



**Politecnico
di Torino**

Master's degree programme in
**Territorial, Urban, Environmental
and Landscape Planning**
Curriculum: Planning for the Global Urban Agenda

Master Thesis
**Geographies of Carbon Trading:
Spatial Planning Strategies for Equitable Offset
Projects**

Supervisors

Prof. Giancarlo Cotella
Asst. Prof. Erblin Berisha

Candidate

Cemre Betul Ay

Academic Year 2024/2025

Abstract

Environmental justice and neocolonial practices are deeply intertwined with the historical resource exploitation and ongoing inequities that take their roots from the global environmental challenges. As one of the contemporary challenges all countries suffer from, climate change is an urgent challenge of our time, causing disproportionate harm to both nature and human lives (IPCC, 2023). Aiming to overcome these inequalities, the United Nations (UN) introduced several frameworks, principles, and tools, and the carbon market mechanism is one of them.

Carbon accounting mechanism is a financial tool that aims to balance the carbon emission of countries and compensate severe impacts of climate change on developing countries by channeling climate finance to help them implement adaptation and mitigation projects. The mechanism was introduced by the Kyoto Protocol, expanded through the private market actors, and recently advanced with the Paris Agreement's Article 6. Even though the projects provided social and economic benefits for the developing countries by channeling foreign investment to their countries, on the flip side, considering their market-based nature, the carbon offset projects also have been criticized for perpetuating inequalities, having the risk of neocolonialism, and excluding local communities.

Aiming to provide a comprehensive understanding of carbon trading mechanisms, this research examines the context of Uganda. With favorable bureaucratic processes that are influenced by its colonial legacy and conducive natural environment, Uganda has become a hotspot for carbon trading projects over the last 20 years. In order to understand the operationalization processes, three different methodologies have been employed. Firstly, policy analysis has been conducted to understand how carbon markets have been integrated into land and environment management policies and spatial planning documents. Secondly, two contrasting case studies have been examined: the Kachung Forest Project (KFP) and the Trees for Global Benefits (TGB) Project. While the former is a top-down approach from supranational levels, the latter is considered a grassroots activity initiated by a local NGO, and their comparison presents vastly different outcomes of two different approaches. Lastly, semi-structured interviews are conducted with experts and researchers to understand the operationalization processes better.

Drawing the lessons from the Ugandan experiences, this research examines how spatial planning tools can enhance the operationalization of carbon markets to deliver environmental justice and avoid colonial practices. The findings highlight the importance of policy-making processes on the multilevel structure, the need for inclusive stakeholder participation, and equitable land use policies.

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

Table of Content

Abstract	i
Table of Content	ii
Acknowledgments	vi
Abbreviations	vii
1. Introduction	9
1.1. Research Hypotheses and Objectives.....	10
1.2. Research Question.....	11
1.3. Structure of the Research & Roadmap for the Reader.....	12
2. Setting the Context: Justice, Carbon Market, and Planning.....	13
2.1. Ecological and Spatial Concepts in Justice and Colonization.....	13
2.1.1. Justice-based Concepts	14
2.1.2. Land Grabbing and Neo-colonization Through Climate Initiatives	18
2.1.3. Justice and Colonization Discussion in the UN Frameworks	22
2.2. Climate Finance and Carbon Pricing.....	26
2.2.1. Carbon Credit Mechanism and its Historical Development.....	27
2.2.1.1. Initiation of Carbon Market: Kyoto Protocol	28
2.2.1.2. Voluntary Carbon Market	36
2.2.1.3. Paris Agreement’s Article 6.....	42
2.2.2. Carbon Markets from the Past to the Future	46
2.3. Carbon Markets in Spatial Planning Discourse.....	51
2.3.1. The Political Geography of Carbon Markets and Spatial Implications.....	52
2.3.2. Critical Aspects of Carbon Market’s Operationalizations	54
2.3.2.1. Multi-level Structure and Policy Design	55
2.3.2.2. Stakeholder Engagement	58
2.3.2.3. Land use Changes and Zoning Management.....	60
2.3.3. Justice in Carbon Market Operationalizations and Spatial Planning	66
3. Methodology	69
3.1. Research Design	69
3.2. Data Collection	70
3.3. Data Analysis.....	71
3.4. Scope and Limitations	73

4.	Operationalization of the Carbon Market in Uganda.....	75
4.1.	Climate Change, Vulnerability, and Carbon Markets in Africa.....	75
4.2.	Background Information About Uganda	77
4.3.	Institutional Organization and Policy Frameworks.....	85
4.3.1.	Administrative Structure	86
4.3.1.1.	Institutional Organization for Environmental Management.....	87
4.3.1.2.	Institutional Organization for Climate Change Actions	89
4.3.2.	Policy Frameworks	91
4.3.2.1.	Policies on Land Management and Spatial Planning.....	91
4.3.2.2.	Policies on Environmental Management & Climate Change	94
4.3.2.3.	Carbon Markets in Planning Policies	98
4.3.3.	Implementation of Policy Frameworks	100
4.4.	Case Studies	102
4.4.1.	Top-Down Approaches: Kachung Forestation Project, Uganda.....	104
4.4.1.1.	Foundations and Frameworks	105
4.4.1.2.	Implementation and Operations.....	106
4.4.1.3.	Outcomes.....	111
4.4.1.4.	Challenges.....	115
4.4.2.	Grassroot Activities: Trees for Global Benefits (TGB).....	117
4.4.2.1.	Foundations and Frameworks	117
4.4.2.2.	Implementation and Operations.....	120
4.4.2.3.	Outcomes.....	126
4.4.2.4.	Challenges.....	130
4.5.	Findings.....	132
4.5.1.	Policy Making and Governance	133
4.5.2.	Stakeholder Management	137
4.5.3.	Land Management	141
4.5.4.	Justice in the Implementation Processes and Spatial Organization	143
4.5.5.	Concluding remarks	147
5.	Discussion	149
5.1.	Justice and Neocolonization in the Climate Change Discourse	149
5.2.	Carbon Markets and their Operationalization	150

5.3.	Policy design on different levels.....	152
5.4.	Stakeholder Engagement.....	153
5.5.	Land use management and activities.....	154
5.6.	Justice and Sustainable Development in Carbon Market Projects	155
5.7.	Role of Spatial Planning and Spatial Planners	156
6.	Conclusion	158
6.1.	Summary of the Results.....	159
6.2.	Broader Implications	160
6.3.	Limits of the Research and Future Perspectives.....	161
8.	References.....	162
9.	Annex	179

*“Only when the last tree has been cut down,
the last fish been caught, and the last stream
poisoned, will we realize we cannot eat
money”.*

- *Cree Indian Proverb*

Acknowledgments

This work would not be possible without the support and contribution of many people:

Firstly, I would like to express my deep and profound gratitude to my supervisors, Prof. Giancarlo Cotella and Asst. Prof. Erblin Berisha, for their patience, understanding, unwavering support, and guidance. There are no words that can express my gratefulness for their encouragement and confidence in my abilities throughout this journey;

Secondly, I would like to express sincere appreciation to all the respondents and informants, for their time, interest, and shared knowledge of this research even though we are in different parts of the world and different time zones. In particular, I am deeply grateful to Anywar Decimon for his invaluable contribution and support;

My sincere thanks to Simona Imazio, Ilaria Lesmo, and the entire Passi Polito Team, for their limitless support, patience, and kindness along with all their help - not only for this research but also for making everything easier;

A big thanks to my family, Guldane Ay and Ismail Ay for always believing in me, and Ceren Ay and Mert Erinc who have been role models, inspiration, and moral support for me throughout the process. I must also acknowledge our beloved family cats Vera, Ferdi, and Tarcin, for the comfort they have given whenever I am with them;

Many warm thanks to Sofia Herbas Luoreiro and Carlos Colonna Caro, my dear study-buddies, for all the enriching discussions and soothing chats during the entire process; Nurdan Gulsever and Fidan Hajiyeva, listening to me in very unexpected places and situations with patience and encouragement; and Andrej C., Marzieh R., Jessica C., Sami A. B., and Clem P. for their support in very needed times;

A very special thanks to Ceren Altan, my long-lasting and will-ever-be science-buddy, and Mert Atmaca and Hasan Ocak, my brothers by heart, for always being there for me.

Lastly, I would like to extend my appreciation to all my friends, colleagues, and everyone who contributed to this research, for their support and belief in me and making this entire experience meaningful.

Abbreviations

AAU – Assigned Amount Units

AIJ – Activities Implemented Jointly

Annex I Countries – Industrialized Countries

Annex II Countries – Developing Countries

CA – Cooperative Approaches

CCM – Compliance Carbon Market

CER – Carbon Emission Reductions credits each equivalent to 1 tonne of CO₂

CCM – Compliance Carbon Market

CDM – Clean Development Mechanism

COP – Conference of the Parties

EC – European Commission

EEA – East African Alliance

GHG – Greenhouse Gas Emission

GRAS – Green Resources AS

IET – International Emissions Trading

ITMO – Internationally Transferred Mitigation Outcomes

JI – Joint Implementation

NAPA – National Adaptation Programs of Action

NDC – Nationally Determined Contributions

ND-Gain – Notre Dame University Gain Index

NFA – National Forest Authority

KFP – Kachung Forest Project

KP – Kyoto Protocol

LDC – Least Developed Countries

LULUCF - Land use, land-use change, and forestry

MAAIF – Ministry of Agriculture, Animal Industry and Fisheries

MLHUD – Ministry of Land, Housing and Urban Development

MoFPED – Ministry of Finance, Planning and Economic Development

MWE - Ministry of Water and Environment

OECD - Organisation for Economic Co-operation and Development

PA – Paris Agreement

PDD – Project Design Document

SDM – Sustainable Development Mechanism

SEA – Swedish Energy Agency

t CO₂e – Tonnes of carbon dioxide equivalent

TGB – Trees for Global Benefits Project

UN – United Nations

UNDP – United Nations Development Program

UNFCCC – United Nations Framework Convention on Climate Change

WB – World Bank

VCM – Voluntary Carbon Market

1. Introduction

Global CO₂ emission and its impact on the climate is one of the most prominent discussions that needs imminent action (IPCC, 2023). Spearheaded by the United Nations (UN) and its extensions, all countries strive to implement better policies and take stronger actions to cope with climate change impacts, however, the unbalanced impacts of climate change that are caused by the historical power dynamics and their spatial reflections, creating uneven geographies (Fairhead, Leach and Scoones, 2012; Sultana, 2021). Numerous meetings have been organized to address this issue, and UN bodies have released various policy frameworks. However, they did not always give the expected outcomes.

As one of these solutions, carbon trading mechanisms were introduced with the Kyoto Protocol and expanded its scope and geographies over the years. Being invented in 1997 by the Kyoto Protocol, Carbon Markets aimed to decrease overall GHG emissions of countries by assigning developed countries to take more responsibility for their GHG emission and supporting developing countries in building coping mechanisms (Kyoto Protocol, 1997; Michaelowa *et al.*, 2019b; Carton, 2020). However, the governance and implementation processes of the system have been widely criticized. Even though these projects were aiming to steer industrialized countries to invest in developing countries, the operationalization of the projects and their outcomes went the other way around, and these projects have been under fire for laying the groundwork for neocolonization (Bachram, 2004; Lohman, 2008; Lahsen, 2009; Dehm, 2016; Gonzalez, 2021; Sultana, 2023). Over time, the carbon trading market continued to expand with the inclusion of private bodies under a voluntary participation system (Michaelowa *et al.* 2019c; Ahonen *et al.*, 2022). However, the critics about the risk of neocolonization remained the same considering their impacts on nature and communities (Carton, 2020; Carton and Edstedt, 2021; Gonzalez, 2021). In order to address these issues, the UN released a new carbon trading system in the scope of the Paris Agreement that has a more inclusive and regulated system for the carbon trading system. Having the operationalization of the Paris Agreement's carbon offset mechanism on the horizon, governments are getting prepared for the implementation by establishing laws, regulations, and rules to operate the market (Michaelova *et al.*, 2019a; World Bank, 2024).

Taken all the history together, since the carbon market's initiation, the mechanisms have had a complicated organization that includes multi-levels and multi-stakeholders with impacts on nature, societies, and the economy. Considering the multi-faceted processes used to implement carbon market projects, these systems have been criticized for having detrimental impacts on nature and societies and creating inequalities. The most criticized aspects of these projects are their governance with their institutional and political structures (Fogel, 2004; Andresen, 2015; Ahonen *et al.*, 2022), stakeholder engagement in the processes (Lahsen, 2009; Tramel, 2016; Carton, 2020) and land use

management (While, 2008; Bumpus and Liverman, 2008; Gifford, 2020). And it is highlighted that, in order to implement the projects in a way that they can deliver justice and prevent the risk of colonization, these projects should be designed on multi-level structures with holistic policy-making approaches that also promote stakeholder engagement (Mohai, *et al.*, 2009; Mathur *et al.*, 2014). And considering the scope of the field, spatial planning has the potential to contribute to better implementations by using urban and regional planning tools, particularly policy-making and land use management with participatory planning approaches.

Aiming to provide how spatial planning tools can help effective implementation processes, the carbon markets' operationalization in Uganda will be examined to make a narrative of how the system works and how it can be upgraded with the support of spatial planning tools. Uganda, located in Sub-Saharan Africa, is classified as one of the Least Developed Countries (LDCs) and is highly vulnerable to the adverse impacts of climate change, and faces significant risks from the increasing effects of climate change (). Regarding that, the country became one of the hotspots for carbon market investors in Africa (Akrofi, 2024). To provide a landscape of the integration and operationalization of the carbon markets in Uganda, policy analysis focusing on environmental management and spatial planning has been done and followed by case studies, namely the Kachung Forest Project and Trees for Global Benefits, with having two contradictory carbon market operationalization processes, it also presents a prime case study for examining the complexities of carbon market operationalization in developing countries.

Taken together, this research aims to examine how supranational climate change adaptation and mitigation actions can contribute to delivering environmental justice at the local level and what occurs when these efforts fall short. Furthermore, the study will explore how urban planning, through tools such as policy-making, land-use management, and participatory planning, can enhance the implementation of these actions.

1.1. Research Hypotheses and Objectives

This thesis is based on the hypothesis that carbon trading mechanisms, which are invented with promise to deliver justice, yielded various outcomes, however, there is still a long way to reach justice that is valid on the multilevel, multidimensional, and multiscale levels. With a particular lens on Uganda, how carbon market projects have been operationalized over years and how environmental justice and new colonial waves have been reinvented is examined. In order to address the issues that reveal themselves during the implementation processes, particularly the challenges that have been faced with the multilevel governance and policy making, stakeholder engagement and land use and zoning management, strengthening spatial planning tools provides a solution in the countries struggling with the implementation of the carbon offset projects.

The main objective of this research is understanding how spatial planning can contribute to the carbon market operationalization processes to reach environmental justice. Social science studies focusing on the theoretical aspects of carbon markets have significantly contributed to discussions, helping the field evolve.

Therefore, in order to present the ways spatial planning can be a part of this discourse, there are three main outcomes at the end of this research that are expected to be unveiled:

- Unveiling the concept of environmental justice and injustice, and how they emerge through land management,
- Examination of the operationalized carbon trade-off projects in Uganda to understand how environmental justice and injustice occur through land use and policy changes, and
- How to address associated problems through policy and action changes by using spatial planning tools.

1.2. Research Question

This research aims to examine the implementation of carbon trading at local scales by exploring a multilayered and multistakeholder structure that spans from supranational levels to local levels, as well as its relation to land management. Although carbon markets have been widely discussed regarding their governance, implementation, and impacts; their spatial implications, particularly how they occupy land and affect local communities, have received limited attention in the spatial planning discourse. To address this gap, this study explores how spatial planning tools can contribute to better management of carbon market projects. By analyzing two case studies from Uganda, which represent contrasting implementation processes, the research seeks to provide insights into how spatial planning can enhance carbon market outcomes while addressing environmental justice and local needs.

Therefore, the research question is *“How can spatial planning tools improve the operationalization of carbon markets to promote justice and prevent neocolonial practices by looking at the context of Uganda?”*

The sub-questions that are aimed to be addressed can be listed as the following:

- How theories take ground from justice-based concepts and neo-colonization reflected in the UN frameworks?
- How UN-promoted carbon markets have evolved in the way they have been implemented in different levels with different stakeholders?
- How carbon markets related to spatial planning discourse?
- How did Uganda integrate and implement carbon market mechanism?
- Why carbon markets should be discussed in spatial planning discourses and how it can help for better implementations of the system?

1.3. Structure of the Research & Roadmap for the Reader

In order to answer above mentioned questions, this research starts with a literature review that focuses on the topics of environment-based justice and their integration to UN frameworks (Section 2.1), carbon markets and their historical developments (Section 2.2), and how carbon markets, environmental justice, and spatial planning are related to each other (Section 2.3). To concretize these abstract terms, two case studies from Uganda, namely the Kachung Forest Project and Trees for Global Benefits, will be discussed in the following sections. For this part of the research three integrated Methodologies (Chapter 3), which are content analysis for the policy framework that prepared the groundwork for the carbon market implementations (Section 3.1) and case studies to explain project operationalization processes (Section 3.2) and interviews (Section 3.3) to have a deeper understanding of the processes. And in Chapter 4, the outcomes of the applied methodologies will be shared. Lastly in the Discussion (Chapter 5) part, why carbon markets should also be researched in the urban planning discourse will be discussed, and the summary of the research that also includes the outcome of it will be presented in Conclusion (Chapter 6).

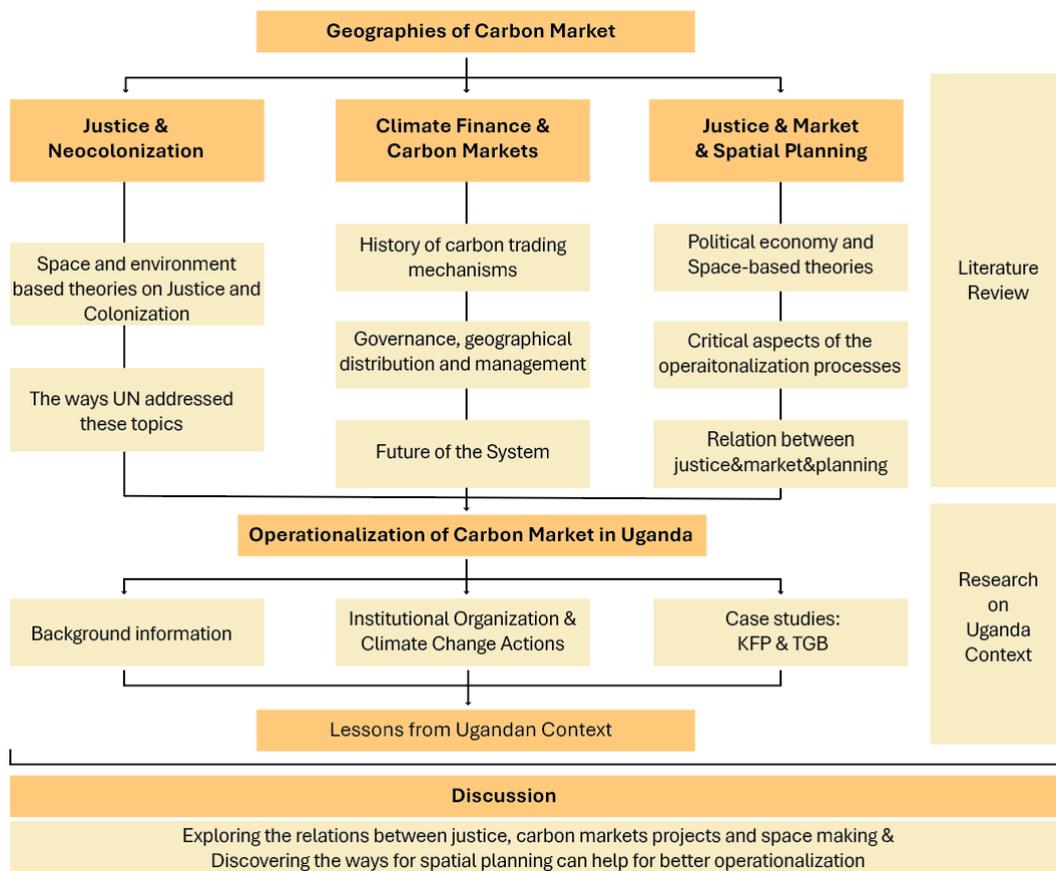


Figure 1 Roadmap for the readers (author's own elaboration)

2. Setting the Context: Justice, Carbon Market, and Planning

This chapter aims to explore the relationship between environmental justice, carbon trading mechanisms, and spatial planning. First, it will explain the concepts of environmental justice and green colonialism and how they are addressed in international frameworks. The chapter then will provide an overview of the Carbon Trading Systems introduced by the UN to promote equitable development. Finally, it will investigate the spatial dimensions of these mechanisms and consider how spatial planning can contribute to their effective implementation.

2.1. Ecological and Spatial Concepts in Justice and Colonization

Justice can be discussed through several concepts and approaches regarding the broad perspective. Considering the scope of this research, justice will be discussed, focusing on ecological and spatial contexts. Since the 1980s, environment and space-based justice has been a focal point for academics seeking to address the uneven distribution of environmental burdens and benefits. Over time, this discourse has evolved, supported by a growing body of research that has expanded the field. The concept has also influenced international frameworks, such as those developed by the United Nations, which emphasize the disproportionate impacts of climate change on vulnerable nations. This section will explore the principles of environmental and spatial justice and its extensions focusing on environment and space-based concepts, with also explaining the theoretical concepts of environmental and spatial injustice that might reach neo-colonization. Lastly, the ways the UN reacts to these concepts through the international policy frameworks will be examined.

Table 1 Terminology (adapted from Martinez-Alier, et al., 2016, and expanded by the author)

Concept	Origin	Brief description
Environmental justice	Civil rights movement origins in the USA	Disproportionate impacts of environmental problems on people of color and low-income classes ⁽¹⁾
Climate justice	Centre of Science and Environment, Delhi, 1991	Inequalities between developed and developing countries regarding GHG emission and responsibilities they bear ⁽¹⁾⁽²⁾
Spatial justice	E. Soja and D. Harvey, 2000	Ensuring social equity and fairness in physical environments ⁽³⁾
Planetary justice	Biermann and Kalfagianni, 2020	Understanding global environmental changes by social, political, ecological, economic aspects on a planetary scale ⁽⁴⁾
Land grabbing	GRAIN, 2008	Land appropriation in the Global South countries ⁽¹⁾⁽⁵⁾
Environmental colonialism	Centre of Science and Environment, 1991	Unequal GHG emissions and their unbalanced impacts that particularly affect developing countries' natural resources ⁽²⁾
Carbon colonialism	NorWatch, 2000	Causing environmental and local damages through CDM projects ⁽⁶⁾⁽⁷⁾
Climate colonialism	<i>unknown</i>	The ways climate change impacts are worsened by colonial periods' impacts and ongoing decarbonization goals ⁽⁸⁾

⁽¹⁾ Martinez-Alier, *et al.*, 2016, ⁽²⁾ Agarwal and Narain, 1991, ⁽³⁾ Doing Justice Collective, *et al.*, 2024, ⁽⁴⁾ Biermann and Kalfagianni, 2020, ⁽⁵⁾ GRAIN, 2008, ⁽⁶⁾ Bachram, 2004, ⁽⁷⁾ World Rainforest Movement, 2000, ⁽⁸⁾ Sultana, 2023

2.1.1. Justice-based Concepts

The justice discourse that is evolving around environmental and spatial contexts underscores the need for a definition of justice that includes multilayers and multidimensions of fairness and equity. Since 1980, there are several approaches that have been developed to fill the paucity by integrating social, ecological, economic, and political aspects of the discourse. In this section, the understanding of environmental justice will be discovered by exploring its relationship with space and its transboundary dimensions.

Environmental Justice is invented in the USA as a social movement against environmental racism. In 1982, human rights activists organized movements to protest transferring tons of contaminated soil and garbage to the neighborhoods where people of color live. The main point of this social movement was to emphasize the fact that different groups of society, namely marginalized poor communities and white middle-class people, are facing different levels of ecological risks, only because of their skin color and accents (Martinez-Alier, *et al.*, 2016; Mohai, Pellow, and Roberts, 2009). Soon after, this movement was carried into academic discussion and environmental justice became an interdisciplinary field researching environmental racism, inequalities, and injustices (Mohai, Pellow, and Roberts, 2009).

Environmental justice is usually considered a multi-dimensional approach that consists of four different aspects: *distributive justice*, *procedural justice*, *recognitional justice*, and *contextual justice*. These four pillars of environmental justice serve as dimensions of decision making and inclusiveness: (i) distributive justice refers to equal distribution of scarce resources, along with the environmental costs and benefits to the people from different scales (Hedberg, 2016; Zimm, *et al.* 2024), however, this approach misses the geographical and sociocultural factors in the allocation of resources (Ntiwane and Coetzee, 2018); (ii) recognitional justice implies awareness about various identities and cultures, highlighting the need for policies and programs to formalize the recognition of different cultures, values and parties that have been effected from the processes (Hedberg, 2016; Ntiwane and Coetzee, 2018; Zimm, *et al.*, 2024), (iii) procedural justice focuses on participation in the decision-making and implementation processes (Hedberg, 2016), with a particular focus on the participant and the methods to operate these processes (Zimm, *et al.*, 2024), and lastly, (iv) contextual justice concerns about the ways social factors affecting the other three dimensions to reach environmental justice (Hedberg, 2016).

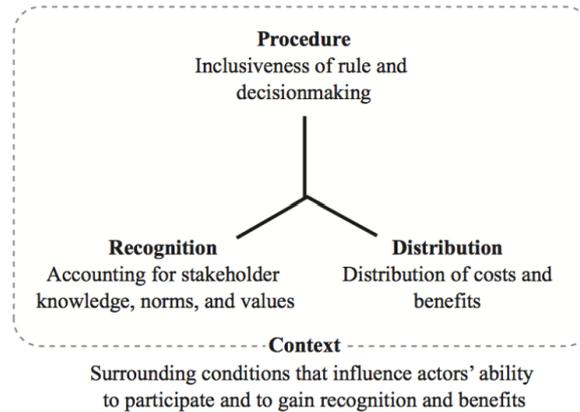


Figure 2 Different dimensions of environmental justice (Pascual, et al., 2014 as cited in Hedberg, 2016, p. 16)

Since 1990s, there are a lot of studies that examines the relations between ethnicity, socioeconomic status and exposure to environmental risk which shows that there are ubiquitous outcomes from the research that there is a relation between environmental injustices and races (Mohai, et al., 2009). Over time, this discussion have been moved to other levels and context in the ecological and spatial discourses.

Firstly, climate justice became a topic that is discussed by the scholars. Climate change is one of the most pressing challenges facing the world today, with its impacts disproportionately affecting different regions and communities (IPCC, 2023). These disproportionate effects have exacerbated existing social and economic inequalities, giving rise to critical discussions on environmental justice about who is responsible, who should act and who has the resources to do so (Mohai, et al., 2009). On the global level, two main reasons have been pointed out for the disproportioned climate change impacts. The first one is the location of the developing countries on the world and having climatic conditions that are already challenging, and the second one is lacking the resources to cope with the climate change impacts such as technology, infrastructure, legal and institutional structures (Miranda, et. al., 2011).

However, the discussion about the inequality of climate change impacts goes back to the early 1990s through the work of Agarwal and Narain (1991) which set the groundwork for the climate justice discussions by criticizing the differences among countries for GHG emissions. Their work, *Global Warming in an Unequal World: A Case of Environmental Colonialism*, highlighted the difference between carbon emission for subsistence and luxury consumption, and sparked discussions about the contribution of North and South countries to climate change impacts. Even though environmental degradation affects everyone, it firstly favors powerful communities over others, and capitalist approaches keep producing environmental and social damage for the sake of financial benefit. The reason for this conflict goes back to the power dynamics for accessing environmental, economic, and social resources (Agarwal and Narain, 1991; Mohai, et al., 2009). The

most common conflict that has been faced is stakeholder engagement in the climate and environmental justice discussions, and it is followed by a lack of compensation. When it comes to negative impacts on societies, they are displacement, repression, corruption and violence against activists, and fatal casualties (Martinez-Alier, *et al.*, 2016).

In short, climate justice refers to addressing the injustices caused by climate change through fair and equitable practices that integrate social justice and environmental conservation. Climate justice also questions the root reasons for climate change including infinite capitalist growth, dependency on unrenowable sources, constant extraction of natural resources (Sultana, 2022), and it aims to address complex conflicts across space, place, and scales, therefore, the scale of climate justice is not limited only to the local scales, but rather, it also concerns about the inequalities between developed and developing countries (Okereke and Coventry, 2016; Sultana, 2023). While traditional climate change mitigation strategies focus on the local solutions, climate justice is concerned about the disproportional impact of climate change on vulnerable communities on the global level, and promotes the solutions to realize just transition for all the people (Tramel, 2016). Shortly after, the scholars recognized global environmental inequalities, and a growing body of academics and researchers started to delve into the topic. New patterns of resource extraction have been brought up with globalization, and as transnational and global corporations are spreading around the world and operating exploitation-based projects in the most isolated locations of the world, the existing inequalities have been worsened with the burdening impacts of climate change (Mohai, *et al.*, 2009). And two new terms have been added into the lexicon, not only to explain the climate injustices and their impacts, but to examine spatial injustices occurring on different scales.

Spatial justice is a concept that Edward Soja and David Harvey introduced in the late 2000s to refer to social equity and fairness in physical environments. The concept analyses the ways urban and regional planning can contribute to overcoming social inequalities in the physical landscapes (Doing Justice Collective, *et al.*, 2024) through questioning the ways spatial justice be employed differently than environmental and social justice with its relationship to geography and political theory. Space is a produced entity with social, material, and ideological dimensions (Lefebvre, 1992; Harvey, 1996 as cited in Williams, 2013), and therefore, social processes also reflect on the space. Along with that, spatial organization is a political action itself with putting orders and creating conflicts on the site which can also lead to inequalities (William, 2013). In order to address this situation, geographers and planners have underscored the ways planning studies can contribute to spatial justice discourse (DJC, 2024).

In her work, Fainstein (2009) highlights the relationship between public places and public interest, and she underscores the importance of participatory approaches for reaching justice in the planning processes. Even though participatory approaches have been

considered as utopian perspectives, given the main aim of planning studies the equal distribution of limited resources and mitigating disadvantages in society through providing mixed uses to mixed incomes for varied ethnic and cultural origins in publicly accessible places, participatory approaches are one of the ways to reach justice in the cities (Fainstein, 2009; Williams, 2013). The scale of spatial justice ranges from the international level with seeking peace in the conflict areas (Ethiopia-Eritrea, Croatia-Serbia, India-Pakistan, etc.) to local levels with searching justice for very fundamental needs such as public spaces, housing, public amenities, and so on (Fainstein, 2009).

Over time, the discussion of spatial justice has expanded, and a new concept has been added to the lexicon of planetary justice. Planetary justice aims to provide an understanding of global environmental changes by taking into account the social, ecological, economic, and political connections in a broader way within the consideration of planetary boundaries (Biermann and Kalfagianni, 2020; Stevis and Felli, 2020). Unlike other justice frameworks, it underscores the relationship between human activities, their environmental impacts, and the ties between social, ecological, economic, and political systems from different spatial dimensions (Stevis and Felli, 2020). In doing so, it aims to frame promoting fairness and equity on the planetary level by considering the well-being of not only humans but all the entities that are impacting and being impacted (Biermann and Kalfagianni, 2020; Stevis and Felli, 2020).

Moreover, planetary justice considers the broader implications of wars, uneven development between the regions and countries, colonization, and other human-induced activities that have created profound inequalities (Stevis and Felli, 2020). Planetary justice also consists of the historical aspect of the justice discussion highlighting the impacts of colonialist and capitalist systems over the environmental changes. It highlights the uneven outcomes of the countries' economic development and the gap between them. Despite the fact that the Global North is the most industrialized part of the world with high consumption and emission levels, the environmental impacts of these activities show themselves in the Global South which has less resilience than developed nations (Stevis and Felli, 2020; Sultana, 2023). Rather than focusing on the local and national scales, planetary justice offers a new perspective that considers the inequalities between North and South, considering transboundary relationships (Stevis and Felli, 2020). Therefore, planetary justice asserts that the pursuit of justice should scale up from local scales to global ones leaving the anthropocentric understanding behind since the problems that are affecting not only the related places but the whole humanity and nature.

Despite the fact that different types of justice have been developed in history, scholars have examined the lack of environmental justice and its spatial impacts. Racialized and indigenous groups have less access to the climate politics, and their knowledge and needs are usually ignored in these discussions (Cooalsaet *et al.*, 2024; Zimm *et al.*, 2024),

the root of climate injustices have been built historically and spatially. Colonialism, capitalism and globalization and their legacies in the countries uneven impacts of climate change and leads to global inequalities (Sultana, 2021), and this is one of the drivers how climate injustices occurs and lay the groundwork for the colonization (Coolsaet *et al.*, 2024).

With all different concepts, the discussion of justice is becoming a topic that is ambivalent and complicated (Zimm *et al.*, 2024; Biermann and Kalfagianni, 2020), With all different concepts, the discussion of justice is becoming a topic that is ambivalent and complicated (Zimm *et al.*, 2024, Biermann and Kalfagianni, 2020), These concepts are strongly related with the environmental and climate justice considering its focus on shaping the physical environment aiming to provide equal distribution of scare resources every affected individuals in a fair way (William, 2013; Stevi and Felli, 2020).

Given the broad and constantly evolving scope of justice in the ecological and spatial understandings, it is not easy feat to define “environmental justice” in a fixed way. In this research, environmental justice is conceived as a multidimensional concept involving providing equitable conditions within the physical environment to ensure that all entities of it are treated fairly, regardless of geographical, spatial and social differences. This approach integrates the spatial dimensions of justice by recognizing the ways inequalities are reflected and reproduced in physical environment, while also including historical and structural injustices perpetuated by colonialism, capitalism and globalization. Furthermore, it also includes the disproportionate impacts of climate change on vulnerable communities and seeking solutions for promoting just transition. Finally, influenced by planetary justice, the approach embodied in this research involves global and transboundary relations emphasizing the intercorporating of ecosystems and the need to safeguard the well-being of all life on Earth. By merging these concepts, environmental justice in this thesis extends beyond the local scales to address systemic inequalities and ensure fair resource distribution, inclusive decision-making processes, and the protection of diverse cultural and ecological values on the planetary scale.

2.1.2. Land Grabbing and Neo-colonization Through Climate Initiatives

The history of global environmental injustices can be traced back to the 17th century through resource extraction and land appropriation activities that have been strongly tied to historical patterns of colonialism. Over time, the practices have evolved, coupled with capitalist power unbalances and the new auspices of international agreements, and they have been reinvented under the name of environmental protection and sustainable development. Regarding that, new terms, such as environmental colonialism, carbon colonialism, climate colonialism, and green colonialism, have been coined to explain the phenomena that manifests itself through the commodification of nature to favor

developed nations at the expense of vulnerable communities. This section explores these interlaced concepts by discovering their relation to land governance.

Land grabbing is added to the lexicon by GRAIN, an international NGO supporting small farmers, to refer to the land acquisition activities in developing countries by Global North for food production. Instead of cultivating agricultural products on their own countries' lands, many private investors are buying vast agricultural areas from other countries to produce food more cheaply without considering how the host countries might be affected (GRAIN, 2008). Over time, these terms have been expanded in a way that also encompasses other kinds of initiatives such as the biofuels industry, forestry and conservation, and ecotourism, and “green grabbing” has been coined to refer to all the land acquisition activities that are made under the guise of environmental initiations. Considering the scope of the projects, green-grabbing examples usually are justified with biodiversity and environmental protection, therefore, the stakeholders involved in the processes have more complicated structures regarding the legal and institutional processes (Fairhead, Leach, and Scoones, 2012).

Land grabbing was raised as an issue, especially after 2006, and while biofuels accounted for most of the activities, forestry and carbon sequestration activities are the following sectors respectively. There is a massive concentration of land acquisitions in Africa with almost 70% of reported acquisition activities (Sassen, 2013). As explained by Sassen (2013) and highlighted by Fairhead and colleagues (2012), carbon trading schemes have the biggest third share in the land-grabbing sectors through biodiversity conservation, forestry, and agricultural commodities (Fairhead, *et al.*, 2012).

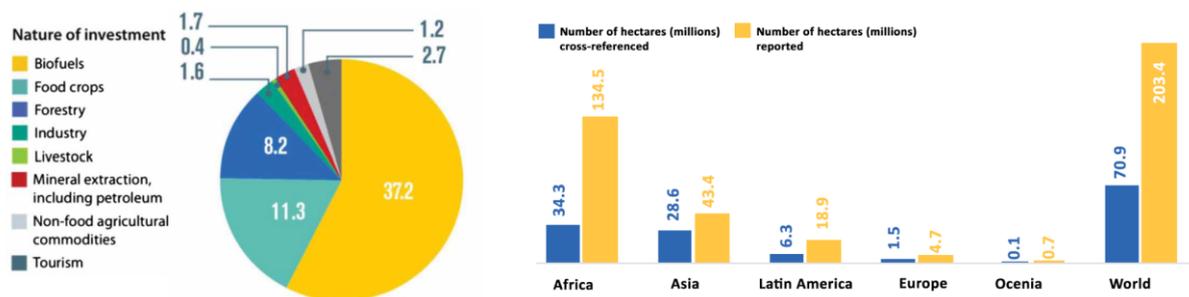


Figure 3 Land grabbing activities' distribution by 2012 according to sectors and region (Anseeuw, *et al.*, 2012 as cited in Sassen, 2013)

Even though there are controversialities on land grabbing about whether it creates economic opportunities for local communities or a threat to their livelihoods, the concept has been considered under “land governance” (Gebremichael, 2016). Regarding the historical relation between land governance and resource exploitation, land-grabbing processes also sparked new concepts in the colonization discourses.

Environmental colonialism is a term coined by Agarwal and Narain (1991) in their work “Global Warming in an Unequal World: A Case of environmental colonialism”. As

mentioned, in their research, they highlight the difference between the GHG emissions made by developed and developing countries and the adverse impacts of it on the Global South countries. Besides the historical and ongoing contributions, the disparity between the reasons for carbon emissions adds another layer to global inequalities. The disproportioned impacts of climate change are mostly due to the historical and ongoing GHG emissions of developed countries; however, the adverse impacts of these activities are experienced in Global South countries through environmental degradation and changing climate change (Agarwal and Narain, 1991).

In the early 2000s, the discussion expanded to include the term *carbon colonialism*, which refers to activities conducted to balance GHG emissions in countries while obscuring the ongoing business-as-usual practices of developed countries. Shortly after the enacting of the Kyoto Protocol, the carbon offset projects (which will be discussed in Section 0), their real benefits and costs sparked a discussion. A journalist published an article about Norway's tree plantation projects in Uganda and who benefits from it in a national journal. Afterwards, a new term, "*carbon colonialism*" or "*CO₂lonialism*", was invented to refer to the negative impacts of carbon sequestration projects causes (Eraker, 2000 as cited in World Rainforest Movement, 2000). Since its invention, the carbon colonialism risk has been reiterated by different environmental and social nongovernmental organizations to highlight these projects' adverse impacts on Indigenous and local communities:

"expropriation (our) lands, seas and territories and violating (our) rights that would culminate in a new form of colonialism, (...), violence for access to basic resources would endanger (our) survival ..."

-International Indigenous Peoples' Forum on Climate Change, 2000, as cited in Bachram, 2004

These discussions also shed light on the adverse impacts of the projects that have been conducted under the name of sustainable development and climate change adaptation and mitigation.

Mahony and Endfield put emphasis on the relationship between colonialism and climate change impacts. Natural resource exploitation during the colonial periods still affects countries, particularly their climatic conditions, and along with the formally colonized countries' lack of technology and knowledge to cope with climate change impacts, they are burdened by the climate change impacts (Mahony and Endfield, 2017). Therefore, another term has been added to the lexicon is "*climate colonization*" which points out both the global inequalities rooted in colonialism that worsening climate change impacts. The severity of climate change impacts is deeply rooted in the historical exploitation of natural resources in formerly colonized countries (Sultana, 2023; Mahony and Endfield, 2017; Gonzalez, 2021). As explained by Hartnett (2021), climate change impacts can be discussed as a form of slow violence, in which the effects of colonization

linger over time and space by gradually reducing the natural resilience capacity. This lack of resilience makes communities vulnerable to environmental changes, particularly in regions such as Latin America and Africa (Hartnett, 2021).

Along with the historical roots, the concept of climate colonization critiques how certain decarbonization projects in the Global South prioritize developed countries' emissions reduction goals, often neglecting the long-term social and environmental well-being of local communities. This practice often involves dispossession, land grabbing, and exploitation of natural resources in diverse forms, particularly within vulnerable societies in developing countries (Bhambra and Newell, 2022; Gonzalez, 2021). Climate colonialism, therefore, refers to a systemic pattern wherein highly industrialized countries have historically and currently contributed to environmental, social, and economic degradation within vulnerable communities in the Global South through the exploitation of natural resources. These continuous forms of exploitation have worsened the impacts of climate change, forcing these communities to bear the brunt of its life-threatening effects.

As the discussion expanded through the new concepts *green colonialism* was also introduced as an umbrella term to refer to the expansion of capitalists' power through the commodification of nature that ends up exacerbating vulnerabilities and inequalities. The concept highlights the historical aspect of resource exploitation that goes back to the 17th century when the colonial powers degraded ecological systems in Africa, Asia, and South America for financial benefits (Blanc, 2022; Manahan, Bringel, & Lang, 2024). In the contemporary context, decarbonization and low-carbon development are the tools used for green colonization through favoring market interests over sustainable development goals through extraction of natural resources in overseas territories and causing environmental and social degradation (Sultana, 2023; Manahan, *et al.*, 2024). Green colonialism usually manifests itself through land-grabbing practices that include changing the land usage of local communities and affecting their social and economic activities, and in extreme cases forcing them to displace under the guise of environmental protection and development (Manahan, *et al.*, 2024) which is caused by the top-down approaches of colonizers (Sultana, 2023). Such practices often incorporate top-down approaches by including external actors, therefore, implementation processes often tend to lack community engagement and social impact analysis, which lays the groundwork for the adverse impacts of land appropriation in the name of environmental enhancement (Enriquez-de-Salamanca, 2024). According to Vieira and Bauer (2023) and Carton and colleagues (2020), the Northern actors have used climate variability to justify their neocolonial practices by allowing them to continue their business-as-usual GHG emissions under the veil of transferring knowledge and supporting development in other parts of the world.

Regarding the intertwined definitions of environmental, carbon, climate and green colonialism, in the scope of this thesis, the term colonization will be used to define the environmental burden on the Global South countries that have been gradually developed in the historical timelines that go back to the colonial periods of the 17th century, and still occurring through the decarbonization and low-carbon development initiatives that are instigated by the Global North countries under the auspices of international frameworks and goals of the United Nations.

2.1.3. Justice and Colonization Discussion in the UN Frameworks

Aiming to deliver justice and prevent any situation that can lead to any type of colonization, international frameworks started to discuss and implement policies to address global inequalities. Accepting UNFCCC as the main international framework of global justice discussions created the interaction between climate change, justice, and policies (Okereke and Coventry, 2016), the policy frameworks introduced by the UN will be discussed in the following.

Even though climate change was a scientific fact that was proved in the 19th century, any action about it was not taken until 1980 except for several international treaties (Okereke and Coventry, 2016). In 1988, the Intergovernmental Panel on Climate Change (IPCC) was organized by the UN Environment Program and the World Meteorological Organization (WMO) aiming to link scientific information and institutions with governmental bodies to act on climate change impacts (IPCC, n.d.). In 1990, the first report of the IPCC was released and assigned responsibilities to industrialized and developed countries for their major contribution to carbon emissions, and the report emphasized the need for cooperation in supporting the latter for its development in financial and technological terms. In this way, the first crucial step in justice has been made in the international climate regime. This report also pointed out the fact that developing countries might start to emit more carbon for their development, which might create a dilemma (Okereke and Coventry, 2016).

While blame for global warming has often been assigned to all countries without considering their specific roles, it became clear in the early 1990s that not all countries share the same level of responsibility for greenhouse gas (GHG) emissions. Countries' historical emissions significantly influence the global warming crisis, which currently affects our environment and will impact future climates. All the Conferences that were organized in the late 80s and early 90s ended up concluding that the Global North countries are the biggest responsible bodies for GHG, and given the fact that developing countries have lower carbon emissions per capita, while Global South emits carbon dioxide for meeting their needs, in the North it is mostly for luxuries, which creates another inequality (Agarwal and Narain, 1991; Liverman, 2009). In order to address this injustice that is caused by the disproportioned GHG emissions and their disproportioned

impact, the UNFCCC accepted the principle of “*Common but differentiated responsibility and respective capabilities*” in 1992 which highlights the importance of different levels of responsibility for the contemporary global warming crisis, and the capability to respond (IPCC, 2018).

After several years, the Kyoto Protocol was launched in 1997 aiming to reduce countries’ GHG emissions by up to 5.2% compared to 1990 levels. According to the Act, each signatory must determine their mitigation targets, known as assigned amount units (AAU), which refers to the maximum CO₂ amount countries can generate. And the Protocol was the first legal and robust step for controlling global GHG emission and applying the common but differentiated responsibilities principle with aiming to reach fairness and equity by categorizing the countries as developed (Annex I) and developing (Annex II) countries (Kyoto Protocol, 1997). The Protocol also proposed climate change action on the international level by setting up climate funds and market tools, particularly carbon trading systems (will be explained in the [2.2](#)), to coordinate and facilitate just and balanced development (Kyoto Protocol, 1997; Mathur, Afionis, Paavole, Dougill and Stringer, 2013; Fisher, Cavanagh, Sikor and Mwayafu, 2018; Michealowa *et al.*, 2019a; 2019b; Carton and Edstedt, 2021). On the national level, Quantified Emission Limitation and Reduction Commitments (QELROs) were assigned to industrialized countries to determine their targets for GHG emission by promoting energy efficiency, forestry activities, sustainable agriculture, and using market mechanisms such as fiscal incentives, carbon taxes, and emission trading systems (Kyoto Protocol, 1997; *Cap-and-Trade Programme*, n.d.). QELROs were compulsory only for developed countries, and for the rest, preparing action plans that are called *Nationally Appropriate Mitigation Actions (NAMAs)* was a voluntary activity (Ahonon *et al.*, 2022; Michaelowa *et al.*, 2019b). After years of observing the practices of the Kyoto Protocol, countries united to create a new global agreement that addresses fairness and promotes effective participation (Okereke and Coventry, 2016; Kainou, 2022).

The UN launched the Paris Agreement (2015) as a successor to the Kyoto Protocol to stimulate countries to take action against climate change. The Agreement aims to keep the global temperature rise lower than 2°C, and after long-lasting discussion, a compromise was found to be optimal at 1.5°C (Paris Agreement, 2015; Okereke and Coventry, 2016; Sadai *et al.*, 2022). With the Paris Agreement, the disparity of developed/developing has been removed, however, common but differentiated responsibilities have been reiterated within Articles 2 and 4 for GHG emission abatement, and “climate justice” has been mentioned thereby stating “*noting the importance for some of the concept of ‘climate justice’ when taking action to address climate change*” (p. 1). In order to achieve climate justice, regulating countries’ carbon emissions has been accepted as one of the priorities and the Agreement obliges its parties to prepare their Nationally Determined Contributions (NDCs) to determine their own GHG emission goals and the ways of reaching these goals with policies and actions

(Paris Agreement, 2015). Other important policies that are related to justice were adaptation (Article 7), mitigation (Article 4), climate finance (Article 9), loss and damage (Article 5), technology development and transfer (Article 10), and capacity building (Article 11).

Climate mitigation and adaptation activities are particularly important for the least developed countries (LDCs) in terms of their vulnerability and potential devastating impacts when the 1.5°C is exceeded. Their risk of experiencing any injustices is higher than the other communities, therefore, during the negotiations, their slogan has been “1.5 to Stay Alive” (Okereke and Coventry, 2016). During negotiations, while developed countries called all Parties to take action, developing countries were more focused on adaptation processes and sustainable development with adequate support from the Global North countries in matters of finance, technology, and capacity building (Okereke and Coventry, 2016), and this part sparked discussions between the countries regarding the colonial history of the countries and the disproportioned impacts of climate change between the countries (Gonzalez, 2021).

The concept of “*loss and damage*” has been discussed for many years. It refers to a specific financial support system for vulnerable communities that are disproportionately affected by climate change. However, it was not until COP19 in 2013 that this issue gained significant political attention with the establishment of the Warsaw International Mechanism for Loss and Damage. This mechanism aimed to provide a comprehensive understanding of the problem and support actions related to finance and technology. The principle of loss and damage was incorporated into the Paris Agreement in 2023 during the COP27 meetings, which aimed to establish a financial mechanism to address the needs of affected communities. (“Warsaw International”, n.d.; Okereke and Coventry, 2016).

And in order to start to implement climate finance tools, capacity building, and technology transfer are key factors. Even though these two factors are overshadowed by climate adaptation and mitigation actions, they are important for utilizing existing sources effectively and reaching low-carbon development. Despite the fact that both of these principles are incorporated into the Paris Agreement, there is a lack of specific mechanisms to operate them (Okereke and Coventry, 2016). Although the removal of developed/developing disparity was a big achievement in the Paris Agreement, there is still a long way to go to pursue climate justice. It is impossible to discuss a just transition process without discussing the historical pollution that has been done for centuries, which will also affect future generations, all the countries also have to face their colonial past and take responsibility considering the burden the colonized countries experienced over the last five centuries (Vieira and Bauer, 2023). In aiming to decolonize climate multi-scale actions should be taken with various institutions and robust laws, policies, and frameworks should be designed to not fall into this vicious circle again (Sultana, 2022).

In the latest IPCC report, “*Colonization*” has been mentioned first time in a policy framework by describing “Present development challenges causing high vulnerability are influenced by historical and ongoing patterns of inequity such as colonialism, especially for many indigenous peoples and local communities” (IPCC, 2023). However, even though international agreements express concerns about achieving just societies during and after transformation processes, their scopes remain limited. One key limitation is the Western-centric approach of policy frameworks that prioritize sustainability within their societies while offering insufficient solutions for the rest of the world (Lahsen, 2009; Sultana, 2022). Sultana (2022) calls Conference of the Parties (COP) meetings “*theaters*” (p. 2) considering their results. Even though they touch upon important topics such as decolonization, anti-racism, and feminist approaches, unbalanced power dynamics hamper the processes and repoliticize the climate change discussions rather than depoliticizing and delivering collective world-making (Sultana, 2022; Okereke and Coventry, 2016; Tramel, 2016).

The historical evolution of international climate frameworks represents a continuous effort to address global inequalities and deliver justice. From the unbalanced GHG emissions and disparities acknowledged in the Kyoto Protocol to the more inclusive Paris Agreement, significant progress has been made in mitigating the disproportionate impacts of climate change. However, challenges remain, including injustices rooted in colonial legacies, uneven power dynamics between nations, and the limited capacity of international frameworks to create truly equitable solutions.

The inclusion of principles such as “*common but differentiated responsibilities*” and mechanisms like “*loss and damage*” marks significant progress in the pursuit of justice. Yet, the effectiveness of these frameworks is often dampened by Western-centric approaches and the absence of robust operational tools. Achieving justice is only possible through the establishment of a decolonized, multi-scalar, and multi-stakeholder system that addresses historical emissions and resource inequities. Carbon trading mechanisms, as a key component of climate finance applications, have been introduced as a tool to facilitate this transition. The following sections will explore their application and potential in addressing these complex challenges.

2.2. Climate Finance and Carbon Pricing

Climate finance refers to the financial tools that are used to support multilevel and multistakeholder activities with aiming of achieving a low-carbon global economy by contributing to building climate-resilient societies and adapting the climate change impacts (“Climate Finance”, n.d.). The concept was invented in 1992, during the United Nations Conference on Environment and Development declaring that developed countries shall take responsibility for the climate change impacts, and support developing countries through financial resources and technological capacity. Over the years, the term *climate finance* became clearer through the Copenhagen Accord declaring that various sources, from various actors, in bilateral or multilateral ways, can be provided, and with the Paris Agreement, the term and its usage have been confirmed (Climate Action Network, 2016).

There are multiple ways to develop and channel climate finance and one of them is carbon pricing. It can be implemented in two ways, either through carbon taxes on the national levels or carbon trading mechanisms on various levels (World Bank, 2024).

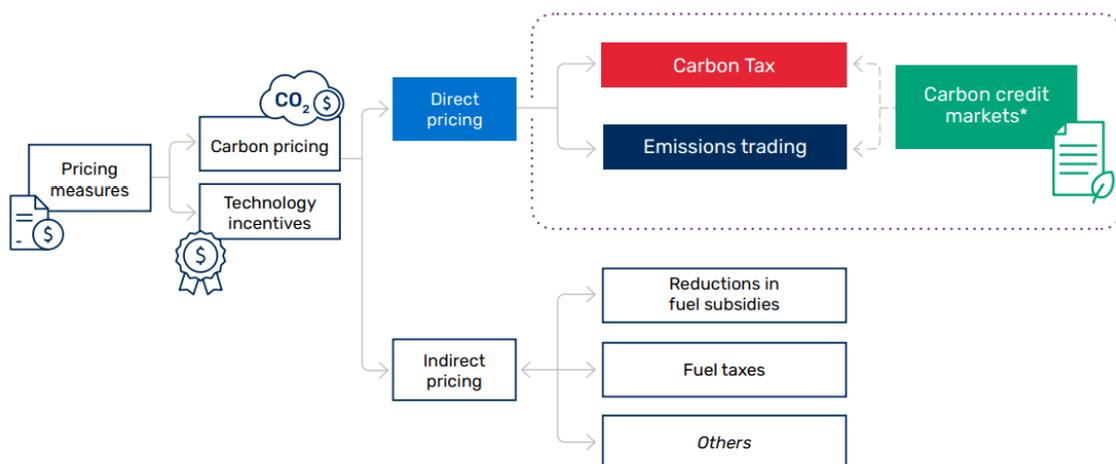


Figure 4 Carbon pricing and its tools (World Bank, 2024)

In the scope of this research, carbon trading mechanisms will be delved into. Carbon trading is a market-based approach that is operated through converting sequestered, avoided, or abated carbon emissions into one tradable carbon reduction unit (“Emissions Trading”, n.d.). This mechanism has been operated both by the guidance of the UN (called as *Compliance Market*) and the private market (with another name *Voluntary Market*). While the Compliance Market has been brought up by the UN’s agreements and countries’ national pledges to comply with them, in the Voluntary Market, demand is created only by parties willing to buy offsets. This situation makes the market significantly smaller than the Compliance Market. In 2020, while CCM generated \$899 billion outcome, VCM had only \$2 Billion (Streck, Dyck, and Trouwloon, 2021). Both markets are still functioning, however, with the new Carbon Market mechanism that was introduced by the Paris Agreement, a new era of carbon trading is starting.

