



MINISTRY OF  
ENVIRONMENT,  
CLIMATE CHANGE  
& FORESTRY

# NATIONAL STRATEGY AND ACTION PLAN FOR CONTROL OF *PROSOPIS JULIFLORA* (MATHENGE) IN KENYA

(2025 - 2035)





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# FOREWORD

In Kenya, Arid and Semi-Arid Lands (ASALs) account for approximately 89% of total land area. The ASALs are rich in plant and animal biodiversity. The vegetation in ASALs plays a critical role in economic, ecological and livelihood needs of inhabitants of the drylands. The Government of Kenya recognizes the contribution of ASALs to the national economy hence the policy re-orientation initiatives to develop these lands. Among the key policies is "The ASALs Policy of Kenya 2013", which is instrumental in the realization of ASALs development.

Despite their importance, the ASALs face serious threats including land degradation, deforestation, biodiversity loss, invasive plant species and desertification. To mitigate the impacts of land degradation in the ASALs, *Prosopis* (locally known as 'Mathenge'), a tree species native to South America, was identified and introduced in the drylands of Kenya to address challenges that included; firewood shortage, dust storms and land degradation. Although *Prosopis* addressed some of these identified problems, however, due to lack of proper management and control, the species spread beyond the targeted areas with devastating consequences to the environment and livelihoods.

Therefore, the government of Kenya, through the National Strategy and Action Plan for the Management and Control of *Prosopis* Tree Species 2025-2035 will address challenges that have emerged due to the continued exponential rate of invasion by *Prosopis*. This Strategy underlines the need to reverse these adverse trends by focusing on efforts to prevent further spread to new areas, eradicating isolated plants from newly invaded areas and to promote active containment of heavy invasions to reduce high densities to manageable and desirable levels. Utilization of massive biomass from clearing operations is key and will contribute to Bottom- Up Economic Transformation Agenda (BETA) of the Government of Kenya through value addition of *Prosopis* products, industrialization and creation of a Micro, Small and Medium Enterprises (MSME) economy as well as employment creation. Major products from *Prosopis* will include fuelwood, food and feed for livestock. These *Prosopis* products, when utilized in a responsible manner to ensure that the primary objective of the Strategy is not lost or compromised, will help uplift the lives and livelihoods of

For successful management and control of *Prosopis*, there is need for collaboration and partnerships among the state and non-state agencies that include different government ministries and departments, private sector players, development partners and communities.

communities in heavily invaded areas of ASALs.

In order to achieve the goals of this Strategy, resource mobilization will be important for effective implementation. Therefore, the National Planning and Coordination Committee (NPCC), the policy organ to lead implementation of the National Strategy and Action Plan, will provide strategic direction and coordinate resource mobilization, as well as provide leadership for field activities.

For successful management and control of *Prosopis*, there is need for collaboration and partnerships among the state and non-state agencies that include different government ministries and departments, private sector players, development partners and communities.

The Ministry of Environment Climate Change and Forestry is committed to support implementation of the National *Prosopis* Strategy and plans for integrated management and control of *Prosopis* tree species to reclaim the once degraded landscapes and bring them to sustainable productivity.



**Dr. Deborah Mlongo Barasa**

Cabinet Secretary, Ministry of Environment, Climate Change and Forestry



# PREFACE

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The National Strategy and Action Plan for the Management and Control of *Prosopis* aims to guide coordination of stakeholders in planning and implementations of actions by National and County governments, environmental agencies, local communities, Community Based Organizations (CBOs), and Non-Governmental Organizations (NGOs) on *Prosopis* management. This Strategy introduces a framework that confines existing invasions by preventing any further spread to new areas through Early Detection and Rapid Response (EDRR) measures. It also seeks to minimize impact of the species in invaded areas by introducing a range of integrated methods that include biological, chemical and mechanical control methods.

The Strategy will guide management of *Prosopis* in 22 Counties in Kenya. However, Baringo County will act as the National Centre for Excellence where piloting of the integrated methods for management and control of *Prosopis* will be done on a relatively large scale for the first two years. Activities will begin with participatory development of *Prosopis* Management Plan. Thereafter, the roll out of other activities on prevention, early detection and rapid response, intensive containment of invasions through introduction of integrated management methods will be done according to the Strategy and Management Plan period. It is envisaged that Baringo County will act as a referral learning centre where other counties will be trained.

We therefore look forward to active participation of all stakeholders at all the stages of the Strategy implementation period.

A handwritten signature in blue ink, appearing to read 'Gitonga Mugambi', with a long horizontal line extending to the right.

**Gitonga Mugambi, CBS**  
Principal Secretary, State Department for Forestry  
Ministry of Environment, Climate Change and Forestry

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This Strategy introduces a framework that confines existing invasions by preventing any further spread to new areas through Early Detection and Rapid Response (EDRR) measures.



## ACKNOWLEDGEMENT

The Ministry of Environment, Climate Change and Forestry extends its sincere appreciation to all institutions, organizations, and individuals who contributed to the successful development of the *Prosopis Management Strategy and Action Plan*. This Strategy is the product of a multi-stakeholder effort that brought together expertise from key government agencies and development partners. We acknowledge the Kenya Forestry Research Institute (KEFRI), Kenya Forest Service (KFS), Kenya Wildlife Service (KWS), National Environment Management Authority (NEMA), Ministry of Agriculture and Livestock Development (MoALD), the Council of Governors, and the Centre for Agriculture and Bioscience International (CABI) for their valuable technical input. We particularly thank the core drafting team supported by CABI Kenya, the technical working group on control of *Prosopis* composed of Dr. Gabriel Muturi, Dr. James Ndufa, Dr. George Muthike, Ms. Nelly Oduor, Mr. Simon Choge, Dr. Clement Ng'oriareng, Ms. Jane Ndeti, Mr. Mwai Muraguri, and Mr. Edward Munene alongside Ms. Nafasi Mfahaya, Mr. Bernard Ngoru, Mr. Godfrey Wafula, Dr. Richard Kyuma, Mr. Levis Kibet, Dr. Ivan Rwomushana, Ms. Winnie Nunda, and Ms. Linda Likoko for their technical leadership.

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Our appreciation also goes to the County Governments of Baringo, Turkana, Garissa, Tana River, Isiolo, and Taita Taveta for facilitating technical and stakeholder engagements during the public participation process. We recognize and value the long-term technical and research collaboration from FAO and ICRAF on *Prosopis* species management.

**MR. GEORGE TARUS,**  
Secretary, Forest Development, State Department for Forestry  
Ministry of Environment, Climate Change and Forestry

This Strategy is the product of a multi-stakeholder effort that brought together expertise from key government agencies and development partners.

# EXECUTIVE SUMMARY

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*Prosopis juliflora*, a tree native to South America was intentionally introduced in Kenya due to; its adaptability to dry conditions, fast growth and ability to provide fuelwood, livestock fodder, human food and bee forage. The species also provides shade, stabilizes soil through its extensive root system thereby controlling soil erosion; and increases soil fertility through litter and fixing of atmospheric nitrogen as it belongs to the legume family.

*Prosopis* has progressively become an invasive species, colonizing many parts of Kenya's arid and semi-arid lands (ASALs). The rapid spread of the tree is largely fuelled by its prolific seeding, powerful ability to regenerate in high densities, and lack of coordinated strategy to manage and control the species.

In the past, the Government of Kenya embraced the concept of management and control of *Prosopis* through utilization as a resource. It was then envisaged that the impact of harvesting and commercialization of the *Prosopis* resources would significantly reduce the invasions to manageable levels. These activities began by mobilizing and facilitating communities to form Charcoal Producer Associations (CPAs) and given permits to harvest and transport large volumes of charcoal to the market. Other *Prosopis* products that were processed and traded included; livestock feeds, poles, firewood and timber. Unfortunately, these efforts to manage *Prosopis* invasions through utilization did not work as intended as the species has continued to spread at an exponential rate in the ASALs.

Recent studies show that about 80% of the wetlands including RAMSAR sites in the ASALs are in great danger of invasion by the species. Though *Prosopis* provide important goods and services, if not well managed and controlled, the negative impacts associated with the species override the positive attributes. There is therefore need for introduction of more effective short- and medium-term management and control measures towards significant reduction of the invaded areas in Kenya. This Strategy and Action Plan is to be implemented for a period of ten years from 2025 to 2035, will employ simultaneous combination of a wide range of viable integrated management and control methods for *Prosopis* species that have been tested and proven in other parts of the world. These methods include: use of biological agents that destroy seed stocks and hence slows down invasive potential of the species; chemicals

that kill the target plants in unwanted areas; large scale mechanical removal of invasions and responsible utilization of the species. This Strategy and Action Plan also focusses on reclaiming the invaded sites by introducing active land use systems that include planting alternative tree species, appropriate pasture grass, perennial browse shrubs, horticultural and food crops that offer alternative livelihood options to the affected communities. All these interventions will guarantee biodiversity conservation and environmental restoration.

The overriding goal for the Strategy and Action Plan is to effectively control and manage *Prosopis* for enhanced ecological functioning of landscapes and improved livelihoods. This will be achieved by: setting up and facilitating institutional and community structures for prevention, early detection, and rapid response interventions; introduction of integrated management systems to minimize impacts of established invasions; and enhancing capacity and commitment of the National and County Governments to control and manage the existing invasions.

The Strategy will put in place measures to mitigate emerging challenges as they arise in the process of Strategy and Plan implementation. Implementation of the activities will also leverage on opportunities presented by *Prosopis* that include; availability of *Prosopis* biomass technological advancement in forest products value addition; increasing market demand for *Prosopis* tree products and emerging carbon market. For example, investors will also be brought in to harvest large quantities of biomass to produce electricity, briquettes and biochar in the form of green energy. These commercial activities will be well coordinated to ensure that the primary objective of effective long-term management and control is not lost or compromised.

Financial requirements for implementation of the National Strategy and Action Plan will be mobilized; within the Government ministries, from development partners and private sector.

To effectively achieve the objectives of the Strategy, a monitoring and evaluation framework has been put in place. The proposed institutional framework involves organizations with clear mandate for their implementation in order to ensure effective monitoring and evaluation.

# LIST OF ACRONYMS

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<b>AFFA</b>	Agriculture Fisheries and Food Authority
<b>ASALs</b>	Arid and semi-arid lands
<b>CPAs</b>	Charcoal Producer Associations
<b>CBO</b>	Community-based organization
<b>CBD</b>	Convention of Biological Diversity
<b>CSF</b>	County stakeholder forums
<b>EMCA</b>	Environmental Management and Coordination Act
<b>FAO</b>	Food and Agricultural Organization of the United Nations
<b>KEFRI</b>	Kenya Forestry Research Institute
<b>KFS</b>	Kenya Forest Service
<b>KWS</b>	Kenya Wildlife Service
<b>MOECC&amp;F</b>	Ministry of Environment, Climate Change and Forestry
<b>NEMA</b>	National Environmental and Management Authority
<b>NGO</b>	Non-governmental organization
<b>NSF</b>	National stakeholder forum
<b>SDGs</b>	Sustainable Development Goals
<b>SWOT</b>	Strengths Weaknesses Opportunities Threats
<b>TOTs</b>	Trainer of Trainers
<b>EDRR</b>	Early Detection and Rapid Response

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# 1.0

## INTRODUCTION

## 1.1 Background

Invasions by alien plant species (non-native, or non-indigenous) are harmful to any ecosystem both ecologically and economically. These invasive species pose threats to biodiversity and human well-being. Among the most common exotic invasive woody plants are *Prosopis* species.

The genus *Prosopis* is in the family Leguminosae (Fabacea), sub-family Mimosoideae. The genus has four genera and forty-four (44) species and a number of varieties of which 40 are native to the Americas (mainly South America), whereas one is native to Africa (*Prosopis africana* (Guill., Perr. & Rich.) Taubert) and three native to Asia (*Prosopis cineraria* (L.) Druce, *Prosopis farcta* (Solander ex Russell) MacBride, and *Prosopis koelziana* Burkart. Most of the *Prosopis* species are mainly found in hot and dry regions in all their native areas. However, only four species have been successfully introduced and are now well established around the world. These are *Prosopis juliflora* Swartz DC, *Prosopis pallida* (Humboldt & Bonpland ex Willd.) in the tropics and *Prosopis glandulosa* var Torrey, *Prosopis glandulosa* var *glandulosa* and *Prosopis velutina* Wooton, in the sub-tropics (Pasiiecznik et al. 2001). Other species such as *Prosopis alba* Grisebach, *Prosopis chilensis* (Molina) Stuntz emend. Burkart, *Prosopis cineraria*, *Prosopis tamarugo* F. Philippi and *Prosopis pubescens* Benthham have been less successful outside their respective native ranges perhaps due to climatic conditions.

The earliest known introduction of *Prosopis* to Africa was done by the governor of Senegal with the first plantings at the town of Richard Toll in the River Senegal estuary in 1822 with seeds originating from Mexico (Pasiiecznik et al., 2001). Several other introductions to and from Senegal around the neighbouring arid and semi-arid West and Sahelian Africa countries may have followed in the subsequent years (Diagne 1992). About sixty years later (1879), *Prosopis pubescens* was introduced to the dry areas in South Africa to provide fodder for livestock and fuel wood. Seeds originating from South Africa (and Egypt) were introduced to Sudan in 1917 with the aim of stabilizing sand dunes (Broun and Massey, 1929). *Prosopis* has since spread across the country at an estimated rate of 400 ha/yr and covers about 230,000 ha (Elsidig et al. 1998; Babiker, 2006). The successful plantings in Sudan was quickly shared by Kenya, where in 1948, colonial veterinary workers introduced *Prosopis pallida* from South Africa to Mrashe Township in Taita Taveta County (Choge et al., 2010). Their popularity gradually picked up as a tree of choice for dry areas, and soon spread into the arid and semi-arid northern frontiers of Kenya planted by missionaries for shade and as ornamental trees in 1950s and 1960s.

In 1973, *P. pallida* sourced from Brazil and Hawaii were introduced and planted at Bamburi near Mombasa to rehabilitate quarries. Seedlings from Bamburi were distributed and planted in Voi, Njoro, Narok and Lake Baringo as shade and fodder trees (Nightingale, 1980). These and other plantings brought positive impacts on environmental rehabilitation, shade and fodder production thus making the species very popular. In the 1970s and 1980s there was widespread uncoordinated planting of the species in many marginal areas of Kenya by NGOs, Government departments, institutions and individuals with little or no control on seed quality or origin (Johansson, 1990; Otsamo et al., 1993). This was aimed at land rehabilitation to ensure self-sufficiency in wood, non-wood products, food production, feed and fodder, aesthetics and making the environment habitable to mitigate the impacts of drought and famine and to safeguard the existing natural vegetation from over-exploitation.

It is around this time that *P. juliflora* was inadvertently introduced in Kenya due to the taxonomic confusion and similarities between the two species. It quickly found its way to other parts of the Country as it was more adapted and aggressive. The wet years of late 1996 to 1999 (El Niño weather phenomenon) triggered the massive spread, establishment and colonization of grasslands and biodiversity by the species, making its weediness and negative impacts visible for the first time in Kenya. The species is currently estimated to cover over 1,200,000 ha and is found in most of the northern, north eastern and coastal areas of the country and continues to spread (Eckert, et al., 2019). Local common names for the species are 'Mathenge' (Baringo, Garissa, Isiolo, Kajiado, Marsabit, Tana River, Wajir counties), 'Mrashe' (Taita Taveta, Kwale Counties) and 'Iterai' (Turkana, West Pokot counties). The species is hereby referred TO as "*Prosopis*" throughout the document. The Government has therefore prioritized management of the species to control its spread and reduce its densities in invaded areas.



# 1948

The successful plantings in Sudan was quickly shared by Kenya, by colonial veterinary workers who introduced *Prosopis pallida* from South Africa to Mrashe Township in Taita Taveta County

## 1.2 Current Status of Prosopis

Currently *Prosopis* in Kenya covers about 11,658 km<sup>2</sup> land area (approximately 1,165,771 ha) predominantly found in public, community and private land. The species has invaded 22 counties with the largest invasion occurring in Turkana, Tana River, Garissa and Baringo counties. Other considerable invasion is found in Taita Taveta, Kilifi, Samburu, Isiolo, Mandera, Marsabit, Wajir, Kajiado, Kwale, Lamu, Tharaka Nithi, Meru, Mombasa, Kitui and West Pokot counties (**Annex 1**).

The *Prosopis* invasion is mainly along the rivers network in the dry lands (Figure 1). Due to its fast spreading characteristics; the species has blocked river systems, irrigation canals, and roads, invaded wetlands, and encroached on to farms and grazing lands, National Parks and Game Reserves and even institutional compounds. Invasions by *Prosopis* has in some cases posed insecurity to the community as they act as hideouts for criminals and wildlife.

