, the country has developed a National Climate Change Response Strategy and a Green Economy Strategy aimed at a low carbon–climate resilient pathway.

This cluster focuses on climate change programmes and strategies that protect forest landscapes and enhance the provision of ecosystem goods and services. The programmes and strategies are also designed to address the drivers of deforestation and degradation. These measures increase resilience to risks, which include flooding, droughts, reduced crop yields and landslides.

8.7.1 Challenges, situational analysis and results framework

Challenges are summarised in box 7.

Situational analysis: Climate change presents a complex mix of challenges and opportunities for Kenya, particularly within the forestry sector. Kenya's strategies for addressing climate change in the forestry sector will largely revolve around responding to uncertainties and shocks from natural disasters while reducing the growing population 's vulnerability to the impacts of climate change on ecosystems.

The SWOT (Table 8.32) presents the results of the thematic challenges in this cluster.

7 FOREST AND CLIMATE CHANGE

Challenges

- Weak forest sector governance
- Unsustainable use of forest products
- Decreased potential to mitigate effects of climate change due to loss of forest cover
- Uncontrolled erosion and land-uses changes
- Increased exposure to risks of climate change extremes such as droughts, floods and landslides
- Complex direct and proximate drivers of deforestation and degradation.

Results framework: Table 8.33 presents the strategic planning framework for this thematic cluster.

Programmes within this cluster:

- **Climate change mitigation**
- **Climate change adaptation**
- **Disaster risk reduction.**

Table 8.32. SWOT analysis for the forest and climate change cluster.

STRENGTHS	WEAKNESSES
• Support from legal instruments such as the Constitution, and documents such as the NCCAP, the NCCRS, etc. • Climate change mainstreaming in other related sectors such as agriculture, poverty reduction, energy and housing • Support from national and county governments, such as the Climate Change Directorate • Awareness of the role of forests in providing ecosystem goods and services • Emphasis on the role of forests in climate change through carbon financing mechanisms including REDD+ • Growing culture of tree planting • Awareness of climate change impacts.	• High extraction rates of forest products such as wood fuel • Under-valuation of forests in the provision of ecosystem goods and services • Weak enforcement of forest regulations and laws • Conflicting institutional mandates on the forest resource • Inadequate representation of non-state actors in decision-making • Climate change interventions are under-funded.
OPPORTUNITIES	**THREATS**
• Conducive legislative environment (Forest Conservation and Management Bill, Climate Change Act, 2016, etc.) • Devolved forest extension services • Global support for climate action (implied in global support).	• Loss of ecosystem integrity and functions • Climate change impacts remain un-quantified and "unknown" • Land conversion.

Table 8.33. Thematic objective, outcomes and indicators.

Thematic objective	Outcomes, 2016–2030	Indicators of achievement
Integrate climate change actions in forest programmes	**Long term (2030)** Reduced deforestation and forest degradation Diversified livelihood options and energy sources	• 10% forest cover goal achieved in line with Vision 2030 and the Constitution
	Medium term (2025) Reduced emissions from forest land cover change Increased resources from well-managed, productive forests	• % change in emissions from deforestation and degradation measured in tCO2e per hectare • % increase in biomass
	Short term (2020) Climate resilience programmes operationalised	• No. of new mechanisms for forest resource management and benefit-sharing developed

8.7.2 Climate change mitigation

Climate change mitigation refers to buffering against the causes and impacts of a changing climate. Mitigating the impacts of climate change resulting from forest loss entails conserving and protecting forests as described in the Natural Forest Management and Conservation cluster and synergised with Kenya's emerging national REDD+ arrangements. Although forest conversion has occurred in some public forests, it is more significant in areas outside gazetted forest reserves. The greatest potential for mitigating climate change is in reducing current degradation and restoring degraded forest and other forested landscapes through tree planting.

Objectives: To enhance carbon stocks within and outside public forests.

Intervention strategies: Table 8.34 illustrates the intervention strategies.

Implementation modalities: Implementation will largely be integrated into emerging and ongoing programmes by the national government, county governments, communities, private sector and civil society. Emphasis will be on enhancing forest ecosystem services. Climate change interventions will be realised through implementing policy, legislative and institutional mandates. Incentives for communities involved in conservation and sustainable forest management, such as benefit-sharing mechanisms, will be established or enhanced. Land managers and small-scale farmers will be encouraged to maintain at least 10% tree cover on their land.

