

Toward Equitable Carbon Markets: Spatial Planning for Climate Justice in Uganda^{1 2}

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Abstract

Introduced by the UN, the carbon trading mechanism aims to balance countries' GHG emissions and decrease CO₂. It allows developed countries to compensate for their excessive emissions by assisting developing countries in boosting their climate resilience. However, offset projects are often criticized for prompting neocolonial practices by promoting land grabbing and overlooking local needs. This research investigates how spatial planning can support more just and effective carbon offsetting with focusing on Uganda's experience. Through policy analysis and comparative case studies, a landscape of project implementation is presented. Findings show that multilevel governance, community involvement, and land-use management are critical to deliver justice. Drawing from Uganda's experience, the study proposes that spatial planning is crucial for aligning global carbon policies with local justice goals.

Keywords: carbon trading systems, environmental justice, climate colonization, spatial planning

1.Introduction

Climate change is one of the most pressing global challenges, and although all countries share responsibility, its impacts are felt unevenly. Particularly, vulnerable regions and communities in the Global South are disproportionately affected (IPCC, 2023). These unequal impacts deepen existing social, economic, and environmental inequalities, raising fundamental questions about who contributed the most, who should act, and who has the resources to do so (Mohai et al., 2009). To address these issues, the United Nations introduced the carbon market mechanism in 1997 within the Kyoto Protocol. However, in its short but intense history, the mechanism has faced serious criticisms. Even though each country operationalized the projects in different ways regarding their own environmental, political, social, and economic contexts (Purdon & Byakagaba, 2022), the negative outcomes of the projects have raised concerns for what costs these projects have been operationalized, and the criticisms included that the mechanism laying the groundwork for neocolonization under the guise of green initiatives (Carton et al., 2020; Enríquez-de-Salamanca, 2024)

Introduced under the Kyoto Protocol in 1997, and later expanded into voluntary markets, carbon trading systems were designed to reduce global greenhouse gas (GHG) emissions by allowing countries or companies to offset their emissions through investments in mitigation projects elsewhere (UNFCCC, 1998; Michaelowa et al., 2019). In theory, these mechanisms were expected to serve both global environmental goals and local development needs. Yet in practice, carbon offset projects have often been criticized for excluding local communities, marginalizing indigenous knowledge, undermining sovereignty over land, and prioritizing market efficiency over social and ecological justice (Bachram, 2004; Gonzalez, 2021; Sultana, 2023).

Among the Global South countries, Uganda is a particularly relevant case study in this context. As one of the Least Developed Countries (LDCs), with high levels of climate vulnerability and a strong reliance on foreign investment, it has emerged as a hotspot for carbon offset initiatives. Uganda is currently the fourth-largest producer of carbon credits in Africa (EAA, 2022), the country's colonial legacy (Gebremichael, 2016), fragmented land tenure system (Fisher, 2012; Fisher et al., 2018), decentralized governance structure (Ojambo, 2012), and institutional weaknesses (Ampaire, et al., 2018; Fisher, 2012; Fisher et al., 2018) complicate the implementation of such projects.

These challenges often lead to uneven outcomes across regions and communities, where some benefit while others are displaced or excluded from decision-making.

1 The title of the proposal was changed from "Geographies of Carbon Trading: Spatial Planning Approaches for Equitable Off-set Projects" to better reflect the focus of the paper.

2 The author used AI-assisted tools to improve the clarity and correctness of the language.

Although traditionally underexplored in climate finance discussions (Bumpus & Liverman, 2008), spatial planning can play a central role in operationalizing more just and effective carbon offset mechanisms (Knuth et al., 2025). Concerned with land management, policy integration, and stakeholder participation, it offers practical tools for navigating these challenges and can help guide land allocation, manage competing interests, and ensure that global climate strategies align with local needs and capabilities (Ay, 2025).

This paper aims to contribute to this discussion on how spatial planning tools can enhance the operationalization of carbon markets by analyzing how carbon offset projects are conducted in Uganda, which has a long history with such kind of mechanism, having both successes and failures. Drawing on policy analysis, a comparative case study of two offset projects, and insights from interviews with local experts, the paper investigates how governance structures, stakeholder dynamics, and land management systems shape project outcomes. The central argument is that spatial planning, if meaningfully integrated, can address many of the criticisms levelled at carbon markets, particularly around governance, inclusivity, and land management.

After this brief introduction, Section 2 sets the context for the subject at stake, introducing carbon markets from a critical standpoint and reflecting on how spatial planning can contribute to bridging the gap with Climate Justice. Then Section 3 explains the methodology implemented in this research, and Section 4 presents the outcomes. The concluding section rounds off the contribution, summarizing its main messages and paving a number of avenues for future research on the matter.

2. Carbon Markets, Justice and Spatial Planning

This section provides a brief overview of carbon markets and the critiques they have sparked in environmental and climate justice debates. Finally, it explores how carbon markets, justice concerns, and spatial planning intersect.