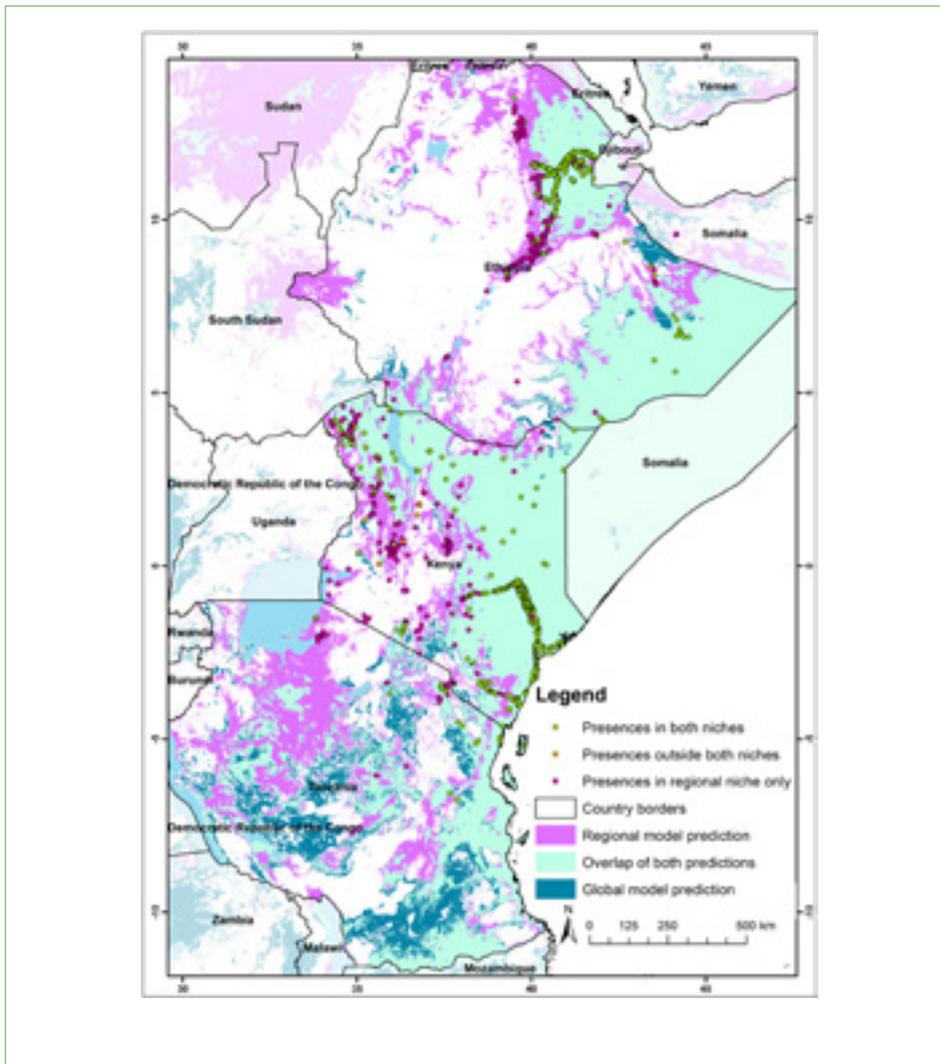
Although the Government of Kenya has embraced the concept of management of *Prosopis* invasions through utilization, the species has continued to spread. About, 80% of the country that constitute arid and semi-arid areas (ASALs) especially areas with altitude below 1,100 m a.s.l is under threat of invasion (**Annex.1**). This calls for intervention measures to reverse the trends by implementing a well-coordinated management and control programme at national, county, and community levels in the affected counties in the Country.



Currently *Prosopis* in Kenya covers about

**11,658 km<sup>2</sup>**

land area (approximately 1,165,771 ha) predominantly found in public, community and private land.



**Figure 1:** The suitable habitat for *Prosopis juliflora* in eastern Africa (Ethiopia, Kenya, Tanzania). Cyan: overlapping area of a regional and a global model; magenta: area of the regional model only; dark cyan: area of the global model only (Source: Eckert et al., 2020)



**80%**

of the country that constitute arid and semi-arid areas (ASALs) especially areas with altitude below 1,100 m a.s.l is under threat of invasion

### 1.2.2. Challenges associated with management of *Prosopis*

Conflict of interest species are plants that provide a range of benefits that are of socio-economic, ecological and environmental importance, but at the same time, are highly invasive and have the potential to decimate the positive gains associated with them. The *Prosopis* tree species falls under the category of conflict-of-interest species. The species presents a dilemma on what to do with such a tree species that is well-adapted to arid and semi-arid areas, providing a wide range of benefits while at the same time destroying biodiversity and devastation to livelihoods.

*Prosopis* provides various goods and services, some of which include:

- Firewood, charcoal, construction wood and timber often as the only source;
- Industrial biomass for generation of electricity, and making of briquettes both of which require sustainable source of wood;
- Pods/fruits which when processed are a valuable source of carbohydrates, sugars and proteins for livestock and, occasionally human populations in dry seasons when feeds and food are scarce;
- Bee forage from flowers which are an excellent source throughout the year and therefore supports honey production for domestic food and industrial use;
- Provision of shade, soil stabilization, control of erosion and increased soil fertility through litter and fixing of atmospheric nitrogen as *Prosopis* belongs to the legume family.

Although *Prosopis* provides this range of products and services, the species has also brought direct and indirect negative impacts to man and the environment. The major negative impacts include:

- Aggressive vegetative growth that leads to colonization and devastation of grazing lands, farmlands, and rangelands;
- Colonization of wetlands, conservation sites, and other biodiversity hotspots threatening indigenous species and protected areas, game parks and reserves;
- Blockage of irrigation canals, river banks and watering points human settlements, footpaths, and roads often leading to diversion of resources and time to manage;
- Prolific seeding habits, re-sprouting, regeneration, and easy dispersal by livestock hence difficulties in controlling and eradicating the species;
- Significantly reduction of ground water;
- Occasionally causing death of livestock when pods are eaten in excess or through starvation when animals lose teeth from high sugar content of pods;
- Possession of powerful and long thorns that inflict threatening injuries to persons.
- Increase in density of malaria- and other disease-transmitting insects such as mosquitos.

Scientific evidence shows that *Prosopis* causes serious conflicts; while it increases the availability of wood, non-wood products, and other environmental services, it negatively impacts biodiversity and many critical ecosystem services upon which rural people depend. Recent socio-economic studies conducted in *Prosopis*-invaded areas in Baringo County in Kenya and the Afar region of Ethiopia suggest that the cost of preventing new invasions and reclaiming and restoring invaded lands are lower than the short to longterm costs of allowing *Prosopis* to overrun even larger landscapes unchecked.

Overall, the negative impacts associated with the species have been found to outweigh the positive effects, thus requiring effective management, control, and ultimately eradication. This necessitates the removal of *Prosopis* trees and the rehabilitation of such sites by introducing active land use systems that involve planting alternative tree species, suitable pasture grasses, and perennial browse shrubs. Horticultural and food crops that all offer a range of alternative sustainable livelihood options to affected communities.

### **1.3. Global examples of integrated management of Prosopis trees**

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Many countries have adopted integrated methods for managing and controlling invasive *Prosopis* tree species. Examples from Australia and South Africa have partly shaped the approaches within this National Strategy and Action Plan.

#### **1.3.1. Integrated methods for management and control of invasive Prosopis tree species from Australia**

*Prosopis* spp. is recognised as a weed of national significance in Australia due to its invasiveness and subsequent ecological, economic, and social impacts. The species was introduced in the late 1890s in northern Australia and was widely planted across the country in the 1900s to 1940s, mainly on private properties for shade, shelter, and fodder. By 2003, it had invaded over one million hectares of the country. A national strategy to address its potential threat was launched in 2001 with a vision to confine *Prosopis* spp. and all its hybrids and eventually eradicate *Prosopis* in Australia.

Australia employs mechanical, chemical, and biological control methods to manage invasions. Medium to high-density invasions are removed using earth-moving equipment, while low-density invasions are eradicated with four-wheel tractors fitted with blades. Harvested biomass is destroyed by fire, and the cleared areas are reseeded with suitable pastures to reduce re-invasion. However, immediate follow-up to remove young seedlings is carried out by landowners due to regeneration triggered by soil surface disturbance. A range of chemicals is also used in Australia to spray the bark, leaves, and stumps, leading to high mortality rates.

Additionally, four biological control agents have been tested and released in Australia on *Prosopis* species. These include seed feeders (*Algarobius Prosopis* and *Algarobius bottimeri*), a sap-sucking psyllid that causes dieback (*Prosopidossylla flava*), and a leaf-tying moth that defoliates the plants (*Evippe* spp). The biological control agents have enhanced the effectiveness of other control methods by slowing the growth and spread of *Prosopis* trees. Other approaches used in Australia to manage large infestations include strategically fencing off the areas and preventing livestock from accessing the invaded sites when pods are on the trees.

#### **1.3.2. Integrated methods for management and control of invasive Prosopis tree species from South Africa**

In the year 1995, the Republic of South Africa developed a 20-year vision to bring the 1.8 million hectares of *Prosopis* spp in the country under control and confining the species only to areas where they can be managed to deliver sustainable benefits, and only using non-invasive varieties of the tree species. Management of *Prosopis* and other invasive species is carried out under the Working for Water Programme (WfW) whose main objective is to address the threat of invasive alien species while contributing to economic empowerment, social equity, and poverty alleviation.

Like Australia, mechanical, chemical, and biological control methods have been introduced across South Africa. While the chemical and biological methods used are similar to those in Australia, the mechanical approaches are quite different, as they involve using human labour and simple hand-operated tools to clear infestations and create employment. Infestations in target areas are accurately mapped, classified by density categories, zoned into blocks, and the costs of clearing each block are estimated by the Government. Companies owned by local communities are invited to tender for the various blocks identified for clearing. The local administration selects the most marginalized members of society – such as the poor, women, the disabled, youth, single-headed households, individuals infected with HIV/AIDS, and ex-offenders- from rural communities for engagement. These individuals undergo intensive training on the use of tools, healthy living, and other positive social programmes. The contract conditions require that the clearing of *Prosopis* and the follow-up programme must be maintained for three years by the contractors. Afterwards, landowners are legally required to sustain the follow-up programmes, with some limited assistance from the Government in the form of subsidized herbicides, spray equipment, and other tools.

The cleared biomass is commercially exploited to minimise or offset the costs of clearing operations, thereby maximizing the economic impacts of the programme through job creation. The programme also contributes to minimizing potential negative environmental impacts, such as fire damage, by leaving less biomass after clearing. Activities of the programme are implemented through a secondary industries programme (SIP), public-private partnerships (PPP) and the small business initiative (SBI) that focuses on entrepreneurial development at small, medium, and micro-enterprises. Wood industries, charcoal making, and the manufacture of livestock and human food supplements from *Prosopis* species pods have been successfully established, with varying degrees of success. Owing to the growing demand for *Prosopis* pods in South Africa over the years, Kenya exported 20 tons worth about KES300,000 to Dune Foods Company in South Africa in 2006 to meet demands for making human food supplements.



Owing to the growing demand for *Prosopis* pods in South Africa over the years, Kenya exported

**20 tons**

By 2003, over 15 million person-days had been generated, and more than 1.2 million hectares of infestations, or 12% of the estimated 10.5 million hectares, had been cleared. By the end of 2002, the programme had invested approximately US\$ 0.3 billion in its first seven years, making it the largest environmental programme on the African continent at that time. Since its inception in 1995, the programme has cleared more than one million hectares of invasive alien plants, providing jobs and training to roughly 20,000 people from the most marginalized sectors of society annually. Of these, 52% are women. The Working for Water Programme (WfW) currently runs over 300 projects across all nine of South Africa's provinces.

#### 1.4. Proposed management and control Technologies in Kenya

As the rollout of the Strategy and Action Plan activities is undertaken, interventions will vary based on characteristics of the different ecosystems. Ecosystem-specific interventions for control and management of *Prosopis* are shown in **Table 1**.

**Table 1:** Proposed ecosystem-specific interventions for control and management of *Prosopis*

Type of Ecosystem	Proposed Interventions	Category of methods applied
Rangeland	<ol style="list-style-type: none"> <li>Selective control of <i>Prosopis</i></li> <li>Grass reseeding</li> <li>Restoration by planting appropriate species for various uses</li> <li>Enclosures for natural regeneration</li> </ol>	<ul style="list-style-type: none"> <li>Biological</li> <li>Manual</li> <li>Mechanical</li> <li>Chemical</li> <li>Prevention of further spread and re-invasion</li> </ul>
Riverine	<ol style="list-style-type: none"> <li>Selective removal of <i>Prosopis</i></li> <li>Crop and fruit production</li> <li>Enrichment planting of indigenous trees</li> </ol>	<ul style="list-style-type: none"> <li>Biological</li> <li>Manual</li> <li>Prevention of further spread and re-invasion</li> </ul>
Wetland	<ol style="list-style-type: none"> <li>Selective removal of <i>Prosopis</i></li> </ol>	<ul style="list-style-type: none"> <li>Biological</li> <li>Manual</li> <li>Prevention of further spread and re-invasion</li> </ul>
Irrigated areas	<ol style="list-style-type: none"> <li>Complete removal of <i>Prosopis</i></li> <li>Boundary planting with appropriate trees</li> </ol>	<ul style="list-style-type: none"> <li>Mechanical to open invaded areas</li> <li>Manual removal to prevent further spread and re-invasion</li> </ul>
Conservation areas	<ol style="list-style-type: none"> <li>Complete removal of <i>Prosopis</i></li> <li>Allow for natural regeneration</li> </ol>	<ul style="list-style-type: none"> <li>Biological</li> <li>Manual</li> <li>Mechanical</li> <li>Prevention of further spread and re-invasion</li> </ul>

This Strategy and Action Plan is also intended to guide Kenya's *Prosopis* research and development (R & D) programmes as well as education, regulatory and management activities in consistent with existing law, policy, and legal frameworks at the national and county levels. Where policy and legal gaps exist at national and county levels, they will be formulated and enacted accordingly to remove any conflict of interest situations and barriers to ensure smooth implementation of activities. Implementation of the Strategy and Action Plan is categorised under short-term, medium-term and long-term basis. Appropriate revisions of the Strategy and Action Plan will be undertaken thereafter to sustain *Prosopis* control and management activities in perpetuity. The revision will be led by the Ministry responsible for Environment, Climate Change and Forestry in close collaboration with key Ministries responsible for Agriculture, National Treasury, Lands, Devolution and ASALs.

## **1.5 Relevant Policy, Legal, and Institutional Framework**

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Kenya is signatory to nearly fifty internationally agreed legal instruments or guidelines that deal with various aspects of the introduction, control and eradication of invasive alien species globally. The integrated management methods to be utilized under the National Strategy for management and control of *Prosopis* are well aligned to these conventions.

Among the set of policy and technical instruments that form the basis for national legal environmental frameworks are the following: The Convention on Biological Diversity (CBD), the Ramsar Convention on Wetlands, the International Plant Protection Convention (IPPC), and the United Nations' Sustainable Development Goals (SDGs), particularly SDGs 15. Management and control of *Prosopis* trees will contribute to achieving SDGs 1 by reversing the impacts of *Prosopis*, such as water scarcity and food shortages (SDGs 6), as well as SDGs 15, which provides for the protection, restoration, and promotion of sustainable use of terrestrial ecosystems, sustainably managed forests, combating desertification, and halting and reversing land degradation and biodiversity loss. This strategy specifically addresses Target 15.8: "Introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species." The Objectives of this Strategy and Action Plan are also in tandem with the United Nations Convention to Combat Desertification (UNCCD) which provides for the need to reduce and manage conflicts in natural resources for the environmental and ecological sanity and the reduction of the effects of climate change.

The control and management of invasive species is well anchored in several Kenyan legal instruments, policies and strategies. The foundation of which is the Constitution of Kenya 2010, where article 69 (1)(g) calls for the elimination of processes and activities that are likely to endanger the environment, and promotes the utilisation of natural resources for the benefit of Kenya. The Forest Conservation and Management Act 2016 is the primary legislation that provides for the development and sustainable management of forest resources, including biodiversity protection and management of invasive species. Other sectoral laws include: the Energy Act 2019; The Environmental Management and Coordination Act (EMCA) 2016; The Water Act, 2016; and the Agricultural Act, Cap 318, which support environmental management. Transition to Devolved Government Act-2012, provides for sustainable management of natural resources at the county level and the need to share functions between the national and county governments. This has led to the creation of Transition Implementation Plans for the distribution of functions. The Forest (Charcoal) Rules, 2009, and the Charcoal Regulation 2024 provide for sustainable production, transportation, and trade in charcoal. This allows the utilisation of *Prosopis* for charcoal production, thus reducing its effects. The Agriculture (Farm Forestry) Rules 2009 advocate for the sustainable management of natural resources.

Country policies, including Kenya's national development blueprint, Vision 2030, and the draft Forest Policy 2023, the Ministry's strategic plan promote sound environmental conservation. Various sectoral strategies and Plans, such as the National Forest Programme 2016 - 2030 (NFP), the national landscape and ecosystem restoration strategy, Kenya National Agroforestry Strategy 2022 – 2030, and various County Integrated Development Plans, are supportive of initiatives towards the management of invasive species, including *Prosopis*.

## 1.6 The need for a National Strategy and Action Plan for *Prosopis*

Developing a national strategy for the management and control of the invasive *Prosopis* is a matter of priority due to the threat posed by the invasion. However, the delay has been partly occasioned by a lack of reliable data to inform policy development for effective management and control. Previous efforts were initially focused on research and technology development towards the utilisation of the species as a means of control and management. The scope of research on the species has since been expanded to include its impacts on the environment, livelihoods, and land use systems as well as measures and guidelines for responsible utilization of the conflict-of-interest species.

Research results from experiments that have been conducted in Kenya and those that have been documented and shared from other countries undertaking similar research and development activities on *Prosopis* and other related invasive species show a high level of convergence on the need to introduce a range of integrated methods for control and management of the species. These have been used to inform the development of this National Strategy and Action Plan document. This Strategy and Action Plan aims to guide resource mobilisation and coordination of effort across all jurisdictions and affected stakeholders on *Prosopis* control and management activities in Kenya. It underlines the plans and actions by National and County governments, local communities, Community Based Organisations (CBOs), Non-Governmental Organisations (NGOs), environmental agencies, as well as by industry, landholders and the wider community. It promotes active involvement of key stakeholders, institutions and communities in planning and execution of *Prosopis* control and management activities across the country.