Table 8.34. Climate change mitigation: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Enhance forest law enforcement and management	• Reduced deforestation and forest degradation • Increased provision of forest products and services • Reduction in illegally harvested forest resources	• % net change in forest cover • % reduction in emissions associated with forest conversion • Arrest and prosecution data	Forest fires Pests and diseases
Promote joint forest management systems and best practice through CFAs, private sector groups and other community groups	• Increased carbon stocks • Reduced degradation in forest areas • Increased income and improved living standards	• % change in carbon stocks • Proportion of degraded forest area rehabilitated • % increase in contribution of sustainable forest management activities to livelihoods	
Restorate degraded forest areas	• Improved forest areas • REDD+, MRV and other monitoring systems	• % tree cover increased • % increase in key indicator species • % increase in ecosystem goods and services • No. of functional MRVs system	
Promote clean energy technology	• Reduced reliance on wood fuels	• No. of clean energy technologies adopted • % reduction in demand for wood fuel per capita	

8.7.3 Climate change adaptation

Climate change adaptation activities aim at enhancing resilience to shocks associated with the impacts of a changing climate. Kenya's National Adaptation Plan (NAP), under the National Climate Change Response Strategy emphasises the socio-economic costs of climate change. The NAP stresses that adapting to climate change will rely on integrating climate change programming across all sectors, including forestry. It highlights that underlying development and growth challenges must be addressed to provide sustainable responses to effects of climate change.

Droughts and floods in areas with low forest cover have detrimental effects on land productivity. Strategies that emphasise watershed management, afforestation and reforestation of areas prone to severe flash flooding, and use of tree cover to slow water run-off are all adaptation strategies that utilise forests to protect rural livelihoods.

Objectives: To enhance resilience to climate change shocks and land productivity.

Intervention strategies: Table 8.35 illustrates the intervention strategies

Implementation modalities: Relevant ministries in county and national governments will coordinate with local communities to conduct natural resource management planning and zoning activities. Structures to support zoning will be established, funded and supported with county governments and other stakeholders providing technical expertise. Education on climate smart agricultural practices will be prioritised and provided by county governments in concert with national efforts. Climate smart agricultural practices should be prioritised in new and existing developments of agriculture plans and actions. The explicit prioritisation of afforestation activities using primarily indigenous species should be included at all levels of development, with a view to relieving pressure on forest resources.

Table 8.35. Climate change adaptation: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Landscape zoning and land-use planning	• All land uses zoned • Decreased conflicts over resources	• No. of county land use/planning systems being implemented • % decrease in agricultural expansion in forest areas • Reduced no. of conflict incidents over natural resources	Land-use conflicts Perverse incentives for clearing forest land for agriculture
Promote climate smart agriculture / conservation practices	• Increased productivity of agricultural land • Increased use of improved crops • Decreased clearance of forest sites	• % decrease in agricultural expansion into forested areas • % increase in yields • No. of conservation agriculture techniques practiced • % increase in area under climate smart agricultural practices	
Afforestation and reforestation with improved, drought-resistant and multi-purpose tree species	• Secured water courses and availability	• % change in tree cover	
	• Increased livelihood options	• % change in household income	

8.7.4 Disaster risk reduction

Disaster risk reduction is important in reducing exposure to disasters related to climate change. Forests play an important role in risk reduction by providing key environmental services. Risk reduction will involve careful environmental resource planning, sustainable extraction of forest and environmental resources, and improving capacity for preparedness against extremes. Linking preparedness to other interventions related to forest health and decreased direct dependence on forests for livelihoods are the basis for the strategies envisaged under this thematic cluster. Other important strategies include improved crop husbandry and water harvesting techniques.

Objectives: To decrease vulnerability to severe impacts of climate change and create opportunities for alternative livelihoods.

Intervention strategies: Table 8.36 illustrates the intervention strategies.

Implementation modalities: Community awareness and education materials on climate smart agroforestry systems will be developed. Support will be provided to county governments to implement awareness strategies and risk reduction measures. The relevant ministry will coordinate and liaise with other stakeholders including development partners to ensure the NCCRS is implemented. SDGs will guide implementation and ensure that community rights are safeguarded and prioritised in all disaster risk reduction activities.

