Appendix 1

Table 1: Key documents reviewed

Document	Type	Key findings	Source
National Landscape and Ecosystem Restoration Strategy (2023-2032)	Strategy	The strategy aims to increase the tree cover of the country from the current 12.13 percent to 30 percent by 2032 while restoring degraded landscapes and ecosystems. Some of the activities to achieve this goal include growing 15 billion trees, promoting sustainable agricultural practices, soil and water conservation, sustainable livelihood options, proper land-use planning, and waste disposal.	Kenya Forest Service Office record
Forest Conservation and Management Act (2016)	Legal	Under this Act, grazing within forest areas is strictly regulated. Individuals or communities must obtain a license or permit from the Kenya Forest Service (KFS) before engaging in grazing activities. The Act mandates that grazing should be carried out that does not harm the forest ecosystem or hinder its regeneration capacity. Furthermore, the Act emphasizes the importance of adhering to the management plans developed for each forest area, which include designated grazing zones and limits on the number of livestock allowed.	Internet
Forest Policy (2023)	Policy	It addresses grazing in forests with a focus on sustainability and environmental protection. The policy encourages adopting controlled grazing practices that align with forest management plans to mitigate negative impacts on forest biodiversity and regeneration.	Kenya Forest Service Office record
Aberdare Ecosystem Management Plan (2010-2020)	Plan	The plan identified that the Aberdare Ecosystem (AE) was a vital ecological region that faced numerous challenges and threats, primarily driven by human activities. Overgrazing and illegal livestock grazing have been identified as forest conservation threats. Even though it expired, the plan established the multiple-use zone, which served as a vital interface between forest conservation and community livelihood. Livestock grazing was not permitted in a tourist facility's exclusive area. The plan identified livestock grazing as having a high risk on the river	Internet

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		systems and Lake Ol Bolossat, high altitude grasslands, and medium impact on corridors and forest patches. As such, the plan prescribed for establishing livestock stocking rates and the forest's carrying capacity was established by taking cognizance of the requirements of wildlife grazers.	
Report of the Prime Minister's Task Force on the Conservation of the Mau Forests Complex (2009)	Report	The report identifies the Mau Forests Complex as important for economic sectors in Rift Valley and western Kenya, including energy, tourism, agriculture, and water supply. The Mau Complex is particularly important for two of the three largest foreign currency earners: tea and tourism. The report acknowledges that the pace and severity of the destruction and degradation of Kenya's forests have generated increasing publicity and concern over the past two decades. The cause of this destruction is a change of land use from forest to agriculture and a change in ownership from public to private. The report notes that Increased farm production and livelihood are likely to lessen the pressure on the forest and contribute to food security. The area's agricultural and livestock extension services are weak and need to be strengthened.	Internet
Rehabilitation of the Mau Forest Ecosystem: A Project Concept prepared by the Interim Coordinating Secretariat, Office of the Prime Minister, on behalf of the Government of Kenya (2009)	Report	The proposal outlined that degradation of the Mau Forests Complex was associated with activities of communities residing in and around the forests Complex through activities such as firewood collection, overstocking livestock, encroachment, illegal logging for timber and charcoal production.	Internet
Kenya Forestry Research Institute (2013)	Study	The study sought to establish the density of livestock grazing and the impact of grazing on the regeneration capacity of the Mau Forest Complex. Results showed that the Eastern Block recorded the highest density (557 per beat). The Southwest Block recorded the lowest density (297 per beat). The total livestock in the forest were 256 cattle, 579 sheep, 276 goats, and	JSTOR

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		154 donkeys. However, this data might have underestimated the actual densities due to incomplete and inconsistent grazing permit records, lack of detailed breakdown of permits by livestock type, and omission of certain livestock types. Nevertheless, results showed that grazed areas exhibited lower species richness compared to non-grazed areas, with grazing promoting unpalatable plant species over palatable ones, as evidenced by the absence of seedlings of palatable species in grazed areas. The study noted that the impacts of grazing, including seedling removal, trampling, and altered plant community composition, highlighted the need for careful consideration of livestock grazing in future forest management plans for the Mau Forest.	
Wambugu et al. (2018)	Study	The study notes Aberdare forest ecosystems are crucial for ecological and socio-economic well-being, significantly contributing to the diversification of livelihoods for adjacent communities. Therefore, the approach to forest management in an ecosystem affects the availability, access, and utilization of forest products and community participation in conservation efforts. The study found that most (61%) of the forest-adjacent community members had small land parcels, and 23% and 16% depended on forest grazing for cattle and sheep, respectively.	ScienceDirect
Wambugu (2018)	Study	The study evaluated forest ecosystem services and socio-economic factors influencing community participation in forest management around the Aberdare forest ecosystem. Using semi-structured questionnaires, focus group discussions, and the benefit transfer method, it surveyed 202 households. Analysis showed that the net annual benefit of ecosystem services was KES 36.8 billion, with regulating services constituting 98%. Communities lost KES 172 million annually to wildlife. Key factors included	Google Scholar