This Strategy and Action Plan further provides information on where improvements can be made at the national level to result in benefits, especially in hot spots across Kenya, where *Prosopis* is likely to invade if intervention measures are delayed. The Strategy and Action Plan introduces a framework that includes major activities towards prevention, detection and early intervention measures; as well as seeks to minimise the impact of the species in invaded areas as well as to enhance Kenya's capacity and commitment to manage *Prosopis* as one of the worst invasive weeds of national importance in the country. The Strategy and Action Plan draws attention to areas that require national collaboration and will drive development of consistent and coordinated national approaches by providing clarity around priorities, roles and responsibilities.

## 1.7 Scope of the Strategy and Action Plan

The Focus of the National Strategy and Action Plan is to undertake initiatives for prevention, management, control and responsible utilisation of *Prosopis* at the national, county and community levels in Kenya. The Strategy and Action Plan will promote active collaboration among stakeholders on prevention of new invasions, control and management of existing invasions, reclamation and restoration of invaded areas. Through research and development initiatives aimed at closing the knowledge gaps that exist on management of the species.

Implementation of this Strategy and Action Plan will employ a wide range of viable integrated management and control methods for *Prosopis* species that have been tested and proved successful in other parts of the world. These methods include: the use of biological agents that slow down the growth and consequently the invasive potential of the species; chemicals that kill the target plants in unwanted areas; large-scale mechanical removal of invasions; and promotion of guided and responsible utilisation as a resource in sites where management interventions are being carried out. Coordinated, sustained, and targeted harvesting and processing of various *Prosopis* wood and non-wood biomass resources from core invasions, combined with follow-up activities to prevent re-invasion, is envisaged to reduce the high densities of invasions to manageable levels, thereby allowing re-establishment and growth of indigenous biodiversity over vast areas and improve livelihoods.

## 1.8 The process for development of the Strategy and Action Plan

The Ministry of Environment, Climate Change, and Forestry (then Ministry of Environment and Natural Resources), through the Kenya Forestry Research Institute (KEFRI) and Kenya Forest Service (KFS- then Forest Department) responded to the *Prosopis* challenge by jointly undertaking baseline studies between 2000 and 2002 to determine status and impact of

the species in Kenya. The studies entailed surveys of spread habitats affected, as well as impacts on livelihoods. A major output of the study was the first National Workshop on Integrated Management and Control of *Prosopis* Species (2003) that led to the formation of the first National *Prosopis* Task Force in 2004. Task Force members were drawn from key Government Ministries (Environment, Agriculture, Livestock, Education-Universities, Lands), international agencies (WWF, CABI, ICRAF, UNEP, UNDP and FAO) and several NGOs and CBOs. Representatives of the six affected counties (then Districts) were also included, namely Baringo, Garissa, Mandera, Tana River, Turkana and Taita Taveta.

The Task Force was charged with the responsibility of developing a national strategy for the management and control of the *Prosopis* species in the country. The Task Force held two preliminary sittings in 2004. However, the necessary basic research data was inadequate, and the benefit of reliable local experiences on which to inform strategy approaches was lacking. To fill the knowledge gap, the Task Force was transformed into a steering committee for the first pilot project on integrated management and control of *Prosopis* in Kenya, where Baringo County was used as a pilot site between 2005 and 2008.

To date, there have been several initiatives to manage the species by various parties, based on technologies for management and utilization of the species that were developed in Baringo County during the pilot phase. Unfortunately, these efforts have been carried out with no proper coordination through the participating institutions. This has contributed to ineffective management, control and utilization of the species at all levels of intervention. This period has also given an opportunity for research organizations and universities to conduct research experiments aimed at filling knowledge gaps towards effective management and control of the species. In 2015, the Government of Kenya, through KEFRI assembled a battery of national and international experts and partners from Ethiopia, Tanzania, South Africa, Switzerland, Australia and America to fill the knowledge gaps on the impacts of *Prosopis juliflora* on biodiversity, livelihoods and land use systems in Eastern Africa through the Woody Weeds Project ([www.woodyweeds.org](http://www.woodyweeds.org)). The project was implemented in Kenya, Ethiopia and Tanzania between the years 2015 to 2020 with support from the Swiss National Science Foundation (SNSF) and the Swiss Agency for Development (SDC) in the frame of the Swiss Programme for Research on Global Issues for Development (r4d).

In 2019, the Ministry of Environment and Forestry, using results from the Woody Weeds Project and additional research data collected over the years, took a decisive step to take leadership by establishing a Multi-Agency Technical Committee comprising officers from the Ministry (KEFRI, KFS, NEMA, KWS) Ministry of Agriculture and Livestock, Council of Governors and International organizations (Centre for Agriculture and Bioscience International - CABI). The committee was later expanded to include additional Ministries (Ministry of Finance, Ministry of Energy, Ministry of Devolution, Attorney-General Chambers, and the Ministry of Interior). The technical committee members came together in a series of workshops and meetings to develop the Strategy, drawing on practical and documented experiences, as well as extensive literature/technical research reports. The draft Strategy was subjected to stakeholders' engagements and reviews for improvement and validation, and then to the Ministry of Environment and Forestry for final approval.

This strategy will be reviewed every five years to capture the dynamic nature of realities on the ground. It is envisaged that all relevant Ministries will work together in tandem by allocating appropriate financial resources to jointly support all the activities that have been identified in this strategy document.



# 2.0

## SWOT AND RISK ANALYSIS

## 2.1 SWOT Analysis

Kenya has some identifiable strengths and opportunities which can be utilised in the management of *Prosopis*. However, there are apparent weaknesses and threats that can constrain the efforts. **Table 2.** presents an analysis of the strengths, weaknesses, threats, and opportunities that influence the management of the species.

**Table 2:** SWOT Analysis

STRENGTHS	WEAKNESS
<ul style="list-style-type: none"> <li>• Trained and experienced human resource in management of <i>Prosopis</i>.</li> <li>• Favourable national and county policies and legislations on dryland forestry development</li> <li>• Emerging public-private sector partnerships with community groups</li> <li>• Capacity to mobilize resources</li> <li>• Ability to initiate partnerships/networks at national, county, regional and global levels</li> </ul>	<ul style="list-style-type: none"> <li>• Low prioritization and inadequate resource allocation towards <i>Prosopis</i> management</li> <li>• Lack of common cross border approach and coordination management measures to reduce invasions</li> <li>• Under-utilization of <i>Prosopis</i> resources</li> <li>• Weak incentives for private sector participation in <i>Prosopis</i> utilization</li> <li>• Poor coordination of policies and institutional frameworks in management of <i>Prosopis</i> at National level</li> <li>• Inadequate monitoring and evaluation mechanisms for already applied strategies</li> <li>• Absence of policy on invasive species</li> </ul>
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>• Increasing public/private networks and partnerships</li> <li>• Emerging strong global initiatives on management of invasive species</li> <li>• Constitutional, Vision 2030 and presidential initiative towards increasing tree cover including management of invasive species</li> <li>• Technological advancement in forest products value addition</li> <li>• Qualified and experienced personnel in forestry and allied sectors</li> <li>• Availability of human labour</li> <li>• Increasing market demand for <i>Prosopis</i> tree products</li> <li>• Strong government support in forestry development</li> <li>• High potential on the role of <i>Prosopis</i> in the emerging carbon market and green energy production</li> <li>• Increased interest /goodwill from development partners</li> <li>• Potential investors in <i>Prosopis</i> tree products exists</li> <li>• Increased awareness on negative environmental effects on habitats where <i>Prosopis</i> occurs</li> <li>• Expansion of irrigated agriculture which enhances active land use</li> </ul>	<ul style="list-style-type: none"> <li>• Prolonged dry spells and erratic rainfall due to climate change enhance <i>Prosopis</i> invasion</li> <li>• Inadequate market information on <i>Prosopis</i> tree products</li> <li>• Poor infrastructural development especially in areas dominated by <i>Prosopis</i> species</li> <li>• Insecurity specifically in areas dominated by <i>Prosopis</i></li> <li>• Limited funding</li> <li>• Lack of coordination in the implementation of policies and regulations that may hinder management and control of <i>Prosopis</i></li> </ul>

## 2.2 Stakeholder Analysis

There are many stakeholders who are involved in the management of *Prosopis* within the affected counties in Kenya. Table 3.2 presents the various stakeholders and their mandates/roles and responsibilities in the entire *Prosopis* value chain.

**Table 3:** Stakeholder analysis

Stakeholder	Mandate/Role	Responsibility
<b>Parastatals, Government Ministries</b>		
<b>Kenya Forest Service</b>	Sustainable management and utilization of forestry Resources for socio- economic development	<ul style="list-style-type: none"> <li>Awareness creation, up scaling of management technologies, formulation and enforcement of policies</li> </ul>
<b>Kenya Forestry Research Institute</b>	Research and development	<ul style="list-style-type: none"> <li>Technology development for management, processing and utilization of <i>Prosopis</i>,</li> <li>Identification of alternative species for restoration;</li> <li>Establishment and management of the Centre of Excellence on <i>Prosopis</i> management</li> </ul>
<b>Kenya Agricultural and Livestock Research Organization, Kenya Soil Survey</b>	Research and development	<ul style="list-style-type: none"> <li>Restoration and management technologies,</li> <li>Germplasm sourcing and preservation</li> </ul>
<b>Arid Lands Resource Management Projects</b>	Development of Arid Lands	<ul style="list-style-type: none"> <li>Restoration of invaded lands</li> <li>Community livelihoods enhancement</li> <li>Funding of community micro projects</li> </ul>
<b>Kenya Industrial Research Development Institute (KIRDI)</b>	Research and development	<ul style="list-style-type: none"> <li>Fabrication</li> <li>Upscaling of technologies for local adaptability</li> </ul>
<b>National Environmental Management Authority (NEMA)</b>	Regulatory	<ul style="list-style-type: none"> <li>Environment Impact Assessment</li> <li>Environmental management</li> </ul>
<b>Kenya Plant Health Inspectorate Services (KEPHIS)</b>	Regulatory	<ul style="list-style-type: none"> <li>Phytosanitary</li> </ul>
<b>Poisons and Chemical Protection Board (PCPB)</b>	Regulatory	<ul style="list-style-type: none"> <li>Chemical control</li> <li>Biological control</li> </ul>
<b>Kenya Wildlife Services (KWS)</b>	Wildlife conservation regulatory	<ul style="list-style-type: none"> <li>Biodiversity conservation</li> </ul>
<b>Ken Gen</b>	Generation of electricity	<ul style="list-style-type: none"> <li>Power generation from <i>Prosopis</i> biomass</li> </ul>

Stakeholder	Mandate/Role	Responsibility
<b>Regional Development Authorities: Tana and Athi Rivers, (TARDA), Coast (CDA), Ewaso Ng'iro South (ENSDA), Ewaso Ng'iro North (ENNDA), Kerio Valley (KVDA), Lake Basin (LBDA)</b>	Regional development	<ul style="list-style-type: none"> <li>Improvement of community livelihoods</li> <li>Environmental conservation and afforestation</li> </ul>
<b>Water Resource Management Authority</b>	Regulation management of water resources	<ul style="list-style-type: none"> <li>Conservation of water sources and water ways</li> </ul>
<b>Ministry of Agriculture and Livestock Development</b>	Food security and rural livelihoods	<ul style="list-style-type: none"> <li>Agroforestry development,</li> <li>Capacity building for common enterprise groups</li> </ul>
<b>Ministry Agriculture and Livestock Development</b>	Livestock subsector development	<ul style="list-style-type: none"> <li>On-farm growing of fodder trees and grasses</li> </ul>
<b>NGOs and International Agencies</b>		
<b>Forest Society of Kenya</b>	Forestry professional body	<ul style="list-style-type: none"> <li>Advocacy on <i>Prosopis</i> management standards</li> </ul>
<b>UN Agencies</b>	Community development	<ul style="list-style-type: none"> <li>Resource mobilization</li> </ul>
<b>World Vision</b>	Community development	<ul style="list-style-type: none"> <li>Resource mobilization</li> </ul>
<b>CABI</b>	Livelihood enhancement	<ul style="list-style-type: none"> <li>Database of invasions</li> </ul>
<b>Red Cross</b>	Emergency monitoring and mitigation	<ul style="list-style-type: none"> <li>Resource mobilization</li> </ul>
<b>Arid Land Info Network</b>	Information management on arid lands	<ul style="list-style-type: none"> <li>Information sharing and networking</li> </ul>
<b>Land O'Lakes</b>	Dairy development in arid lands	<ul style="list-style-type: none"> <li>Promotion of responsible utilization of <i>Prosopis</i> pods for animal feeds</li> </ul>
<b>Nature Kenya</b>	Community development	<ul style="list-style-type: none"> <li>Promotion of biodiversity</li> </ul>
<b>Kenya National Federation of Agricultural Producers</b>	Advocacy	<ul style="list-style-type: none"> <li>Resource mobilization</li> <li>Capacity building of farmers</li> </ul>
<b>Action AID</b>	Community development	<ul style="list-style-type: none"> <li>Resource mobilization,</li> <li>Extension and advocacy</li> </ul>
<b>Forest Action Network</b>	Advocacy	<ul style="list-style-type: none"> <li>Resource mobilization and</li> <li>Policy influencing.</li> </ul>
<b>World Wide Fund for Nature</b>	Biodiversity Conservation	<ul style="list-style-type: none"> <li>Livelihood enhancement</li> <li>Restoration</li> </ul>

Stakeholder	Mandate/Role	Responsibility
<b>Tree is Life</b>	Promotion of tree growing	<ul style="list-style-type: none"> <li>Capacity building</li> <li>Advocacy</li> </ul>
<b>Kenya Forest Working Group</b>	Conservation and Advocacy	<ul style="list-style-type: none"> <li>Environmental Conservation</li> </ul>
<b>Financial Institutions</b>		
<b>Equity Bank</b>	Rural and Community Development	<ul style="list-style-type: none"> <li>Support to livelihood enterprises</li> </ul>
<b>Agricultural Finance Corporation (AFC), Kenya Commercial Bank (KCB), Commercial Bank of Africa, Africa Development Bank (AfDB), World Bank among others</b>	Rural and Community Development	<ul style="list-style-type: none"> <li>Support to livelihood enterprises</li> </ul>
<b>Entrepreneurship</b>		
<b>Timber Processors and users</b>	Value addition	<ul style="list-style-type: none"> <li>Purchase of <i>Prosopis</i> wood products</li> </ul>
<b>Animal feed manufacturers</b>	Value addition	<ul style="list-style-type: none"> <li>Purchase of <i>Prosopis</i> pods</li> </ul>
<b>Kenya herbal practitioners</b>	Promotion of herbal products	<ul style="list-style-type: none"> <li>Purchase of/ <i>Prosopis</i> plant parts</li> </ul>
<b>Tobacco factories</b>	Manufacture of tobacco products	<ul style="list-style-type: none"> <li>Purchase of wood fuel</li> </ul>
<b>Charcoal Producer Associations (CPAs)</b>	Charcoal production	<ul style="list-style-type: none"> <li>Responsible utilization and management of <i>Prosopis</i> invasion</li> </ul>
<b>Restoration Arid Environment (RAE)</b>	Community development	<ul style="list-style-type: none"> <li>Restoration</li> </ul>
<b>Universities</b>		
<b>National and Private Universities</b>	Research	<ul style="list-style-type: none"> <li>Research on the different aspects of <i>Prosopis</i></li> </ul>

## 2.3 Economic Analysis

Using traditional production methods of 10% recovery, *Prosopis* biomass from clearing operations can produce slightly over one million tonnes of high-grade charcoal with an approximate value of KES 54 billion/year hence can contribute to the national charcoal demand if the charcoal industry is well regulated (**Table 4**). Expected revenue through tax charges from the *Prosopis* based charcoal is estimated at KES 11 billion/year and direct gainful employment of over 500,000 persons. These figures will be more than double with the use of modern efficient charcoaling technologies with recovery rates of between 25 % to 30%.

**Table 4:** *Prosopis* standing biomass and equivalent charcoal values

County	Fresh Biomass (million Tonnes)	Dry Biomass (Million Tonnes)	Equivalent Charcoal (Million Tonnes)	No. of Charcoal bags (Million)	Estimated Value (Ksh Billion @ksh. 800)
Turkana	10	5	0.5	30	24
Baringo	0.5	0.25	0.025	1.5	1.2
Isiolo	1	0.5	0.05	3	2.4
Garissa/Tana River	4.5	2.25	0.225	13.5	10.5
Taita Taveta	1	0.5	0.05	3	2.4
Kajiado	0.5	0.25	0.025	1.5	1.2
Others	5	2.5	0.25	15	12
<b>Total</b>	<b>22.5</b>	<b>11.5</b>	<b>1.125</b>	<b>67.5</b>	<b>54</b>

## 2.4 Risk Analysis

The risks associated with implementation of the National Strategy on integrated management and control of *Prosopis* have been analysed for the purpose of mitigation of the potential significant risks as shown in **Table 5**.