Table 8.36. Disaster risk reduction: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Promote climate smart agroforestry systems	• Agroforestry crops that are more resistant to climate change shocks	• % change in yields • % of household dependence on food aid is decreased	Unpredictability of climate change impacts
Promote information sharing on risk factors	• Better understanding by stakeholders of the risks associated with climate change and the role of forests	• No. of stakeholders who can identify measures for both adaptation and mitigation of climate change • No. of stakeholders practicing climate change actions	
Enhance disaster preparedness	• Disaster preparedness mechanisms in place	• No. of internally displaced men and women reduced	
Diversify livelihood opportunities in rural areas	• Decreased direct dependence on forest	• No. of livelihood options practised	
	• Decreased pressure for new land and/or urban migration	• % of population migrating to urban centres stabilises	

STRATEGY 8.8

FOREST FINANCING CLUSTER

Investment in forestry has remained low, resulting in resource degradation and lost opportunities for producing and processing products. This thematic cluster addresses forest resource valuation, finance mobilisation as well as investment in forestry and related ecosystem services.

Forest resource valuation: Investment in forestry is likely to increase if the value of trees and forests is well understood. To spur investments in the sector, it is necessary to capture and document the gross value of forest products and ecosystem services.

Resource mobilisation: Creating enabling environments for forest investments and for results-based payments from climate change mitigation and adaptation funds should be a priority area for mobilisation. This can help Kenya deliver on forest cover and sustainable development goals. In addition, it will create opportunities to generate revenue and sustainable financing. Creating such an enabling environment will require that institutional arrangements are aligned, safeguards for finance are created, and benefit-sharing mechanisms are in place.

8 FOREST FINANCING

Challenges in forest financing

- Inadequate synthesised data on total economic value of forest and its contribution to the GDP
- Low resources allocated to forestry and related sectors
- Uneven distribution of benefits and costs associated with ecosystem goods and services
- Low involvement of the private sector and other stakeholders in forest financing
- Mechanisms for private sector investment in the management of forest concessions are not in place
- Short licensing periods
- Poor capacity and pathways to access climate change mitigation funds
- Conflicting and inadequate international and national policies and legislations
- Insecure land and tree tenure across gender and age structures
- Risks associated with tree planting, e.g. forest fires, diseases and pests
- Low understanding by financial institutions of tree growing as a commercial enterprise
- Long gestation periods in forest investments
- Low value addition of forest products
- Limited certification and standards for operations

New funding mechanisms such as payments for ecosystem services have been initiated to finance activities that increase carbon sequestration and thus mitigate climate change. Such payment systems from resource users to resource managers have been developed and applied successfully in some parts of the world. In Kenya these payments have been pioneered and their applicability is still being explored (Bernard et al., 2014).

Forest investment: Forest investment packages are developed under this programme. Each of these packages will describe how national and county governments and the private sector will work together to create better platforms for forest investments.

8.8.1 Challenges, situational analysis and results framework

Challenges: Key challenges facing the investment environment in the forestry sector are summarised in box 8.

Situational analysis: Identification and analyses of the above challenges by the thematic working group form the basis of the SWOT analysis in Table 8.37.

Table 8.37. SWOT analysis for the forest financing cluster.

STRENGTHS	WEAKNESSES
• Availability of land for investment • Labour (plenty of unemployed manpower) • Institutions in place (CFAs, research institutions, KFS/KWS & training institutions) • Enabling legal environment (new Forest Bill, Constitution, Vision 2030) • A sense of corporate social responsibility in society • Strong and broad participation in the NFP development process by stakeholders (communities, in CSOs, county government, central government etc.) • Favourable climate in the highlands for production of wood and non-timber forest products (NTFP) • Increased interest in tree growing.	• Forest investment pathways and finance mechanisms are underdeveloped • Poor implementation and awareness of previous strategies in forest management • Lack of capacity in counties to manage forests • Beneficiaries' interests are not always protected • Weak forest-focused civil society and professional bodies advocating forest financing • Lack of prioritised forest programs • Limited awareness and communication on importance of forest conservation at all levels • Lack of access to databases for forest resource funding • Inadequate involvement of the private sector • Poor accounting, certification and standards • Undervalued forest resources and non-recognition of the total contribution of forests • Insufficient commitments to long-term programmes • Unclear forest benefits/cost-sharing policies.
OPPORTUNITIES	**THREATS**
• Increasing per capita income and associated interest in forest investments • Promotion of legal/tax/partnership incentives • Carbon market mechanisms, e.g. REDD+ funds, Green bonds and other climate finance mechanisms • Rising demand for forest products and services • Avenues for accessing finance from international conservation funds and instruments available • Development of a national forest trust fund open for applications from all stakeholders • Involve financial institutions in forest investments • Ensure forest benefits are shared reasonably • Development of PPP frameworks.	• Charcoal production and illegal cutting of trees • Lack of existing standard for governance • Climate change.