2.1. Carbon Markets

Aiming to balance responsibilities between developed and developing countries, the carbon market mechanism is designed to channel financial resources by converting GHG emissions into tradable units and allowing their exchange. It enables industrialized countries that exceed their annual GHG limits to invest in emission reduction projects elsewhere and, in return, purchase unused emissions allowances (Michaelowa, 2019; EAA, 2022). The main objective is to compensate for environmental damage caused by high-emitting developed countries by supporting mitigation efforts in more vulnerable countries (Bond et al., 2012). The focus of projects varies based on national needs and investor interest (EAA, 2022).



Figure 1 System of Carbon Market Mechanism (Ay, 2025)

Over the years, the mechanism has evolved under the influence of new regulations and market forces. Currently, with one of them cancelled but still having operational projects, there are three different carbon market mechanisms:

Kyoto Protocol's Mechanism

As the initiator of the carbon offset mechanism, the Kyoto Protocol offers two different mechanisms for carbon trading, namely Joint Implementation (JI) and Clean Development Mechanism (CDM). While JI has been mostly operated among developed countries (Annex A), CDM has operated between developed and developing countries (Annex B). These mechanisms were started to be operated in 2005 and they lasted until 2020. During this period of time, CDM has been a preferred mechanism to compensate GHG emissions. In these operational processes,

the main stakeholders that took roles are the UN's Executive Bodies, project developers which is also Investors, the Host's Designated National Authority, and Designated Operational Entities as the third-independent party (Pollack and Wilson, 2009; UNDP, 2015).



Figure 2 CDM's Project phases, governance structure (adapted from Kollmuss et al., 2008)

Voluntary Carbon Market

The voluntary carbon market was created by private market actors as an alternative to the Kyoto Protocol's rigid and complex mechanism in the early 2000s, and still actively used by a wide range of market players ranging from big companies to individuals (Pagop & Savard, 2024). And instead of having strict rules about the countries, projects, and actors, VCM is regulated by a set of rules and frameworks that have been created by organizations. Seven different standards have been most commonly used by the market actors, and they vary based on the project types they usually accept (Kollmuss et al., 2008). Alongside the regulatory flexibility, VCM also allows all the bodies that want to be a part of the mechanism to participate in the market with almost no rules and no regulations (Ahonen et al., 2022; Bumpus and Liverman, 2008). Therefore, even though the stakeholders that take roles in the processes vary, the key actors in the process are project designers and investors; Carbon Standards; and the auditors; and, depending on the host countries' regulations, National and Local Authorities take part in the implementation of the projects (Kollmuss et al., 2008; Streck et al., 2021).

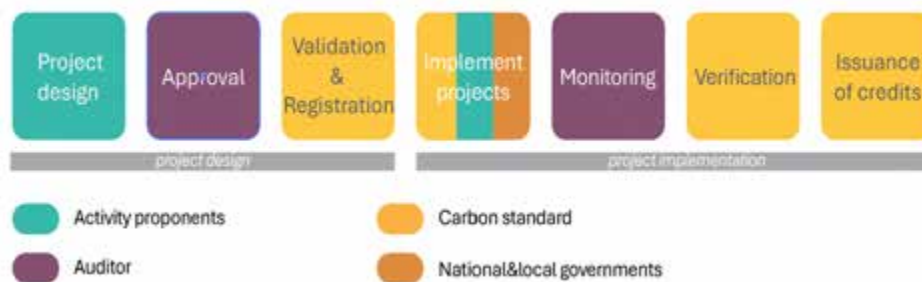


Figure 3 VCM project cycle (adapted from Streck et al., 2021)

Operationalization and Critics

These two mechanisms have been criticized for different aspects. One of the most discussed points about the Kyoto Protocol's carbon trading mechanism is its top-down approach, which starts at the supranational level and rarely reaches local levels. This has led to an oversimplification of national and subnational governance structures, prioritizing market benefits over global environmental objectives (Carton et al., 2020). Alongside that, the complexity of the documents and administrative burden have made the mechanism less accessible, especially for countries with limited institutional capacity. Moreover, the division between "developed" and "developing" countries has deepened existing inequalities, with investment flowing primarily to certain countries while others, particularly in Africa, were left behind (Akrofi, 2024).

As a result, CDM has been criticized for its complicated structure, the decisions it generated, and its failure to

3 As of 2025, the most commonly used Voluntary Carbon Market (VCM) standards include Verra (VCS), Gold Standard, Plan Vivo, Climate Action Reserve (CAR), American Carbon Registry (ACR), and Cercarbono. Project developers select the standard based on the type of project they aim to implement. While Verra, Gold Standard, ACR, CAR, and Cercarbono accept a wide range of greenhouse gas (GHG) reduction projects, Plan Vivo primarily focuses on Land Use, Land-Use Change and Forestry (LULUCF) projects (Kollmuss et al., 2008; Ecosystem Marketplace, 2024).

include or empower critical actors involved in implementation.

