Original Paper

The challenges of private sector engagement in forest landscape and ecosystem restoration in Kenya

The case of Makueni and Elgeyo Marakwet Counties

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Keywords: inclusivity; sustainable forest management; private sector; participation.

List of Abbreviations: ADSE: Anglican Development Services Eastern; AFR100: African Forest Landscape Restoration Initiative; AUDA: African Union Development Agency; CBD: Convention on Biological Diversity; CI: Conservation International;

COP 21: Conference of Parties; FLR: Forest Landscape Restoration; FOLAREP: Forest Landscape Restoration Implementation Action Plan; HDI: Human Development Index; IUCN: International Union for Conservation of Nature; KFS: Kenya Forest Service; LDN: Land Degradation Nuetrality; NDMA: National Drought Management Authority; P4F: Partnerships for Forests; SDGs: Sustainable Development Goals; SDL: State Department of Livestock; TWENDE: Towards Ending Drought Emergencies; UNCCD: United Nations Convention to Combat Desertification; UNFCCC: United Nations Framework Convention on Climate Change; WRI: World Resource Institute; WWF: Wildwide Fund for Nature.

Abstract. *Private sector participation in forest landscape restoration is critical for sustainable development. Even though the role of the private sector in landscape restoration is still evolving, the existing theoretical models indicate that involving the private sector effectively in forest restoration drives financial, technological, and innovative solutions, forging a collaborative approach that benefits both forest ecosystems and businesses. Although Kenya has made strides in ensuring private sector participation in local forest restoration, private sector participation is still inadequate even though there is interest in landscape restoration. This paper aims to explore the current status of private sector engagement in forest restoration to identify the key challenges facing private actors by examining the cases of Elgeyo Marakwet and Makueni Counties in Kenya. The intention was to enhance participation by devising strategies for sustainable participation practices. Based on the case study approach, involving literature review and textual analysis of key documents and county-specific County Integrated Development plans retrieved from official online sources, the results revealed that Elgeyo Marakwet and Makueni counties have distinct statuses and challenges affecting private sector participation. In Makueni County, private sector involvement in landscape restoration is centered on agroforestry, silvopastoral, and plantation forests, comprising 95% of available options. The focus is on enhancing rangeland resilience against climate-induced drought in targeted project wards, with the TWENDE Project collaborating with various private sector partners. Even though limited information on incentives exists, WRI,*

backed by the Mastercard Foundation, funded the planting of 1,200,000 seedlings. In Elgeyo Marakwet, the United Nations Development Programme leads private sector engagement, aiming to increase forest cover. Challenges include invasive species, population pressure, limited youth participation, legal framework gaps, and unclear incentives. These results imply the need for a collaborative and well-coordinated approach to restoration, policy reviews, and conducting a total economic valuation of forest landscapes to sustain private sector interest and engagement in the restoration efforts.

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1. Introduction

Restoration of the world's depleted forests and landscapes is crucial for preserving ecological processes and ensuring the well-being of current and future generations. Moreover, restoration provides a vital nature-based solution to combat climate change. Recent years have witnessed a surge in global and national policy focus on restoration, with various commitments and pledges like the Bonn Challenge, the 1 Trillion Trees Initiative, and the United Nations Decade of Ecosystem Restoration. Despite these initiatives, only a fraction of the pledged land for restoration by 2020 had undergone the process, and countries are currently falling short of meeting their 2030 restoration targets (Forest declaration website 2021). Currently, most restoration projects in Africa rely on traditional funding sources such as government budgets and philanthropic funds, with limited participation from the private sector. Involving the private sector has the potential to mitigate environmental and social risks associated with these initiatives. The private sector's involvement drives financial, technological, and innovative solutions, forging a collaborative approach that benefits forest ecosystems and businesses. Consequently, many countries are devising more robust strategies and re-evaluating the existing strategies for hastening private sector engagement in forest landscape restoration.

Kenya has also embraced promoting the private sector in forest landscape restoration efforts. The country has developed key forestry development policies and initiatives that recognize the role of the private sector in landscape restoration. Kenya's Forest Conservation and Management Act (2016) shapes sustainable forest management, prioritizing community involvement and private sector engagement. Encouraging public-private partnerships establishes

mechanisms for collaborative forest management. The National Forest Programme outlines strategic goals involving diverse stakeholders, including the private sector. In addition, the Climate Change Act (2016) and the National Strategy for Landscape and Ecosystem Restoration 2023-2032 highlight the private sector's pivotal role in forestry landscape restoration. However, with the changing socio-economic matrices, the level of private sector participation in restoration efforts remains insufficient despite significant interest in participating in forest restoration. To understand why participation remains low despite the growing conservation interest, this article explores the current status of private sector participation in forest landscape restoration in the case of Elgeyo Marakwet and Makueni counties to identify the barriers in restoration, aiming to understand the persistent gap between ambition and reality in forest restoration actions.

The study focuses on recognizing their distinct objectives and approaches. Key questions examined include the current status of private sector involvement in forest restoration, alignment of restoration projects with the key ingredients of forest landscape restoration, barriers faced by private actors, and strategies to overcome these barriers. The investigation involved textual analysis of key documents analyzed through thematic analysis to identify inductive themes. In order to holistically respond to the research aims, the concept of forest landscape and ecosystem restoration will be reviewed from the theoretical background of sustainable forest management. The key theoretical and empirical findings were then applied to the Kenyan cases to generate the policy implications of this study. Makueni County and Elgeyo Marakwet are selected for their distinct characteristics, providing insights into challenges in private forestry sector engagement for restoration in Kenya. The diverse ecological zones and land uses offer a nuanced understanding of complexities in restoration initiatives. Makueni's commitment to sustainable development and Elgeyo Marakwet's emphasis on indigenous knowledge integration present unique cases for studying private sector involvement. It allows for a comprehensive examination of challenges and opportunities in private forestry sector engagement across Kenya's varied environmental and socio-cultural contexts.

2. Forest landscape and ecosystem restoration: Theoretical Analysis

Forest landscape and ecosystem restoration is a mutually beneficial strategy, positively impacting the environment by addressing climate change and preserving biodiversity. It enhances human welfare by creating eco-friendly

employment, improved food security nutrition, and increased income prospects. Forest landscape restoration is pivotal in advancing sustainable forest management by fostering a holistic and long-term approach to environmental conservation. Through targeted restoration efforts, the approach mitigates the adverse effects of deforestation and promotes the regeneration of diverse ecosystems. It contributes to forests' overall health and resilience, ensuring their sustained productivity. Moreover, forest landscape restoration initiatives incorporate community engagement and participatory approaches, aligning with sustainable forest management principles. By balancing ecological integrity and human needs, forest landscape restoration becomes a cornerstone in maintaining forests as vibrant, self-sustaining ecosystems for present and future generations.

The imperative drives forest landscape restoration (FLR) to enhance landscape resilience and optimize ecosystem goods and services in anticipation of future changes (IUCN Website 2024). The approach is guided by principles emphasizing a holistic, landscape-focused perspective over isolated sites. Acknowledging the intricate mix of land uses and management practices, FLR operates within entire landscapes, integrating diverse tenures and governance systems. This comprehensive approach allows for harmonizing ecological, social, and economic priorities. Central to FLR is the commitment to maintain and enhance natural ecosystems within landscapes, avoiding the conversion or destruction of natural forests. Instead, FLR champions the conservation, recovery, and sustainable management of these crucial environments, recognizing their intrinsic value and ecological significance. Stakeholder engagement and participatory governance are pivotal, involving diverse groups in decision-making processes related to land use, restoration goals, and ongoing monitoring. FLR's adaptability is evident in its tailored strategies for each unique local context (IUCN Website 2024). Using scientific insights, best practices, and traditional knowledge, FLR integrates information into the local context, considering social, cultural, economic, and ecological values. The restoration efforts aim at multiple functions across landscapes, generating diverse ecosystem goods and services to meet varied stakeholder needs. A crucial aspect of FLR is adaptive management for long-term resilience. Recognizing the dynamic nature of ecosystems and societal needs, restoration approaches evolve, enhancing species diversity and adjusting strategies based on changes in climate, knowledge, and stakeholder needs. Monitoring activities, ongoing research, and stakeholder input are vital in shaping adaptive management plans, ensuring FLR remains responsive and effective throughout its implementation (IUCN Website 2024).