Table 8.38. Thematic objective, outcomes and indicators.

Thematic objective	Outcomes, 2016–2030	Indicators of achievement
Diversify forest financing mechanisms	**Long term (2030)** Increased investment in the forestry sector	• % increase in national and county government finances allocated to forest investment • % increase in private sector investment in forestry
	Medium term (2025) Increased funding and finances for forest resources management	• % increase in external funding • % of PES revenue reinvested in forest conservation
	Short term (2020) Enhanced enabling environment for forestry investment and funding	• Policies adopted that promote investment in forestry • Open and transparent procedures for allocation of forestry resources

Results framework: Table 8.38 presents the strategic planning framework for this thematic cluster.

Programmes within this thematic cluster are:

- **Forest resources valuation**
- **Forest resource mobilisation**
- **Forest investment.**

8.8.2 Forest resources valuation

Forests are poorly valued and their contribution to the GDP is under-estimated. Reasons for undervaluation include:

- Forest products are consumed at the subsistence level, thus, no record of trade flows exist.
- The real value of forest products and services is direct or indirect inputs for other businesses or industries. Examples include the role of trees in enhancing soil fertility to support agriculture or the provision of tree fodder in ASALs and other areas.
- The value of ecosystem services is rarely recorded. Global estimates indicate that the value is significantly higher than the total global GDP (Costanza et al., 1997; Costanza et al., 2014).

Limited understanding of the value of forests both in terms of products and services results in policy- and decision-makers giving forests insufficient attention.

Objective: To determine the total value of forest resources and increase financing to the forest sector.

Intervention strategies: Table 8.39 illustrates the intervention strategies.

Table 8.39. Forest resources valuation: Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Determine Total Economic Value (TEV) of forest resources	• Increased investment in forestry sector • TEV documented by 2020 • Revised costing and pricing of goods and services from forests • Willingness to pay for environmental goods and services	• No. of investments in forestry and related sectors by individuals and institutions • % change in financial allocation to forestry sector by national and county governments • % change in quality and quantity of data captured and stored	Climate change
Develop a satellite forestry resource account	• Forest resource account to document contribution to GDP established • Increased resource allocation (county and national government) towards forestry sector	• % change in financial allocation to forestry sector by national and county governments • % change in quality and quantity of data captured and stored	

8.8.3 Forest resource mobilisation

The forestry sector is financed mainly from three sources: budgetary allocations, retained income from forest revenues, and support from development partners. The bulk of programmes in the sector are implemented with external support through technical cooperation arrangements.

Forests for commercial use: Forests are suitable for commercial use and revenues from the use of forest resources could, in many cases, advantageously be ploughed back into forest management. The NFP aims to facilitate a better environment for investments.

Conservation of forests: Payments for Environmental Services (PES) is the practice of offering incentives to producers (communities, farmers or landowners and government) in exchange for sustainably managing land and its resources to provide environmental services. PES programmes promote conservation of natural resources and are voluntary transactions/mutually beneficial contracts between consumers of environmental services and suppliers. The party supplying environmental services holds the property rights over an environmental good that provides a flow of benefits to the demanding party. For this, the supplying party is financially compensated by the demanding party. Environmental services fall in five broad categories:

- **Regulating services:** benefits obtained from regulating ecosystem processes, e.g. regulating climate, water, and some human diseases.
- **Cultural services:** non-material benefits obtained from ecosystems through spiritual enrichment, recreation, social relations, and aesthetic values.
- **Supporting services:** benefits obtained from production of other ecosystem services, e.g. biomass, soil formation and retention, nutrient cycling, water cycling, and provisioning of habitat.
- **Provisioning services:** supply of products from ecosystems, e.g. genetic resources, food and fibre, and fresh water.
- **Climate change services of forests:** forests have four major roles in climate change—they currently contribute about one-sixth of global greenhouse gas emissions when cleared, or degraded; they possess a major mitigation potential through their carbon pools and sinks when managed sustainably; they produce wood fuel as an alternative to carbon-intensive fossil fuels; and, they provide a major sector for supporting climate change adaptation efforts.