On the other hand, while the VCM made the mechanism more accessible by allowing various actors to participate, it has also been criticized for its lack of regulation and oversight, leading to low accountability and transparency (Pagop & Savard, 2024). As project quality declined and questionable credits continued to circulate, many initiatives were eventually labeled as greenwashing, which caused a significant loss of credibility (Oakland Institute, 2017). Overall, both mechanisms have been accused of deepening inequalities and facilitating neocolonial dynamics. While industrialized countries benefited from GHG allowances and market mechanisms, host countries, which are already dealing with internal and global injustices, were left to absorb the negative impacts (Bond et al., 2012; Enríquez-de-Salamanca, 2024). In many cases, these host countries, lacking carbon pricing mechanisms, became suppliers of credits, offering up their natural and social resources in exchange for limited benefits. Meanwhile, investors from developed countries continued to grow economically. The capitalist cycles embedded in the system, and their resemblance to colonial resource extraction, have been widely criticized for reproducing exploitative structures under the guise of environmental solutions (Bumpus & Liverman, 2008; Lahsen, 2009; Oakland Institute, 2017).

2.2. Justice and Colonization Discussion

While carbon markets are often promoted as flexible tools to mitigate climate change, they are also criticized for their role in reinforcing global inequalities. This has given rise to the concept of carbon colonialism, which was introduced to address the negative outcomes of carbon offset projects. These critiques are also directly related to broader debates on climate justice, which emphasize fairness, responsibility, and inclusion, especially for those who are most affected but least responsible.

Debates around responsibility emerged as early as the 1990s, when Agarwal and Narain (1991) coined the term “environmental colonialism.” They argued that developing countries emit less, primarily for basic needs, yet suffer more, while industrialized countries emit more for luxury consumption and are more insulated from climate impacts. The term “carbon colonialism” gained traction in the mid-2000s, initially used by journalists reporting on harmful reforestation projects in Uganda. These initiatives, often led by foreign investors, were developed with little local consultation and led to displacement and ecological harm (World Rainforest Movement, 2000; Bachram, 2004). Since then, the term has been embraced by indigenous and environmental justice movements to describe unequal power dynamics in global climate governance. After that, the term started to be widely used by environmental and social justice organizations, particularly by the indigenous people and local communities (Bachram, 2004).

Aiming to call attention to these uneven distributions and responsibilities of climate change impacts, the concept of Climate Justice has started to be discussed. The concept questions the core reasons for the inequalities, including capitalist and neoliberal policies, overextraction of natural resources, and dependency on nonrenewable sources (Sultana, 2022). Rather than focusing only on local issues, the concept spans across scales and geographies, and questions the global inequalities, particularly looking at the vulnerable communities and how they experience adverse impacts of climate change (Okereke and Coventry, 2016; Sultana, 2023; Tramel, 2016).

2.3. Bridging Climate Justice, Carbon Markets, and Spatial Planning

While carbon markets are accepted as flexible tools for reaching global climate goals and balancing the impacts of climate change, their implementation on the ground reveals spatial and social inequalities. Given the deeply political and geographical nature of these mechanisms, carbon offset projects can produce a wide range of outcomes for both the local environment and affected communities. And as growing practices, these outcomes have been widely explored within economics and geography, yet there remains a notable gap in the spatial planning discourse (While, 2008; Bumpus and Liverman, 2008; Knuth et al., 2025). Considering the multilevel nature of governance, the multi-actor structure of climate projects, and their direct implications for land use, spatial planning has much to offer in understanding and addressing the uneven outcomes of carbon markets. This section examines how the operationalization of carbon markets causes injustices, and how spatial planning tools can support more equitable and inclusive solutions.

In particular, Land Use, Land Use Change and Forestry (LULUCF) projects have triggered critical discussions about justice in their implementation. While aimed at restoring degraded lands through reforestation and afforestation,

many of these projects have capitalized on low land prices in the Global South, resulting in the displacement of local communities and the exploitation of natural resources, often with minimal or no benefits for the inhabitants (Bond et al., 2012; Gonzalez, 2021; Carton et al., 2020; Vieira & Bauer, 2023). As a result, the mechanism has been criticized as a new form of imperialism that uses the resources of developing countries to generate emission allowances for developed ones (Vieira & Bauer, 2023). While industrialized countries profit from offset credits, local communities are left to bear the environmental and social burdens. Bumpus and Liverman (2008) describe this phenomenon as “accumulation by dispossession,” highlighting how carbon markets can reproduce historical patterns of inequality.