Aiming to provide a narrative about how these markets are formed and operationalized at various levels with multiple stakeholders, the following section will explain their histories and development trajectories.

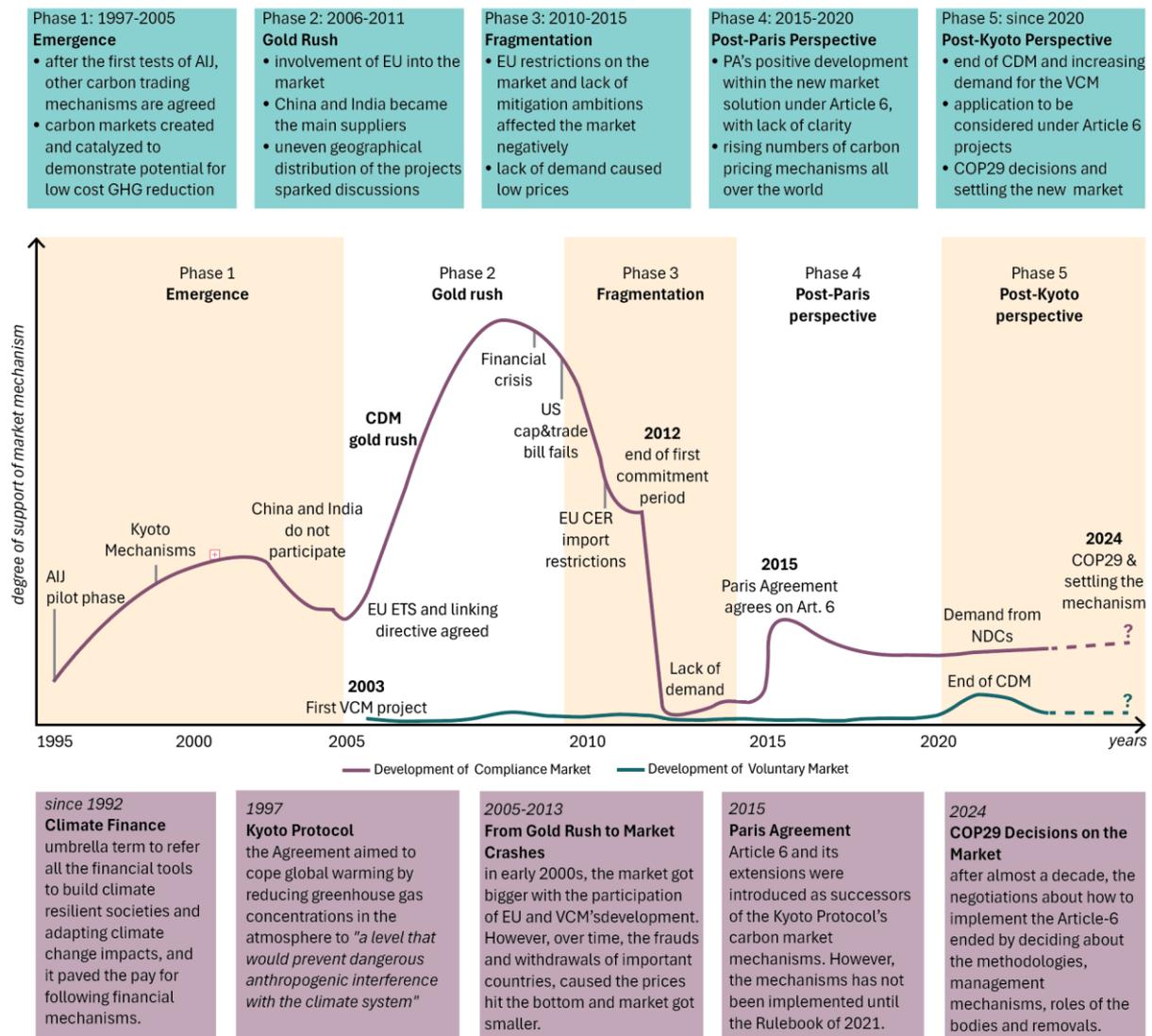


Figure 5 Historical development of carbon markets (author's own elaboration by adapting the graph from Michaelowa et al., 2019b and Ecosystem Marketplace, 2024a with combining information from the other resources)

2.2.1. Carbon Credit Mechanism and its Historical Development

Carbon trading is a concept introduced in the mid-1990s during the COP1 meeting with the operationalization of voluntarily national GHG reduction projects, which is also known as “Activities implemented jointly (AIJ)”s. After the satisfactory results of these implementations by creating win-win solutions for both the host and investor countries (“Activities Implemented Jointly”, n.d.: Michaelowa et al., 2019b), in 1997, Carbon Credit Mechanism was introduced by the Kyoto Protocol as the successor of AIJ (Michaelowa et al., 2019b; Bumpus and Liverman, 2008).

2.2.1.1. Initiation of Carbon Market: Kyoto Protocol

Kyoto Protocol was launched in 1997 and entered force in 2005 with aiming to stimulate countries to limit or reduce their GHG emissions by up to 5,2% compared to 1990 levels. According to the Act, each signatory must determine their mitigation targets, known as assigned amount units (AAU), which refers to the maximum CO₂ amount countries can generate, and in the cases of exceeding AAUs, the Protocol offers a solution by establishing the Carbon Market Mechanism by allowing them to trade their extended emission allowances with the ones that have unused emissions units. Three mechanisms had been used for this exchange:

International Emissions Trading (IET): Under compliance with Article 17, countries are allowed to exchange emission units. The Protocol allows the exchange of unused emission allowances of Signatory countries by transforming carbon into a “*new commodity*” that can be traded to assist countries that have exceeded their AAUs in reaching their goal (UNFCCC, 2007; “Emissions Trading”, n.d.).

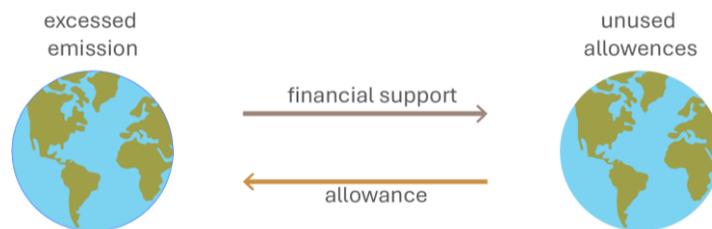


Figure 6 International emissions trading system (author’s own elaboration)

Joint Implementation (JI): Countries can invest or contribute to projects that aim to reduce carbon emissions in any other Parties (mostly in other developed countries) of the Kyoto Protocol. JI helps countries to gain emission reduction units that can be counted for their emission reduction goals (Kyoto Protocol-Article 6, 1997; UNFCCC, 2007).

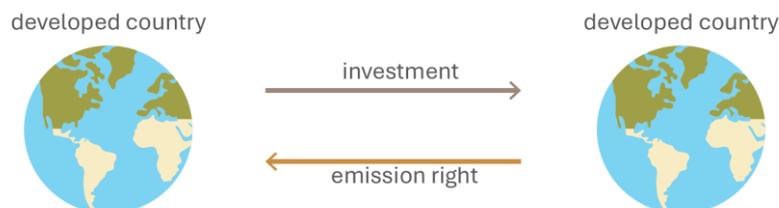


Figure 7 System of Joint Implementation (author’s own elaboration)

Clean Development Mechanism (CDM): Countries that have developed industries are allowed to conduct projects in developing countries to reduce their GHG emissions for their extended usage. This mechanism offers a win-win solution for both parties. While the industrialized countries have the chance to compensate for their extended carbon emissions, developing countries accelerate their process to reach sustainable development (Kyoto Protocol-Article 12, 1997; UNFCCC, 2007).

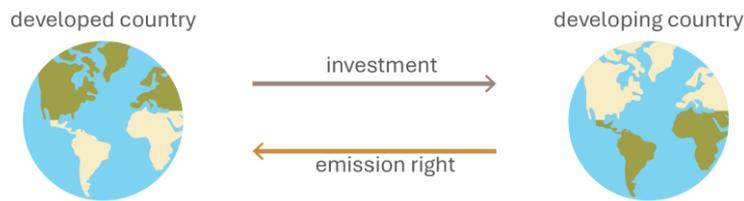


Figure 8 System of Clean Development Mechanism (author's own elaboration)

These mechanisms have been accepted as a prior for global sustainable development by conferring the possibility to earn carbon emission credits while doing an environmental investment (UNFCCC, 2007). The scope of the projects includes energy efficiency and renewable energy; methane recovery projects, enhancing industrial facilities, low-carbon transportation, and low-carbon developments in the agriculture sector and land use, mostly focusing on afforestation and reforestation activities. Besides these big-scale activities, there are projects focusing on the improvement of small households' living conditions such as cook stoves and water filters that meet basic needs (UNDP, 2015).

Among these three systems mentioned above, CDM garnered attention and appeared as a promising solution to rejuvenate the developing countries' market by attracting foreign investors. Besides creating monetary benefits, the mechanism improved human capacity with knowledge transfer and helped Host countries cope with the economic crisis (Michaelowa *et al.*, 2019b; Lahsen, 2009). The most significant benefits of the CDM projects are that they provide employment opportunities and a new way of subsistence for the local people through carbon credit generations. However, on the flip side, the rights to use land and water were restricted in Host countries for the sake of projects' investors (Bumpus and Liverman, 2008).

For the project investors that are in industrialized countries, these mechanisms created a complete win-win solution by providing a convenient alternative to continue business-as-usual GHG emissions rather than implementing political or action changes that might be costly (Lahsen, 2009; Liverman, 2008; Bumpus and Liverman, 2008).

Project Design and Management

Carbon market mechanisms, especially CDM, have formal methodologies that set base standards to understand the quality of the project's design and formalize the documents to register the project. The actors taking a role in the CDM project are the UN's bodies, funding institutions, and the Host's responsible governmental authorities. UN bodies are responsible for confirming and registering the projects, supranational and private-sector actors usually fund the projects, and governmental actors are in charge of the regulation and implementation phases on the national and local scales (Pollak and Wilson, 2009). As a requirement from UNFCCC, the Host country's government should assign a Designated National Authority (DNA) that is responsible for certifying the projects as

“assists in achieving sustainable development”. It is important to note that, with the inclusion of private actors in the system, the Clean Development Mechanism (CDM) is the first environmental policy framework that converts environmental commodities into a consistent and dynamic outcome driven by market mechanisms (Bumpus and Liverman, 2008).

The project design process starts with the submission of project proposals to the UN for registration. In the initial registration stages, the focus is on the theoretical parts to understand the efficiency of the project to obtain high-quality CERs that conform with the UN standards. The projects are designed by either international companies experienced in preparing proposals for development projects, or local companies, or in collaboration with these two actors (Pollack and Wilson, 2009). After registration, carbon finance is being sought by either the private sector or supranational institutions to meet the monetary requirements for the project. Then, the other steps of project design, such as environmental impact analysis, communication with stakeholders, and the steps that require communication and local analysis, are the responsibilities of DNAs. After the installation and running of the project, produced CERs are registered into the UN Databases to monitor and record the carbon credits that have been generated by the mechanism, and following that, the credits are transferred to the buyer countries’ accounts (Bumpus and Liverman, 2008). Another actor taking a role in these processes is the Designated Operational Entity (DOE) which is an independent participant as the third-party actor responsible for approving the project proposal with confirming their compatibility with the Kyoto Protocol’s requirements with the DNAs. DOEs, as the objective actors in the CDM projects, are very important in the processes of validation and verification. To prevent any kind of calculation mistakes that might happen in the identification, monitoring, and trading, having a third party is crucial to ensure the credibility of the project (UNDP, 2015; Pollak and Wilson, 2009; Bumpus and Liverman, 2008).

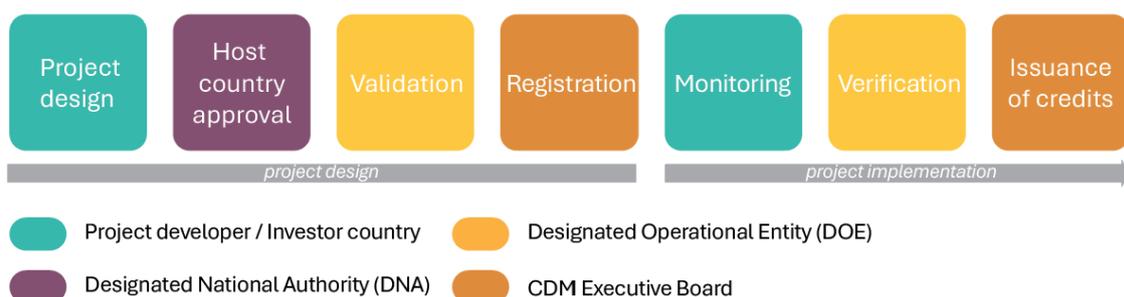


Figure 9 CDM's Project phases and governance structure (adapted from Kollmuss et al., 2008)

And, for the project design, the proposals are required to have seven fundamental elements: Baseline setting, Additionality, Monitoring, Verification, Transparency,

Timeline, and Permanence (Shishlov and Bellasen, 2012). While the first two criteria are more related to the project proposal, the rest are for the ex-post phases.

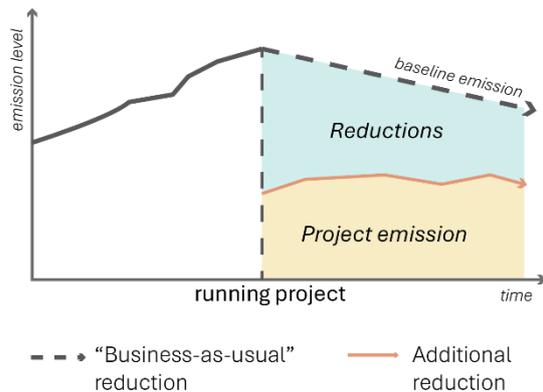


Figure 10 Additionality and baseline (adapted from van Abel, 2011).

Baseline is the reference scenario that shows the most likely scenario in the absence of the CDM project. Additionality is the key criterion that presents the additional carbon reduction from the baseline projections, and it proves that the emission reduction would not have taken place in the absence of CDM projects (Michaelowa *et al.*, 2019b; Bumpus and Liverman, 2008).

Given the very abstract nature of the concepts, these principles are the main reasons for the complexity of the CDM (Michaelowa *et al.*, 2019b).

Projects on Practice

Between 2005 and 2020, almost 8000 CDM projects were conducted saving more than 2 billion tonnes of CO₂ (UNFCCC, 2018; 2023). While Asia-Pacific regions had the highest number of projects with 82% of them, they were followed by Latin America (13%), Africa (3%), and the Middle East and Europe (1%) respectively. Similarly, CER issuance is also mostly made by the Asia-Pacific region generating 1.96 billion emission units through 3179 projects (Brescia *et al.*, 2019). During its lifespan, the UK, Switzerland, and the Netherlands have had the highest share in the CDM projects (UNFCCC, 2023). Back in the early 2000s, the USA decided not to be a part of the Kyoto Protocol, and Canada withdrew in the mid-2010s. Therefore, both countries are not listed in the Buyers' ranking since they did not utilize the CERs generated through CDM (Gerrard *et al.*, 2007).

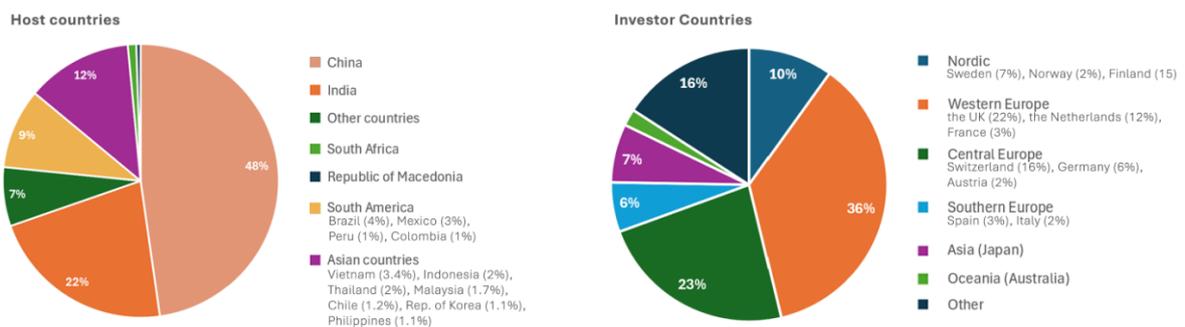


Figure 11 Distribution of 7841 projects based on Host and Investor countries (charts are prepared by the author by using data shared on UNFCCC, 2023)

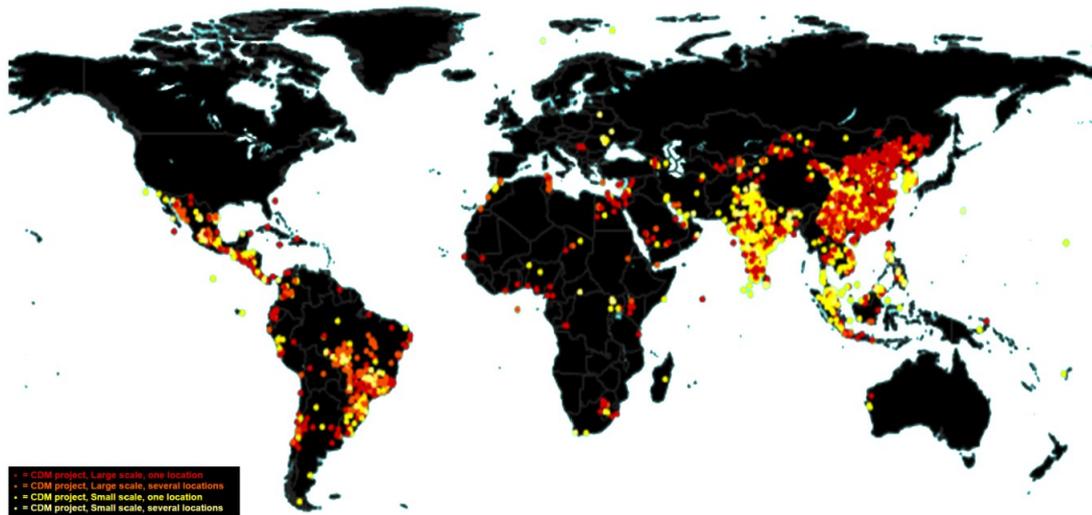


Figure 12. Geographical distribution of CDM projects (adapted from UNFCCC, 2023).

In the sectoral division, the project focuses on renewable energies (solar, hydro, wind, biomass, and geothermal) had the lead in the number of projects, and it is followed by waste handling (10.7%), and manufacturing activities (4.3%). Meanwhile, infrastructure projects and industrial production enhancement activities are the least represented sectors. Nature-based solutions (agriculture and afforestation projects) have only a 3% share in all project activities (Brescia *et al.*, 2019; UNFCCC, 2023).

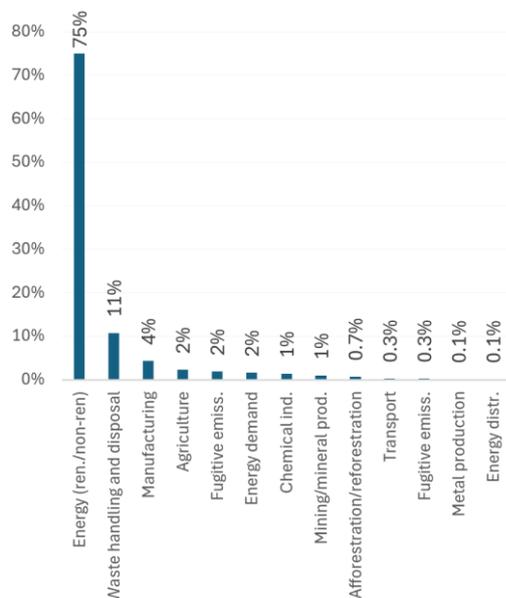


Figure 13 Distribution of registered projects by Scope (adapted from UNFCCC, 2023).

Moreover, after witnessing the success of the projects, the regions started to initiate their own carbon markets. While the EU's Emission Trading System (EU ETS) took the lead in 2004, other countries also built their national system to regulate carbon market mechanisms. And, over time, the Kyoto Protocol's Market Mechanism scaled down, and countries started establishing their territories' markets. Relying on CDM Methodologies, governments, and territorial authorities established regional, national, and in some cases subnational markets to operate the Carbon Market Mechanism (Newell *et al.*, 2013).

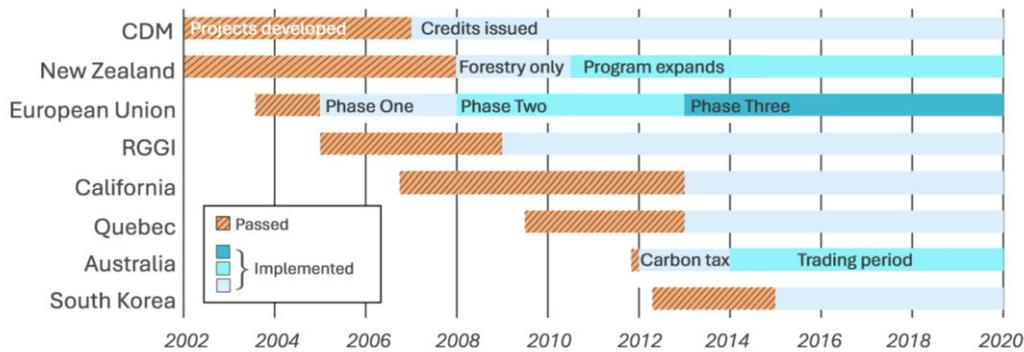


Figure 14 Timeline of GHG Emission Trading Programs that have been developed in different regions (adapted from Newell, et al., 2013).

After negotiating and setting up the system for the CDM, the first project was registered in 2004 to reduce methane emissions from landfills in Brazil, funded by several European countries and Japan. Over time, the CDM market kept growing larger and required additional regulations to stabilize CER prices, and the establishment of EU ETS rejuvenated the whole Carbon Market Mechanism. Between 2008 and 2012, CDM experienced the “Golden Rush” period with having the highest prices for one ton of CO₂ (Michaelowa et al., 2019b). Until 2012, 6600 projects were registered, 1.2 billion tons of CO₂ were saved, and the price for one ton of CO₂ hit up to 25 euros. However, the abundance of projects and credits ended up with a gradual price slump in the market down to 10 Euro per ton of CO₂ (Kainou, 2022; Michaelowa et al., 2019b). In 2012, a “carbon panic” outburst occurred after the EU altered its carbon market policies, and Japan withdrew from the AAU. The political conflicts between countries led the EU to implement an isolationist policy for the CDM project and permit only CERs that can be acquired from the least-developed countries (Bond et al., 2012; Carton, 2020; Kainou, 2022). Meanwhile, in 2011, Japan decided not to determine a national mitigation target after the accident at the Fukushima Nuclear Plant and the severe earthquake that happened in the same year. These changes caused a great panic in the market, and the price of carbon credits crashed to 0.5 Euros per ton of CO₂ (Kainou, 2022). After these crashes, the liquidation of the CDM started to be discussed, and in 2020, the mechanism ended with leaving a lot of discussions behind.

Overview of the System and Criticisms

Kyoto Protocol’s Carbon Market Mechanism functioned from 2005 to 2020, and during this period, CMD was considered a “learning-by-doing” practice (Michaelowa et al., 2019b) for supranational and national bodies to understand how to assist countries in limiting and reducing CO₂ emissions. However, the disparity between developing and developed countries that were made in the CDM mechanism undermined its equity and efficiency, and its snowballing effect impacted the whole process. Consequently, the mechanism has faced criticism throughout its lifespan, notably regarding project

management, credibility, and exacerbated inequalities. The multilevel, intergovernmental, and hierarchical governance structure of CDM incorporates private and supranational actors, and enables the management of the monetary movement in space, through the trade of carbon trading mechanisms (Bumpus and Liverman, 2008). Combined with the geographical distribution of the projects ([Figure 12](#)), this situation sparked discussions about the uneven development of Carbon Markets cause.

Firstly, the distribution of the projects raised questions about the evenness of the CDM. As shown on [Figure 12](#), countries with emerging economies, such as China, Brazil, and India, have the highest benefit from the CDM projects (Gerrard, et. al, 2007; Lo and Cong, 2022; UNFCCC, 2023). In their work, Lo and Cong (2022) examined the impacts of CDM projects on the countries' economic systems by looking at 3311 projects out of 8065 implemented in 79 countries. This research showed that the countries that registered for the system earlier or had more projects, benefited from the system more (Lo & Cong, 2022). Even though this fact helped the countries, it also exacerbated the unevenness of the system by creating uneven geographic economies.

While CDM takes root from the idea of promoting sustainable development through supporting developing countries in financial, technological, and capacity means, the main aim shifted from benefitting climate and developing countries to market approaches (Gifford, 2020). Instead of making new investments and contributing to countries' efforts to develop more sustainable structures, the projects' spatial distribution was formed based on the Host countries' resources. While the countries with vast agricultural and forestry areas were mostly selected for nature-based investments such as afforestation, reforestation, and agricultural restoration, the countries with mining industries attract investments from developed countries to advance their technological advancements (Lo & Cong, 2022; Michaelowa *et al.*, 2019b; Brescia *et al.*, 2019). For instance, in order to build renewable energy projects, the countries that already have human and material capacity have been selected over the less developed countries. This situation particularly holds African countries back from benefitting from the system (Bond *et al.*, 2012).

On top of these, another factor stirring the pot for uneven economic geographies was the constantly growing rift between developing and developed countries. The opportunity to compensate for GHG emissions through “*low-hanging fruits*” of carbon credits allowed Northern countries to keep expanding their industrial development and this situation extended the gap between Global North and South (Vieira and Bauer, 2023; Carton, 2020; Gifford, 2020; Bond *et al.*, 2012). These situations have fanned the flames of uneven development between countries.

Another topic was the credibility and efficiency of projects. The Kyoto Protocol's carbon mechanism primarily mobilized financial resources rather than focusing on CO2 emission abatement, therefore, it is widely discussed by scholars and research

institutions, such as Liverman (2008), Bumpus and Liverman (2008), Lahsen (2009), Carbon Market Watch (2017), and Gifford (2020), that the overall carbon emission has not decreased. In her article, Liverman (2008) claims that CDM did not reduce overall GHG emission, but released 450 metric tons more carbon to the atmosphere which would not happen if these projects were conducted in the country's own territories. This discussion brought up another topic which is projects' credibility.

The credibility of the projects was highly dependent on technical calculations for the CER units, and they were the indicators to prove whether the project was efficient. However, there were discussions about the trustability of the calculations. As pointed out by Michaelowa and colleagues (2019b), data manipulation which happens through overestimating the baselines has been a major concern in CDM project implementations. Considering the complexity of calculations, the difficulty in proving environmental benefits brought up by the project, and the indicators' vulnerability to manipulation, the credibility of the CDM projects has been widely questioned (Bumpus and Liverman, 2008; Michaelowa *et al.*, 2019b).

Another criterion that shows the projects' credibility was economic efficiency and their real impact. Given the large-scale capital expenditures that are required to implement a CDM project, even though there were projections for the total expense of the whole project, the implementation phases required more investment than assumed. Over time, the research on CDM projects indicated that the actual implementation costs often surpassed the initial projections. Along with the price volatility in the market, the unexpected fiscal outcomes from the CDM projects impacted investors' perspectives and gradually ceased the revenue stream for the CDM projects (Michaelowa *et al.*, 2019b; Lo & Cong, 2022). Also, the fragility of the political tensions affected the prices and seized the carbon market by deterring investors (Kainou, 2018). All these factors caused a loss of credibility of the projects.

Even though CDM projects contributed to channeling funds from developed countries to developing ones by supporting the transition to low-carbon economies, the market-based approaches overshadowed the benefits of the projects. Along with top-down approaches, benefit-oriented practices caused social and environmental inequalities and sparked debates over the entire mechanism.

Carbon Market Further from the Kyoto Protocol

After observing the outcomes of CDM projects and the collapse of the market in 2013, the Executive Board (EB) of CDM convened to discuss the future of the mechanism. When the prices crashed down, this situation also caused a drastic decline in the registration of projects (Kainou, 2022; Michealowa *et al.*, 2019). In addition to the “*carbon panic*” and Japan's step back, several countries did not reach their mitigation targets and withdrew from the Kyoto Protocol, and the market which was already struggling with liquidity

started to shrink (Falkner, 2016). In order to overcome this problem, the Executive Board proposed a couple of solutions such as simplifying CDM methodologies, designating a standardized baseline, and developing loan schemes and modifications in the governance structure (UNFCCC, 2013). Moreover, several proposals such as making the system more inclusive by involving developing countries and international organizations in the market to benefit CERs, or making carbon credits accessible to the public by selling them with overpriced event tickets (Kainou, 2022). Despite these brainstorming and efforts, the low demand for the CDM project remained and the transformation to a new agreement started to be mentioned (UNFCCC, 2014). Even though the humor started in 2009, the initiatives failed until the Paris Agreement of 2015 (Falkner, 2016; European Parliament, 2015). Even though the Paris Agreement was released in 2015, the negotiations for the Rulebook lasted for 6 years (“COP26 Outcomes”, n.d.), and negotiations ended in 2024 with the COP29 meeting with agreeing on methodologies, management mechanisms, roles of bodies, and removals after almost a decade (Chandrasekhar *et al.*, 2024). During this period of time, in order to continue to operate carbon trading mechanisms, Kyoto Protocol’s carbon mechanism functioned until 2020, and the Voluntary Carbon Market (VCM) gained importance and started to be the main system for the Carbon Market after CDM’s expiration. And, in this way, the transition from the top-down KP system to the rule-less VCM system began.

2.2.1.2. Voluntary Carbon Market

In the early 2000s, the Voluntary Carbon Market (VCM) was created as an alternative to CDM promising more flexibility. In contrast to CDM’s complexity and rigidity, VCM creates room for all the bodies willing to participate in the market with almost no rules and no regulations (Ahonen *et al.*, 2022; Bumpus and Liverman, 2008). VCM is a still ongoing system with 4661 VCM activities producing 1594 Mt CO₂e of GHG emission reductions which equals to 2384 coal plants’ GHG emission yearly (Streck *et al.*, 2023).

The history of VCM dates back to 1989 with a power plant project applied in Guatemala by an international power company. However, the project concluded with negative consequences on the natural environment, and after this failure, there was little progress until 1994. In that year, Plan Vivo, a non-governmental organization set up by the University of Edinburgh, El Colegio de la Frontera Sur, and local actors from Mexico, was established to support communities in planting trees in Chiapas, Mexico. In 1997 the first VCM carbon credit was generated thereof and sold to supranational organizations. Following this trade, there has been a surge in carbon offset projects from private sector actors. In the early 2000s, a proto-standard was released for Plan Vivo, which includes a guide for project development and operationalization requirements (Faecks, 2023; Plan Vivo, 2020). After this accomplishment, the VCM began to expand through new collaborations within NGOs and adhering to new voluntary carbon standards.

Project Design and Management

Same with CDM, the projects that are designed and implemented in the scope of the Voluntary Market should follow particular methodologies including Accounting Standards with Baseline and Additionality assessments, policies and strategies for Monitoring, Verification, and Certification, and standards for Registration. Having the same core elements as CDM, each standard has its own methodology and terms to implement the projects (Koollmuss, *et al.*, 2008).

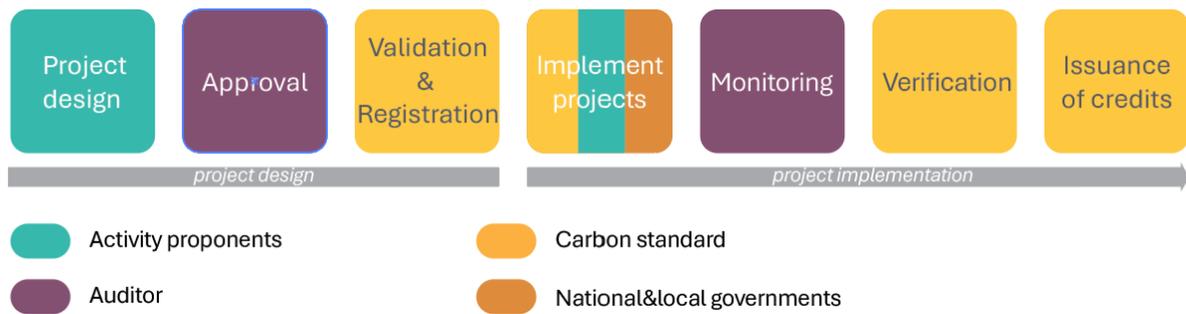


Figure 15 VCM project cycle (adapted from Streck, *et al.*, 2023)

In the planning phase, Feasibility studies and the project design are managed by the Project proponents according to VCM standard requirements. Following the design phases, Validation and Registration to Standard are made. After Registration, the project can be implemented and following the project's timeline, the emission reduction is started to be monitored. Based on the results of the monitoring phase, the functionality of the project is Verified and the credits are issued to the proponent's account to be sold in the market (Streck *et al.*, 2021). Even though the project design processes are remarkably similar, VCM gives a more flexible mechanism to carbon credit generations excluding Governmental institutions from the project management phases.

Projects on Practice

Regional disparities are evident in the application of VCM with some areas demonstrating strong engagement and others showing minimal involvement. Asian countries dominate the carbon credit market with holding over 50% of the global share. Latin America and Caribbeans follow with a 31% share, while Europe and Oceania contribute minimally with 1.1% and 0.3% shares (Streck *et al.*, 2021).

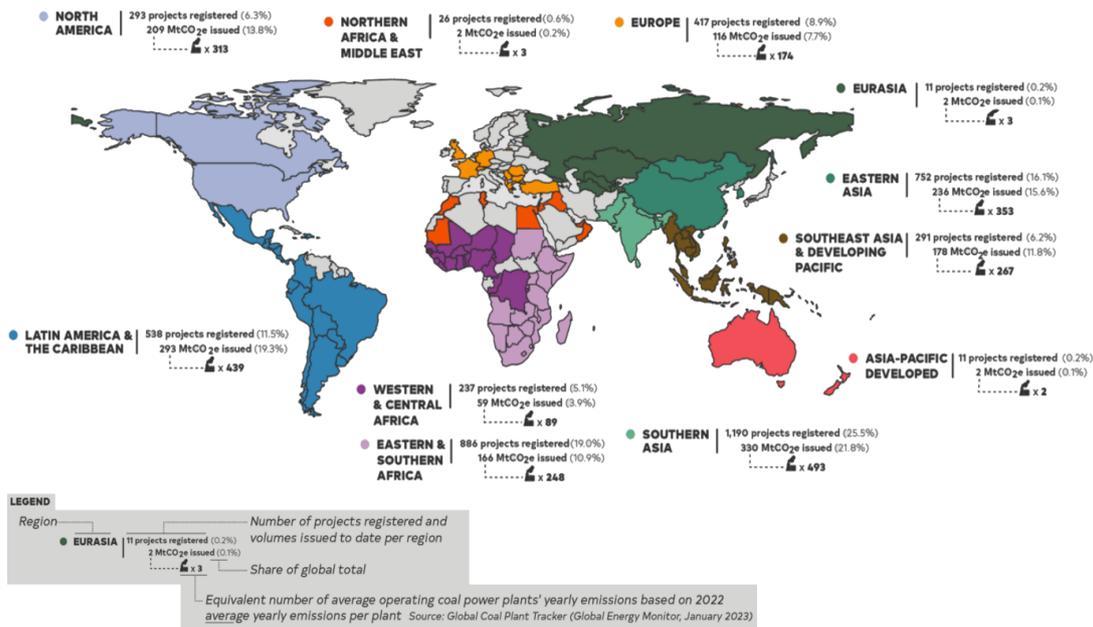


Figure 16 Geographical distribution of VCM Projects (Streck et al., 2023)

Furthermore, sectoral analysis of projects reveals the trend for nature-based solutions within agricultural, forestry, and other land-use projects, highlighting fading interest in coal mines and methane production year by year. Recent years demonstrated a surge in credits generated through nature-based solutions and renewable energies (Streck et al., 2021).

Forestry and land use credits have the highest price and make up a considerable share, while renewable energy projects have the highest sales volume, making them the most sold type of credit (Streck et al., 2023; Compensate, 2021). However, in 2023, the reports released by Ecosystem Marketplace (2024) showed that while the trend for forestry and land use credits is under the spotlight, the interest in renewable energy is waning.

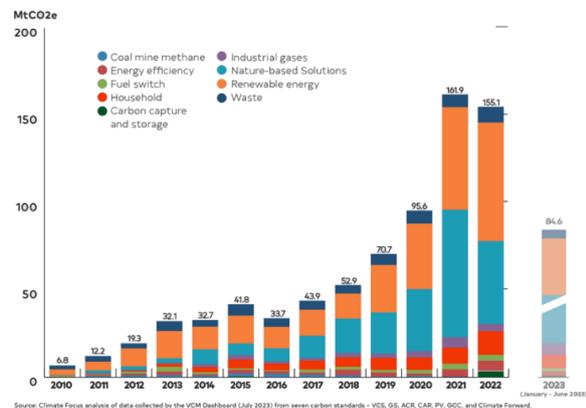


Figure 17 Sectoral division of VCM projects (Streck, et al., 2023)

Despite the recession after the 2008 market, after the expiration of the Kyoto Protocol's CDM, VCM started to be preferred by the actors again, and the mechanism reached its widest in 2021 (Streck *et al.*, 2021).

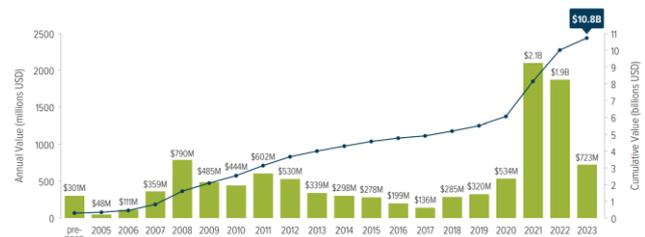


Figure 18 VCM Size by Values of Traded Carbon Credits (Ecosystem Marketplace, 2024a)

In addition to CDM's expiration, another factor accelerating the market growth in the post-Kyoto period was the corporations' and initiatives' commitments to net-zero goals. The European and North American countries purchase more than 95% of the generated offsets, and in 2019, European countries were forefront with having a 65% share in the voluntary offset purchases followed by North American countries with 33%. European buyers mostly preferred credits generated through Forestry and Land use projects (Figure 19) and the purchased credits were produced out of the European continent. While India has the lowest prices with the highest volume of carbon emission reduction, African countries were the least chosen ones with high prices (Figure 20). Additionally, only 1% of the purchased credits are produced in the European continent (Ecosystem Marketplace, 2021).

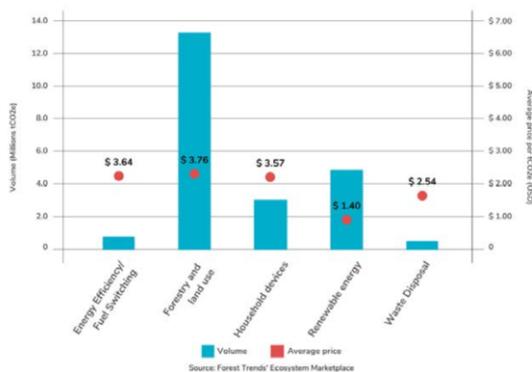


Figure 19 Prices and Volumes by scopes in Europe (Ecosystem Marketplace, 2021)

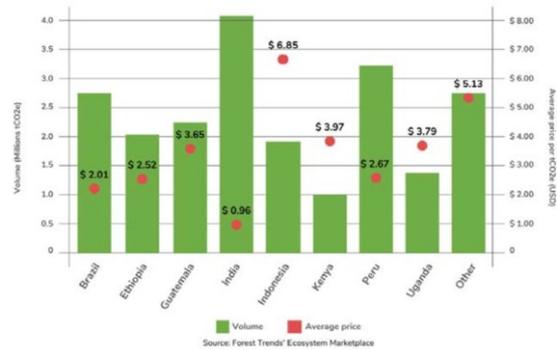


Figure 20 Prices and volumes by leading project countries (Ecosystem Marketplace, 2021).

While European buyers tend to purchase the credits generated in other countries, Northern American buyers prefer to buy the CERs generated in the United States considering the large volume of the market with the lower prices. Whereas the most popular project category is Waste Disposal, the second one is Forestry and Land Use projects (Figure 21). Even though Brazil, Canada, and Peru also have VCM projects generating credits, their market size is much smaller than the USA with higher prices (Figure 22) (Ecosystem Marketplace, 2021).

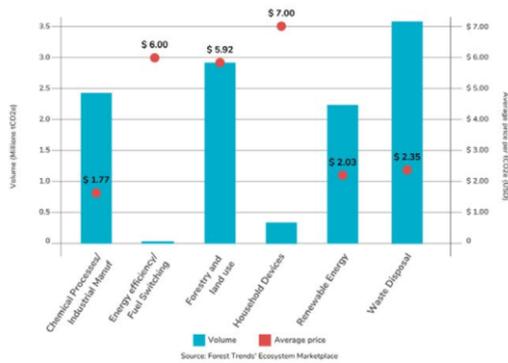


Figure 21 Prices and Volumes by Project sectors in N. America (Ecosystem Marketplace, 2021)

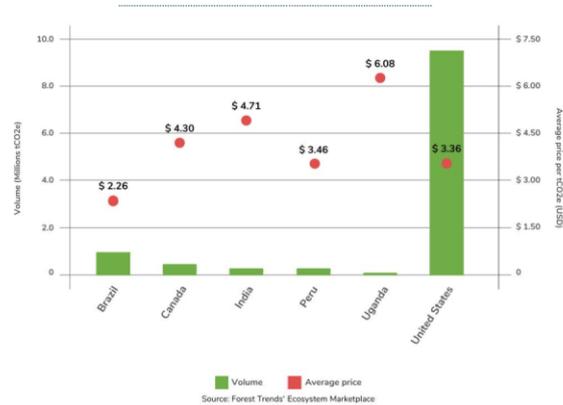


Figure 22 Prices and volumes by Host countries in N. America (Ecosystem Marketplace, 2021).

With its more flexible structure, VCM enables diverse actors to participate in the market with a wide range of activities. While Asian countries are leading the market, Western and Central African countries hold the smallest share in the market after the Northern countries. In terms of sectoral division of the projects, although renewable energy projects have attracted the most investment, interest in them is declining. Conversely, there is a trend for nature-based solutions, particularly in the agriculture and forestry sectors. While the European buyers mostly prefer to benefit from these projects, it is the second most favored sector for the Northern American buyers. The wide range of activities and the opportunity to conduct projects all over the world helped VCM to grow its size.

Overview of the System and Criticism

Voluntary carbon markets emerged as a simpler, more accessible option to the intricate framework of the Kyoto Protocol's carbon trading system by providing an opportunity for individuals and companies to take action on climate change in a more flexible way. Even though both markets have the same logic that is based on purchasing carbon allowances to compensate for extended usage, the differences in the organization processes and the level of inclusivity make the main differences split apart these two systems.

Since both CDM and VCM have the same idea of selling carbon emission units with similar methodologies, criticisms for VCM mostly align with the criticisms for the CDM by orienting around the problems related to project management and the instability of the market.

Given the fewer regulations in the VCM, the mechanism has been mostly criticized for its management system. Particularly, the monitoring processes are under the spotlight by raising concerns about double counting (Ahonen *et al.*, 2022; Lovell, 2010) and double issuance (Streck *et al.*, 2021). Despite the nimble and flexible nature of VCM, given the

high number of alternatives for Standards, the same credit might be accounted for and sold to more than one company. And, this gap in the regulations is one of the reasons that caused low interest along with lower prices in the market. Even though the market attempted to standardize and formalize the processes, the rapid growth and avoidance of complex processes seized the search for a more legitimate system (Climate Focus, 2021; Lovell, 2010).

However, since the concerns about double counting and selling remained, *what is being sold* has provoked discussions. Even though the credibility of the credits is dubious, respecting the issuance made by the Standards, they were still on the market. The research conducted by Compensate (2021), a foundation working on carbon credits, claimed that most of the registered projects are failing to fulfill their goals and the GHG emissions they made are overestimated (Battocletti *et al.*, 2023; Compensate, 2021). Moreover, an article published in the Guardian a couple of years after this report asserted that 90% of rainforest offset projects registered by Verra standards are “*phantom credits*” by overstating the emission reductions. Even though Verra disputed the claims, they also accepted it is difficult to capture the exact numbers of real emission reductions (Greenfields, 2023; Battocletti *et al.*, 2023). And, this negative impact from the media influenced the market participants, and the Forestry and Land Use credits lost their value in the same year (Ecosystem Marketplace, 2024).

Less-regulated mechanism of VCM has been widely questioned and raised concerns considering the lack of regulation and the problems it might cause. The negative impression created in recent years also fanned the flame for the credibility of the projects and ended up with a fading interest in the system.

Future of VCM

Compared to the Kyoto Protocol’s firm requirements, VCM has been established as a counteract to CDM and it was promising by leaving room for the involvement of NGOs and charitable institutions in the market with having the same aims as the CCM (Lovell, 2010). Considering the constantly changing market size, vulnerability to policy changes and volatile prices, it is difficult to make assumptions about the future of VCM.

In 2021, after witnessing the rapid growth of the market, Ecosystem Marketplace (2021) claimed that despite the posing issues and challenges, there is still high interest in VCM regarding its convenience, and with the changing and evolving standards, VCM can be an important instrument to reach decarbonization goals and green economies (Ecosystem Marketplace, 2021). However, the fragile structure of the market also has shown itself with the negative impressions that have been created in recent years. In 2023, the interest in VCM faded after the “*phantom credits*” news. Considering all the concerns about the regulatory part of the VCM, there is some evidence these projects have not always

fulfilled their goals. Therefore, along with the fluctuating prices and intricated climate change impacts, the VCM is perceived as “*greenwashing promises*” (Battocletti, *et al.*, 2023; Compensate, 2021).

Another significant issue is lacking regulations. Given the very few regulations for the firm climate impact mitigation, the future of VCM is at risk of underperforming (Carton, 2020). For an effective climate finance policy, Kollmuss and colleagues (2008), foresaw the necessary gradual transformation from VCM to CCM aiming to regulate the market, boost the quality, and consequently, the prices for the carbon market while ensuring a safe environment (Kollmuss *et al.*, 2008). The mechanisms introduced by the Paris Agreement facilitate the transformation from VCM to the next era of Carbon Markets in the scope of Article 6, and countries can use these transferred projects to reach their determined goals. To do that, the projects have to comply with the Paris Agreement methodologies (Streck *et al.*, 2021).

With all the ups and downs, VCM is still a promising option for the private sector, and there are initiatives to improve the market. The movement from CDM to VCM has been considered an enhancement with a more flexible and inclusive structure. While the CDM projects’ future is already determined by the expiration of the Kyoto Protocol, considering the reshaping Carbon Market under Article 6 and increasing demand for them, what will happen to VCM is a matter of curiosity.

2.2.1.3. Paris Agreement’s Article 6

Paris Agreement was released in 2015 being adopted by 196 countries aiming to take GHG emissions under control. The Agreement's main goal is to keep the global average temperature rise under 2°C above pre-industrial levels. Paris Agreement is the first legally binding legislative framework that brings all the countries together to cope with climate change. Every five years, the goal for GHG emission reduction is renewed ambitiously in the scope of the Agreement, and, after witnessing the successful carbon emission reductions by several Parties, a new target for 2030 has been determined as remaining 1.5 °C above the pre-industrial level with promoting zero-carbon solutions (“The Paris Agreement”, n.d; Paris Agreement, 2015). In the scope of the agreement, each Party has to designate their Nationally Determined Contributions (NDCs) that include a climate action plan that has targets, policies, and measures to reduce GHG emissions and adapt to climate change impacts (“The Paris Agreement, n.d.; “The Paris Agreement and NDCs”, n.d.). Paris Agreement introduced Article 6 as the new Carbon Market Mechanism of the UN, however, the discussions for settling down the terms for operating it took time. In 2021, 6 years after the Agreement’s release, the negotiations for the operationalizing of the mechanism ended and the Rulebook for the new carbon offset mechanism was unveiled, and recently, with final negotiations in COP29 the mechanism will be started to

operationalize (“COP26 Outcomes”, n.d.; Chandrasekhar *et al.*, 2024). As the successor to the Kyoto Protocol, the Paris Agreement implements carbon tradeoff mechanisms similar to the Kyoto Protocol’s.

Article 6.2 – Cooperative Approaches: Under compliance Article 6.2, the parties of the Agreement can exchange the credits, as called Internationally Transferred Mitigation Outcomes (ITMO), bilaterally or multilaterally to promote sustainable development by conducting all the processes transparently without the guidance of UNFCCC. Parties are also required to guarantee environmental integrity and prevention of any calculation errors (Paris Agreement, 2015).

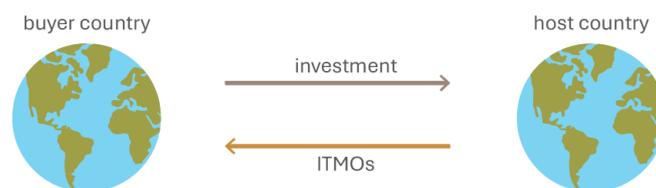


Figure 23 System of Article 6.2 (author’s own elaboration)

Article 6.4 – Sustainable Development Mechanism: Article 6.4 is the main part of the Agreement that allows countries to trade credits voluntarily. According to this system, emission reduction units can be generated in the Host country with the financial assistance of the Buyer country under the oversight of UNFCCC (Paris Agreement, 2015). Known as the “Sustainable Development Mechanism (SDM)”, Article 6.4 establishes an international carbon market that is operated voluntarily and governed by the UNFCCC to have a centrally guided and supervised structure (Michaelowa *et al.*, 2019a; Ahonen *et al.*, 2022).

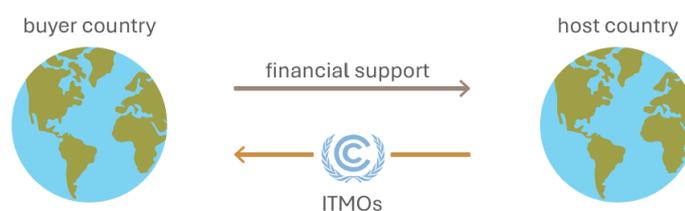


Figure 24 System of Article 6.4 (author’s own elaboration)

Article 6.8 – Non-market Approach: Article 6.8 highlights the importance of non-market approaches in the carbon trading mechanism aiming to promote sustainable development and poverty eradication through the transfer of knowledge, and technology, with supporting capacity building to improve the inclusivity of public and private actors for the fulfillment of NDCs (Paris Agreement, 2015). Given the fact that this mechanism is less explained than the latter, it is still unclear how it might function (Michaelowa *et al.*, 2019a; The Nature Conservancy, 2024).



Figure 25. System of Article 6.8 (author's own elaboration)

REDD+ Mechanism: Different from the other carbon offset mechanisms, REDD+ has a longer history and practices. Aiming to halt deforestation and forest degradation, the UN introduced Reduction Emissions from Deforestation in its nascent form in 2005. Over time, the Program has been formalized in the Warsaw Framework, and in 2013 had its new name “Reducing Emissions from Deforestation and Forest Degradation (REDD+)” (Governo do Pará, n.d.; “What Is REDD+?”, n.d.). The program was mentioned in the Kyoto Protocol for the first time within the scheme of LULUCF, had been improved in the COP meetings, and became a part of the Paris Agreement under Article 5. In addition to Article 5, during the Article 6 negotiations, REDD+ activities were also added under Article 6 as a mechanism to decrease GHG emissions (“REDD+”, n.d.).

Compared with the Kyoto Protocol and VCM, the Paris Agreement provides a new carbon trading system that combines the positive sides of the formers with integrating the lessons taken from the experiences. The first significant difference is the liquification of developed and developing disparity and inviting all the Parties to work on the problem together. It also allows not only the Governments but also private sector actors to take part in the market.

Governance and Project Design

Article 6 unveils a system that is more inclusive by making the Host country the most responsible body in the process and giving less responsibility to the UN Bodies. According to the Article, Parties are required to designate their own NDCs with their emissions goals, policies to achieve them, and measures to assess their success. In other words, countries themselves are the main bodies responsible for their GHG emissions and management processes in this mechanism. The same condition applies to the implementation of the projects. While the Kyoto Protocol is oriented around a top-down approach that mandates the UN to control each step of the projects, the Paris Agreement embraces a bottom-up regime by giving National Governments more responsibility and pulling the UNFCCC back from the project management processes (Ahonen *et al.*, 2022; Michaelowa *et al.*, 2019a; Paris Agreement, 2015).

