



Biodiversity and Conservation Challenges in the Forests of Mudug and Galgaduud Regions, Somalia: A Mini Review

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Abstract

The charcoal industry in Somalia significantly contributes to deforestation, particularly in the Mudug and Galgaduud regions, where regulatory frameworks are weak. Despite efforts from the Somali government and international organizations to curtail charcoal exports, enforcement remains inconsistent, largely due to the influence of non-state actors. This study examines the challenges and implications of charcoal production on biodiversity and emphasizes the need for robust governance frameworks. It highlights the necessity of integrating sustainable alternatives to mitigate environmental degradation. Strengthening community engagement and collaborative efforts among various stakeholders is vital for fostering sustainable practices in charcoal production and enhancing conservation initiatives.

Keywords: Charcoal Production; Deforestation; Biodiversity Conservation; Sustainability

Introduction

The Mudug and Galgaduud regions of central Somalia represent unique ecological landscapes that are vital to both the local biodiversity and the livelihoods of their inhabitants. These regions, located between the arid northern territories and the more fertile southern areas, are characterized by semi-arid environments that feature savannas, sporadic forest patches, and coastal zones. Although these regions have historically supported a variety of plant and animal species, increasing environmental pressures, particularly from human activities such as charcoal production, have severely threatened the stability of these ecosystems. The need for effective conservation strategies in these areas is paramount to prevent further biodiversity loss and environmental degradation. The urban centers of Galkayo, Cadado, Hobyo, Guriel, Dhusamareb, and Cabudwaq are spread across the Mudug and Galgaduud regions, each with its distinct

environmental and socioeconomic characteristics. Galkayo, the largest city in Mudug, serves as a strategic commercial hub, while Hobyo, situated along the Indian Ocean, supports both terrestrial and marine ecosystems. Inland cities like Cadado, Guriel and Dhusamareb, the regional capital of Galgaduud, are predominantly agrarian but face substantial challenges due to overgrazing, deforestation, and unsustainable agricultural practices. The regions are rich in environmental species, particularly drought-resistant trees such as Acacia and Commiphora species, which play crucial roles in stabilizing the soil and preventing desertification. These trees are not only important for maintaining the ecological balance but also provide valuable resources for the local population, including fodder, firewood, and medicinal compounds. The species provide essential habitat for a wide range of fauna, including bird species such as the Somali Sparrow (*Passer castanopterus*) and numerous reptiles. Additionally, insects like bees and butterflies are integral

to pollination processes, supporting both wild flora and agricultural crops. However, the unsustainable exploitation of these forests, primarily for charcoal production, has led to the degradation of habitats and a significant decline in biodiversity. The Mudug and Galgaduud regions encompass diverse geographical features, ranging from coastal plains to arid interior landscapes. Hobyo, located on the Indian Ocean coast, is known for its sandy beaches and nearby mangroves, which support both terrestrial and marine biodiversity. In contrast, the interior cities such as Dhusamareb and Guriel are characterized by more arid landscapes, with savannas and scrubland dominating the terrain. These regions receive limited and erratic rainfall, further complicating efforts to sustain agriculture and biodiversity.

Environmental and Socioeconomic Challenges

One of the most significant threats to the biodiversity of the Mudug and Galgaduud regions is the widespread practice of charcoal production. The high demand for charcoal, both domestically and for export, has led to the unsustainable harvesting of trees, contributing to deforestation and land degradation. This has had a profound impact on the region's ecosystems, leading to habitat loss for wildlife and increased vulnerability to desertification. Furthermore, the economic reliance on charcoal production, particularly in rural areas, has created a cycle of environmental degradation that is difficult to break without viable economic alternatives. Efforts to regulate charcoal production and promote

conservation have been sporadic, with limited success. The government has introduced various policies aimed at curbing deforestation, but enforcement remains weak due to political instability and the economic importance of the charcoal trade. A more sustainable approach to land management is urgently needed to restore the ecological balance and ensure the long-term viability of both the environment and local livelihoods.

Biodiversity in Mudug and Galgaduud Regions

The forests of Mudug and Galgaduud are home to a diverse array of plant species, including drought-resistant trees like Acacia and Commiphora, which are critical for the region's ecology and economy. These trees serve as fodder for livestock, sources of traditional medicine, and contribute to soil stabilization, making them integral to the survival of local communities [1]. Additionally, the region hosts various bird species, reptiles, and small mammals adapted to the harsh environmental conditions. However, the precise extent of biodiversity in these areas is understudied due to the lack of comprehensive research and limited access caused by ongoing conflicts and political instability. The tree cover in these regions is also essential for maintaining soil fertility, preventing desertification, and conserving groundwater resources [2]. Given the climatic conditions of Somalia, characterized by low rainfall and frequent droughts, the resilience of biodiversity in Mudug and Galgaduud is closely tied to the health of these dry forests (Table 1).

Aspect	Before Charcoal Production Boom	Current Situation	Future Projections
Forest Coverage	40% forest cover	15% remaining cover	Continued decline without intervention
Biodiversity	Rich flora and fauna	Significant loss of key species	Further loss of endemic species
Soil Erosion	Minimal soil erosion	Increased erosion due to deforestation	Accelerated land degradation
Economic Dependency on Charcoal	Limited use for local consumption	Major source of income for communities	Continued dependency without alternatives
Government Policy and Regulation	No significant regulation	Inconsistent enforcement of bans	Potential for stricter regulations

Table 1: Environmental and Economic Impact of Charcoal Production in the Regions.