To address these challenges, scholars have emphasized three key areas. First, the complex governance structure, spanning from supranational to local levels, requires more coherent, multilevel policy design with a holistic perspective (Benites-Lazaro & Mello-Théry, 2019; While, 2008; Fogel, 2004). Second, meaningful stakeholder engagement across scales is essential to ensure that the diverse needs, knowledge, and rights of communities are included, thus supporting fairness and equity (Bond et al., 2012; Tramel, 2016; Michaelowa et al., 2019). Third, careful project siting that aligns with local needs and ecological realities is critical to avoid reinforcing spatial injustices (Cavanagh et al., 2017; Carton et al., 2020).

Carbon markets have been widely criticized for reinforcing spatial and social inequalities through top-down decision-making, poor stakeholder inclusion, and ecologically insensitive siting. These concerns are central to the climate justice discourse, which emphasizes not only who contributes to emissions, but also who suffers the consequences and who participates in shaping solutions. As a discipline concerned with governance, coordination, and land use, spatial planning holds practical tools that can help operationalize climate justice. By integrating spatial planning into carbon offset governance, it is possible to move toward more inclusive, equitable, and place-sensitive outcomes.

3. Methodology

The methodology for this research includes an iterative process of desk research and interviews that takes their basis form of qualitative approaches. Firstly, desk research has been conducted to set the background for the Ugandan context through their history, environment, and social characteristics.

Following that, policy analysis has been conducted to understand how legal frameworks set the ground for carbon markets, and how the relationship between environmental management and carbon offset projects has been formed. Thirty-nine policy frameworks that are related to spatial organization (11), environmental management and climate change (19), and their implementation (9) were selected for the content analysis. Before operating the analysis, the key terms that are important in the carbon market and urban planning fields have been selected, and they are expanded based on the terminology used in the policy frameworks. Ultimately, the content analysis was conducted with forty-two keywords under eight main topics, including the UN, international agreements, climate finance, carbon credits and markets, inclusivity, local governments, low carbon development, and sectoral terms. In addition, relevant grey and peer-reviewed literature was reviewed to further understand the policy formulation and implementation environment at the national and district levels.

Thirdly, two contradictory case studies have been examined to understand the ways the policy frameworks have been reflected in the operationalization processes of the projects. While the first case study, the Kachung Forest Project (KFP), is an initiative run by foreign stakeholders with a top-down approach, the second case study, Trees for Global Benefits (TGB), is a grassroots project led by a local NGO with a bottom-up approach. These two case studies standing as poignant examples of carbon market operationalization processes with their management styles, and environmental and social outcomes. The differences between top-down and bottom-up approaches caused to while reflected themselves in the outcomes of the project with being called as “market failure” and “best example of the practice”. In order to compare two case studies, firstly, the project management processes examined by looking at stakeholders, the legal frameworks projects relied on, site selection procedure; then implementation and operation processes have been researched through land use and zoning management, plantation procedure, and participatory approach in these operations; lastly, the social, environmental and political outcomes have been compared.

Lastly, aiming to understand the implementation processes better, experts and researchers are interviewed in order to have a broader insight. Nine people from international, national, and local institutions and universities, with different affiliations, have been contacted, including UN representatives, high-level officers from the ministries and municipalities, and researchers from universities and research institutions. The interviewees are selected from the climate change and land management departments of the institutions while the researchers are contacted based on their focuses. After that, snowball sampling has been used to by targeting the practitioners in the fields. The interviews are conducted online in a semi-structured way. Before the interviews, all participants were informed about the purpose of the research, their consent was taken with ensuring their confidentiality would be strictly maintained. Regarding the geographical distance and language barriers, any representative from the local communities could not be reached out to, however, their perspective towards the projects has been added to the research through secondary data from the existing literature. The interviews are used to complement the findings of the research and present a general overview of the operationalization processes.

Through a four-step methodology; desk research, policy analysis, comparative case studies, and interviews; this research aims to present a broader perspective on the operationalization of carbon offset projects. By starting with the historical and natural context, Uganda serves as a key case to understand how environmental justice and injustice manifest through policymaking, project management, and community engagement. The multilayered structure of carbon market projects, from the supranational to the local level, is explored through policy integration, implementation practices, and expert perspectives. This methodological approach lays the groundwork for discussing how spatial planning can contribute to the field through three key tools: multilevel governance and policymaking, community engagement, and land management and tenure.

4. Operationalizing Carbon Markets in Uganda

Uganda, like many African countries, has become a hotspot for GHG emission reduction projects due to its vast natural and degraded areas, institutional weaknesses (Bond et al., 2012; Pagop & Savar, 2024), and high climate vulnerability (Trisos et al., 2022). As one of the LDCs, Uganda has increasingly attracted carbon market investments intended to strengthen climate resilience. Given the need for investment and the conditions that facilitate project management, Uganda became the fourth-largest carbon credit producer in Africa (EAA, 2022). Understanding the implementation of carbon offset projects in Uganda requires attention to three interrelated dimensions: its colonial legacy, land tenure complexity, and institutional structure.