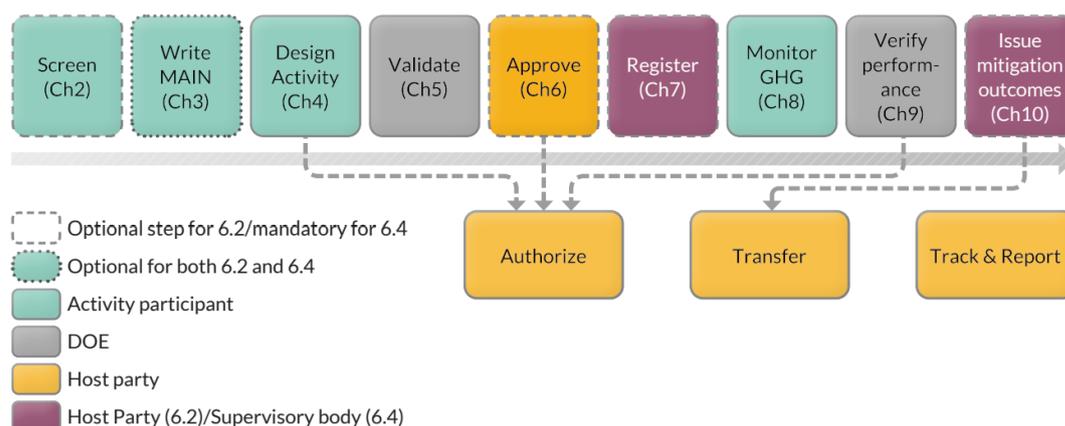


Figure 26. Activity sequence of Article 6.4 (Ploechl, et al., 2023).

According to the Agreement, Host countries will be the main bodies who are responsible with the approval of the activities and for communicating with other stakeholders. While the initial project steps’ (analyzing the options, choosing the best one, and designing the activity) are the responsibilities of the Participants, Host countries are in charge of the Authorization and Transferring, Monitoring, and Reporting (Greiner *et al.*, 2020; Ahonen *et al.*, 2022; Ploechl *et al.*, 2023). In the project design and implementation phases, the baseline and additionality requirements remained the same in Article 6. The project developers are required to submit their projections for the baseline and additionality with more ambitious GHG reduction goals (“Baselines and Additionality”, 2021). For the other steps, although they are almost the same as CDM, the responsible actors and their tasks changed in the Paris Agreement. The inclusive nature of the Paris Agreement invites Host countries to take on more responsibilities in the phases of the project, too. While the UN and the Mediators were responsible for the Approval, Authorization, and Monitoring of the former systems, the Host country and its bodies are in charge of these steps and tracking ITMOs in the Paris Agreement’s carbon market (Ahonen *et al.*, 2022).

Challenges

Considering the long-lasting negotiation process, there are limited numbers of activities developed under Article 6. In their research, Greiner *et al.* (2020) discuss that even though there are only several pilot activities, the outcome showed that the Host countries are being cautious during the project development and management. While the Buyer countries are concerned about reaching their NDCs, the Host countries have more to lose (Greiner *et al.*, 2020). Along with reaching their goals, the main concerns Host countries have are focused on the governance structures, and the benefit for the local communities (Battocletti *et al.*, 2023).

Another challenge is the pending CDM and VCM activities to be considered under Article 6. Even though the Paris Agreement sets the stage for a new era of carbon trading by

simplifying procedures, it also blurs the line between voluntary and compliance-driven markets which sparks questions about NDC achievements by using these mechanisms (Ahonen *et al.*, 2022; Streck *et al.*, 2021; Micheolawa *et al.*, 2019a). Although the Agreement allows the transformation of both the Kyoto Protocol's and Voluntary market projects into Article 6 activities, the transformation processes are still ongoing (The Nature Conservancy, 2024; "Paris Agreement Crediting Mechanism", n.d.). Therefore, the management processes for these transformations are still dubious.

As the practices outlined in Article 6 are still developing, concerns regarding management systems, the integration of previous and current markets, and the potential risks that this system could pose remain uncertain.

2.2.2. Carbon Markets from the Past to the Future

Carbon market mechanisms invented by the Kyoto Protocol, have been extended through VCM, and the implementation of the Paris Agreement is on the horizon. In its recent but long history of more than 30 years, these mechanisms make a narrative of global carbon market landscapes including political economy, global geography, and land use practices with their different governmental structure, project management, and challenges.

In the beginning, in its nascent form, the Carbon Market Mechanism was introduced as a win-win solution for developed and developing countries to mitigate climate change by using climate finance tools (Mathur, *et al.*, 2013; Fisher *et al.*, 2018; Carton and Edstedt, 2021). However, the multi-dimensional and multi-stakeholder structure of the mechanisms posed challenges over time.

Kyoto Protocol's market mechanism, particularly CDM, was a top-down approach that allowed only the national and supranational bodies to take part in the market without considering the regional and local levels (Mathur *et al.*, 2013; Andresen, 2015; Okereke and Coventry, 2016; Michaelowa *et al.*, 2019b). Moreover, the Protocol divided the countries into two "*developing*" and "*developed*" which strained the tension between Global North and Global South. Over time, this tension became visible, and the climate change conventions and the carbon market's development represented international political power relations in the climate government approaches (Bumpus and Liverman, 2008; Gonzalez, 2021). Unbalanced political power between countries caused uneven social and environmental outcomes, specifically making developing countries bear the burden of climate change (Liverman, 2009). While the expectation was to provide benefits to both the buyer and host countries, the system ended up mostly favoring the market (Gifford, 2020). Shortly after the experiences with the UN's carbon market, VCM was initiated as a counteract to the Kyoto Protocol's stringent mechanism (Lovell, 2010). The main difference was allowing diverse actors to be a part of a less regulated market.

However, the volatile prices and fragility of the changing political atmosphere caused a constant alteration in the market size, and the interest in the market faded over time making the future of VCM unpredictable (Compensate, 2021; Battocletti, Enriques and Romano, 2023).

Consequently, these two established markets have faced criticism regarding their governance structures. Firstly, top-down approaches that ignore the regional and local scales sparked. Projects that have been designed and implemented without the participation of regional and local authorities seized the importance of land by putting biophysical and economic features in the frame of market-based approaches and oversimplifying the importance of social and environmental dynamics, coupled with, belittling traditional practices through implementing the standard solutions (Carton, 2020; Fogel, 2004). While carbon trading mechanisms were evolving in years on the supranational levels, the regional and national governments initiated their own markets through carbon taxes and their own carbon trading mechanisms aiming to strengthen their policies about GHG emission abatement. While carbon trading mechanisms take their base from the quantity of emission reduction units and let the price vary, carbon taxes keep the price fixed and allow the quantity to vary (Pollitt, 2015).

Both carbon taxes and carbon trading mechanisms are integrated into policy frameworks to strengthen the policies about decarbonization and low-carbon development (Pollitt, 2015; World Bank, 2024). Building their own carbon pricing systems helps countries to control the generated credits and convert them to compliance-market credits, and able to connect to the global market in the future under the auspices of Article 6 (Michealowa *et al.*, 2019c; World Bank, 2024). Other reasons for the creation of regional, national, and sub-national markets are tailoring the policies according to the specific economic, social, and environmental contexts of the territories, and getting ready for the implementation of the Paris Agreement's Article 6 through the establishment of the carbon pricing mechanism and overcoming the complexities of the international mechanisms (Michealowa *et al.*, 2019c; World Bank, 2024).

Significant regions and their carbon market operationalizations are already strongly connected to the global trading markets. In some countries, these two systems are linked to each other, and the financial benefits acquired from the national carbon taxes and permits for GHG emissions can be collected nationally and they might be transferred to another country for a more equitable economic burden. EU ETS system is one of the good examples of the transboundary carbon trading mechanisms in terms of being linked to regional and international levels (Pollitt, 2015; Michealowa *et al.*, 2019c).

Promotion of local and regional programs are initiated aiming to strengthen the participation of multi-level structures in the market (Newell *et al.*, 2013), and subnational emission trading systems (ETS) started to be created by the countries (Michealowa *et al.*, 2019a; World Bank, 2024). As of 2024's end, 36 carbon trading mechanisms are in

operation with a further 22 under-development systems that range from local to supranational levels. Emission trading systems started to be operated at every level of the governmental systems ranging from local to supranational. While in the EU, there is a supranational system that allows emission trading between EU Member states, and Iceland, Lichtenstein, and Norway, there are Chinese cities that operate their own ETSs (ICAP, 2024; World Bank, 2024).

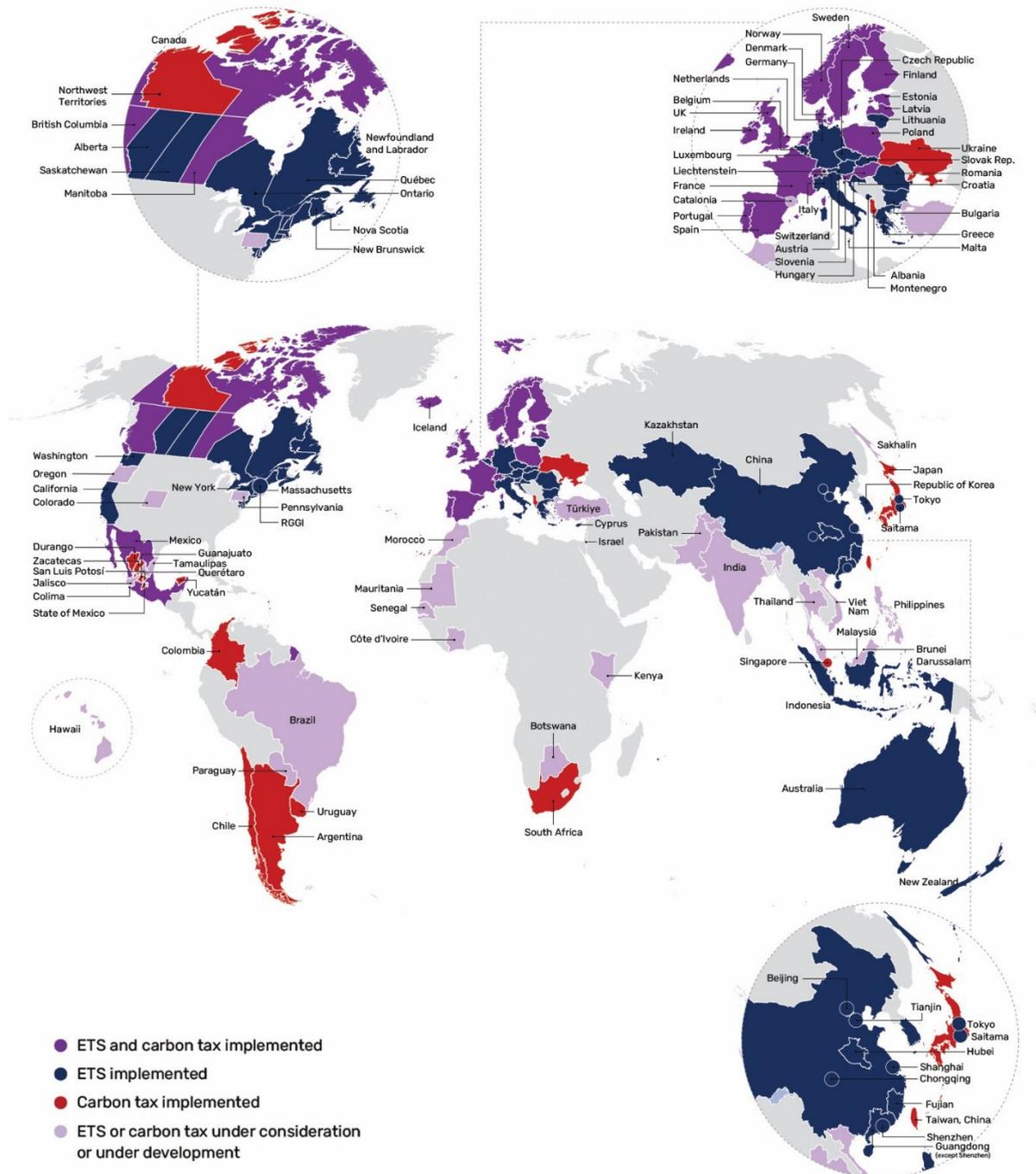


Figure 27 Countries carbon pricing mechanisms and their development in 2024 (World Bank, 2024)

While in some cases these regional markets are connected to the international markets, their main goal is usually achieving national mitigation targets (Michealowa, *et al.*, 2019c), and a growing body of developing countries are establishing their domestic carbon markets to be prepared for the possible participation in international markets (World Bank, 2024). Among 36 trading mechanisms, the ones in Europe and North America are more mature than the other ones, and considering their already developed industries and urbanization processes, carbon markets are the tools for economic growth, rather than the factors creating environmental pressure. On the other hand, for developing countries and emerging economies, carbon markets should be established by taking into account environmental governance and nature protection (D. Wang and Sun, 2024). China has the largest national ETS in the world, and Thailand, Vietnam, India and Pakistan are the countries preparing their ETSs (Ngai, 2017).

And for the future of the carbon market projects, Akrofi's (2024) research aims to understand the hotspots for the carbon projects by analyzing the location of the projects from 2002 to 2022, revealing that 12 countries have been hotspots for the VCM project. While Turkey has remained a hotspot during the lifespan of the carbon trading mechanism through renewable energy projects, China, Brazil, Peru, Panama and Cambodia were the hotspots between 2004-2016, India, Kenya, Rwanda and Uganda became the new hotspots after 2017 (Akrofi, 2024). However, while some of the countries already have their own carbon pricing mechanisms, how the project will be kept implemented in the countries that do not have the policies, particularly the African countries, raises questions. Especially given the fact that they can not demand the credits they generate, however, they can be the suppliers (Gonzalez, 2021).

The Paris Agreement's Article 6 addresses the challenges of these mechanisms by combining their strengths and tackling the criticisms they have faced. Firstly, multiple options proposed by Article 6 herald a new and more inclusive carbon market mechanism for the future. The multiple options allow both state and non-state actors to participate in the market with its bottom-up approach. The unveiled bottom-up approach is the second brand-new implementation in the compliance market that was brought in by the Paris Agreement. While mediators and buyers held most of the responsibility in the CDM and VCM, Article 6 makes the Host country the primary authority within the process. This change aims to stimulate both public and private bodies to participate in the market to reduce disparities by providing more funding options. This policy change aims to attract new investors and lead them to apply for SDM (Michaleowa *et al.*, 2019a; 2019b). Also, the mechanism gives the chance for the regional markets to link to the global markets (Michealeowa *et al.*, 2019c; World Bank, 2024).

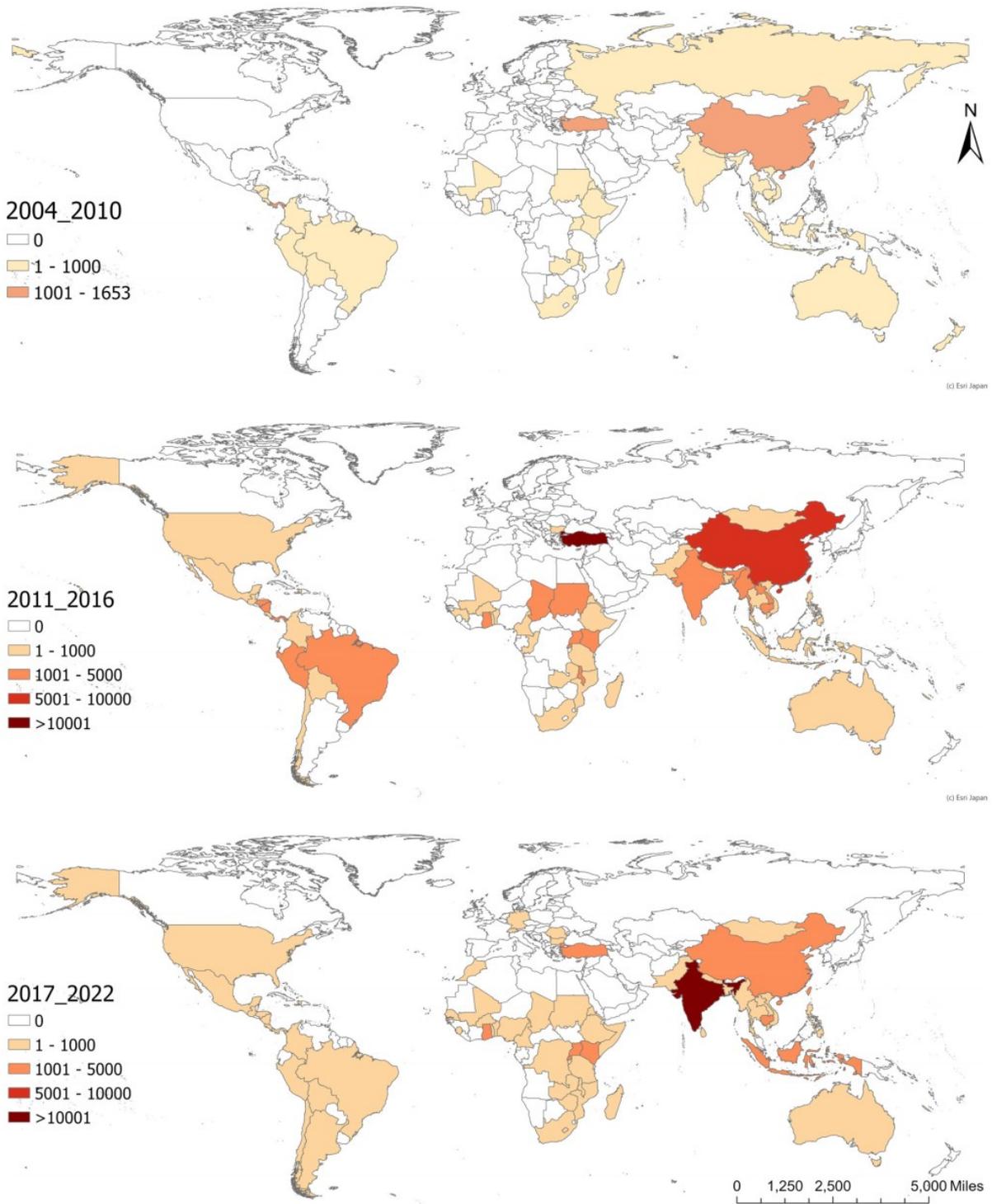


Figure 28 Carbon credit projects' spatiotemporal distribution between 2004-2022 (Akrofi, 2024, p. 8)

In conclusion, countries can connect to global carbon trading mechanisms through either domestic carbon mechanisms or carbon taxes by using the credits that have been generated in these two mechanisms (Michealeowa et al., 2019c). However, a lack of

clarity on market integration creates a bottleneck for the countries to scale up their initiatives. How these different levels will be integrated is still a matter of curiosity that has been worked on by international organizations (World Bank, 2024). Even though this principle has been accepted, the political economy of carbon markets has remained largely unchanged. Given the abstract nature of carbon markets, the uncertainty of the size of GHG emissions claimed to be removed from the atmosphere sparks questions. Subsequently, the geographical disparity in carbon reduction and carbon generation, and its contribution to zero-sum policies, has been a debatable topic for decades (Michaelowa *et al.*, 2019b; Battocletti *et al.*, 2023). Overall, carbon markets represent an example of “overconfidence” in environmental markets (Carton, 2020), and the future of the carbon market is still unknown.

Even though the carbon markets failed in the story with prices crashing to the bottom and having negative impacts on the environment and societies, the interest in the carbon credit mechanism is still going on. Although there is hesitancy to invest in this mechanism, the wide range of opportunities provided by Article 6 of the Paris Agreement leaves the door open for new market players to invest in these sectors (Carton, 2020). One lesson that can be taken from the process is that Carbon Markets are dynamic entities rather than static ones. Even though it started as a very top-down approach that has been operated by a supranational body, during history, it evolved and became a virtue of national and subnational programs (Newell *et al.*, 2013).

Although there are crucial changes in the governance system, the Host countries are cautious about participating in the mechanism, and their concerns are mostly focused on the governance structures, and the benefit for the local communities (Battocletti, *et al.*, 2023). Therefore, in the following parts, carbon markets will be scrutinized through justice-based concepts and land management processes.

2.3. Carbon Markets in Spatial Planning Discourse

While there are a lot of studies conducted in the fields of economic and geography related to the carbon trading market and its impacts, there is a literature gap when it comes to spatial planning and its interaction with carbon offset projects. As highlighted by Gifford (2020), referencing the works of Lovell and Liverman (2010), Bumpus, Liverman, and Lovell (2010), Lovell and Bulkeley (2009), Liverman (2009), and Bumpus and Liverman (2008), much of the research has focused on the operational steps of carbon markets, with limited exceptions examining how the operationalization of these markets occurs. Some examples of these studies include Ahonen *et al.* (2022), Lo and Cong (2022), Michaelowa *et al.* (2019b, 2019c), Tramel (2016), and Andresen (2015), who discuss how multilevel governmental structures have shaped the market. Carton *et al.* (2020), Carton (2020), Newell *et al.* (2013), Bond *et al.* (2012), Lahsen (2009), and Bumpus and Liverman (2008) explore how the natural environment and local communities have been affected

by carbon trading activities. However, there are a limited number of studies connecting carbon markets with their spatial and social impacts (Wang and Hao, 2023).

Given the scope of the activities and the space they occupy, spatial planning is becoming an important field in the implementation of climate finance and carbon trading projects to address these challenges (While, 2008; Knuth *et al.*, 2025). Taking multi-level decision-making processes, stakeholder management through participatory approaches, and land use management for economic development on multiple levels as parts of the spatial planning tools, this section seeks to bridge the gap between the operationalization of carbon finance projects and the ways spatial planning can contribute for more equitable and sustainable implementation processes.

2.3.1. The Political Geography of Carbon Markets and Spatial Implications

Scholars have widely discussed the political geography that the carbon market projects have created by examining capitalist cycles and their environmental impacts.

The global carbon market is one of the tools in the contemporary world to renew the means of production, and the organizational and institutional structure of carbon markets is usually categorized as capital accumulation strategies through financial mobilization (Bumpus and Liverman, 2008). Given the fact that the carbon market projects have spread the whole world, extended geographies of carbon offset projects can be seen as “*spatial fixes*” that always look for new places to expand to attract new investors. These projects, as products of neoliberal policies, allow the use of land in developing countries for capital accumulation and create new revenue streams for capitalists (Harvey, 2001; Bumpus and Liverman, 2008). By commodifying nature and shifting environmental governance to market-based mechanisms, these policies facilitate neocolonial processes, as they prioritize financial returns over environmental and social equity.

The carbon market and the neoliberal policies that have been introduced to support capital accumulation also influence the governmental systems. In traditional organizations, the governments are responsible for regulating the rules and policies to prevent air, water, and soil pollution and protect the right to access clean resources. However, under neoliberal economic frameworks, natural resources have been globalized and turned into commodities, as a consequence, the Governments often relinquish control to private actors, as exemplified by the Carbon Market Mechanism (Bond *et al.*, 2012). This commodification has led to the atmosphere being fragmented into properties, with rights to pollute allocated to countries. These discussions of “*property*” and “*rights*” have sparked concerns about the “*privatization of air*” and “*colonization of the atmosphere*” (Bhambra and Newell, 2022; Bond *et al.*, 2012; Bumpus and Liverman, 2008; Bachram, 2004). Moreover, the extension of this topic can be related

to land grabbing activities through Land Use, Land-Use Change, and Forestry (LULUCF) projects. These initiatives often disregard traditional practices, displace local populations, and exploit natural resources to generate carbon credits (Carton, *et al.*, 2020). Forests, rivers, and agricultural lands are transformed into raw materials for carbon markets, endangering local communities that rely on these resources for subsistence. In such cases, the privatized and commoditized atmosphere exacerbates challenges for marginalized groups while benefiting market players (Bond, *et al.*, 2012; Bumpus and Liverman, 2008; Bhambra and Newell, 2022).

The political economy of carbon markets reflects broader inequalities. Critics argue that these markets enable wealthy actors to “*pay to pollute*” rather than implement meaningful emission reductions (Gifford, 2020; Bumpus and Liverman, 2008). The geographical distribution of carbon offset projects and the division between host and buyer nations mirror colonial-era mechanisms of global power. Carbon markets represent a new form of imperialism, where natural resources in developing countries are exploited to produce emission reduction credits for wealthier nations (Vieira and Bauer, 2023; Gifford, 2020). Despite claims of fostering sustainable development, these mechanisms often prioritize cost-efficiency, placing the natural resources of vulnerable regions at risk (Carton, 2020; Bond *et al.*, 2012).

The systemic flaws in the carbon market are further reflected in the failure to adequately address historical responsibilities for climate change. At the start of the UNFCCC meetings, developed nations agreed to lead efforts against climate change due to their higher historical contributions to global warming (Michaelowa *et al.*, 2019b; Carton, 2020; Sultana, 2022). However, carbon markets have enabled emitter countries to maintain “*business as usual*” practices rather than taking meaningful action to mitigate climate impacts (Liverman, 2008). Critics argue that if the 10 highest emitter countries, responsible for 40% of global GHG emissions, took more significant action, global efforts would be far more effective than involving over 200 nations in complex carbon trading systems (Andresen, 2015). This system has exacerbated unequal power dynamics and increased resistance among host countries to the Paris Agreement’s carbon market provisions.

Karl Marx’s three circuits of capital offer a theoretical lens to understand this dynamic. While capital is initially produced in a specific territory, revenue from the first circuit is reinvested elsewhere to generate further value within the second circuit of capital (Avar, 2019; The Marxist Project, 2021). The political economy shaped by carbon metrics has evolved beyond simple exchange practices, emerging as a new capitalist means of production (Vieira and Bauer, 2023). Bumpus and Liverman (2009) draw parallels between David Harvey’s “*accumulation by dispossession*” and decarbonization processes. Harvey’s theory explains how public or individual possessions are transformed into private property through neoliberal policies, strengthening capitalist

power while dispossessing the public (Harvey, 2004). In decarbonization projects, natural resources like forests or agricultural lands are transformed into raw materials for carbon credits, perpetuating uneven power dynamics and benefiting developed countries at the expense of developing regions.

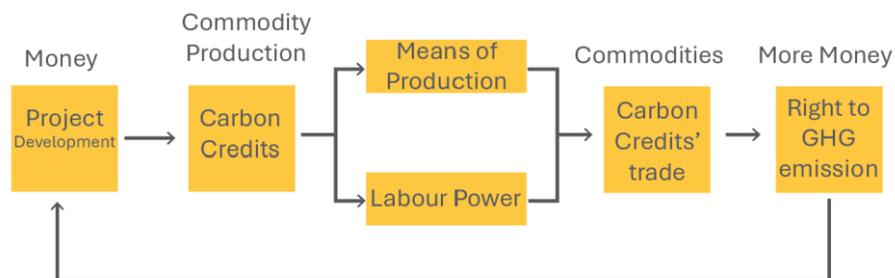


Figure 29 Marx's capitalist circulation through carbon crediting system (Authors own elaboration based on "Marx's Circuit of Capitalist Production", Murray, 2017, p. 4).

The mobilization of monetary values, combined with the pervasive nature of capitalism, has resulted in unevenly developed economic and social geographies. The carbon market mechanism exemplifies how climate change adaptation and mitigation strategies can create unjust systems on both local and global levels. What sets the carbon market apart is its reliance on international agreements and standards, which have entrenched the supremacy of Northern countries while jeopardizing the natural resources of developing nations (Bumpus and Liverman, 2008; Bond, *et al.*, 2012). These systemic flaws highlight the urgent need to reform the global carbon market framework to ensure equitable and effective climate action.

2.3.2. Critical Aspects of Carbon Market's Operationalizations

Climate finance and carbon trading mechanisms are important parts of global climate policy, and translating these mechanisms from a supranational level into actions on the local scale is not an easy feat.

Given the multi-level structure of the carbon market mechanism, bridging different levels of governance is crucial for policy-making processes. Policies should be designed in a way they are coherent with the upper and lower institutional organizations' capability and power (Andresen, 2015; Michaelowa *et al.*, 2019b; Ahonen *et al.*, 2022). Another important factor for policy design is stakeholder engagement. Decision-making processes should be inclusive in a way that includes local levels, particularly local communities and indigenous people with respect to their domestic knowledge (Fogel, 2004; Lahsen, 2009; Tramel, 2016; Carton, 2020). Last, but not least, carbon market projects and land use changes and zoning management should be intertwined each other to achieve justice (While, 2008; Bumpus and Liverman, 2008; Bond *et al.*, 2012;

Gifford, 2020) (that will be discussed in the following sections respectively [2.3.2.2](#) and [2.3.2.3](#)).

In that part of the research, examples from different parts of the world will be explained to make a narrative about the carbon market's implementation focusing on the parts spatial planning tools can contribute.

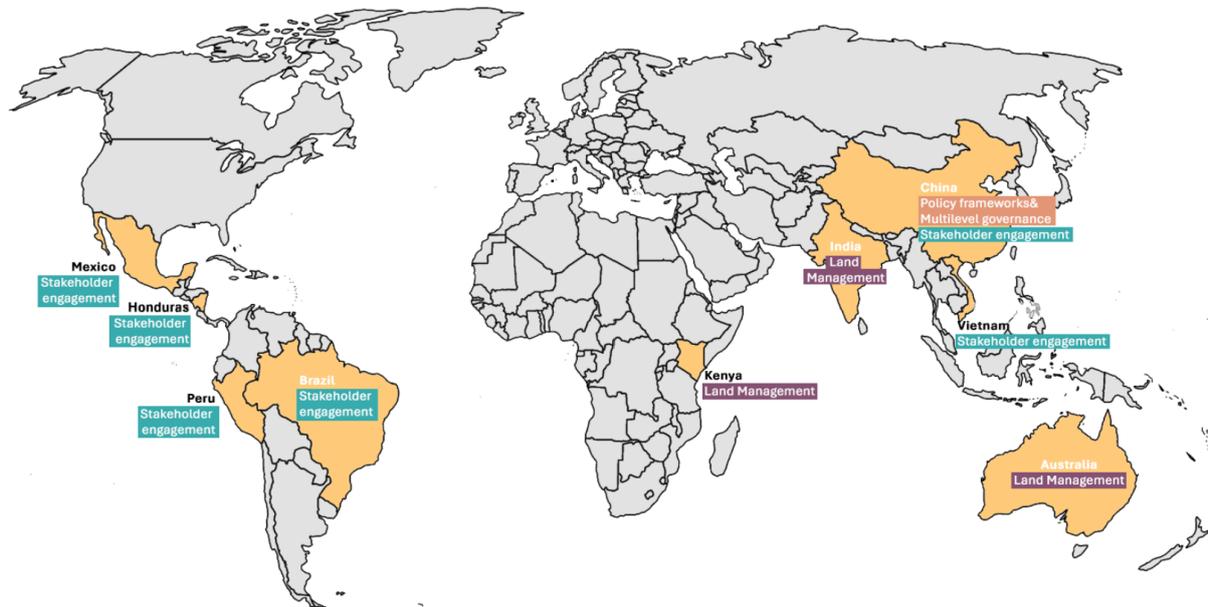


Figure 30 Countries their policies discussed in the following (author's own elaboration)

2.3.2.1. Multi-level Structure and Policy Design

Policymaking is a crucial step for implementing climate finance and carbon trading mechanisms. To effectively integrate these mechanisms, countries need to develop new regulations, such as additional taxes, low-carbon standards for services, and monitoring systems on different levels and scales for GHG emissions and climate change impacts (Benites-Lazaro and Mello-Théry, 2019; While, 2008; Fogel, 2004). However, the governance of carbon markets, which operate on multi-level, multi-stakeholder platforms, presents significant challenges considering the complexity of the system.

Starting from the supranational levels, the policy frameworks needed to scale down to the local levels, and this conversion and transformation of the policies along with the complicated institutional structures poses challenges. National and regional policies are the strongest tools to operate carbon trading mechanisms, however, given that top-down policy design and guidance alone are insufficient to reach Nationally Determined Contributions (NDCs) (Yin and Sovacool, 2021, as cited in X. Wang, *et al.*, 2022), and both regional and local offset programs have been proposed as a solution for distributing carbon market projects to strengthen the multilevel structure of the implementations (Newell, *et al.*, 2013). Also, in these processes, the implementations on the local levels

provide significant opportunities for both national and local governments with helping to reach NDCs and finance mitigation projects on the lower scales (C40 Knowledge Community, n.d.). Even though the current mechanisms are mostly based on a top-down approach that comes from the supranational levels (Michealowa *et al.*, 2019), some scholars suggest starting carbon markets at the local level and scaling them up to the national level while designing policies to might help to achieve coordinated urban development for better climate change coping mechanisms in financial, governmental and environmental terms (Wang & Sun, 2024).

However, there is still a paucity of ways to benefit from climate finance and carbon market mechanisms on the city scale. Carbon market projects can be integrated into climate action planning on the local scale reflecting the unique context of each city (C40 Knowledge Community, n.d.). However, the multi-level governance structures that involve local communities in global climate mitigation actions often spark debates about responsibility, benefits, and burdens at different levels (Fogel, 2004; Carton, 2020). As highlighted by Knuth and colleagues (2025) research, there is still a gap in understanding how climate finance tools can be used in the city scales by looking at the top-down approach in the institutional structure. The differences between global priorities and local needs may cause contradictions, potentially hindering the fair delivery of climate justice (Knuth *et al.*, 2025; Mathur *et al.*, 2014). Cities often face challenges in addressing future climate change impacts and navigating complex urban planning processes considering their lack of autonomy to regulate carbon emissions, as emission goals and related actions to control them are typically determined at the national or regional levels (Michaelowa *et al.*, 2019b; 2019c). Additionally, the adaptation of larger-scale projects designed for higher governance levels to local scales can be challenging (Clapp *et al.*, 2010).

Respecting the practical implementations of these policies, different institutions and different countries had various implementations and implementation guidelines. In the early 2010s, supranational organizations began releasing research and guidelines on how local levels could be integrated into carbon markets. In 2010, the OECD launched a report explaining the low proportion of urban carbon projects within the Clean Development Mechanism (CDM). By that year, only 4% of CDM projects were related to urban mitigation, including building retrofits, renewable energy generation, waste management, and transportation improvements. The report identified challenges such as the lack of access to carbon markets on the city scale and the limited autonomy of local authorities (Clapp *et al.*, 2010) along with the potential for carbon markets to help cities move towards low-carbon development by providing financial and technological support. Later that year, UN-Habitat released guidelines to support local governments in participating in the global carbon market, emphasizing the social, environmental, and financial benefits, including helping cities meet sustainability goals (Fairhurst *et al.*, 2010). Also, highlighting the private-public partnerships in for the implementation

processes of climate finance projects requires a particular interest in the land tenure systems and their protection through the policy frameworks. As highlighted by Knuth and colleagues (2025) the relationship between private financial institutions and tools, and their reflections in the urban dimension is related to impacting real estate and land values, which may worsen the climate change vulnerabilities of local communities which is very critical for the cities' economies (Knuth *et al.*, 2025).

There is also ongoing work in the countries to strengthen multilevel governance of the operationalization of carbon market projects. In recent years, Asian countries have become front runners in implementing carbon markets at the national level, integrating them into their planning agendas. The Asian Development Bank (2023) launched a guideline for assisting countries to develop national strategies to integrate the Paris Agreement's carbon market mechanisms, underscoring the importance of stakeholder participation in decision-making processes. The guideline also addresses land use management issues, such as property rights and land tenure, by providing examples from different parts of the world (Asian Development Bank, 2023).

China, in particular, has made significant strides in integrating carbon markets. The Chinese government actively supports carbon markets to not only abate carbon emissions but also promote poverty alleviation. Carbon trading mechanisms align with China's Five-Sphere Integrated Plan, which focuses on economic, political, cultural, social, and ecological goals. By strengthening institutional structures and enhancing policy design, carbon markets are seen as key tools to achieve China's carbon neutrality goals by 2060 (X. Wang, Huang & Liu, 2022; D. Zhang, Chen, Siqu, & Wen, 2022). One notable initiative in China has been the establishment of pilot carbon trading areas. In their research, X. Wang and colleagues (2013) examined the 10-year development of regional and provincial carbon trading systems starting from 2013, and they found that carbon trading could promote development in mountainous areas, integrate green policies into national agendas, and support ecological civilization principles by prioritizing ecological conservation (X. Wang *et al.*, 2022).

Research on spatial spillover effects has shown mixed results regarding the impact of these pilot regions on neighboring areas. While some studies indicate that carbon market regions positively influence their neighbors by encouraging investments in technological advancements (Wang & Hao, 2023), others suggest that competition between regions may dampen green innovation initiatives in neighboring areas (Zhao *et al.*, 2023). Nonetheless, studies have shown a positive correlation between coordinated urban development and the size of the carbon markets in cities, with carbon price, market volume, and liquidity contributing to improved urban well-being (D. Wang & Sun, 2024; Wang & Hao, 2023).

In conclusion, multi-scalar governance bridges global policy frameworks with national, regional and local implementation strategies is crucial for achieving success for

coordinated and sustainable development. While carbon markets are primarily governed at the national and regional levels, local-level implementation holds the potential to significantly enhance climate action and they are important for the implementation processes (C40 Knowledge Community, n.d.). The case of China demonstrates the potential of carbon markets to drive low-carbon development, and local authorities' involvement in the carbon market process can be a catalyst for broader environmental and socio-economic benefits such as promulgation of green innovations, poverty alleviation and technological improvements.

2.3.2.2. Stakeholder Engagement

Although carbon removal systems were initially designed to benefit poor communities in the Global South, in practice, they have largely failed to meet expectations. These projects have instead resulted in the materialization of nature, limiting local communities' access to vital resources (Carton *et al.*, 2020; Fogel, 2004; Oakland Institute, 2017). This outcome has attracted significant criticism from scholars (Bond *et al.*, 2012; Fogel, 2004) and has become a key issue that requires immediate action.

To better understand how neoliberal policies are operationalized in carbon market systems, one must consider the various actors involved in these processes. The implementation of carbon market projects is complicated by multilevel governance and a multistakeholder structure. In the decision-making processes, factors such as the scale of the markets, intermediaries, state actors, NGOs, local communities, and the geographical distribution of stakeholders must all be taken into account (Bond *et al.*, 2012; Benites-Lazaro and Mello-Théry, 2019; Michaelowa *et al.*, 2019b). Therefore, understanding the geographical and governmental scales of carbon markets is essential to grasp how they operate and impact different actors.

International frameworks such as the UNFCCC's Article 6 and the Marrakesh Accord have underscored the importance of public participation in carbon market systems. These agreements, along with others like the Earth Summit of 1992, the Aarhus Convention, and Rio Summit's Principle 10, have played significant roles in promoting the inclusion of local communities in decision-making processes (Benites-Lazaro and Mello-Théry, 2019). These agreements have also laid the foundation for national policies that foster community engagement in carbon markets, ensuring that local voices are heard in the implementation of such projects.

Several countries have established frameworks that require public participation in carbon market projects. Asian countries, particularly China, have been frontrunners in operationalizing carbon credit systems by creating laws and guidelines for stakeholder engagement. China's governmental frameworks mandate public participation in the decision-making processes for CDM projects, outlining clear guidelines for stakeholder

selection, their roles, and the procedures for holding meetings (Dong and Olsen, 2017). Dong and Olsen (2017) conducted surveys with local stakeholders, including residents, governments, social organizations, and enterprises, showing that the majority of feedback was positive—particularly regarding employment opportunities, raised salaries, and improved urban services. However, despite this positive feedback, a lack of policies to address negative comments (only 8% of negative feedback was acted upon) limits the effectiveness of these consultations (Dong and Olsen, 2017).

In contrast to China's positive examples, the lack of stakeholder participation in some countries has led to negative consequences. In Latin American countries like Brazil, Honduras, Mexico, and Peru, the design and execution of carbon credit projects have varied widely in terms of community engagement. Benites-Lazaro and Mello-Théry's (2019) research found that in Brazil, for instance, the Designated National Authority (DNA) played an essential role by releasing guidelines for stakeholder participation, specifying how stakeholders should be consulted and how their feedback should be verified. Similarly, in Peru, national authorities required social and environmental consultations, including the development of social investment plans to address local concerns (Benites-Lazaro and Mello-Théry, 2019).

However, in countries like Mexico and Honduras, where local stakeholder participation is not required, private companies often dominate the decision-making processes. In these cases, stakeholders with conflicting interests, such as private corporations, might control the consultation process. For example, the Yaqui Cement Project in Mexico, led by a private cement company and the National Cement Chamber, ignored the non-environmental aspects of cement production in its decision-making processes (Benites-Lazaro and Mello-Théry, 2019). These examples emphasize the need for stronger national institutions and policies to ensure that local communities are genuinely engaged.

According to Mathur and colleagues (2013), national-level support is crucial for empowering local communities to defend their interests. Without robust national institutions and clear policies for engagement, local communities often lack the power to influence the carbon market projects that impact them. In their research, Dong and Olsen (2017) advocate for broader consultations that include civil society, organizations, and compensation mechanisms, which would help overcome social and environmental injustices. They emphasize that the inclusion of a diverse range of stakeholders is essential to achieving social equity, sustainable development, and addressing the challenges of environmental justice in carbon market projects (Benites-Lazaro and Mello-Théry, 2019).

Carbon market projects often exhibit an imbalance of power. Even though in the policy frameworks of these systems, local communities' participation is mandatory through stakeholder consultation (Michaelowa *et al.*, 2019c), both in the compliance and voluntary-driven markets, the private sector's influence is disproportionately large

compared to that of local communities (Mathur, *et al.*, 2013). Local communities have had minimal impact on decision-making, which raises concerns about justice and fairness in the implementation of these projects (Mathur, *et al.*, 2013, Ampaire, *et al.*, 2017). As shown by the case studies from China, Brazil, Peru, Mexico, and Honduras, strong institutional frameworks and policies encouraging participatory approaches play critical roles in the success of the projects. While in the countries where participation is already made a part of the system (China and Brazil), the projects are more likely to achieve success, in the cases governance structure is weak (Mexico, Honduras, and so on), the adverse impacts of the projects worsen and fell short of expectations. To achieve equity and justice in carbon market projects, it is essential that all stakeholders, particularly those affected by the projects, are included in the decision-making processes.

2.3.2.3. Land use Changes and Zoning Management

The economic, political, and social impacts of carbon credit projects are well-documented, but their spatial implications are also significant and far-reaching. As the holder of the largest carbon trading system in the world, China has led research on the impacts of carbon offset projects, particularly in terms of urban development and spatial inequalities. Studies conducted by D. Wang and Sun (2024) and J. Wang and Hoa (2023) found a positive correlation between cities' coordinated urban development, taking into account environmental, social, and economic factors, and the size of carbon markets. As the carbon price, market volume, and market liquidity increase, cities' overall well-being tends to improve. However, these studies also highlight a negative relationship between cities' environmental situations and the focus of carbon markets on industrial activities. Although industrial development accelerates economic growth, it often does so at the expense of environmental quality (J. Wang and Hoa, 2023; D. Wang and Sun, 2024).

On the global level, the research conducted by Akrofi (2024) showed that spatial distribution of the projects on the global scale is related to socio-economic conditions, policy frameworks of the countries, available carbon pricing mechanisms, vulnerability to climate change and biodiversity loss, and environmental protection. In the regions that have strict regulations for the operationalization processes of the project, the project developers may be fined when they do not reach their goals, and it might create pressure on the investors and hold them back from initiating a project (Akrofi, 2024).

In addition to urban development, scholars have examined the ecological benefits of carbon market projects. Zheng and Zhang (2023) explored the impact of forestry carbon sequestration, noting its positive effect on city greening efforts. Their regional-scale research demonstrated a correlation between economic development and green

initiatives within carbon trading projects (Zheng & Zhang, 2023). When the social impacts of these projects are considered, Zhang et al. (2023) illustrated how carbon markets could help address spatial inequalities by increasing access to clean energy, thus contributing to the creation of more just cities.

Renewable energy projects and land use, land-use change, and forestry (LULUCF) are key sectors for carbon credit generation, as previously discussed (2.2). LULUCF projects, especially those focused on afforestation, reforestation, and sustainable agricultural practices, are particularly relevant because of their easily traceable spatial footprints. These land-based carbon sequestration initiatives, as noted by Cavanagh and colleagues (2017), hold high potential for mitigating climate change. Such projects involve land resource management, reducing deforestation, rehabilitating degraded lands, and improving agricultural systems through better fertilizers and enhanced feeding systems (Scherr, Shames, & Friedman, 2012).

In rural areas, carbon market projects focused on LULUCF can provide significant benefits, offering win-win solutions for both economic development and environmental protection (Cavanagh, 2017; Corbera & Brown, 2008 as cited in Lee *et al.*, 2016). However, the implementation of these projects has also sparked discussions regarding their outcomes. While they offer potential ecological benefits, their impact on local communities and the environment requires further scrutiny.

Afforestation and Reforestation

Carbon sequestration through forestry activities, such as afforestation and reforestation projects, is a widely adopted practice due to its cost-effectiveness and high sequestration potential, benefiting both investors and practitioners (Aggrawal, 2020; Fogel, 2004). However, these projects have raised significant concerns regarding their environmental and social outcomes. Enríquez-de-Salamanca (2024) examined the negative impacts of such projects, particularly their effects on biodiversity and local communities. The most widely discussed concerns relate to the social and environmental consequences of these projects.

From a social perspective, land protection policies associated with carbon sequestration can limit local communities' access to essential resources. This restriction often leads to job losses, decreased income, and food security issues. Furthermore, communities can become dependent on third parties, such as NGOs and private companies, which may result in unequal distribution of benefits between these parties and local individuals (Enríquez-de-Salamanca, 2024).

Environmental concerns are also significant, with land conflicts emerging as one of the most critical issues. Conflicts often arise when project proposals do not align with soil suitability, particularly when high-sequestration potential plants are used instead of local

species. Although these plants are chosen to increase carbon sequestration, their use in monoculture projects jeopardizes biodiversity (Enríquez-de-Salamanca, 2024; Bond *et al.*, 2012; Fogel, 2004). Additionally, the occupation of arable lands by afforestation projects for carbon sequestration displaces agricultural activities, exacerbating food security challenges (Enríquez-de-Salamanca, 2024).

Aggrawal and Brockington (2020) examined a carbon sequestration project in northern India, which posed risks such as sandstorms and droughts. A forestry project under the CDM was implemented in 2008 to mitigate these risks. This project aimed at enhancing sandy, less productive soil through nursery activities and building water infrastructure. Farmers were required to devote at least 0,05 hectares of their land for the project for 20 years. The farmers were promised benefits from the trees' products, such as fruits and timber, along with the financial outcomes of carbon offsetting (Aggrawal & Brockington, 2020).

While the project improved the built environment, it also caused significant drawbacks. Farmers were constrained in their land usage, being able to use only half of their land for the project, with pre-determined species and restrictions on cropping weeds. As a result, 53% of participants reported economic losses due to these limitations (Aggrawal, 2020). The project's benefits were disproportionately distributed, with smallholder farmers bearing the brunt of the negative impacts. Long payment processes, the commitment of land for forestry activities, and the costs of maintenance created bottlenecks, especially for smallholder farmers. As a result, 35% of participants withdrew from the project, and 15% altered their land use to combine both agricultural and forestry activities (Aggrawal & Brockington, 2020).

Indigenous communities are also severely impacted by carbon forestry projects. At the outset of Kyoto Protocol negotiations, indigenous groups expressed opposition to these projects, as the land use transfers from agricultural or vacant land to forestry areas often encroach on their traditional territories. The implementation of standardized carbon sequestration projects jeopardizes their livelihoods and undermines their traditional practices of maintaining forested lands (Carton *et al.*, 2020; Fogel, 2004).

Climate Smart Agriculture (CSA)

Climate-Smart Agriculture (CSA) has gained attraction within carbon credit projects, as it provides a framework for improving food security and rural livelihoods while simultaneously facilitating climate change adaptation and mitigation activities. CSA incorporates various sustainable agriculture practices, including agroforestry, waste management, and land conservation. These practices are implemented across different scales, from individual farms to large-scale projects, with diverse land management and land use schemes (Scherr *et al.*, 2012).

A notable example of an agriculture-based carbon credit project is the Degree Celsius Wet Tropics Biocarbon Sequestration Project in Australia. This project was designed to combat the adverse impacts of climate change, such as temperature fluctuations, altered rainfall patterns, and increasing extreme weather events, alongside the challenge of land degradation threatening agricultural productivity. The project aimed to enhance agricultural productivity through improved land management practices, such as better-quality fertilizers and pasture management, which also helped prevent deforestation, promoted reforestation, and minimized land degradation. The project aligned with the Regional Natural Resource Management Plan and was integrated into a decentralized decision-making system involving over 50 regional governmental bodies. Credits from the project were sold in both the voluntary and regulated Australian markets (Scherr *et al.*, 2012).

However, not all CSA projects have been successful. The Kenya Agricultural Carbon Project (KACP), initiated between 2009 and 2030, sought to link agricultural land use with climate-smart practices to benefit smallholders. The project aimed to reach 60,000 farmers, but by the end of 2014, only 30,000 farmers had registered, and the project did not yield the expected outcomes (Cavanagh *et al.*, 2017). A key issue was the disconnect between the proposed solutions and the real challenges faced by farmers. Despite previous soil rehabilitation efforts, the proposed solutions were not innovative enough to convince farmers to invest in them. While farmers prioritized immediate food security, the long-term payback process and the lack of effective solutions for managing degraded lands contributed to the project's failure (Atela, 2012).

Agroforestry projects, which combine forestry and agricultural activities, also offer a win-win solution for carbon sequestration. These projects help local communities build resilience to climate change by providing additional food sources, enhancing biodiversity, and mitigating soil erosion risks (Scherr *et al.*, 2012). However, careful implementation is essential, as trees can overshadow agricultural products, impacting crop growth (Enríquez-de-Salamanca, 2024). Moreover, smallholder farmers, particularly low-income groups, may face challenges in adopting agroforestry due to limited land size and lack of essential resources, such as water for specific tree species (Cavanagh *et al.*, 2017; Aggrawal, 2020). The World Bank Group (2010) reported that poorly planned agroforestry projects could lead to competition for water and nutrients between trees and crops, ultimately affecting agricultural productivity (World Bank, 2010, p. 47 as cited in Cavanagh *et al.*, 2017).

Furthermore, the success of agricultural projects often hinges on participatory planning and local community involvement in decision-making processes. Without continuous local support, these projects are unlikely to succeed (Lee *et al.*, 2016; Atela, 2012). Successful climate-smart agriculture projects are characterized by well-defined spatial and economic goals, complementary land resource management, and strong monitoring

systems for economic, social, and environmental changes (Scherr *et al.*, 2012; Atela, 2012; Lee *et al.*, 2016; Lee, 2017).

And the common problems that have been faced during the implementation processes of LULUCF projects are mostly project management. The lack of awareness and knowledge from both developers and practitioners has been a significant issue (Carton, 2020; Cavanagh *et al.*, 2016). While project developers were often unfamiliar with the area, practitioners lacked an understanding of the political and institutional setups (Olsson *et al.*, 2007 as cited in Lee, *et al.*, 2016; Lee, 2017). On the other hand, the managers were struggling to understand local people's perception of the area and project, and ignoring their familiarity and knowledge of the implementation processes (Cavanagh *et al.*, 2017; Atela, 2012; Fogel, 2004), lack of knowledge about the project of practitioners ended up less engagement to the project, flaws during the implementation phase and unwillingness to continue to the projects (Carton, 2020; Fisher *et al.*, 2018) which lead to lack of trust between the practitioners and managers (Lee, 2017; Lee *et al.*, 2016), and eventually affected the efficiency and success of the projects.

And when it comes to land-related problems, the inconsistencies between the soil types and proposed projects raise concerns about environmental protection. The project proposals and implementations that are not coherent with the ecological characteristics of the area have been questioned by scholars (Cavanagh *et al.*, 2017; Carton *et al.*, 2020; Enríquez-de-Salamanca, 2024). In addition to land-use decisions, land tenure systems and the inequalities within them must also be addressed (Atela, 2012). It is difficult to assert that carbon markets ensure equality, as a prerequisite for benefiting from them is secure land tenure, which low-income groups often do not have access to (Lee *et al.*, 2016). Moreover, land management plays a critical role in the success of carbon trading projects, as highlighted by the Chinese case studies. One of the challenges faced during implementation was that while already-industrialized regions struggled to find suitable locations for projects, developing regions had an abundance of such land available (Zhao *et al.*, 2023; Zheng and Zhang, 2023).

Radical environmental movements view carbon credit projects in the Global South as a form of commodification through carbon trading schemes (Bond *et al.*, 2012; Newell *et al.*, 2013; Gonzalez, 2021). These industrial tree plantation projects, funded by wealthy countries, allow them to offset their CO₂ emissions while continuing their industrial activities. This represents a form of neoliberal globalization, where natural resources are commodified for market benefit (Bond *et al.*, 2012; Oakland Institute, 2014; 2017). However, these monoculture plantations often jeopardize biodiversity (Enríquez-de-Salamanca, 2024; Oakland Institute, 2017) while the Global North continues to emit CO₂ (Carton *et al.*, 2020; Fogel, 2004; Gonzalez, 2021). In CDM projects, forestry locations are often chosen from areas categorized as “outside the management,” “degraded,” or “in need of rehabilitation,” effectively using carbon market projects to transform these lands

into “manageable” ones (Lovell, 2014, as cited in Gifford, 2020). In the case of afforestation projects, a major concern is the displacement of local communities from their lands (Carton *et al.*, 2020; Bond *et al.*, 2012). For agricultural projects, however, the issue lies in reaching the poorest members of society, who lack access to the necessary financial and physical resources (Cavanagh *et al.*, 2017; Fisher *et al.*, 2018; Hedberg, 2016).

China stands as a good example from which others can learn regarding the establishment of carbon markets. Among the Asian countries, China has already inspired Southeast Asian countries, including Vietnam. Despite the absence of a forest carbon credit trading mechanism or a sectoral development plan for forestry regions, the country is preparing regional plans to operationalize forest carbon sequestration projects, supported by international initiatives (Ngai, 2021).