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		forest management approach, distance to reserves, gender, land tenure, and income sources. The study concluded that monetizing all ecosystem services and increasing economic benefits to communities is essential for reducing forest depletion and promoting participatory forest management.	
Langat et al. (2018)	Study	This study estimated the economic values of East Mau forest services using household interviews and secondary data. The total indirect use values (soil functions, hydrological functions, climate regulation) amounted to about US$219 million (KES 20 billion). Key values included nutrient cycling at US$13.30 ha-1yr-1, erosion control at US$4.50 ha-1yr-1, water flow and quality regulation at US$1421.03 ha-1yr-1, carbon sequestration at US$3308.05 ha-1yr-1, and oxygen generation at US$1365.13 ha-1yr-1. These findings are crucial for informed conservation and management decisions.	Google Scholar
Langat (2016)	Study	This thesis quantified the economic values of the East Mau forest ecosystem using Market-based, Contingent Valuation, and Benefit Transfer techniques. The study found that the total economic value (TEV) of the East Mau forest was KES 24 billion (US$266 million) per annum, with indirect use values at KES 19.7 billion (US$219 million). Direct use values were KES 4.2 billion (US$46 million), and non-use values were KES 31 million (US$347,000). Local communities appropriated 96% of direct use values, and carbon sequestration and oxygen generation contributed 79% of indirect use values. Local communities and the Kenyan government subsidized conservation by KES 650 million (US$7.2 million) annually. Forest income contributed 33% of household income, with poorer households more dependent on forest resources, though wealthier households derived greater absolute monetary benefits. Key	Google Scholar

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		determinants of forest dependence included off-farm income and number of cattle. These results provide valuable information for decision-making on the conservation and management of the East Mau forest ecosystem.	
Langat et al. (2016)	Study	The study conducted in the East Mau forest ecosystem noted that forest income was significant, contributing 33% of total household income, with fuelwood comprising 50%, food at 27%, construction material 18%, and fodder and thatching material at 5%. Livestock keeping was an important economic activity for households, with average numbers of cattle, sheep, goats, donkeys, and hens being 5.0, 4.0, 2.0, 1.0, and 7.0, respectively. The households that had alternative land also showed large livestock sizes and the lowest forest grazing incidence. Forest grazing is dependent on the seasonal availability of fodder on the farms, and forest grazing is an alternative resource. The implication is that alternative land ownership accounts for the additional livestock units. Forest income varied significantly among wealth classes, with poorer households more dependent on forest resources, though richer households derived higher absolute forest income. These results provided valuable information on the role of forest resources.	Google Scholar
Leley et al. (2022)	Study	This study investigated forest dependence for grazing, grazing impacts on forest structure and composition, permissible forage off-take levels, and sustainable carrying capacity in Southwest Mau. The study found that 96% of households grazed livestock in the forest year-round. Natural regeneration occurred generally but not in heavily grazed areas. Significant variations in species diversity, stand density, and basal area were observed across different grazing intensities. Daily, 17,263 livestock (14,804 cattle, 2,365 sheep, 44 goats, and 50 donkeys) grazed in the forest, with available forage estimated	Google Scholar

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		at 14 million kg DM/year, supporting 6,104 Tropical Livestock Units (TLUs). The forest supported 10,629 TLUs, exceeding the sustainable grazing threshold by 74%. It highlighted the need to maintain a sustainable grazing threshold to ensure forest regeneration and adequate forage availability, informing future grazing policies for sustainable forest management in Kenya.	
Tarus and Nadir (2020)	Study	The study found that forest disturbance impacted soil carbon stocks, and for effective management of forests towards climate stabilization, disturbance should be minimized if not avoided.	Google Scholar
Ruto et al. (2023)	Study	This study was carried out to determine the effects of different land use systems (i.e., natural forest, crop fields, and grazing fields) on riparian vegetation along Rivers Sondu and Ndoinet within the Mau Forest Complex. The study found that plant diversity was similar in all the sites covered by different land uses along the Rivers Sondu and Ndoinet. Significant relationships existed between grazing fields and crop fields, land disturbance, and herb/ seedling/grass species diversity and richness. It was attributed to grazing and crop farming activities along the two rivers, which had harmful effects and resulted in low riparian plant diversity. The riparian communities should be educated on sustainable riparian management practices through the protection (preventing human-induced alterations) and restoration (repairing of human alterations) of the riparian areas through indigenous tree planting and conservation of the existing trees.	Google Scholar