

CONTROL AND MANAGEMENT OF *Neltuma juliflora* (formerly *Prosopis juliflora*) INVASIVE WEED: A BOON FOR COMMUNITIES IN DRYLANDS OF KENYA

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EXECUTIVE SUMMARY:

Neltuma juliflora (formerly *Prosopis juliflora*) an invasive woody plant introduced to Kenya's Arid and Semi-Arid Lands (ASALs) in the 1970s for erosion and desertification control, and fuelwood provision, has become a significant ecological and socio-economic challenge. Due to its aggressive growth, *Prosopis* has outcompeted indigenous vegetation (Plate 1A), disrupted local ecosystems, and negatively impacted livelihoods, food security, and biodiversity



Plate 1: Site before (A) and after (B) planting Sudan grass on land reclaimed from *Neltuma juliflora*, (Bura - Tana River, Kenya 2024)

Despite its harmful impacts, *N. juliflora* offers untapped opportunities for dryland communities. The tree's products, such as firewood, charcoal, animal feed, construction materials, biochar, honey and medicine, present potential benefits for local economies. However, managing this invasive species is complex due to its rapid regeneration and the lack of awareness about its economic potential. Effective management of the species requires a dual approach of controlling its spread and harnessing its value. Strategies include: community-based management; value addition through product development; and ecological restoration through controlled clearing; and replacing with alternative high value species. To achieve this, a supportive policy framework is essential, with incentives for sustainable harvesting and restoration of the affected ecosystems.

Key recommendations for policymakers include; approval of the national strategy for *N. juliflora* management, promoting public-private partnerships for product commercialization, and supporting research and capacity building for local communities. Collaboration among stakeholders, including; government agencies, local communities, and civil societies, is crucial for developing best practices and monitoring long-term ecological and economic impacts of the species. By implementing these recommendations, Kenya can transform the challenge posed by *N. juliflora* into an opportunity for socio-economic development, environmental restoration, and sustainable land management in the ASALs.

BACKGROUND INFORMATION

Neltuma juliflora (formerly *Prosopis juliflora*), locally known as Mathenge or Aligorob, is a shrub/tree with origin from Central and South America. In Kenya, the species was introduced in the 1970s in the Arid and Semi-Arid lands (ASALs) to combat soil erosion and desertification, and for provision of fuelwood. However, the species has since become a rapidly spreading weed, adversely affecting livelihoods, biodiversity, and ecosystem services in 22 ASAL counties, including; Tana River, Garissa, Wajir, Mandera, Isiolo and Turkana (Figure 1).

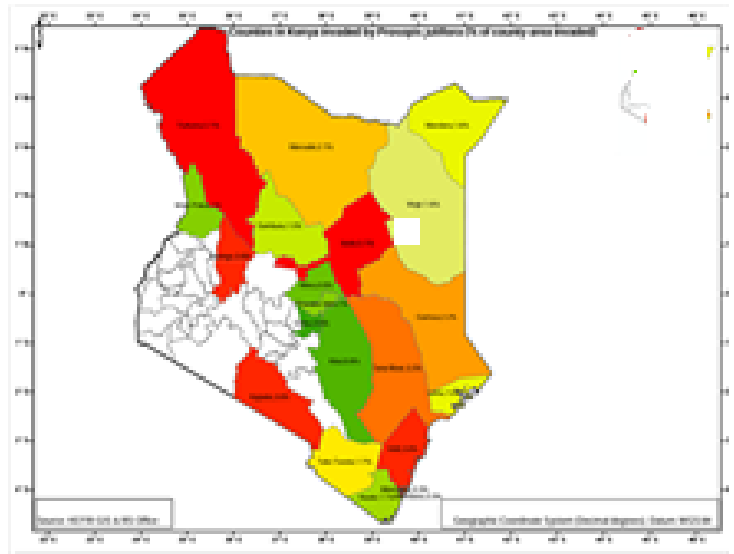


Figure 1: The spread of *Neltuma juliflora* (formerly *Prosopis juliflora*) in Kenya

The plant's aggressive growth and resilience enable it to outcompete indigenous vegetation, disrupting local ecosystems, and reducing biodiversity. *Prosopis* spread is facilitated by its prolific seed production and long seed viability period, as well as by lack of natural predators. Human activity also transports the seed. Dense thickets of *N. juliflora* hinder grazing and cultivation, leading to reduced food security and livestock productivity. Invasion by the species negatively impacts water flow, and local biodiversity.

Although damaging to ecosystems, *N. juliflora* offers potential for livelihoods and green jobs through commercialization of its products, such as charcoal, firewood, and animal feed. Managing *N. juliflora* spread should involve an integrated approach of controlling its spread to restore land while utilizing its products to improve livelihoods. Replacing *N. juliflora* with high-value crops is critical for food security and ecosystem conservation.