The colonial period and its legacies still impact Uganda's legislative system and land management practices. Historically, land in Uganda was communally owned by tribal systems. After the declaration of the British protectorate in 1894, which lasted for 68 years, private land ownership was introduced through the mailo system, under which land was owned by a single individual or group, and inhabitants became tenants without formal agreements (Tukahirwa, 2002). Colonial authorities also appointed chiefs to manage rural communities, a practice that laid the groundwork for today's decentralized governance system (Ojambo, 2012). Coupled with an easily exploited land tenure system and fragmented decentralization, colonization planted the first seeds of Uganda's current challenges.

Even though the colonial period ended in 1962, its legacies persist. The land tenure system still includes mailo along with three other types: customary (communal ownership), leasehold (limited-time rental), and freehold (unlimited ownership) (UN-Habitat, 2007). Over time, even though local groups and families gained some recognition, tenure insecurity remains widespread (UN-Habitat, 2007). Similarly, the decentralized system, though promoted by the government as a way to involve local communities in decision-making, has been criticized for weak coordination, political interference, and high levels of corruption (Friis-Hansen et al., 2013; Ampaire et al., 2018; Ojambo, 2012).

Alongside these governance issues, Uganda's land cover has further attracted carbon market interest. Agricultural land comprises 44.5% of the country's territory and is the main source of income (MLHUD, 2017), but it is also a key driver of deforestation. Although forests cover 32% of the land (MWLE, 2001), forest areas are shrinking due to expanding agriculture, urban growth, and overharvesting (MWLE, 2001). Colonial overexploitation of forest resources has also contributed to long-term environmental degradation (RoU, 2007; Oosterveet & van Vliet, 2010). Combined with increasingly frequent extreme weather events and climate-related disasters, the country's vulnerability continues to grow (MAAIF, 2018).

Taking all these facts into account, Uganda's administrative and policy design structure in spatial planning reveals a complex system. The planning scheme is divided into national and local levels, with each producing its own legally binding documents. While local authorities are responsible for preparing their own plans, they must align with directives from the national level (MLHUD, 2017; NPA, 2014). Uganda's decentralized system, which dates back to colonial times, aims to empower local governments and communities through hierarchical governance structures (Oosterveet & van Vliet, 2010; Ojambo, 2012). However, despite the apparent autonomy of local governments, their actual capacity is limited due to insufficient human resources and institutional weaknesses. Interviews with officials emphasized the shortage of skilled personnel needed for spatial planning at the district and sub-county levels (Int8, Int9). Moreover, Uganda's classification as one of the LDCs with high vulnerability to climate change allows for considerable influence from the UN and its agencies. This influence predominantly shapes national-level frameworks, but their implementation often remains weak at the local level, leading to inconsistencies and disjointed planning practices (Oosterveet & van Vliet, 2010; MWE, 2024).



Figure 4 institutional organization for spatial planning and plan types and levels (adapted from NPA, 2007; NPA, n.d.)

In this context, carbon markets appear to be a tempting instrument for building both climate resilience and economic development with posing challenges in the implementation processes. Uganda's combination of ecological potential, foreign investment needs, and governance weaknesses makes it a prime site for project developers. However, the same combination raises critical questions about justice in how these projects are implemented. In the following sections, Uganda's carbon market operationalization will be explored through a policy framework analysis and a comparative case study of two offset projects.

4.1. Policy frameworks

Uganda began enacting climate change-related policy frameworks after becoming a signatory to the UNFCCC in 1993. Since then, the country has adopted a number of frameworks aimed at environmental protection and land management. During the late 1990s, the Government initiated reform to replace colonial-era legislation, starting with the land and environment management-related policies. In 1995, the National Environment Act, in 1997, the Local Government Act, and in 1998, the Land Act were decreed to make the groundwork for future environment management and nature protection. These laws laid the institutional foundation for environmental governance and decentralized planning. The National Land Use Policy (2006) further established a formalized planning structure, reinforcing land resource protection and land use management.

In 2007, following UN requirements for Least Developed Countries (LDCs), Uganda adopted the National Adaptation Programs of Action (NAPA) to have a guideline for coping with climate change impacts with particular focus on managing degraded areas and drought. Tree planting and benefitting from indigenous knowledge and integrating climate resilience into development plans were among the proposed solutions (RoU, 2007).

NAPA marked a turning point by introducing a holistic and decentralized governance model, encouraging participation from multiple actors—particularly local communities, in climate response initiatives (Nyasimi et al., 2016; Ampaire et al., 2017).