In summary, the spatial implications of the carbon credit markets consist of several complexities. Firstly, the geographical and spatial distribution of the projects might cause uneven development, and eventually, social and economic inequalities. Not only on the national scale but also global scale, uneven distribution of the projects is a matter of concern. Secondly, the projects’ locations and the compatibility of the projects’ focuses to the sites are important in order to ensure environmental sustainability. As shown by the case studies, the inconsistencies between the project locations and the land use changes that have been implicated by the projects can cause irreversible problems for the local communities. Thirdly, in all the projects, land tenure systems of the countries carry significant importance to provide justice. Secure land tenure systems usually exclude the low-income groups from the system, while supposed to support mostly them. In extreme cases, lack of land and secure land also might cause displacement of local communities. Last but not least, environmental protection and biodiversity have been one of the biggest concerns in the implementation processes of these projects. The inconsistencies between the land character and project focus might cause irreversible impacts on the project's sites affecting the natural characteristics and biodiversity of the area. Considering all these facts, the land management problems that have been discussed above show that land use plans and zoning management should be

2.3.3. Justice in Carbon Market Operationalizations and Spatial Planning

Operationalization of the carbon market projects reveals a complex interplay between governance, stakeholder engagement, and land-use management. Even though the mechanism was introduced to build a more equal world for everyone, the implementation processes that vary based on the context caused environmental justice to fall short by lacking in addressing local needs, exacerbating inequalities, and eventually, holding the countries to reach their long-term sustainability goals (Bachram, 2004; Mathur *et al.*, 2013; Tramel, 2016; Gifford *et al.*, 2020; Gonzalez, 2021). In the governmental processes, the top-down approaches that incorporate the decision-making processes with overlooking stakeholder consultation hinder the adaptability and maintenance of the projects. Along with that, a lack of community engagement dampens the benefits that can be acquired from the projects by hampering the trust among the actors and disconnecting the global climate goals and local realities (Lahsen, 2009; Fisher, 2012; Schreckenber, Mwafayu, and Nyamutale, 2013; Fisher *et al.*, 2018; Tramel, 2016; Carton, 2020). Moreover, land use management and zoning has its own set of challenges that are related to conflicts over resource allocation and usage. Therefore, for the implementation of a carbon trading mechanism, robust policy and regulation, public awareness and participation, and integration of green development principles are the keys (X. Wang *et al.*, 2022).

All these aspects of the carbon credit projects can be addressed through spatial planning mechanisms that involve technical practices for planning studies and cultures involving “institutionalization” through laws and rules, social aspects of the land rights, and planning practices themselves. With respect to the latter, planning practices should be considered as a collective action to organize the physical environment in a way that can benefit the most to the users. In these processes, the role of governmental bodies cannot be excluded from the whole process considering the indeed political roots of the planning mechanisms, as a consequence, their role also can not be limited only to the regulation-makers. They also carry the responsibility of preventing “expansion and exclusion” that manifest themselves in capitalist societies for land use control unbalanced power dynamics and conflicting interests (Janin Rivolin, 2012), which is one of the main concerns for the operationalization of carbon market projects.

Level	Main Actors	Tools
Supranational	UNFCCC	International Agreements
International	Private Companies; Governments	International Agreements; Public-Private Partnerships
National	Governments	Laws, Regulations, Strategic Plans; Spatial Plans
Regional	Regional Institutions	Strategic Plans, Spatial Plans
Local	Local Governments; Local communities	Strategic Plans, Implementation Plans

Figure 31 Levels, actors and relevant spatial planning tools for carbon market operationalization (author's own elaboration)

In order to understand the relationship between climate finance, environmental justice, urban governments, and their geographical reflections, there is a growing body of research studies. At the end of 2024, the term “*climate finance justice*” was added to the lexicon by Gifford and Sauls (2024) to address the global and local inequalities happening under the guise of climate finance channelization. Channeling climate finance from developed countries to developing countries reproduces the capitalist cycles of extractivism, and worsens the inequalities (Gifford and Sauls, 2024) laying the groundwork for the risk of green colonialism. Knuth and colleagues (2025) point out the importance of political economy and critical planning studies in the climate finance discourses. Financing climate change adaptation projects by changing their forms through creating new ways for capital accumulation, and the ways urban governance can help organize this financial flow is a topic of discussion that has several layers including climate action, justice, and finance (Knuth *et al.*, 2025).

Aiming to prevent this issue, spatial planning tools such as well-designed multilayered policies (2.3.2.1), robust community engagement (2.3.2.2) and land management (2.3.2.3) are crucial for delivering justice in the carbon credit projects. In its almost 30 years of history, inadequate local participation in decision-making and project design has also been criticized. Processes that exclude local perspectives tend to have more negative impacts on communities and can lead to green colonialism. As discussed above, through the case studies from all over the world, the projects are more likely to achieve justice when there is an impact assessment, prioritizing grassroots activities, local participation, and promoting traditional practices. And, regarding land management, carbon sequestration projects may cause the commodification of carbon and nature, potentially laying the groundwork for green colonialism. Carbon projects, particularly those related to forestry, should also be discussed within the context of social power dynamics, as well as their contribution to nature conservation and sustainable development (Oakland Institute, 2014; 2017; Gifford, 2020; Gonzalez, 2021).

Lessons learned from these experiences indicate that carbon removal technologies, particularly large-scale, land-use-related ones, should be carefully implemented, as their impacts on society and the environment are significant. Additionally, existing structural inequalities should be addressed in these projects. Instead of exacerbating inequalities, new policies should be designed to alleviate global disparities and build political solidarity with poorer regions of the world, directing financing and project design accordingly (Bond *et al.*, 2012; Gonzalez, 2021; Sultana, 2022; Enríquez-de-Salamanca, 2024). With the Paris Agreement's implementation on the horizon, integrating carbon markets into spatial planning agendas presents an intriguing avenue for research. As highlighted by X. Wang and colleagues (2022) study, although carbon markets have the potential to enhance the ecological, social, and economic well-being of communities, the allocation of resources should be carefully considered during policymaking and public functions of government.

In the bottom line, these studies show that the operationalization of carbon markets has been, and can be, facilitated through spatial planning tools such as land use planning, climate action planning, and socioeconomic development. Therefore, projects should be designed with a holistic approach that aims to achieve both nature protection and poverty alleviation (Enríquez-de-Salamanca, 2024) aiming to get closer to global environmental justice. Common elements of successful projects include a well-organized institutional structure, objectives that prioritize project goals over profitability, the political will to implement the projects, robust multilevel governance, engagement of markets to manage risks, and co-benefits that are beneficial to local communities (Clapp *et al.*, 2010; X Wang *et al.*, 2025).

Multilayered policies, stakeholder engagement, and land use management are essential for carbon credit projects' operationalization which are cross-cutting tools with spatial planning studies. Even though the number of studies that highlight the relationship between spatial planning and carbon markets is limited and mostly conducted in the fields of economy and geography, as discussed above, involvement of spatial planners in the process through well-designed planning mechanisms might help to address the issues related to capital accumulation, uneven regional development, lack of public participation and land-related problems.

3. Methodology

This research aims to discover the ways spatial planning discourse can facilitate the operationalization processes of carbon trading projects. Aiming to provide a better understanding of how the multilayered structure that spans from supranational levels to local ones functions, the mechanism will be investigated through lenses into Uganda’s experiences for the implementations.

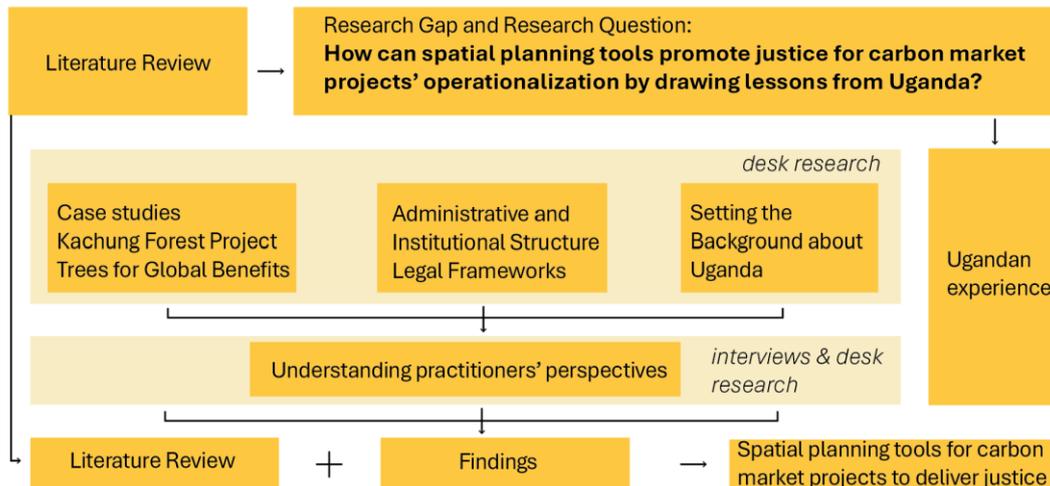


Figure 32 How the methodology functions (author's own elaboration)

3.1. Research Design

This research is structured around three main components policy analysis, case studies, and interviews.

Policy analysis

Aiming to understand how the carbon trading projects have been operationalized in the context of Uganda, a critical examination of the policy framework has been conducted by focusing on the ones that are related to environmental and land use management and planning documents.

Case studies

In order to understand the implementation processes of the project, two contrasting carbon offset projects have been analyzed in detail, namely the Kachung Forest Project (KFP) and the Tree for Global Benefits (TGB). These two case studies represent a comparative understanding of different market types and management styles.

Interviews

Aiming to develop a narrative that shows how carbon markets, environmental management and urban planning are related, after examining the policy frameworks and

case studies, semi-structured interviews are conducted to bridge the gaps and have insights about the future implementations.

3.2. Data Collection

Data collection for this research have been managed by using three different methodologies, desk research, case study selection and semi-structured interviews.

Desk research for policy analysis

A context analysis has been conducted within Uganda's land use and environmental management frameworks to understand how the carbon market and its applications have been integrated into the country's agenda. In order to do that, policy frameworks that are focused on land management, urban management and planning, environmental management, and climate change adaptation have been read and the context of the selected keywords has been represented.

Case study selection

Two case studies that have been operationalized in different ways will be presented to understand the problems in the implementation phases, and how the problems have been faced can be addressed through urban planning policy-making tools.

The first case study, the Kachung Forest Project, was a CDM initiative that continues to take place in the country's rural area. The project was started officially in 1997, and it has been active on the site since 2005. Regarding the complicated CDM operationalization structure, the Kachung Forest Project has been widely discussed by scholars. The top-down decision-making approach that comes from the supranational level caused environmental and social conflicts by lacking policy and planning documents and poor community engagement (Oakland Institute, 2014; 2017; Carton, 2020; Carton and Edstedt, 2021).

The second case study, Trees for Global Benefits (TGB), was initiated by a local NGO and then funded by international and supranational organizations. The project started in 2013, and it is still active in 14 different districts of Uganda. The project embraced a bottom-up approach since the beginning, and this structure helped its development a lot by facilitating the building of bonds between the local communities and investors along with the concerns about how just it is (Schreckenber *et al.*, 2013; Fisher *et al.*, 2018; Carton, 2020).

These two projects, their historical development, and their impacts on society, the economy, and the environment have been discussed by scholars. With this section, the research aims to integrate the urban planning perspective into the existing discourse.

Semi-structured Interviews

The interviews are conducted with seven different actors from different sectors who are involved or can be involved or have already researched the topic. Representatives from the UN, Ministries, academicians, and researchers have been contacted to learn more about the planning processes, and how better urban planning would have helped the implementation processes. Among the 62 individuals who are attempted to contact, 13 responses have been taken and 7 interviews are conducted. Interviews are conducted in a semi-structured manner with having 7 pre-determined questions. The focus of the interviews was on discovering how the projects have been operationalized in Uganda in the institutional, organizational, and spatial dimensions, therefore the questionnaires were oriented around the decision-making processes, legislative frameworks, and community engagement, and additional questions have been added based on the participants' experiences that can be seen in Annex 4: Questions. Interviews are conducted online, and each interview lasts between 25-45 minutes. The answers are analyzed by using the content analysis method by selecting key themes that have been repeated by different participants, and additional thoughts are added to the findings section of the case studies.

Considering the geographical difficulties and language barriers for reaching local people to conduct interviews, secondary data has been used to understand local communities' approach to the carbon markets. The research that has been used to understand their perspective is conducted by Fisher (2012), Gebremichael (2016), Hedberg (2016), Edstedt (2017), Fisher and colleagues (2018), and Carton (2020).

3.3. Data Analysis

In the scope of this research, three different methodologies have been employed: content analysis, comparative analysis, and coding.

Content Analysis on Policy Frameworks

Aiming to provide a policy landscape of land and environmental management, 39 policy frameworks have been analyzed by dividing them into three groups: Spatial Organization (11), Environmental Management and Climate Change (19), and Implementation (9).

Among these 39 policy frameworks, six from different periods—early (late 1990s), middle (late 2000s), and recent (late 2010s)—and the key terms that are repeated and important in the policy frameworks were selected. As the analysis progressed, the key terms have been expanded based on the terminology that has been used in the policy framework. Ultimately, 42 keywords under 8 main topics were examined in the policy frameworks.

Through the “UN” and “international agreements” topics, the aim was to understand the integration of international frameworks into Uganda’s national agenda. “Climate

finance” and “carbon credits and market” helped to provide a narrative of carbon markets’ integration into the policy frameworks while also giving the change to provide the development direction of the country.

Table 2 Main topics and key terms for the policy frameworks' content analysis.

#	Themes	Keywords
1	UN	UN, UNFCCC
2	International agreements	Paris agreement, Kyoto protocol
3	Climate finance	Climate finance, carbon finance, climate fund, carbon fund
4	Carbon credits and market	Carbon market, carbon credit mechanism, carbon credits, carbon trading, carbon trade-off, carbon offset, carbon projects, emission reduction units CDM RED/REDD+
5	Inclusivity	Inclusiveness, including (local communities), inclusive Participation, participatory, participatory planning, participatory mechanism, participation of citizens, democratic participation, civic participation Community engagement, Community-based, community participation, involvement, grassroots (decision making, planning, taking actions)
6	Local Governments	Local government, governments on the local level, local authorities
7	Low-Carbon development	Low carbon development, low emission development
8	Sectoral terms	Climate-smart agriculture, climate resilient agriculture, agroforestry

Comparative Analysis on Case Studies

Even though the two projects were operationalized under different markets, considering their origin as carbon offset projects, the similarities and differences between them are delved into. While KFP was initiated under the compliance market scheme with being under the auspices of the UN, TGB is operated as a voluntary market project. These two projects have been compared based on their characteristics.

Table 3 Comparative analysis themes

#	Main theme	Sub-themes
1	Foundation and Frameworks	Stakeholders Legal Frameworks Site selection Participation (only TGB)
2	Implementation and Operations	Land use and zoning management Plant selection and plantation Participatory Design and Practices (only TGB) Payments (only TGB)
3	Outcomes	Policy changes (only TGB) Environmental Impacts Socio-economic Impacts & Challenges

Coding Analysis on Interviews

While analyzing the interview, a deductive approach is employed in order to contextualize the answers of the interviewees according to the themes. The themes are determined based on the topics of the questions, and sub-themes are extended during the data analysis period based on the participants' answers to the questions.

Table 4 Coding themes and sub-themes for the interview analysis

#	Main Themes	Sub-themes
1	Policy making and governance	Policies and their efficiency Institutional structure Knowledge in the field Capacity building Future pathway
2	Stakeholder management	Stakeholder design Stakeholder consultation Participatory structure Stakeholders' knowledge
3	Land management	Land tenure system Land selection Activity selection
4	Justice in the Implementation	Sustainable development Environmental justice Distribution of resources Planning studies

3.4. Scope and Limitations

Scope

The scope of this research included the carbon trading projects and their operationalization in the Ugandan context. The first project in Uganda was approved in 2003, with the TGB, and afterwards, the other projects promulgated around the country.

Aiming to make a narrative of the carbon market implementations in the country, policy frameworks, case studies and interviews have been organized with the people who are already familiar with the implementation of the projects.

Limitations

Considering the remote conduction of the research, one of the major limitation was not being able to have enough perspectives from wide range of interviewees. Even though communication with institutions and organizations have been made, this research is missing local people's perspective to the problem. In order to fill this paucity, previous research have been used and extra questions to the interviewees that worked and work with local people have been added.

Positionality and Biases

Since the case studies that have been researched are in Uganda, and different than both my and Italian culture, it was important to get familiar with Ugandan culture by using online resources (books, documentaries, videos, etc.) and by meeting people online to have a general understanding of Ugandan culture. Either before or during the interviews, I introduced myself as an international student, and when it was asked, I mentioned I am from Turkey and my country is not a part of these projects, however, I am interested in the topic.

In the last few years, I participated in several conferences and meetings about climate change and its impacts on vulnerable communities, and currently, I am a part of an international youth network working on the same topic. Taking my observations in my country about the climate change impacts on the local communities and nature, I acknowledge that these experiences have affected my biases in this research. Aiming to avoid reflecting my bias, I tried to read the case studies from different perspectives, reach people from different sectors, and represent the ongoing discussions from an objective perspective.

Ethical Consideration

Before, during and after the interviews, ethical guidelines have been incorporated for conducting the interviews. Participants were informed about the author, the objectives and the scope of the study, and their consent was asked to the interviews (Annex 2: Consent Form), and the approvals were obtained either in written or oral ways before the interviews. Also, as agreed with the participants, the respondents' information has been kept confidential to protect their anonymity, considering the politically sensitive nature of the topic.

Additionally, as part of the writing processes, artificial intelligence tools were used for the organization and language refinements of the thesis. These tools are used only for enhancing clarity and not influence the originality or integrity of the research findings or the analysis. All the decisions are made by the author by ensuring fitting into the academic ethical standards.

4. Operationalization of the Carbon Market in Uganda

Aiming to provide a unique lens of the operationalization of carbon markets, how supranational carbon market policies have been converted into local practices will be discovered in that section. As one of the LDCs with significant vulnerability to climate change, Uganda has been under the spotlight for international investors to operationalize carbon market projects, and this section aims to explore the political, social, and environmental action that have been taken in the country for the operationalization of carbon markets with a specific focus on governance structures and legal framework, community engagement and land use management with also shedding light on the tension between global and local needs.

4.1. Climate Change, Vulnerability, and Carbon Markets in Africa

Africa is one of the world's most vulnerable continents to climate change. Despite having the lowest contribution to global GHG emissions, the continent has suffered from human-induced climate change impacts for decades. Floods, droughts, and extreme weather conditions are becoming more frequent, and their secondary effects, such as reduced food production and economic growth, outbreaks of epidemics, loss of lives, and so on, also affect people's lives there (Trisos, Adelekan, Totin, *et al.*, 2022).

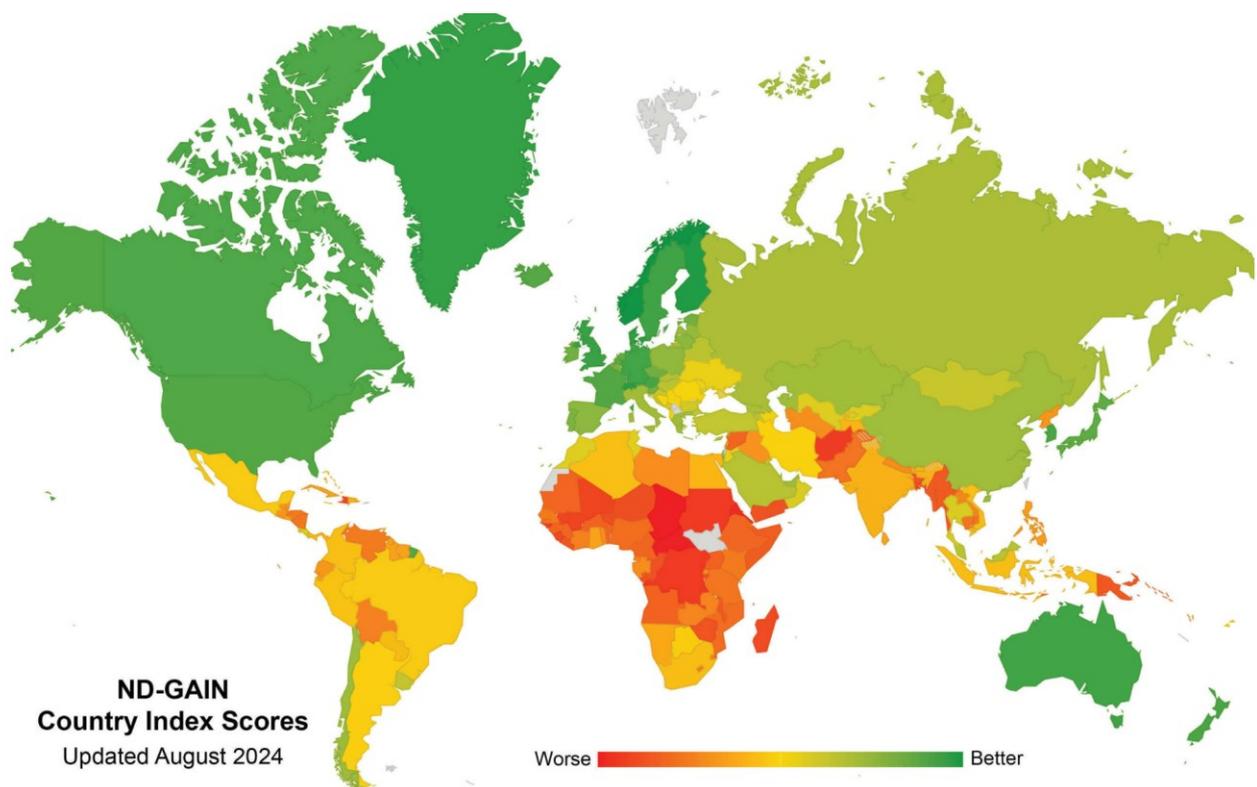


Figure 33 Notre-Dame Global Adaptation Initiative (ND-Gain) Country Index Map shows countries' resilience capacity to climate change by measuring their readiness and vulnerability (University of Notre Dame, 2024)

Vulnerability to climate change is a cross-sectional issue that has socioeconomic, political, and environmental dimensions. As agriculture, fisheries, forestry, and other land and water-based sectors as their main subsistence resource, Africa is becoming more vulnerable to climate change (African Climate Policy Centre(ACPC), 2013; Trisos *et al.*, 2022). Specifically, agriculture and water resources are the biggest concerns since they might base bigger dangers such as food and water security and scarcity that threaten the health of humans (ACPC, 2013).

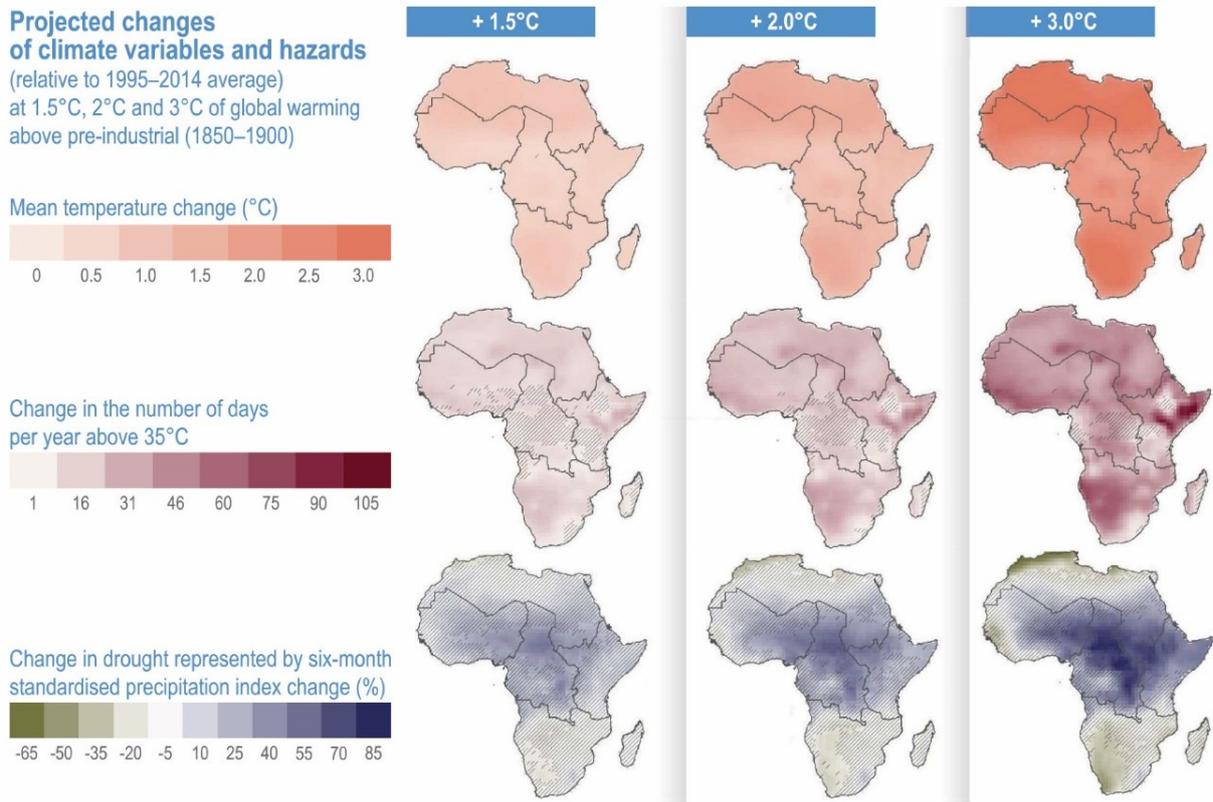


Figure 34 Climate threats in African continent (a) mean temperature change, (b) number of days per yer above 35°C, (c) change in drought (adapted from Trisos *et al.*, 2022).

In sub-Saharan Africa, more than half of the population (between 55-62%) work in the agriculture sector, particularly in rural areas (Trisos *et al.*, 2022). And this situation makes these countries more vulnerable to climate change impacts than the others. 48 of 54 countries in the African continent are in the Sub-Saharan part, and this part of the continent has the most vulnerable countries in itself with having Least Developed Countries (LDCs) and Small Island Developing States (SIDS) in and around the territory. UN accepts that these groups of countries as the most vulnerable ones in the world (Nyasimi *et al.*, 2016; Trisos *et al.*, 2022).

Addressing this vulnerability, carbon markets have been offered as a solution to channel climate finance to Africa. Since the establishment of Carbon Markets, African countries attracted investors with their vast natural areas providing a ground for fruitful GHG emission reduction projects. As mentioned in the earlier chapters, even though Africa did

not have the highest share of the carbon market projects, after COP28, they became an attraction point for carbon trade-off projects (Pagop and Savar, 2024). However, given the fact that the lives of local people are highly dependent on natural resources, carbon emission reduction projects come with advantages and disadvantages. In particular, with more than 80% agricultural land cover, Sub-Saharan Africa has great potential for GHG reduction projects in pursuit of poverty alleviation. Potential sequestration that can be made in sub-Saharan Africa through agro-forestry and cultivation systems' enhancements ranges between 0.4-18.5 TgC/year (which equals to 59 to 2,716 factories annual CO₂ emission (*calculated by an AI tool / OpenAI,2024*)) also creating financial and social benefits for the local people (Lee, *et al.*, 2016). Despite the numerous opportunities for land use, land use changes, and forestry (LULUCF) projects, they may pose a threat to local people and biodiversity if the protection of these lands is not guaranteed (Pagop and Savar, 2024). Regarding this concern, the Carbon Market in Africa has always been a subject of debate among scholars and practitioners (Bond, *et al.*, 2012)

Among the LULUCF projects, along with the afforestation, reforestation, and REDD+ activities, climate-smart agriculture projects became popular. These types of projects ensure a win-win situation for both the Buyer and Host countries by guaranteeing the generation of carbon credits as well as the other types of projects while protecting the natural resources (Bond, *et al.*, 2012). And the reason forest projects are losing their popularity is the risk the investors need to take. Considering the dependency on climate, the investors have concerns about having enough tradable carbon units in the future. Also, another point of concern is what would happen in the case of failure. Beyond the incidents that could happen every forestry such as wildfires, and pests, the mismatching strategies and implementations could cause irreversible effects on the land. During this time, the lives of local and indigenous people living in the forest areas have been marginalized (Gifford, 2020).

4.2. Background Information About Uganda

Uganda is one of the countries that bears the brunt of climate change impacts with being in the Sub-Saharan Africa and one of the LDCs. The country is ranked as the one of the most vulnerable ones in different rankings. According to ND-Gain Index, it is the 24th in the global list, and 15th among the African countries. The United Nations Office for Disaster Risk Reduction (UNISDR) Index for Risk Management ranked the country as the 18th country at risk of climate change with being not ready to hazards, having high volume of vulnerable groups, and lacking institutional frameworks and infrastructure for coping climate change impacts (EC, 2024).

As a way to address this vulnerability, carbon markets have been strongly support in the country. As being one of the frontrunners in the African continent, Uganda has the 4th biggest carbon market in the continent following the Democratic Republic of Congo, Kenya and Zambia (WBG and KEPSA, 2024).

Considering the country's location and the social and economic conditions, it needs immediate actions. However, regarding its weak economy, having international funds for the project design and implementation is crucial for Uganda. As one of the climate finance tools to fund climate adaptation and mitigation methods, carbon markets have been used in the country in more than 20 years. Also, considering its fragility with being one of the LDCs, the country have been added into several UN programs to assists their development. Even though these projects helped the country to channel international funds to the country, they also have had benefits and drawbacks. In this section, a general overview of Uganda will be presented to provide a better understanding of the countries' social, economic and political dynamics through explaining its characteristics, history, land use characteristics, climate change vulnerabilities and carbon market.

Location and History

Uganda is a landlocked country located in the central-eastern part of Africa. It shares borders with South Sudan, Ethiopia, Kenya, Tanzania, Rwanda, and the Democratic Republic of Congo, and the country resides between two lakes, Lake Victoria and Lake Albert, and the whole territory is rich in water sources (MWE, 2022b).

The history of Uganda started in the 16th century with the establishment of Bito dynasties in northwestern Uganda, in the 19th century, one of the tribals of the Bito dynasty called "Buganda" expanded its territory until Lake Victoria and drew Uganda's first boundaries. By this extension, Buganda became the most powerful kingdom in the region until the early 20th century. The boundaries have been designated during the colonial period in the late 19th century (BBC News, 2018; Ingham and Lyons, 2023).

In the late 19th century, the whole of Eastern Africa's history changed with the arrival of the British Missionary Society. In 1877, the Society arrived in Buganda, and in 1894 it was declared as a British protectorate. The colonization of Uganda lasted for 68 years, and in 1962, Uganda became independent and declared as a Republic in 1963 (BBC News, 2018; Ingham and Lyons, 2023). Even though the country was free from its chains to Britain, the political conflicts have kept arising. The first Legislative Council was founded in 1921, however, it is power was so small, that the country was governed by the British colonial administrator until the 1950s. In the early 1950s, political parties commenced to exist, and in 1958, the first steps for independence were made through the emergence of political parties. However, the conflicts between parties and different groups in the society resulted in a tense atmosphere in the whole society, and in 1971, a military coup

seized the power of the government. The leader of the coup, Idi Amin, became the president of the country and stayed in power between 1971 and 1979. This period is also known in world history as the most brutal dictatorial government since all the immigrants were deported from the country, along with committing massacres to ethnic and political groups of local people. By time, this situation started civil war in the country. In 1979, a counter-invasion from Uganda ended a succession, and Idi Amin fled out the country. Until 1986, the political atmosphere was always tense and the conflicts between the Government and the local resistant groups 1986. In 1986, Yoweri Museveni, the leader of a rebellious group, seized the power and since then, the country has been governed by him and his party by being selected in the elections (Government of Uganda, n.d.; BBC News, 2018).

Uganda's political system is a democratic republic with national and local institutions having the authority to govern. It is a decentralized system with different governmental institutions at different levels (Commonwealth Local Government Forum, 2018).

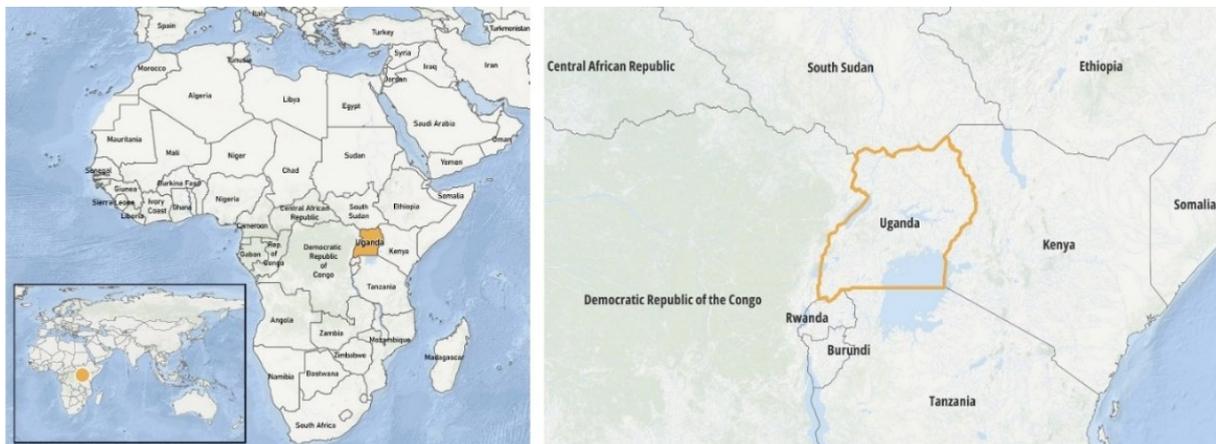


Figure 35 Location of Uganda (author's own elaboration)

Colonial Periods' Impacts on the Land

In the colonial periods, one of the first changes that have been made in Uganda was introducing individual ownership of properties. While the land was owned communally until the arrival of the British, they changed the land tenure system. In the pre-colonial area, the land management system was customary through owning it communally. The land belonged to a small group of people who were living on the same land while also maintaining their life in the same place, and individual ownership was few and was inherited (Tukahirwa, 2002).

However, when it was declared as a British Protectorate at the beginning of the 20th century, private land ownership was introduced in the name of promoting self-sufficiency while also aiming to initiate industrial activities and markets in the country (Tukahirwa, 2002). After a while, British Colonial Government introduced two forms of land tenure: “crown land” and “mailo”. While crown land was referring to the areas that were under

the Queen’s custodian, *mailo* system was more complex. This system was implemented on communal lands by assigning a landlord to the communal land and turning inhabitants into tenants by leasing the land. This new system displaced a lot of indigenous people from their lands and left many rural areas unmaintained in the long term (Tukahirwa, 2002). Also, the lands declared as crown lands evicted rural and minority groups by turning these areas into conservation areas (MLHUD, 2013).

Even though the Government decreed different land-related acts and policies over the years, the colonial relicts on the land tenure system still keep their place. Currently, with acceptance of the Land Act of 1998, the Government decreed 4 different types of land tenure systems which are the land can be owned communally (*customary*), can be used a specific activity for limited (*leasehold*) or unlimited time period (*freehold*), or can be owned by a group of people with a main owner (*mailo*) (UN-Habitat, 2007; RoU, 2010 as cited in FAO, 2023). Moreover, another impact of the colonial legacy on land management caused by the extraction of natural resources. Several environmental problems have been identified originate from the extensive resource extraction that happened in the colonial period. The most poignant sector is forestry. The extraction of timber has caused environmental degradation in Uganda over years (RoU, 2007).

Land Cover

The country has 4 regions Central, western, Northern, and Eastern Regions and 11 cities with 146 districts. The total area of the country is 241.555 square kilometers, and more than half of the country is covered by agricultural lands (44,5%) and water bodies (19%). The rest is mostly covered by forests (32%) while only 1,07% is urban areas (GGGI, 2017; GoU, n.d.).

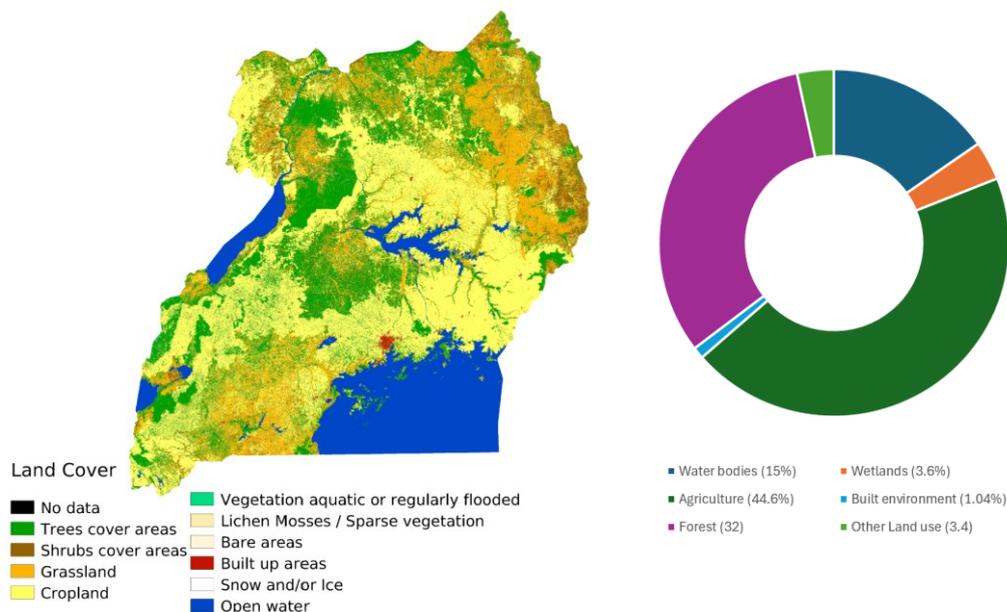


Figure 36 Land cover in Uganda (Ardö, 2021) and shares of land usage (adapted from GGGI, 2017; GoU, n.d.)

Natural resources are the most important resources for the Ugandan people to make their livings, and arable lands and forests are very important for the country considering their dependency on land for subsistence. Agriculture is the most dominant land use in the country, and there are 10 different major agro-ecological zones in the country (Figure 37) that are categorized based on the climatic characteristics and agricultural products that have been produced in these areas. This variety is mutually affecting and being affected by climate change and impacts the areas' vulnerability to climate-induced hazards, including extreme weather conditions, droughts, floods, and so on (Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), 2018; EcoTrust, 2020).

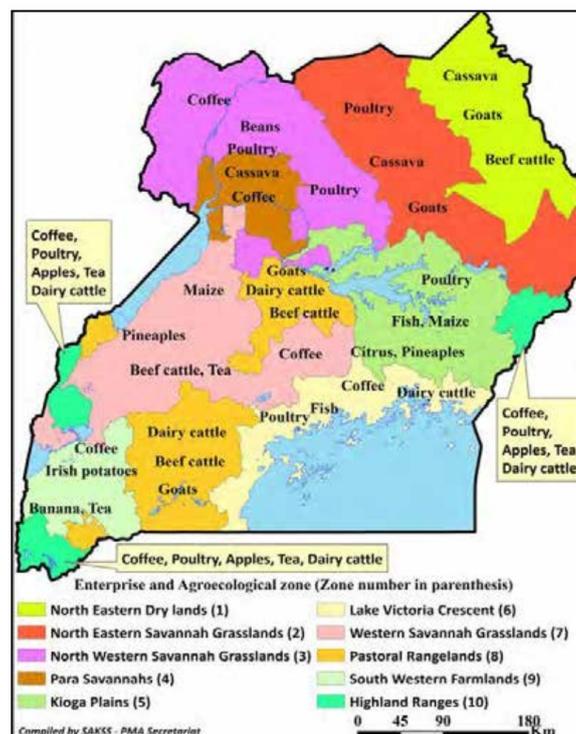


Figure 37 Agro-ecological zones in Uganda (MAAIF, 2018, p. 10).

When it comes to forestry, Uganda has experienced a significant decline in forest and woodland cover, losing 44,7% between 1990 and 2019, while rapid urbanization has emerged as a pressing issue for the Ugandan Government to address (GGGI, 2017; GoU, n.d.). Key drivers of deforestation include forest clearance for agriculture, charcoal production, urban expansion, overharvesting, industrial growth, and gaps in policies governing forest product trade (Ministry of Water, Lands and Environment, 2001). Forest management in Uganda operates under various systems. Protected forest areas fall under the jurisdiction of the National Forestry Authority (NFA), while other management systems promote community participation, such as Collaborative Forest Management (CFM), community forests on common lands, and private forests owned by individuals (Ministry of Water and Environment, 2017).

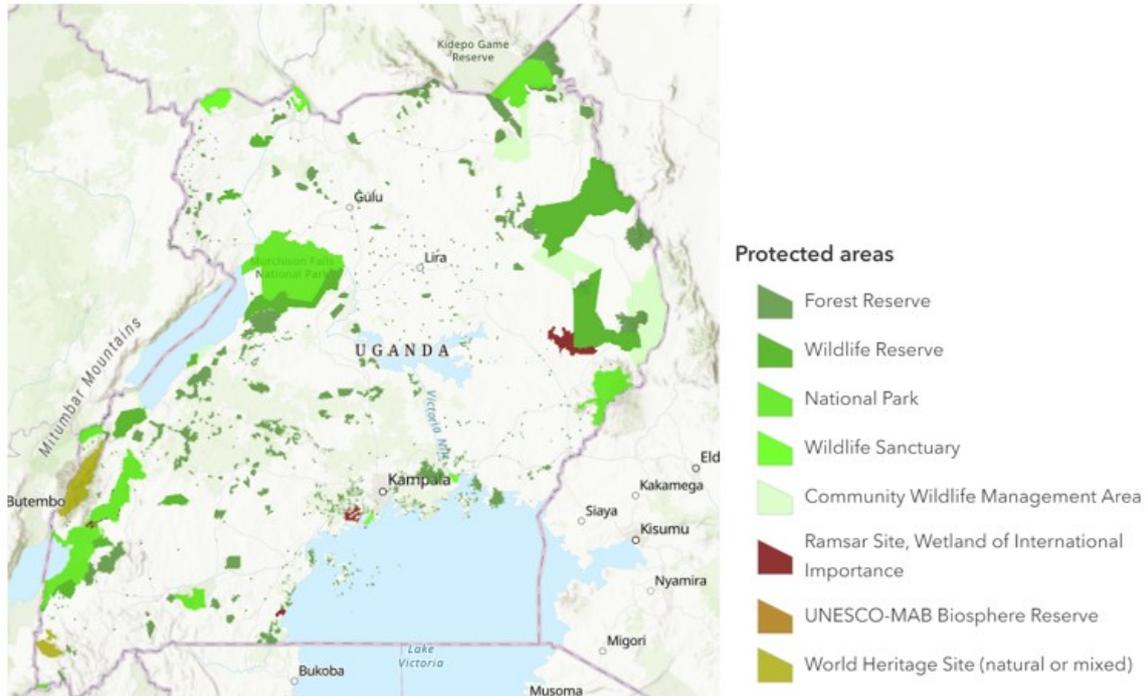


Figure 38 Protected areas in Uganda (Shedrak, 2022).

Socio-Economic Context

Uganda has a population of over 45.9 million people and is home to a diverse range of social groups. It is one of the youngest countries in the world, with 74% of the population under the age of 30. Additionally, the population continues to grow at a rate of 3% per year. Most of the people, about 76%, live in the rural areas (UNDP Uganda Team, 2024). Uganda’s economy is built on agriculture (24,2%), industry (25,5%) and services (50,3%) sectors (GoU, n.d.). Even though economic growth is majorly based on services, in parallel with the number of people living in rural areas, 70% of the population works in the agriculture sector. 80% of the rural population makes their income through agriculture, mostly smallholders and forestry’s contribution to agricultural income is 4% (RoU, 2018; GGGI, 2022). However, the high unemployment rate is one of the greatest concerns in Uganda. While the adult unemployment rate is 11,9%, it reaches 17% when it comes to the youth (GGGI, 2017, 2022; UNDP Uganda Team, 2024).

The lack of job opportunities and the high unemployment rate among young people is one of the significant problems in the country (GGGI, 2017). It is also one of the least developed countries with one of the lowest incomes in the world. 20% of the population still lives in poverty and the daily income is less than 1,25\$ (RoU, 2018). Moreover, a World Bank report reveals that 4 out of 10 Ugandan people are identified as poor staying below the international poverty line which corresponds to making \$2,15/day (World Bank, 2024). Even though new policies spurt the growth of the economy, the country still struggles with low income, poverty, and climate change.

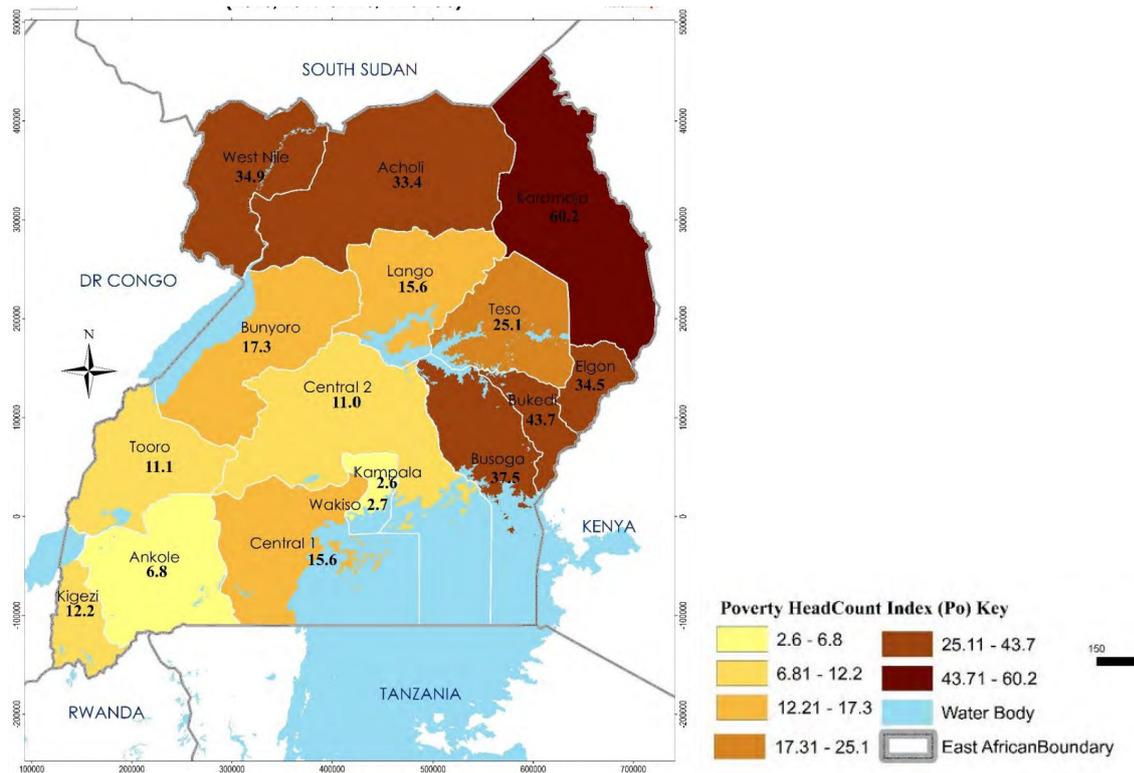


Figure 39 Subregional poverty status in Uganda in 2016/2017 (NPA, 2020)

Climate Change and Vulnerability

As mentioned before, Uganda is one of the most vulnerable countries to climate change, ranked 36th out of 182, and needs urgent actions to cope with climate change. The forecasts for the country show that it will experience a 1.5°C temperature increase in the next 20 years, and 4.3°C temperature rise is expected by 2080. Additionally, with the increasing humidity, 10% to 20% more rainfall is forecasted. Even though Uganda has been affected by extreme weather events in the past, with the impacts of climate change, they become more frequent and severe. Since 1979, over 5 million people have been affected by climate change directly through drought, floods, and the health problems they brought in (Ministry of Agriculture, Animal Industry and Fisheries, 2018). The country has experienced fatal extreme weather events in its history repeatedly. Only between 1991 and 2000, seven droughts affected more than four million people by destroying their livelihoods, causing infrastructure damages, and displacing people. Floods are also significant life threats in Uganda. The flood happened in 1961-62, 97/98, and 2007 caused an influx of inner migration due to severely damaged livelihoods. The projections show that 34.600 people might be affected by inland river floods annually until 2030. These events also brought up health problems with them by causing outbursts of waterborne and respiratory diseases (Winthrop, Kajumba, and MacIvor, 2018).

Besides the direct impacts, given the high dependency on natural resources, the changes in the climate and extreme weather events, such as fluctuating rainfall schedules, the

water level on the rivers and lakes, and decreasing underground levels, cause crucial problems for Ugandan people. Floods, droughts, and secondary incidents they cause such as landslides, erosion, and damages to the infrastructures, also create irreversible impacts on the land and affect agrarian communities (MAAIF, 2018).

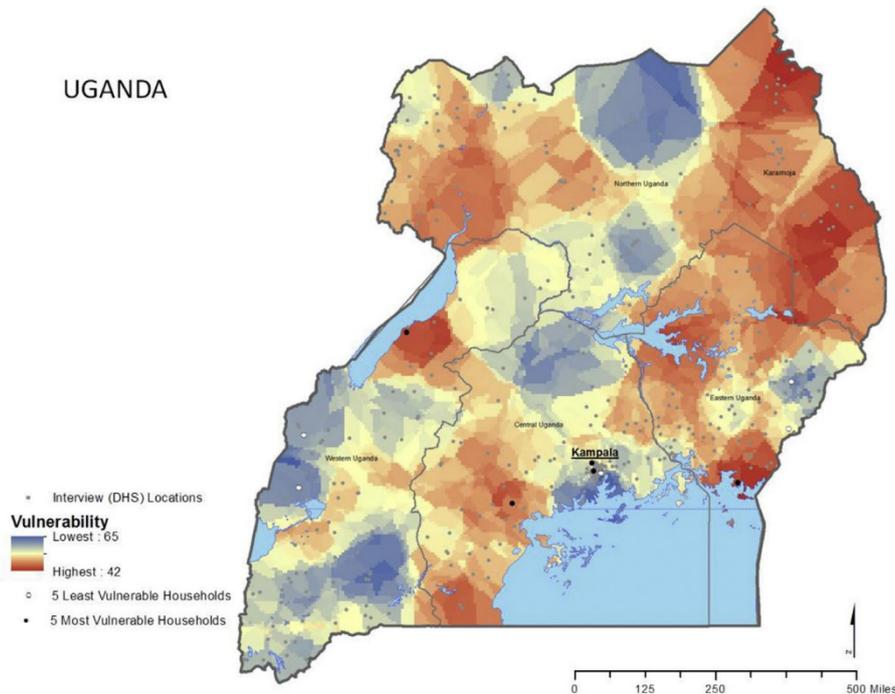


Figure 40 Household vulnerability to climate change (Richmond, et al., 2015)

Figure 40 shows the vulnerability to climate in Uganda. Most of the Ugandan people live in rural areas and their subsistence relies on agricultural production. As shown in the figure, most of the country is at substantial risk of climate change impacts, and it is highly dependent on clean water, and sanitation. Since 2010, there has been a constant inclination for rainfalls and an increase of flash floods in southeastern Uganda (MAAIF, 2018). These impacts cause irreversible impacts on land use. These extreme climate events and their secondary incidents cause severe damage to arable lands and affect fertility and yield potential (MAAIF, 2018). As a result, the deforestation rate is accelerating to extend the agricultural land and production and starts a vicious cycle for land resources management. Moreover, all these also cause deterioration in the water resources, and threaten not only human life but all living beings in the country (Oosterveet and van Vliet, 2010).

Climate change and extreme weather events as impacts of it caused drought and floods and affected the agricultural productivity and efficiency in the country. Combined with insufficient health infrastructure, the epidemic started the outburst of diseases. The projections show that 21.600 will be affected by climate change due to the socio-economic change annually (Winthrop et al., 2018).

Carbon Markets

In order to address this vulnerability, one of the tools that have been used is the carbon credits mechanism. As the 4th biggest carbon credit producer, until December 2022, Uganda produced 33 million carbon credits through 290 CDM and VCM projects that focus on different sectors. The country has 189 registered CDM projects and more than 101 VCM activities that are mostly oriented around energy efficiency and forestry. In alignment with the country’s needs, renewable energy projects are the most invested ones in the CDM sectors (GGGI, 2017). Among 92 VCM projects, 78 were Gold Standard Activities with energy efficiency, 13 of them VCS projects with agriculture and energy as the dominant sectors, and 1 of them Plan Vivo activity focusing on small-scale agroforestry activity (Eastern Africa Alliance, 2022).

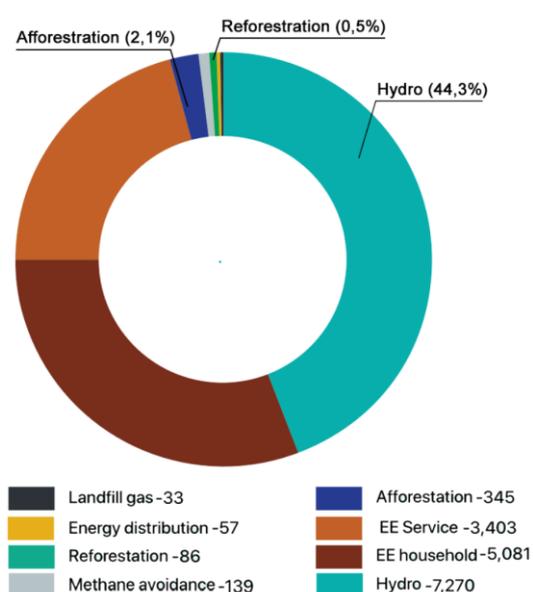


Figure 41 CDM credit issuance by sectors (EAA, 2022)

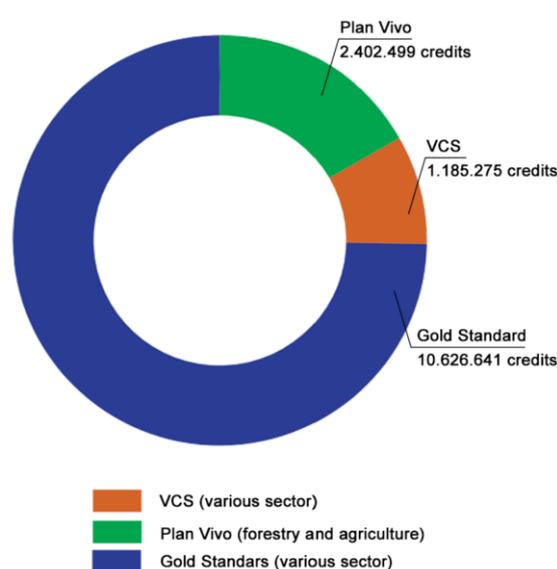


Figure 42 VCM credit issuances based on sector (EAA, 2022)

With the Paris Agreement’s carbon market mechanisms on the horizon and Uganda’s natural resources, it can be assumed that the country will remain a hotspot for carbon credit investments in Africa. The following sections will present Uganda’s carbon market landscape through a review of policy frameworks, case studies, and insights gathered from stakeholders.