In Kenya, *N. juliflora* plant is listed under the Suppression of Noxious Weeds Act, but eradication efforts have been unsuccessful. Various laws and policies including: The Forests Act; the Environmental Management and Coordination Act; Wildlife Management and Conservation Act; and Community Land Act; govern its production and sale.

PURPOSE OF THE POLICY BRIEF:

This policy brief presents the management and control of *N. juliflora* as a means of addressing both environmental degradation and socio-economic challenges faced by communities in ASALs in Kenya. The brief outlines strategies for control, management, and utilization of the species, as well as restoration of invaded areas, emphasizing the need for collaborative approaches involving local communities, policymakers, and environmental organizations.

This policy brief provides actionable recommendations to inform policymakers and stakeholders on integrated approach for control and management of *N. juliflora* invasive weed in the ASALs for provision of green jobs, enhanced community livelihoods and ecosystem resilience.

ANALYSIS, DISCUSSION AND CONSIDERATIONS

Data was obtained from literature, as well as consulting local communities and experts. Information gathered was grouped into 3 thematic areas namely; impact, benefits, and challenges.

1. Impact of *Neltuma juliflora* on the Ecosystems and Security

- **Loss of indigenous plants and animals** - *N. juliflora* spreads rapidly and outcompetes indigenous plants for water, nutrients, and sunlight resources, leading to a decline in indigenous species, thereby altering local ecosystem
- **Loss of large amounts of water that was available to other plants and animals.** The plant produces large biomass per annum and this consumes a lot of water
- **Economic loss** - the spread of *N. juliflora* impedes pastoralists and farmers access to grazing and crop lands, reducing overall land productivity and livestock health
- **Interference with water sources and roads:** Blockage of watering points, watering corridors (locally known as Malkas / hilas) and access roads
- **Insecurity:** *N. juliflora* thickets act as hiding place for predators and thugs

2. Potential Benefits of *Neltuma juliflora* to Dryland Communities:

While *N. juliflora* is recognized as an invasive species, it offers valuable uses to local communities:

- **Firewood, charcoal and briquette production.** *N. juliflora* has high calorific energy value (4,213 kcal/kg to 6,620 kcal/kg) comparable to *Acacia* and *Eucalyptus*
- **Animal Feed** - milled pods are rich in nutrients and can be used as feed for animals (Plate 2). Pods can therefore provide nutritive feed for livestock and wildlife in ASAL counties, especially in dry seasons. A *Prosopis* tree yields 20-50 kg of pods per year, which contain high protein, carbohydrates, crude fibre, fats and ash, important for livestock health.
- **Honey production** - for income generation
- **Medicine** - for animal and human health, and income
- **Wood** - for construction materials, wood carvings, furniture and handicrafts
- **Biochar** - for water purification, organic farming and carbon sequestration



Plate 2: Goats feeding on milled *Neltuma juliflora* (formerly *Prosopis juliflora*) pods, (Bura - Tana River, Kenya 2024)

3. Challenges in Control and Management of *Neltuma juliflora*

Management of *N. juliflora* is faced with difficulties, mainly due to its rapid growth and spread, and ability to thrive in arid conditions. Local communities also have varying perspectives on the species value, with some viewing it as a nuisance and others recognizing its economic benefits.

- **Control Efforts:** Traditional approaches to managing invasive species, such as cutting down trees is not effective because *N. juliflora* regenerates quickly from remaining root systems and germinates from seedbank in the soil.
- **Lack of Awareness and Capacity:** Many local communities lack awareness of the economic potential of *N. juliflora* and may continue to view the species primarily as a problem. There is therefore need for training and capacity building for stakeholders to manage the species.
- **Inadequate capacity to control and manage prosopis:** knowledge, tools and equipment.

DISCUSSION AND CONSIDERATIONS

Management and Control Strategies

1. **Harvesting and Utilization:** One of the key approaches to managing *N. juliflora* is through harvesting and utilization. This includes: **Participatory mapping** to identify priority area for urgent intervention, **Community-based Management:** Development and implementation of community-driven management plans; and **Value Addition:** Developing value chains for Prosopis products to stimulate local economy. However, there is need for complete removal of Prosopis in irrigated areas as the species block irrigation canals.
2. **Innovative Solutions for Ecosystem Restoration** to address the ecological threat posed by *N. juliflora*, various measures should be explored including: **Controlled Clearing and Restoration:** clearing *N. juliflora* followed by replanting with high value/indigenous species. This would restore ecological balance while mitigating the spread of Prosopis; **Ecosystem Services Monitoring:** Implementing systems to monitor the impact of Prosopis on water table, soil health, and biodiversity could help tailor management practices and track progress.
3. **Policy and Regulatory Framework** to enforce policies and laws governing management of *N. juliflora* is critical; **Incentives for use of *N. juliflora* products:** The government to introduce incentives, such as subsidies or tax breaks, for businesses and communities that engage in sustainable harvesting, processing, and selling of *N. juliflora* products; **Land Use Planning:** The Government should integrate Prosopis management into land use planning, ensuring that harvesting does not conflict with agricultural or pastoral activities. **Public Awareness Campaigns:** Increasing public awareness about the potential benefits of *N. juliflora* can shift perceptions to embrace prosopis as beneficial.
4. **Collaboration with Stakeholders** Effective management requires collaboration between government agencies, local communities, researchers, NGOs and private sector investors. Stakeholders should work together to: **Develop best practices for use** and harvesting techniques; **Monitor the long-term environmental impact** of Prosopis and refine management strategies accordingly, and **Promote alternative livelihood** options that reduce dependence on natural resources, prevent over-exploitation of indigenous species and encourage overuse of *N. juliflora*.