Carbon financing of forestry: The global threats of climate change have added an international dimension to forest conservation as forests provide greenhouse gas sinks. Emerging international funds for greenhouse gas reductions from forests are beginning to provide significant input into forest financing resources. Eligibility will vary depending on the funding mechanism, but there is consolidation around the concept of measured and verified actions that reduce emissions.

International market mechanisms for reducing carbon emissions through forests continue to emerge. There is optimism that carbon markets could provide a revenue source for forest landowners and rights holders, in addition to creating employment opportunities. Paris COP 21 of the UNFCCC included such market mechanisms as key features in financing forest cover conservation. REDD+ related initiatives are credited with much of the growth in voluntary carbon markets with the private sector taking on roles as investors, project developers, buyers and intermediaries. With the inclusion of large multilateral funds such as the Green Climate Fund, this market is expected to grow.

Establishing a strategy for accessing forest financing funds: Kenya will continue to invest in quantifying greenhouse gas emissions and developing mechanisms for reducing emissions from changes in forest cover. This will include a strategy for accessing international market mechanisms and finance for mitigating climate change.

Expanding voluntary approaches and improving forest finance pathways for accessing climate finance will be established. These pathways will include how benefits will be reinvested and shared.

Objective: To mobilise resources for forest development.

Intervention strategies: Table 8.40 illustrates the intervention strategies.

Table 8.40. Mobilising resources for forests: Intervention strategies and outcomes

Programme strategies	Programme outcomes	Key indicators	Risks
Forestry to finance itself (Forestry as a productive chain of activity bearing its own costs, as a business)	• Increased forest cover	• % change on forest cover	Economic recessions, Forest fires and other natural disasters Corruption Outbreaks of pests and diseases Climate change Global financial crisis
	• A viable venture for investors e.g. bonds and national pride in the industry	• % change in income generated from forest investment • Amount of money raised from bonds and equities as well as other financial instruments	
Promote forest partnerships (i.e. PPPs and concessions)	• A viable venture for investors e.g. bonds and national pride in the industry	• No. of investment as a result of PPPs • No. of partnerships formed and maintained • No. of concessions formed	
Lobby for financiers to forego interest accumulated on loans to the government to redirect funds to forest management	• More finance available for forest management and conservation	• No. of financial instruments available to investors	
Consolidate national approaches and pathways to access international climate finance for forests	• Explicit pathways for accessing forest finance are established • MRV system established and functioning	• No. of results-based payments flowing through established pathways • % change in external funding	
Promote climate change services of forests/carbon financing of forestry	• Increased applications for carbon credits	• Amount of money raised from carbon credits	
Implement various forest investment funds	• Increased public, private and international investments in forestry	• No. of financial instruments available	

8.8.3 Forest investment

The investment level in the management of forest plantations and in the forest industry has been low for many years. The temporary logging ban between 1997 and 2012 contributed significantly to this situation. However, with the projected reforms in policy and governance, opportunities to invest in forests will become more attractive.

Developing value chains for forest products and removing investment and trade impediments will make investing in forest more competitive for small and large-scale tree growers and traders. This will lead to a more diverse business environment. For example, SMEs and cottage industries, providing the bulk of furniture in the country will gradually grow their investments in a better policy environment. These opportunities will enhance macro and micro businesses, ultimately enhancing livelihoods through commercial tree growing and processing.

This programme has been designed to orient and facilitate investors at community, county and national levels.

Objective: To provide investment opportunities, profiles and incentives.

Intervention strategies: Table 8.41 illustrates the intervention strategies.

Table 8.41. Forest investment (industry and livelihoods): Intervention strategies and outcomes.

Programme strategies	Programme outcomes	Key indicators	Risks
Develop forest business models/schemes/ investment packages	• Better understanding of forest investment profiles • Viable forest business schemes for investors • Increased forest sector investment	• No. of forest investment profiles • No. of investors in business schemes	Conflicts Market failure
Establish cost/benefit sharing schemes	• Equitable cost/benefit sharing schemes	• No. of cost/benefit sharing schemes developed • No. of private sector investors	
Establish forest insurance schemes and tap into the existing government financing schemes	• Forest insurance products available • Available funding mechanisms in the public and private sector promoted	• No. of insurance products • No. of forest insurance taken	

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APPENDIX A

History of Forestry in Kenya

In the early 1890s, Kenya began experiencing colonial rule and forests were handled in various ways. Under the British rulers, the governance system was disorderly, allowing Arab settlers to massively harvest mangrove trees without limitation. However, in 1891, some of the mangroves were protected. The construction of the railway line triggered further protection of the forest as builders cut trees for firewood and railway sleepers. In 1890, forests of the coastal areas, areas covering five miles around the court house in Nairobi (present day High court) and area covering two miles on either side of the railway line, were reserved as protected forests (Logie & Dyson, 1962). In 1902–1905, existing forest reserves were managed, as more non-occupied forested land areas were being discovered and added as forest reserves. Between 1900 and 1910, the demand for wood products for general development activities was on the rise and timber was freely extracted. Sawmills were established and by 1920 at least 20 sawmills were operational in the country (Mugo, Nyandiga & Gachanja, 2010).