4.3. Institutional Organization and Policy Frameworks

Uganda is a Republic that has different administrative bodies on various levels for decision-making and implementation, and in that section, an overview of the administrative structure will be provided by focusing on spatial planning and environmental management coupled with the policy frameworks and their implementations.

4.3.1. Administrative Structure

Three levels influence the decision-making processes in Uganda. First, the supranational level is dominated by the UN and its extensions, the second is the regional bodies that Uganda as a part of the alliances (East African Community, African Union and IGAD), and the third is the national level itself.

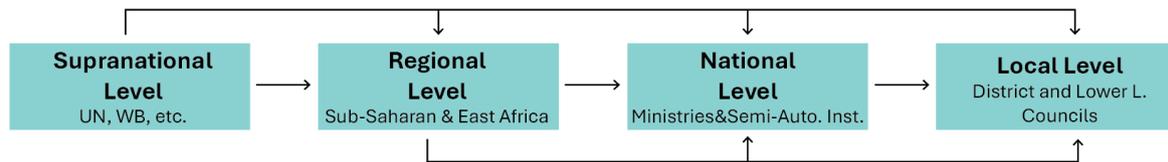


Figure 43 Relation between levels (author's own elaboration)

The political system of Uganda is a democratic republic and the Republic of Uganda has a decentralized system with different governmental institutions at diverse levels (Commonwealth Local Government Forum, 2018). Decentralized system was introduced during the colonial periods to facilitate governance in the protectorate areas through managing administration on various levels by regional kingdoms and district governance. In 1962, when Uganda gained its independence, there were four kingdoms and eleven districts. These districts had also their own subdivisions with villages, counties, and sub-counties. The British appointed chiefs to the villages, counties, and sub-counties to be in charge of collecting taxes and maintain law and order. By these practices, the first seeds for the decentralization of the country have been planted. Since then, the country has used a decentralized governance system except for the Idi Amin regime (Ojambo, 2012).

In this decentralized system, the national bodies, the Parliament, the Government and the Ministries are mainly responsible for law, policy-making, along with monitoring the implementation processes (MWE, 2024). On the local scale, Municipal, Town, and Cell councils are the political actors in the urban areas; and in the rural setting, District, County, Parish, and Village Councils are the main bodies for the governmental systems. There are 5 different levels of local government in Ugandan as Local Councils (LC), villages (LC1), parish (LC2), sub-county (LC3), county (LC4), and district (LC5). Particularly district and subcounty levels were included in the governmental system through the policy changes, while the other levels were kept as administrative units. Districts are the main administrative units that take part in the governmental processes, and the Local Councils of districts are selected by the local population (Oosterveet & van Vliet, 2010).

While the national bodies are mainly responsible with law and policy making along with monitoring their implementation, the local governments are the main bodies for the implementation of the policies. While the decisions for the transportation system and environmental protection are a shared responsibility of national and local governments, local governments are also responsible for providing clean water, health services, and provision of education services. Additionally, Districts and lower tiers of government are

also responsible with Local Economic Development (Commonwealth Local Government Forum, 2018).

Since the 1980s, Uganda has strived to decentralize the system and reinforce local governments. Over the years, the importance of local government in the system has been highlighted. The main aim of the decentralization of the system is empowering the local communities by giving them a chance to represent and have a part in the decision-making processes through a hierarchical structure in the governance (Oosterveet & van Vliet, 2010). And the policy frameworks for the spatial planning system give more responsibility to local governments while putting national actors as policy makers in the planning processes.

Plan types		Format	Insitution
Annual Plans and Budgets	30-years National Vision	Strategic	Governeemnt of Uganda
	Long Term National Physical Development Plan	Spatial	MLHUD
	10-year National Development Plan	Strategic	NPA
	5-year National Development Plan		Ministries
	5-year Development Plans		
	10-20 years Physical Development Plans	District	Spatial
Urban			
Town			

Figure 44 institutional organization for spatial planning and plan types and levels (adapted from NPA, 2007; NPA, n.d.)

4.3.1.1. Institutional Organization for Environmental Management

Land and environmental resource management are mainly the responsibilities of the Ministry of Local Government, the Ministry of Land, Housing and Urban Development, and the Ministry of Water and Environment. The latter is also Uganda's representative institutional body for the UNFCCC and is responsible for integrating climate actions into domestic sector policies, plans, and projects. However, all Ministries take a role in the decision-making processes in collaboration with related partners from governmental, semi-autonomous, and private actors (MWE, 2024).

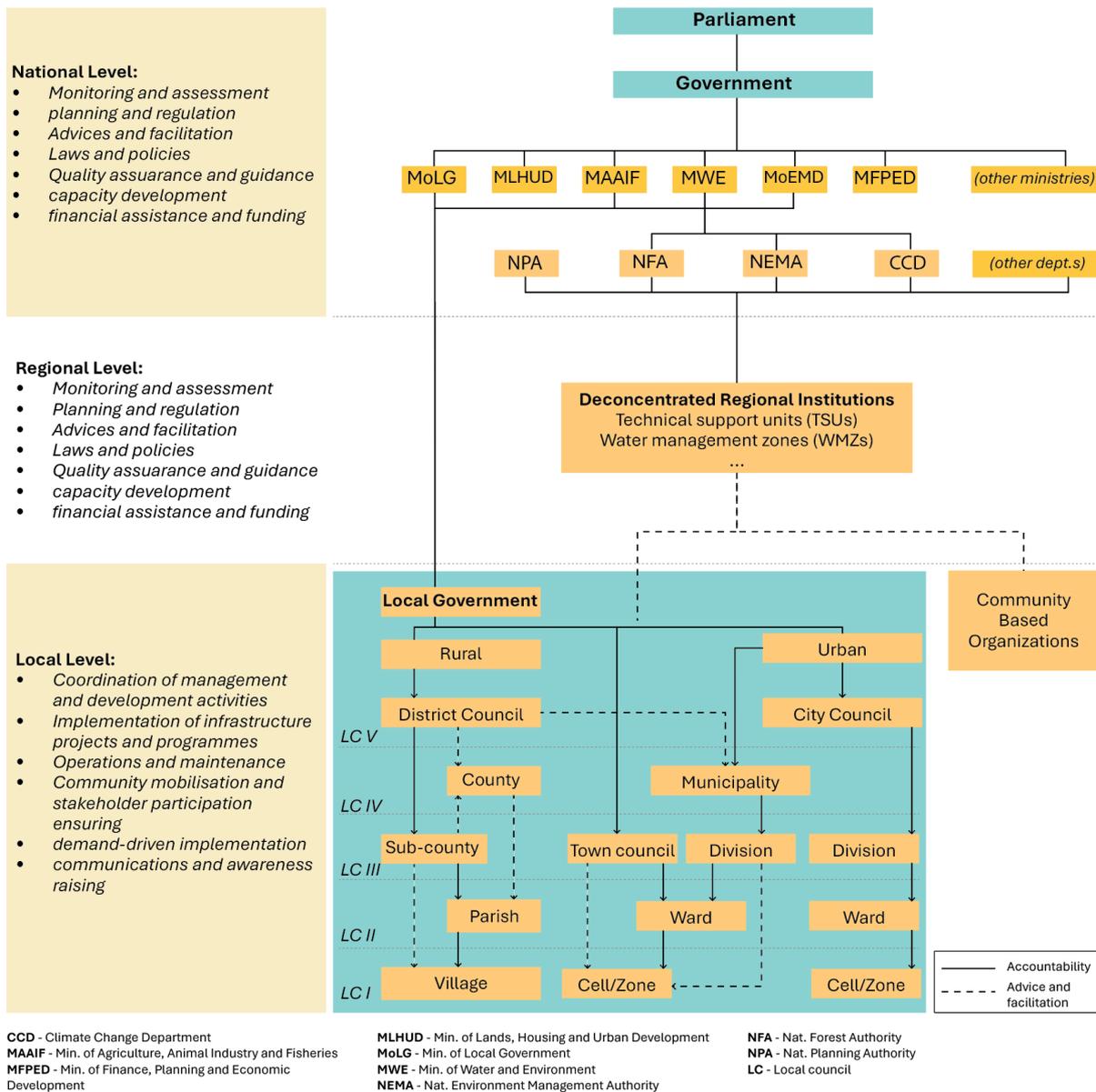


Figure 45 Institutional organization of environmental protection in Uganda (Authors own elaboration by compiling the information from the interviews and graphs from MWE, 2024; Muguzi and Kafuuma, 2020, p. 61)

Three important semi-autonomous actors are actively taking roles in the implementation of spatial planning and environmental management policies. The first one is the National Environment Management Authority (NEMA), Climate Change Department (CCD), and Climate Finance Unit (CFU). NEMA is the main institution in charge of coordinating, monitoring, and supervising the environmental protection management processes. After NEMA, District Environment Offices are the most powerful organizations. NEMA is a semi-autonomous agency takes place between Ministries and District Governmental Bodies, and it is in charge of monitoring, supervising, and coordinating the projects. And the District Environment Office (DEO) is responsible for the coordination and implementation of activities along with communicating with the stakeholders and local

people (MWE, 2024). And CCD is the national focal point of UNFCCC in Uganda. The Department aims to integrate UN-baked conventions and agreements to Uganda's agenda and monitor the mitigation and adaptation activities in the country (CCD, n.d.). Lastly, aiming to organize the climate finance activities in the country, Climate Finance Unit (CFU) was established under the Ministry of Finance, Planning and Economic Development (MoFPED). The department was established in 2022 with the support of the UK Foreign, Commonwealth and Development Office to be able to coordinate and integrate the sectoral approaches to the national climate action planning processes (GGGI, n.d.). For the implementation of carbon credit projects, MoFPED, MWE and NEMA are the main bodies for mobilizing the climate finance into different governmental bodies and levels. Even though there are several units that are responsible with the distribution of the fund and management of the resources, they work coordinately (Bakiika, *et al.*, 2020).

On the local level, each governmental body on the five-tier hierarchical structure has its own departments for land management and natural resources protection. Environment Office, Forest Office, and Physical Planning Offices are the main ones when it comes to environmental protection and spatial organization (MWE, 2024; Int8). In these processes, community engagement is also an important part of the land management decisions. Community-Based Organizations that are supported by the Ministry of Internal Affairs through the National Bureau for Non-Governmental Organizations to understand local needs, contribute the peaceful atmosphere, and enhance community engagement in the governmental processes (MWE, 2024; National Bureau for NGOs, n.d.)

4.3.1.2. Institutional Organization for Climate Change Actions

In the institutional arrangement of climate change actions, there are four different levels with various actors in Uganda. Starting in 2020, the country divided the operationalization processes into four levels Strategic level, Enforcement level, Coordination level, and Implementation level. The strategic level is about the development goals the country wants to achieve through strategic actions. In this context, Uganda 2040, which is influenced by the UNFCCC policies, Kyoto Protocol, and Paris Agreement is the keystone to take action. Along with that, the National Development Plan (NDP), Green Growth Strategy, and Roadmap for Creating an Enabling Environment for Delivering on SDGs, NDCs are important policy frameworks in the country that steer climate change actions. At the Enforcement level, the laws and policies that facilitate and regulate implementation policies are highlighted, particularly the National Climate Change Act of 2021 (MWE, 2022b).

At the Coordination level, two different governmental levels play important roles. Firstly, on the national level, the Parliament, the Ministry of Water and Environment and its

extensions, the Ministry of Finance, Planning and Economic Development, and the National Planning Authority are responsible for policy-making and allocation of resources. In the second step of the Coordination level, Environment Committees, District Authorities, and other important stakeholders take roles (MWE, 2022b).

And when it comes to the Implementation, there are again two different levels. First, the Ministries' Climate Change Departments, Ministry of Local Government, and Ministry of Water and Environment initiate the process for implementing the action through registration of the projects, and in the second level, District and their National Resources Departments maintain the operationalization of the policies and strategies that are tailored to address the local needs while strengthening the local resilience (MWE, 2022b).

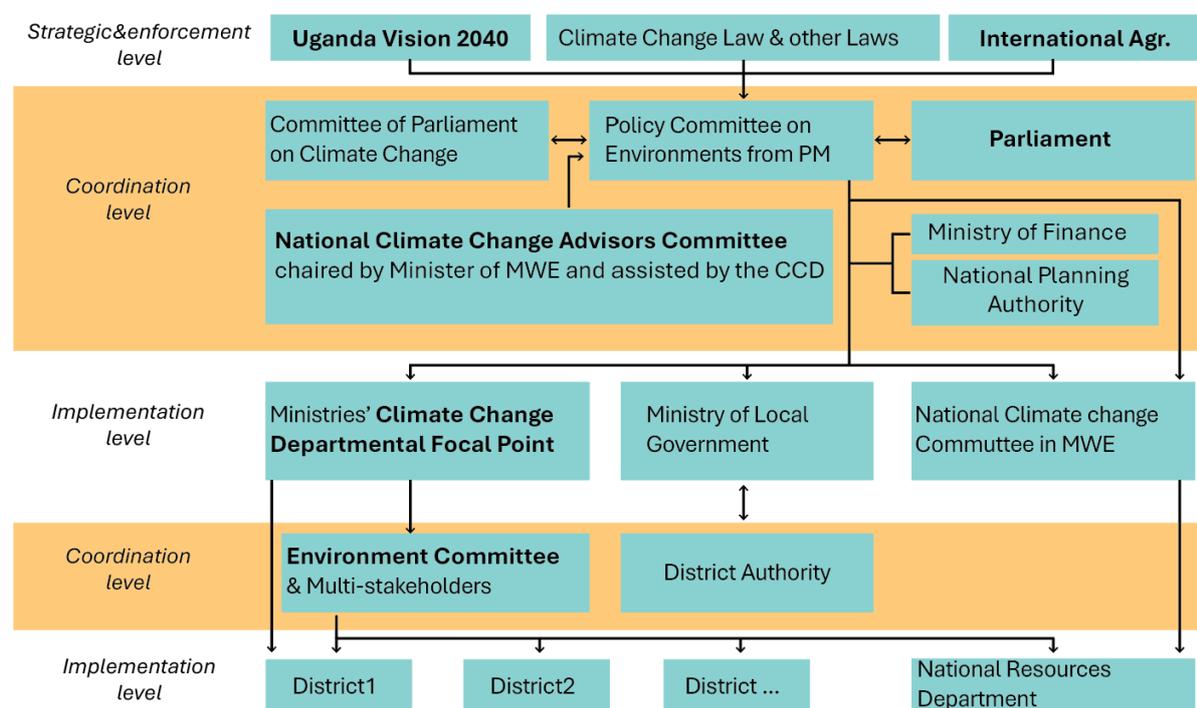


Figure 46 Institutional arrangement for the climate change action (adapted from MWE, 2022b, p. xxxviii)

In the bottom line, that can be said, while the national level is mostly responsible for law and policy-making, both national and local levels are in charge of monitoring and assessment processes by giving advice and facilitating the implementation processes. The local governments are the most important bodies for the implementation processes. Operations and maintenance, along with community engagement and stakeholder participation are managed at this lowest level.

4.3.2. Policy Frameworks

The initial step for operationalizing the carbon market is developing policies that address the various aspects of projects. Therefore, the following sections examine the policy frameworks related to land management and urban planning in Uganda, focusing on land property systems and urban planning schemes. Subsequently, the legal frameworks for environmental management and the integration of climate change into these frameworks are explained. Finally, the ways in which carbon markets are addressed within the identified planning frameworks are discussed, and the section concludes by outlining the implementation of these policy frameworks.

4.3.2.1. Policies on Land Management and Spatial Planning

Uganda has a rapid urbanization rate that mostly occurs informally through the expansion of slums around the city centers. The population shift from rural areas to the capital, and also the migration from other countries, resulted in the accumulation of public services in the capital while leaving the rural areas behind and causing environmental stress and urban poverty. Nonetheless, the country struggles with building up an urban planning system that has strong institutional roots.

Back in the 19th century, the land management of Uganda was built on tenure and the British formed the initial system during the colonial era. While in the pre-colonial period, the land was owned either communally or by the tribes or clans, the British colonials introduced private land ownership and the complicated land tenure system. After gaining its independence in 1962, the Republic of Uganda started to build a new regulation for property ownership in 1969 with the new Public Lands Act (UN-Habitat, 2007). During the same period, the Town and Country Planning Act of 1964 was considered as the main policy framework for physical planning (National Planning Authority, 2009). While approval of these Acts were signs of a developing planning system, when Idi Amin came to power in 1971, he abolished the previous legal frameworks and held the country back from having a modern system.

Under his government, a new land ownership law was decreed in 1975 that announced all the land of Uganda is publicly owned. All the private ownership was canceled and the Ugandan Land Commission was assigned as the main department responsible for land management. After the fall of Amin's regime in 1979, the Government worked on a new regulation meticulously in collaboration with national and international universities (UN-Habitat, 2007). In the last decade of the 20th century, the Ugandan Government accepted important legal frameworks for the benefit of the country.

In 1995, a new constitution was released that followed by the Local Government Act of 1997 which granted local governments the authority to prepare short term development plans. With this Act, the country declared that local actors will be more important in

engaging local communities in the decision-making processes (NPA, 2009; MLHUD, 2017). Lastly, the Land Act of 1998 laid the base for the current land tenure system with offering a new division of land tenure system that is still on the force (FAO, 2023). These developments in the legislative frameworks paved the way for the contemporary land management system in the country with a land tenure system and decentralized planning system.

Following this, the National Land Use Policy of 2006 was inaugurated to strengthen land management. This policy framework was the first step of the Ugandan Government toward a modern planning structure aiming “*to achieve sustainable and equitable socio-economic development through optimal land management and utilization*” (MLHUD, 2006, p. viii). The policy framework declared the main pillars of the planning system by highlighting the importance of scarce land sources protection and natural resource management through amplified institutional structure and well-designed policies along with a strong and inclusive system (Ministry of Lands, Housing and Urban Development, 2006). In the following years, the National Planning Authority released the Comprehensive National Development Planning Framework of 2009 to refine Uganda’s planning system. With this framework, the planning system on the national level was staged according to the 30-, 10-, and 5-years periods, and a general structure for the planning system was prepared based on the national and local levels (NPA, 2009). With the Physical Planning Act enacted in 2010, the planning system was elaborated to explain how physical planning processes at the national, regional, and local levels would be structured through various hierarchical relationships between institutions and policy frameworks. Additionally, it details the approval processes of the plans, and the integration between physical plans and environmental policies (RoU, 2010a; FAO, 2015). With the accreditation of the Physical Planning Act, it was official the Republic of Uganda has a structured planning system. In 2013, the MLHUD released the Uganda National Land Policy to facilitate the implementation of a planning system with drawing a pathway to be followed by the policy and placemakers. The main aim of the policy frameworks was strengthening the economy by ensuring the “*equitable and optimal utilization*” of land resources. The framework also highlights the importance of climate change, and the integration of international frameworks to cope with climate change impacts (MLHUD, 2013).

After the National Land Policy in 2013, Uganda released its first comprehensive policy framework, Vision 2040, that will draw a pathway for sustainable development. As a complementary document to it, the Local Government Development Planning Guideline of 2014 was accepted to guide Local Governments in developing their own 5-year plans. Participatory planning schemes have been promoted in the policy framework not only for plan preparation but for all decision-making processes (NPA, 2014).

In 2016, the UN Human Settlement Programme Regional Office for Africa also prepared a Country Programme Document valid between 2016 to 2021 to support sustainable urban development in Uganda. They highlighted the main goals and priorities to integrate the UN New Habitat Agenda into the country's frameworks. Including a better planning system with better natural resource management and urban environment, the policy framework pointed out seven sectors for taking action. One of the focus areas was the importance of physical development plans on every level empowering the capacity and innovation to strengthen the relationship between land use plans and land management (UN-Habitat, 2016).

After this advisory document, the Republic of Uganda launched the National Urban Policy (NUP) (2017) and the main aim of the policy framework is to address the urbanization issues associated with rapid urban growth such as urban poverty, environmental degradation, inadequate urban services, financial inadequacy with including all stakeholders into the problem-solving process. Building a strong planning system with good governance, taking action against climate change impacts, and balanced regional development are included in the priority issues (MLHUD, 2013). In 2019, the first National Physical Development Plan 2019 was accepted as the implementation of the previous blueprints. The Plan aimed to provide the “*best and most equitable use of land resources*” (p. 23) by integrating economic and social dimensions into each other by using physical space to address the issues mentioned in the NUP. As happens with the other policy frameworks, NPDP also emphasized stakeholder participation to promote an inclusive approach in the planning processes (MLHUD, 2019; Byendaimira, 2020).

Uganda took a very long way to build its planning system since its independence, and it still strives to do it better. Even though they had to start from scratch several times due to economic, political, and environmental challenges, as of 2024, the country has a working planning system that considers the contemporary challenges Uganda faces. However, several issues could not have been addressed adequately. Firstly, land management becomes fragile with the skewing land tenure system. The colonial roots of property rights and communal ownership base the ground for the corruption. Secondly, even though the planning system looks well-designed in the current situation, the lack of policies and weak institutional structure has been discussed in the policy framework itself. Even though the policy frameworks highlight the importance of decentralization and describe the work definitions of local governments, when it comes to the practices, their roles in the planning system need to be strengthened. On the other hand, years of work and numerous documents show that the policy frameworks are adapting themselves in the way to answer problems. While in the first documents, the need for community engagement was the most emphasized issue, after the 2000s, climate change, and inclusive planning approach became one of the most crucial topics the State addressed.

In the following, the frameworks related to climate change will be delved into to make a narrative of Uganda’s reaction to climate change.

4.3.2.2. Policies on Environmental Management & Climate Change

Uganda's history of policy frameworks on climate change goes back to the late 20th century, when it became a signatory to the UNFCCC in 1993. Since then, the Republic of Uganda has strived to strengthen its policy frameworks to cope with climate change impacts.

Until 1995, even though there were policy frameworks for land management, none of them touched upon environmental protection except the Forest Acts of 1947. In 1995, the Ugandan Government enacted the National Environment Act to highlight the importance of nature and natural resource management. The National Environment Management Authority (NEMA) established the National Environment Act to ground the institutional structure for environmental protection. Along with NEMA on the national level, the Law was also enforcing the establishment of District Environment Committees for each district, and these committees were responsible for preparing the District Environmental plans that needed to be consistent with the National Plan (“Uganda”, n.d.; Ministry of Natural Resources, 1995; FAO, 2024). After the first environmental law that lays the groundwork for environmental protection, the National Environment Action Plan (NEAP) was released to address the environmental problems that have been faced for years. The Plan aimed to provide an institutional framework for the applications of practical solutions for environmental problems. In this document, the strong relationship with the UN was shown through integrating their priorities into the plan. One of the priorities that was proposed by the plan was establishing environmental economics in the country through using UN financial tools (Ministry of Natural Resources, 1998).

After NEAP, environmental economics have been integrated into the policy frameworks starting with the Forest Policy of 2001. With this Policy, the carbon credits scheme was introduced to the Republic of Uganda, as a way to attract international funds to support biodiversity conservation. Also, tree planting on private properties and agricultural lands has been proposed to strengthen forestry in the country. To do so, NGOs’ importance in the organization was also underscored (Ministry of Water, Lands and Environment, 2001). In the subsequent policy document, the National Forestry Plan of 2002, the same policies have been repeated highlighting the importance of agroforestry for the local communities with its benefits to make people’s lives easier by providing food, medicines, the materials to build houses, and their help to mitigate the impacts of natural disasters (Ministry of Water, Lands and Environment, 2002). The next year, the National Forestry and Tree Planting Act of 2003 was launched to aim for the protection of forests within the frame of sustainable use of its resources and promote tree planting. The Acts included

an article to support forestry to acquire carbon sequestration credits while also accelerating trade development (RoU, 2003).

In 2006, the National Land Use Policy was promulgated to provide a policy framework that has a comprehensive approach to land use planning since the country's main sectors are dependent on land. The policy framework was also supporting the other documents by promoting agroforestry activities to prevent natural disasters. And to prevent deforestation, carbon credit projects have been proposed as one of the strategies that could be beneficial (Ministry of Lands, Housing and Urban Development, 2006).

Following this comprehensive policy framework for land use, the National Adaptation Programs of Action (NAPA) of 2007 was decreed to cope with climate change impacts. NAPAs are the policy frameworks promoted by the UN for the LDCs to be prepared for the adverse climate change impacts ("National Adaptation Programme of Action", n.d.). The policy framework was the first action taken under the auspices of the UNFCCC, and it was a spearheading action of the Ugandan Government to cope with climate change impacts with having a comprehensive approach. The major strands were: (i) tree planting, (ii) land degradation management, (iii) enhancing the meteorological services, (iv) access to clean water and sewer system, (v) water for production, (vi) adaptation to drought, (vii) vectors, pests and disease control, (viii) indigenous knowledge and natural resources management, (ix) climate change and development planning (RoU, 2007). The NAPA strategies prepared the ground for the experiment of decentralized and more inclusive approaches in policy-making, and the pilot projects showed that the involvement of the local communities in adaptation strategies makes the core of the success of coping with climate change impacts, and capacity building is one of the keys for environmental management. Additionally, the involvement of different actors from various levels is important in implementing effective planning and budgeting processes (Nyasimi, Randey, Mungai, and Kamini, 2016). Overall, NAPA practice showed that there is a need for a holistic approach in Uganda to build a strong policy framework to mitigate climate change impacts. The policies promoted by NAPA have served as the foundation for various policy frameworks. Additionally, the practices established by NAPA have helped the Government of Uganda to better understand how to design future policy frameworks, particularly for the National Development Plan, the National Adaptation Plan, and the National Climate Change Policy (Nyasimi *et al.*, 2016; Ampaire *et al.*, 2017).

In the following documents, such as Strategic Investment Framework for Sustainable Land Management (2010), National Forest Plan (2011), National Forest Plan (2011) and Nationally Appropriate Mitigation Actions (2012), the main problems and challenges have been highlighted as the subjects that should be prioritized. The importance of the land has been highlighted in each document, and agricultural and forestry policies have been developed in a way that promotes agroforestry activities. Deforestation is pointed out as

one of the priority subjects and carbon credit markets and projects have been offered as a solution to overcome it. Along with carbon credit projects, REDD+ applications were also burgeoning in Uganda's development agenda. These activities are mentioned as the tools to attract investments to the country from supranational and foreign resources. Additionally, all these frameworks also highlight the need for a land management policy (RoU, 2010b, 2010c; Ministry of Water and Environment, 2011, 2012).

National Land Policy was launched in 2013 to compile all the scattered land policies in a blueprint to provide an organized and updated scheme for land usage and urban planning. While the Policy Frameworks points out deforestation and land degradation as the most crucial problems along with poor settlement planning, it also touches upon climate change and its impacts. It reiterates the importance of UN Frameworks, and the consistency between the local adaptation strategies and the Convention policies (MLHUD, 2013). The following policy frameworks, the National Environment Management Policy of 2014 and the National Climate Change Policy (NCCP) of 2015, were concerned with policies and strategies to combat climate change impacts. Additionally, the NCCP also touched upon the integration of the carbon market into national strategies. The policy framework underscores the importance of REDD+ projects and emphasizes the need for a more comprehensive legislative framework. It also highlighted the importance of the integration of international agreements into the policy frameworks (RoU, 2014; MWE, 2014, 2015). Over time, the NCCP became a cornerstone policy framework by combining all the climate change-related policies into one blueprint, and defining a clear pathway to deal with adverse climate change impacts in Uganda. The framework identified the vulnerable sectors to climate change as agriculture, forestry, and energy, and emphasized the importance of investments from supranational and foreign institutions to cope with climate change impacts (Ministry of Water and Environment, 2015).

After these comprehensive frameworks, the country started to promulgate legislative frameworks that have sectoral approaches to integrate climate finance tools. In 2017, three important frameworks for forest management were released. Firstly, the Forest Investment Program, which aimed to decrease the deforestation rate and strengthen afforestation and reforestation was decreed in 2017. The policy framework suggested strengthening the institution's capacity to fight deforestation caused by agricultural land expansion and encroachments and promoted agroforestry and planting trees on private lands, and REDD+ project the ways to overcome the deforestation problem. The policy framework also highlighted the importance of bottom-up approaches and inclusive decision-making processes in forest management (MWE, 2017a). Strategic Program for Climate Resilience was also released in the same year to reinforce the political frameworks, and it highlighted considering the dependency on natural resources, finding climate-resilient solutions that are environment and society-friendly are crucial for the Ugandan people. It also bridged a gap between the former policy frameworks and future

ones by mentioning the Paris Agreement and its tools to channel climate finance to amplify adaptation and resilience practices (RoU, 2017). Along with the latter frameworks, the Government accepted the National REDD+ Strategy and Action Plan in the same year and set a direction for the implementation of the REDD+ projects by promoting agroforestry and climate-smart agriculture. These projects are also mentioned as ways to finance reforestation projects while producing carbon credits (MWE, 2017b). Another sectoral plan that was promulgated by the Government is the National Adaptation Plan for the Agriculture Sector. The policies in the framework aimed to move towards sustainable commercial agriculture by promoting climate-smart and climate-resilient practices. In order to achieve this goal, the policy framework pointed out climate finance tools and also underscored agroforestry activities along with REDD+ projects (MAAIF, 2018).

These frameworks and the lessons taken from their implementations paved the way for more grounded legislative blueprints that are consistent with UN frameworks. And, the backbones of contemporary environmental management for Uganda have been released since the late 2010s. In 2019, the National Environment Act was accepted and promoted low-carbon development by compiling all the policies related to environmental management in Uganda by explaining the protection standards, the authorities in charge of environmental protection, and the coordination and monitoring of these processes (RoU, 2019). Following this act, in 2021, the Climate Change Act was decreed with putting a great emphasis on UN Frameworks, particularly the Kyoto Protocol and the Paris Agreement, while promoting inclusive climate change mechanisms for environmental and institutional management (RoU, 2021). In 2021, the second National REDD+ Strategy and Action Plan was released highlighting the importance of carbon trade to create monetary resources for adaptation and mitigation projects. Along with REDD+ projects, agroforestry, and climate-smart agriculture have been promoted to do that. In these processes, the inclusion of Civil Society Organizations was also underscored for the grassroots project development (MWE, 2020). Even though the National Environment Act does not mention the UN and its extensions, the subsequent frameworks showed the Ugandan Government's willingness to be part of the future global climate finance market by leaving space for the UN, the Paris Agreement, and its tools within the following frameworks.

Over the years, Ugandan environmental protection has taken a long way toward a comprehensive and grounded framework. In the early periods, after the UN introduced carbon markets, emission trading was considered a tool for attracting international funds and curbing deforestation. In addition, the RoU published various strategic plans and actions to guide the implementation processes. However, after the mid-2010s, which corresponded to the failure of the global carbon market, climate finance tools started to be mentioned in the frameworks less than the former ones. Along with this change, the Ugandan Government's reliance on UN-influenced policies also evolved. While in the

early periods, the frameworks were UN-policies oriented, and implementing mainstream approaches, with time, the Government transformed their perspective to a more nation-focused one. In recent years, the Government started to focus on low-carbon emission policies in every sector to ensure sustainable development in the country. In order to do that several frameworks merge the planning and environmental management policies that provide a comprehensive approach for the national development agenda.

4.3.2.3. Carbon Markets in Planning Policies

National Development Plans are planning tools that lay a broad perspective on the national level that steers development by combining the national interests and countries' policy frameworks. And National Development Plans, their complementary documents, and the blueprints that influence them from different levels are mutually reinforcing each other.

In 2010, the first National Development Plan of Uganda was decreed. The policy framework pointed out the need for a better urban planning system that has a better structure for land management highlighting the importance of natural resources. At the same time, the NDP promoted agriculture-based sectors and the protection of forests for the benefit of the country and the citizens. And carbon market has been promoted as a way to attract investments for better environmental management (NPA, 2010). After a year, in 2011, the East African Community (EAC) released a set of frameworks to for a better mechanism to cope with climate change impacts in the territory. EAC Climate Change Policy, Master Plan and Strategy promoted the carbon credit market on the regional scale for the whole East African Countries, particularly in forestry and agriculture sectors through REDD+, agroforestry, and climate-smart agriculture practices (East African Community, 2011a, 2011b, 2011c).

In 2013, Uganda Vision 2040 was released. The policy framework acts as an umbrella by combining all the previous policy frameworks and charts a course for sustainable development by focusing on both land and environment management in rural and urban areas in the social, economic, and environmental aspects. The main aim is to create more livable cities by enhancing access to clean water and energy while reducing poverty. In order to achieve that, the country aims to integrate climate change governance into its system by focusing on promoting efficient usage of natural resources, social inclusion, and justice, low carbon development, and green and sustainable economic growth. The Framework highlights the compatibility with the UNFCCC Frameworks as being a part of the signatories for the Convention and the Kyoto Protocol (RoU, 2013; GGGI, 2017; NDPII; NDPIII) In the same year, 2015, the Second National Development Plan was launched, highlighting the need for "*promotion of green industry and climate-smart industrial activities*". The policies and strategies proposed in the Plan are oriented around energy efficiency, green growth, and green economy, and the term "climate

finance” is introduced by referencing the investments coming from international resources for the climate adaptation projects that include carbon credit generation and REDD+ activities. Along with these new policies, public participation in the decision-making processes is strongly supported in the policy framework (RoU, 2015).

Aiming to steer the implementation of Vision 2040 along with the National Climate Change Policy of 2015 and National Development Plan II, the Ugandan Government released two additive guidelines in 2017 which are the Implementation Roadmap and Green Growth Strategy. These frameworks were one of the first blueprints for the country to integrate Sustainable Development Goals and Paris Agreement decisions into the political agenda of Uganda. Both documents promoted climate finance and suggested policies to channel it (MWE, 2015; NPA, 2015; 2017a, 2017b).

Afterward, in 2020, the Ugandan Government promulgated the Third National Development Plan. The policy framework underscores national interests and development and points out several sectors to be strengthened. One of the major strands for economic development was accepted as agro-industrialization through using climate smart agricultural techniques and agroforestry. Also, the policy framework highlighted the importance of area-based spatial planning that considers the SDGs. While promoting low-emission development to build an inclusive climate-resilient system, the carbon market projects were mentioned as opportunities to fund the projects only if the negotiated parts were dissolved (NPA, 2020).

Recently, the Government decreed the updated version of Nationally Determined Contributions (NDC) in 2022 with the obligation coming from the UN. Even though an infant version was submitted to the UN in 2016, the framework was updated in 2021 to strengthen the policies for better adaptation and mitigation mechanisms to climate change impacts. This new NDC represents the strongest blueprint the Ugandan Government prepared for climate change impacts with all the intentions that have been delivered in the previous documents. Also, the blueprint integrates the UN’s Sustainable Development Goals and Paris Agreement into the country’s agenda (MWE, 2022). Right after the end of Article 6 negotiations, Uganda accepted the Climate Change Act of 2021, and confirmed NDC commitments legally. In this way, the country guaranteed to encourage climate actions with ambitious goals in the way of aligning with UN frameworks (MWE, 2022; Eastern Africa Alliance, 2022). The main objective of the NDC is achieving adaptation to climate change aiming to achieve “*a climate-resilient and low-carbon society by 2050 that is prosperous and inclusive*” (p. 15). The blueprint prioritizes the policies about ecosystem, water, agriculture, and forestry considering their vulnerability to climate change. And to do so, the NDC underscores the importance of international funds to implement climate adaptation and mitigation projects. As a way to do that, Article 6 implementation is mentioned in the document (MWE, 2022).

As an umbrella policy framework, NDC compiles all the policies and strategies for climate change adaptation. Regarding the importance of land use sectors as the main resource of subsistence, the framework prioritizes LULUCF sectors to take action through promoting climate-smart agriculture and REDD+ activities that are followed by agroindustry, forest restoration, and energy efficiency. Besides these major strands for adaptation of climate change, the policy framework also provides solutions for transportation, waste, and industrial sectors. In order to implement the policy framework, it suggests attracting domestic and international investments under the auspices of climate finance by mentioning their willingness to conduct Article 6 projects (MWE, 2022).

For years, Uganda has shown great effort and progression for climate change policy frameworks that commit to sustainable development, environmental protection, and climate adaptation. Starting with Vision 2040, development policies started to be merged with environmental management approaches, and National Development Plans helped the country to woven climate resilient, low carbon growth into their national agenda by highlighting community engagement and natural resource management. With recent policy frameworks, including the Climate Change Act of 2021 and the Nationally Determined Contribution (NDC) of 2022, Uganda has outlined a broad perspective for its future by integrating its interests in sustainable development with United Nations objectives. These frameworks underscore the need for global cooperation to implement adaptation and mitigation projects, aiming to build a more resilient future for the country. Carbon markets have been employed as a tool to attract investment, and despite the ups and downs of this mechanism, Uganda has demonstrated its commitment to participating in the new carbon market framework by approving Article 6 projects. However, legislative frameworks to regulate project implementation are still lacking at both national and local levels.

4.3.3. Implementation of Policy Frameworks

Implementing the policy frameworks required the integration of spatial organization strategies and environmental management principles, with careful consideration of climate change impacts, within Uganda's decentralized administrative structure.

In the implementation of the policies, the decentralized system of Uganda influences the entire process of operationalization. Decentralization of environmental protection is particularly important, not only in Uganda but, in all African countries since the local communities are considered as the custodians of nature. Therefore, decentralization also implies sharing the nature protection responsibility with local people who are more familiar with the local conditions. In this way, local communities find a way to share their main environmental problems and find solutions through working in collaboration with

governmental bodies. (Oosterveet and van Vliet, 2010). As a consequence, through decentralization, participatory decision-making was also promoted by making local communities a part of the process.

However, this system has sparked debates and disagreements. While there are scholars claim that Uganda implemented a well-structured decentralization and the system works efficiently (Oosterveet and van Vliet, 2010; Lubega, 2019), there are also other opinions that criticize the operationalization of the system considering the corruption level and policy gaps (Ojambo, 2012; Friis-Hansen, Bashaasha and Aben, 2013; Bidandi and Williams, 2020). The main aim of decentralization in Uganda is to empower local communities in the decision-making processes and democratize the country (MLG, 2014), however, considering the high level of corruption in the country by being the 139th out of 180 countries, the operationalization of decentralization widely questioned. The different interests of multiple stakeholders, coupled with the various policy frameworks and their suggestions caused clashes of interests (Friis-Hansen *et al.*, 2013). Both Ampaire *et al.* (2018) and Ojamba (2018) elaborated on interest conflicts with examples of agricultural investments and projects. Both of them highlighted that politicians benefit from the system by prioritizing their supporters' ideas over the common interest. Another problem that has raised widespread concern is ineffective urban governance and management. Considering the numerous policies that are on the same topic, the policy frameworks lacking a holistic approach were causing complexities in the planning processes. Therefore, even though on the national level there are well-structured plans, their reflections on the local level are still nascent (Atakunda, 2020).

Another problem of the policy design is implementing mainstream environmental policy rather than solving the problems requiring urgent actions also became a problem for Ugandan environmental protection (Oosterveet and van Vliet, 2010; Ampaire, *et al.* 2017). Along with that the policy frameworks that have been prepared by the pressure coming from the UN have flaws in terms of lacking the local perspective in the documents. NAPA, which was accepted in 2007, was criticized for having a top-down approach and suggesting strategies that are not answering community needs. The factors that took part in the decision-making processes were not either local communities or central government. This is again discussed as having a top-down approach by Friis-Hansen *et al.* (2013) by highlighting the process were ignoring the local perspective and missing meeting the local needs.

Financial resources and their distribution are also one of the subjects of concern. Even though the local governments were the key actors in the design and implementation of plans, the financial resources that are distributed by the National Government were not enough (Ojambo, 2013), or it was coming very late when the project was supposed to be completed (Nyasimi *et al.*, 2016; Okiror, 2017 as cited in Friis-Hansen, 2013).

Considering all the disadvantages of decentralization listed above, even though the country has a decentralized governance system, climate change policies and their implementation remain as centralized practices. These policies could not find any reflections on the local scales due to inadequate and incoherent policies, lacking financial resources, and inadequate civic participation (Friis-Hansen, 2013), and therefore, community engagement in the climate change adaptation practices is limited (Nyasimi, *et al.*, 2016).

All the policy frameworks that have been launched and implemented since 2002 laid the groundwork for a robust system for climate change resilience in the country with all nuts and bolts. However, some challenges are faced in the implementation processes. Considering the sole dependence on the land resources, environmental management is significantly important in the African countries, and making local communities a part of the governmental system through decentralization vital, however, in the implementation phase of the policy frameworks, considering the decentralized administrative structure, the integration of the policies with each other have been a problem for the local governments. Even though the planning system, along with the environmental protection legislations, have taken a long way, the policy frameworks are lacking consideration of local governments. Despite the fact that the system is decentralized, and the policy frameworks are promoting participatory processes in the decision making and implementation, in practice, there are several problems that holding the local governments to develop and implement their own plans. Besides that, lack of holistic approach in the policy making processes might cause irreversible land changes. Even though the environmental management and climate change focused policy frameworks underscored the importance of the carbon markets, any of the planning frameworks mention it. This shows that even though carbon markets are important for the countries' development, they have been neglected in the urban planning policies.

In the next sections, two case studies will be explored to illustrate how these challenges manifest themselves in the practical processes.

4.4. Case Studies

Aiming to create a narrative of the operationalization processes of the carbon market project in Uganda, two case studies will be presented in that section, underscoring the challenges and opportunities that have been experienced with different governance and implementation approaches. Kachung Forest Project (KFP) and Trees for Global Benefits (TGB) are two projects that have been operationalized in the country for a long time. While KFP is a CDM project that have implemented with top-down approaches, and exemplifies what can go wrong; TGB has been considered as one of the good examples worldwide

with having an participatory approach, and strengthening community engagement in the policy implementation processes. By exploring these two distinct case studies, the aim is unveiling the broad implications of carbon offset project on Uganda’s socio-economic and ecological landscapes.

Table 5 Case studies

Project	Mechanism	Region	Investors
Kachung Forest Project (KFP)	CDM	Dokolo District, Central Uganda	Norway, Finland, Sweden (former)
Trees for Global Benefits (TGB)	VCM	14 district, various parts of Uganda	Supranational (WB, IUCN), International organizations (USAID, etc).

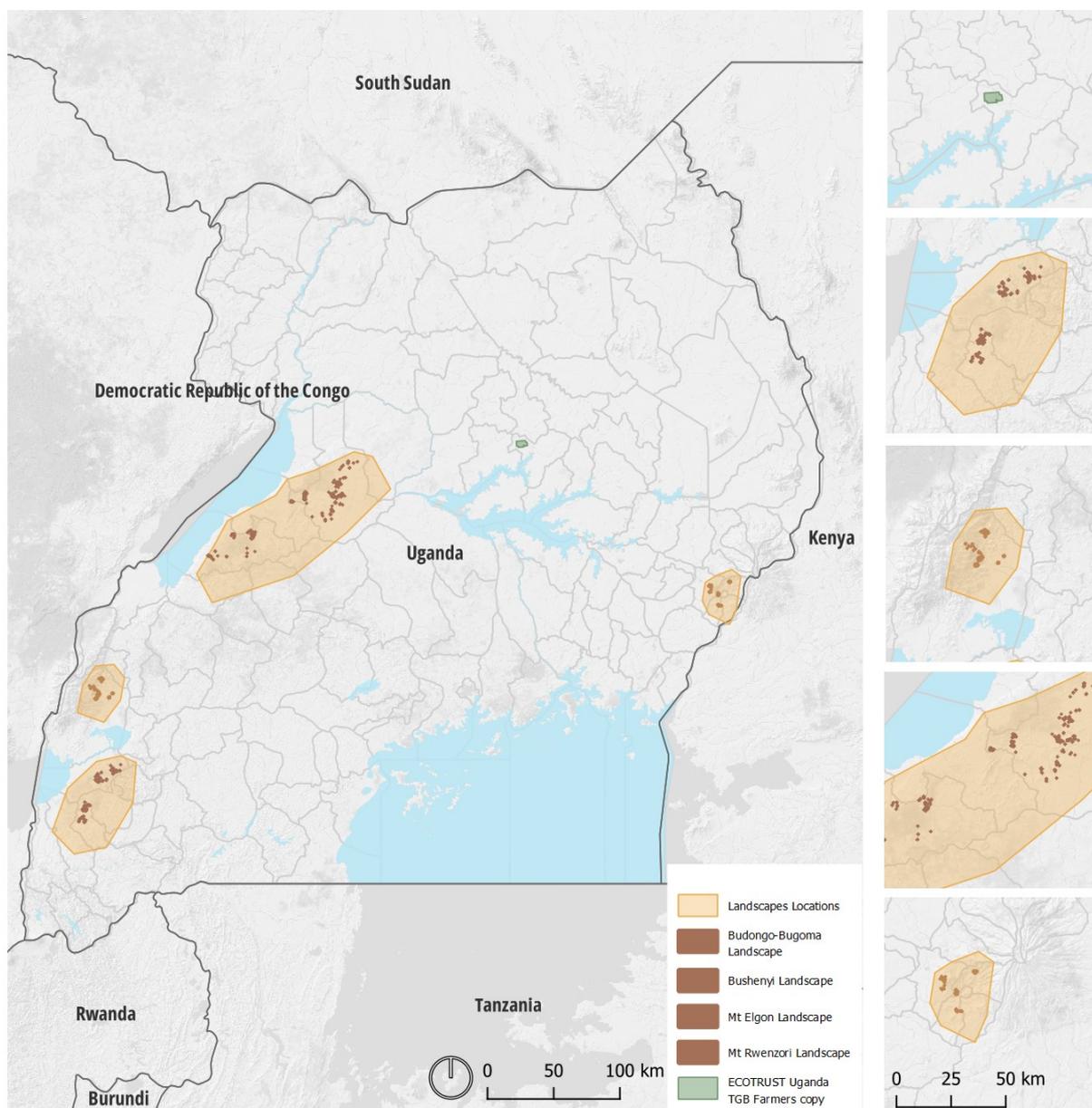


Figure 47 Projects' locations (author’s own interpretation using the database of EcoTrust)

4.4.1. Top-Down Approaches: Kachung Forestation Project, Uganda

Kachung Forest Project (KFP) is one of 19 CDM activities implemented in Uganda (UNFCCC, n.d.). The project area is located in the Northern part of the country taking 2.699 hectares (ha). In that part of the country, the average temperature is 30 °C, the high-rainfall belt zone with two rainy seasons in the fall and spring, and dry seasons in summer and winter. There is a wetland in the project site that carries a flooding risk (PDD, 2012). Regarding the area's ecological characteristics, the whole project site was considered a “*degraded savanna environment*” with mainly grass and shrubs. Before the implementation of the projects by both Project Design Document (PDD) (2012) and Gebremichael (2016), it was reported that the area had 12 different species from 3 different families with a remnant of afforestation attempt from the Government. However, in order to address land degradation and deforestation, the project was initiated in 2006 to remediate the soil for plantation activities (PDD, 2012).

Overall, the objective of the project as “*contributing to mitigating climate change while meeting the growing demand for quality wood products from well-managed plantation forests and contributing to sustainable environmental management, community development, and poverty alleviation in Uganda*” (PDD, 2012, p.2). The project aimed to address the high deforestation rate by facilitating the demand for wood products and diminishing the pressure on the natural forest areas; sequestering GHG emissions; promoting nature protection; providing social and economic benefits for the local communities, along with the enhancement for the local infrastructure (PDD, 2012). It is secured approval from international institutions, including the United Nations through the CDM, based on its promising goals. However, during implementation, the project faced several scandals, ultimately leading to its failure and causing significant environmental, social, and economic damage.



Figure 48 Project location (Google Satellite view, 2024; for the small map, PDD, 2012).

4.4.1.1. Foundations and Frameworks

Under the auspices of the UN, KFP has a complicated structure including bureaucratic processes that require the involvement of actors from different levels and operationalization relying on different legal frameworks.

Site Selection

The project is located in Dokolo District, in the Northern part of Uganda and the area settles on one of the Central Forest Reserves areas, which is owned by the Government. The history of the forest goes back to the colonial periods being used to generate timber and other forestry products. The understanding of the use value of the forest to make money also persisted in the post-colonial period until the late 1990s (Gebremichael, 2016). In 2006, the land was rented to a Norwegian company for 50 years helping the land tenure system in Uganda, and Green Resources, a Norwegian-based carbon offset company, initiated a forest plantation project on the site in 2006. (PDD, 2012). Even though the type of land ownership allows local communities to benefit from its resources for their subsistence, when the project was started, the area was covered by the fence, and access was limited. Furthermore, timber collection, grazing, and cultivation were also strictly prohibited in the area to protect the forest and not affect the calculations of GHG emissions (Gebremichael, 2016; Edstedt, 2017; Carton and Edstedt, 2021). These activities were crucially important for livelihoods, and their limitations and prohibitions had a profound impact on the lives of local communities.

Legal Frameworks

The legal frameworks this project relied on are the Local Government Act of 1997, the National Forest Plan of 2002, and the Tree Planting Act of 2003. According to these legal frameworks, the company is required to conduct a participatory approach for the whole process to ensure sustainable development in the economic, environmental, and social aspects (PDD, 2012).

Stakeholders & Shareholders

In the early 2000s, Green Resources started KFP to benefit from the carbon trading system, and the other Nordic countries also supported the project. For a long period of time, the Swedish Energy Agency has been the only purchaser of the credits (Gebremichael, 2016) while Green Resources has investments from Norfund (Norway) and Finnfund (Finland) (Oakland Institute, 2014; 2019).

The main actors of the project were the Ugandan Government, the National Forest Authority (NFA), Green Resources (GRAS), Lango Forest Company (LCF) formerly the Norwegian Afforestation Group, and the Swedish Energy Agency (SEA) from the Swedish Government.

The project was designed by the LCF and Green Resources and approved by the NFA on behalf of the Ugandan Government. In the whole process, NFA acted as an intermediary between the Government and private companies (Gebremichael, 2016). LCF is a company that own the lease agreement for the Kachung Forest Project for the next 50 years with tree planting license, and their biggest share is held by GRAS. The credits that have been generated in the KFP are sold by the GRAS to other Nordic Countries, particularly to Sweden. SEA had been the biggest purchaser of the credits for a long time, however, even though there was a contract between GRAS and SEA to trade the credits until 2032 (Edstedt, 2017; Gebremichael, 2016), SEA withdrew from the project in 2020 for several reasons that will be explained in below.

Even though the PDD (2012) mentions that the project is being conducted in a participatory way, in practice, research studies by scholars and research institutions (Oakland Institute, 2014; 2017; 2019; Edstedt, 2017; Gebremichael, 2016; Carton and Edstedt, 2021) claim the opposite and highlight the ways the company and other stakeholders ignored local communities.

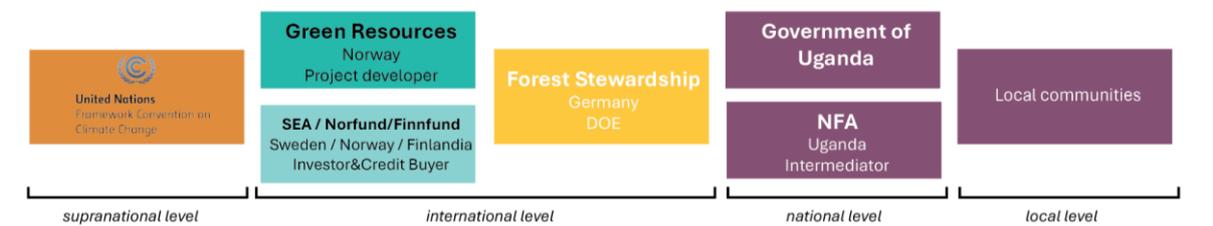


Figure 49 Stakeholder organization in the KFP (author's own elaboration)

4.4.1.2. Implementation and Operations

After the accomplishment of the foundational steps, the implementation of the CDM started. Considering the need for the UNFCCC's and DOE's confirmation, the implementation process is a back-and-forth system that has a complicated structure with many bureaucratic steps for each level and stakeholder.



Figure 50 operational steps of the KFP (author's own elaboration)

Land use and Zoning management

The land use history of the Kachung Forest goes beyond older than the project initiation. The historical roots of land acquisition can be traced to colonial times (Gebremicheal, 2016). However, since these historical roots go beyond the scope of this research, the reasons for being selected as a CDM project area will be explained.

Considering the land availability, low costs of labor, political stability, good climatic conditions, and long history of countries' relations, Green Resources selected East Africa as the best location for plantation projects (Green Resources, 2012 as cited in Gebremichael, 2016). The forestation project was planned long before the actual starting date. Going back to the 1970s, Norwegian companies attempted to start forestation projects in the country. However, with the rise of Idi Amin in the country, not only Norwegian but all foreign companies had to leave the country (Gebremichael, 2016).

However, this fact also raised another contradiction in the process. While the Kyoto Protocol conditioned to accept the afforestation projects in areas that had not been planted for more than 50 years, the forestation activity in the KCF area was started in 1941, and when the area was leased to the Norwegian group GRAS, the afforestation was still on progress (Gebremichael, 2016). However, in the PDD, the history of the area has been explained as the afforestation projects ceased considering the financial constraints the country is struggling with, and there have been no attempts since the 1970s to afforest rate the area (PDD, 2012).

Between 1986-1994, a civil war outburst in the area, and the majority of the local people left their homes, however, they came back in the late 1990s onwards. During this period of time, the forest area was left neglected, and the grasses and bushlands continued to grow (Gebremichael, 2016).