**Table 5:** Risk analysis and mitigation measures for identified threats

RISK	LEVEL	MITIGATION	RESPONSIBILITY FOR MITIGATION
<b>Prolonged dry spells and erratic rainfall due to climate change</b>	Moderate	<ul style="list-style-type: none"> <li>• Identification of drought tolerant species to compete <i>Prosopis</i></li> <li>• Droughts enhance effects of chemicals</li> </ul>	KEFRI, KFS, Counties
<b>Inadequate market information on <i>Prosopis</i> tree products.</b>	Moderate	<ul style="list-style-type: none"> <li>• Marketing,</li> <li>• Establishing demonstrations of various products,</li> <li>• Awareness creation</li> </ul>	KEFRI, KFS, Counties

RISK	LEVEL	MITIGATION	RESPONSIBILITY FOR MITIGATION
<b>Insecurity risks in areas dominated by <i>Prosopis</i></b>	Moderate	<ul style="list-style-type: none"> <li>Rural roads constructed</li> </ul>	Counties
<b>Insecurity especially in areas dominated by <i>Prosopis</i></b>	Moderate	<ul style="list-style-type: none"> <li>Security enhanced</li> </ul>	Ministry of Interior and National Administration (Internal security)
<b>Limited funding</b>	Moderate	<ul style="list-style-type: none"> <li>Proposal development</li> <li>Lobbying</li> </ul>	<ul style="list-style-type: none"> <li>KEFRI,</li> <li>KFS,</li> <li>Stakeholders</li> </ul>

Likelihood (Low=1, Moderate = 2, High = 3); Severity (Low=1, Moderate = 2, High = 3); Level (Low 1-3, Moderate 4-6, High 7-9). Risk level is calculated as Likelihood x Severity





# 3.0

THE STRATEGY

### 3.1. Vision

Kenya's ecological, economic and social assets are secure from the invasive *Prosopis* tree species.

### 3.2. Mission

To effectively manage *Prosopis* invasion, protect uninvaded areas and rehabilitate degraded landscapes through capacity building and empowerment of communities and institutions at national, county and community levels.

### 3.3. Goal

To effectively control and manage *Prosopis* for enhanced ecological functioning of landscapes and improved livelihoods

### 3.4. Objectives and Activities

Proposed objectives and activities are outlined in this section. Details of the various tasks and institutions responsible are shown in Annex 2.

**Table 6:** Proposed objectives and activities

S/No.	Objective	Actions
3.4.1	<b>Establish and strengthen governance and institutional frameworks at national, county and community level to support implementation of policies and measures for management and control of Prosopis</b>	<ul style="list-style-type: none"> <li>Establish <i>Prosopis</i> multi-sectoral management committees at national, county and community levels;</li> <li>Sensitize and lobby the Environment, Forestry &amp; Mining Departmental Committee of Parliament, Pastoralists Parliamentary Group (PPG) and County Assembly Environmental Committee on the need for control and management of <i>Prosopis</i>;</li> <li>Build capacities of the environmental committees at the county level for effective management and control of <i>Prosopis</i>;</li> <li>Lobby the environmental committees and members of the county assemblies to enact policies and laws addressing <i>Prosopis</i> control and management; and</li> <li>Mainstream <i>Prosopis</i> control and management into relevant institutional policy and planning frameworks to enhance resource allocation for effective management and containment.</li> </ul>
	<b>Raise awareness on Prosopis invasions, impacts and effective control and management</b>	<ul style="list-style-type: none"> <li>Sensitize policy makers, leaders and land owners on <i>Prosopis</i> invasion and impacts;</li> <li>Enhance level of awareness to institutions and the general public on <i>Prosopis</i> invasion, control and management;</li> <li>Incorporate information on <i>Prosopis</i> to existing education and outreach platforms (barazas, print- and electronic media, knowledge management systems);</li> </ul>

S/No.	Objective	Actions
		<ul style="list-style-type: none"> <li>• Enhance capacity of communities to detect and report on presence of <i>Prosopis</i> in counties with high potential of invasion;</li> <li>• Recruit and recognize <i>Prosopis</i> invasion management champions at all levels; and</li> <li>• Support and demonstrate practical implementation of large-scale integrated control and management approaches.</li> </ul>
	<p><b>Develop and Implement policies, laws and regulations governing management of land, natural resources and environment</b></p>	<ul style="list-style-type: none"> <li>• Undertake Strategic Environmental Impact Assessment on management and control of <i>Prosopis</i> at landscape level;</li> <li>• Implement recommendations of the Strategic Environmental Impact Assessment;</li> <li>• Develop/Strengthen relevant policies, laws, rules and regulations for management and control of <i>Prosopis</i>;</li> <li>• Sensitize and build capacity of stakeholders on relevant laws and policies on control and management of <i>Prosopis</i>;</li> <li>• Ensure compliance with relevant laws to prohibit introduction and propagation of <i>Prosopis</i> through responsible utilization;</li> <li>• Implement standard rules, regulations and guidelines on management, control and utilization of <i>Prosopis</i>; and</li> <li>• Enforce safeguards to guide harvesting, processing and marketing of <i>Prosopis</i> based products.</li> </ul>
<p><b>3.4.4</b></p>	<p><b>Promote and upscale appropriate interventions for control and management of <i>Prosopis</i></b></p>	<ul style="list-style-type: none"> <li>• Identify and map priority areas that require control and management intervention;</li> <li>• Develop zonation maps showing heavily invaded areas and those with potential for invasion;</li> <li>• Conduct participatory identification and prioritization of key assets threatened by <i>Prosopis</i> invasion;</li> <li>• Implement appropriate integrated system and technologies for effective management and control of <i>Prosopis</i> (<i>Mechanical, Biological and Chemical</i>); and</li> <li>• Implement area-specific management and ecosystem restoration plans to prevent <i>Prosopis</i> re-invasion in the affected areas.</li> </ul>
<p><b>3.4.5</b></p>	<p><b>Promote <i>Prosopis</i> value chains</b></p>	<ul style="list-style-type: none"> <li>• Identify viable <i>Prosopis</i> value chains;</li> <li>• Identify relevant investment vehicles and promote/incentivise partnership and private sector investments across <i>Prosopis</i> value chains;</li> </ul>

S/No.	Objective	Actions
		<ul style="list-style-type: none"> <li>Promote incentives to attract investors through tax relief/breaks and revolving short-term loans;</li> <li>Identify the investors to engage in the control and management of <i>Prosopis</i>;</li> <li>Pilot and scale up <i>Prosopis</i> exploitation of harvested biomass; and</li> <li>Implement alternative land use systems in intervention areas to prevent reinvasion.</li> </ul>
3.4.6	<b>Enhance research and development in the control and management of <i>Prosopis</i></b>	<ul style="list-style-type: none"> <li>Identify potential/ hotspot areas for <i>Prosopis</i> invasions through use of predictive/probability models;</li> <li>Test the effectiveness of prescribed management interventions and approaches;</li> <li>Assess technology adoption, identify barriers and recommend methods of addressing them;</li> <li>Undertake periodic assessment on the impacts of <i>Prosopis</i> invasion and interventions on community livelihoods, biodiversity and environment;</li> <li>Develop and implement new technologies for emerging challenges in management and control of <i>Prosopis</i>;</li> <li>Establish and strengthen centres of excellence to demonstrate and build capacity on best practice for management and control of <i>Prosopis</i>;</li> <li>Develop and regularly update the national <i>Prosopis</i> invasion management intervention database; and</li> <li>Disseminate relevant research findings to stakeholders.</li> </ul>
3.4.7	<b>Strengthen coordination, collaboration and partnerships for implementation of the <i>Prosopis</i> Strategy.</b>	<ul style="list-style-type: none"> <li>Undertake stakeholder mapping;</li> <li>Identify roles and responsibilities for the stakeholders in the implementation of the Strategy; and</li> <li>Develop an appropriate collaboration, partnership and coordination framework for the key national, regional and international stakeholders.</li> </ul>
3.4.8	<b>Monitoring, evaluation and reporting on the Strategy implementation</b>	<ul style="list-style-type: none"> <li>Develop and implement a Participatory Monitoring and Evaluation (PM&amp;E) framework for the implementation of the Strategy;</li> <li>Analyse institutional arrangements of multi-sectoral planning and implementation structures for <i>Prosopis</i> management and control; and</li> <li>Establish and activate a monitoring system and an early detection and rapid response (EDRR) network in affected counties.</li> </ul>

S/No.	Objective	Actions
3.4.9	<b>Resource mobilization and networking for implementation of the Strategy</b>	<ul style="list-style-type: none"> <li>• Identify potential sources of funding;</li> <li>• Undertake internal fund-raising initiatives at the national and county level budgets;</li> <li>• Development of proposals for funding;</li> <li>• Undertake fundraising promotions, campaigns and expeditions with a broad spectrum of partners both locally and internationally; and</li> <li>• Establish a dedicated <i>Prosopis</i> Fund to mobilize public and private financing of initiatives for control and management of <i>Prosopis</i>. This fund shall be institutionalized and managed within the key implementing institutions.</li> </ul>





# 4.0

*PROSOPIS* RESOURCE  
VALUE CHAINS

## **4.1. Introduction**

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Utilization of massive biomass from clearing operations in combination with extensive planting of native trees will contribute to Bottom-Up Economic Transformation Agenda (BETA) of the Government of Kenya through value addition of *Prosopis* products, industrialization and creation of Micro, Small and Medium Enterprises (MSME) economy as well as employment creation. Major products from *Prosopis* will include wood and non-wood products. These *Prosopis* products, when utilized sustainably in a responsible manner for domestic and commercial purposes, will go a long way in uplifting the lives and livelihoods of communities in the ASALs particularly during the ten-year strategy implementation period (2025 - 2035). It is envisaged that after this period, most of the *Prosopis* invasions will have been cleared and plantations of alternative native and appropriate naturalized trees with similar or superior qualities will be well established and utilized commercially.

## **4.2. Wood products value chains**

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A wide range of utilitarian wood products can be made from *Prosopis* wood. The most significant products include fuel wood, posts and poles, sawn timber, and other related secondary processed wood items such as furniture, flooring materials, and wood carvings. These products originate from wood of good form, which depends on silvicultural or agronomic practices carried out in designated areas from an early age of the trees until they reach maturity. Such practices involve thinning and pruning of trees growing along wetlands, riverine, and irrigated areas, especially those designated for producing commercial wood for industrial purposes. The thicket growth characteristics of the invasive *Prosopis juliflora* outside these moist areas may not easily produce such products as they remain dwarfed and small-diameter saplings due to a lack of sufficient moisture.

It is therefore important to note that due to the economic value of large trees, when carrying out silvicultural/agronomic management interventions in areas heavily invaded by *Prosopis*, the thickets should be thinned and pruned to grow knot-free wood for processing. These commercial activities will be well coordinated to ensure that the primary objective of effective long-term management and control of *Prosopis* is not lost or compromised.

**Descriptions of the main wood value chains are given below:**

### **4.2.1. Firewood**

This is the most common use of *Prosopis* in all areas where it occurs. In addition, it is the primary fuel source for the two refugee camps in northern Kenya; Kakuma and Daadab with a population of 255,000 and 201,000 respectively.

### **4.2.2. Charcoal**

The standing biomass of *Prosopis* trees amount to slightly over 1.1 million tonnes of charcoal. Thus, management and control interventions can generate a lot of biomass. In 2019, the Ministry of Environment, Climate Change and Forestry developed safeguards for the production and trade of *Prosopis* charcoal. These safeguards detail trade practices and utilisation, and outline conditions for actors along the charcoal value chain. They also minimise the abuse of harvesting local indigenous trees other than *Prosopis* and provide management structures that outline the roles of various government agencies and non-state actors in its implementation.

### **4.2.3. Commercial energy**

*Prosopis* wood has high energy values and is therefore suitable for commercial utilisation. The wood can be chipped and used for industrial steam for electricity generation and other heating needs. In Baringo County, a pilot gasification plant using *Prosopis* feedstock failed due to the wood's high lignin content, leading to the accumulation of tar that clogged the boilers. With the right technology, the species has potential for commercial exploitation from the cleared biomass during the strategy implementation period.

### **4.2.4. Briquette**

A briquette is a compressed block of coal dust or other combustible biomass material (e.g., charcoal, sawdust, wood chips, peat, or paper) used as fuel and

kindling to start a fire. Biomass briquettes offer a sustainable alternative to fossil fuels such as coal and charcoal.

Briquettes can be produced from two processes: as a by-product of charcoal and commercial energy production, and from carbonizing the small diameter trees, twigs and branches where *Prosopis* is being eradicated by mechanical means. The carbonized materials can be reconstituted into briquettes for fuel.

#### **4.2.5. Biochar**

Biochar is a charcoal-like substance made from organic materials like wood chips, manure, or agricultural waste. It's used as a soil amendment to improve water retention, soil health, and carbon storage. Biochar can be produced through two processes: as a by-product of charcoal and commercial energy production, and from carbonizing small-diameter trees, twigs, and branches that are being eradicated by mechanical means. The carbonized materials can be used as biochar for soil conditioning and carbon storage.

#### **4.2.6. Wood carvings**

*Prosopis* wood presents vast opportunities for production and marketing of handicrafts/woodcarvings, given that its characteristics and wood properties are close to *Dalbergia melanoxylon* (ebony), *Olea africana* (Olive) and *Brachylaena huillensis* (Muhugu) efforts must be made to carry out further tests on the drying and vanish uptake of the finished carvings. The wood carving industry in Kenya is facing serious challenges of a lack of preferred species, and wood is often smuggled from Tanzania through Lungalunga port in coastal Kenya.

The following are indicative guidelines for exploiting *Prosopis* wood on a commercial scale.

- i. In most cases, high-quality industrial products require wood with good form, which depends on silvicultural or agronomic practices carried out in designated areas from an early age of the trees until they reach maturity. These practices involve the deliberate removal of excess stems (thinning) and branches (pruning) of trees growing within such designated areas, without which quality products may not be guaranteed;
- ii. The thicket growth characteristics of the invasive *Prosopis juliflora* outside these moist areas may not easily produce quality wood products as they remain dwarfed and small-diameter saplings due to a lack of sufficient moisture. However, charcoal, briquettes, wood chips and biochar products are viable in such situations, but to a limited scale;
- iii. In future, commercial cultivation of fast-growing non-invasive species with similar qualities as *Prosopis juliflora* may be considered for investors after undertaking rigorous research on them.

## **4.3 Non-wood products**

### **4.3.1. Livestock feed production value chain.**

The fruit produced by *Prosopis* is high in sugars, carbohydrates and protein. They contain 7-22% protein, 30-75% carbohydrates, 11-35% crude fibre, 1-6% fat and 3-6% ash. They can potentially be used to mix with other fodder material for manufacture of livestock feed. Consumption by humans, even as a staple food, has not resulted in any recorded harmful effects on health.

The use of pods as a raw material in the livestock feeds industry or for local formulations to feed livestock during drought periods presents a unique win-win strategy to control *Prosopis* while maintaining livestock health and survival. Processing pods for livestock feed can be used as one of the biological control methods, as milling one tonne destroys over 2 million viable seeds that could otherwise spread and germinate in the landscape. Additionally, milling enhances feed quality by releasing proteins embedded in the seed that are normally inaccessible to livestock. High-quality, clean pods can also be processed for human consumption.

### **4.3.2. Honey value chain**

*Prosopis* trees flower throughout the year, but with two peak seasons. They are excellent bee forage species, producing nectar most of the year and thus supporting the production of high-quality honey. However, experience has shown that *Prosopis*-based honey easily crystallizes and forms visible layers in containers, which can be mistaken for adulterated honey. They are often mixed with honey from other forage species to address this common issue.





# 5.0

STRATEGY, SUSTAINABILITY  
AND SAFEGUARDS

## **5.1 Strategy Sustainability**

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Sustainability assessment of the strategy has been done at various levels, technical, policy, social and economic. These are described in detail below:

### **5.1.1 Technical levels**

The strategy contributes several technical outputs that will be in use even beyond its life span. These include:

- The land degradation maps, reports, spatial database, images and intervention measures;
- The vegetation maps and models will help define the policy measures and actions required for the ecosystem management of invasive species;
- Institutional and actors network mapping will be the basis for seeking assistance among the different actors and beneficiaries at the county, national and international levels;
- Long-term action plans developed by the actors could guide the future implementation of the activities and outputs even after the active life of the key actors; the national government, county governments, communities and other stakeholders; and
- Capacity building of key actors made.

### **5.1.2 Policy level**

- Through the policy-legislation component, the strategy will build the capacity of the various institutions and Department of the different participating Ministries for better coordination and harmonization of policies and legislations and bring together the actors with stakes in the management of invasive species and other related ecosystems; and
- The Ministry of Environment, Climate Change and Forestry, which houses the secretariat, will be vested with the powers to lead the coordination and harmonisation of policies and legislations that will guide actions by different institutions and stakeholders that have an interest in the management of invasive species across various ecosystems.

### **5.1.3. Social level**

- The Strategy enhances the need for accountability in the use of common property resources across landscapes;
- The strategy empowers the local communities and creates awareness on resource management schemes; and
- Through actors and stakeholders' analysis, the Strategy creates a negotiation platform to bridge the interests of the pastoralists and sedentary communities, where conflicts frequently occur on the use rights of pastures and water resources;

### **5.1.4 Economic level**

- The Strategy provides diversity in sources of sustainable income to pastoral communities, such as charcoal, poles, timber, livestock feed and bee forage;
- The adoption of viable active land use options in *Prosopis* management activities contributes to the well-being of the community in pasture development and crop production, which directly enhances their economic sustainability;
- The Strategy attracts a wide range of investors who will provide direct and indirect sources of employment to communities;
- The Strategy enhances the contribution of *Prosopis* resources to the climate change mitigation measures in green energy production (biochar, electricity from biomass), carbon sequestration and other related processes that provide economic opportunities to the actors directly and indirectly without compromising the primary objective of effective management and control of invasions; and
- The communities trained by NGOs, CBOs, county governments and public agencies/institutions through pilot sites and workshops will facilitate propagation

of desired actions by use of the training sites and contents beyond the strategy period.