Examining the challenges facing the private sector in forest landscape restoration is inherently linked to sustainable forest management principles. Both concepts share a common objective of balancing ecological preservation with economic interests. Sustainable forest management emphasizes the responsible use of forest resources, aligning with the private sector's long-term viability needs. Forest landscape restoration, as a subset, specifically addresses the rehabilitation of degraded areas, creating opportunities for private enterprises involved in afforestation and reforestation. Investigating the hurdles the private sector faces in this context provides valuable insights into optimizing the integration of environmental and economic goals. It highlights potential barriers, such as financial constraints or regulatory complexities. It informs strategies to enhance the collaboration between private entities and conservation efforts, fostering a more effective and sustainable approach to forest landscape restoration.

2.1 Global reviews on private sector engagement in forest landscape restoration: Empirical Analyses

In this paper, the private sector refers to entities and businesses that operate independently from government or public ownership. These can include corporations, companies, and individuals engaged in activities related to forestry, land management, and environmental services. Private sector involvement in FLR often encompasses initiatives, investments, and collaborations that contribute to the restoration and sustainable management of forest landscapes. This involvement may range from corporations participating in reforestation projects to businesses offering environmental services and products that align with FLR goals. The private sector's engagement in FLR can play a crucial role in providing resources, expertise, and innovation to enhance the effectiveness and scalability of restoration efforts.

Forest Landscape Restoration (FLR) represents a proactive collection of strategies to effectively realize various international policy objectives related to global forests. The Sustainable Development Goal (SDG) 15, the Convention on Biological Diversity (CBD) Aichi Target 15 which aims to restore a minimum of 15 percent of degraded ecosystems, the United Nations Framework Convention on Climate Change (UNFCCC) concerning Reducing Emissions from Deforestation and Forest Degradation in Developing Countries and the United Nations Convention to Combat Desertification (UNCCD) Land Degradation Neutrality (LDN) Project can be realized through the FLR approach (Partnership for Forests 2022). Forest landscape restoration (FLR) encompasses diverse strategies for revitalizing degraded or deforested areas. Options include

afforestation, planting trees in barren regions to establish new forests; reforestation, replanting in areas where forests were removed; and agroforestry, integrating trees into agricultural landscapes for ecological and economic benefits. Natural regeneration allows forests to regrow organically, while assisted natural regeneration involves human interventions to facilitate the process. Sustainable land management practices, like rotational grazing and fire management, maintain ecological balance. Creating buffer zones and wildlife corridors also connects fragmented habitats, emphasizing FLR's adaptability to diverse contexts for a holistic and sustainable approach to restoring forest landscapes (Partnership for Forests, 2022).

This paper will use the illustration of FLR initiatives to explore the challenges facing the private sector when involved in large-scale restoration efforts. In the African context, there is concurrence that FLR has the potential to contribute to sustainable development. Studies show that 60% of Africa's population relies on forests for a significant portion of their food, goods, and services. The standing forests and mangroves play a crucial role in mitigating the impact of climate change by absorbing greenhouse gases, regulating water flows, and protecting coastal communities against extreme events and rising sea levels. However, the challenges of increasing urbanization, conflict, the expansion of refugee settlements, and inadequate soil management practices have resulted in Africa experiencing a loss of 4.4 million hectares (ha) of forest annually between 2015 and 2020 (Partnership for Forests 2022). It highlights the urgent need for sustainable forest management practices and conservation efforts to safeguard the essential resources provided by forests and ensure the well-being of the dependent population. Various Forest Landscape Restoration (FLR) initiatives have been established in Africa to tackle these challenges, such as the Pan African Ecosystem Restoration Action, the Great Green Wall, and the African Forest Landscape Restoration Initiative (AFR100). These initiatives represent long-term, collaborative efforts involving multiple partners to restore ecosystems and enhance human well-being in areas that have been deforested or degraded (Partnership for Forests 2022). The focus is on sustainable, multi-faceted approaches to rejuvenate landscapes and create positive impacts for the environment and the communities dependent on these ecosystems (Partnership for Forests 2022).

The African Forest Landscape Restoration Initiative (AFR100) was inaugurated in 2015 during the 21st session of the Conference of Parties (COP21) in Paris. AFR100, a country-driven initiative, aims to restore 100 million hectares (ha) of land across Africa by 2030. Aligned with the Bonn Challenge, African Resilient

Landscapes Initiative, African Union Agenda 2063, Sustainable Development Goals, and other targets, AFR100 is spearheaded by the AFR100 Secretariat within the African Union Development Agency (AUDA). Supported by a Management Team, including representatives from Partnerships for Forests (P4F), Federal Ministry of Economic Cooperation and Development of Germany (BMZ), International Union for the Conservation of Nature (IUCN), World Bank, World Resources Institute (WRI), and Food and Agriculture Organization (FAO) (Partnership for Forests 2022). AFR100 unites various partners, including participating African nations, civil society, and private sectors, to collaboratively pursue shared restoration goals. These goals encompass food security, climate change resilience, and poverty alleviation. At the multinational level, AFR100 facilitates political engagement and knowledge sharing. It enhances restoration endeavors for signatory countries by providing a platform for communication, exchange, coordination, and access to technical and financial support. With over 32 African countries pledging their commitment to the initiative, AFR100 signifies a concerted effort to address environmental challenges and promote sustainable land restoration. In implementing the highlighted global and regional forest restoration efforts, the core function of the FLR approach is to shift the focus from merely maximizing tree cover to considering the broader functions of forests within landscapes crucial for human dependence. This shift has turned FLR into a unified framework for various international actors to expand forest restoration initiatives through an integrated landscape approach, aligning with national priorities and voluntary commitments (Partnership for Forests, 2022). However, the implementation of FLR in Africa faces challenges, and hence, establishing partnerships between public, private, and non-profit entities is crucial for the economic viability and long-term success of Forest Landscape Restoration (FLR) initiatives. Currently, most restoration projects in Africa rely on traditional funding sources such as government budgets and philanthropic funds, with limited participation from the private sector. Involving the private sector has the potential to mitigate environmental and social risks associated with these initiatives. However, the assessment highlighted that engaging all relevant stakeholders at the national level is a significant challenge in implementing restoration activities. Forest Landscape Restoration (FLR) platforms serve as diverse forums engaging stakeholders from government bodies, international communities, the private sector, civil society, and local communities. These groups often diverge in values, interests, and approaches despite their potential. The initiatives of regional coordinators to unite these various actors faced challenges due to a lack of alignment in vision and a common language within and between ministries and countries. This misalignment

hindered effective collaboration and coordination efforts, emphasizing the need for enhanced communication and shared understanding to foster successful restoration implementation (Partnership for Forests 2022). Limited coordination among various entities has resulted in challenges for regional coordinators, including the duplication of efforts in setting up national stakeholder platforms and monitoring systems within restoration initiatives. Furthermore, infrastructure is absent to facilitate private sector involvement in restoration efforts. The lack of incentives, such as access to funds, poses a barrier to aligning private sector interests with national pledges and government objectives, particularly in areas like improving gender equality in accessing landscape restoration services. Financing remains a significant challenge for initiatives like AFR100, with funders, including private sector actors, often deterred by the long-term nature and perceived lack of a business proposition in these projects. The AFR100 Secretariat identified the urgent need to enhance systems for tracking and reporting on the progress of AFR100 restoration efforts in member countries. The assessment revealed a fragmented and duplicative reporting system due to the absence of a continent-wide AFR100 monitoring framework, making it challenging to comprehensively assess progress as restoration data are scattered across institutions and ministries. This lack of communication and advocacy impedes replicability and knowledge sharing among member countries, diminishing the effectiveness of meeting AFR100 pledges on time and creating an information gap between stakeholders (Partnership for Forests 2022). Three main funding gaps were identified: a lack of funding for restoration actors on the ground, insufficient funds for stakeholder engagement, and a deficit in supporting the private sector—especially female and young entrepreneurs—due to a lack of innovative restoration business models. Addressing these challenges necessitates capacity building and increased collaboration between stakeholders. The Secretariat's assessment emphasized that establishing a transparent and verifiable AFR100 monitoring platform would attract investment into restoration by providing clear information on changes in land cover. This tracking mechanism helps ministries and countries demonstrate progress and encourages donors to continue investing in successful projects (Partnership for Forests 2022).