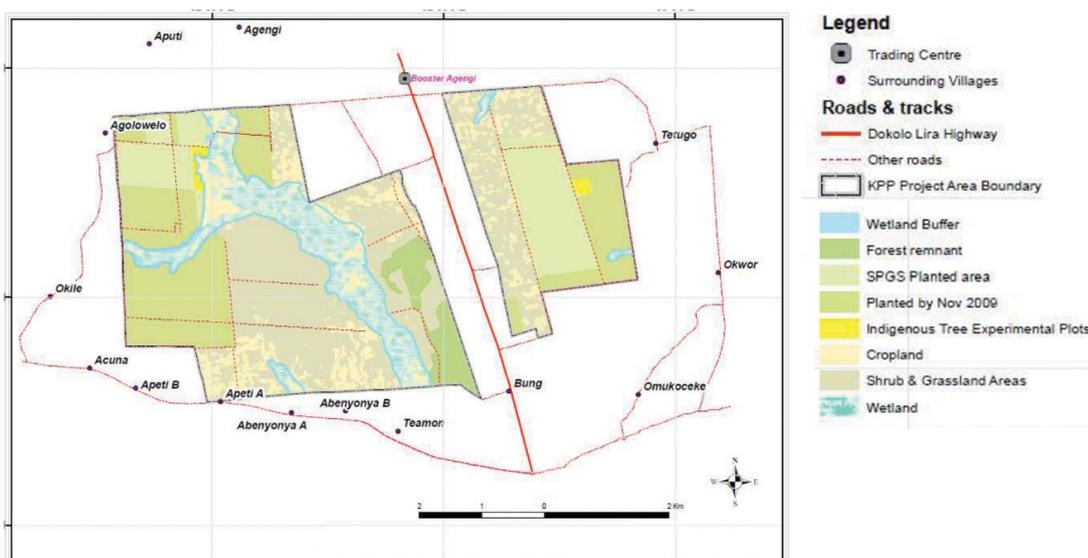
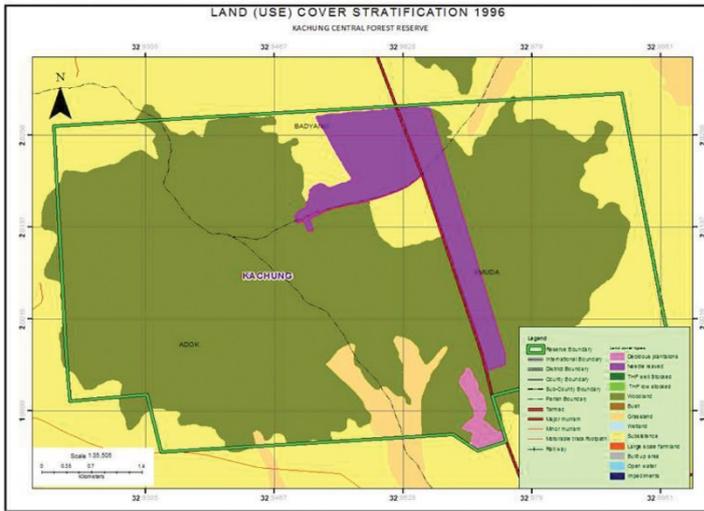


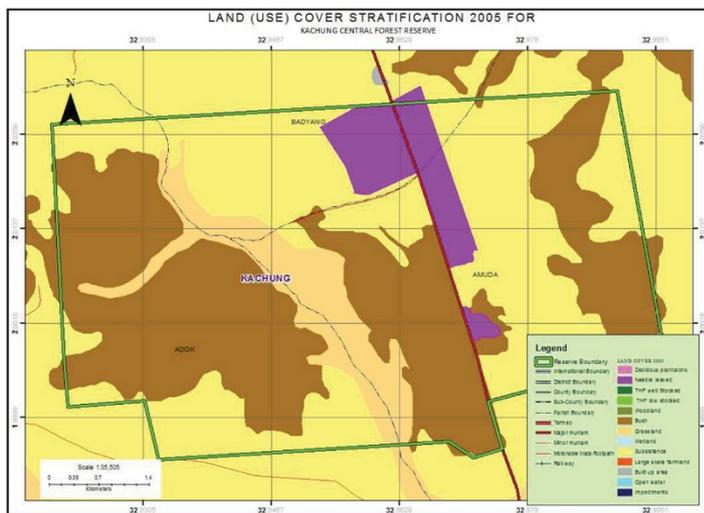
Figure 51 Land class cover and local communities around the KFP area (PDD, 2012)



While in 1995 most of the area (69,71%) was covered by tropical forest and the area was used for agricultural activities, over the years, the area has been covered with needle-leaved trees. Also, the wetlands in the boundaries disappeared.

Table 6 Land use change of KFP

Land use	1996	2005	2015
Tropical forest	69.71%	0%	0%
Subsistence farming	20.59%	41.41%	22.75%
Needle-Leaved trees	6.52%	5.7%	73.52%
Deciduous plantation	2.55%	0%	0%
Grassland and others	0.63%	8.61%	3.73%



When the project was started in 2006, the forest reserve was about 3590 hectares, and GR leased about 2800 hectares (Gebremichael, 2016). In this area, 2669 ha are planted with pine and eucalyptus, and indigenous trees and rocks cover the rest. However, the historical change in land use is also significant. Gebremicheal (2016) has done an analysis using the land use maps they acquired from the NFA for the years 1996, 2005, and 2015.

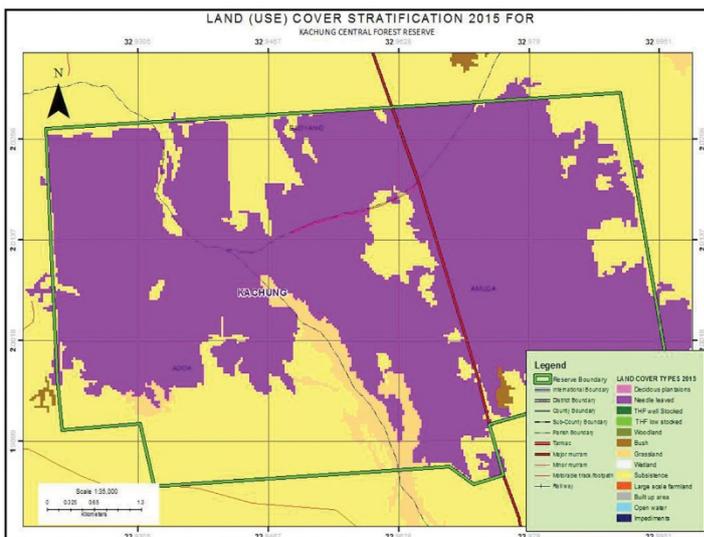


Figure 52 Land uses in the KFP area (NFA, 1996; 2005, 2015 as cited in Gebremichael, 2016)



Figure 53 Land cover change in Kachung Forest Area, Uganda (Produced by Google Earth Satellite Views)

Plant Selection and Plantation

The project initially proposed afforestation with a mix of exotic and indigenous species, aiming to combat climate change and promote sustainable economic development through wood production (Carton and Edstedt, 2021). In order to sequester carbon, the project planned to plant four different species which are not invasive (PDD, 2012), however, also not native (Gebremichael, 2016).

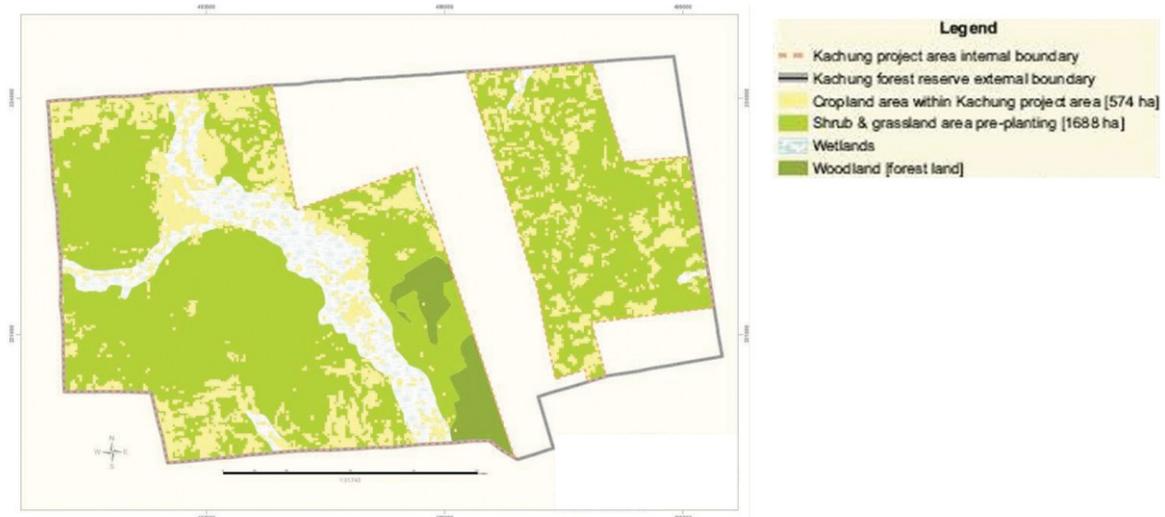


Figure 54 Tree plantation and their years (PDD, 2012).

In 2012, LCF shared a document showing the number of trees that have been planted according to their species. This data showed that even though 6 different species were selected, one of them was planted more, *pinus caribaea*, which is not a native tree, and with its dominance, it was also proof of the monoculture practices in the project (Gebremichael, 2016; Oakland Institute, 2014; Edstedt, 2017).

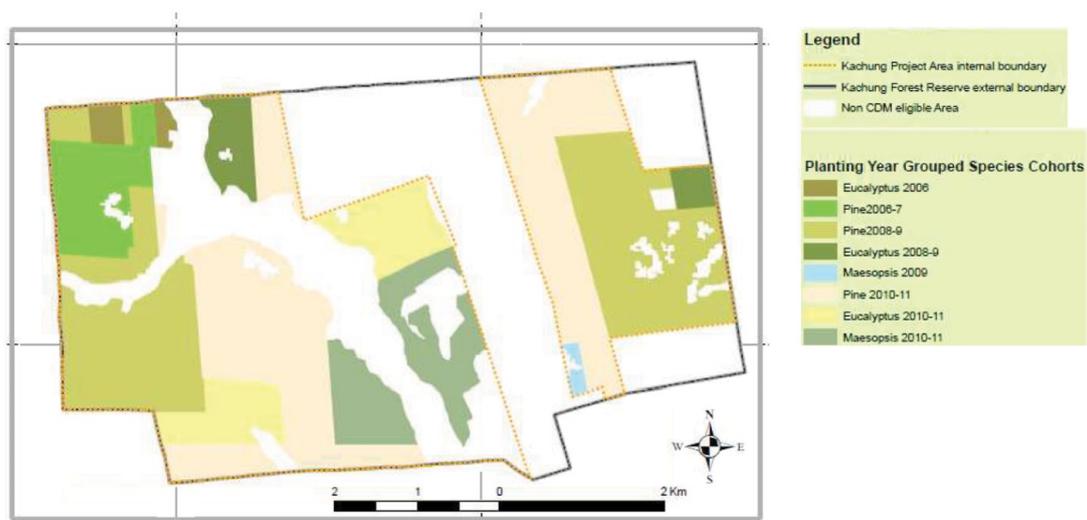


Figure 55 Ex ante phases of the project (PDD, 2012; Planted areas by tree species (LCF, 2012 as cited in Gebremichael, 2016)

4.4.1.3. Outcomes

KFG has been under fire by scholars and researchers for the environmental and social consequences it causes. Even though the initiation of the project got the hopes of aiming to create benefits for all stakeholders, it ended as a market failure by creating social, environmental, and economic degradation in Uganda (Oakland Institute, 2017). With the initiation of the projects, the local people lost their access to the project's areas and were evicted from the reserve (Oakland Institute, 2017; Edstedt, 2017). Since their income was also dependent on this area, their livelihoods were directly impacted negatively by the implementation of the project. Even though the projects have created some benefits, such as generation employment opportunities, they were limited to 250-400 people with low-salary seasonal jobs (Edstedt, 2017; Carton and Edstedt, 2021).

In 2015, a documentary on a Swedish channel aired about what is happening in Uganda, and since then, Swedish universities have conducted research in Uganda to understand the impacts of carbon trading projects (Gebremichael, 2016; Edstedt, 2017). These research studies helped to develop a broad understanding of the ways carbon sequestration is being operationalized, and in 2022, SEA withdrew from the project (UNFCCC, n.d.-a).

Environmental Impacts

KFP has been heavily criticized for its detrimental impacts on the project site with monoculture plantations, grazing and cultivation restrictions, and tree plantation methods. Monoculture planting, primarily of pine trees selected for their high carbon sequestration capacity and high-quality timber, has negatively affected biodiversity. Using only a few species during the plantation process disrupted the ecosystem and affected natural habitats sparking debates about biodiversity protection (Carton & Edstedt, 2021). Before the project, the site was reported to host 12 distinct species and three genera of flora, and the site was primarily used for cultivation, grazing, and timber collection for livelihoods (PDD, 2012; Gebremichael, 2016). However, these activities also caused landscape degradation, reducing woodland areas and creating fragmented islands of trees (PDD, 2012). While the project aimed to address these issues, its implementation introduced new environmental challenges.

Besides the impacts of monoculture plantation and the havoc it wreaked on the site, the use of herbicides and sprays during plantation processes had a cascading effect on exacerbating the impacts on biodiversity. Indigenous plants and small shrubs were endangered, while invasive grasses began to spread. These chemicals also contaminate water resources and accelerate environmental degradation (Gebremichael, 2016). Once essential for the community's traditional medicine, medicinal plants were severely affected. Removing indigenous trees and frequent spraying altered the site's ecological

character, rendering the production of herbal medicines impossible for the local community (Edstedt, 2017). The tree species planted were inappropriate for the regional climate, and as a result, they became invasive, disrupting the natural ecosystem. These trees, along with the already scarce water resources, exacerbated water depletion (Edstedt, 2017; Carton & Edstedt, 2021). Edstedt (2017) reported that when the company's wells ran dry, they used the local community's wells. This situation provoked mixed reactions from the community, particularly regarding the water infrastructure built by the company (Oakland Institute, 2014; Edstedt, 2017).



Figure 56 Water resource and warning about it inside the KFP (Oakland Institution, 2014)

When it comes to the project's impacts on the climatic conditions, Community members attributed climatic changes in the region to three main factors: increased vegetation (78%), decreased vegetation (21%), and temperature changes (1%) (Gebremichael, 2017). However, ongoing environmental challenges, including water scarcity and unsuitable tree types, have discouraged people from engaging with the site, even though cultivation and grazing are now partially allowed.

Restrictions on accessibility to the site, removal of indigenous vegetation and constant chemical use led to significant changes in the site, further alienating the community from the land they once relied on.



Figure 57 Pine plantation in the Kachung Forest Reserve (Oakland Institute, 2019)

Socio-Economic Impacts

KFP promised several benefits for community development including employment opportunities for local people, training and workshops for the farmers with also providing support for the seeds, and developing infrastructure to facilitate communities' lives. Also, the company accrued 10% of revenue from carbon credits was separated for local development to support climate change mitigation and sustainable development (PDD, 2012). The company also distributed 10% of seedlings to the local communities that have been obtained from the cultivation of the trees. Also, Green Resources constructed several structures, including two health centers with children's wards, four water springs, three boreholes, and roads in and around the plantation site (Oakland Institute, 2014). Even though these activities created positive impacts for the local communities, they were a far cry from a compromise plan to address communities' losses and prevent poverty.

Firstly, even though the company claimed the project would create job opportunities, the salary was very low. Even though all the employees working on the project were Ugandans and local people, they received low wages (6.000–7.000 Uganda shillings/day, equivalent to 1,78–2,08 USD/day) (Gebremichael, 2016), and job opportunities were limited (Edstedt, 2017). Annual Report of Green Resources for 2020 revealed that only 12–27 people worked in the Kachung Forest Project area (Green Resources, 2020) which is far fewer than the initially promised number. Also, respondents in Edstedt's (2017) research indicated that their income from agrarian activities prior to the project was higher than the wages offered by the company.

As the forest transitioned to monoculture cultivation and the accessibility to the area was restricted, local communities not only lost their arable lands but also additional benefits they acquired from the forest such as honey production and access to traditional medicinal plants (Gebremichael, 2016). Restrictions on cultivation and grazing significantly affected livelihoods, as land is a vital resource for subsistence in Africa. Reduced agricultural activities led to lower crop yields and incomes for local communities (Oakland Institute, 2014; 2017, Gebremichael, 2016). Grazing restrictions also posed challenges. Some respondents in Edstedt's (2017) study reported being fined when their animals accidentally entered the plantation site. Additionally, herbicides used by the company allegedly caused the death of livestock. With limited grazing options, local people resorted to grazing near their homesteads, which led to crop destruction (Edstedt, 2017).

Even though the company allowed to use of some natural resources from the forest, they were very limited and were not enough to cover local people's needs. For example, firewood collection for domestic purposes was permitted, provided individuals carried only what they could manage on their heads. Grass could also be collected for

construction, traditional medicines, or consumption (if available). However, grazing activities were strictly restricted, except in areas near wetlands (Edstedt, 2017).

Also, eviction has been a controversial topic since the Green Resources claims are contradictory to the findings of research studies. Even though Green Resources asserted no communities were living directly in the forestry areas, three parishes with fourteen villages surrounding the project area (PDD, 2012), raise concerns about the accuracy of their assertion. As discussed by the Oakland Institute (2014; 2017), when the management rights of the reserve area were transferred to Green Resources, access to the site and its vicinity was restricted. This resulted in the displacement of local people from their homes and agricultural lands to protect the forest project. This claim is also supported by Edstedt's (2017) research and the interviews she conducted in the site. One respondent who participated in her research noted that the company evicted local communities, and remnants of their livelihoods -such as mango trees, commonly planted near homesteads- could still be found in the plantation area. Allegedly, 25 to 40 households were evicted, resulting in the loss of their subsistence and worsening poverty (Edstedt, 2017, p. 36).



Figure 58 Mango tree between the pine trees of the KFP (Edstedt, 2017).

Beside living there, the local communities were also addressing their needs from the forestry. The benefits derived from the forest by local communities included building

materials (16%), cultivation (16%), grazing (14%), charcoal production (14%), firewood (9%), collecting snakes and termites (9%), cultural practices (9%), and hunting (8%). However, prohibiting accessing the project site did not restrict only local communities' subsistence activities but also their traditional cultural practices (Oakland Institute, 2014; Gebremichael, 2016).

Gebremichael's (2016) research provides a detailed narrative of local people's perspectives on the project. He began by asking about the significance of the forest in their lives, and an elder vividly described its importance: "*The forest is our life. We would not have any life without it; it is like the sea to a fish*" (p. 58). When asked about sacred places within the project area, several respondents emphasized the cultural significance of a large tree used for rain prayers. However, Gebremichael (2016) reported that this tree had been cut down during his research, and the company operating the project claimed ignorance about who cut it down, adding that "*the old man who used to conduct the rain worship is also dead, and his instruments were broken*" (p. 58).

Over time, this displacement led to unemployment and food security challenges (Oakland Institute, 2019), which eventually ended in poverty. Considering the importance of land in Africa, local people evicted from their places either found very small pieces of land that barely cover their own food needs for food and created a very low amount of subsistence, or they could not find enough land and were displaced from the district (Gebremichael, 2016).

The company's objectives included providing jobs for local communities, promoting economic development, building capacity for forest management and agroforestry, and involving stakeholders in project management (PDD, 2021). However, studies conducted by the Oakland Institute (2014; 2019), Gebremichael (2016), Edstedt (2017), revealed the negative impacts of the Kachung Forest Project. Although the project initially promised to channel foreign investments, promote sustainable development, and deliver urban services to local communities, its management and outcomes have been widely criticized in carbon market discourses causing environmental degradation and social decline.

4.4.1.4. Challenges

All these environmental, social, and economic problems, along with the inequalities that have been carried further with the project, the history of the KFP is mostly mentioned as a market failure and as an example of carbon colonialism (Oakland Institute, 2014; 2017; 2019, Carton and Edstedt, 2017).

On top of all these controversies, the bureaucratic processes also caused a lot of problems that reached military interventions with violence. Inevitably, conflicts and

resistance emerged from the local communities to continue to use their lands. In some cases, local communities witnessed violence from the company staff and soldiers to force them to leave their cultivation (Edstedt, 2017). During the lifespan of the project, over 350 local community members took the case to court, but during the trials, responsibility for the problems was shifted between the company and the National Forestry Authority (NFA). Fearing further loss of land-use rights, local people eventually abandoned their legal claims (Oakland Institute, 2017; 2019; Edstedt, 2017).

After the findings of both Oakland Institute (2014) and a documentary released by a Swedish channel, SEA decided to suspend the payments to Green Resources in 2015 by sending recommended reforms and actions for 10 critical grievances to be solved. However, the last decision about terminating the payments was made in 2020 after several research had been conducted by the audits, SEA in collaboration with universities, and the Oakland Institute (Oakland Institute, 2020), and Sweden withdrew from the project in 2022 (UNFCCC, 2022).

Although the project aimed to create a forest, the reality was a loss of forest diversity, with tropical and deciduous trees replaced by monoculture pine and eucalyptus plantations. The Kachung Forest Project stands as a poignant example of the adverse effects of poorly executed environmental initiatives, highlighting the importance of inclusive and sustainable project planning.



Figure 59 "No grazing" sign from the forest project (Oakland Institute, 2019)

4.4.2. Grassroot Activities: Trees for Global Benefits (TGB)

Trees for Global Benefits (TGB) is a tree-planting project for small-scale farms in Uganda that aims to improve living standards while promoting sustainable agricultural practices. It connects global carbon market actors with small-scale landholders to channel carbon finance from the international to the local level and encourages small-scale farmers to engage in agroforestry activities by creating a cooperative carbon offsetting program. Farmers generate carbon credits based on the number and growth of trees planted on their land, which can be sold in the global carbon market for financial compensation (“Trees for Global Benefit”, n.d.).

Initiated by an NGO EcoTrust in 2003, the project has received support from supranational institutions, including financial backing from organizations such as the World Bank and UNDP and technical expertise from IIED and WWF (EcoTrust, n.d.; 2013; 2020). Plan Vivo, a VCM standard, collaborated with EcoTrust and CARE International to adapt this system in Uganda, focusing on preventing deforestation and alleviating poverty. To enhance community participation and build trust, EcoTrust provides training, saving and loaning systems, and self-reported monitoring systems to foster trust and engagement (Schreckenber *et al.*, 2013; Lee *et al.*, 2016; EcoTrust, 2020).

Since its inception in 2003 with 33 farmers in the Bushenyi district, the project has expanded significantly. As of 2023, TGB operates across five different regions in the country -the Rwenzori Mountains, Queen Elizabeth National Park, Murchison Falls, Mt. Elgon, and Mpologoma- with 18.936 participating farmers managing 12.204 hectares of land (EcoTrust, 2024). Over 2 million tons of CO₂ have been sequestered, contributing to climate mitigation and local livelihoods (EcoTrust, n.d.). Considering the vast land of implementation only the Albertine Rift Landscape including the Rwenzori Mountains and Queen Elizabeth National Park, and Mt. Elgon landscapes will be discussed since the lack of information for the others.

4.4.2.1. Foundations and Frameworks

As an example of voluntary carbon market operationalization, the TGB has a multilevel structure that includes different stakeholders at each level relying on legal frameworks and processes.

Stakeholders

As an agroforestry project, TGB works in collaboration with local governments and local communities. Even though EcoTrust is the main body that designed the project, local governments are a part of the process for legal processes for the applicants’ secure tenure confirmation. And local people are the second main actors in the project with

being the implementors of the project (Schreckenber *et al.*, 2013). Environmental protection is a legal commitment for all levels of government, and the project has been considered beneficial for helping especially local levels to achieve their goals while providing financial support for the local communities (Schreckenber *et al.*, 2013).

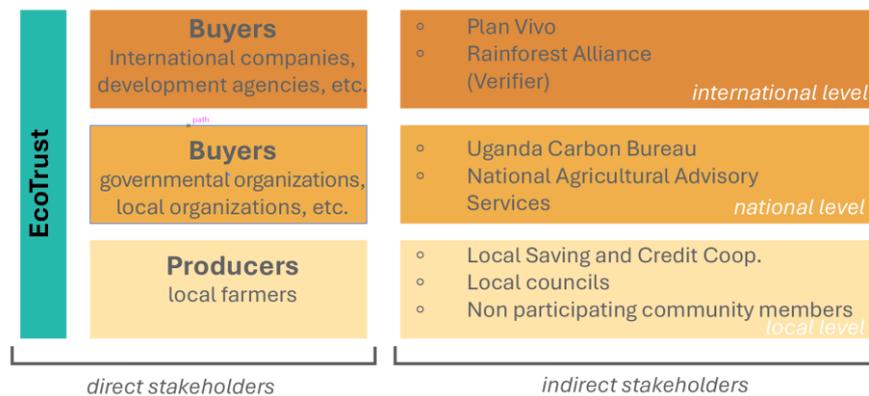


Figure 60 Stakeholders (adapted from Schreckenber *et al.*, 2013)

Legal Frameworks

And the legal compliances the project is relying on for the operationalizations are the National Environment Management Act, Land Act, and the National Forestry and Tree Planting Act of 2003 (EcoTrust, 2020; 2024). Also, in some cases, the strategic plans prepared with the support of supranational institutions have been used in specific districts, as happened with the Territorial Approach for Climate Change (TACC) program supported by the UNDP and DANIDA and implemented only in the Mbale Region (Okiror, *et al.*, 2017).

Site Selection

Several factors were taken into consideration during the location selection ranges from the protection of natural areas to international funding programs.

In the Albertine Rift, the project was started in 2003, in the Bushenyi district to strengthen nature protection throughout the Rift. The Rift is a biodiversity hotspot containing several areas with various protection statuses, including national parks (Queen Elizabeth National Park, the Murchison Falls and Rwenzori), protected forests (Kalinzu, Maramagambo, and so on), and areas under international auspices such as Lake George and Rwenzori Mountains Ramsar Areas and UNESCO Man and Biosphere Reserve (Queen Elizabeth National Park) and World Heritage Sites (Rwenzori Mountains) (EcoTrust, 2020). However, deforestation for firewood collection and timber production started to threaten the site along with the land degradation that is caused by

encroachments for agricultural production. In order to address these issues, the project was started in this district in 2003 (Schreckenber, *et al.*, 2013; EcoTrust, 2020).

In 2011, TGB included the Mt. Elgon Sites in Eastern Uganda in the scope of the TACC program. The districts of Mt. Elgon landscapes, Mbale, Manafwa, and Budunda, are considered the most vulnerable areas to climate change in Uganda, especially after the tragic landslide caused more than 100 death tolls after heavy rain (BBC News, 2010). UNDP and DANIDA developed the TACC to support the district in developing its climate action plan and provide regulatory and financial tools for its implementation, and tree planting is one of the activities highly supported by the program (Kakuru, 2013; Council Dickson and Rijal, 2014). Another reason was the deforestation rate in the area which resulted in a loss of at least 25.000 ha of land in the last 40 years meaning almost one-fifth of Mt. Elgon’s forest below 2000 m elevation has been removed for agricultural activities (EcoTrust, 2013; 2020).

Along with these facts, another important reason to select these areas was their land tenure systems. In order to prevent any bureaucratic conflicts around the protected areas, the districts that have a co-management agreement with NFA are prioritized (EcoTrust, 2020).

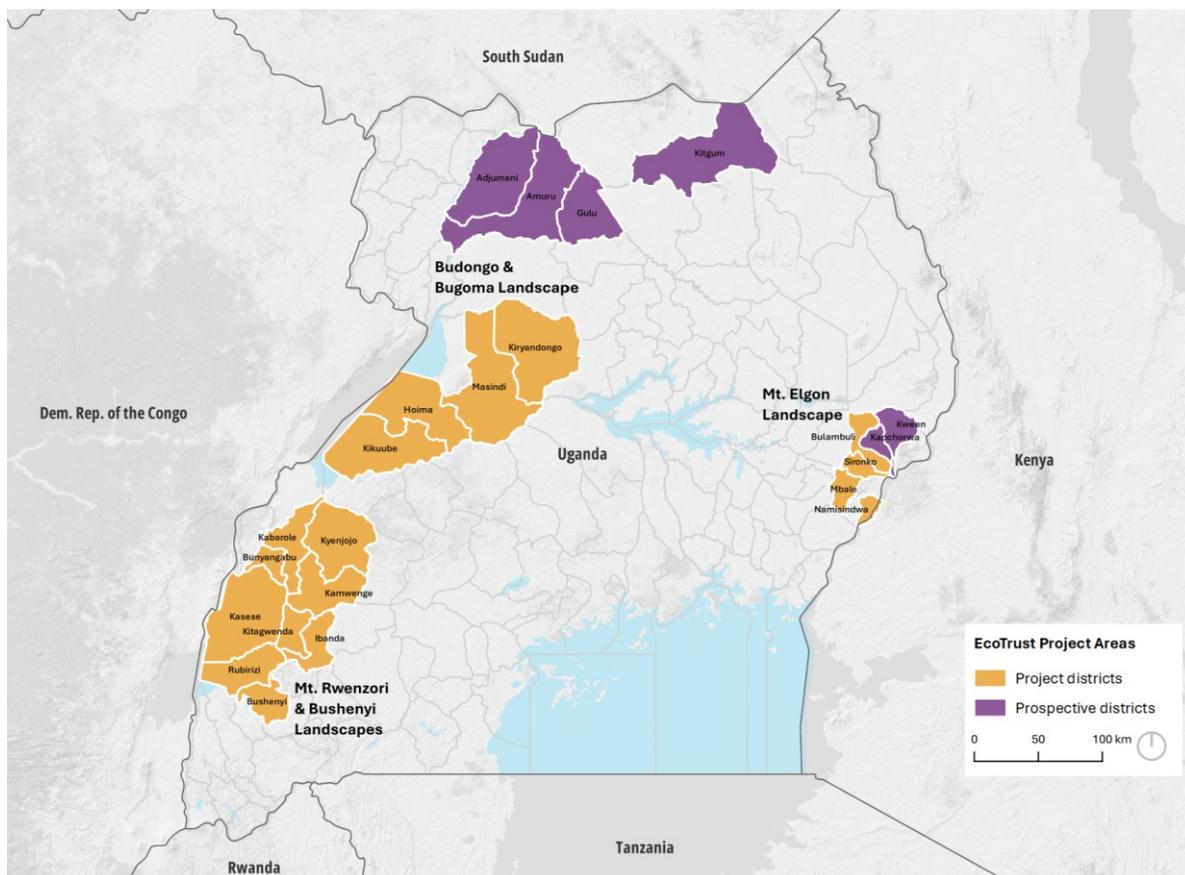


Figure 61 Project locations (adapted from EcoTrust, 2020; 2024)

Participation

Participating in the project requires several requirements from EcoTrust that are related to land rights and use, vegetation types, and long-term commitment. The first condition to become a carbon farmer is having secure land where the ownership is approved by the local authorities (EcoTrust, 2020). In order to be a part of the project, farmers must have enough property to plant both trees for carbon credits and for their subsistence. Even though the size of the land is not mentioned in the documents, the least size was mentioned as 1 ha by the local people, and 3 or 4 ha of land is convenient to have enough space to apply for participating in the project (Fisher, 2012; Schreckenberg *et al.*, 2013; Hedberg, 2016). Secondly, the most important condition was their vegetation and clearance. The project is strict about protecting the biodiversity of the land; therefore, any applicant who removes Indigenous trees from their land is not allowed to participate (EcoTrust, 2020). Lastly, the participants are also asked to sign a contract that guarantees commitment for 25 to 50 years (Fisher, 2012; EcoTrust, 2020).

The project gained recognition across its operational sites primarily through word-of-mouth. TGB did not distribute any paper-based fact sheets to make the project known (Schreckenberg *et al.*, 2013), and the bonds between the community members helped the TGB to be known in the district in the project has been operated (Fisher, 2012; Schreckenberg *et al.*, 2013; EcoTrust, 2020). For the TGB case, the project was getting known by word-of-mouth since there were not any fliers, or information sheets that explained and promoted the project. One church official reported that the project participant became a part of it when the church itself started planting trees, and the projects became known in the parish and then went further (Schreckenberg *et al.*, 2013).

4.4.2.2. Implementation and Operations

The implementation process of the TGB was complicated, not only regarding the multilevel and multistakeholder structure but also because of the vast land the project is being in function. Since it is difficult to formalize the implementation of the implementation, the company conducted the project in an inclusive way by organizing public meetings and assisting farmers with the implementation of the project which will be explained in detail in the following.

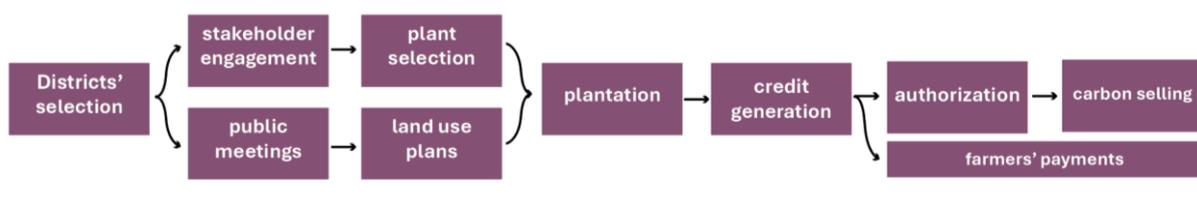


Figure 62 Organizational structure (author's own elaboration)

Participatory Design and Practices

Participatory approaches have been held during the whole implementation process (EcoTrust, n.d.; 2020). After the site selection and bureaucratic processes, the TGB conducts public meetings to inform the local communities about the project and how they can be involved. During these meetings, TGB staff prepares land use plans with farmers to assist them in selecting the best species and best land design for their fields in a way they can continue their agrarian activities while cultivating carbon. Also, during and after the implementation, the meetings of grievance have been kept organized to learn insights from the farmers (EcoTrust, 2020).

Furthermore, for the monitoring system, local people are taking part in the system. While in the early years, monitoring was conducted by the EcoTrust staff (Schreckenber, *et al.*, 2013), currently it is a co-management process between EcoTrust staff and farmers who are trained in monitoring processes. This practice is called “peer group monitoring” since farmers are monitoring the other farmers (EcoTrust, 2020). The system has been introduced to integrate local people into the system more and strengthen the bonds between the community excluding the pressure EcoTrust staff might have created on the farmers before (Lee, *et al.*, 2016).



Figure 63 Scenes from community consultations (EcoTrust, 2020).

Every year, EcoTrust organizes local, regional, and national meetings for feedback from the farmers, and landscape coordinators, and these meetings also create a common ground for all the landscapes to meet and share knowledge with each other (EcoTrust, 2024). However, some farmers reported while their complaints were listened to and answered by EcoTrust in the initial steps of the project, the situation changed in the latter years, and their concerns were not taken into account (Schreckenber *et al.*, 2013).

Plant selection and Plantation

Biodiversity protection was prioritized in the plantation processes, and the decisions about the species and the plantation progress were made in collaboration with experts.

Aiming to protect biodiversity, the project promoted the plantation of indigenous trees which is also accepted as a key factor for its success (EcoTrust, 2020). During the selection process, a conservation organization facilitated the process by promoting indigenous species rather than eucalyptus and pine trees. Also, the species that are planted and cultivated in the districts are excluded from the list, such as coffee and bananas since they are not accessible to all the farmers. It is also reported that some farmers already have vast lands with coffee plantations, and it would benefit more for these farmers to include coffee in the system (Schreckenber *et al.*, 2013), therefore, aiming to find a common ground that can help everyone to benefits this project, 12 species have been determined that are native for Uganda and easily adapt the conditions (EcoTrust, 2020).

TGB offers three different types of land management systems categorized according to the location of the trees; woodlot, dispersed, and boundary planting. Within the woodlot plants, the farmers should use at least 60% of their lands for *Maepsis eminii*, and the remaining should be used for their subsistence with native species or fruit trees, typically jackfruit, avocado, and mango. Dispersed and boundary planting allows the farmers to use mixed land with the native species determined by the project while also giving the chance to farmers to design their plots. Among these tree systems, woodlot planting is the preferred one (EcoTrust, 2020; 2024). Also, in order to prevent any overuse of the land, EcoTrust limited the highest number of trees that can be planted on the fields (Lee, *et al.*, 2016).

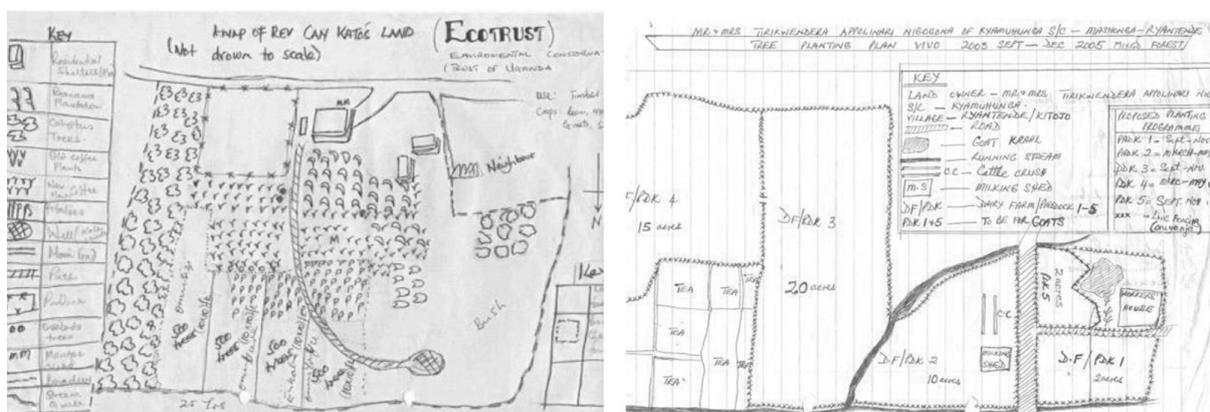


Figure 64 Plans prepared by Plan Vivo during public meetings (EcoTrust, 2020).

Payments

Farmers are being paid according to the scheme designed by EcoTrust that aligns with Plan Vivo's expectations. Payments are made according to the results of monitoring processes that are conducted after Year 0, Year 1, Year 3, Year 5, Year 7, and Year 10. For each year, there are different goals aimed to be achieved (Table 7) (EcoTrust, 2020) which is equal to USD 200-300 for half of a hectare in 10 years (Shames *et al.*, 2016). The

payment scheme consists of only the first 10 years of the commitment, and the project documents do not mention the ways to maintain trees after the end of the payments (Fisher, 2012; Hedberg, 2016). However, the scheme shared by Plan Vivo allows the cutting down of trees for timber production based on their qualities. With this plan, TGB can contribute to local farmers' income of around \$7.750 per ha (Purdon and Byakagaba, 2022).

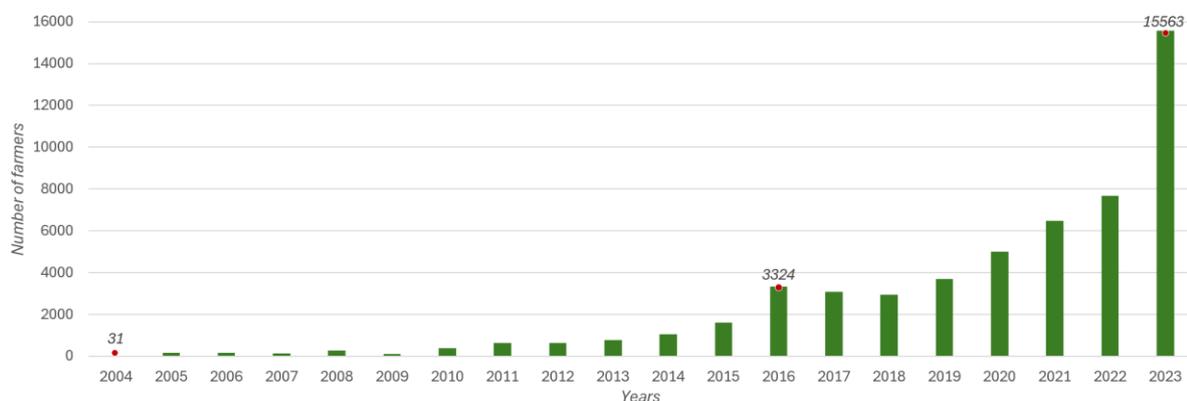


Figure 65 Number of farmers recruited for the TGB (prepared based on the EcoTrust's Annual Reports)

And the financial benefits acquired from the project are divided between the local communities and the administration. At least 60% of the gain is given to the local communities, and the remaining is used for administrative costs such as issuance of certificates, payments for outside verifications, and so on. Also, 10% of revenue from carbon credit trading is saved for the Community Carbon Fund (CCF) to benefit the local communities. The ways to use this fund are decided by the participants, communities decide how to use this monetary resource (EcoTrust, 2020).

One of the criticized points about the project was the contract and its content. Besides the drawback explained above with lacking explanation for the payment scheme, the contract was confusing for the local people since it was in English (Fisher, 2012; Schreckenberget al., 2013; Lee et al., 2016).

Table 7 Payment scheme (EcoTrust, 2020)

Year	Basis of payment	Target	% of total payment per ha
0	Number of trees planted	At least 50% plot established	20%
1	Number of trees planted	Whole plot (100%) established	20%
3	Percentage survival	70% survival	20%
5	Girth of stem/ diameter of the trees planted	Average DBH of at least 10cm	10 %
7	Girth of stem/ diameter of the trees planted	Average DBH of at least 14cm	10%
10	Girth of stem/ diameter of the trees planted	Average DBH of at least 20cm	20%

*DBH: Diameter breast height

Land Use and Zoning management

Several factors were taken into consideration during the location selection ranging from the protection of natural areas to international funding programs. More specifically,

In the Albertine Rift, In order to address these issues, a project was started in this district in 2003 to support the local governments for the tree plantation as they mentioned in their Environment Action Plans and District Environmental Action Plan (EcoTrust, 2020), and the policy frameworks still include carbon offsetting projects as an action to cope deforestation and provide job opportunities for youth (Bushenyi-Ishaka Municipal Council, 2021).

In the scope of TACC, tree planting is one of the activities strongly supported, and EcoTrust became one of the partners for the program to build carbon finance schemes for the economic development in the region while implementing the TGB project and helping for the distribution of improved cookstoves (Kakuru, 2013; Council Dickson and Rijal, 2014). Uganda's TACC stands as a good example of a climate change adaptation plan being supported by national, international, and local institutions in terms of policymaking and funding (Okiror, *et al.*, 2017).

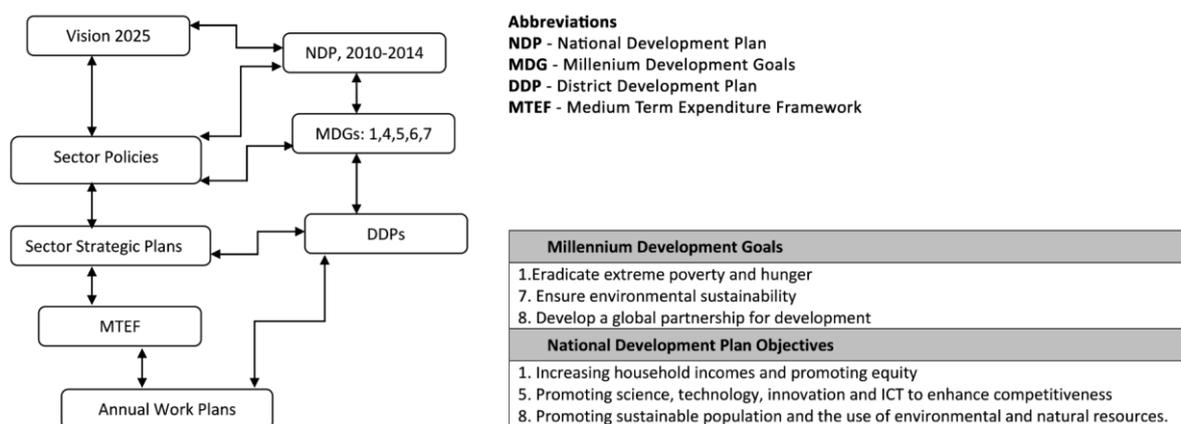


Figure 66 Relevance to national goals and linkages between the levels (Kakuru, 2013)

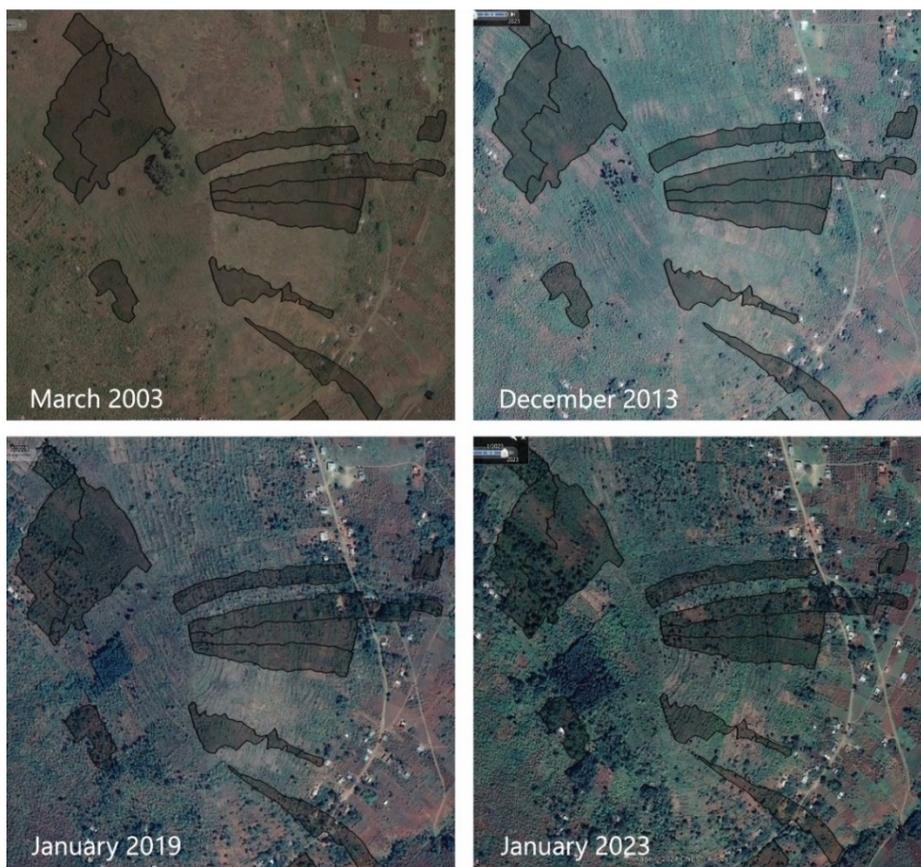


Figure 67. MT Elgon Landscapes, Mbale, Manafwa, and Bududa Districts, TGB Project area-land changes on satellite views. Registration date for smallholders is 2013.

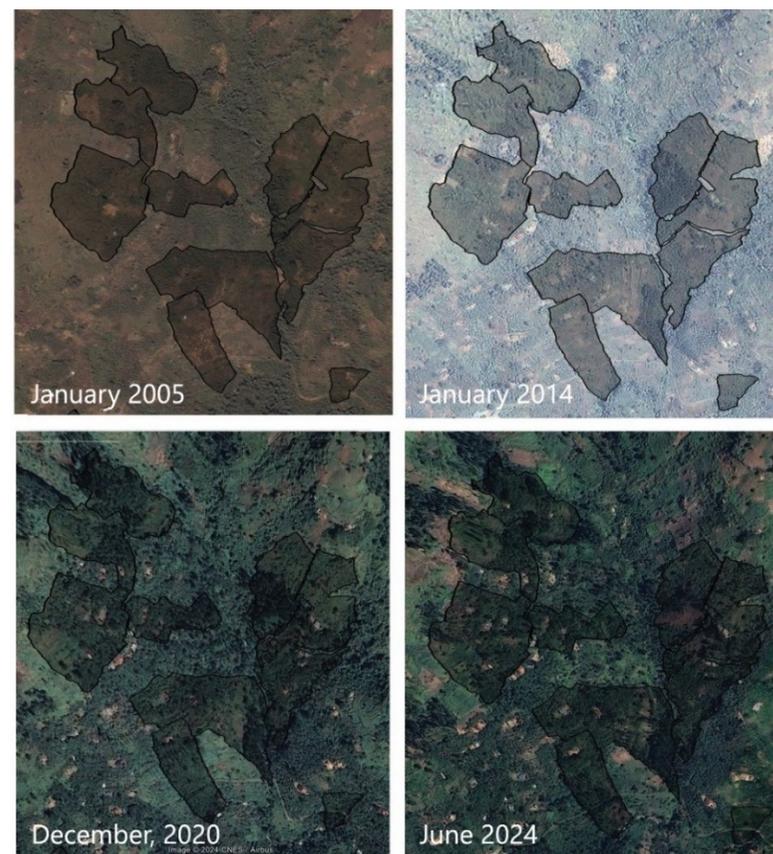


Figure 68. Mt Rwenzori Landscape, Kasese District, TGB Project area – land cover changes on satellite views. Registration date of smallholders is unknown.

4.4.2.3. Outcomes

TGB was promising to cover the need for a long-term subsistence source while also ensuring environmental protection as the ultimate goal of the project. After 21 years of experience, the outcomes of the projects have yielded, and the project has both advantages and disadvantages in terms of political structure, environmental management, and socio-economic characteristics of the cities.

Political Changes

After witnessing the success of the projects, the local governments added carbon market practices in their policy agendas in Albertine Rift landscapes as a way to promote environmental protection through tree planting while also contributing to local households' income (Bushenyi-Ishaka Municipal Council, 2021).

On the other hand, in the Mt. Elgon Landscape, the carbon markets have not been mentioned as a practice for sustainable development. In the Mt Elgon District, the project included 400 farmers in the system planting 35.000 trees and sequestering 25.000 tons of CO₂ until 2016 (Shames *et al.*, 2016). Even though Mbale is one of the districts that have completed physical and strategic development plans. Even though the district has carbon credit projects, they are not mentioned in the last updated development plan (Mbale District Local Government, 2020).

Considering the fact that the TACC Program initiated the operationalization of carbon trading in the region, despite the fact that was a frontrunner project for the development of the region (Okiror, et al, 2017), the integration of the market into the system could not be completed. And, the critics of Mbale's TACC were orienting around (i) the lack of local politicians' participation, (ii) most of the budget was distributed to the actors rather than transferred to the local government, (iii) the budget necessary for the implementation of the plan was much higher than the district's budget (Friis-Hansen *et al.*, 2013).

Also to strengthen the links between the project and the local governments, EcoTrust organized capacity-building initiatives to be mediators between communities and carbon projects in the Mt Elgon Landscape along with spreading information about agroforestry systems and tree species. Mediators took roles for technical aspects of the projects such as managing monetary resources and supporting monitoring processes. However, limited resources from the local governments hold the training back. Additionally, even though a new policy design for the implementation of the carbon trading projects and increasing capacity building was offered, the local governments did not adopt a new framework (Shames *et al.*, 2016).

When it comes to the project's management itself, EcoTrust also changed its own policies according to the feedback coming from the practitioners to tailor the program for their

benefit. Particularly for the monitoring processes, the system evolved from a point where it was controlled only by the company's staff to a more inclusive structure (Lee, *et al.*, 2016). Recently, the company started to use technological advancements, particularly GPS and phone applications, to monitor the field changes, and the monitoring processes are being made in both ways by using peer-monitoring with EcoTrust staff and GPS (Purdon and Byakagaba, 2022).

Therefore, that can be said, that even though TGB laid the groundwork for changes in environmental management, the political reflections are still weak. However, the company's willingness to adopt new policies for making the system better for the local communities can be considered a positive step for reaching just implementations.

Environmental Impacts

Improving land and forestry management is one of the aims the TGB strives to achieve by working on the districts that have degraded lands, and the project helps for the recovery of land to favor the local communities for their own benefit while promoting nature protection. Along with that, the environmental benefits the project provides can be listed as increasing tree diversity and contributing to biodiversity protection, decreasing the pressure on the protected areas, improving forestry management, not only for the plant species but also for birds and animals, and enhancing climate change adaptation and mitigation through land use plans (EcoTrust, 2020). The research conducted by different scholars also aligns with these claims made by EcoTrust.

Local communities have also reported that trees provide environmental benefits by bringing rain, which is very valuable for soil fertility. Along with the use value of trees and nature, the informants also highlighted the non-use values and their contribution. While nature protection and natural heritage were the most prevalent non-use values mentioned by the interviewees, the aesthetical contribution of trees "*swaying in the wind*" and attracting animals was also touched upon (Fisher, 2012). And when it comes to agricultural fertility, supporting biodiversity through tree variety helped to recover the soils, and as a consequence, higher yields for both trees and agricultural products (Fisher, 2012; Hedberg, 2016).

On the other hand, the land that is used for carbon sequestration raised concern among the participants about agricultural activities. The interviewees of Hedberg (2016) reported their concern that they will not have enough supply to survive when the trees grow. As the trees grow, their roots outcompete with other agricultural products. Also, overshadowing the agricultural products, and leaving no space for agrarian activities also makes the farmers concerned. Another study reported that when farmers tried to plant both the trees and bananas, the trees did not leave space for bananas for a few years, and growing them together was impossible (German, *et al.*, 2011 as cited in Hedberg,

2016). Therefore, food security has decreased since some participants transformed their agricultural lands into forests, and agricultural activities' been put in jeopardy (Fisher, 2012; Hedberg, 2016).

Keeping trees for over 20 years was also another subject the local communities expressed their worries about since it might affect the fertility of the soil. Even though the trees contributed to making the communities more resilient through mitigating soil erosion (EcoTrust, 2020), participants said that keeping the same trees for a long time might make the soil inefficient for food crops in the future, also it might dry the soil, and which eventually cause starvation (Hedberg, 2016).