#### **5.1.5. Physical level**

- Enhanced *Prosopis* management activities will open clogged roads, paths and livestock water access routes across invaded areas; and
- Irrigation canals in all affected schemes are opened up and well-managed as guided by regulations developed through the Strategy.

#### **5.1.6. Political level**

- Resource use conflicts will be minimized due to more accountable management of pastures, grazing areas, crop farming and *Prosopis* biomass arising from clearing interventions;
- Mandates and responsibilities of the county and national governments will be much clearer on aspects such as charcoal production, revenue sharing mechanisms and other revenue related issues (carbon credits, etc);
- Responsibilities of the national and county legislative arms (National and County Assemblies respectively) in developing and enforcing policies and laws governing the management of invasive species will be clearly defined to minimize conflicts; and
- Shared responsibility in the effective management of *Prosopis* resources by different actors and communities will minimize legal challenges that have been seen in the past against the introduction and utilization of the species.

#### **5.1.7 Environmental level**

- Responsible management and utilization of *Prosopis* resources ensured across landscapes;
- Negative impacts of *Prosopis* minimized, harvesting of *Prosopis* biomass enhanced;
- Vigilance and active participation in the management of our environment are improved, and the consequences of inaction are made clear to communities;
- Responsible use of chemicals and biological control agents whose introduction and authorised application go through rigorous processes;
- Integrated management of our environment is significantly enhanced;
- Creation of awareness on conservation of fragile environments;
- Reverting back to sustainable land uses by the landowners/users; and
- Mitigation plans, awareness creation, compensation/reward schemes for the involved land users.

## **5.2 Environmental sustainability**

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The primary drivers of the National Strategy and Action Plan implementation will be the counties and communities at the grassroots level. These communities will be the direct beneficiaries of the implementation activities. The National Strategy has outlined targeted capacity building and empowerment of key stakeholders at all levels to ensure smooth, continuous, and accurate information flow and action. All these activities will be regularly monitored and evaluated, with appropriate corrections made promptly. Any practice introduced that has a negative impact will be addressed accordingly, following the recommended mitigation pathway. It is envisaged that pastures will be developed to support livestock in various intervention sites will generally provide a positive outcome to pastoral communities who in return, will support these initiatives in the long term.

## **5.3 Safeguards and protocols specific to harvesting, processing and trading of *Prosopis* resources**

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Past experiences have shown that in certain occasions, communities illegally harvest and process indigenous trees in areas where mature *Prosopis* trees have been exhausted. The Strategy implementation process has therefore introduced additional levels of accountability at the community level involving a number of institutions to address this challenge as described in **Annex 4**.

## **5.4 Environmental impact assessment and audit**

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The National Strategy and Action Plan has provided for an elaborate baseline study on Environmental Impact Assessment and Audit of the potential impacts of each of the integrated management methods to be introduced. Negative environmental impacts associated with *Prosopis* make it necessary to introduce integrated methods of managing the species.

## **5.5 Integrated management methods**

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The integrated methods for managing the species include biological, chemical, mechanical and utilization methods, each of which may also have negative impacts. Appropriate mitigation measures will be recommended for each of the identified issues in the use of natural enemies, chemicals, restoration and reclamation of the invaded areas.

### **5.5.1 Biological method**

Entails the introduction of a set of natural enemies that reduce the seed output of *Prosopis*, thus significantly reducing the rate of spread in the ecosystem. Introduction of biological control, if used as an option, carries a risk of: attack on non-targets; dispersal of a biocontrol agent to a new area; and changed relationships between a control agent and a native species, particularly as generated by global climate change. This Strategy recommends appropriate mitigation measures for each of the potential negative impacts. Different biological agents to be introduced will undergo mandatory risk assessment under strict quarantine conditions. Indigenous tree species in the same family or closely related to *Prosopis* will be used as a test crop. All relevant Government regulatory bodies will be involved at all stages of identification, importation and testing. Public participation is also encouraged at all stages of the exercise as appropriate. Biological control involves the introduction of seed feeders (*Algarobius Prosopis*, *Apion* spp and *Algarobius bottimeri*), sap-sucking psyllid insects that cause dieback (*Prosopidossylla flava*) and leaf-tying moth that defoliates the plants (*Evippe* spp). All these agents significantly reduce the growth and spread rates of *Prosopis* trees without affecting the wood characteristics, and help to improve the effectiveness of other control techniques. *Algarobius Prosopis* is already widespread in Kenya, having been introduced in Yemen in 1987 and gained entry through Djibouti and Ethiopia. Impacts of the agent on *Prosopis* in Kenya are being monitored as plans are underway to introduce additional agents into the country for more effective impact, as informed by experiences elsewhere around the world.

### **5.5.2 Chemical methods**

This entails the use of chemical control of *Prosopis*. Suitable herbicides are recommended for the control of *Prosopis* plants in areas of high conservation values where mechanisation may not be applicable. The strategy will ensure maximum care in the use of chemicals as guided by appropriate policies, regulations and rules to address *Prosopis* issues in Kenya. Owing to the negative impacts of widespread use of chemicals on environment, relevant legislation will be developed to guide their distribution, storage and application at the target sites and standard procedures on use of chemicals will be ensured. Chemical control involves the use of systematic herbicides on stem or vegetative parts of the plant to kill them from selected sites of high conservation value. Common herbicides of choice are 2,4,5 – T, Clopyralid, Dicamba, Piclorum, Triclopyr, and Ammonium sulphamate. Many of these chemicals are now available in Kenya to control weeds in cropping areas, mainly wheat and maize farms. Trials on their impact on *Prosopis* are underway

### **5.5.3 Mechanical method**

The method entails the use of machinery and human labour to remove *Prosopis*, as well as restoration and reclamation of large invaded areas. The materials that are removed by this method can be utilised for various products. The reclaimed area can be used for pastures, crops and alternative drought-tolerant fast-growing trees. The strategy ensures planting the reclaimed area avoids unintended negative consequences such as loss of rare species, minimized compaction of soil and reduced invasion by other species.



# 6.0

## IMPLEMENTATION FRAMEWORK AND COORDINATION

## **6.1 Governance and Implementation of the National Strategy and Action Plan**

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The implementation framework for the National Strategy and Action Plan recognizes two committees, one at the national level with a national secretariat and one at the County level, whose roles and membership are described below.

### **6.1.1 National Planning and Coordination Committee (NPCC)**

The National Planning and Coordination Committee (NPCC) will carry out the overall implementation of the National Strategy and Action Plan. Their roles are as follows.

- (a) To provide national policy directions on the implementation of the National Strategy and an Action Plan;
- (b) Mainstream *Prosopis* control and management into all institutional policy and planning frameworks of all participating institutions to enhance resource allocation for effective management and containment of the species;
- (c) To ensure financial resources from the Government and Development Partners are available regularly and on time in a sustainable manner (including *Prosopis* Fund) to facilitate implementation of the National Strategy and Action Plan;
- (d) To set up systems to ensure efficient and effective utilization of available resources allocated to the implementation of this National Strategy and Action Plan;
- (e) Approve annual work plans and budgets developed by the National secretariat; and
- (f) Facilitate M & E of the Strategy and Action Plan activities.

Membership of the NPCC will be drawn from:

- Ministry of Environment, Climate Change, and Forestry (MOECC&F)
- Kenya Forestry Research Institute
- Kenya Forest Service
- The State Department for ASALs
- The State Department for Agriculture
- The State Department for Livestock Development
- A representative of development partners
- Council of Governors (CoG)
- A representative of the private sector

The NPCC will have a minimum of 10 and a maximum of 15 members. It will be chaired by the Principal Secretary in charge of forestry matters. The Committee will meet **quarterly** to review progress of the National Strategy and Action Plan implementation and provide strategic directions. The Committee will also perform coordinating functions for resource mobilization for implementation of the Strategy and Action Plan.

### **6.1.2. County Implementation Committee (CIC)**

Membership of the County Implementation Committee (CIC) will be drawn from National and county government institutions operating at county and sub-county levels dealing with environment, agriculture, livestock, lands, devolution and county administration, including representatives from the County department committee on environment and County Environmental Committee. CBOs, FBOs, NGOs, Community Associations, opinion leaders will also be included. **A minimum of 10 and maximum of 15 members** will be constitute the committee. The CIC will meet on **a quarterly basis and be co-chaired by the County Commissioner and the** county executive committee member in charge of forestry. KFS and KEFRI in the county will be joint secretariat.

#### **Roles of CIC**

- (a) Refining work plans and their implementation;
- (b) Coordination and supervision of field activities;
- (c) Identification of stakeholders for capacity building;

- (d) Undertake monitoring and evaluation (M&E) of the activities;
- (e) Ensure grass root teams are well facilitated;
- (f) Receive monthly progress reports and on roll out of the National Strategy and Action Plan and process them further for submission to the national secretariat to inform M&E, policy direction, and any further action.

## **6.2. National Secretariat**

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The National Secretariat anchored at the MOECC&F and will be responsible for day to day running of the National Strategy and Action Plan activities under the overall guidance of the Principal Secretary, Ministry of Environment, Climate Change, and Forestry. The operational implementation and coordination of the Secretariat duties will be under the stewardship of the Director KEFRI and the Chief Conservator of Forests. In the Counties, the secretariat will work closely with Governors to ensure prudent management of budgets and efficient utilization of the allocated resources.

The key roles of the national secretariat will be to;

- (a) Host national workshops every 2 years to share progress of activities;
- (b) Plan and coordinate the national planning and coordination committee and the county implementation committee meetings.
- (c) Facilitate timely release of funds to support activities at all levels;
- (d) Facilitate the county committees;
- (e) Facilitate M & E of the Strategy and Action Plan activities
- (f) Monitor the implementation of field activities;
- (g) Receive progress reports from county committees;
- (h) To be custodians of data collected from field activities, correspondences, communications, software and hardware related to implementation of the National Strategy and Action Plan;
- (i) Updating of databases, maps and other software related to the implementation of the National Strategy and Action Plan.

## **6.3 Linkages with the existing national policy and institutional strategic plans**

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Development of this National Strategy and Action Plan has been aligned to the relevant global, national and institutional initiatives from the key participating ministries, their related semi- autonomous government agencies (SAGAs) and other relevant national and International institutions. Examples of the policies are the Convention on Biological Diversity (CBD), Ramsar Convention, Sustainable Development Goals (SDGs), National Forest Programme (2016-2030), Forest Conservation and Management Act (2016) and Resource Mobilization Strategy for KEFRI. The respective strategic plans for Ministry of Environment Climate Change and Forestry (2023- 2027), Ministry of Agriculture (2018-2022), National Treasury and Planning (2018-2022), KEFRI (2022-2027), KFS (2023-2027), NEMA (2018-2022), CETRAD (2018-2022), CIDPs from selected Counties have also been factored. The revised strategic plans for the respective Ministries for 2023 – 2027 and the third generation CIDPs (2023-2027) have also been factored. Points of convergence on strategic directions and implementation of the relevant policies and activities related to the National Strategy and Action Plan have been reviewed. These will provide a common platform in order to facilitate resource allocation to support the Strategy activities during the plan period and beyond.

## **6.4. Information and technology dissemination**

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A robust information and technology dissemination strategy will be adopted to ensure that local communities implementing the activities are well-informed. Dissemination methods to be used will include: audio-visual, digital and print media, road shows and other promotion materials. Other targeted forums are field and open days, exhibitions, conferences and workshops.



# 7.0

## RESOURCE MOBILIZATION

## **7.1 Financial resources**

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Financial requirements for implementation of the National Strategy and Action Plan is estimated at KES 20 billion (**Annex 2**). These resources will be mobilized; within the Government ministries, from development partners, and private sector as follows.

### **7.1.1 Internal budget support within government ministries.**

Each Government Ministry has a sector budget committee that allocates funding for identified activities every year. The National Planning and Coordination Committee (NPCC) will lobby appropriately to ensure that activities in the Strategy and Action Plan are given priority and commensurate funding every year throughout the Strategy plan period.

### **7.1.2 Development partners.**

The National Secretariat (NS) will work closely with NPCC and other partners and lead in the development of project proposals in consultation with various stakeholders. Appropriate lobbying missions with development partners will be done in consultation as necessary.

### **7.1.3 Private sector.**

Investors with interests in various activities in the Strategy will be lobbied to provide support through their; corporate social responsibility budgets and the public private partnership investments. The NPCC will seek collaboration with potential national and international investors for support.

### **7.1.4 Targeted fundraising promotions**

Undertake targeted fundraising promotion through campaigns and expeditions with a broad spectrum of partners both locally and internationally. These included road races, marathon runs, motor racing amongst others.

### **7.1.5 Human resources**

The strategy will be implemented in 22 counties of Kenya which are adversely affected by *Prosopis*; Baringo, Garissa, Isiolo, Kajiado, Kwale, Lamu Malindi, Mandera, Marsabit, Samburu, Taita Taveta, Tana River, Turkana, Wajir, and West Pokot. During the National Strategy and Action Plan implementation period, each participating ministry and institution whose activities have been outlined in the document will undertake staff capacity enhancement to support the implementation of the strategy. The National Secretariat will provide policy direction while the county implementation committees will guide and supervise implementation of activities within their respective counties down to the ward levels.



# 8.0

## MONITORING AND EVALUATION

To achieve the objectives of the *Prosopis* Strategy, an effective coordination, monitoring and evaluation framework is necessary. The wide range of players involved in implementation of this Strategy will require a harmonized and coordinated framework to effectively, and efficiently manage and utilize the resources. The proposed institutional framework will involve organizations with clear mandate and facilitate active participation of all stakeholders involved in *Prosopis* management.

The National Strategy and Action Plan covers a period of ten years (2025- 2035) thus partly coinciding with Medium Term Strategic Plans for all the key participating Ministries and institutions. Activity monitoring will be done quarterly (3 months), while project evaluation will be done every two (2) years. Internal and external evaluation process will focus on critical examination of the strategic objectives and activities to ensure delivery of expected outputs within the time frame allocated in the implementation matrix. Evaluation reports will guide and inform the core implementing teams on recommended areas to improve and revisions made accordingly.

The first two years will also be the time in which biological agents and chemicals will be secured, tested, approved, registered and ultimately availed to the counties by the end of the second year. Availing of the chemicals or release of biological control agents will only be done after Environmental Impact Assessment (EIA) license is issued and the baseline Environmental Audit (EA) is conducted and approved.



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# ANNEXES

## ANNEX 1

Predicted status of *Prosopis* invasion in different counties in Kenya

County	Total Area (Km <sup>2</sup> )	Prosopis density (>50%) (Km <sup>2</sup> )	Prosopis density (<50%) (Km <sup>2</sup> )	Prosopis mixed with other Vegetation (Km <sup>2</sup> )	Total area invasion by Prosopis (%)	Areas without Prosopis (%)	Area invaded by Prosopis (Ha)
<b>Baringo</b>	11,075.30	78.07	247.32	73.66	3.6	96.4	<b>39,905</b>
<b>Turkana</b>	71,597.80	471.19	2370.16	776.52	5.1	94.9	<b>361,787</b>
<b>Garissa</b>	45,720.20	221.67	597.66	174.3	2.2	97.8	<b>99,363</b>
<b>Taita Taveta</b>	17,083.90	47.4	205.2	32.05	1.7	98.3	<b>28,466</b>
<b>Tana River</b>	35,375.80	543.17	431.73	167.47	3.2	96.8	<b>114,239</b>
<b>Isiolo</b>	25,336.10	353.79	749.74	188.62	5.1	94.9	<b>129,214</b>
<b>Kajiado</b>	21,292.70	67.19	326.41	336.15	3.6	96.6	<b>72,975</b>
<b>Marsabit</b>	66,923.10	57.18	1071.77	293.22	2.1	97.9	<b>142,216</b>
<b>Mombasa</b>	212.5	3.25	3.01	0.67	3.3	96.7	<b>693</b>
<b>Tharaka Nithi</b>	2,409.50	12.28	6.64	4.49	1	99	<b>2,341</b>
<b>Samburu</b>	20,182.50	56.36	187.46	55.91	1.5	98.5	<b>29,973</b>
<b>West Pokot</b>	8,418.20	45.43	29.4	8.41	1	99	<b>8,324</b>
<b>Kilifi</b>	12,245.90	137.48	305.16	2.55	3.6	96.4	<b>44,519</b>
<b>Kwale</b>	8,270.30	22.33	67.81	0.49	1.1	98.9	<b>9,063</b>
<b>Lamu</b>	6,497.70	54.52	47.83	2.5	1.6	98.4	<b>10,485</b>
<b>Meru</b>	7,003.10	34.46	19.2	6.78	0.9	99.1	<b>6,044</b>
<b>Kitui</b>	24,385.10	148.11	48.42	4.93	0.8	99.2	<b>20,146</b>
<b>Embu</b>	2,555.90	13.23	0.94	0.5	0.6	99.4	<b>1,468</b>
<b>TOTAL</b>	<b>386,585.6</b>	<b>2367.11</b>	<b>6715.86</b>	<b>2129.22</b>	<b>42</b>	<b>1758.2</b>	<b>1,121,221</b>

**Source:** Eckert et al., 2020: Woody Weeds Project: Assessing impacts of invasive alien species in Eastern Africa

## ANNEX 2

Projected financial requirements for Implementation of Action Plan for Management and Control of the Invasive *Prosopis* species in the period 2025 to 2035 (in KES millions)