Oh et al., (2020) scrutinized the divergence, trajectory, and attributes of North Korean forest restoration policy vis-à-vis analogous strategies in South Korea. South Korea's Forest Conservation and Afforestation Project's triumph factors were segmented into four policy spheres: policy and system enhancement, assessment and skill augmentation, populace engagement stimulation, and restoration infrastructure establishment. These facets bore resemblance to North

Korea's Forest Restoration Battle. South Korea crafted the 1st and 2nd Forest Conservation and Afforestation Plans, shifting Korea Forest Service governance to its Ministry of Home Affairs, akin to North Korea's forest development plan and command unit for the Forest Restoration Battle. While South Korea relied on tree monitoring and forestry associations, North Korea embraced socialist competition and agroforestry. South Korea fostered participation through nursery projects, tree planting drives, and responsible afforestation systems, while North Korea pursued agroforestry, a patriotic forest campaign, and a responsible forest regime. South Korea's substitution of forest fuels with fossil fuels, slash-and-burn field clearance, and erosion mitigation contrasted with North Korea's emphasis on ultra-high-grade anthracite coal and dedicated firewood forests. North Korea toughened penalties for deforestation like anthropogenic forest fires, replacing erosion control with agroforestry for slope management. Restoration foundation creation delineated the most significant disparity, implying potential guidance for future inter-Korean forest collaboration.

In their review of global restoration initiatives, Castro et al., (2021) posits that global environmental policies prioritize forest restoration, launching billion-tree initiatives. However, resources are limited, emphasizing the need for effective restoration. Precision Forest Restoration (PFR) focuses on individual plant success, ensuring adult tree establishment with functional ecosystems, utilizing ecological knowledge and diverse technologies. Though costly per plant, PFR promises long-term cost-effectiveness and resilient forests.

In Europe, Cortina-Segarra et al., (2021) established that ecological restoration stands as a crucial measure against human-induced biodiversity decline and disaster vulnerability. Despite political prioritization, Europe's ecological restoration progress falls short, failing international agreements and EU directives. Through a Delphi process, on surveyed restoration experts, revealing 33 barriers primarily rooted in socio-economic challenges rather than environmental concerns. Insufficient funding, stakeholder conflicts, and low political prioritization emerged as key hurdles. Findings underscored the imperative of heightened political dedication, legal compliance, and optimized financial allocation towards ecological restoration, urging integration into land-use planning and enhanced stakeholder collaboration. This study informs strategies to realize the European Biodiversity Strategy for 2030 and the EU 2030 Restoration Plan.

Other large-scale forest restoration initiatives dating back to the 19th century have been implemented worldwide. Some examples are the successful restoration

of degraded heathlands in Denmark and southern Sweden and the establishing of the Tijuca Forest and Paineiras conservation area in Brazil in the 1860s. In the 20th century, significant forest restoration projects include the extensive reforestation efforts in South Korea after the Korean War, the Green Belt Movement founded by Nobel Prize laureate Wangari Maathai in Kenya in 1977, and natural regeneration programs in Costa Rica and Tanzania during the 1980s (Carrapatoso & Geck 2018). Throughout much of the 20th century, the international forest agenda primarily focused on conservation and sustainable management. The concept of Forest Landscape Restoration and its vision of achieving multiple benefits emerged in 2000 during a workshop organized by the IUCN and the WWF in Spain. However, it was not until the launch of the Bonn Challenge in 2011, calling for the restoration of 150 million hectares by 2020, that forest restoration gained global momentum. This momentum was further amplified by the New York Declaration on Forests in 2014, which extended the target to an additional 200 million hectares by 2030, solidifying FLR as a prominent and influential global movement (Carrapatoso and Geck 2018).

Despite the scarcity of literature on the participation of the private sector in FLR, the few available studies show that in many landscapes, the intricacies of land ownership patterns necessitate the active engagement of the private sector in restoration efforts. Some landowners may willingly participate in Forest Landscape Restoration due to the expectation of direct benefits, anticipating profits from the sale of forest products or environmental services for themselves and their families. Alternatively, landowners may engage in FLR driven by indirect benefits, such as safeguarding commercial crops from erosion and promoting sustainable production practices. Large corporate landowners may find FLR appealing as natural regrowth or planted forests act as effective erosion prevention measures on steeper terrains or serve as crucial firebreaks. Participating in FLR demonstrates a commitment to biodiversity conservation and enhances local livelihoods, providing corporations with positive reputational benefits. The level of private-sector involvement hinges on the policy and institutional frameworks established by governments, including the legal obligations imposed on landowners. Research funded by government initiatives, which mitigates silvicultural and economic risks, often serves as a prerequisite for private-sector involvement, rendering investments more attractive and feasible.

Nonetheless, there is a growing interest among asset managers in sustainable investments. Currently, 128 banks from 41 countries, holding a total of US$74 trillion (approximately 40% of global banking assets), have pledged to the industry-led and UN-supported Net-Zero Banking Alliance. This initiative aims

to align investments with carbon neutrality by 2050. Furthermore, the Principles of Responsible Investment, which outline commitments to environmental, social, and governance standards (consistent with fiduciary duty), boast over 3,000 signatories. These signatories collectively manage assets valued at over US$103 trillion, highlighting a significant global commitment to integrating sustainable practices into investment strategies. Financial instruments like green bonds can potentially mobilize investments for environmentally sustainable assets. However, the impact on restoration funding has been limited. Currently, only 5% of green bonds are allocated to investments in land restoration. It contrasts with more established sustainable asset classes, where allocations are higher: renewable energy receives 35%, sustainable buildings receive 30%, and sustainable transport receives 18%. The disparity in funding distribution highlights the need for increased attention and investment in land restoration through financial instruments like green bonds to address environmental challenges effectively.

Corporations increasingly turn to restoration to address carbon emissions and achieve net-zero emission reduction goals. Over 4,000 corporations have committed to Science-Based Targets, aligning their emission reduction efforts with the Paris Agreement. Restoration plays a crucial role in achieving these targets, with carbon offsets gaining recognition as a viable means. In 2021, carbon credits traded in the voluntary market surpassed US$1 billion, with Forestry and Land Use credits accounting for 61% of this total. Additionally, there is a growing acknowledgment that unsustainable corporate practices pose reputation risks, particularly for consumer-facing brands. With heightened public concern for environmental issues, adopting sustainable actions becomes essential for corporate responsibility and advantageous for marketing purposes.

Despite the increasing interest in restoration, funding from private actors remains limited. In 2019, it was estimated that global funding for biodiversity conservation needs to increase by over US$700 billion annually to combat and reverse land degradation, biodiversity loss, and climate change effectively. A stark contrast is observed in the financial support for agriculture, which was 15 times higher than that allocated for forestry objectives in countries with high deforestation rates in 2019. This substantial financial gap underscores the challenges faced by restoration interventions in attracting sufficient funding despite the growing enthusiasm from private actors. Surprisingly, there is a lack of studies exploring the reasons behind these persistent funding shortfalls.

Increased engagement from private funders holds the potential to scale global restoration efforts significantly. While some barriers hinder corporate finance,

corporations often perceive existing market-driven incentives to participate in agroforestry, regenerative agriculture, and active restoration (Löfqvist et al. 2023). This engagement is driven by a desire to meet emission reduction commitments, enhance the sustainability of supply chains, make a positive impact, and improve branding. A clear business presence in the target region plays a pivotal role. Conversely, asset managers encounter barriers, viewing restoration as a nascent, high-risk asset class with insufficient return on investment (ROI) to justify the associated risks (Löfqvist et al. 2023). Asset managers typically favor low-risk projects with commercial products and find that few restoration projects meet these criteria. Notably, there is limited interest in natural regeneration due to a lack of storytelling potential, and quantification systems for benefits were a barrier to financing restoration approaches, such as natural regeneration, which did not have easily communicated pathways linking intervention to outcomes (Löfqvist et al. 2023; Kedward et al. 2022; Begemann et al. 2023). Overcoming these barriers requires three strands of public intervention: expanding markets for restoration benefits, developing green finance mechanisms with public support, and implementing regulations and subsidies for restoration investments. Public and civil society involvement can facilitate leveraging private finance for equitable and ecologically sound restoration initiatives (Löfqvist et al. 2023; Löfqvist and Ghazoul 2019). However, financial instruments designed to attract substantial private finance into conservation often face challenges related to high transaction costs, which are necessary to ensure ecological effectiveness. These costs may conflict with the preferences of institutional investors seeking competitive returns, market efficiency, and scalable investments. Market-led environmental governance approaches often encounter conflicts of interest, undermining their ability to address this trade-off effectively. Strategies involving investors using public funds to reduce risks in natural investments may not be as promising as assumed. The substantial costs involved in making nature markets conventionally 'investible' can limit the success of such approaches (Flammer et al. 2023; Ding et al. 2017).