In 2013, the Government of Uganda released Vision 2040, which shows the main path for the country's development for the next 25 years, and the following policy documents were prepared accordingly. This was followed by the National Climate Change Policy (NCCC) in 2015, which was the first climate change-focused policy framework and the cornerstone to implement projects for coping with climate change impacts. The policy frameworks emphasize the importance of international agreements and mention carbon markets for the first time in the policy frameworks (RoU, 2014; MWE, 2015). In the following years, the National Development Plan II of 2015, Green Growth Strategy of 2017, National Development Plan III of 2020, and lastly Nationally Determined Contributions (NDC) of 2022 have been prepared with taking basis from Vision 2040 and NCCC, and they prioritized sustainable development with integrating the objectives of international frameworks into their agendas while also taking into account the needs of the country. In these policy frameworks, carbon market projects have been mentioned as a tool to support development of the country (NPA, 2010; 2013; MWE, 2015). The NDC, in particular, functions as an umbrella framework for all former policy frameworks and defines a clear pathway for the country to adapt to climate change impacts. In this document, carbon market has been mentioned as one of the ways to “reach a climate-resilient and low-carbon society by 2050 that is prosperous and inclusive” (NDC, 2022, p. 15). Within this document, the LULUCF sector is prioritized, with focus areas including climate-smart agriculture, REDD+ projects, agro-industry, forest restoration, and energy efficiency.

Uganda's post-colonial policy trajectory reflects a genuine effort to build cross-sectoral, forward-looking frameworks for sustainable development and environmental resilience. Starting with Vision 2040, national policies have increasingly combined land management, environmental protection, and climate adaptation. National Development Plans have become key vehicles for implementing these objectives. Allied with recently decreed and upcoming policy frameworks, NDC acts as a connector between different policy frameworks and sectoral plans that focus on climate change actions to strengthen the country's climate resilience.

Despite this progress, significant gaps remain in the operationalization of these frameworks. Firstly, institutional structure and policy frameworks' implementation pose challenged in the country. Given the decentralized structure of the government, operationalizing the policy frameworks is a shared responsibility between different levels, and local communities are a key plank in the process with being custodians of nature, (Oosterveet and van Vliet, 2010). yet their inclusion in actual decision-making remains inconsistent. While roles and responsibilities are clearly defined in principle (Oosterveet & van Vliet, 2010; Lubega, 2019), in practice, the influence of international agreements and elite stakeholders has resulted in top-down policy design that frequently overlooks local priorities (Friis-Hansen et al., 2013; Ampaire et al., 2017).

Secondly, the multiple stakeholder structure in the policy design lays the groundwork for conflicts of interest. Given the high level of corruption in the country, coupled with the decentralized system, the decision has been made with a bias in support of the ideas of powerful stakeholders (Ampaire, et al., 2018; Ojamba, 2018). During implementation, the proliferation of overlapping policies often causes confusion at the district level, where capacity and resources for enforcement are limited (Atakunda, 2020).

All these conditions make policy implementation challenging, particularly on the local level. The policies that have been designed on the national level fall short for finding reflecting the local levels, especially when it comes to climate change-related policies (Friis-Hansen et al., 2013).

Most critically, even though the country has been operationalizing carbon projects for more than 20 years, there is still no policy framework that focuses just on the procedural side of the mechanism. Although carbon markets are referenced as a climate financing tool and resilience strategy in national policy documents, there are no clear guidelines for project development, approval, monitoring, or spatial allocation. Interview respondents noted that various ministries are currently working on carbon pricing and offset regulation frameworks (Int4, Int9), yet the date for formal adoption remains unclear (Int4). As a result, even after two decades of carbon project activity, Uganda continues to operate without a cohesive framework to govern the institutional, spatial, and social dimensions of the carbon offset mechanism.

4.2. Comparative case studies

Aiming to represent how the operationalization processes of carbon market projects in the Ugandan context, two contradictory case studies have been elucidated. The first, the KFP, is widely regarded as a top-down, externally driven initiative. The second, TGB, is often cited as a grassroots, participatory model. Together, they illustrate the diversity of governance structures and outcomes in Uganda's carbon market landscape.

KFP was initiated under the framework of Kyoto Protocol projects as a reforestation activity on degraded savannah land in 2006, through a collaboration between companies from Norway and Sweden. The project has been operated on land leased from the National Forest Authority, which was formerly classified as savannah land. However, its top-down implementation, land selection process, lack of inclusivity, and overall operationalization have been widely criticized, and the project has been described by scholars as a market failure (Oakland Institute, 2014, 2017, 2019; Carton & Edstedt, 2021). Although the project involved multiple stakeholders, including the UN, international actors, and government ministries, it excluded local authorities and communities from the decision-making process. To implement the project, local communities were displaced and lost access to their lands. The project site was fenced off, and entry was strictly controlled (Gebremichael, 2016; Edstedt, 2017; Carton & Edstedt, 2021). Furthermore, while the project had promised to create job opportunities and support biodiversity, its single-species plantation approach harmed biodiversity (Oakland Institute, 2014, 2019; Edstedt, 2017), and the limited employment options left many people in poverty (Edstedt, 2017; Oakland Institute, 2017, 2019). Some reports claim that the project brought economic benefits to the country by attracting foreign investment (Gebremichael, 2016; PDD, 2012; Edstedt, 2017), and argue that it displaced informal inhabitants rather than evicting formal residents (Oakland Institute, 2019; Edstedt, 2017; Carton & Edstedt, 2021). However, overall, the project has been widely criticized for the negative social and environmental outcomes it produced.