Strategic objective	2025/ 26	2026/ 27	2027/ 28	2028/ 29	2029/ 30	2030 /31	2031 /32	2032/ 33	2033/ 34	2034/ 35	TOTALS
1. Establish and strengthen governance and institutional frameworks at national, county and community level to support implementation of policies and measures for management and control of <i>Prosopis</i>	300	300	300	300	300	300	300	300	300	300	<b>3000</b>
2. Raise awareness on <i>Prosopis</i> invasions, impacts and effective control and management	400	400	200	200	150	150	125	125	125	125	<b>2000</b>
3. Develop and Implement policies, laws and regulations governing management of land, natural resources and environment	2,000	600	600	500	500	500	500	500	500	500	<b>6,700</b>
4. Promote and upscale appropriate interventions for control and management of <i>Prosopis</i>	50	50	30	30	30	30	20	20	20	20	<b>300</b>
5. Promote <i>Prosopis</i> value chains	100	50	50	50	40	40	40	40	40	40	<b>490</b>
6. Enhance research and development in control and management of <i>Prosopis</i>	1200	1200	800	600	200	564	564	564	564	564	<b>6820</b>
7. Strengthen coordination, collaboration and partnerships for implementation of the <i>Prosopis</i> Strategy	50	40	30	20	20	20	20	20	10	10	<b>240</b>
8. Monitoring, evaluation and reporting on the Strategy implementation	50	50	30	20	20	20	20	20	10	10	<b>250</b>
9. Resource mobilization and networking for implementation of the Strategy	40	40	20	20	20	20	10	10	10	10	<b>200</b>
<b>Total</b>	<b>4,190</b>	<b>2,730</b>	<b>2,060</b>	<b>1,740</b>	<b>1,280</b>	<b>1,644</b>	<b>1,599</b>	<b>1,599</b>	<b>1,579</b>	<b>1,579</b>	<b>20,000</b>

## ANNEX 3

Action Plan 2025 – 2035 for the Control of *Prosopis juliflora*

Strategic Initiatives	Task/activity Detailed description and key milestones	Outcomes	Year (2025-2035)					Responsible
			25/27	27/29	29/31	31/33	33/35	
<b>1.0. Establish and strengthen governance and institutional frameworks at national, county and community level to support implementation of policies and measures for management and control of Prosopis</b>								
<b>Strategic initiatives 1.1: Establish Prosopis multi- sectoral management committees at national, county and community levels;</b>	1.1.1 Form the National Planning and coordination committee	Secretariat team for the National Strategy and Action Plan established and functional						MOECC&F, KEFRI, KFS, NEMA, Mol&NA, MOALD, NTEP, CoG, AG,
	1.1.2 Form and launch County, Committee	County, Sub County, Ward and Community Committees established and functional						CoG, MOECC&F, KEFRI, KFS, Mol&NA, , MOALD, NTEP,
	1.1.3 Operationalize the framework through appropriate facilitation	Facilitated committees at National and County level						MOECC&F, KEFRI, KFS, , MOALD, MOE&P, NTEP
<b>Initiative 1.2: Sensitize and lobby the Environment, Forestry &amp; Mining Departmental Committee of Parliament, Pastoralists Parliamentary Group (PPG) and County Assembly Environmental Committee on the need for control and management of Prosopis</b>	1.2.1 Secretariat to seek the necessary appointments and host the necessary meetings with all targeted Committees	Members of Parliament (MPs) and Members of County Assemblies (MCAs) informed and participate in <i>Prosopis</i> control and management						MOECC&F, , CoG, KEFRI, KFS
	1.2.2 Develop and share basic literature and information sheets on the current state of knowledge and threat of <i>Prosopis</i>	Basic and accurate information disseminated						MOECC&F, KEFRI, KFS, NEMA, KWS
<b>Initiative 1.3: Build capacities of the environmental committees at county level for effective management and control of Prosopis;</b>	1.3.1 Undertake training needs assessment among Committees and stakeholders	Training needs among Committees determined						KEFRI, KFS, CoG, CABI, MOALD, Mol&NA, , CETRAD, UON
	1.3.2 Develop training modules	Training materials and guides availed						KEFRI, KFS, CoG, CABI, MOALD, M, UON, MOE&PS&T, CETRAD
	1.3.3 Conduct trainings	Capacity of all the committees enhanced						MOECC&F, Mol&NA, CoG, KEFRI, KFS, MOE&P, MOALD, CETRAD

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Strategic Initiatives	Task/activity Detailed description and key milestones	Outcomes	Year (2025-2035)					Responsible
			25/27	27/29	29/31	31/33	33/35	
<b>Initiative 1.4: Lobby the Environmental committees and members of the county assemblies to enact policies and laws addressing Prosopis control and management;</b>	1.4.1 Identify existing laws and gaps	Laws and regulations enacted						MOECC&F, CoG, KEFRI, KFS, MOE&P, MOALD, AG, CETRAD
	1.4.2. Develop appropriate bills to fill the gaps	New laws developed and enacted						MOECC&F, CoG, KEFRI, KFS, MOE&P, MOALD,AG, CETRAD
<b>Initiative 1.5: Mainstream Prosopis control and management into relevant institutional policy and planning frameworks to enhance resource allocation for effective management and containment.</b>	1.5.1 Identify legal experts from key institutions (Ministries, NGOS,CBOs, etc) and host meetings to interrogate appropriate policies	<i>Prosopis</i> invasion control and management is embedded in all institutional policies and planning frameworks and resources allocated towards it.						MOECC&F, MoI&NA, MOE&P, MOALD, NTEP, MoLPP, MoWS& I, MOE&PS&T, (All key Ministries), CoG
<b>Strategic objective 2: Raise awareness on Prosopis invasions, impacts and effective control and management Performance</b>								
<b>Initiative 2.1: Sensitize policy makers, leaders and land owners on Prosopis invasion and impacts;</b>	2.1.1 Gather, package and disseminate information and education materials on <i>Prosopis</i> invasion and impacts (Audio- visual and print - brochures, posters, handbooks, manuals, radio and TV scripts, road shows, promotion materials)	10,000 copies of communication materials disseminated to end users Managers, land owners changing their management practices as a result of the information						MECC&F, MOECC&F and KEFRI, KFS, KWS together with their communications /media teams, CoG, MOALD, MoI&NA, MOE&P, CETRAD, UoN
	2.1.2 Establish platforms for sharing and dissemination of <i>Prosopis</i> information (email groups, print media, broadcast media, social media, meetings, electronic libraries, and compendium).	Report of the survey on suitability and appropriateness of platforms Efficient platform for dissemination established						MOE&P&F KEFRI, KFS, KWS (Communications /media and M&E teams) CoG, MOALD, MOE&P, MoI&NA

Strategic Initiatives	Task/activity Detailed description and key milestones	Outcomes	Year (2025-2035)					Responsible
			25/27	27/29	29/31	31/33	33/35	
<b>Initiative 2.2: Enhance level of awareness to institutions and the general public on Prosopis invasion, control and management;</b>	2.2.1 Organize institutional <i>Prosopis</i> invasion awareness and removal field days to prevent and reduce invasions.	<i>Prosopis</i> removed and managed in invaded areas						MOE&P&F KEFRI, KFS, KWS (Communications /media and M&E teams) CoG, MOALD, MOE&P, MOE&PS&T, CETRAD, UON, Moi&NA
	2.2.2 Establish platforms for sharing and dissemination of <i>Prosopis</i> information (email groups, social media, meetings, electronic libraries, and compendium)	A report of the survey on communication platform Efficient dissemination platform identified						MECC&F, County Environment and Forestry departments and related institutions (Communications /media and M&E teams) CoG, MOALD, MOE&P, KEFRI, KFS
	2.2.3 Organize <i>Prosopis</i> invasion awareness and removal field days (wipe-out campaigns) for the public to prevent and reduce invasions	<i>Prosopis</i> is removed and managed						MECC&F, County Governments, and related institutions (Communications /media and M&E teams), CoG, Moi&NA, MOALD, MOE&P, KEFRI, KFS
<b>Initiative 2.3: Incorporate information on Prosopis to existing education and outreach platforms (barazas, print- and electronic media, knowledge management systems);</b>	2.3.1. Undertake training needs assessment among stakeholders	Training needs among stakeholders determined						MECC&F, KEFRI, KFS, CoG, CABI, MOALD, Moi&NA, CETRAD, UoN
	2.3.2 Develop training modules	Training materials & guides availed						MECC&F, KEFRI, KFS, CoG, CABI, MOALD, UON, MOE&PS&T
	2.3.3 Gather, package and disseminate information education materials on <i>Prosopis</i> invasion and impacts (Audio- visual and print - brochures, posters, handbooks, manuals, radio and TV scripts, road shows, promotion materials)	Communications products in place The public is aware of <i>Prosopis</i> invasion and its impacts						MECC&F, MOE&P&F and KEFRI, KFS, KWS CoG, MOALD, MOE&P, MOE&PS&T, CETRAD, UoN, Moi&NA
	2.3.4. Conduct trainings for all identified stakeholders	Trained staff among stakeholders						MECC&F, KEFRI, KFS, CoG, CABI, MOALD, , CETRAD

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Strategic Initiatives	Task/activity Detailed description and key milestones	Outcomes	Year (2025-2035)					Responsible
			25/27	27/29	29/31	31/33	33/35	
<b>Initiative 2.4: Enhance capacity of communities to detect and report on presence of Prosopis in counties with high potential of invasion;</b>	2.4.1 Prepare educational materials for dissemination of information to learning institution (e.g. brochures, pamphlets, posters, billboards, media programs, videos, and school curriculum).	Education materials on <i>Prosopis</i> management are in place School communities are aware of <i>Prosopis</i> invasion, impacts and required intervention actions						MOALD, MOE&PS&T, CoG, KEFRI, KFS, CETRAD, UON
	2.4.2. Conduct training of trainers (TOT) from representatives of major stakeholders (Schools, County administrators, chiefs, Internal security personnel, etc)	Capacity building of major stakeholders achieved						MECC&F, MOALD, , MI&CNG, MOE&PS&T, CoG, KFS, KEFRI, CETRAD
<b>Initiative 2.5: Recruit and recognize Prosopis invasion management champions at all levels</b>	2.5.1 Participatory development of a reward scheme to recognize the best players	A team fully established Meeting notes and a reward scheme document						MECC&F, MOE&P & F, CoG, KEFRI, KFS, Mol&NA, to constitute and formerly appoint a team in consultation with related institutions.
	2.5.2 Recognise <i>Prosopis</i> invasion management champions	<i>Prosopis</i> invasion management champions recognized						MOE&P & F, CoG, KEFRI, KFS, Mol&NA to facilitate the process and to host the events.
<b>Initiative 2.6: Support and demonstrate practical implementation of large-scale integrated control and management approaches.</b>	2.6.1: Baseline assessment of the status of <i>Prosopis</i> management in Kenya	Status of <i>Prosopis</i> management in Kenya documented						MECC&F, CoGs, KEFRI, KFS, KWS, NEMA, MOALD, MOECC&F
	2.6.2. Establish pilot sites showing best practices for <i>Prosopis</i> management and control technologies	Training sites established for <i>Prosopis</i> best management practices						CoGs, KEFRI, KFS, KWS, NEMA, MOALD, MOECC&F
<b>Strategic objective 3: Promote and upscale appropriate interventions for control and management of Prosopis</b>								
<b>Initiative 3.1: Identify and map priority areas that require control and management intervention;</b>	3.1.1: Undertake surveillance and mapping of <i>Prosopis</i> at the landscape.	Affected areas identified and mapped, Map produced						KEFRI, KFS, KWS, NEMA, Counties
	3.1.2: Assess the risk of introduction of <i>Prosopis</i> invasions and implement prevention measures	Risk assessment report.						KEFRI, KFS, KWS, NEMA, Counties

Strategic Initiatives	Task/activity Detailed description and key milestones	Outcomes	Year (2025-2035)					Responsible
			25/27	27/29	29/31	31/33	33/35	
<b>Initiative 3.2: Develop zonation maps Showing heavily invaded areas and those with potential for invasion</b>	3.2.1. Acquire updated images for various <i>Prosopis</i> habitats and ecosystems across the country	Appropriate number of images acquired						KEFRI; KFS, CABI; Regional Centre for Remote Sensing and Resource Mapping for Development (RCRSRMD); MoLPP, SoK County
	3.2.2: Establish a nationally and county coordinated <i>Prosopis juliflora</i> alert and early warning system with effective surveillance mechanisms	New <i>Prosopis</i> invasions are detected at early stages of establishment						KEPHIS; KFS; KEFRI, NEMA (DRSRS), MOALD, CoG
	3.2.3: Establish buffer zones that exclude high priority areas from new invasions eg. containment corridors around infested areas, livestock holding areas	Containment corridors established and regularly monitored Livestock holding areas established and <i>Prosopis</i> saplings removed						CoG, KEFRI, KFS, MOALD, , Mol&NA
	3.2.4 Produce detailed maps showing areas of core invasions, medium to low invasions and areas in danger of being invaded	Detailed maps showing core, medium, and low- invasions produced						KEFRI; KFS, CABI; Regional Centre for Remote Sensing and Resource Mapping for Development (RCRSRMD); MoLPP, SoK County
<b>Initiative 3.3: Conduct participatory identification and prioritization of key assets threatened by <i>Prosopis</i> invasion</b>	3.3.1: Develop and implement a nationally agreed <i>Prosopis</i> plan for eradication or containment of new invasions	Management and restoration Plans developed for the country and implemented						MECC&F, KEFRI; KFS; CABI; NEMA (DRSRS), MOALD, Mol&NA, COG, CETRAD, UON
	3.3.2. Participatory development of County management plans/ zonation maps for <i>Prosopis</i>	Management plan documents for affected counties, <i>Prosopis</i> distribution maps developed						MECC&F, KEFRI, KFS, CoG, MOALD, Mol&NA to provide technical backstopping, County Governments to facilitate the process (thematic, visioning, validation workshops)

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Strategic Initiatives	Task/activity Detailed description and key milestones	Outcomes	Year (2025-2035)					Responsible
			25/27	27/29	29/31	31/33	33/35	
	3.3.3: Develop a plan of action with all relevant stakeholders on restoration activities for each county.	At least a half of the counties action plan on restoration within plan period developed						MECC&F, CoGs, KEFRI, KFS, MOALD, MoI&NA, NEMA
	3.3.4: Establish pilot demonstrations for restoration technologies.	<i>Prosopis</i> demonstration plots established according to area restoration plans						MECC&F, KEFRI, KFS, MOALD, KWS, CABI, CoG, NEMA, CETRAD, UON
<b>Initiative 3.4: Implement appropriate integrated system and technologies for effective management and control of <i>Prosopis</i> (Mechanical, Biological and Chemical);</b>	3.4.1 Identify the range of equipment, facilities and tools required for management	Prepared list of equipment & tools						MECC&F, KEFRI, KFS, KWS, NEMA, MOE&P&F, CoG, NTEP
	3.4.2 Procure and/or hire and distribute the required equipment, facilities and tools	Equipment, facilities, and tools available						KEFRI, KFS, KWS, NEMA, MOE&P&F, CoG, NTEP
	3.4.3 Import, test and release biological control agents for the management and control of <i>Prosopis</i>	Biological control measures introduced						MECC&F, KEPHIS, KEFRI, KFS, CABI, MOALD,
	3.4.4. Mechanised large-scale removal of invasive <i>Prosopis</i> trees from public institutions, irrigation schemes, wetlands, grazing, and other ecologically sensitive areas	Mechanized control measures adopted						Ministry of Public works and Infrastructure development, MECC&F, MOALD, CoG, KEFRI, KFS, Private sectors,

Strategic Initiatives	Task/activity Detailed description and key milestones	Outcomes	Year (2025-2035)					Responsible
			25/27	27/29	29/31	31/33	33/35	
	3.4.5: Establish <i>Prosopis</i> management and responsible utilization resource centres in each community	Community members are knowledgeable about management and utilization of <i>Prosopis</i> At least 5 centres established in each County						MECC&F, KEFRI, KFS, CoG, MOECC&F, MOALD, MOE&P, NTEP
	3.4.6: Import, test and register appropriate chemicals for the killing invasive <i>Prosopis</i> trees species	Chemical control measures introduced						KEPHIS, KEFRI, KFS, CABI, MOALD,
	3.4.7: Upscale the successful integrated management methods selected	Reports						MECC&F, KEFRI, KFS, Mol&NA, CABI, MOALD
	3.4.8: Establish learning sites at communities for demonstration of best-bet management technologies	Knowledge of community members on <i>Prosopis</i> management enhanced						MECC&F, KEFRI, KFS, CoG, MOALD
	3.4.9: Work with communities to implement different management methods at the landscape level	Hectares restored						KEFRI, KFS, KWS, CoG, MOALD, Mol&NA, CETRAD, UON
	3.4.10: Support and demonstrate practical implementation of large-scale integrated ecosystem management approaches and technologies	Integrated Ecosystem management approach applied						KFS, KEFRI, , MOALD , Mol&NA KWTA,
<b>Initiative 3.5 Implement area specific management and ecosystem restoration plans to prevent <i>Prosopis</i> re- invasion in the affected areas;</b>	3.5.1: Restock areas where <i>Prosopis</i> has been removed with other suitable tree species, grass for animal feed or agricultural crops.	Area restored						MECC&F, CoGs, KEFRI, KFS, NEMA, MOALD, MOECC&F
<b>Strategic objective 4: Develop and Implement policies, laws and regulations governing management of land, natural resources and environment</b>								
<b>Initiative 4.1: Undertake Strategic Environmental Impact Assessment on management and control of <i>Prosopis</i> at landscape level;</b>	4.1.1 Carry out EIA for <i>Prosopis</i> invaded landscapes	Mitigation measures identified and implemented						KEFRI, KFS, NEMA, MOALD, MOECC&F