From this review, forest landscape restoration represents a dual benefit strategy, enhancing the environment while uplifting human well-being through green jobs, food security, and income opportunities. Seed funding is crucial for effective implementation of national FLR platforms. Challenges facing the private sector in FLR, such as limited funding and regulatory barriers, differ between developed and developing nations, demanding tailored solutions and incentivized partnerships to ensure sustainable restoration efforts.

2.2. Private sector participation in forest landscape restoration in Kenya

Kenya has a total forest cover of 5,226,191.79 hectares, accounting for 8.83% of the country's land area (Chisika & Yeom 2023). The last two decades have witnessed a transformative change in Kenya's forest sector, driven by governmental reforms. Key milestones include the Forest Act of 2005 and the Forest Conservation and Management Act of 2016, coinciding with the 2010 Constitution. Establishing the Kenya Forest Service (KFS) as a semiautonomous agency enhanced resource allocation and operational capacity. The Participatory Forest Management approach led to 250 Community Forest Associations and 290 Charcoal Producer Associations regulating charcoal production. Devolution of some forestry functions to county governments, decentralization of governance, and strengthened water tower management exemplify Kenya's commitment to environmental sustainability and community engagement (Mutune et al. 2017).

Unfortunately, approximately 22% of the entire land area in Kenya is degraded, resulting in an annual economic loss of around USD 1.3 billion. It emphasizes the critical requirement for landscape restoration. Kenya has established ambitious Forest and Landscape Restoration (FLR) objectives to raise and sustain a 30% tree cover and rejuvenate 10.6 million hectares of deteriorated lands by planting 15 billion trees before 2032. On the global stage, the country has pledged to decrease its greenhouse gas emissions by 32% by 2030 (Muthuri et al. 2022; Muthuri et al. 2023).

To address the above challenges, the Ministry of Environment, Climate Change and Forestry (MoECCF) developed the Forest Landscape Restoration Implementation Action Plan 2023-2027 (FOLAREP) through the Kenya Forest Service. Recognizing the pivotal role of FLR, the plan is aligned with efforts with Kenya's broader goals of achieving food and water security, sustainable energy, low-carbon resilience, and economic empowerment. Given the collaborative nature of FLR, county governments hold a crucial role, and the Ministry facilitates cooperation between national and county entities. Additionally, efforts underway to foster partnerships with development partners, research institutions, and grassroots networks are also entrenched in the plan.

Recently, the FOLAREP was merged with other forestry development plans in the country to generate the National Landscape and Ecosystem Restoration Strategy 2023-2032, which seeks to accelerate actions towards the achievement of the 30% national tree cover by 2032 to enhance climate-reliant national economic growth and development goals within the context of the Vision 2030

and contribute toward Kenya's commitments to regional and global conventions. Strategy implementation is geared toward supporting a whole-government and whole-society approach to fully rehabilitate and restore 10.6 million hectares through constituency-based nerve centers covering 290 constituencies and some specially selected ecosystems and water towers threatened by deforestation and degradation.

In the context of climate change, numerous private sector stakeholders in the Kenyan forestry sector are actively involved in primary and secondary forest production (Makanji & Oeba 2019). At the grassroots level, individual farmers, driven by personal initiative or encouraged by incentives from entities like the Kenya Forest Service (KFS), partake in tree planting on their farms or engage in participatory forest management. The primary motivation for these farmers is to cultivate trees for personal use, such as constructing houses, obtaining firewood, or generating income through selling tree products to support their households. TIST stands out in Kenya as a distinctive program involving farmers in tree cultivation for climate change mitigation and adaptation. Its primary objectives include increasing biomass and carbon sequestration, ensuring a sustainable fuel wood supply, generating revenue through carbon credit sales, providing crucial training on social and health-related topics, and enhancing area biodiversity with canopy and indigenous trees. Over 54,000 farmers participate in TIST, consciously contributing to climate change mitigation. TIST has successfully validated and verified Voluntary Carbon Standard (VCS) projects, achieving gold-level certification under the Climate Community and Biodiversity Standard (CCBA). Forest carbon credits are obtained and shared with participating farmers (Makanji & Oeba 2019).

In contrast, secondary forest production involves actors like charcoal producers, loggers, and millers, who are less consciously engaged in climate activities and emphasize profit margins over environmental sustainability. However, the potential exists to inform and encourage these actors to shift towards climate-friendly practices. Noteworthy organizations consciously engaged in climate change mitigation and adaptation include Mikoko Pamoja, VI Agroforestry WWF, Kenya Airways, Bamburi Cement Company, and British American Tobacco (BAT). These entities actively participate in tree planting, land rehabilitation, and capacity building to enhance resilience and adaptive capacity, offsetting their emissions through increased carbon stock. Vi Agroforestry, Mikoko Pamoja, and WWF engage in carbon credit trading based on their afforestation, reforestation, and rehabilitation initiatives, showcasing the private sector's potential in forestry to combat climate change. However, these projects

heavily rely on external funding and carbon credit sales are affected by fluctuating prices in compliance and voluntary markets, posing a sustainability challenge. To address this, promoting and expanding such successful practices across the forestry sector is crucial. Sustainable solutions demand collaborative efforts between the government and private sector in forestry, necessitating the development of appropriate institutional and legal frameworks to support enduring climate change and adaptation activities across devolved governance units (Makanji and Oeba 2019). From this review, even though the engagement of the private sector in forest landscape restoration is commonly viewed as a financing mechanism, their involvement is crucial for realizing the Government of Kenya's commitment to raise tree cover to 30% and restore 5.1 million hectares of deforested and degraded landscapes by 2030, aligning with the Bonn Challenge and AFR100 targets.

2. Materials and Methods

3.1. Case study research design

This study used a case study research design to evaluate the implications of private sector participation in forest landscape restoration. This method was characterized by its in-depth exploration of two cases, allowing researchers to gain a nuanced understanding of the complexities and dynamics at play. Unlike quantitative research, which focuses on statistical trends across a large sample, case study design prioritizes the richness of detailed information. Moreover, the strength of case study research lies in its ability to provide insights into real-world situations, offering a contextually rich narrative beyond mere statistical analysis. Researchers employing this design aimed to uncover patterns, relationships, and underlying mechanisms that contributed to a more profound comprehension of the specific case, making it a valuable tool in fields where a comprehensive exploration of unique and intricate phenomena was essential.

2.1. Case studies

2.1.1. Makueni County

Makueni County, located in the southeastern part of Kenya, shares borders with Machakos, Kitui, Taita Taveta, and Kajiado. Encompassing an area of 8,176.7 km², it has a population of 987,653, with a growth rate of 1.1%. The county's monetary poverty rate is 34.5%, slightly below the national average of 35.7%, indicating around 341,197 people experiencing monetary poverty. However, the multidimensional poverty rate in Makueni is 59.7%, significantly higher than the

monetary poverty rate, affecting 589,618 individuals. The projections estimate the population will reach 1,065,482 and 1,087,776 by 2025 and 2027, respectively, highlighting the challenges of multidimensional poverty in the region. Makueni County aspires to build a resilient economy and community, emphasizing forest landscape restoration within the Environment, Natural Resources, and Climate sub-sector. Initiatives include afforestation at household and institutional levels, greening school programs, and law enforcement against deforestation. The county also implements an enhanced climate information system to provide timely and relevant data, empowering communities in decision-making processes.

In forest and landscape restoration, the county government collaborated with the World Resources Institute in 2018 to conduct a Restoration Opportunities Assessment Methodology study (ROAM). The primary objective of this assessment was to pinpoint the challenges and opportunities related to land use for restoration within the county. The findings of this study served as the foundational framework for subsequent forest and landscape restoration initiatives. The assessment identified seven restoration options, including afforestation and reforestation of natural forests, agroforestry, riparian land restoration, road buffer zone restoration, rangeland rehabilitation, plantation forests, and the rehabilitation of natural forests. Subsequently, the government implemented the recommendations outlined in the ROAM report, fostering the practical application of restoration strategies in the county. The key outputs and outcomes from implementing the ROAM process in the county are discussed hereunder.