Conservation Challenges

Deforestation and Overgrazing

The primary drivers of deforestation in these regions are the expansion of agricultural activities and the increasing demand for charcoal. Charcoal production is a major

economic activity in Somalia, and the Mudug and Galgaduud regions are key sources of this commodity [3]. This practice, coupled with overgrazing by livestock, has led to a sharp decline in tree cover, threatening both biodiversity and the livelihoods of pastoralists.

Unsustainable Land Use Practices

The shift from traditional nomadic pastoralism to more sedentary farming systems has further contributed to land degradation. Over-cultivation of fragile lands and the lack of effective land management policies exacerbate soil erosion and reduce the capacity of ecosystems to regenerate. As a result, the habitat for both plant and animal species is shrinking, leading to biodiversity loss [4].

Climate Change

Climate change has amplified the challenges in these regions by increasing the frequency and severity of droughts. The rising temperatures and erratic rainfall patterns undermine the growth of vegetation and strain the already limited water resources. This has placed additional pressure on biodiversity, as species struggle to adapt to the changing environment [5].

Political Instability and Insecurity

The ongoing political instability in Somalia, particularly in the central regions, has severely hampered conservation efforts. The lack of governance and effective law enforcement allows illegal logging and unregulated land use to continue unabated. Moreover, the conflict-driven displacement of communities has disrupted traditional land management practices, further contributing to environmental degradation [6].

Conservation Strategies

Community-Based Conservation

Engaging local communities in conservation efforts is critical for the success of any biodiversity protection strategy. Traditional knowledge and practices, such as rotational grazing, can be integrated into modern conservation approaches to sustainably manage natural resources. Empowering communities with the tools and knowledge to protect their environment can also reduce dependence on destructive activities like charcoal production.

Reforestation and Agroforestry

Reforestation programs, coupled with agroforestry practices, can help restore degraded lands in Mudug and Galgaduud. By planting native drought-resistant species, these initiatives can improve soil fertility, enhance water retention, and provide alternative livelihoods for local communities. Additionally, agroforestry can promote biodiversity by creating diverse habitats for wildlife.

Policy and Governance Reforms

Strengthening governance and policy frameworks is essential for effective biodiversity conservation. Establishing protected areas, enforcing anti-deforestation laws, and regulating land use practices are critical steps toward preserving biodiversity in Somalia. Moreover, regional cooperation with international organizations can help mobilize resources for large-scale conservation projects.

Climate Adaptation Measures

Implementing climate adaptation strategies, such as water conservation techniques and drought-resistant crop varieties, can mitigate the effects of climate change on local ecosystems. Supporting research on climate-resilient biodiversity and ecosystem services in the Mudug and Galgaduud regions is vital for long-term sustainability.

Discussion on Current Trends in Charcoal Production and Conservation

The charcoal industry in Somalia continues to be a significant catalyst for deforestation, particularly in the Mudug and Galgaduud regions, where regulatory oversight is markedly inadequate.

Recent initiatives by the current Somali government, supported by international organizations, have made modest progress in mitigating charcoal exports through enforcement measures. Notably, the United Nations implemented a ban on Somali charcoal exports in 2012, which initially diminished international demand; however, the enforcement of this ban remains inconsistent, primarily due to challenges posed by non-state actors who exert control over substantial segments of the trade. The transition in governance has had a profound impact on the dynamics of the charcoal trade. Table 2 illustrates that previous administrations were able to implement environmental regulations more effectively, while the political instability following the 1991 collapse of the central government has severely hindered regulatory efforts. The once centrally regulated charcoal industry has now devolved into a network of informal operations that exacerbate environmental degradation.

The integration of community-based management approaches and the promotion of alternative livelihoods can play a significant role in mitigating the adverse impacts of charcoal production on the environment. Enhanced collaboration between government entities, local communities, and international stakeholders will be essential in fostering a sustainable balance between economic development and environmental conservation in Somalia.

Aspect	Earlier Governments	Post-1991 Governance (Current)
Charcoal Regulation	Strict laws on tree cutting; reforestation	Weak regulations: illegal production persists
Economic Control	Regulated production; small-scale management	Largely informal; controlled by non-state actors
Environmental Protection	Reforestation initiatives	Limited implementation of environmental laws
Export Management	Domestic use prioritized	Significant illegal export to Gulf countries
Revenue Control	Revenues reinvested into state development	Revenues diverted to informal sectors

Table 2: Comparison of Environmental Policies in Somalia on Charcoal Production.

Conclusion

The forests of Mudug and Galgaduud in Somalia are at a critical juncture. While they harbor significant biodiversity, they are also highly vulnerable to deforestation, overgrazing, and climate change. Addressing these conservation challenges requires an integrated approach that combines community engagement, sustainable land use practices, and robust policy frameworks. Without immediate action, the biodiversity of these regions may be lost, with profound consequences for both the environment and the local populations who depend on these ecosystems. The study recommends; To address the challenges of charcoal production in Somalia, the Somali Federal Government should establish comprehensive national policies for sustainable forest management. The Ministry of Environment, Climate Change and Rural Development of Galmudug State must develop localized strategies tailored to regional needs. Local district authorities should implement awareness campaigns on the impacts of unsustainable practices. Regional authorities need to enhance inter-regional collaboration to strengthen enforcement efforts. Finally, community and volunteer organizations should provide training in sustainable livelihoods to reduce reliance on charcoal production.

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