POLICY IMPLICATIONS

1. **Promote Multi-Stakeholder partnership** between the Government, local communities, civil societies, environmental scientists, private sector and policymakers to develop integrated strategies for controlling and managing *N. juliflora*.
2. **Support Harvesting and Utilization by communities:** Policies should be developed to promote harvesting of *N. juliflora* including incentives for communities in the dryland to use the wood for charcoal production, handicraft (Plate 3), or other value-added products.



Plate 3: Sale of handicraft - walking stick from Mathenge
(Modogashe - Garissa, Kenya 2024)

3. **Promote Training, Research and Development, Knowledge Sharing to control and manage *Neltuma juliflora*:** Increase investment in research and demonstrations on *N. juliflora*'s ecological and economic impacts in Kenya's drylands. This should include studies on; its potential as a resource, methods of control, and strategies for rehabilitation of affected ecosystems. Knowledge sharing platforms for best practices will aid communities manage the species effectively.
4. **Community and Stakeholder Capacity Building** on managing *N. juliflora* invasions and impacts. There is need for strong institutional governance and laws/bylaws at county and community levels
5. **Incentivize Ecological Restoration:** Policy should encourage and provide financial incentives for restoration of indigenous plant species and ecosystems affected by *N. juliflora*. This can include supporting agroforestry practices and the planting of indigenous plants, as well as monitoring the long-term effects of *N. juliflora* removal.
6. **Monitoring and Enforcement of Control Measures:** Stronger enforcement of existing regulations regarding management of the species is crucial. The Government should ensure that control efforts, such as cutting and uprooting, are carried out effectively, with penalties for non-compliance.
7. **Public Awareness Campaigns:** Launch nationwide campaigns to raise awareness of the ecological and economic significance of managing the species.
8. **Diversify Land Use Practices:** Policymakers should encourage the diversification of land use practices in the ASALs. This may include promoting agro-pastoral practices, reforestation, and alternative livelihoods.
9. **Financial Support for Invasive Species Management:** Allocate specific funding for managing invasive species, with clear guidelines on how the funds will be used to support control, removal, and alternative livelihoods development. International funding and partnerships should also be pursued to supplement local efforts.
10. **Localize Policies to Fit Regional Contexts:** Develop localized, region-specific policies based on the unique challenges faced by different ASAL communities. Policy frameworks should allow flexibility to accommodate the diverse needs of these communities, considering varying degrees of *N. juliflora* infestation and available resources.

CONCLUSION

The control and management of *N. juliflora* presents both challenges and opportunities for Kenya's ASAL communities. While it is essential to control the species spread to prevent long-term ecological damage, the tree's value as a resource cannot be overlooked. It offers untapped opportunities for local communities. By focusing on harvesting and utilization, alongside ecological restoration efforts, *N. juliflora* can become an asset to dryland communities and refugees, contributing to their economic resilience and environmental sustainability. Effective policy frameworks on integrated approach and coordination, capacity building and community empowerment, ecological restoration of reclaimed land with high value species, provision of incentives and multi-stakeholder collaboration are essential to achieving this balance, long-term monitoring and evaluation will refine strategies and ensuring that management efforts are effective and sustainable over time and raising Public Awareness and Engaging Stakeholders is essential. The control and management of *Prosopis* will require continued collaboration, innovation, and commitment from all sectors of society.

RECOMMENDATIONS

- Approve and implement the National *Neltuma juliflora* (formerly *Prosopis juliflora*) Management Strategy and integrate it into county and national development plans.
- Encourage investment in *Prosopis* value chains through Public-Private Partnerships, support control measures, and offer financial incentives for restoration initiatives.
- Develop local capabilities through training, teaching, and research on management strategies and ecological implications.
- Conduct public awareness campaigns, encourage alternative livelihoods, and strengthen stakeholder engagement to support sustainable management.
- Promote control and utilization of *Prosopis* by communities for healthy rangelands and crop lands
- Restore reclaimed land with high value trees and crops
- By implementing these recommendations, Kenya can transform the challenge posed by *N. juliflora* into an opportunity for socio-economic development, environmental restoration, and sustainable land management for dryland communities.

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