Makuli- Nzaui Landscape restoration: In collaboration with WRI, a Restoration Action Plan 2021-2026 was prepared. WRI, through the Mastercard Foundation, is financing the planting of 1,200,000 seedlings in five (5) years. So far, 87,500 seedlings have been planted in forest areas and farmland. On afforestation, the government, in partnership with Kenya Forest Service (KFS), rehabilitated degraded natural forest through enrichment planting of 100 Ha in Makuli, Nthangu, Mbooni, and Kilungu Forests; production of four million seedlings in KFS tree nurseries in Makuli, Kibwezi, Mbooni, Kilungu, Nthangu, and Makueni central nursery; establishment of 100 Ha woodlots on farms; restocking of 50 Ha of industrial forest plantations; rehabilitation of 10 Ha in riverine areas and establishment of 10 km firebreaks. One hundred thirty thousand eight hundred seedlings were also planted in institutions, market areas, water project sites, and an additional 58 tree nurseries. A devolution forest was established at Kwa Kathoka ATC during the devolution conference, where 1,000 indigenous tree

species were planted in collaboration with the Council of Governors. On degraded Land rehabilitation, the government rehabilitated the Matwikani watershed by planting 3,000 tree seedlings, 200 stalks of Napier grass, 400 giant bamboo seedlings, and 100 stalks of live materials (Sisal). Nine farm ponds were excavated, one water pan was de-silted, and 59 household farms were provided with 1 kg of grass for grass reseeding. They were also trained in water harvesting technologies.

Additionally, nine gully sites were rehabilitated across the county. For water catchment protection, 17 km of terraces were excavated as soil-water conservation structures in Muuni-Maatha Hill, Mbui Nzau Hills, and Yekanga forest to enhance the hydro-ecological function of county forests. The government Rehabilitated Kiboko and Kiu in Kibwezi West, Mangelete, Kwa Mukonza, and Umani in Kibwezi East, and Kinyongo wetlands in Mbooni sub-county by planting seedlings in 40 hectares of land, constructing and rehabilitating weirs, sand dams, and grass reseeding. One thousand five hundred tree seedlings were also planted along the river banks of the Kanyonga and Kambu rivers. Kenya Forest Service (KFS) protected and conserved 15,004.5 Ha of gazetted forest against all threats and degradation activities on forest conservation.

On environmental governance, the sub-sector developed the Makueni Environment and Climate Change Policy (ECCP), 2021, amended Makueni County Sand Conservation and Utilization Act 2015, revised in 2022; 19 Ward Sand Conservation and Utilization Committees (WSCUC) were established to oversee the sustainable sand harvesting and enhanced participatory natural resource management; County Environment Committee (CEC) was established and gazetted in 2018; Community Forest Associations (CFA) were established, that is Mbooni Community Forest Association (MBOCOFOA).

2.1.2. Elgeyo Maraakwet County

Elgeyo Marakwet County covers an area of 3029.6 km², constituting 0.4% of Kenya's total landmass. Positioned between latitude 0o 10' and 1o 20' North and longitude 35° 10' to 35° 44' East, it shares borders with West Pokot County to the North, Baringo County to the East, Trans Nzoia County to the Northwest, and Uasin Gishu County to the West. With an elongated shape, the county lies between the Uasin Gishu Plateau in the West and the Kerio River in the East. Originating in the Southern highlands of the county, the Kerio River flows into Lake Turkana. The sub-counties in Elgeyo Marakwet exhibit a balanced distribution of gender. Marakwet West has a higher population of both males

(68,948) and females (68,560), as well as Keiyo South with males (60,919) and females (59,827).

In contrast, Keiyo North has a slightly lower population, with males at 49,601 and females at 49,574. Similarly, Marakwet East has a population of 47,849 males and 49,190 females. Elgeyo Marakwet County's HDI is 0.53, lower than the national HDI of 0.60. It can be partly attributed to the ecological zones of the county, with the Kerio Valley region having a high poverty index. In pursuit of its vision, the county aims to be a beacon of progress, advocating for citizen-centric development that places the well-being and aspirations of its residents at the forefront. With a mission focused on transformative actions, the county is committed to empowering its community members, fostering active participation, implementing innovative sustainable development practices, and bolstering climate resilience. Through these concerted efforts, the county envisions a future where livelihoods are elevated and its residents' overall quality of life is enhanced.

In forest landscape restoration, the county government had set a target to mitigate climate change impacts by increasing forest cover from 37.04% to 40.6%. However, by the end of the planned period, the forest cover had decreased to 29.95%. This decline was attributed to technological advancements that refined measurement standards, transitioning from assessing land under cover to precise tree counting. The negative impact of this measurement shift, coupled with deforestation, forest encroachment, charcoal burning, soil erosion, forest fires, and illegal logging, could have had severe consequences. Fortunately, various interventions were implemented, including establishing 47 tree nursery beds, planting 537,411 assorted exotic tree seedlings, and introducing 10,077 bamboo and other environmentally friendly trees.

Furthermore, upon realizing that indigenous forests in Elgeyo Marakwet County face depletion due to human activities, impacting the environment and exacerbating climatic challenges. The county recognizes the importance of integrating indigenous principles into forest conservation to address adverse weather conditions. Traditional practices, such as respecting riverbanks, were crucial in maintaining water sources. However, contemporary farming practices contribute to environmental degradation and health issues. The United Nations Development Programme (UNDP) supports the county in incorporating indigenous knowledge into climate adaptation strategies. The Sustainable Forest Management and Tree Growing Bill establishes a Conservation Council involving indigenous communities to promote community-driven development

priorities through public participation and citizen conservation groups, ensuring ownership and sustainability (Maarifa Centre Website 2024).

Moreover, to promote sustainable tree utilization, the county enacted the Charcoal Act 2017, designed to apply to all forests and woodlands within the county and private lands within the county. Its primary focus is the regulation of charcoal production. Its objectives are poverty reduction, employment creation, and improved livelihoods by encouraging the sustainable use, conservation, and management of forests and trees. The Act also aims to promote soil and water conservation, tree planting, engage communities, the private sector, and other stakeholders in forest management to generate employment, foster dry land forestry for wood fuel, charcoal, and non-wood forest products, and support adaptation and mitigation efforts in climate change. The legislation establishes the County Environmental Committee, which is responsible for vetting and approving applications from Charcoal Producer Associations, reviewing and recommending licensing, monitoring restoration plans, and overseeing tree planting events, with comprehensive powers to execute its functions (UNEP-LEAP Website 2024).

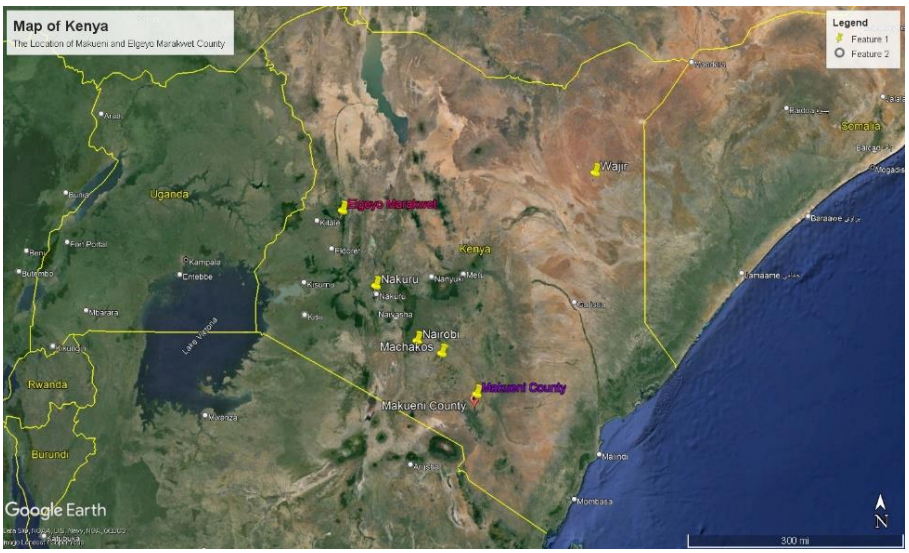

Figure 1. The location of Elgeyo Marakwet County

2.2. Data sources and collection process

The textual analysis process was used to explore the current status of private sector participation in forest landscape restoration in Elgeyo Marakwet and Makueni counties. Five broad areas, namely, participation activities, process, impacts, challenges, and achievements of private sector participation, were analyzed for the current status of each county. The process of data evaluation involved several steps. First, the text was read and reread to gain a general understanding of the content. Second, the text was broken down into smaller units of meaning, such as words, phrases, and sentences. Third, the units of meaning were coded based on their relevance to the three thematic areas. Fourth, the codes were categorized based on their similarities and differences. Fifth, the categories were analyzed to identify patterns and themes related to each of the three key thematic areas of sustainability, which include social, economic, and environmental. Finally, the themes were interpreted and used to conclude the current status of community participation in development planning. The key documents consulted, including the type, source, and key findings during the study, are shown in Table 1.