Studies have also reported farmers' concerns about what will happen after the end of the contract. The interviews Fisher (2012) conducted with local people showed that people are willing to care for the trees as long as they contribute their income. However, this motivation raises concerns about the future of the project because, in 2023, 70% of the farmers who are a part of the program did not reach the goals for the payments (EcoTrust, 2024). As mentioned before, even after the end of payments, the participants had to keep the trees for an additional 10 to 15 years. However, the participants also admitted that when there is an emergency, they harvest the trees to cover their needs, or they might change the land use if they find a more lucrative way to use their lands (Fisher, 2011 as cited in Hedberg, 2016). However, Fisher (2012) also highlighted that back in those times, the project was in practice for 6 years, and none of the implementers had any plans for what to do with the planted trees. After 10 years, the research of Purdon and Byakabanga (2022) put the evidence about loss of the willingness to maintain the trees after the end of payments.

Purdon and Byakagaba's (2022) ten-year investigation of the project showed that the program delivers positive outcomes for the participants; however, its effectiveness is declining. The taper-off payments after 10 years while the maintenance was still there, keeping the trees additional 10 to 15 years without any payments, and the benefits that were not equitable distributed were the main reasons for the dissatisfaction with the project (Purdon and Byakagaba, 2022).

Socio-Economic Impacts

ECOTRUST also provides technical support to the farmers through offering training and workshops on climate-smart agriculture and agroforestry practices (EcoTrust, 2020; Lee, *et al.*, 2016). Furthermore, the capacity building includes also nurseries for better quality seedlings, land-use management, group work, and so on (EcoTrust, 2020). The village economies are also supported by the project indirectly. As a condition to be a part of the project, the participants have to open bank accounts from the local village banks, and regular payments for the purchased carbon credit create funds for the loans (EcoTrust,

2020). In the scope of the project, the farmers who became a part of it are paid, not only for the credits they generate but also to meet tree planting costs and maintenance. However, this long-term payback process created problems for some of the participants (Schreckenber *et al.*, 2013).

The project has also contributed to local communities' economic development through CCF. In Bunyaruguru District, local communities initiated a Beekeepers Association to produce and sell their own honey, and this experience also inspired other local communities to build their own businesses for selling fruits and milk, producing plant-based medicines, and so on. And in some cases, this fund is being used to cover the needs for public services such as schools, bridges, and so on. Also, it can be used to support the farmers' needs for financial support acting as a loaning system (EcoTrust, 2020). Currently, there are 13 groups for beekeeping, 10 groups for coffee trading, 1 group for fish farming, and 6 groups for nursery bed management that are using the same business development system (EcoTrust, 2024). Even though the CCF and the benefit acquired through the project were expected to be spent for the social benefit of the communities, the informants reported to Hedberg (2016) a major amount of the payments were spent on tree maintenance. Also, none of her interviewees acknowledged the CCF and the benefits they can acquire from this system. Therefore, she claims, rather than creating a spill-over effect, the project raised questions about whether the fund is used for the communities themselves (Hedberg, 2016).

The majority of the participants do not make any calculations about the project's profitability, either in the present or the future. Only a small percentage (11%) of Fisher's (2012) respondents said they made a calculation, for the remainder, they were either motivated by the future benefits (43%), particularly timber production, or they just planted (46%) since they believe EcoTrust is a trustable organization (Fisher, 2012). Higher yields also helped farmers to make more money through carbon sequestration and contributed to their access to food by supporting their income (Hedberg, 2016).

The size of the plots has been one of the critical points that determine the benefit farmers acquire from the project. While the participants who had higher plots had the opportunity to benefit from both agricultural and carbon cultivation, the ones who had small plots had fewer benefits and, in some cases, some adverse impacts (Hedberg, 2016). While the project carries less risk for middle- to large-holders, for small-holders the payback time is a problem (Schreckenber *et al.*, 2013; Hedberg, 2016). As reported by a participant in Schreckenber and colleagues (2013) work, while they wanted to be a part of the project to have enough money for their children's education, the family did not receive any payment at the end of the 2 years, and could not send their children to school.

Even though there was no sign showing TGB worsened the local level disparities, people who do not have enough land are inevitably excluded from the project, considering the conditions for participation (Schreckenber *et al.*, 2013). Moreover, many of the non-

participant community members who have lands next to carbon farmers experienced negative impacts since the trees were consuming a lot of water (Hedberg, 2016).

In addition to these social benefits, the project also tries to achieve gender equality. While the number of employees based on their genders does not have a huge difference (41% women, 59% men) working in the offices, participation of women farmers is strongly promoted in the project (EcoTrust, 2024). On the other hand, the number of women farmers in the system is still very low. In Mt Elgon Landscape, EcoTrust put efforts to make women farmers a part of the project, however, even though 50% of the women farmers interviewed with agreed to implement carbon trading activities, only 30% of them participated in training sessions. Therefore, while there were 228 men, the women farmers were only 78 people (Shames *et al.*, 2016).

Higher agricultural yields resulting from improved soil fertility have helped participants increase their income and access to food (Hedberg, 2016). Despite these benefits, challenges remain in maintaining equity, addressing financial sustainability, and ensuring that the project's benefits are equitably distributed among all community members.

4.4.2.4. Challenges

TGB has also sparked considerable debate over its implementation, justice, and equity. Despite its promises of economic growth and environmental sustainability, critical gaps in community involvement, transparency, and equitable distribution of benefits have been identified.

First and foremost, in all these processes, the participants did not know enough about the processes, why they planted trees, how long they needed to keep the trees, what are the short-term and long-term benefits of the project, and how the non-participant members of the communities would be affected, also steer for the second thoughts about how just is TGB (Hedberg, 2016; Carton, 2020). This lack of knowledge raises concerns about whether the farmers made their decisions about reasonably participating in the project, or if they joined the project since they needed money (Fisher, 2012).

And when it comes to equity issues, they might spark between and within different levels of value chains (Schreckenber *et al.*, 2013). On the international level, since local people's understanding of the process is weak, they relate justice among themselves and EcoTrust, while the buyers of the carbon credits have been kept as a mystery for the people (Fisher *et al.*, 2018). Instead of knowing the projects' international impact, the local communities are left to believe that the TGB was implemented to address a problem they caused (Fisher, 2012). On the national level, the lack of clarity for the site selection causes discussions. Even though some districts are willing to be a part of the projects,

since they cannot understand why these districts have been selected and why they have not been selected yet, it also leaves some questions marks for the local people (Fisher, 2012; Schreckenber *et al.*, 2013).

On the local level, the participatory approach and accessibility of the project have been discussed. Even though EcoTrust emphasizes that the project has been conducted with a participatory approach, local people's involvement in the project design and decision-making processes is very limited also leaving very little room for future adaptability (Fisher *et al.*, 2018). Also, the inequalities that arise regarding the plot sizes are another issue. Even though the program provides some benefits for the whole community, they are skewed since the program favors mostly the participants who are already in the higher socioeconomic cases in society. However, the fact is that, even though the wealthy classes in the society benefitted most, they were still under the international poverty line (Purdon and Byakagaba, 2022). Therefore, the project provided relatively economic development that still does not help the local communities a lot.

In summary, the TGB highlights the tension between environmental objectives and social equity in carbon offset initiatives. The limited knowledge of participants, lack of clarity regarding project operations, and unequal distribution of benefits have raised significant concerns about the fairness and inclusiveness of the initiative. Even though some level of economic improvement is achieved, benefits remain uneven by favoring those already in relatively better socioeconomic positions. This case exemplifies the need for more transparent, inclusive, and equitable approaches in designing and implementing carbon trading projects, ensuring that local communities are not only beneficiaries but also active participants in the process.

Concluding Remarks from the Case Studies

These two projects, KFP and TGB, stand as poignant examples of how carbon markets and environmental justice are imbricated through spatial organization. Both projects have been discussed in the ways they deliver and do not deliver environmental justice. KFP has been called an example of market failure and carbon colonization with the environmental and social degradations it caused (Oakland Institute, 2014; 2017; 2019; Carton and Edstedt, 2021). TGB has been considered as a good example of a carbon trading mechanism with participatory processes and delivering benefits to the local communities, which is a sign of prioritizing the economic outcome over environmental and social benefits (Schreckenber *et al.*, 2013; Carton and Edstedt, 2021).

Given the fact that both projects are market-based approaches for climate change adaptation and mitigation, it is not surprising that both of the benefits that could be obtained from the projects were prioritized over environmental and social benefits. However, when it comes to which one was more just, including local communities in the

processes and making them a part of the decision-making processes, TGB was delivering some benefits for the local people. On the other hand, with the causes of environmental, social, and economic problems, the KFP has been an example to discuss *market failure* and *climate colonization* (Oakland Institute, 2017; Edstedt and Carton, 2018). These case studies support the findings of Lee and colleagues' (2016) research conclusions. The success or failure of the projects is strongly related to the farmers' willingness to participate in them with long-term commitments. Along with that, social capital and networks are crucial for implementing the projects to find common ground and resolve conflicts (Lee *et al.*, 2016).

In conclusion, that can be said, while there are decision-making processes that consider all the participants' benefits, community engagement, and zoning management, the project is more likely to success deliver.

4.5. Findings

Research on Uganda's carbon market implementations reveals how these processes may negatively impact environmental justice during the operationalization of carbon offset projects. Uganda is one of the LDCs in Africa that has high climate change vulnerability with low-resilient capacity, and the carbon market has been seen as a great opportunity to channel foreign investments. However, the challenges that have been faced during the implementation processes have caused projects to fall short when it comes to providing justice to the local communities.



Figure 69 Relationship between the concepts (author's own elaboration)

4.5.1. Policy Making and Governance

Policies and their implementations are critical points for explaining why carbon offset projects fell short of addressing environmental justice in Uganda. Supporting their statement on the last National Communication Report to UNFCCC, the country is struggling with weak institutional coordination to implement the policies (MWE, 2022b, p. 216). Therefore, in that section, Uganda's policies and institutional organization to implement them will be discussed.

Uganda's Policies and Their Efficiency

Policy analysis shows that even though Uganda has a bunch of legal frameworks, plans, and acts for land management and environmental protection, carbon trading mechanism and their operationalization have not been discussed in these frameworks broadly. Given the fact that the first carbon trade-off project was started in the country in 2003 with EcoTrust, as of 2024, the Government has not entered into a law or regulation only for carbon trading mechanisms and their operationalization yet. Besides not being comprehensive, existing frameworks also are not integrated to each other horizontally and vertically in the governmental hierarchy. Considering the planning documents as the main development blueprints for the country, even though Uganda expects a flow of investments from the carbon trading projects, the mechanism and the ways to operationalize it have not been mentioned enough in the policy frameworks.

As mentioned by the Officer from the Ministry of Land, Housing and Urban Development (Int8), the policy frameworks are isolated, and they do not work all together. Along with the fact that Uganda does not have specific regulations for the operationalization of the carbon market projects, the existing policy frameworks are not integrated to each other, and any of the regulatory frameworks answer the issues of land in the operationalization processes (Int8).

“There is a substantial legal and policy framework. However, they are not aligned per se in the carbon market scheme sort of operations. They are isolated, (...), and my understanding is that if the regulations or the policy for the carbon market comes in place particularly to regulate the carbon market then they isolate (...) regulatory frameworks addressing issues of land use” – Officer from MLHUD

Also, the old and not-updated policy frameworks were missing corresponding contemporary needs (Int8). While the policy frameworks that have been relied on for the implementation of the case studies were well-designed for land management, they did not include the community consultation processes, which is one of the most problematic parts for the implementation of the carbon trading projects. This paucity also manifested itself during the implementation processes of the projects. Even though the projects

relied on the same policy frameworks, while KFP did not conduct almost any stakeholder consultation, TGB partially achieved community engagement considering its grassroots nature.

And the respondents for the interview had contrary thoughts on the policy frameworks. While some of them declared that the country has well-designed policies (Int7), some of the respondents said the country does not have enough to implement carbon markets (Int1, Int2, Int3, Int5, Int9), but the country improved the policy frameworks very well over the years (Int6). When it comes to how the policy framework functions, the same contradiction happened, and while some thought they function effectively (Int6, Int7), some of them (Int3, Int4, Int5) reported the problems they are aware of about the system. However, the lack of a carbon pricing mechanism and its institutional background were also criticized by the interviewees (Int1, Int4, Int5, Int6, Int8, Int9) and the isolation of the policies is also underscored (Int8). Policy frameworks' analysis, case studies focus, and the interviews bring out the fact that the country needs an organized policy framework for carbon market projects that integrates different sectors to each other on various levels.

Institutional Structure

Operationalization of the carbon market is a multi-stakeholder process in Uganda that requires the participation of different actors from different levels. The Ministry of Water and Environment acts as the leader of the cohort with the Nationally Designated Authority of UNFCCC, along with the Ministry of Finance, Planning, and Economic Development for the distribution of financial resources are the most important actors in the implementation processes (Bakiika, *et al.*, 2020). As explained by the Officer from the Ministry of Water and Environment (Int7), the operationalization of the projects is a collaborative process that relevant actors involved in the process based on the type of the project. Ministry of Land, Housing and Urban Development, Ministry of Agriculture, Ministry of Energy and Mineral Development, Ministry of Work and Transport are the main bodies along with the NEMA, CCF, CCD, and National Planning Authority for the policy-making and decision-making processes for carbon offset projects. Therefore, the processes are being managed collaboratively. Additionally, the local governments are also incorporated into the process through their Natural Resources Department, and Carbon Market Offices (Int7). In these processes, community engagement is also an important part of the implementation processes that have been added into the institutional structure of the operationalization processes over time (MWE, 2024; Int9).

On the other hand, the multiplicity of the actors and fragmented bureaucracy is considered a problem. This polycentric and decentralized governance, which takes its roots from the colonial legacy, creates confusion on different levels (Int3). As mentioned by the officer from the National Forest Authority (Int4),

“The decentralization creates confusion. ... the political okay we have a decentralized system where the technical people are the ones who do the work. At each level. The politically elected people only look on. But on the other hand, the political elector can incite the public to antagonize what the technical people are doing. Decentralized system antagonizes the implementation of programs” – Officer from NFA

Additionally, the inconsistencies among local governments and national bodies are also problems when it comes to implementing the policies. The analysis conducted through Policy Frameworks shows that policy frameworks do not provide enough instructions to the local governments for the implementation of the projects, therefore, even though the national policies are well-designed and are working on their scales, their reflection on the local scales is very small. Even though some participants reported the processes are working in a way there is always feedback between different levels during the implementation processes, some participants reported there are some flaws considering the level of knowledge and lack of transparency.

Lack of Knowledge and Human Capacity

Lack of knowledge and lack of human capacity are significant problems that the operationalization of the carbon trading mechanism revealed in Uganda. Governmental institutions do not have enough experts to build a strong mechanism for the implementations (Int1, Int6, Int8, Int9) and technology (Int7) and they are also not very willing to do that (Int3). Coupled with the carbon market’s exploitable nature and the decentralized system of the country, lack of knowledge and insufficient human capacity only fuel the flame for nature-related problems.

“What do we need to do? People should be knowing about that. But they don't know. So ignorance and lack of good will clear will most people have the political will, but don't have the goodwill to implement and achieve the goals that are discussed. So that's where partly our decentralized system goes wrong but above all we also don't have the many experts for environmental and climatic issues to uh plan well and offer solutions to cure the problems”. – Officer from the NFA

“[Carbon markets] it's a learning by doing, but they need to understand what they're doing”. – Officer from the GIZ

The country still strives to build capacity with the support of international actors. As explained by the officers from UNDP, aiming to regulate the carbon market operations, an expert hired for the Climate Finance Unit, which works under the Ministry of Finance, Planning and Economic Development, however, after a couple of years, she needed to leave, and now, they are struggling to find an expert. Even though they try to train their

own employees, there is a still long way to go (Int1, Int2, Int6, Int7), and there are already projects that have been developed to strengthen the capacity (Int1, Int5, Int6, Int7)

Additionally, lacking technological advancements and not having enough human resources to utilize them is also a problem for the operationalization processes. As highlighted by the Officer from the MWE, the country does not have a registration system that is being updated, rather there is an Excel file that they keep updated to monitor the development of the market (Int7).

Additionally, not only for the carbon market operationalization but also for the spatial planning implementations, the country struggles with a lack of human capacity. As explained by the Officer from the MLHUD and the Officer from the Local Government, each local government level needs its own experts and committees for the spatial organization of activities, however, there is a lack of human capacity for the implementation of the policies and plans (Int8, Int9).

Implementation of the Policies

The policy framework analysis revealed that there are multiple legal frameworks for land management, however, the implementation of the policies has sparked discussions on multiple subjects regarding the decentralized system, lack of transparency, paucities within the frameworks, and lack of integration among the blueprints (4.3.3). These findings are also supported by the interviewees by highlighting the problems that pose challenges for the implementation processes.

Lack of financial resources and their distribution from supranational levels to the local levels have been one of the most discussed issues both by the scholars and the respondents. While the lack of financial resources that come from the supranational levels has been found insufficient (Int3, Int5, Int7), their distribution to the local governments is also problematic considering the long-lasting bureaucratic processes and lack of transparency (Int5, Int7, Int9). Going further from the limited climate finance that has been channeled to the country, the money melts into the air from the national level to local levels, and only a very small amount of funds is being given to the local governments which is not enough for project implementations (Int1, Int2, Int5, Int9).

Also, given the fact that the same president has been in power over 20 years, the country is also struggling with democracy and transparency. Considering the atmosphere in the country, during the implementation processes, some problems have been caused by corruption (Int4), and the governmental institutions tend to accept illegalities to be able to stay in power (Int5):

“I mean, it's all very political. What I could say is ... the policies are in place” – Academician (Int5)

Upcoming and Future Political and Institutional Organization

Although it was impossible to reach all the policy frameworks considering the research conducted remotely and the language barriers, the policy frameworks that have been analyzed in the scope of this research showed that Uganda puts a lot of effort into building a strong structure for the operationalization of carbon market projects. Especially, after COP26 of 2019, the works have been accelerated with the entering new laws to the force regarding climate change actions, and as reported by the respondents, the country also keeps working on the policy frameworks to adapt carbon finance into their agenda (Int1, Int2, Int6, Int7, Int9). Even though a new law for the carbon markets was accepted in the early 2020s (Int1 and Int2), however, the bureaucracy is working very slowly (Int1, Int2, Int5, Int7).

Also in order to strengthen the institutional organization, new departments and offices have been added to organizational bodies (as happened with the Climate Finance Unit of MFPED). However, the need for better capacity building, spanning from national levels to local governments, is also highlighted by the respondents for the operationalization of carbon markets and their integration into the other frameworks for more resilient local communities (Int9).

I think we can do better in Article 6 now about the carbon market and the Paris Agreement when we have a register we can track the MRV, ... and we have the technical capacity and financial capacity to do the training, (...) we have better planning. I think we can do it better this time. – Officer from MWE

4.5.2. Stakeholder Management

Even though both the UN and the Government of Uganda oblige the project developers and investors to make local communities a part of the processes, the practical implementations might end up in different directions. The main reasons behind this issue are multistakeholder and multilevel structure, and lack of knowledge, which will be discussed in more detail in the following.

Stakeholder Engagement from different levels and sectors

One of the topics that have been constantly highlighted in the policy frameworks is community engagement during the projects' implementation. However, during the implementation processes of the CDM and VCM projects, stakeholder management was very limited. Considering the market-based nature of these systems, the mechanism excluded the governmental bodies and local communities from the process. While during the implementation of KFP, which is a CDM project, the governmental bodies had a role in the monitoring, reporting, and verification (MRV) processes, in the VCM project,

there were collaborations with some of the local governments, however, national bodies were excluded from the process.

Despite policy frameworks emphasizing participatory approaches, implementation processes have often deviated from these principles. The KFP was a top-down project that did not involve the communities and local governments being excluded from the process. On the other hand, TGB is considered a respectively participatory project by including both local communities and local governments in the implementation step through land use plans, organizing regular grievance meetings, taking complaints into account, and tailoring their management accordingly (Purdon and Byakagaba, 2012). However, considering the corporative approach it embraces, project management is also criticized for lacking community engagement, particularly in the project design phase (Fisher, 2012; Int3). In the end, the thought on KFP's community engagement was controversial, TGB has been considered a good example of participatory project management by the respondents of the interviews.

Additionally, the power imbalances in the public meetings were also another issue that sparked discussions. Even though the projects conducted community engagement sessions, they still favored investors and developers, therefore, public opinions were partially taken into consideration (Carton and Edstedt, 2021). Moreover, the dominance of the private market excludes local people from processes (NFA and Int7), and instead of conducting community engagement sessions, private actors often select an area and implement their projects without prior consultation (Int7).

“The public participation in green projects is purely a private business and whatever they do and decide to make are at the directorate level and management level” -Officer from the NFA

Additionally, when it comes to participatory approaches, the Officer from GIZ highlighted the importance of Stakeholder Consultation in the implementation processes. Stakeholder consultation and participatory approaches in decision making is an obligation for operationalizing carbon offset projects. Even though the management system works in that way on paper, the operationalization might change in the practice. As seen with the KFP example, local-level stakeholders were completely excluded from the process. In some exceptional cases, when the project management has been conducted accordingly, and the projects that were not approved by the local communities were canceled (Int6, Int9). Therefore, that can be said, even though on paper the local communities have been integrated into the process, their opinions most probably are not taken into consideration, and the consultation process is pseudo (Int5). Mostly, this process has been overlooked or abused (Int5, Int7).

*[Public participation] “that is the biggest problem we had”
– Officer from MWE*

Also, the level of transparency and democracy is one of the factors that is holding back the participatory approach in the implementation processes since all the decisions are made on very high levels relying on the same approach over 20 years (Int4, Int5). The corruption level creates another problem dampening community engagement in project management. While the politicians are the exclusive groups in the decision-making processes, this also gives advantages for some local people who are close to or supporters of the politicians by prioritizing them over the other members of the societies (Lee *et al.*, 2016; Ampaire *et al.*, 2018; Int3). Moreover, while getting closer to the election period, the politicians tend to accept illegalities on land usage to stay in power. These processes are also considered “community engagement” by the politicians (Int5).

In order to change the system, Uganda accepted a new policy framework called as National Climate Change Mechanism Regulation of 2024, and in the scope of this regulation, stakeholder consultation and validation have been made obligatory for the implementation of emission reduction projects (Int7). With this regulation, the aim is to strengthen stakeholder participation in the decision-making process by including public bodies, such as civil society organizations, academicians, ministries, and agencies, to break the private sector players’ dominance in the process (Int7). There are ongoing projects that aim to integrate local people into resistance-building mechanisms that are funded by the UK, USA, and Irish Governments (Int5, Int7).

In the bottom line, as underscored by the Officer from the Local Government, it is difficult to generalize the sense of community engagement in the projects. Considering the more than 20 years of carbon market history in the country, it is clear the Government made a lot of progress in incorporating local communities into project design and management. The involvement of local communities is an obligation for project developers to continue to operate the projects (Int7, Int9). However, the regional differences should be taken into consideration. While in some areas community engagement is achieved through sufficient funding and enough human capacity, the lack of these features in some districts still poses challenges for the operationalization of projects.

Lack of knowledge

Even though interviews with local people are not included in the scope of this research, several studies have been done to understand local people’s approach (Fisher, 2012; Schreckenber *et al.*, 2013; Gebremichael, 2016; Hedberg, 2016; Lee *et al.*, 2016; Edstedt, 2017; Fisher *et al.*, 2018; Carton, 2020) have been used to present their understanding. In all these studies, the respondents lacked enough information about the project. For both projects the local communities’ understanding of carbon markets, and how the mechanisms work was very low. Considering the complicated relationship between and within the levels, it was difficult for the local people to understand how a tree can help them to make money (Schreckenber *et al.*, 2013; Edstedt, 2017;

Gebremichael, 2016; Hedberg, 2016; Carton, 2020). And carbon trading and carbon payment have been understood in different ways:

“Why would someone pay us to plant trees and then not want something in return?” - Local person (Schreckenberget al, 2013).

Also, the carbon payments were introduced to the local people as “*token thank you*” or a “*carbon bonus*” (Lee, et al., 2016):

“You plant trees here, but you are helping people in the US, Europe, Kenya and Japan – All over the world...” - EcoTrust member (Fisher et al., 2018)

Some people think the clean air they produce is taken by Europeans:

*“Those [Europeans] want to have good air ... so they come [here] and capture the fresh air and they take it to European countries”
– A local person, Edstedt, 2017*

Carbon projects have been considered in different ways from also EcoTrust employees:

*“You are selling the absorption of CO2 into your trees. The tree is yours, the timber is yours. A person is buying the air entering your trees. Nobody will come to take your tree. What is the problem with someone giving you money for a tree which is yours?”
- EcoTrust staff member (Fisher, et al., 2018, p. 264-265)*

During the interviews, the Officer from the MLHUD also shared their opinion about the carbon markets:

“Trees we call ‘carbon trees’ (...) I did not understand the whole concept sometime back. But I know it is a practice in my country, some communities and regions are doing that. And then there are agencies and individuals who buy the trees for selling carbon. But who gives them funds? The polluters, those who are emitting which I assume could be within the region or could be In other continents. So that's my understanding of the carbon market”. – Officer from MLHUD

The lack of knowledge about the carbon credit mechanism also sparked superstition in the project areas. In the KFP example, local communities still believe in and do rain prayers (Edstedt, 2017), and cutting their access to trees they worship (Gebremichael, 2016) can be considered a severe act. People were relating all the climatic changes to their inability to worship and restricted access to the sacred tree. Similarly, in the TFG area, the lack of knowledge made people think the project was being conducted because of a problem local people caused (Fisher et al., 2018, p. 264). Also, the lack of knowledge showed itself during the implementation processes. People do not know what carbon markets are, why they grow trees, and how they make money with it (Int3, Int7, Int5). Therefore, their participation in the decision-making was also a question mark.

“How informed are they about the carbon market? ... How ready are we to make sure that the community knows what we mean by carbon market? And how they are supposed to be like one of the players what are their roles and how they can benefit from this? “

– Officer from the MWE

This lack of knowledge also affects their decision to participate in the project. While signing the contracts, the local communities do not consider how beneficial the project will be for them, and this poses a challenge for both local people in terms of using their lands and for project developers to maintain the project (Hedberg, 2016; Int7).

4.5.3. Land Management

When it comes to land management for carbon projects, the findings show that the most crucial topics are the colonial legacy of land management and land selection for the projects and the land use changes they cause.

Colonial history and land tenure system

Along with its vulnerabilities in the economy and climate change, Uganda became a hotspot in the global arena with the convenient and easily exploitable bureaucratic processes on land management to implement carbon offset projects. The land tenure system, which takes its roots from the country's colonial past, puts people's property rights in jeopardy with the legal gaps in its policy frameworks. However, because the system is still a market-based approach, and prioritizes financial benefits over environmental ones, becoming a hotspot for investments caused detrimental outcomes as seen in the KFP. Even though colonial history and its legacies on land management are not the only reasons to explain the environmental injustices that occurred in the carbon offset projects, they can be accepted as the spark that ignited the fire.

Additionally, the land tenure systems affected the implementation processes of TGB in another way. While in general it was not a problem, and EcoTrust worked in collaboration with the local governments to operate the project in either community-led forestry or private lands, in some cases the *mailo* system sparked discussion. Inherited from the colonial periods, *mailo* tenure consists of two levels of ownership with the main owners, and tenants, which led to problems for the project's acceptance and implementation in these individual areas. The tenants were not allowed to be a part of the projects without the consent of the landowner. Since the last decision was up to the landowner, there were land conflicts when it came to the operationalization of the project (Int8).

In the bottom line, the colonial legacy of the land tenure system adds another layer to the complexity of the carbon market's operationalization processes.

Land selection and land use changes

Location selection processes of these projects show how the countries' own contexts with their histories and local characteristics affect the implementation processes of carbon market projects. The lack of policy frameworks shows itself during the location selection for the projects. Rather than discussing and agreeing on a place with the governmental bodies, the project developers decided where to start their projects by benefitting from the legal gap. And, this situation affected the regional development levels. The inconsistencies between what the regions need and what the project developers offer have been a problem.

Projects' locations are usually decided by the investors in Uganda, who usually consider their benefits, but not local communities' needs, by looking only to the financial benefit they can yield from the projects (Int4, Int8). In the researched case studies, while in the KFP the location selection was related to the colonial history of the country (Gebremichael, 2016), in the TGB, the districts that need environmental protection and economic development have been prioritized at the beginning (EcoTrust, 2020), however, in the following destinations, the ways districts were selected remained unclear (Schreckenber *et al.*, 2013). These gaps lay the groundwork for land-grabbing activities in Uganda by allowing private bodies to benefit from the relics of the colonial past (Ashukem, 2020).

“The developer decides where to go. Without that planning and seeing (...) if they had that there have been some gaps if we had a very good better planning special planning, we wouldn't have so many carbon developers in the same place”. -Officer from the MWE

The gap in the policy frameworks and spatial planning mechanisms also paves the way for land-grabbing activities. Along with the fact that there is no regulation about carbon market projects' locations, in the physical plans, the standards to prepare them do not require demonstration areas for the carbon credit projects (Int9). Also, as seen in the policy framework analysis and case studies, these projects and their locations are not mentioned in the strategic plans, too. The officer from the Local Government stated that rather than showing these land usages separately, they are focusing on environmental protection, and while these sensitive areas (forests, wetlands, natural habitats, etc.) are shown in the physical plans, the location of the carbon credit projects are usually embedded in these areas according to their focuses under the auspices of the local governments (Int9).

Also, the land use changes made to the project sites have been controversial. In the KFP, transforming the savannah land into forestry through using monoculture plantation practices with the species having high CO₂ absorption rates was considered a *colonial practice* (Oakland Institute, 2014). On the other hand, even though there is no clear explanation about their land selection processes, selecting and supporting

environmentally sensitive places and vulnerable communities through the usage of indigenous species with aiming to protect local biodiversity (Carton and Edstedt, 2021), EcoTrust's effort to deliver justice can be seen within the TGB. Considering the water scarcity and environmental vulnerabilities, eucalyptus trees were excluded from the TGB project design, and local species that will not damper the agricultural activities were selected (EcoTrust, 2020). Also, during the selection process the trees that had already been planted by a part of the community, particularly coffee and banana, were eliminated from the process aiming to prevent any inequalities that might emerge between the local people (Schreckenber *et al.*, 2013). Regarding this fact, TGB is also considered a good example of carbon offset projects (Int1, Int2, Int3, Int4, Int5).

Along with that, the accumulation of the projects in the same regions caused unbalanced regional development in the country. Since the developers were deciding on the location of the projects, after a while, they started to select the same places, and this created a problem with leaving some regions behind the economic benefits the projects are providing (Int7, Int9). To prevent similar problems, with the lessons from the previous experiences with CDM implementation, Uganda started to create a landscape map for the whole country to direct the investors to the regions where the project can correspond to the needs aiming to support balanced regional development (Int7).

4.5.4. Justice in the Implementation Processes and Spatial Organization

The intersection of environmental justice, sustainable development, and spatial planning is a cross-cutting issue in Uganda. While all the actors are putting effort into creating beneficial outcomes from the carbon market projects, there are flaws in the policy framework, stakeholder management processes, and land use management as explained above. This section aims to present the ways connecting these three topics to each other by highlighting both limitations and potential pathways for more equitable operational processes of carbon market projects in Uganda's environmental and social landscape.

Environmental Justice

Aiming to deliver justice to all the local communities and vulnerable groups, both the UN and Ugandan Governments put effort into developing policies and trying to integrate them into the operationalization processes. However, considering the market-based nature of the carbon offset projects, they have not achieved delivering justice to everyone in all the projects. In order to deliver environmental justice, the regulatory frameworks for the implementation of the carbon markets, and their integration into spatial planning schemes is an urgent need in the Ugandan context.

“We need to have these regulatory frameworks in place. And these regulatory frameworks should be very cognizant of the role that land use planning (...) in the aspect of regulating land use. So the balance is on regulating land use (...) and several interests (...) of the entire spectrum of carbon markets”. – Officer from MLHUD

Along with the fact that the climate finance fund separated for the local communities is very limited, accessibility to the project has been criticized for both projects. While KFP caused economic degradation in society, which in some cases led to poverty (Gebremicheal, 2016), with TGB the problem was mostly related to the size of the lands. While the people who have lands were able to benefit from the projects, small-holders and people who do not have enough land have been excluded from the processes (Schreckenberget al., 2013).

One of the agreed points by all the respondents was the projects that create positive outcomes for the local communities by covering some of their basic needs such as providing new job opportunities, setting up health facilities, building new roads, and building infrastructures, particularly for clean water and sewer system (Int4, Int6), clean cooking mechanisms (Int6). However, the carbon initiatives and their paybacks are also considered not sufficient for the local people (Int5, Int8).

“People were really not benefiting from this project. (...) since they privatized the land, they may not use it as before. And this was the main source of income and main source of livelihood for the people who lived within this area. ... people saying that they were fine before, but now they're deep into poverty” – Researcher from SEA

For both projects, justice on the international level is also a matter of concern. While the acknowledgment of carbon trading is very vague among the local communities, they also do not understand the logic behind the system and the motivations to implement the projects (Fisher, et al., 2018, p. 264). Also, Edstedt (2017) reported that some of the questions she has been asked were *“What does Sweden do with these carbon credits?”* and *“Why Sweden does not plant trees in Sweden?”* (p. 47). Moreover, Fisher and colleagues' (2018) research showed that the few who fully understood the projects thought it was unfair how much they had been paid for the effort and money they invested in it.

[it would be fair] ... “if they pay us good money, but they are paying us little money and we are helping the whole world – it is global- We are helping the whole world, and they are paying little money and we have sacrificed our land to absorb CO2 ...”
- A local person (Fisher, et al, 2018, p. 264).

As discussed through the Uganda example, any parts of the system that are not functioning well might lead to injustices on the global and local levels. While Uganda is

one of the countries that is contributing to GHG emissions at a very low level, Ugandan people are carrying the burden of the climate change impacts. Considering all these processes *ensuring justice* is a complicated issue in Uganda that has multidimensional aspects spanning from the supranational level's market organization to the local people's livelihoods.

Sustainable development

Carbon markets are still accepted as an important tool to attract foreign investment to be more resilient for climate change adaptation and mitigation projects by covering the financial requirements for initiating the projects and providing additional benefits by strengthening urban services. However, several factors are holding these projects from contributing sustainable development goals of Uganda.

Firstly, Uganda does not have any carbon pricing mechanism, which means that the credits that have been produced within the boundaries of the country cannot be used for the benefit of itself. Despite this, the Government's willingness to allow carbon trading projects while lacking policies also raises the risk of land grabbing and eco-colonization in the country (Cardomy and Taylor, 2016). Therefore, while there is a need for adaptation programs in the country to reach sustainable development with mitigation projects (Int8), the carbon trading mechanism favors investors more than the country itself (Int3, Int4, Int8).

Even though there are carbon credits that have been produced and sold, their reality has been questioned (Int7) considering the adverse impacts of the projects. Even though the projects provide some social and economic benefits, they do not contribute to sustainable development (Int4, Int5). Firstly, considering the number of initiatives and their activities, the climate finance that is channeled to the country is not sufficient and the initiatives are not enough when it comes to creating real impact (Int5). Considering the abstract nature of the mechanism of commodifying emission reduction and trading it, it is also hardly possible to imagine real impacts (Int7).

Another issue brought by the Officer from the Local Government is the *sustainability* of these projects (Int9). Also as highlighted by Fisher (2012), even though these projects contribute sustainable development of the country at a certain level, they are usually not maintained as they are. As discussed in the TGB case ([4.4.2](#)), willingness and capacity building in the local governments and local communities are important to create a real impact. However, the project designers tend to leave the projects abruptly without having any *exit strategy* to leave some permanent effect on the project areas (Int9).

However, the biggest issue in Uganda related to carbon trading systems and sustainable development is that even though the carbon projects are contributing the decreased emissions overall on the global scale, the credits that have been generated through the

projects in Uganda cannot be used for Uganda since they do not have a carbon pricing mechanism (Int1, Int4, Int7). Therefore, it stays on the supplier side lending land to the investors and developers (Int6) and while not implementing the projects themselves, they regulate and monitor the practices (Int7).

Spatial planning

The most criticized parts of the projects are the policies and their scope, stakeholder engagement, and land management which can be addressed through strengthened spatial planning mechanisms. Spatial planning is still a growing field in Uganda in institutional, organizational, and financial terms. The lack of integration between the forestry, climate change, and agriculture policies and their different requirements for implementation requires a better spatial planning mechanism that can act as an umbrella sector to lead all the operationalizations. This paucity reflects itself also in the carbon market projects (Int8). In order to enhance the system, as reported by the Officer from the MLHUD (Int8), they keep working on new Acts and new systems to strengthen the spatial planning mechanism.

All the participants agreed that a better spatial planning system with strengthened planning policy frameworks, stakeholder management, and land use regulations would help the operationalization of the carbon markets. However, the fact that spatial planning can help only when there is transparency with a democratic approach in the governmental processes is highlighted by the Academician from a Ugandan University (Int5).

Along with the carbon market project, there are also international development partnerships that work similarly in the country including Ministries, Local Governments, and local communities to the project design processes including the land selection and tailoring of the projects according to local needs. They are most likely to be seen in the vulnerable areas of the country that are struggling with harsh environmental conditions. As explained by the Officer from the Local Government, all the international projects that have been conducted in the country over decades helped them to strengthen their system for the operationalization of the projects. Along with enhanced community engagement, the Physical Planning Departments of the governmental bodies are made a part of the implementation processes to support the climate resiliency of the local communities (Int9).

Also, when it comes to the distribution of resources in an equal way, the importance of spatial planning has been highlighted again (Int6), and it is also necessary for balanced economic regional development in the country to deliver justice (Int7).

“Then the special planning (...) is to rule with the mapping of the landscape, different landscape, how do they behave and how this

ecosystem or the biodiversity in each of these landscapes what are the biodiversity that we need to protect to make sure that when we are dealing with the carbon markets, there's also what we call Environmental justice. Just not about bringing in the carbon market then you are killing the other part of the ecosystem so that is also what is lacking for us I think we can do better in that when we have proper planning".
– Officer from the MWE

However, in these processes, participatory approach in the decision-making processes should be implemented in these kinds of projects that come from the supranational level and implemented at the local levels (Int4), including all the components in all scales, to contribute to building climate resilience (Int5). Spatial planning can help better operationalization processes by organizing land usage and creating new solutions for land commitments through varied land tenure systems in Uganda to deliver justice on the local scale (Int8).

4.5.5. Concluding remarks

Ensuring just implementations of the projects in the operationalization of the carbon offset mechanisms has been a matter of debate since the mechanism was initiated, and this research aimed to provide a general overview of the Ugandan context. Starting from the colonial legacies of the land tenure system and decentralized governance, coupled with legal ambiguities and weaknesses, the country enables land lending to the international actors aiming to channel climate finance to the country. However, in the situation where the Government acted very permissive, and the investors abused the legal gaps, the processes ended up being considered as land-grabbing examples that led to severe environmental and social justice issues.

Who is to blame for the injustices and neo-colonial practices associated with carbon trading in Uganda is an ongoing debate. Three key actors play roles in these processes: the UN, market players, and the Government of Uganda. The UN has been widely criticized by scholars for developing carbon trading mechanisms that, instead of prioritizing equity and sustainability, have laid the foundation for neo-colonial exploitation (Bachram, 2004; Bumpus and Liverman, 2008; Lohmann, 2008; Lahsen, 2009; Bond *et al.*, 2012; Dehm, 2016; Oakland Institute; 2017; Edstedt and Carton, 2018; Fisher, *et al.*, 2018; Carton, 2020). Similarly, the Voluntary Carbon Market (VCM) has been a point of contention due to its systemic failures, favoring large-scale market actors while neglecting the needs of vulnerable communities.

When it comes to policy design in Uganda, better policy designs with strengthened human capacities and institutions are needed. As mentioned by the high-level officers from the UN Local Program, the governmental and institutional system is still developing to build a strong structure for climate finance applications. After the ending of Article 6

discussions in the UN meetings, the Ugandan Government showed their tendency to implement the Paris Agreement's carbon market practices by improving and enforcing new policies. Several pilot projects already have been initiated in Uganda in the scope of Article 6, and even though the projects are not LULUCF ones, the pilot activities that were implemented up until now showed that the country needs more integrated approaches in the policy-making processes (Greiner *et al.*, 2020). However, even though there are a lot of efforts to strengthen the system, the political dynamics regarding the level of democracy in the country also raise concerns about how the system will be effective (Int4, Int5).

The Government of Uganda also bears significant responsibility for these issues. Its failures can be linked to (i) inefficient policies that do not adequately address land use and carbon market governance, (ii) a highly decentralized system riddled with latent corruption, and (iii) a clear lack of alignment between policies and their actual implementation. These factors have contributed to an environment where land grabbing and exploitation are prevalent. In all these discussions, it is essential to remember that land is not just a tradable commodity but a shared resource that must balance ecological integrity with the rights of local communities. Also, as reported by respondents, the Government is also willing to lend the land to make money through carbon market projects (Int4, Int5).

Moreover, the lack of community engagement in project designs and implementations also has systemic weaknesses. Carbon forestry projects lead to evictions and displacements of people also causing a lack of access to live-depended on resources (Tienhaara, 2012; Edstedt, 2017). Even though there are participatory approaches like TGB that incorporate local communities into the project implementations and are respectively inclusive compared to the top-down KFP, both projects prioritize monetary benefits over nature and local communities, which leads to injustices.

Tackling these challenges calls for a bold approach that combines comprehensive policy reforms with strengthened institutional capacities and a genuine commitment to participatory governance. As Uganda is getting ready for the Paris Agreement applications through amplified policy frameworks and capacity-building efforts, bridging the policy gaps, enhancing community engagement, and integrating spatial planning into the other policy frameworks can be the steps that might be followed for better operationalization processes. Only through a holistic and inclusive approach can Uganda fully realize the potential of carbon markets while ensuring environmental justice for its communities.

5. Discussion

This research has discovered the operationalization of carbon offset projects and their relation to spatial planning studies by focusing on Uganda. As one of the most vulnerable countries in the world, Uganda has been a hotspot for carbon market projects since the introduction of the mechanism, and it stands as a poignant example to understand the dynamics of the system with having two contrasting case studies: the Kachung Forest Project (KFP) and Trees for Global Benefits (TGB). While both projects aimed at carbon sequestration by providing benefits for the local communities, they have yielded vastly different outcomes through their governance system and implementation processes. While the KFP is a top-down approach that has been managed by excluding local levels and causing injustices; TGB has been considered a relatively successful project with a grassroots-oriented approach that includes local governments and communities in the project up to a point.

Key findings of this research underscore the need for holistic approaches encompassing environmental management, community engagement and spatial organization while implementing carbon trading projects in order to achieve environmental justice and avoid green colonialism. These findings also highlight the critical role of spatial planning during the implementation of projects that can address the issues the environmental injustices.

5.1. Justice and Neocolonization in the Climate Change Discourse

In the recent 30 years, scholars and activists have highlighted environmental problems and their impacts on societies to enhance people's life standards. The discussion started with environmental justice, which refers to the search for equality to have a healthy livelihood, has been expanded to include spatial justice, climate justice, and climate finance justice ([Ecological and Spatial Concepts in Justice and Colonization](#)).

These processes are also related to land grabbing in transboundary areas that started with land appropriation activities in developing countries for agricultural product and expanded its sectors. As the practices started to be promulgated all around the world, neo-colonization discussions also have been started. While the term environmental colonialism was introduced in the early 1990s to refer to the activities that have been operated in developing countries to favor industrialized countries, the field also has been expanded with the terms of carbon colonialism and climate colonialism to refer the resource extractions in the developing countries under the auspices of climate change adaptation and mitigation. To amplify environmental justice and prevent any kind of neo-colonization, the UN released several documents, which are also criticized for paving the way for neo-colonization, especially with the carbon finance mechanisms (Bachram, 2004; Cardomy and Taylor, 2016; Dehm, 2016; Carton *et al.*, 2020; Gonzalez, 2021).

As a response to the UN-baked frameworks, in academic discourses, climate change is represented as a consequence of modernism and its dynamics of production and conception, accompanied by global capitalism and its core practices that are implemented by developed countries (Bhambra and Newell, 2023). Capitalism always finds a way to reinvent itself to create benefits for the market through spatial practices (Harvey, 2001; 2004), and the carbon credit mechanism is one of the systems that was introduced under the guise of a “*climate change adaptation*” which led to wide usage of “*colonization*” in the same discussion to refer various activities that facilitates the reproduction of capitalism and ended up causing global injustices (Bhambra and Newell, 2023; Mahony and Endfield, 2018; Sultana, 2022). The carbon trade-off system is also defined as “*the owner of a major polluting vehicle in Europe can pay an African country to not pollute in some way so that the owner of the vehicle is allowed to continue emitting*” (Bond *et al.*, 2012 p. 9).

Even though the UN introduced numerous frameworks and principles as a way to balance the severe impacts of global climate change, the implementation of these policies yielded vastly different outcomes. Considering the market-based approach of the implementations through financial exchange, the injustices remained between the industrialized and developing countries. Even though there were ethical concerns from the market players, they have not been reflected enough in the operationalization processes. Especially, in the cases where the rights of the local communities are ignored and financial and political benefits are prioritized over them and the natural environment, the projects favor only the market and elites, rather than creating benefits to reach a more just system. In order to achieve real global justice, there is a need for collaboration with both Global North and South voices to determine a common path, even though the conditions are different (Gonzalez, 2021; Sultana, 2022; Gifford and Sauls, 2024; Manahan *et al.*, 2024)

5.2. Carbon Markets and their Operationalization

Climate finance and carbon markets are some of the pivotal tools that have been introduced by the UN. Carbon markets, introduced under frameworks like the Kyoto Protocol, expanded by the private sector, and recently by the Paris Agreement, aim to reduce global greenhouse gas emissions by creating financial incentives for carbon sequestration and emission reductions (Newel *et al.*, 2013; Michaelowa *et al.* 2019b; 2019c). These mechanisms allow emitters in developed countries to offset their emissions by investing in carbon-reducing activities in developing nations. While carbon markets present an innovative solution for addressing climate change, their implementation has faced criticism for perpetuating inequalities, excluding local communities, and failing to deliver the promised socio-economic and environmental benefits (Bachram, 2004; Bumpus and Liverman, 2008; Edstedt and Carton, 2018).

Therefore, carbon accounting, while intended to support environmental and climate governance, also contributes to creating unequal geographical political economies. Carbon markets were designed as a global climate mitigation tool to incentivize sustainable land use practices while providing economic benefits to host communities. However, as evidenced by the case studies analyzed, their implementation often fails to align with these objectives due to weak policy design, insufficient community engagement, and inequitable land use management.

There are two carbon credit mechanisms that have been widely discussed: the Compliance Market under the auspices of the UN and the Voluntary Market which is managed by the private sector actors. While the Kyoto Protocol's mechanism was a top-down approach that is mostly managed on the supranational level, and implemented on the local scales excluding the actor's in-between levels and oversimplifying their importance (Carton *et al.*, 2020); VCM was started as a counteract to CDM's complex structure (Lovell, 2010). However, having fewer regulations, being purely market-based approach, and excluding governmental bodies also sparked discussions. Given the market-based approach, the need for financial funds in developing countries, and already existing inequalities, the regional disparities of carbon offset projects often reflect the unequal power dynamics between developed and developing nations. The mobilization of monetary values, combined with the pervasive nature of capitalism, could result in unevenly developed economic and social geographies, potentially leading to neo-colonial processes in the modern world. The carbon market mechanism is only an example of the climate change adaptation and mitigation techniques that create their own market. What sets the Carbon Market apart is its reliance on international agreements and standards, which makes it more justified and grounded. However, it also, in turn, lays the groundwork for an unjust system, not only on the local level but also on the global stage.

Given the multilayer, multidimensional, and multistakeholder structure of the operationalization of carbon markets, the system only as a market-based approach that provides funds would be an oversimplification of a complex and broader system. As discussed above, the scope of the implementations goes beyond the financial values and extends itself to the governmental systems, policy frameworks, community engagement, and spatial impacts of the projects. Therefore, that can be said, that transferring monetary values from developed countries to developing countries is not merely enough to achieve ethically functional carbon markets, the projects should also ensure sustainable development and enhance the livelihoods of local people (Enríquez-de-Salamanca, 2024).

5.3. Policy design on different levels

Policy design is the foundational step for implementing carbon market projects. However, as illustrated by the Uganda example, the scope and structure of these policies must address potential challenges arising from the multilateral and multistakeholder nature of the system.

While the discussion of the UN policies on justice is beyond the scope of the thesis, it is crucial to underscore the shared responsibility for achieving it. Achieving justice, required effort not only from the Host countries but also from the UN and the investor countries. These actors must develop policies to avoid burdening the climate change impacts of the developing countries. Taking responsibility for climate change impacts goes beyond simply reducing GHG emissions in the national boundaries, but also includes actively avoiding colonizing neocolonial practices. As Dani Rodrik explains in his book *Straight Talk on Trade* (2017), climate change is a global issue, and when designing policies, countries should consider not only their own benefits but also the interests of other countries. Strong international GHG emission regulations are needed to help countries reduce their emissions (Newell *et al.*, 2013; Rodrik, 2017). Rodrik (2017) asserts, “*Failure to reach global agreement would condemn all to a collective disaster*” (p. 220).

Secondly, considering the multiple levels of the system that span from the supranational levels to the local ones, the integration between and within them is a fundamental requirement. As shown in the China example (2.3.2.1), the policies that have been designed on the national levels, and implemented at the lower levels are more likely to achieve success in both reaching sustainable development goals and more just implementations. On the other hand, the policy gaps and conducive institutional structure in Uganda, favored private market actors to exploit the mechanism and create environmental injustices. Therefore, that can be said, as one of the fundamental steps for the operationalization of the carbon market projects, policies that can be integrated at different levels should be designed.

Thirdly, the integration of carbon markets into all relevant policy frameworks and institutional organizations is essential for a holistic approach. In highly decentralized systems, numerous policies created by different government bodies often complicate implementation. To avoid these issues, policies should be designed to complement and reinforce each other. As explained by the Officer from MWE (Int7), after years of experience, Uganda developed an institutional and political system to implement the carbon project in a more structured way with several governmental bodies, and the policy frameworks are still in progress. However, as also revealed with the examples from China, a collective and holistic approach for the operationalization of carbon market projects is an indeed obligation.

5.4. Stakeholder Engagement

Considering the multilevel structure of carbon market mechanisms, stakeholder engagement is one of the parts that is difficult to manage. In the governmental structure of the Kyoto Protocol, the Host countries and their governmental organizations were excluded from the decision-making processes and included in the system only with the MRV processes. This issue has been criticized widely and in the Paris Agreement, a more inclusive approach has been embraced. In the same way, during the implementations of VCM projects, the governmental bodies do not take roles in the operationalization processes.

As being the policy makers, regional, national, and subnational levels should be included in the system for better mechanisms. As explained by Lee's (2016) and colleagues (2017) works, which focus on carbon projects in Kenya, Uganda, and Tanzania, show that the success of the projects is highly related to bridging the actors from global scales to local ones and building trust (Lee *et al.*, 2016; Lee, 2017). In these examples, carbon markets have been operationalized in a collaborative way with having support from East African Community, their national governments, and local governments. With having the hierarchical structure, and support from each level, the local communities were convinced they have safeguards, and they build trust to the project developers.

And on the local scales, for having efficient and effective projects, including local communities to the design and implementation steps have been considered one of the keys. As mentioned before, local communities are the practitioners of the projects, therefore, "how to build trust" should be one of the key aspects that should have been considered in project management, particularly with the local communities and smallholder agrarians for the success and maintenance of the projects. As another important factor, bridging the institutions is also crucial for the implementation of the projects. As discussed in the Uganda example, while local communities are not familiar with the carbon trading mechanisms and why they do these activities, project developers are also not aware the local conditions and the characteristics of the areas. Therefore, while it is important for farmers to understand global carbon markets, it is equally crucial for actors at higher levels, such as carbon buyers and bridging organizations, to comprehend the social, ecological, and cultural contexts of local communities. Without this understanding, global decision-makers will remain unable to structure market conditions that deliver the intended win-win outcomes for all stakeholders (Lee *et al.*, 2016).

Despite the fact that carbon trading mechanisms are market-based approaches and there is a belief that whether there is a community engagement or not, the projects based on payment for ecosystem services will not deliver justice since the logic they have been created is not considering social and environmental impacts, but materialistic benefits (Hedberg, 2016). Especially in cash-poor communities, people tend to accept the

conditions without considering the consequences (Hedberg, 2016; Fisher, 2012). And, given the fact that *the market is there and will not canceled*, finding new solutions for better stakeholder engagements should be one of the priorities in the topic.

5.5. Land use management and activities

Considering land use management in various scales as one of the pivotal tools spatial planning has, the activities and their spatial distribution on various levels is a topic that needs to be under the spotlights.

Even though the mechanism was supposed to transfer not only climate finance but also technological advancement and human capacity, the operationalization processes have ended up in another direction. As highlighted by Akrofi (2024) and Michaelowa and colleagues (2019b), project developers tend to invest in projects based on the existing infrastructure the country has, rather than their needs. As witnessed by the Uganda example, while there is a need for clean energy systems in the whole country, most of the investments have been made to clean cooking systems and forestry projects (EAA, 2022). And when it comes to big-scale projects, especially within the CDM projects, the uneven geographical distribution has been discussed widely. Particularly, forestry locations are often chosen from areas categorized as “outside the management,” “degraded,” or “in need of rehabilitation,” effectively using carbon market projects to transform these lands into “manageable” ones (Lovell, 2014, as cited in Gifford, 2020).

Highlighting the distribution of the projects and the equality they bring, it is also important to mention not all the activities have the same impact. While it is easy to produce carbon credits through tree planting, generating credit through fossil fuel reduction activities is more challenging. *“To what extent, for example, can we reasonably expect synergies between climate action and biodiversity protection, when climate policy and standard carbon accounting is rendering the difference between natural forests and tree plantations invisible?”* (Carton, 2020, p. 9). Therefore, that can be said, that even though carbon markets are considered a way to mitigate climate change impacts, implementations of carbon markets through greenery projects are not healing the real impacts of the business-as-usual activities of investors and buyers.