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Strategic Initiatives	Task/activity Detailed description and key milestones	Outcomes	Year (2025-2035)					Responsible
			25/27	27/29	29/31	31/33	33/35	
<b>Initiative 4.2: Implement recommendations of the Strategic Environmental Impact Assessment</b>	4.2.1 Carry out EIA for mechanical removal <i>Prosopis</i>	Mitigation measures identified and implemented						KEFRI, KFS, NEMA, MOALD, MOECC&F
	4.2.2 Undertake EAI for biological control of <i>Prosopis</i>	Mitigation measures identified and implemented						KEFRI, KFS, NEMA, MOALD, MOECC&F
	4.2.3 Carry out EIA on chemical control of <i>Prosopis</i>	Mitigation measures identified and implemented						KEFRI, KFS, NEMA, MOALD, MOECC&F
<b>Initiative 4.3: Develop/Strengthen relevant policies, laws, rules and regulations for management and control of <i>Prosopis</i></b>	4.3.1: Identify the existing appropriate policies and laws	Relevant policies and laws developed						MOECC&F, CoG, KEFRI, KFS, MOE&P, MOALD, AG.
	4.3.2: Strengthen the existing policies and laws	Stakeholders sensitized and their capacity of all the enhanced						MOECC&F, CoG, KEFRI, KFS, MOE&P, MOALD, AG, CETRAD, UON
	4.3.3: Develop relevant supporting polies and laws to complement the existing ones							
<b>Initiative 4.5: Ensure compliance with relevant laws to prohibit introduction and propagation of <i>Prosopis</i> through responsible utilisation;</b>	4.5.1: Establish nationally consistent regulations to address <i>Prosopis</i> issues	<i>Prosopis</i> ACT/ legislation is nationally consistent and cohesive						AFFA, MOALD, AG, MOECC&F, KEFRI, KFS, NEMA, MoI&NA
	4.5.2. Ensure compliance of the laws to prohibit the introduction and propagation of <i>Prosopis</i> through responsible utilisation.	Compliance to the laws enhanced						MI&CNG, KFS, CoG,, MoI&NA, NEMA, MOALD
<b>Initiative 4.6: Implement standard rules, regulations and guidelines on management, control and utilization of <i>Prosopis</i>;</b>	4.6.1. Participatory development of rules, regulations and guidelines governing management and responsible utilization of <i>Prosopis</i> resources	Rules, regulations and guidelines developed						MOALD, AG, MOECC&F, KEFRI, KFS, , MoI&NA, NEMA
	4.6.2 Gazettement and enforcement of rules, regulations and guidelines on the management and utilization of <i>Prosopis</i>	Rules, regulations and guidelines Gazette and enforced						KFS, KEFRI CoG, NEMA, MOALD
<b>Initiative 4.7: Enforce safeguards to guide harvesting, processing and Marketing of <i>Prosopis</i> based products.</b>	4.7.1 Pilot safeguards in Baringo County	Safeguards finalized and adopted in Baringo County						MECC&F, KFS, KEFRI CoG, NEMA, MOALD
	4.7.2 Validate the safeguards and upscale to 14 other affected counties	Safeguards published and implemented in 14 other affected counties						KFS, KEFRI CoG, , NEMA, MOALD

Strategic Initiatives	Task/activity Detailed description and key milestones	Outcomes	Year (2025-2035)					Responsible
			25/27	27/29	29/31	31/33	33/35	
<b>Strategic objective 5: Promote Prosopis value chain</b>								
<b>Initiative 5.1: Identify viable Prosopis value chains.</b>	5.1.1: Conduct a survey and inventory across invaded areas of the country to map distribution and quantities and analyse the resource base in terms of quality and quantity available	Information on <i>Prosopis</i> quantities availed to land managers and other users						SoK, RCMRCD, MOALD, , KEFRI, KFS, KWS, CABI
<b>Initiative 5.2: Identify relevant investment vehicles and promote partnership and private sector investments across Prosopis value chains;</b>	5.2.1 Identify the value chains and their respective potential investors and link them to resources and resource owners	Business opportunities created and activated Area under <i>Prosopis</i> reduced						MOECC&F, MOALD, MOT&I, CoG, KEFRI, KFS, MOE&P
	5.2.2. Establish mechanisms to ensure conflict of interest between commercial utilization and management of <i>Prosopis</i> resource base is minimized	Implementation and enforcement of the identified measures						
<b>Initiative 5.3: Promote incentives to attract investors Through tax relief/break and revolving short term loans;</b>	5.3.1. Identify incentives to attract investors through tax relief/break and revolving loans etc	Number of businesses booming and thriving						MOT&I, CoG, NTEP, PPP, MOECC&F, AG
	5.3.2. Formalization of the incentive system	Incentives validated and used						MOT&I, CoG, NTEP, PPP, MOECC&F, AG
<b>Initiative 5.4: Identify the investors to engage in the control and management of Prosopis;</b>	5.4.1 Registration of investors to engage in the control and management of <i>Prosopis</i> resources	Number of active businesses running						MOT&I, CoG, NTEP, PPP, MOECC&F, AG
<b>Initiative 5.5: Pilot and scale up Prosopis exploitation of harvested biomass;</b>	5.5.1 Pilot large scale <i>Prosopis</i> exploitation and introduction of alternative land use systems	Alternative land use systems and species introduced and adopted						MOALD, MOECC&F, KEFRI, KFS, CoG, MoI&NA, MOL&H
	5.5.2 Scaling up <i>Prosopis</i> exploitation and introduction of alternative land use systems	Alternative land use systems and species introduced and adopted						MOALD, MOECC&F, KEFRI, KFS, CoG, MoL&PP
	5.5.3. Support alternative livelihoods in restored areas	Stable and improved livelihoods						MOALD, KEFRI, KFS, CoG,

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			25/27	27/29	29/31	31/33	33/35	
<b>Strategic objective 6. Enhance research and development in control and management of Prosopis</b>								
<b>Initiative 6.1: Test effectiveness of prescribed management interventions and approaches;</b>	6.1.1. Measure and analyse the identified parameters to inform success of the intervention measures	Reports of monitoring activities						KEFRI, KFS, KWS, NEMA, MOALD, CoG, , MOECC&F
	6.1.2. Develop and operationalize <i>Prosopis</i> management/ eradication guidelines/ manuals for community invaded land	Hectares of community <i>Prosopis</i> land effectively managed and <i>Prosopis</i> eradicated						KEFRI, KFS, MOALD, MoI&NA, CoG, CABI, UoN
	6.1.3: Develop and operationalize <i>Prosopis</i> eradication guidelines/ manuals for protected areas and gazetted forests	<i>Prosopis</i> eradicated in protected areas						KEFRI, KFS, MOALD, CoG, KWS, CETRAD, UoN
	6.1.4: Review and develop corrective measures on implementation of <i>Prosopis</i> invasion management/ eradication guidelines through continuous monitoring of the effectiveness of prescribed interventions	Guidelines reviewed /updated with new corrective actions						KEFRI, KFS, MOALD, CoG, KWS
	6.1.5: Develop and test <i>Prosopis</i> invasion prediction models	Potential new invasion areas mapped						KEFRI, CABI, KFS, MOALD, CoG
<b>Initiative 6.2: Assess technology adoption, identify barriers and recommend methods of addressing them</b>	6.2.1. Conduct a study on workings of the National Strategy and Action Plan Committees at all levels	Gaps identified, workings improved and corrected where necessary						KEFRI, UoN, CABI, CETRAD
	6.2.2. Assess impacts of information flows and information exchange between grassroots and National levels and how to overcome any challenges	Gaps identified, workings improved and corrected where necessary						KEFRI, UoN, CABI, CETRAD
	6.2.3: Conduct a socio-economic study to determine the levels of income to communities with decreasing <i>Prosopis</i> biomass	Gaps in community alternative income streams identified and addressed						KEFRI, KFS, KWS, CABI, UoN
	6.2.4. Study to determine the impact of alternative land use systems on intervention areas	Improved income from alternative land use made						KEFRI, KFS, KWS, CABI, UoN

Strategic Initiatives	Task/activity Detailed description and key milestones	Outcomes	Year (2025-2035)					Responsible
			25/27	27/29	29/31	31/33	33/35	
<b>Initiative 6.3: Develop and implement new technologies for emerging challenges in management and control of Prosopis;</b>	6.3.1. Establish permanent sample plots in intervention sites (PSPs) for long term monitoring of biodiversity restoration processes	Number of Reports on PSPs done						MECC&F, KEFRI, KFS, CoG, MOALD
	6.3.2. Undertake adaptive research on new approaches to the management of <i>Prosopis</i> in all invaded areas	A range of new technologies adopted						KEFRI, CABI, KWS, MOALD, , CoG, UoN
	6.3.3: Test and introduce alternative indigenous species for restoration of <i>Prosopis</i> invasions reclaimed areas	Area of ecologically resilient ecosystems restored						KEFRI, KFS, MOALD, MOE&PS&T
	6.3.4: Develop policy briefs on management of <i>Prosopis</i> invaded landscapes	Updated National policy on the management of invasive <i>Prosopis</i> species developed						MECC&F, KEFRI, KFS, CABI, MOALD, , KWS, CETRAD, UON
<b>Initiative 6.4: Establish and strengthen centres of excellence to Demonstrate and build capacity on best practice for management and control of Prosopis;</b>	6.4.1. Establish and equip a National Centre of Excellence (National Referral Centre) to demonstrate and train on best practice for the management and control of <i>Prosopis</i>	National Centre of Excellence established, Capacities of stakeholders enhanced, <i>Prosopis</i> well managed and controlled						MOECC&F, MoI&NA, CoG, KEFRI, KFS, MOE&P, MOALD, CETRAD, UoN
	6.4.2. Establish at least 10 Satellite Centres of Excellence at most affected Counties	Satellite Centres of Excellence established, capacities of stakeholders enhanced, <i>Prosopis</i> well managed and controlled						MOECC&F, MoI&NA, CoG, KEFRI, KFS, MOE&P, MOALD, CETRAD, UON
	6.4.3 Undertake exchange programs to share experiences and technologies across Counties	Exposed/expe rienced stakeholders <i>Prosopis</i> control teams						KEFRI, KFS, CoG, CABI, MOALD, MoI&NA,

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			25/27	27/29	29/31	31/33	33/35	
<b>Initiative 6.5: Undertake periodic assessment on the impacts of Prosopis invasion and interventions on community livelihoods, biodiversity and environment;</b>	6.5.1: Establish the baseline on the impacts of <i>Prosopis</i> invasion and interventions on community livelihoods, biodiversity and environment  6.5.2: Undertake periodic assessment on the impacts of <i>Prosopis</i> invasion and interventions on community livelihoods, biodiversity and environment	Baseline report on community livelihoods, biodiversity and environment  Assessment report on community livelihoods, biodiversity and environment						MECC&F, KEFRI, KFS, CoG, CABI, MOALD, MoI&NA,
<b>Initiative 6.6: Develop and regularly update the national Prosopis invasion management intervention database;</b>	6.6.1. Develop and regularly update the national <i>Prosopis</i> invasion management intervention database	An up-to-date national database on <i>Prosopis</i>						KEFRI, KFS,
	6.6.2: Acquire and/or develop technology and applications for the collection, storage, and distribution of spatial and tabular information related to <i>Prosopis</i> invasion management/ eradication	Data collection, transmission and storage procedures developed						KEFRI DRSSRS KFS KWS County Governments
	6.6.3: Develop a national <i>Prosopis</i> invasion management/local eradication database and knowledge management system for all invaded landscapes	Interactive database on <i>Prosopis</i> invasion management/ eradication developed and operationalized KM system						KEFRI, CoG
<b>Initiative 6.7: Identify potential/hotspot areas for Prosopis invasions through use of predictive/ probability models.</b>	6.7.1: Modelling climate change and its impact on potential further invasions of <i>Prosopis</i>	Information on <i>Prosopis</i> availed to decision makers for mitigation and prevention						KEFRI, KFS, KWS, CABI, MOALD
<b>Initiative 6.8: Disseminate relevant research findings to stakeholders</b>	6.8.1: Package research findings	Research findings disseminated to stakeholders						KEFRI, KFS, KWS, CABI, MOALD
	6.8.2: Disseminate packaged research findings through appropriate pathways							
<b>Initiative 7.1: Undertake stakeholder mapping</b>	7.1.1. Use Snow ball method to identify stakeholders involved in management and control of <i>Prosopis</i> in Kenya	Full range of stakeholders identified						MOECC&F, KEFRI, KFS, MOALD, CoG

Strategic Initiatives	Task/activity Detailed description and key milestones	Outcomes	Year (2025-2035)					Responsible
			25/27	27/29	29/31	31/33	33/35	
<b>Strategic objective 7. Strengthen coordination, collaboration and partnerships for implementation of the Prosopis Strategy</b>								
	7.1.2. Document the mandates and relative strengths for each of the stakeholders in relation to management and control of <i>Prosopis</i>	Mandates well aligned to different components of the Strategy implementation						MOECC&F, KEFRI, KFS, MOALD, CoG
<b>Initiative 7.2: Identify roles and responsibilities for the stakeholders in implementation of the Strategy;</b>	7.2.1. Undertake a participatory determination of the influence and motivation for each of the identified stakeholders in the management and control of <i>Prosopis</i>	Influence and motivational roles and responsibilities of stakeholder in the Strategy and Action Plan implementation determined						MOECC&F, KEFRI, KFS, MOALD, CoG
	7.2.2. Participatory assignment of roles and responsibilities for stakeholders	Proper assignment of roles and responsibilities in the Strategy and Action Plan implementation undertaken						MOECC&F, KEFRI, KFS, MOALD, CoG
<b>Initiative 7.3: Develop appropriate collaboration, partnership and coordination framework for the key national, regional and international stakeholders</b>	7.3.1. Develop formal working relations through Memorandum of Understanding (MOU) between different stakeholders for purposes of implementing the Strategy and Action Plan	Proper and formal working relations developed						
	7.3.2. Establish and launch regional network to share information on <i>Prosopis</i> management across Eastern African countries	Number of signed MOUs between institutions						MOECC&F, KEFRI, KFS, CABI, CETRAD, UON
	7.3.3: Develop plans for Kenya and regional bodies to action against cross border <i>Prosopis</i> invasions	Regional <i>Prosopis</i> response plans in place Reduced cross border invasion within the region						MOE&P & F, KEFRI, KFS, DRSRs, MOALD, CETRAD
	7.3.4 Strengthen regional and international partnerships on <i>Prosopis</i> invasion management	Strong and sustained regional and international partnerships in place						MOECC&F, KEFRI, KFS, CABI

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			25/27	27/29	29/31	31/33	33/35	
<b>Strategic objective 8. Monitoring, evaluation and reporting on the Strategy implementation</b>								
<b>Initiative 8.1: Establish and activate a monitoring system and an early detection and rapid response (EDRR) network in affected counties</b>	8.1.1: Map and assess potential <i>Prosopis</i> invasions using GIS and CLIMEX technologies for decision making	Current prediction maps for <i>Prosopis</i> high risk areas Current probability models for establishment and invasion by <i>Prosopis</i>						CABI; RCMRD, KEFRI, KFS, MOALD, MoLPP
	8.1.2: Use predictive models to identify new potential/hotspot areas for <i>Prosopis</i> invasions (probability models)	Invasions accurately predicted, early intervention measures carried out, cost effective management and control of invasions						CABI; RCMRD, KEFRI, KFS, MOALD, MoLPP
	8.1.3. Establish and empower community structures (Scouts) to detect and report on new invasions at County, Sub County and Ward levels	Number of reports done and acted upon						KEFRI, KFS, CoG, MOALD, MoI&NA
	8.1.4. Establish and activate a monitoring system and an early detection and rapid response (EDRR) network field teams at County, Sub County and Ward levels	New invasions completely curtailed						MECC&F, KEFRI, KFS, CoG, MOALD, MoI&NA
<b>Initiative 8.2: Enhance capacity of communities to detect and report on presence of <i>Prosopis</i> in counties with high potential of being invaded</b>	8.2.1: Conduct training needs assessment for different stakeholder groups (TNA) and develop training programme on identification and monitoring tool	Training programmes on identification and monitoring by different stakeholder groups developed						MECC&F, KEFRI, KFS, CoG, MOALD, , CETRAD, UON
	8.2.2: Undertake training to enhance capacities of stakeholders at the county and community levels for detecting and reporting on <i>Prosopis</i> invasions	Capacities of stakeholders enhanced and <i>Prosopis</i> invasions are reported and responded to quarterly						MECC&F, KEFRI, KFS, COG, MOALD, CETRAD, UON
	8.2.3. Facilitate the teams and clearly define and communicate <i>Prosopis</i> reporting roles and responsibilities at state, county and community level	All stakeholders understand and carry out their <i>Prosopis</i> reporting and response tasks efficiently						CoG, MOALD, KEFRI, KFS, MOECC&F, MoI&NA

Strategic Initiatives	Task/activity Detailed description and key milestones	Outcomes	Year (2025-2035)					Responsible
			25/27	27/29	29/31	31/33	33/35	
<b>Initiative 8.3: Develop and implement a monitoring and evaluation (M&amp;E) system for implementation of the Prosopis Strategy</b>	8.3.1. Take inventory of sites where management interventions are active at County , Sub County and Ward levels	Locations of active sites made through progress reports, areas covered						MECC&F, KEFRI, KFS, MOALD, MoI&NA, CoG, CABI, UON
	8.3.2 Develop parametersto monitor and evaluate them	M&E System developed and implemented						MOECC&F, KEFRI, KFS, MOALD, CoG
	8.3.3 Develop and implement an appropriate reporting procedure on performance of the parameters monitored and evaluated in different sites;	Reporting procedure established and activated						MOECC&F, KEFRI, KFS, MOALD, CoG
<b>Strategic objective 9. Resource mobilization and networking for implementation of the Strategy Performance measure 9: Levels of sustainable financing mechanisms secured</b>								
<b>Initiative 9.1: Identify potential sources of funding</b>	9.1.1 National Planning and Coordination Committee (NPCC) and National Technical Implementation Committee (NTIC) host meetings to discuss and identify sources of funding	Funding sources identified and mapped % increase in amounts of resources raised & availed						MOECC&F, KEFRI, KFS, CABI
<b>Initiative 9.2: Undertake internal fund-raising initiatives at the national and county level budgets</b>	9.2.1 (NTIC) host meetings to undertake consultation on fund raising							Relevant/ participating Ministries and SAGAs and stakeholders (NGOs, CBOs, CoG, CABI, CETRAD etc)
<b>Initiative 9.3: Establish a dedicated Prosopis Fund to mobilize public and private financing of initiatives for control and management of the tree species</b>	9.3.1 Lobby and establish a dedicated Prosopis Fund to mobilize public and private financing of initiatives for control and management of Prosopis	A Prosopis Fund created and operationalised						MECC&F, KEFRI& KFS
<b>Initiative 9.4: Develop proposals for funding by Development Partners</b>	9.4.1 Inter- agency development of joint proposals for donor funding	Amount of resources raised & availed						Relevant/ participating Ministries and SAGAs, stakeholders (NGOs, CBOs, CoG, CABI, CETRAD etc

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			25/27	27/29	29/31	31/33	33/35	
<b>Initiative 9.5: Undertake fundraising promotions, campaigns and expeditions with a broad spectrum of partners both locally and internationally;</b>	9.5.1. Identify local and global fund-raising opportunities and undertake promotions, campaigns and expeditions with a broad spectrum of partners both locally and internationally	% increase in amounts of resources raised & availed						Relevant/ participating Ministries and SAGAs, stakeholders (NGOs, CBOs, CoG, CABI, CETRAD, etc



*Prosopis juliflora* (thorns and seedpods). Location: Oahu, Keehi Lagoon



MINISTRY OF  
ENVIRONMENT,  
CLIMATE CHANGE  
& FORESTRY

## Annex 4: Safeguards for control of *Prosopis juliflora* (Mathenge) in Kenya



# ACKNOWLEDGMENT

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The report was prepared by experts from Kenya Forestry Research Institute (KEFRI), Kenya Forest Service (KFS) and County Government of Baringo with contributions from the Baringo Council of Elders and Charcoal Producers Associations in Baringo South Sub-County.