Gazetted forests in Kenya from 1900–2015

Between 1900 and 1904, the case of forestry reservation and regulation was advocated and the colonial administration passed the East Africa Forest Regulations. This in turn improved on the administration of forests, which increased to 359,200 ha before World War I (Mugo, Nyandiga & Gachanja, 2010).

During 1907–1911, David E. Hutchins made a blueprint for Kenya's forestry. He set up a programme to replace cut-over forests. He started the arboretum in Nairobi, introduced the art of pit-sawing and had forests managed in 20-year felling cycles rather than haphazardly (Mugo, Nyandiga & Gachanja, 2010).

Through and after World War I, ordinary administrative and forest reservation operations were interfered with and large montane conifer forests were left denuded of accessible timber (Logie & Dyson, 1962). Between 1915 and 1916 there was an ordination of armed forest guards and this brought about the military type of forest protection.

The Second World War led to rapid forest exploitation. In 1940, forest resources as wood cut from forest reserves rose from approximately 27,470 m^3 to 52,901 m^3 before the war and in 1941, increased to 62,417m^3 (Ofcansky, 1984). In 1941, the forest ordinance was revised and provisions were set up for nature reserves. Reserves such as the Kikuyu Escarpment (38,311 ha), Aberdares (103,025 ha) and Mt Kenya (200,870 ha) were gazetted by Legal Notice 48 of 1943. A Forest Ordinance was passed in 1942 and by 1946, Kenya had endorsed a firm re-forestation policy where, "6,000 acres of softwoods would be planted in a year for 35 years to provide the main timber requirements of the country" (Pudden, 1957).

The White Paper No. 85 of 1967, titled "A Forest Policy for Kenya" was issued by the colonial government stating the government's Forest Principles in 10 headlines: Reservation; Protection; Management; Industry; Finance; Employment; African Areas; Private Forests and other Forests not under State Ownership; Public Amenity; Wildlife Research and Education. Londiani Forestry Training School was then opened to train African forestry rangers. In 1962, Egerton College of Agriculture opened and admitted 15 students to training in diploma courses in forestry (Mugo, Nyandiga & Gachanja, 2010). By the end of the 1970s, most of the expatriate officers had been replaced.

In 1962, the Forest Ordinance (CAP. 385) was enacted; after independence it became the Forests Law, Cap. 385. The Ministry of Natural Resources was responsible for forestry legislation and executive duties. The Forest Boundary Commission was formed in 1946 and at least 35,208 ha of forest land was excised for agriculture while valuable catchments were added to forest reserves (Mugo, Nyandiga & Gachanja, 2010). In 1968, excisions for the Royal National Parks for wildlife protection were declared in the moorland areas.

By 1970, at least 70 sawmills had been licensed to operate in government forest reserves (Mugo, Nyandiga & Gachanja, 2010).

Two plywood mills were available, producing 0.90 million m^3 of plywood. In 1971, the log consumption was 12,907 m^3. Most of the paper and pulp consumed in the country was imported, (Mugo, Nyandiga & Gachanja, 2010) but a small pulp mill in Thika produced 2,500 tonnes annually from waste paper and imported pulp. A pulp mill was then established at Webuye and the government agreed to provide 500,000 m^3 of cypress and pinewood annually. Forests in Uasin Gishu, Lugari, Turbo and South Nandi supplied the mill. The Pan-African Paper Mills Limited was licensed in 1970 and construction of the factory started and was operational in 1974. However, it did not last, as poor management and inefficiency resulted in its collapse (Mugo, Nyandiga & Gachanja, 2010).

In 1976, the Kenya Agricultural Research Institute took over the forestry research role from the East Africa Agriculture and Forestry Research Organization. In 1986 the Kenya Forestry Research Institute was established under the Science and Technology Act (Chapter 250).