No.	Name of document	Type	Source	Key Findings
1.	Constitution of Kenya, 2010	Policy	Internet	Encourages private sector participation in forest restoration by recognizing environmental rights, promoting public participation, and emphasizing collaborative approaches to forest management.
2.	Public Private Partnership Act, 2013	Policy	Internet	Provides a legal framework that encourages private sector participation in forest restoration by facilitating collaboration, sharing risks, promoting innovation and efficiency, attracting financial resources, and ensuring timely project implementation.
3.	Sessional Paper on Devolved Government Under the Constitution of Kenya, 2010	Policy	Internet	Indirectly promotes private sector participation in forest restoration by empowering county governments, encouraging partnerships, mobilizing resources, creating economic opportunities, and fostering inclusive planning processes at the local level.
4.	County Governments Act, 2012	Policy	Internet	Indirectly promotes private sector participation in forest restoration by decentralizing decision-making, encouraging the development of CIDPs, allowing for partnerships, facilitating resource mobilization, mandating environmental

No.	Name of document	Type	Source	Key Findings
				management, and promoting local economic development at the county level.
5.	Makueni County Integrated Development Plan 2023- 2027	Action plan	Internet	Provides opportunities for private sector involvement in the environment sub-sector.
6.	Makueni County Forest and Landscape Restoration Implementation Plan (FOLAREP) 2023-2030	Action Plan	Internet	Provides opportunities for private sector involvement in the environment sub-sector.
7.	Elgeyo Marakwet County Integrated Development Plan 2023-2027	Action plan	Internet	Provides opportunities for private sector involvement in the environment sub-sector.
8.	Chepsiror (2020)	Research article	University of Nairobi Research Archive	The study examined the impacts of Chebara Dam on a local community in Elgeyo-Marakwet county, Kenya, using qualitative and quantitative methods. While 68% reported social and economic benefits, 81% were unaware of conservation efforts by ELDOWAS, causing dissatisfaction. Only 3% were employed directly, and 6% received irregular water supply. The study suggests a need for continuous community-based plans to share benefits from the dam.
9.	Cherop et al. (2023)	Research article	Google Scholar	The pre-colonial history of Elgeyo Marakwet reveals an agro-pastoral society closely linked to the environment. The introduction of the shamba system in 1941 aimed to utilize local knowledge for sustainable forest resource management. However, the system failed due to mismanagement and abuse. Local communities desire its reintroduction, emphasizing the need for improved governance, transparency, and rules for successful and sustainable operation.
10.	Kibet (2021)	Research article	University of Nairobi Research Archive	This study, conducted in Marakwet East Escarpment, Elgeyo-Marakwet County, explores the impact of forest cover on landslide risk reduction. Analyzing data from 2000 to 2020 reveals a loss of 390.53 ha of forest cover, correlating with increased landslide frequencies. The local community knows the importance of forest cover, but poverty drives deforestation. Recommendations include policy development for forest protection, conservation, and sustainable management.

No.	Name of document	Type	Source	Key Findings
11.	Abuya (2021)	Research article	Maseno University Institutional Repository	This study in Kalawani Location, Makueni County, examines the impact of the Resilience Livelihoods (RELI) program on community response to climate-related shocks. Focusing on drought, the research finds that RELI interventions, including addressing agriculture risks and providing financial services, increased the community's capacity to respond to climate-related challenges. The study emphasizes the need to overcome barriers for sustained resilience building.
12.	Wanjira & Muriuki (2020)	Research article	Status report	The study highlights the evolution of agroforestry research and development in Kenya, emphasizing investments in research, extension services, education, and certification of tree nurseries. It stresses the need for central coordination, education programs, certification of nurseries, institutional frameworks, farmer associations, and climate finance to scale up agroforestry practices for environmental and economic benefits. The collaboration between government ministries, research institutions, universities, and farmers is crucial for the successful implementation and widespread adoption of agroforestry in the country.
13.	Kenya Water Towers Status Report for Elgeyo Hills (2019-2020)	Status report	Internet	The Elgeyo Hills Water Tower, vital for Elgeyo Marakwet County, faces challenges threatening its ecosystem services like water provision, climate regulation, and cultural significance. Increased degradation endangers its capacity to provide essential goods and services. Conservation initiatives and campaigns are crucial for restoration, involving collaborative efforts and implementing recommended measures such as reclaiming encroached areas, rehabilitating degraded zones, promoting alternative livelihoods, and sustainable land management practices. These actions aim to safeguard this critical water source for Lake Victoria and Turkana, drained by Nzoia and Kerio Rivers.

Table 1. Documents reviewed

2.3. Data analysis

The study evaluated the challenges facing the private sector in landscape restoration using the Triple Bottom Line Approach by textual analysis. This approach evaluates challenges across three key dimensions: economic, social, and environmental impacts. A holistic assessment is achieved by scrutinizing the economic viability, social responsibility, and environmental stewardship of private sector initiatives. The analysis goes beyond mere financial considerations, incorporates the broader implications of restoration efforts on communities and ecosystems, and underscores the importance of a balanced and sustainable approach, ensuring that economic gains are achieved without compromising social well-being or environmental integrity. Figure 1 summarizes the conceptual framework developed after the synthesis of the theoretical and empirical findings. Engaging the private sector in landscape restoration encounters multiple challenges. Short-term profit priorities often overshadow a commitment to long-term environmental benefits, while the prolonged timeframe for restoration results conflicts with businesses' preference for quicker returns. Uncertain regulatory environments, marked by ambiguous policies and frequent changes, add hesitancy. Lack of expertise in ecosystems, biodiversity, and sustainable practices hampers participation. Collaboration hurdles with government bodies, NGOs, and local communities hinder effective teamwork. Perceived high risks from climate change uncertainties and market fluctuations discourage involvement. High investment costs and limited understanding of long-term benefits contribute to the private sector's reluctance to embrace landscape restoration initiatives.

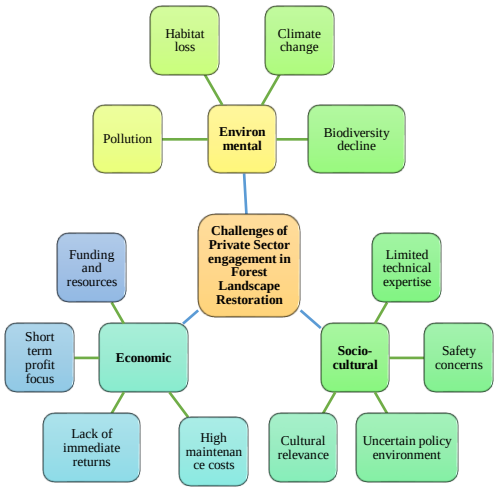

Figure 2. Conceptual framework for challenges facing private sector involvement in forest landscape restoration

3. Results

3.1. Current status of private forestry sector engagement in landscape restoration

3.1.1. Makueni county

Private sector involvement in County landscape restoration focuses on agroforestry, silvopastoral, and plantation forests, comprising 95% of options (Table 2). The emphasis is on enhancing rangeland resilience against climate-induced drought. Key project wards include Nguumo, Makindu, Thange, Ivingoni/Nzambani, and Nguu/Masumba. Private actors, seen as resource mobilizers, operate through the county environment committee. The TWENDE Project, with partners like NDMA, ADSE, IUCN, CI, and SDL, drives involvement. Limited information on participation incentives exists. WRI, with Mastercard Foundation support, funds the planting of 1,200,000 seedlings, with 200,000 already planted.

Broad area	Description
Participation options	The largest opportunity for landscape restoration in the county lies in Agroforestry (44%), Silvopastoral and Rangeland rehabilitation (32%), and Plantation forests (19%); collectively, it accounts for 95% of the restoration options in the county.
Activities	Reducing the cost of climate change-induced drought on the national economy by increasing resilience of the livestock and other land use sectors in restored and effectively governed rangeland ecosystems (FOLAREP 2023-2027).
Restoration sites	The project wards in Makueni are Nguumo, Makindu, Thange, Ivingoni/Nzambani, Nguu/Masumba.
Process	Private sector players are viewed as the resource mobilization actors. Forest landscape restoration is implemented through the county environment committee. Its membership includes six representatives from Private Sector, Development Partners, and PBOs, and representatives from County Departments and Lead Government agencies.
Private actors	The TWENDE Project implemented by the county in collaboration with partners
Incentives for participation	Information on incentives for promoting forest landscape restoration is scarce.
Impacts	WRI, through the Mastercard Foundation, is financing the planting of three and growing 1,200,000 seedlings in five (5) years. So far, more than 200,000 seedlings have been planted in both forestland and farmland.