In contrast, TGB has been recognized as one of the strongest examples of carbon market projects in Uganda, thanks to its bottom-up approach and its positive impacts across environmental, social, economic, and policy domains. The project was initiated by a local NGO, EcoTrust, to reverse deforestation in vulnerable areas and support nature protection. TGB participants—mostly small-scale landholders—are paid based on the number of trees they plant on their land, which are then sold on the global carbon market ("Trees for Global Benefit", n.d.). The project began in a region of the country affected by frequent landslides, and over time, it has expanded with support from the UN and other international organizations such as the World Bank, WWF, and IIED (EcoTrust, 2013; 2020; Lee et al., 2016; Schreckenberg et al., 2013). Given the grassroots nature of the initiative, project design and management included local perspectives from the beginning. During implementation, regular meetings were held with community members, and land use and zoning plans were developed collaboratively (EcoTrust, 2020; Schreckenberg et al., 2013). As a result, the project has contributed to environmental protection by enhancing biodiversity, while also generating alternative income sources for participants. Additional benefits, such as improved social infrastructure, have supported better living conditions for local communities. In some districts, the project has even been incorporated into policy agendas as part of broader strategies for sustainable development (EcoTrust, 2024; Schreckenberg et al., 2013; Int9).

In conclusion, these two case studies demonstrate that carbon market projects are more likely to succeed and deliver justice when they are built on inclusive governance structures, active community engagement, and context-sensitive land use planning.

5. Discussion

Ugandan case study shows that the relationship between environmental justice, sustainable development, and spatial planning is highly connected, and in order to reach the optimum level, policy making and governance, stakeholder management and land management are crucial.

Even though numerous laws, regulations and other policy frameworks have been accepted, the country still lacks regulation about carbon pricing and carbon markets, which poses a big challenge for the management of existing and upcoming projects. Lack of integration between the policy framework and deficiencies for policy frameworks' reflection on the local levels are keystones in the governmental aspects, as well as, the weak institutional structure and lack of human capacity and financial support. Moreover, in the implementation processes of the projects, the decentralized structure of the government also held the country back from more efficient operationalization processes. The confusion created by the various policy frameworks, and lack of

guidelines for the local governments causes various practices that end differently at the local level, which in some cases worsen the injustices. In these terms, the urgent need for newly-baked policy frameworks for carbon pricing and operating carbon markets have been highlighted by the all respondents.

Moreover, the participation of different stakeholders have also been a problem in the operationalization processes of carbon market projects. Given the market-based nature of the system, while the market actors (project developers, investors, and so on) are superior in the processes, the governmental bodies and local communities are excluded. The projects show that even though the governmental authorities might be involved in the projects' management, it is very limited. Despite the fact that the local communities are the main groups that know the local characteristics best, excluding them from the processes affecting not only their well-being but also causes missing opportunities to conduct projects better. And enhancing community engagement in the project design processes and strengthening collaboration with governmental bodies can be one of the solutions for better operationalization processes (Oosterveet and van Vliet, 2010). And, one of the reasons the projects lack inclusivity is the gap in the policy frameworks regarding the participatory approaches for the implementation of the projects.

Another important aspect for the operationalization of the projects is land management. Firstly, the land tenure system puts people's property in jeopardy since they do not have any formal ownership on the land, people were evicted from the places they lived for years (Edstedt, 2017) or they had to accept the projects' land use plan without consent (Edstedt and Carton, 2018; Oakland Institute, 2014;2017). Moving further from plot-based injustices, the lack of a planning mechanism also caused problems on different levels. Firstly, given the country's inefficient physical planning mechanism, the projects' locational distribution is not organized. And this situation deepens already existing inequalities between the regions (Fisher, 2012; Edstedt and Carton, 2018; Oakland Institute, 2014; 2017). Secondly, local development plans are either have not been prepared yet or have not integrated the carbon trading mechanism into their agenda. Therefore, the location of the projects is still mostly dominated by the market actors, rather than local experts and practitioners (Int3; Int8; Int9).

In these whole processes, as a part of the institutional organization and mechanism, the lack of land management and spatial planning mechanisms impact how the projects have been implemented. The cycle of capital accumulation enabled by carbon trading mechanisms—often intensified by neoliberal environmental policies—has been widely critiqued in the literature for exacerbating spatial and social inequalities (Bumpus & Liverman, 2008; Bachram, 2004; Carton et al., 2020). These markets reshape social and economic geographies through capital accumulation and spatial impacts (Bond et al., 2012; Bumpus & Liverman, 2008), aligning them closely with spatial planning discourse. Literature highlights that the most criticized aspects of carbon market operationalization include policy design (Bachram, 2004; Fogel, 2004; Michaelowa et al., 2019; Carton et al., 2020), stakeholder engagement (Fogel, 2004; Tramel, 2016), and project siting (While, 2008; Gonzalez, 2021)—all of which fall within the domain of spatial planning.