The year 1989 saw the birth of the Kenya Indigenous Forest Conservation (KIFCON), whose aim was to keep an inventory of the remaining natural State forest estate and provide management. KIFCON recommended that the Ogieks living in Mau forest be settled in part of the forest to avoid scattered human settlements all over Mau. This proposal was accepted but later terminated prematurely and KIFCON disbanded.

Development of the Kenya Forestry Master Plan began with preparatory studies in 1990, with the goal of producing a master sector plan for strengthening the forest department's planning capacity. In 2005, a Forests Act was passed which contributed to positive changes in the sector. These changes include involvement of communities in a joint management scheme named Participatory Forest Management (PFM) and later, the introduction of Plantation Establishment for Livelihood Improvement Scheme (PELIS). The latter is an improved version of the traditional Kenyan Shamba system, a form of the Taungya system where agricultural crops are grown together with tree seedlings to establish plantation on degraded forest land. The two systems today represent participatory forest management in Kenya.

The Forests Act, 2005 also provided for the establishment of a semi-autonomous government agency. The Kenya Forest Service replaced the Forest Department to provide for a better forest service. Currently, forest governance is executed under the Forests Act, 2005 and the Forest Policy of 1968. However, these two documents are being revised. The formulation of the Kenya National Forest Programme kicked off in late 2014 and was completed in 2016.

APPENDIX B

The participatory process

2016	**Launch of NFP** • **Outcome:** Implementation
June 2016	**Finalising NFP Doc, lay-out, source photos, printing and on soft media** • **Outcome:** NFP document and overall forestry framework freely available in the public domain
June 2016	**National validation** • 150 multi-stakeholder representatives in 3-days workshop • **Outcome:** Final feed-back and endorsements
March+ May 2016	**Expert review of programme, 12 experts , 2x5 days** • **Outcome:** Programme: Multi-disciplinary review and quality assurance
January-February 2016	**Consultations with CSOs, Development Partners**
February 2016	**Intra-government pre-consultative meeting with KFS, KEFRI, University of Eldoret, Londiani Forest School** • 150 participants • **Outcome:** First stage of consultation feed-back
December 2015	**Consultative and participatory county engagement with County Environment Ministers** • 35 county ministers as participants • **Outcome:** County priorities well incorporated in the NFP
November 2015	**Thematic Working Session 4** • 140 multi-stakeholder specialists and representatives for seven thematic clusters • **Outcome:** Consolidation of programmes
November 2015	**Expert consultative meeting** • 27 government experts in forestry production and research • **Outcome:** Validation of thematic programmes
August 2015	**Round table seminar with youth and student representatives on forest development** • 20 representatives of youth organisations • **Outcomes:** Capturing private sector challenges and identifying opportunities
August 2015	**Round table seminar on gender and equality** • 20 gender and women's associations representatives • **Outcomes:** Capturing gender mainstreaming opportunities
August 2015	**Web page for NFP** • NFP web page design • **Outcome:** NFP process more transparent and interactive.
August 2015	**Round table seminar with private sector representatives on investment environment** • 15 private sector representatives • **Outcomes:** Capturing private sector challenges and identifying opportunities