Table 2. Current status of forest landscape restoration in Makueni County

Private sector involvement in restoring the Elgeyo Hills Water Tower is marked by the United Nations Development Programme (UNDP) engagement. The county government targets climate change by increasing forest cover. Activities include afforestation, reforestation, and community support. The strategy

emphasizes community awareness, education, law enforcement, and rehabilitation, pushing for public-private partnerships to engage wood-dependent companies. Despite progress, specific incentives for private involvement lack clarity in the Sustainable Forest Management and Tree Growing Bill. Implemented interventions include establishing tree nursery beds, planting various seedlings, introducing eco-friendly trees, and showcasing restoration progress.

Broad area	Description
Participation options	The county government had set a target to mitigate climate change impacts by increasing forest cover from 37.04% to 40.6%.
Activities	Afforestation and reforestation and community livelihood support
Restoration sites	Elgeyo-Cherangany Hills ecosystem traverses Elgeyo Marakwet, West Pokot, Trans-Nzoia, and Uasin Gishu Counties. Elgeyo Hills Water Tower is located in Elgeyo Marakwet County and covers an area of 108,194 ha. It encompasses eight (8) gazetted forest blocks: Kaptagat, Kipkabus, Kessup, Kapchorua IV, Tingwa Hills, Tumeiyo, Kapchorua I, and Metkei.
Process	A comprehensive strategy is proposed to address the challenges facing the Elgeyo Hills Water Tower. Firstly, community sensitization and awareness campaigns will be conducted, emphasizing the importance of the Water Tower. Education and training programs will be implemented to empower local communities with the knowledge needed for sustainable practices. Secondly, strict enforcement of laws, enhanced surveillance, and patrols will be employed to curb illegal activities within the Water Tower and ensure proper management of the PELIS program. The reclamation of encroached areas within the gazetted forest is paramount, followed by rehabilitation and reforestation efforts in these restored zones, including planting indigenous trees. Public-private partnerships will be promoted, engaging companies reliant on wood products through initiatives like payment for ecosystem services. Agroforestry will be encouraged to boost tree cover within the Water Tower, providing an alternative income source and mitigating illegal logging. Additionally, alternative livelihood programs such as bamboo farming, beekeeping and adopting alternative energy sources like solar, energy-saving stoves, and micro-hydro-dam power units will be promoted, reducing dependency on forest products. This comprehensive approach aims to ensure the sustainable management and conservation of the Elgeyo Hills Water Tower.
Private actors	United Nations Development Programme (UNDP)
Incentives for participation	The Sustainable Forest Management and Tree Growing Bill establishes a Conservation Council involving indigenous communities to promote community-driven development priorities through public participation. However, the bill does not explicitly state the specific incentives for private sector involvement in restoration.
Impacts	Various interventions were implemented, including establishing 47 tree nursery beds, planting 537,411 assorted exotic tree seedlings, and introducing 10,077 bamboo and other environmentally friendly trees.

Table 1. Current status of forest landscape restoration in Elgeyo Marakwet County

3.2. Key challenges and strategies for landscape restoration

3.2.1. Makueni County

From Table 4, Elgeyo Marakwet's forest landscape restoration faces environmental challenges like low FLR awareness and prolonged droughts, with social issues including limited awareness, political prioritization, poverty, and gender inequalities. Economic hurdles encompass low prioritization, insufficient funds, high costs, corruption, market fluctuations, and unclear benefit-sharing structures. Addressing these requires a comprehensive, collaborative approach to sustainability.

Thematic Area	Challenge
Environmental	▪ Limited/low uptake of information on FLR; ▪ Prolonged droughts; ▪ Uncontrolled land use changes and settlement in sloppy areas disturb the soil structure (Infrastructure that interferes with the hydrology); ▪ Pollution; ▪ Encroachment
Social	▪ Limited awareness of FLR and its benefits that can influence accurate decision-making ▪ The political inclination of most leaders towards prioritization of FLR projects in hotspots ▪ Negative political incitement towards conservation initiatives ▪ High poverty levels lead to high dependency on the land-based sector; ▪ Insufficient information on degradation status and value of forest resources to support proper planning; ▪ Gender inequalities and lack of inclusivity in decision-making ▪ Inequalities in benefit sharing from proceeds of FLR; ▪ Inadequate knowledge of the importance and impacts of FLR among the communities;
Economic	▪ Low prioritization and inadequate budget allocation for FLR; ▪ Insufficient financial resources for restoration of degraded lands; ▪ High cost of FLR activities implementation; ▪ Unpredictable exchange rates ▪ Corruption; ▪ Market fluctuation and failure – unclear valuation for ecosystem services and nature-based products ▪ Lack of clear structures in benefit-sharing

Table 2. Key challenges affecting private sector participation in forest landscape restoration in Makueni County.

3.2.2. Elgeyo Marakwet County

Private sector involvement in forest landscape restoration in Elgeyo Marakwet County encounters challenges in invasive species spread, population pressure causing land degradation, limited youth participation, gaps in legal frameworks, and public knowledge on conservation (Table 5). Inadequate staffing and monitoring systems, communal land tenure issues, funding delays, and a lack of value addition exacerbate the hurdles.

Thematic Area	Challenge
Environmental	▪ The spread of invasive species such as *Prosopis juliflora* (Sw.) DC., Prodr. [A. P. de Candolle] 2: 447 (1825). ▪ Deforestation, forest encroachment, charcoal burning, soil erosion, forest fires, and illegal logging; ▪ The forest cover had decreased to 29.95%. This decline was attributed to technological advancements that refined measurement standards, transitioning from assessing land under cover to precise tree counting.
Social	▪ Population pressure is contributing to land degradation. ▪ Limited youth participation in forest and landscape restoration ▪ Gaps in some existing legal and policy frameworks for the environment sector that lack provisions on forest and landscape restoration ▪ Limited community/public knowledge on environmental protection/conservation. ▪ Inadequate staffing in county government departments, including departments in charge of the environment ▪ Inadequate monitoring and evaluation systems for restoration initiatives at the county level ▪ Communal land tenure systems may be problematic as county governments cannot initiate restoration initiatives or restrict activities on them.
Economic	▪ Limited funding to the environment sector is aggravated by the slow transfer of funds from the exchequer to various county governments. It delays the implementation of programs aligned with landscape restoration. ▪ Limited value addition and product diversification for forest products resulting in more forest destruction

Table 3. Key challenges facing forest landscape restoration in Elgeyo Marakwet County

4. Discussion

Forest landscape restoration through effective private-sector engagement is a key strategy for achieving sustainable forest management outcomes in both developed and developing countries. The private sector drives financial, technological, and innovative solutions, forging a collaborative approach that benefits forest ecosystems and businesses (IUCN Website 2024; Partnership for Forests, 2022; Carrapatoso & Geck 2018). However, the challenges facing

landscape restoration differ between developed and developing countries calling for differentiated initiatives (Cortina-Segarra et al., 2021; Oh et al., 2020). It is behind this backdrop that in a bid to promote forest landscape restoration through private sector involvement, Kenya has deliberately entrenched the private sector's voice in key national development policies and legislation, such as the Forest Conservation and Management Act of 2016, coinciding with the 2010 Constitution (Chisika & Yeom 2023). Recently, the private sector's role has also been recognized in the National Landscape and Ecosystem Restoration Strategy 2023-2032, which seeks to accelerate actions towards the achievement of the 30% national tree cover by 2032 (Chisika & Yeom 2023).

In the quest to promote the private sector's role in forest landscape restoration at the local level, the many devolved units are increasingly developing and adopting forest landscape restoration implementation action plans as the implementation avenues while aligned with Kenya's broader socio-economic development goals. Forest landscape restoration plans are crucial instruments for translating restoration aspirations into tangible, impactful actions that contribute to biodiversity conservation, climate resilience, and sustainable land management. Their development involves a meticulous and participatory process with multiple stages guided by key policies and legislations, especially the County Governments Act of 2012. However, the progress and process of landscape restoration is not uniform across counties. Moreover, with the changing socio-economic matrices, the forest restoration outcomes at county levels have been largely contextual. This paper aimed to use document content analysis in the case of Elgeyo Marakwet and Makueni Counties to explore the current status of private sector involvement in forest restoration and identify challenges to devise strategies for sustainable participation.