These problems are also clearly visible in the Ugandan context. The weak administrative organization, incoherence between policy frameworks, exclusion of communities, and underdeveloped land management systems have emerged as the most pressing challenges. Interviewees confirmed that these gaps significantly hinder the operationalization of carbon market projects. One of the main problems identified was the lack of alignment between existing laws and frameworks, which creates institutional confusion and leads to uncoordinated implementation across different administrative levels. Officials noted that although multiple policies exist, there are no clear procedural guidelines or coordination mechanisms that explain how carbon offset projects should be executed, monitored, or managed spatially. In addition, stakeholder participation, especially that of local communities, was seen as more symbolic than practical. Although consultation is often mentioned in project proposals and policies, in reality, communities are rarely involved in project planning or benefit-sharing decisions. This exclusion not only affects community wellbeing but also limits the long-term sustainability of the projects.

Despite these challenges, many interviewees expressed optimism about the role of spatial planning in improving project implementation.

They emphasized that integrating planning tools into carbon market mechanisms could support fairer land use decisions, better regional coordination, and more transparent governance. In their view, spatial planning can act as a bridge between global climate agendas and local needs by helping to direct projects to suitable locations, supporting land tenure clarity, and strengthening communication between institutions and communities.

Addressing environmental injustice requires complex policy-making across local, national, and global levels, particularly in systems involving multilevel governance and multiple stakeholders, such as carbon markets (Mohai et al., 2009; Bond et al., 2012). Spatial planning can enhance equity in carbon market implementation through three key contributions. First, its role in multilevel policy-making enables the integration of supranational frameworks into national and local governance. Second, as “knowledge keepers” (Janin Rivolin, 2012), planners can support inclusive stakeholder engagement by bridging knowledge gaps and facilitating dialogue across levels. Third, land use management and zoning, which is core spatial planning functions, can guide more just project siting and land allocation.

Given the alignment between carbon market challenges and spatial planning capacities, integrating spatial planners into climate finance governance could lead to more effective and equitable outcomes. This is particularly important in contexts where capacity-building and coordination are lacking (Okereke & Coventry, 2016). As supported by interview findings from Uganda, spatial planning can support implementation at national, regional, and local levels by directing project siting, enhancing institutional mechanisms, and connecting local stakeholders with decision-makers.

6. Conclusion

This paper has explored how carbon market mechanisms are operationalized in Uganda and what justice-related implications emerge in the process. Although carbon markets, particularly those introduced through the Kyoto Protocol and later through Voluntary Carbon Markets, are framed as tools to mitigate climate change and mobilize finance for climate-vulnerable countries, their implementation reveals a more complex and often problematic reality. Uganda, with its vast natural resources, decentralized political structure, and postcolonial legacies, offers a particularly illustrative case of how such mechanisms unfold on the ground.

The analysis has shown that the challenges in Uganda are not merely technical but deeply embedded in structural and governance-related issues. Fragmented policy frameworks, institutional weaknesses, and the absence of a regulatory structure specific to carbon markets have contributed to inconsistencies in project management and limited local benefits. Furthermore, land tenure insecurity and the weak spatial planning system have made it easier for private actors to access land for offset projects, often at the expense of local communities. Despite the existence of national policies that call for decentralization and public participation, these principles are not effectively practiced in carbon project governance.

The comparative case studies further illustrate this point. The Kachung Forest Project exemplifies how exclusionary, top-down approaches can lead to negative social and ecological outcomes, including displacement, biodiversity loss, and lack of community benefits. In contrast, the Trees for Global Benefit project demonstrates the potential of locally driven, participatory models to deliver positive environmental and socio-economic results, particularly when grounded in community engagement and collaborative land use planning.

These findings support broader critiques in the literature that argue carbon markets, in their current form, risk reproducing patterns of inequality and exploitation, often referred to as “carbon colonialism.” As the interviews in this research confirmed, the lack of regulatory guidance, professional capacity, and coordination between national and local authorities only amplifies these risks.

Spatial planning, however, holds significant yet underexplored potential in addressing these issues. By facilitating multilevel coordination, guiding land allocation, and promoting inclusive governance, spatial planning can serve as a practical tool to operationalize climate justice on the ground. It can help ensure that carbon offset projects are not only technically sound but also socially equitable and locally responsive.

Looking ahead, integrating climate finance into spatial planning discourse, and particularly into carbon offset governance, could be a step toward bridging the gap between global climate goals and local realities. For Uganda

and other countries with similar vulnerabilities, doing so is not only a matter of efficiency but one of justice. Future climate action must not only aim to reduce emissions but also to challenge and transform the unequal structures that shape who benefits, who decides, and who bears the costs.

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