May 2015	**Thematic Working Session 3** • 140 multi-stakeholder specialists and representatives of seven thematic areas • **Outcome:** Consolidation of logic, linkages and programme formulation
March 2015	**Colloquium on deepening dialogue with stakeholders in the Forest Sector in Kenya** • NFP secretariat as a co-organiser of the colloquium aimed at deepening the engagement with forest indigenous communities and sharing international experiences • 300 participants, mainly, Indigenous Forest Peoples (IFPs) participated for 4 days • **Outcome:** A dialogue platform established between government and IFPs; Endorsed matrix of IFP issues; mechanism for continued engagement, built directly on the outcomes of the National Forum on IFPs, previously held by the NFP Secretariat and MENR&RDA in January, 2015
February 2015	**Assisted devolution of KFS forest extension responsibilities from KFS to County Government through Transition Implementation Plans**
January 2015	**National Forum for Forest-dependent Peoples** • NFP collaborated with Indigenous Forest Peoples representatives, MENR&RDA, WB and KFS to create a dialogue platform for exploring constructive ways to address long-standing issues that concern forest management, land use and access rights as well as to promote community-based approaches, which include participatory forest management and the facilitation of community collaboration with government institutions • Communities were represented from 12 counties. They included: Yaaku of Mukokodo Forest, Laikipia County; Ilchamus of Ilmukutani Forests, Baringo County; Sengwer of Cherangani and Embobut forests in Kitale; Ogiek of Maasai Mau, Eastern Mau, and Mt. Eburu in Narok and Nakuru Counties; Ogiek of Mt. Elgon in Chepkitale-Bungoma, West Pokot, Trans Nzoia, Elgeyo Marakwet, Uasin Ngishu and Kericho Counties; and Miji-kenda (Duruma/Warabai) from the Coast, Kilifi/Kwale counties • 150 representatives of Indigenous Forest Peoples attended the 4-day forum in Nakuru • **Outcomes:** A constructive dialogue platform between IFPs and the government was established. Moreover, communities prepared memoranda to the GoK, to form the basis of policy and programming content for the government's engagement with forest-dependent communities within the framework of the National Forest Programme. In addition, a matrix of IFP issues, a draft Action plan and draft guidelines were prepared for a mechanism of continued engagement in the dialogue process
November 2014	**Thematic Working Session 2** • 140 multi-stakeholder specialists and representatives for seven thematic clusters • Outcomes: SWOT analysis for thematic clusters and identification of programmes with their strategic objectives, outcomes and indicators
November 2014	• Thematic Working Session 1 • 140 multi-stakeholder specialists and representatives of seven thematic clusters • **Outcomes:** Problem tree and analysis, strategic objectives, expected outcomes and indicators for each thematic area
October 2014	**Set-up of NFP Secretariat** • Organisation, deployment, budget and office • Development of NFP awareness materials (posters, brochures, banners) • **Outcome:** NFP process got a foundation for commencement

October 2014 - December 2015	**Targeted engagements with stakeholders** • Annual Scientific Awareness creation conference at the Forest Society of Kenya (130 stakeholders) • Kenya Forest Working Group meeting with universities (150 stakeholders) • Meeting with Kenyatta University the Environmental Club (150 stakeholders) • Sessions with KFS management and a range of officers (300 stakeholders) • Two-part sessions and meetings with multiple stakeholders from multiple organisations (250 stakeholders) • Inter-parliamentary meeting on forest policies (international) (60 stakeholders) • Ad hoc expert meeting under UNFF hosted in Nairobi, 2014 (150 participants) • **Outcomes:** Awareness of the cross-sectoral and participatory process as well as on how stakeholders could engage and become part of NFP development
August – September 2014	**Five Awareness and Consultative Workshops** • Participants balanced between national government, county government, parastatals, community organisations, civil society and private sector; the workshops were also geographically and gender balanced • 5 x 500 multi-stakeholders • Representatives from Nairobi, Central, Mau, North Rift, Nyanza, Western, Eastern, North Eastern and Coastal Regions • **Outcome:** Identification of challenges in sustainable forest resource management and grouping of 140 elected multi-stakeholder representatives into working groups
March 2012	**Nyanza and Coastal Region Workshop** • Sensitisation of participants on the approach of NFP and engaging them in discussions of the participatory opportunities available in the forestry sector • 96 participants • **Outcome:** Interaction on NFP development
January 2012	**Children, Women and Youth Symposium** • Forests management and conservation issues • 263 participants • **Outcome:** National interaction on forest development

REPUBLIC OF KENYA

National Forest Programme 2016–2030

Forests are important for sustainable development. They provide the foundation for poverty alleviation, environmental sustainability, food security and agriculture, supply of energy and water, biodiversity conservation and climate change resilience. Forests play a key role in Kenya's environmental, social and economic contexts.

The National Forest Programme (2016–2030) is the first cross-sectoral and multi-stakeholder national framework to coordinate forest development with the aim to meet the needs of Kenyans in the next 15 years.

This document is in three parts divided into ten chapters. The background and descriptive part (chapters 1–4) is followed by the analytical part (chapters 5–6), which examines the nexus —people, trees and forests—in the dynamics of population and land, the drivers of deforestation and forest degradation as well as macro-economic factors and opportunities. The strategic part (chapters 7–10) is organised in a results framework design outlining the hierarchy of objectives and envisaged outcomes. The NFP has eight thematic clusters from which 25 programmes are presented.

The NFP is a joint initiative of all forest sector stakeholders —representatives of national and county governments, the private sector, communities and the civil society. It mirrors the Constitution and the Kenya Vision 2030 in their values and principles as well as the goal of 10% forest cover by 2030. It also streamlines the needs of gender and marginalised groups in the management and use of forest resources.

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