When the data analytical approach developed from a literature review was applied to the two case counties, results show that private sector involvement in County landscape restoration primarily focuses on various restoration options. In the case of Makueni, restoration is focused on agroforestry, silvopastoral, and plantation forests, comprising 95% of available options (Table 2). In Makueni, the core objective is enhancing rangeland resilience against climate-induced drought, with targeted project wards including Nguumo, Makindu, Thange, Ivingoni/Nzambani, and Nguu/Masumba. Moreover, private actors, recognized as key resource mobilizers, operate through the county environment committee, with the TWENDE Project playing a prominent role and collaborating with partners like NDMA, ADSE, IUCN, CI, and SDL. While limited information

exists on incentives, WRI, backed by the Mastercard Foundation, funded the planting of 1,200,000 seedlings, with 200,000 already planted.

In contrast, in Elgeyo Marakwet, the private sector involvement engaged the United Nations Development Programme (UNDP), aiming to counter climate change by increasing forest cover through activities like afforestation, reforestation, and community support. The restoration strategy in Elgeyo Marakwet underscores community awareness, education, law enforcement, and rehabilitation, focusing on public-private partnerships engaging wood-dependent companies. However, the Sustainable Forest Management and Tree Growing Bill and other policy documents lack clarity on private-sector incentives that could spur private-sector involvement in forest restoration. Nonetheless, the county has implemented some interventions, including establishing tree nursery beds, planting various seedlings, and introducing eco-friendly trees, showcasing positive strides in forest restoration efforts.

A number of challenges face private sector participation in forest restoration. In Makueni County, forest landscape restoration faces environmental challenges, including low awareness and prolonged droughts, with social issues like limited awareness, political prioritization, poverty, and gender inequalities. Economic hurdles involve low prioritization, insufficient funds, high costs, corruption, market fluctuations, and unclear benefit-sharing structures. Elgeyo Marakwet County encounters challenges in invasive species spread, population pressure, limited youth participation, legal framework gaps, and public knowledge on conservation. Inadequate staffing, communal land tenure issues, funding delays, and a lack of value addition exacerbate the hurdles. These multi-faceted challenges demand a comprehensive and collaborative approach for sustainable solutions in both counties. This finding is consistent with the findings from local studies conducted in Makueni and Elgeyo Marakwet counties and has called for enhancing private sector participation in forest landscape restoration such as and studies such as Chepsiror (2020), Cherop et al. (2023), Kibet (2021) in Elgeyo Marakwet & Abuya (2021) in the case of Makueni County.

However, in this paper's considered opinion, the lack of explicit policy statement on the specific incentives advanced to the private sector, and lack of economic valuation of various forest ecosystems has the greatest impact on their involvement in forest restoration. A clear policy statement delineating specific incentives for private sector involvement and the lack of economic valuation for diverse forest ecosystems pose significant impediments to robust private sector engagement in forest restoration. Private entities may hesitate to invest or actively participate in restoration initiatives without a defined policy framework explicitly

outlining the incentives. Furthermore, the absence of economic valuation mechanisms for different forest ecosystems makes it challenging for the private sector to assess the tangible benefits and potential returns on investment associated with their involvement. These gaps in policy clarity and economic valuation create uncertainties that may hinder the enthusiasm and commitment of the private sector to contribute effectively to forest restoration efforts. Scholars have raised similar concerns in reviewed studies (Flammer et al. 2023; Ding et al. 2017; Löfqvist et al. 2023; Löfqvist & Ghazoul 2019; Cortina-Segarra et al., 2021; Oh et al., 2020).

To successfully embark on the ambitious journey of land restoration and overcome the highlighted challenges, the two county governments require a multi-faceted support system to address the challenges facing the private sector's contribution. Financial and technical resources are paramount, including technical guidance from researchers and national government agencies on restoring diverse degraded areas. Establishing robust legal frameworks is essential for promoting and sustaining restoration initiatives. Given the competing demands on county finances, exploring alternative funding sources, such as collaborations with Civil Society Organizations (CSOs), becomes imperative. Institutional strengthening, through the adequate staffing of environmental management departments, forms a foundational element for effective implementation.

Moreover, conducting Restoration Opportunities Assessment Methodology (ROAM) assessments in counties that have not prepared such restoration opportunities reports, such as Elgeyo Marakwet, will aid in identifying priority areas for restoration, demanding coordinated efforts for addressing these restoration needs together with the private sector. Strengthening private sector participation in forest landscape restoration from the outset in developing County Integrated Development Plans (CIDPs) ensures a collective and inclusive approach. Community awareness and sensitization, coupled with support for Income Generating Activities (IGAs), serve as vital alternatives to land-degrading practices, which could also promote the role of the private sector. In addition, establishing a joint County-level monitoring and evaluation could necessitate the creation of robust legal frameworks and monitoring tools, ensuring the growth and survival of restoration efforts. Additional support includes mapping tree cover baselines at the ward level and establishing a collaborative platform for shared insights and initiatives. This comprehensive backing lays the foundation for successful and sustainable land restoration efforts.

Moreover, facilitating effective knowledge sharing, experience, and learning forms a crucial pillar for the success of land restoration endeavors, fostering a collaborative environment among stakeholders, including the private sector and county governments. Developing and enforcing spatial plans, delineating specific zones for various land uses, contributing to organized and sustainable land management, and harmonizing stakeholder activities in alignment with County Integrated Development Plans (CIDPs), ensuring a cohesive and synergistic approach towards inclusive restoration goals. Furthermore, enhancing research and knowledge management addresses specific gaps and needs identified in counties, providing an informed foundation for targeted and effective restoration strategies. This collaborative and well-coordinated approach sets the stage for a comprehensive and successful land restoration framework.

Various avenues for private sector involvement in agroforestry in Kenya are apparent across different domains. They could be leveraged by Makueni County, which has identified agroforestry as a key restoration intervention in its forest landscape restoration plan. Firstly, private sector entities can collaborate with esteemed research institutions and universities in research and extension, including KEFRI, KALRO, ICRAF, Vi Agroforestry, KFS, and others. This collaboration can span funding research initiatives, providing expertise, and implementing cutting-edge agroforestry practices. In education and training, private sector companies can also engage with universities offering Agroforestry degree programs, supporting research, development, and practical training initiatives. This collaboration has the potential to foster contextually relevant agroforestry innovations and gender-sensitive extension models, aligning with the interests of the private sector.

Moreover, private sector involvement in the certification of tree nurseries is facilitated through partnerships with KEPHIS, KALRO, and KEFRI, allowing companies to invest in certified nurseries and ensure the availability of high-quality germplasm for tree planting. The absence of a specific instrument in the institutional framework for scaling up agroforestry within the government presents a distinct opportunity for private-sector engagement. Companies can advocate for policies and incentives that promote agroforestry, aligning their interests with the national agenda. Collaborating with agroforestry-related associations, particularly those in agriculture, enables private sector entities to contribute to agroforestry extension, value chain development, and financing, aligning with corporate social responsibility goals. Studies scuh as Cortina-Segarra et al., (2021) have called for similar collaborative schemes in the context of Europe. Lastly, private sector involvement in climate finance mechanisms,

such as the Green Climate Fund and Carbon Credit schemes, allows businesses to invest in agroforestry projects, supporting farmers in adopting sustainable practices and contributing to environmental resilience. Moreover, there is a need for an aggressive campaign targeting corporations to implore them to invest in forest landscape restoration. Castro et al., (2021) calls for precision forest restoration which focuses on individual trees success by utilizing ecological knowledge and diverse technologies.

In summary, private sector involvement in forest landscape restoration in Elgeyo Marakwet and Makueni Counties, Kenya, faces diverse challenges including environmental, social, and economic barriers. Overcoming these hurdles requires targeted holistic approaches and collaboration with various stakeholders.

5. Conclusion and Recommendations

In conclusion, this study has highlighted the critical role of the private sector in sustainable forest landscape restoration in Kenya, specifically within the context of County Integrated Development Plans (CIDPs) for 2023-2027. Examining Elgeyo Marakwet and Makueni Counties has revealed distinct status and challenges in private sector engagement in landscape restoration. Despite robust approaches, the lack of explicit policy statements on incentives for the private sector and the lack of total economic valuation of most forest landscapes present a notable obstacle, underscoring the urgency for increased policy re-examination and economic valuation of forest landscapes. Makueni's county emerges with best practices and has developed the county forest landscape restoration plan for fostering sustainable landscape restoration. Recommendations to enhance private sector participation across the two counties include a collaborative and well-coordinated approach to set the stage for a comprehensive and successful land restoration framework targeting policy reviews and conducting the total economic valuation of forest landscapes. Future studies should focus on assessing the effectiveness and impacts of innovative models such as Makueni's FOLAREP in sustaining private sector engagement. The limitation of this study is that there could be some risk related to the subjective nature of interpretation, as different analysts may interpret texts differently, leading to misinterpretations.

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