# LIST OF ACRONYMS

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<b>ASALs</b>	Arid and Semi-Arid Lands
<b>BCG</b>	Baringo County Government
<b>CG</b>	County Government
<b>CoE</b>	Council of Elders
<b>CoG</b>	Council of Governors
<b>CPAs</b>	Charcoal Producers' associations
<b>CS</b>	Cabinet Secretary
<b>EMCA 1999</b>	Environmental Management and Coordination Act, 1999
<b>FMCA 2016</b>	Forest Management and Conservation Act, 2016
<b>KEFRI</b>	Kenya Forestry Research Institute
<b>KFS</b>	Kenya Forest Service
<b>MOALD</b>	Ministry of Agriculture and Livestock Development
<b>MOECC&amp;F</b>	Ministry of Environment, Climate Change and Forestry
<b>Moi&amp;AN</b>	Ministry of Interior and National Administration
<b>MoLPH&amp;D</b>	Ministry of Lands, Public Works, Housing and Urban Development
<b>MoWS&amp;I</b>	Ministry of Water, Sanitation and Irrigation
<b>NEMA</b>	National Environmental Management Authority
<b>NFP</b>	National Forest Programme (2016-2030)
<b>ToRs</b>	Terms of References

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## 1.0 Introduction

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*Prosopis* (locally known as “Mathenge”), is a native tree of South America and was introduced around the world in the last two centuries due to its adaptability to desert conditions, fast growth and a good source of fuelwood and fodder. *Prosopis* has the capacity to thrive in a range of climates, soils and landscapes implying that it has strong invasive potential. In addition, its prolific seeding, powerful ability to regenerate and re-grow/coppice in high densities has contributed to its rapid spread in countries where it was introduced. Currently, the species has become progressively invasive, colonizing many parts of Kenya’s arid and semi-arid lands (ASALs) threatening the livelihoods of pastoral communities by replacing grass, forage species and other biodiversity in rangelands in addition to blocking waterways and roads.

Apart from the negative environmental and socioeconomic impacts of *Prosopis* in the invaded areas, the species has the potential to provide goods and services and therefore improve the livelihoods of ASALs communities living in invaded areas. Some of the goods and services include;

- Source of firewood, charcoal and construction wood
- Source of biomass for industrial generation of electricity
- Pods for livestock feeds and human food
- The flowers are excellent source of bee forage throughout the year;
- Provision of shade, soil stabilization and control of erosion;
- The high growth rate and its evergreen nature makes it an excellent sequester of atmospheric carbon

The environmental and socioeconomic impacts of *Prosopis* have become an important topic of discussion and policy decisions in Africa, Asia, Australia and the Americas where the species was introduced and has been naturalized. In Kenya *Prosopis* is estimated to have invaded about 2 million hectares. In particular, large biomass of *Prosopis* is found in Tana River, Garissa, Turkana and Baringo Counties. Other considerable *Prosopis* habitats can be found in Taita Taveta, Malindi, Samburu, Isiolo, Mandera, Marsabit, Wajir, Kajiado and Migori Counties. The highly affected County is Baringo, Baringo South Sub-county where it was first introduced in 1970s. Due to its thorny nature many communities find it difficult to manage and or utilize, thus aggravating an already serious environmental problem.

### 1.1 Status of *Prosopis* Management in Kenya

The two main Semi-Autonomous government agencies (SAGAs); Kenya Forestry Research Institute (KEFRI) and the Kenya Forest Service (KFS) have developed various technologies for utilization of *Prosopis* that are relevant to communities living in invaded areas. For example, technologies for sustainable charcoal production has led to commercial exploitation of the species for charcoal from which the communities, resource owners, charcoal producers’ associations (CPAs), private investors and both National and County Governments have respectively received significant revenue. In Baringo, for example, members of six charcoal producers’ associations are reported to cumulatively earn over Ksh 20 million every month. The continued promotion of knowledge and technologies on sustainable management and control of *Prosopis* has helped the communities to gradually change their negative perceptions of the species and is now being viewed as an important resource for livelihood improvement. However, it is important to underline the fact that if left unmanaged, it will continue to be a nuisance to local communities.

## 2.0 Background to Public Reactions to *Prosopis* Invasions in Kenya

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The outcry on spread of *Prosopis* in the pastoral areas came to public knowledge in 1999 after the *El Nino* rains of 1997/8. Difficulties of managing the spread and lack of knowledge in processing and utilizing the species by communities ended up in calls to eradicate the species. Specifically, community members from Baringo South Sub-County, Baringo County took the Government to court in 2006 on the argument that the species was causing health problems and death of livestock.

In August 2018, representatives of community members from the County Government of Baringo petitioned the government to vary the moratorium on the basis that lack of

management of the *Prosopis* had led to;

- Colonization and devastation of grazing lands and rangelands, blockage of roads, footpaths, human settlements, irrigation canals, river banks,
- Death of livestock from over eating and tooth decay and causing difficulties in its management among others. They reported that harvesting reduced *Prosopis* populations while providing a sustainable source of alternative livelihood to the communities.

In August 2018, the Cabinet Secretary MOECC&F accompanied by technical officers from the Ministry carried out a fact-finding mission to verify the complaints. On 20<sup>th</sup> December 2018, representatives of community members led by the Governor of Baringo County presented a memorandum to the Cabinet Secretary on the continued deterioration of environment in the affected areas requesting for a variation of the moratorium to exempt *Prosopis*.

A meeting was therefore held between the leaders and the MOECC&F and the technical officers after which a statement was produced agreeing to vary the moratorium subject to the parties meeting specific conditions. A joint technical committee comprising of members from MOECC&F, County Government, Council of Governors, KFS, KEFRI and NEMA was formed to ensure that the conditions were met before the variation of the moratorium was approved.

### **3.0 Applicable Policies and Legislations**

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It is recognized that management and utilization of *Prosopis* species has the potential to contribute to poverty reduction through employment creation, income generation, promotion of environmental sustainability and climate change amelioration. The country's policies and legal framework is supportive to *Prosopis* management include the Constitution of 2010 that commits the Government to raise and maintain tree cover of at least 10% of the total land area. This applies to sustainable management of all woody vegetation types including *Prosopis*. The Vision 2030, the country's national development blue print, promotes sound environmental conservation including conservation of forests and wetlands. Processing and trade in *Prosopis* products support food security and poverty alleviation, which is in line with the Government Big 4 agenda.

At forest sector level, the draft National Forest Policy 2016, Forest Management and Conservation Act 2016 and National Forest Programme 2016-2030 emphasizes increasing forest and tree cover, conserving and rehabilitating the remaining natural forests and woodlands. The cited statements are supportive to the management of *Prosopis* in the country. Other sectoral laws and policies that support *Prosopis* management include; The Energy Act 2006, The Environmental Management and Coordination Act (EMCA) 1999, The Water Act 2002, The Local Government Act, CAP 285, and The Agricultural Act, CAP 318. Other relevant documents include; The Forests (Charcoal) Rules, 2009, The Draft Forest Charcoal Rules, 2018 and the Baringo County Sustainable Charcoal Production Act, 2016.

The National Forestry Programme 2016-2030 (NFP) identifies the ASALs as the frontiers to contribute to increasing the country's tree cover to achieving the 10% by 2022. The Forest (Charcoal) Rules 2009, provides the framework for sustainable production, harvesting, and trade in charcoal through use of structured and functioning Charcoal Producers Association (CPAs) in the country. The reviewed Forest (Charcoal) rules 2018 provides for engagement of the County Governments in the charcoal value chain.

## **4.0 Operational Ground Rules and Control systems**

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It was agreed that the interested parties as defined in the sections below will observe the specific rules as shown below;

### **4.1 Rules to be met by Charcoal Producers Associations (CPAs)**

Each CPA should ensure the following;

- Be registered with the Registrar of Societies,
- Have a comprehensive register of members
- Adhere to its constitution and bylaws
- Conduct regular meetings and record minutes
- Have conflict resolution mechanisms
- Ensure proper books of accounts are well-kept and audited
- Open an operational office for the association
- Put in place a *Prosopis* enforcement committee.

### **4.2 Rules for Harvesting, Processing and Storage of Prosopis Products**

Each CPA should;

- Adhere to management guidelines and plans that guide harvesting and processing of *Prosopis* resources.
- Ensure removal of debris and stumps in all the harvested areas to allow undergrowth of other species before moving to a new zone.
- Ensure follow up operations to remove new infestations and manage the growing stocks.
- Strictly adhere to the rules and regulations governing the process of charcoal production (Copies of the rules and regulations to be provided to each CPA).
- Adhere to efficient charcoal making technologies
- Obtain clearance permits from the umbrella CPAs with advice of a technical officer from KFS/County Government for further harvesting
- Ensure good quality *Prosopis* charcoal goes to the market.
- Establish collection centers and register them with the County Government. Each center to have storage facility and be managed by an agent of the CPA.
- Develop unique charcoal identification labels for ease of traceability.
- Keep record of transporters.
- The CPA management and Council of Elders should monitor the operations of the CPA members to ensure no abuse of the processes, and
- Adhere to existing laws and regulations under National and County Governments.

### **4.3 The Resource Owners**

The resource owners are required to:

- a) Acquire a proof of ownership of the resources from the local Chief.
- b) Present the proof of ownership to the local KFS officer to facilitate issuance of movement permit.

### **4.4 Rules for Transportation and Trade of Prosopis products**

All Charcoal transporters are expected to:

- Possess a certificate of origin signed by the owner of the resource through the local chief and a movement permit issued by KFS for inter-county transportation.
- Intra county movement permits to be issued by the respective county governments

### **4.5 Private investors in Prosopis**

The private investors are encouraged to invest in management and utilization of *Prosopis* wood either through direct purchase/lease from resource owners in zoned areas. Such investors should invest in modern efficient technologies and operate within existing county and national government policies and laws.

The Private investors are encouraged to engage with the communities and resource owners through the laid down structures and actively undertake Corporate Social Responsibility within their areas of operations.

#### **4.6 Restoration of Prosopis harvested Areas**

Restoration of harvested areas is important to ensuring that *Prosopis* does not re-invade such areas. The following activities will apply;

- Land owners (communal or private) should develop a restoration plan with guidance from technical officers and supervised by of the respective CPA for the intended future use of the land (e.g. grass reseeding for pasture, clearing for crop production and cutting for firewood and charcoal production)
- All residual resources should be managed to enhance under the supervision of the CPA and the council of elders' sustainability of the resource. Management will include management of saplings and coppices for the desired products for example firewood, charcoal or total removal to allow establishment of pasture and control the spread of *Prosopis*.
- CPAs to be proactive in replacing the infested areas, where the *Prosopis* has been removed with alternative species especially the riparian areas
- Each CPA to establish at least one tree nursery for suitable indigenous tree species in the area for enrichment planting
- County Government to facilitate establishment of alternative species in public utilities as a measure to enhance tree cover
- National and County Governments and other stakeholders to undertake capacity building of communities on importance of management and control of *Prosopis*, adoption of efficient processing technologies, value addition and marketing of *Prosopis* products and conservation of indigenous species in *Prosopis* invaded areas.

#### **4.7. Consequences for Non-Compliance**

Non-compliance with the rules will attract penalties in line with the relevant rules and regulations under National and County Governments. This will also include withdrawal of operational licenses.

## **5.0 Inter Agency Roles in the Management and Control of Prosopis Products Processing and Trade in the Counties**

### **5.1 Ministry of Environment, Climate Change and Forestry (MOECC&F)**

- a. Provide oversight and coordination
- b. Develop and provide policy direction
- c. Formulate laws and regulations
- d. Mobilize resources

### **5.2 Kenya Forest Service (KFS)**

The role of KFS is to:

- a) Offer technical advice and monitor compliance with existing rules and regulations.
- b) Issue inter-county movement permit in accordance with the law
- c) Enforce and monitor movement of the products from the source to the markets.
- d) Maintain a register of all the CPAs countrywide
- e) Undertake collaborative Capacity building of stakeholders
- f) Carry out resource inventory and assessment
- g) Participate in the development of *Prosopis* management plans
- h) In collaboration with KEFRI regularly monitor new invasions and advice accordingly, and
- i) Ensure that full chain of custody of *Prosopis* produce is implemented and enforced

### **5.3 Kenya Forestry Research Institute (KEFRI)**

In line with its mandate, KEFRI is expected to:

- a) Develop and disseminate efficient technologies for charcoal processing
- b) Participate in mapping and zoning of *Prosopis* invasion
- c) Undertake capacity building of stakeholders
- d) Participate in resource inventory and assessment
- e) Develop *Prosopis* management plans
- f) Undertake market surveys
- g) Carry out Ecological and socio-economic impacts studies

- h) Provide information for decision making in management of *Prosopis*.
- i) In collaboration with KFS regularly monitor new invasions and advice accordingly

#### **5.4. County Governments**

The County Governments will:

- a. Maintain a register of all the CPAs within the county
- b. Develop and enforce legislation to support sustainable harvesting and utilization of *Prosopis* products.
- c. Issue Intra-County movement permits for *Prosopis* resources
- d. Hire scouts to monitor and protect other tree species from being harvested
- e. Mobilize resources for control and management of *Prosopis*
- f. Participate in the development and formulation of *Prosopis* management plans
- g. Provide policy direction at county level
- h. Coordinate the activities of the *Prosopis* technical team

#### **5.5 Charcoal Producers Associations (CPAs)**

The CPAs are expected to:

- a) Obtain a registration certificate from the registrar of societies
- b) Obtain relevant operation licenses
- c) Maintain a comprehensive register of members of the CPA
- d) Maintain audited accounts for the associations
- e) Develop branding and packaging materials for products in line with chain of custody guidelines
- f) Have an office to manage all CPA transaction records.

#### **5.6 Ministry of Interior and National Administration (Mol&NA)**

The Main role of the Mol&NA is;

- a) Enforce compliance of relevant laws/rules/regulations
- b) Resolve conflicts and disputes
- c) Sensitization of community on *Prosopis* control and management
- d) Mobilize communities to control and manage *Prosopis*

#### **5.7 National Environmental Management Authority (NEMA)**

The main roles are to:

- a) Ensure Environment Impact Assessment/Audit is undertaken as part of control and management of *Prosopis*
- b) Periodic Environmental monitoring
- c) In collaboration with KEFRI and KFS, provide periodic status report of *Prosopis* in the counties

## **6.0 Monitoring and Evaluation**

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- a) The team formed joint implementation secretariat to oversee the process whose members will be drawn from KFS, KEFRI, County Government (CG), CPA representative, CoE representative, private investor representative, NEMA and Ministry of Interior & Coordination.
- b) The CPAs will submit quarterly reports for compilation by KFS and CG
- c) KFS, KEFRI, CG, CoE and CPAs will undertake routine surveillance of the harvesting sites and report on a bi-annual basis to the MOECC&F
- d) KFS, KEFRI, CG and CoE will undertake annual surveillance and reporting of the invasion of *Prosopis* and areas restored.
- e) Bi-annual conservancy/regional level meetings will be convened by the CG to review progress
- f) Joint meetings by all the agencies will be held twice per year and will be convened by County Government / KFS /KEFRI.

These documents will be used in capacity building of communities and stakeholders in the management, utilization and trade of *Prosopis* (*Mathenge*) based products in the Counties.



**For further information, please contact:**

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