Also, on the national level, the distribution of the projects should be made in a rigorous and transparent manner. As discussed in the China example ([2.3.2.3](#)), the projects can have a spillover impact and inspire other regions to implement carbon trading projects. However, on the other hand, there is also the possibility that developed regions might become more attractive for investors with having the required infrastructure and cause uneven development. These inequalities can go further in different contexts. As revealed in the Uganda context, the implementation of the projects might end up with eviction for the local people or creating new attraction points for low-income people. While KFP

ended up displacing people to other districts or villages, TGB created attraction points by giving local people to make money through the project (Fisher, 2012; Edstedt and Carton, 2018; Oakland Institute, 2014; 2017). In a country that already has a lot of economic and environmental inequalities, the distribution of the projects in different parts of the country has the potential to exacerbate spatial injustices through worsening uneven development of the regions and might cause an influx of internal migrants.

The weak carbon trading policies are reflected itself also in the spatial organization and land use changes as discussed throughout India with the usage of agricultural lands for forestry (2.3.2.3), and in Uganda examples (4.4.1). These kinds of changes affect local communities, their livelihoods, and the biodiversity in the area. While the forest reserve was a savannah land before the project's implementation and was used also for agricultural activities, the project converted the area to industrial forestry by using monoculture plantation techniques with species that are not native to the region. Besides affecting the biodiversity itself, this land use change also impacted local people's lives by dampening their agricultural productivity and eventually displacing them from their houses. On the other hand, TGB stands as a good example of how nature protection can be promoted while also supporting local livelihoods. The land use policies that have been integrated into the scope of the project helped biodiversity protection while contributing to local people's livelihoods.

Therefore, that can be said, that during the implementation of the carbon trading projects, the distribution of the projects should be made in a way that corresponds to the national and local needs, and participatory land-use planning into carbon market projects can help identify and mitigate conflicts over land use. Transparent, inclusive processes ensure that affected communities have a say in how land is utilized, promoting ownership and reducing resistance.

5.6. Justice and Sustainable Development in Carbon Market Projects

Carbon markets and their operationalization have been a contradictory topic among scholars for decades considering their environmental, social, and economic impacts. When the implementations are considered based on the scales, on the global level, the carbon credit mechanism has been under fire for the uneven development it created. As explained in *Initiation of Carbon Market: Kyoto Protocol and Voluntary Carbon Market*, several countries benefited from the mechanism more than the other ones, and this uneven geographical development has been a topic of discussion among scholars. Moreover, while the projects were aimed at supporting balanced development, the project locations that were selected by the Project developers also created a development gap between the countries, especially in the LDCs. While the system was supposed to transfer knowledge and technology, the Project Developers continued to

select the countries that have already infrastructural requirements for the projects (Michealowa *et al.*, 2019) and exacerbated the unevenness between the countries.

On the national level, projects have been considered as ways to channel foreign investment to the countries and considered as ways to support the economic development of the countries. However, as highlighted by Benites-Lazaro and Mello Thèry (2019), the projects are more likely to deliver justice and contribute to sustainable development when the governmental processes are transparent, and the countries have strong institutional organizations supported by public-centered systems. Therefore, on the national level, achieving sustainable development is strongly related to the level of democracy and transparency. At local levels, as the practitioners of the projects, local governments and their roles in the processes are as important as local communities' engagement in the project to deliver justice (Knuth *et al.*, 2025).

While the poor bear the brunt of the negative impacts of the carbon sequestration projects, the political and economic elites are being less impacted by getting more benefits. The control they obtain through purchasing and having ownership of land, and having the chance to sublet it by increasing the price. This situation, the lack of property rights, is one of the factors that makes carbon credit markets inaccessible to poor people (Enríquez-de-Salamanca, 2024). However, it is difficult to assert that carbon markets provide equality in societies since the precondition the get benefits is having secured land tenure, and there are low-income groups that do not have access to it (Lee *et al.*, 2016).

Land use provides high potential for climate change mitigation through land-based carbon sequestration projects (Cavanagh, *et al.*, 2017) that include land resources management, reduced deforestation, reviving degraded lands, and improved agricultural systems (better-quality fertilizers, enhanced feeding systems, etc) (Scherr, Shames, and Friedman, 2012), and carbon market projects in the forestry and agricultural sectors are particularly beneficial for rural areas since they provide a “triple win” through opportunities for both economic development and environmental protection (Cavanagh, 2017; Corbera and Brown, 2008 as cited in Lee *et al.*, 2016). Especially in countries that have economies based on land resources, like Uganda, carbon trading project and their implementations should be carefully designed considering the risks of adverse impacts.

5.7. Role of Spatial Planning and Spatial Planners

Addressing environmental injustice involves complex policy-making processes at local, national, and global levels that incorporate social aspects (Mohai *et al.*, 2009), and delivering justice is becoming a more complex issue when the system has various levels. Considering the political economy created by carbon markets, which have multilevel governance and a multistakeholder structure, and the correlations between these

elements (Bond *et al.*, 2012), along with the spatial impacts carbon markets have created by the accumulation of capital and by reshaping social and economic geographies (Bold *et al.*, 2012; Bumpus and Liverman, 2008), carbon markets and their operationalizations are already corresponding the critical topics that have been discussed in the spatial planning discourse. The literature shows that the most criticized aspects of the operationalization of the market are policy design (Bachram, 2004, Fogel, 2004; Andresen, 2015; Michaelowa *et al.*, 2019b; Carton, 2020; Carton *et al.*, 2020), stakeholder engagement (Fogel, 2004; Lahsen, 2009; Tramel, 2016), and the location of projects (While, 2008; Bumpus and Liverman, 2008; Gonzalez, 2021). All these issues can be addressed through spatial planning tools. Given the fact that a holistic approach to the policy design is a significant missing point in the operationalization processes of the carbon offset projects, spatial planning and the fields it is working on and working with can help to provide a better operationalization of the processes.

There are three critical aspects of the operationalization of carbon trading projects that spatial planning can contribute to more equal implementation processes. Firstly, policy making is one of the strongest tools spatial planning has, and practicing it on different levels and integrating them into upper and lower levels is one of the crucial responsibilities a spatial planner has. Adaptation of supranational policies to the lower levels is also a part of the spatial planning discourse as it is experienced with the UN's climate change action recommendations. Secondly, being considered "*knowledge keepers*" (Janin Rivolin, 2012), spatial planners can contribute to the processes of stakeholder design by considering all the components that will affect and be affected by the projects, and they can facilitate the processes for finding common ground among the stakeholders with their technical knowledge, ability to transfer knowledge between the levels and actors. Thirdly, land use management and zoning are crucial parts of spatial planning studies, and by being trained to practice this on different levels, spatial planning can help to build more equal ways to operationalize carbon trading markets.

Given the policy-making, stakeholder engagement, and land use management as the most discussed parts of the carbon trading projects, and the broad perspective of the spatial planning field, the integration of climate finance and carbon trading projects into the spatial planning discourse can help to achieve more just implementations. Considering the overlooked capacity-building initiatives needed to implement carbon trading projects (Okerere and Coventry, 2016), integrating spatial planners into the process may be beneficial in addressing the issues that arise from the lack of coordination between different levels of government and stakeholder engagement. As supported by the respondent of the Ugandan case study, spatial planning can help for better implementations on the national, regional, and local levels by directing projects' locations, supporting related institutions and mechanisms for enhancing the operationalization processes, and creating bridges between different actors, particularly between local stakeholders and decision-makers.

6. Conclusion

Environmental justice and neocolonial practices are two topics that are entangled in the contemporary world, especially with the climate change impacts and the mechanisms to cope with it. Over time, aiming to cope with climate change impacts, several policy frameworks and financial tools have been introduced by the UN and their extensions in order to strengthen the resistance of countries. One of the topics that have been consistently highlighted is the disproportionate climate change impacts between the countries regarding the level of GHG they emit, and the impacts they are suffering from. While developed countries have higher levels of CO₂ emissions, the burden of climate change impacts is mostly on the developing countries, especially Least Developed Countries (LDCs) and Island States.

In order to facilitate climate change adaptation and mitigation in developing countries, climate finance, and as its extension, carbon trading mechanisms have been introduced to channel financial funds from developed countries to developing ones by giving the opportunity to exchange monetary values with unused GHG emission allowances. As introduced by the UN, the carbon trading mechanism was a promising solution to cope with climate change impacts at the beginning by creating a balance between the developed countries and developing ones through GHG emission allowances. Over time, the mechanism has been expanded through private market forces, and after the COP29 meeting and settling down the Paris Agreement's tools, the carbon trading market is expected to get bigger and continue to channel financial funds among countries.

Even though the mechanism was started with high hopes, the multiscale structure that spans from supranational level to local levels, and the extended geographies of implementations pose challenges during the operationalization processes and dampen the efforts to deliver environmental justice. Rather than helping countries' sustainable development, it carries the risk of causing neocolonial practices through land use changes and affecting local communities.

In order to make a broader narrative of the mechanism, its impacts, and the ways it is related to spatial planning practices, this research aimed to discover the relationship between environmental justice, carbon trading mechanisms, and spatial planning strategies. Firstly, a literature review is conducted to understand how space-based justice and colonialism theories, the carbon market, and spatial planning are related to each other. Subsequently, aiming to provide a concrete image of the carbon market operationalization processes, the Uganda context is delved into by researching the history of the country, its policy frameworks, and two operated projects. The findings of the research are supported by interviews to understand the real impacts of the project in the country.

6.1. Summary of the Results

This research has explored the relationships between environmental justice, neocolonial practices, and the operationalization of carbon markets, and how spatial planning tools can enhance the processes by drawing lessons from Uganda's experiences.

Aiming to make a narrative of the system, firstly a literature review has been done to understand the concepts of (i) environmental justice, colonization, and the UN's stand on related topics, (ii) carbon markets and their historical developments, (iii) the relation between environmental justice, carbon markets, and spatial planning. Given the fact that climate change is one of the contemporary crises that requires collective action, achieving environmental justice and avoiding any activities that can cause colonization is the responsibility of all countries. In order to promote this approach, the UN decreed several frameworks and tools, and as a part of them, carbon markets were a promising solution. However, the multiplicity of the market system, their governance, and their credibility are the most discussed topics. In its history, two markets have been operated with different organizational systems, however, the common concerns have been widely discussed; the top-down approach of the systems that excludes local government and local communities, as a consequence, the efficiency and credibility of the projects.

These issues also reflected in the spatial organization discourse. The capital accumulation cycle that is started by the carbon trading mechanisms, and exacerbated by the neoliberal policies have been widely discussed by scholars. The most criticized topics within the system are (i) the complexity of the multiscale decision-making system, (ii) the lack of stakeholder engagement, and (iii) issues with land and environmental management. Even though these critical topics are highly related to spatial planning discourses, there is a paucity of research that related planning studies with carbon market mechanisms and their operationalizations. Despite the fact that most of the research conducted on the topic is from economics or geography fields, in order to discover the ways spatial planning can enhance the practices, case studies from all over the world are examined to support the hypothesis of this research which is when there are well-benefited spatial planning tools, the projects are more likely to yield positive outcomes.

In order to demonstrate the operationalization processes of the carbon credit projects, the historical development of the mechanism is examined also in the context of Uganda. With being a hotspot for carbon trading projects in the recent decades, and having both failure and success, Uganda is a poignant example to understand *what can go wrong* and *what should be done*. Uganda is one of the Least Developed Countries (LDC), and coupled with its colonial history, carbon trading offers a pathway to attract foreign investors to the country. In order to understand the mechanism and its functionality in the country, the environmental and land management policy frameworks analyzed, and two contrasting case studies have been examined, along with the interviews that have

been conducted with the experts and researchers in the field. The findings show that the paucity of legal frameworks and institutional structures, the weak stakeholder engagement, and the lack of planning studies were the main drivers for the projects' outcomes in Uganda. Along with the colonial legacy of the governmental system through decentralized structure and land tenure system, Uganda became a conducive option for the developed countries to exploit its resources for generating carbon credits, which has been under different types of colonial systems.

Another reason the projects have been under fire is that even though the country does not have any national carbon pricing scheme, it is under the spotlight for carbon market projects. Even though Uganda can not benefit from these credits, and stand as the supplier, the mechanism still functions. This situation is also considered a practice of land grabbing and green colonialism by scholars since despite Uganda providing the land for the project, it can not benefit from the produced carbon credits.

And when it comes to the practices, for both case studies, the market-based approach of the projects prioritized financial benefits over the social, economic, and environmental benefits on the local scales, and caused environmental justice to fall short in the implementations. Even though the projects have different characteristics, and while KFP is considered a market failure and TGB is a good example, their efficiency has been always questioned regarding the social impacts of the projects and their maintenance. Even though the project is implemented, after the end of the project, it is difficult to see the continuity of the activities. Moreover, the interviewees from different levels of organizations also expressed contradictory opinions about the efficiency of these projects. Some respondents expressed that the projects are contributing to the country by providing some fundamental services (mostly urban infrastructures), and some respondents mentioned the non-continuous activities and their inefficiencies. However, one common point that has been agreed upon by all the respondents was the urgent need for a carbon pricing mechanism and capacity-building efforts in the country for better operationalization processes. And as discussed with the respondents, spatial planning studies should be a part of the new mechanism to enforce balanced development between different regions, prevent land conflicts, and provide better land management. It is also worth mentioning that Uganda is putting a lot of effort into addressing these issues, through strengthening its policy frameworks and governmental structures, encouraging community engagement in the decision-making processes, and enhancing its spatial planning mechanism.

6.2. Broader Implications

Drawing lessons from the Uganda experience, the findings of this research show that spatial planning and spatial planners can have crucial roles in the operationalization processes as "*knowledge keepers*" (Janin Rivolin, 2021) and bridge the gaps between the

technical knowledge of planning studies, policy making on different levels and adding social perspective as being a part of the local communities. Despite the fact that the practices and outcomes might vary based on the context, as happens with Uganda and its colonial history, there are still problems that spatial planning tools can address. The outcomes of this research show that spatial planning can facilitate reaching just and more equitable operationalization processes through policy-making on multiscale, stakeholder engagement, and land use management. Spatial planners can assist the processes to converse the policies between and with the levels that span from supranational to local and contribute to better-designed policies and their implementations. With the knowledge of stakeholder engagement processes, planners can also help integrate local communities into the decision-making processes to achieve environmental justice during the operationalization processes. Lastly, as one of the main practices, when it comes to location selection for the projects, the knowledge that has been acquired by the spatial planners' land use management on different scales. In the bottom line, spatial planning tools, particularly decision-making on multilevel structure, participatory planning approach, and strategical and spatial planning on various levels can enhance the operationalization of carbon markets to deliver justice for everyone.

6.3. Limits of the Research and Future Perspectives

Considering the context-dependent nature of carbon market projects, and language barriers in accessing information to understand the different implementation processes, the most significant limit of the research is not being able to understand and provide various practices. Although this study identifies a research gap in linking carbon markets and spatial planning, it needs to be clarified the research gap exists in the literature that has been written in English.

Additionally, even though the Ugandan context was researched, the geographical distance, language barriers, and difficulty in accessing experts on the topic posed further challenges. For future research, a site-based approach could help to enhance the depth and accuracy of findings and conduct more grounded research.

For future research, a valuable avenue would be exploring the integration of climate finance tools and carbon market projects into various planning schemes at different levels to deliver environmental justice. Moreover, previous studies also suggested (Schenkenberg *et al.*, 2013; Sultana, 2022; Carton *et al.*, 2020; Knut *et al.*, 2025) that focus on the geographical and social inequalities (gender-based, disabilities, and so on) among societies and how they can be answered through spatial planning mechanisms. Expanding research in these areas could help for better operationalization processes of carbon markets.

8. References

- “Activities Implemented Jointly under the Pilot Phase”. (n.d.). UNFCCC. <https://unfccc.int/cop7/issues/aij.html>
- “Baselines and Additionality for the 6.4 Mechanism”. (Oct, 2021). UNFCCC. https://unfccc.int/sites/default/files/resource/Art.%206%20presentation_ITEDs_Baseline%20and%20additionality.pdf
- “Cap-and-trade Programme”. (n.d.). UNFCCC. <https://unfccc.int/policy/cap-and-trade-programme#:~:text=Renewable%20power%20generation,permit%20system%20for%20GHG%20emissions.>
- “Climate Finance”. (n.d.). UNFCCC. <https://unfccc.int/topics/introduction-to-climate-finance>
- “COP26 Outcomes: Market Mechanisms and Non-market Approaches (Article 6)”. (n.d.). UNFCCC. <https://unfccc.int/process-and-meetings/the-paris-agreement/the-glasgow-climate-pact/cop26-outcomes-market-mechanisms-and-non-market-approaches-article-6>
- “Emissions Trading.” (n.d.). UNFCCC. <https://unfccc.int/process/the-kyoto-protocol/mechanisms/emissions-trading>
- “IET (International Emission Trading)”. (n.d.). UNFCCC. <https://unfccc.int/international-emissions-trading>
- “National Adaptation Programmes of Action”. (n.d.). UNFCCC. <https://unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/introduction>
- “REDD+”. (n.d.). UNFCCC. <https://unfccc.int/topics/land-use/workstreams/reddplus>
- “The Paris Agreement”. (n.d.). UNFCCC. <https://unfccc.int/process-and-meetings/the-paris-agreement>
- “The Paris Agreement and NDCs”. (n.d.). UNFCCC. <https://unfccc.int/process-and-meetings/the-paris-agreement>
- “Paris Agreement Crediting Mechanism”. (n.d.). UNFCCC. <https://unfccc.int/process-and-meetings/the-paris-agreement/article-64-mechanism>
- “Trees for Global Benefit-Uganda”. (n.d.). UNFCCC Activity Database. <https://unfccc.int/climate-action/momentum-for-change/activity-database/momentum-for-change-trees-for-global-benefit>
- “Uganda”. (n.d.). *Harmony with Nature* UN. <http://harmonywithnatureun.org/provision/5jV46ix!vGfnBpfT9PD0mpUxsjiFYYJWExpRW2syKMulymYtGi36FnVM3dSLsNEN5G8sYs7YLoQUq5l6XP4XQA==>
- “Warsaw International Mechanisms for Loss and Damage Associated with Climate Change Impacts. (n.d.). UNFCCC. https://unfccc.int/topics/adaptation-and-resilience/workstreams/loss-and-damage/warsaw-international-mechanism#tab_home
- African Climate Policy Center. (2013). Vulnerability to Climate Change in Africa: Challenges and Recommendations for Africa. *ClimDev-Africa – Policy Brief* 2.

https://archive.uneca.org/sites/default/files/PublicationFiles/policy_brief_2_vulnerability_to_climate_change_in_africa_challenges_and_recommendations_for_africa.pdf

- Agarwal, A., & Narain, S. (1999). *Global warming in an unequal world: A case of environmental colonialism*. <https://www.indiaenvironmentportal.org.in/files/GlobalWarming%20Book.pdf>
- Aggarwal, A. (2020). Revisiting the land use assumptions in forest carbon projects through a case from India. *Journal of Environmental Management*, 267, 110673. <https://doi.org/10.1016/j.jenvman.2020.110673>
- Aggarwal, A., & Brockington, D. (2020). Reducing or creating poverty? Analyzing livelihood impacts of forest carbon projects with evidence from India. *Land Use Policy*, 95, 104608. <https://doi.org/10.1016/j.landusepol.2020.104608>
- Ahonen, H. M., Kessler, J., Michaelowa, A., Espelage, A., & Hoch, S. (2022). Governance of fragmented compliance and voluntary carbon markets under the Paris Agreement. *Politics and governance*, 10(1), 4759. <https://doi.org/10.17645/pag.v10i1.4759>
- Akrofi, M. M. (2024). Green hotspots? Unveiling global hotspots and shifting trends in carbon credit projects. *Sustainable Development*. <https://doi.org/10.1002/sd.3209>
- Ampaire, E. L., Jassogne, L., Providence, H., Acosta, M., Twyman, J., Winowiecki, L., & Van Asten, P. (2017). Institutional challenges to climate change adaptation: A case study on policy action gaps in Uganda. *Environmental Science & Policy*, 75, 81-90. <http://dx.doi.org/10.1016/j.envsci.2017.05.013>
- Andresen, S. (2015). International climate negotiations: Top-down, bottom-up or a combination of both?. *The International Spectator*, 50(1), 15-30. <https://doi.org/10.1080/03932729.2014.997992>
- Ardö, J. (2021). A Sentinel-2 Dataset for Uganda. [Image]. *Data*, 6(4), 35. <https://doi.org/10.3390/data6040035>
- Asian Development Bank. (2023, Nov). National Strategies for Carbon Markets Under the Paris Agreement - Making Informed Policy Choices. <https://www.adb.org/sites/default/files/publication/928596/national-strategies-carbon-markets-paris-agreement.pdf>
- Atela, J.O. (2012) *The Politics of Agricultural Carbon Finance: The Case of the Kenya Agricultural Carbon Project*, STEPS Working Paper 49, Brighton: STEPS Centre.
- Avar, A. (2019). Urban Politics: Circuits of Capital. [Class handout]. Izmir Institute of Technology, CP438.
- Bachram, H. (2004). Climate fraud and carbon colonialism: the new trade in greenhouse gases. *Capitalism nature socialism*, 15(4), 5-20. <https://doi.org/10.1080/1045575042000287299>
- Bakiika, R., Mbatuusa, C., Mugeere, A., & Amumpiire, A. (2020). *Climate Finance Mobilization in Uganda*. Advocates Coalition for Development and Environment. <https://www.acode-u.org/uploadedFiles/PRS102.pdf>

- Bashaasha, B., Najjingo Mangheni, M., & Nkonya, E. (2013). Decentralization and rural service delivery in Uganda. *International Food Policy Research Institute*. <https://cgspace.cgiar.org/server/api/core/bitstreams/c2a06049-df1a-47b0-b06d-2f1794498b46/content>
- Battocletti, V., Enriques, L., & Romano, A. (2024). The voluntary carbon market: market failures and policy implications. *University of Colorado Law Review*, 95, 519. <https://doi.org/10.2139/ssrn.4380899>
- BBC News. (2010, March 3). Hundreds feared dead after Uganda landslides. *BBC*. <http://news.bbc.co.uk/2/hi/africa/8545005.stm>
- BBC News. (2018, May 10). Uganda profile - Timeline. *BBC News*. <https://www.bbc.com/news/world-africa-14112446>
- Belianska, A., Bohme, N., Cai, K., Diallo, Y., Jain, S., Melina, M. G., ... & Zerbo, S. (2022). Climate change and select financial instruments: an overview of opportunities and challenges for Sub-Saharan Africa.
- Benites-Lazaro, L. L., & Mello-Théry, N. A. (2019). Empowering communities? Local stakeholders' participation in the clean development mechanism in Latin America. *World development*, 114, 254-266. <https://doi.org/10.1016/j.worlddev.2018.10.005>
- Biermann, F., & Kalfagianni, A. (2020). Planetary justice: A research framework. *Earth System Governance*, 6, 100049.
- Blanc, G. (2022). *The invention of green colonialism*. John Wiley & Sons.
- Bumpus, A. G., & Liverman, D. M. (2008). Accumulation by decarbonization and the governance of carbon offsets. *Economic geography*, 84(2), 127-155.
- Bushenyi-Ishaka Municipal Council. (2021, September 17). *Five Year Municipality Local Development Plan 2020/21-2024/25*. <https://bushenyi-ishakamc.go.ug/sites/default/files/Bushenyi-Ishaka%20MC%20DP%20III-%20Draft%2020211709-1%20%281%29.pdf>
- Bond, P., Sharife, K., Allen, F., Amisi, B., Brunner, K., Castel-Branco, R., Dorsey, D., Gambirazzio, G., Hathaway, T., Nel, A. Nham, W. (2012). The CDM Cannot Deliver the Money to Africa: Why the Clean Development Mechanism Won't Save the Planet from Climate Change, and How African Civil Society is Resisting. EJOLT Report No. 2. http://www.ejolt.org/wordpress/wp-content/uploads/2013/01/121221_EJOLT_2_Low.pdf
- Brescia, D., Michaelowa, A., Marr, M. A., Espelage, A., & Kassaye, R. (2019). Transition pathways for the Clean Development Mechanism under Article 6 of the Paris Agreement. Options and implications for international negotiators. https://www.zora.uzh.ch/id/eprint/233868/1/Transition_pathways_for_the_CDM_2019.pdf
- Byendaimira, V. B. (2020, Feb). *Uganda's First National Physical Development Plan (NPDP)*. [Conference Presentation]. World Urban Forum 10, Abu Dhabi, United Arab Emirates. <https://spp-pr.com/conferences/pdf/2ndSPP/S01-01.pdf>
- C40 Knowledge Community. (n.d.). How Cities Can Put a Price on Carbon. https://www.c40knowledgehub.org/s/article/How-cities-can-put-a-price-on-carbon?language=en_US

- Carbon Market Watch. (2017). Good-Bye Kyoto: Transitioning Away from Offsetting After 2020. https://carbonmarketwatch.org/wp-content/uploads/2017/04/Good-bye-Kyoto_Transitioning-away-from-offsetting-after-2020_WEB_1final.pdf
- Carmody, P., & Taylor, D. (2016). Globalization, land grabbing, and the present-day colonial state in Uganda: Ecolonization and its impacts. *The Journal of Environment & Development*, 25(1), 100-126. <https://doi.org/10.1177/1070496515622017>
- Carton, W. (2020). Rendering local: the politics of differential knowledge in carbon offset governance. *Annals of the American Association of Geographers*, 110(5), 1353-1368. <https://doi.org/10.1080/24694452.2019.1707642>
- Carton, W., Asiyambi, A., Beck, S., Buck, H. J., & Lund, J. F. (2020). Negative emissions and the long history of carbon removal. *Wiley Interdisciplinary Reviews: Climate Change*, 11(6), e671. <https://doi.org/10.1002/wcc.671>
- Carton, W., & Edstedt, K. (2021). Making, and remaking, a world of carbon: Uneven geographies of carbon sequestration. In *The Routledge Handbook of Critical Resource Geography* (pp. 401-411). Routledge.
- Cavanagh, C. J., Chemarum, A. K., Vedeld, P. O., & Petursson, J. G. (2017). Old wine, new bottles? Investigating the differential adoption of 'climate-smart' agricultural practices in western Kenya. *Journal of rural studies*, 56, 114-123. <https://doi.org/10.1016/j.jrurstud.2017.09.010>
- CCAC (Climate and Clean Air Coalition). (2024). Uganda. <https://www.ccacoalition.org/partners/uganda>
- Chandrasekhar, A., Dunne, D., Dwyer, O., Evans, S., Gabbatiss, J., Lempriere, M., Song, W., Tandon, A., Viglione, G. (2024, December 4). COP29: Key outcomes agreed at the UN climate talks in Baku. Carbon Brief. <https://www.carbonbrief.org/cop29-key-outcomes-agreed-at-the-un-climate-talks-in-baku/>
- Clapp, C., Leseur, A., Sartor, O., Briner, G. and Corfee-Morlot, J. (2010). "Cities and Carbon Market Finance: Taking Stock of Cities' Experience With Clean Development Mechanism (CDM) and Joint Implementation (JI)", *OECD Environment Working Papers*, No. 29, OECD Publishing, Paris, <https://doi.org/10.1787/5km4hv5p1vr7-en>.
- Climate Action Network. (2016, July 3). The Concept of Climate Finance. <https://caneurope.org/concept-climate-finance/>
- Climate Change Department. (CCD). *Objectives & Functions*. <https://ccd.go.ug/objectives-functions/#:~:text=Key%20Functions%20of%20the%20Climate%20Change%20Department&text=Monitoring%20the%20implementation%20of%20mitigation,UNFCCC%20and%20its%20Kyoto%20Protocol.>
- Commonwealth Local Government Forum. (2018). Country Profile 2017-2018. https://www.clgf.org.uk/default/assets/File/Country_profiles/Uganda.pdf
- Council Dickson, L., Rijal, A. (2014, Jan). Territorial Approach to Climate Change (TACC) Project for the Mbale Region of Uganda - Report of the Terminal Evaluation Mission. <https://erc.undp.org/evaluation/documents/download/8102>

- Dehm, J. (2016). Carbon colonialism or climate justice: Interrogating the international climate regime from a TWAIL perspective. *Windsor YB Access Just.*, 33, 129-161. <https://doi.org/10.22329/wyaj.v33i3.4893>
- Doing Justice Collective, Beer, K., Rodriguez, H., Bogner, K., Burkhart, S., Ehnert, F., Hector, V., Herwix, A., Joshi, N., Novikova, M., Sievert, J., Wandl-Vogt, E. (2024). Doing Justice! Doing Just This! Practicing justice in transdisciplinary and transformative research. <https://dx.doi.org/10.5281/zenodo.13766955>
- Dong, Y., & Olsen, K. H. (2017). Stakeholder participation in CDM and new climate mitigation mechanisms: China CDM case study. *Climate Policy*, 17(2), 171-188. <https://doi.org/10.1080/14693062.2015.1070257>
- Dyck, M., Streck, C. and Trouwloon, D. (2023, October). The Voluntary Carbon Market Explained. *Climate Focus*. <https://vcmprimer.org/wp-content/uploads/2023/12/vcm-explained-full-report.pdf>
- Eastern Africa Alliance. (2022, Dec). Carbon Market Profile: Uganda. https://climatefinanceinnovators.com/wp-content/uploads/2023/06/Carbon-Report_-_Uganda_2023_Rev03_single.pdf
- East African Community. (2011a). East African Community Climate Change Policy. <https://www.eac.int/component/documentmanager/?task=download.document&file=bWFpbl9kb2N1bWVudHNfcGRmX0V3bFlaSkJOSFhnU0ZqbUFYtIRvVkrRNRUFDIENsaW1hdGUgQ2hhbmdlIFBvbGljeSAyMDEx&counter=484>
- East African Community. (2011b). East African Community Climate Change Strategy. <https://www.eac.int/component/documentmanager/?task=download.document&file=bWFpbl9kb2N1bWVudHNfcGRmX0ZJeU5CdXRUWG5oUWpyanFxQ3d0VkrRNRUFDIENsaW1hdGUgQ2hhbmdlIFN0cmF0ZWd5&counter=485>
- East African Community. (2011c). East African Community Climate Change Master Plan. <https://www.eac.int/component/documentmanager/?task=download.document&file=bWFpbl9kb2N1bWVudHNfcGRmX0Zsc3lyVWF1UUFZQ3RnbWNpZ3BxVkrRNRUFDIENsaW1hdGUtQ2hhbmdlLU1hc3RlciBQbGFu&counter=486>
- Ecosystem Marketplace. (2021). Buyers of Voluntary Carbon Offsets – A Regional Analysis. State of the Voluntary Carbon Markets 2020, Third Installment Featuring European Buyers Offset Prices, Volumes and Insights. Forest Trends' Ecosystem Marketplace. <https://www.ecosystemmarketplace.com/publications/buyers-of-voluntary-carbon-offsets-a-regional-analysis-state-of-the-voluntary-carbon-markets-2020-third-installment-featuring-european-and-north-american-buyers-offsets-2020/#:~:text=European%20buyers%20are%20gaining%20market,are%20present%20in%20North%20America.>
- Ecosystem Marketplace. (2024b, May 11). *REDD+ in the Paris Climate Accord: a summary*. <https://www.ecosystemmarketplace.com/articles/redd-in-the-paris-climate-accord-a-summary/>
- Ecosystem Marketplace. (2024a). State of the Voluntary Carbon Market-2024: On the Path to Maturity. *Forest Trends' Ecosystem Marketplace*.

<https://www.ecosystemmarketplace.com/publications/2024-state-of-the-voluntary-carbon-markets-sovcm/>

- EcoTrust. (n.d.). Trees for Global Benefits. <https://EcoTrust.or.ug/trees-for-global-benefits/>
- EcoTrust. (2013, May). Plan Vivo Project Design Document (PDD) Extension of Trees for Global Benefits to Mount Elgon – Districts of Mblae, Manafwe and Bududa. https://www.adaptation-undp.org/sites/default/files/resources/mt_elgon_tree_carbon_scheme_extension_pdd_0.pdf
- EcoTrust. (2020, May). Plan Vivo Project Design Document (PDD) – Trees for Global Benefits. <https://www.planvivo.org/Handlers/Download.ashx?IDMF=70720345-45d4-4d88-85e8-60e651914414>
- EcoTrust. (2024, Oct). Trees for Global Benefits Annual Report January to December 2023. <https://planvivofoundation.eu.rit.org.uk/Handlers/Download.ashx?IDMF=54a4ab87-2339-4cac-a9a5-0f2b582531d9>
- Edstedt, K., & Carton, W. (2018). The benefits that (only) capital can see? Resource access and degradation in industrial carbon forestry, lessons from the CDM in Uganda. *Geoforum*, 97, 315-323. <https://doi.org/10.1016/j.geoforum.2018.09.030>
- Enríquez-de-Salamanca, Á. (2024). Environmental and social impacts of carbon sequestration. *Integrated Environmental Assessment and Management*. <https://doi.org/10.1002/ieam.4925>
- European Commission. (2024). DRMKC – INFORM Country Risk Profile. <https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk/Country-Risk-Profile>
- European Parliament (2015, June 4). Doha Amendment to the Kyoto Protocol. <https://www.europarl.europa.eu/EPRS/EPRS-AaG-559475-Doha-Agreement-Kyoto-Protocol-FINAL.pdf>
- Faecks, B. (2023, Nov 10). The Evolution of Sustainable Development in the Voluntary Carbon Market. *Carbon Market Watch*. <https://carbonmarketwatch.org/2023/11/10/the-evolution-of-sustainable-development-in-the-voluntary-carbon-market/>
- Fainstein, S. (2009). Spatial justice and planning. *Justice Spatiale/Spatial Justice*, 1(1), 1-13. <https://ocw.tudelft.nl/wp-content/uploads/5spatial-justice-and-planning.pdf>
- Fairhead, J., Leach, M., & Scoones, I. (2012). Green grabbing: a new appropriation of nature? *Journal of peasant studies*, 39(2), 237-261. <https://doi.org/10.1080/03066150.2012.671770>
- Fairhurst, L., Barth, B., Isiassaias, I., Githaiga, D., Kehew, R., & Kitio, V. (2010). Making Carbon Markets Work for Your City: A Guide for Cities in Developing Countries. *Nairobi: UN-HABITAT*. <https://unhabitat.org/making-carbon-markets-work-for-your-city-a-guide-for-cities-in-developing-countries>
- Falkner, R. (2016). The Paris Agreement and the new logic of international climate politics. *International Affairs*, 92(5), 1107-1125. <https://doi.org/10.1111/1468-2346.12708>
- FAO. (2015, Jan 26). Uganda – Physical Planning Act (No. 8 of 2010). *FAOLEX Database*. <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC140395/>

- FAO. (2023, April 30). Uganda – Land Act (Cap. 227). *FAOLEX Database*. <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC096350/#:~:text=This%20Act%20makes%20provision%20with,and%20functioning%20of%20land%20tribunals.>
- Favasuli, S. & Sebastian, V. (2021, Jun 10). Voluntary carbon market: How they work, how they're priced and who's involved. *S&P Global*. <https://www.spglobal.com/commodityinsights/en/market-insights/blogs/energy-transition/061021-voluntary-carbon-markets-pricing-participants-trading-corsia-credits>
- Fisher, J. (2012). No pay, no care? A case study exploring motivations for participation in payments for ecosystem services in Uganda. *Oryx*, 46(1), 45-54. <https://doi.org/10.1017/S0030605311001384>
- Fisher, J. A., Cavanagh, C. J., Sikor, T., & Mwayafu, D. M. (2018). Linking notions of justice and project outcomes in carbon offset forestry projects: Insights from a comparative study in Uganda. *Land Use Policy*, 73, 259-268. <https://doi.org/10.1016/j.landusepol.2017.12.055>
- Fogel, C. (2004). The global, the local, and the Kyoto Protocol. *Earthly Politics: Local and Global in Environmental Governance*, S. Jassanof and ML Martello, Eds, 103-126.
- Food and Agriculture Organization of the United Nations. (2024, Jan 30). Uganda – National Environmental Act, 1995 (Cap 153). *FAOLEX Database*. <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC008957/>
- Forest Trends' Ecosystem Marketplace. (2024). State of the Voluntary Carbon Market 2024 – On the Path to Maturity. *Ecosystem Marketplace*. <https://www.ecosystemmarketplace.com/publications/2024-state-of-the-voluntary-carbon-markets-sovcm/>
- Friis-Hansen, E., Bashaasha, B., & Aben, C. (2013). *Decentralization and implementation of climate change policy in Uganda*. DIIS Working Paper. https://www.diis.dk/files/media/publications/import/extra/wp2013-17_ccri_uganda_efh_web.pdf
- Gerrard, M. B., Sethy, S., Xu, H., & Gagliardi, B. (2007). Kyoto's Clean Development Mechanism in Action: India, China and Brazil. *NYLJ*, September 24, 2007. https://scholarship.law.columbia.edu/cgi/viewcontent.cgi?article=4105&context=faculty_scholarship#:~:text=The%20United%20States%2C%20as%20the,directly%20participate%20in%20the%20CDM.
- GGGI (Global Green Growth Institute). (n.d.). *UG56 Creation of a Climate Finance Unit (CFU) and the COP26 Taskforce at MoFPED*. <https://gggi.org/project/ug56-creation-of-a-transitional-climate-finance-unit-tcfu-and-the-cop26-taskforce-at-mofped/>
- GGGI (Global Green Growth Institute). (2017). Uganda Country Planning Framework 2017-2021. <https://gggi.org/wp-content/uploads/2018/04/UGANDA-COUNTRY-PLANNING-FRAMEWORK.pdf>
- GGGI (Global Green Growth Institute). (2022). Uganda Country Planning Framework 2022-2017. <https://gggi.org/wp-content/uploads/2022/11/UGANDA-COUNTRY-PLANNING-FRAMEWORK-2022-2027.pdf>

- Gifford, L. (2020). "You can't value what you can't measure": a critical look at forest carbon accounting. *Climatic Change*, 161(2), 291-306. <https://doi.org/10.1007/s10584-020-02653-1>
- Gifford, L., & Sauls, L. A. (2024). Defining climate finance justice: critical geographies of justice amid financialized climate action. *Geography Compass*, 18(11). <https://doi.org/10.1111/gec3.70008>
- Green Climate Fund. (n.d.). *About*. <https://www.greenclimate.fund/theme/mitigation#>
- Green Resources. (2020, July). *Busoga Forestry Company Ltd – Monitoring Report 2019-2020*. <https://www.greenresources.no/wp-content/uploads/2020/12/BFC-Monitoring-Report-2019-2020.pdf>
- Greenfield, P. (2023, January 30). Revealed: more than 90% of rainforest carbon offsets by biggest certifier are worthless, analysis shows. *The Guardian*. <https://www.theguardian.com/environment/2023/jan/18/revealed-forest-carbon-offsets-biggest-provider-worthless-verra-aoe>
- Greiner, S., Krämer, N., De Lorenzo, F., Michaelowa, A., Hoch, S., Kessler, J. (2020). Article 6 piloting: State of play and stakeholder experiences. *Climate Focus & Perspectives Climate Group*. <https://doi.org/10.5167/uzh-233855>
- Government of Uganda. (n.d.). Uganda at a Glance – History. Uganda National Web Portal. <https://www.gou.go.ug/about-uganda/uganda-glance/history>
- Governo de Parà. (n.d.). International History of REDD+. Secretaries of Environment and Sustainability. <https://www.semas.pa.gov.br/redd/en/international-history-of-redd/>
- Gonzalez, C. G. (2021). The sacrifice zones of carbon capitalism: race, expendability, and loss and damage. In *Research Handbook on Climate Change Law and Loss & Damage* (pp. 43-59). Edward Elgar Publishing. <https://doi.org/10.4337/9781788974028.00009>
- Heras, B., Isakova, I., Spalding-Fecher, R., Hopkins, M. & Haselip, J. (2023). SPAR6C Guide 2 - Developing an Article 6 Host Party Strategy. *Global Green Growth Institute*. <https://gggi.org/wp-content/uploads/2023/12/SPAR6C-Guide-2-Developing-an-Article-6-host-party-strategy.pdf>
- Hartnett, R. (2021). Climate Imperialism: Ecocriticism, Postcolonialism, and Global Climate Change. *eTropic: electronic journal of studies in the Tropics*, 20(2), 138-155.
- Harvey, D. (2001). Globalization and the "spatial fix". *geographische revue: Zeitschrift für Literatur und Diskussion*, 3(2), 23-30. <https://geographische-revue.de/archiv/gr2-01.pdf#page=23>
- Harvey, D. (2004). The 'New' Imperialism: Accumulation by Dispossession. *Socialist Register*, 40. <https://socialistregister.com/index.php/srv/article/view/5811/2707>
- Hedberg, J. (2016). Exploring Local Realities of Carbon Offsetting: Environmental Justice in a Ugandan Carbon Forestry Project. [Master's Thesis]. <https://lup.lub.lu.se/luur/download?func=downloadFile&recordId=8892429&fileId=8895447>
- ICAP (2024). Emissions Trading Worldwide: Status Report 2024. Berlin: International Carbon Action Partnership. https://icapcarbonaction.com/system/files/document/240522_report_final.pdf

- Ingham, K., & Lyons, M. (2023, December 5). *History of Uganda | Events, people, dates, maps, & facts*. Encyclopedia Britannica. <https://www.britannica.com/topic/history-of-Uganda>
- Intergovernmental Panel on Climate Change (IPCC). (n.d.). About. IPCC. <https://www.ipcc.ch/about/>
- IPCC. (2018). Annex I: Glossary [J. B. R. Matthews (Ed.)]. In: *Global Warming of 1.5°C* (pp. 541-562). Cambridge University Press. https://www.ipcc.ch/site/assets/uploads/sites/2/2022/06/SR15_AnnexI.pdf
- IPCC. (2023). *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 35-115, doi: 10.59327/IPCC/AR6-9789291691647.
- Jack, K. and Clarke, H. (2022, Nov 24). Understanding the Two Types of Carbon Market. *AHDB (Agriculture and Horticulture Development Board)*. <https://ahdb.org.uk/news/understanding-the-two-types-of-carbon-market>
- Janin Rivolin, U. (2012). Planning systems as institutional technologies: a proposed conceptualization and the implications for comparison. *Planning Practice and Research*, 27(1), 63-85. <https://doi.org/10.1080/02697459.2012.661181>
- Kainou, K. (2022, Mar 16). Collapse of the Clean Development Mechanism Scheme Under the Kyoto Protocol and its spillover: Consequences of 'carbon panic'. *VoxEU*. <https://cepr.org/voxeu/columns/collapse-clean-development-mechanism-scheme-under-kyoto-protocol-and-its-spillover>
- Kakuru, W. (2013, April). *TACC Mbale Capacity Development Action Plan: Short Version Final*. United Nations Development Programme. https://www.adaptation-undp.org/sites/default/files/resources/tacc_mbale_capacity_development_action_plan_short_version_final.pdf
- Knuth, S., Taylor, Z., Zavareh Hofmann, S., Grafe, F. J., & Ponder, C. S. (2025). The urbanization of climate finance: Understanding for urban action. *Journal of Urban Affairs*, 47(1), 1-18. <https://doi.org/10.1080/07352166.2024.2393973>
- Kollmuss, A., Zink, H., & Polycarp, C. (2008). Making sense of the voluntary carbon market: A comparison of carbon offset standards. WWF Germany, 1-23. https://www.globalcarbonproject.org/global/pdf/WWF_2008_A%20comparison%20of%20C%20offset%20Standards.pdf
- Kyoto Protocol. (Dec. 11, 1997). <https://unfccc.int/resource/docs/convkp/kpeng.pdf>
- Lahsen, M. (2009). A science–policy interface in the global south: the politics of carbon sinks and science in Brazil. *Climatic change*, 97(3), 339-372.
- Lee, J., Ingalls, M., Erickson, J. D., & Wollenberg, E. (2016). Bridging organizations in agricultural carbon markets and poverty alleviation: An analysis of pro-Poor carbon market projects in East Africa. *Global Environmental Change*, 39, 98-107. <http://dx.doi.org/10.1016/j.gloenvcha.2016.04.015>

- Lee, J. (2017). Farmer participation in a climate-smart future: Evidence from the Kenya Agricultural Carbon Project. *Land use policy*, 68, 72-79. <http://dx.doi.org/10.1016/j.landusepol.2017.07.020>
- Liverman, D. M. (2009). Conventions of climate change: constructions of danger and the dispossession of the atmosphere. *Journal of historical geography*, 35(2), 279-296. <https://doi.org/10.1016/j.jhg.2008.08.008>
- Lo, A. Y., Cong R. (2022) Emission reduction targets and outcomes of the Clean Development Mechanism (2005–2020). *PLOS Climate* 1(8). <https://doi.org/10.1371/journal.pclm.0000046>
- Lohmann, L. (2008) Carbon Trading, Climate Justice and the Production of Ignorance: Ten examples. *Development* 51, 359–365 (2008). <https://doi.org/10.1057/dev.2008.27>
- Lovell, H. C. (2010). Governing the carbon offset market. *Wiley interdisciplinary reviews: climate change*, 1(3), 353-362. <https://doi.org/10.1002/wcc.43>
- Manahan, M. A., Bringel, B., & Lang, M. (2024, Jun 25). *Unmasking Green Colonialism Behind “Decarbonization Consensus”*. FIAN International. https://www.fian.org/files/is/htdocs/wp11102127_GNIAANVR7U/www/files/WATCH_%20Framing%20Piece_30_05_2024_v2_upload.pdf
- Martinez-Alier, J., Temper, L., Del Bene, D., & Scheidel, A. (2016). Is there a global environmental justice movement?. *The Journal of Peasant Studies*, 43(3), 731-755. <http://dx.doi.org/10.1080/03066150.2016.1141198>
- Mathur, V. N., Afionis, S., Paavola, J., Dougill, A. J., & Stringer, L. C. (2014). Experiences of host communities with carbon market projects: towards multi-level climate justice. *Climate Policy*, 14(1), 42-62. <https://doi.org/10.1080/14693062.2013.861728>
- Mbale District Local Government. (2020). Third District Development Plan 2020/21-2024/25: Improving the Sustainability of Mbale District for Inclusive Growth and Social Economic Transformation. <https://www.mbale.go.ug/publications/district-development-plan-iii#:~:text=The%20Mbale%20District%20Development%20Plan,GROWTH%20AND%20SOCIAL%20ECONOMIC%20TRANSFORMATION%20%22.>
- Michaelowa, A. (2012). Determination of baselines and additionality for the CDM: A crucial element of credibility of the climate regime. In *Climate Change and Carbon Markets* (pp. 329-344). Routledge. <http://ebookcentral.proquest.com/lib/polito-ebooks/detail.action?docID=430222>.
- Michaelowa, A., Espelage, A., Müller, B., & European Capacity Building Initiative. (2019a). Negotiating cooperation under Article 6 of the Paris Agreement. <https://doi.org/10.5167/uzh-195633>
- Michaelowa, A., Shishlov, I., & Brescia, D. (2019b). Evolution of international carbon markets: lessons for the Paris Agreement. *Wiley Interdisciplinary Reviews: Climate Change*, 10(6), e613. <https://doi.org/10.1002/wcc.613>
- Michaelowa, A., Shishlov, I., Hoch, S., Bofill, P., & Espelage, A. (2019c). Overview and comparison of existing carbon crediting schemes. Helsinki: Nordic Environment Finance Corporation (NEFCO). <https://doi.org/10.5167/uzh-175378>

Ministry of Agriculture, Animal Industry and Fisheries. (2018). National Adaptation Plan for the Agricultural Sector. <https://www.agriculture.go.ug/wp-content/uploads/2019/09/National-Adaptation-Plan-for-the-Agriculture-Sector.pdf>

Ministry of Lands, Housing and Urban Development. (2006, June). The National Land Use Policy. <https://mlhud.go.ug/wp-content/uploads/2013/08/National-Land-use-Policy.pdf>

Ministry of Lands, Housing and Urban Development. (2013). The Uganda National Land Policy. <https://faolex.fao.org/docs/pdf/uga163420.pdf>

Ministry of Lands, Housing and Urban Development. (2019). National Physical Development Plan. <https://mlhud.go.ug/wp-content/uploads/2019/05/FINAL-DRAFT-NATIONAL-PHYSICAL-DEVELOPMENT-PLAN.pdf>

Ministry of Water, Land and Environment. (1995). The Draft National Environment Action Plan for Uganda. https://pdf.usaid.gov/pdf_docs/PNABW415.pdf

Ministry of Water and Environment. (2011). The National Forest Plan. <https://faolex.fao.org/docs/pdf/uga176203.pdf>

Ministry of Water and Environment. (2012). Nationally Appropriate Mitigation Actions. https://procurement-notice.undp.org/view_file.cfm?doc_id=52698

Ministry of Water and Environment. (2015). National Climate Change Policy. <https://www.mwe.go.ug/sites/default/files/library/National%20Climate%20Change%20Policy%20April%202015%20final.pdf>

Ministry of Water and Environment. (2017a). Forest Investment Program in Uganda. <https://www.mwe.go.ug/sites/default/files/library/Forest%20Investment%20Program%20for%20Uganda.pdf>

Ministry of Water and Environment. (2017b). National REDD+ Strategy and Action Plan. <https://mwe.go.ug/sites/default/files/library/Final%20-%20Uganda%20REDD%2B%20Strategy%20and%20Action%20Plan-October%202017.pdf>

Ministry of Water and Environment. (2022a, Sep). Updated Nationally Determined Contribution (NDC). https://www.undp.org/sites/g/files/zskgke326/files/2024-10/updated_20ndc_20_uganda_2022_20final.pdf

Ministry of Water and Environment. (2022b, July). Uganda's Third National Communication to the United Nations Framework Convention on Climate Change. <https://unfccc.int/sites/default/files/resource/Final%20TNC%20Uganda.pdf>

Ministry of Water and Environment. (2020, June). National REDD+ Strategy and Action Plan – Second Edition. https://redd.unfccc.int/media/uganda_redd_strategy_-_second_edition_june_2021.pdf

Ministry of Water and Environment. (2024). Institutional Framework for Water and Environment. <https://www.mwe.go.ug/mwe/institutional-framework-water-and-environment>

Ministry of Water, Lands and Environment. (2001). The Uganda Forestry Policy. <https://www.nfa.go.ug/images/UgandaForestryPolicy2001.pdf>

- Ministry of Water, Lands and Environment. (2002, October). National Forestry Plan. https://www.nfa.go.ug/images/National_Forestry_Plan_2002.pdf
- Mohai, P., Pellow, D., & Roberts, J. T. (2009). Environmental justice. *Annual review of environment and resources*, 34(1), 405-430. <https://doi.org/10.1146/annurev-environ-082508-094348>
- Muguzi, H. & Kafuuma, F. V. (2020). Commercialized Politics and Captivity of State Institutions in Uganda. [Image]. Alliance for Finance Monitoring (ACFIM). https://www.researchgate.net/publication/348994216_COMMERCIALIZED_POLITICS_AND_CAPTIVITY_OF_STATE_INSTITUTIONS_IN_UGANDA_ACFIM_Monitoring_Money_in_Politics
- Murray, G. (2017). Marx's Circuit of Capitalist Production. *Capitalist networks and social power in Australia and New Zealand*. [Image]. Routledge.
- National Bureau for NGOs. (n.d.). *Our History*. <https://www.ngobureau.go.ug/our-history>
- National Planning Authority (NPA). (n.d.). *Development Planning*. <https://www.npa.go.ug/>
- National Planning Authority. (2009, Sept). Comprehensive National Development Planning Framework (CNDPF). <https://www.npa.go.ug/wp-content/uploads/2023/03/CNDPF-Revised-04-09-09.pdf>
- National Planning Authority. (2010, April). First National Development Plan 2010/11-2014/15. https://planipolis.iiep.unesco.org/sites/default/files/ressources/uganda_ndp_april_2010.pdf
- National Planning Authority. (2014, April). The Local Government Development Planning Guidelines. <https://www.mbale.go.ug/sites/default/files/LOCAL%20GOVERNMENT-PLANNING-GUIDELINES.pdf>
- National Planning Authority. (2015). Second National Development Plan 2015/16-2019/20. <https://www.ugandainvest.go.ug/wp-content/uploads/2016/03/National-Development-Plan-2015-16-to-2019-20.pdf>
- National Planning Authority. (2017a). Uganda Green Growth Development Strategy, 2017/18 – 2030/31.
- National Planning Authority. (2017b). Uganda Green Growth Development Strategy: Implementation Roadmap: From Strategy To Action.
- National Planning Authority. (2020, July). Third National Development Plan 2020/21-2024/25. https://www.npa.go.ug/wp-content/uploads/2023/03/NDPIII-Finale_Compressed.pdf
- Newell, R. G., Pizer, W. A., & Raimi, D. (2013). Carbon markets 15 years after Kyoto: Lessons learned, new challenges. *Journal of Economic Perspectives*, 27(1), 123-146. <http://dx.doi.org/10.1257/jep.27.1.123>
- Ngai, N. B. (2021, July 23). Building regional strategies for carbon credits in forestry. *Vietnam Investment Review - VIR*. <https://vir.com.vn/building-regional-strategies-for-carbon-credits-in-forestry-86002.html>
- Ntiwane, B., & Coetzee, J. (2018). Environmental justice in the context of planning. *Town and Regional Planning*, 72, 84-98. <http://dx.doi.org/10.18820/2415-0495/trp72i1.7>

- Nyasimi, M., Radeny, M. A., Mungai, C., & Kamini, C. (2016). Uganda's National Adaptation Programme of Action: Implementation, challenges and emerging lessons. <https://cgspace.cgiar.org/server/api/core/bitstreams/a412097b-4710-4bbb-9352-7f25f2243024/content>
- Oakland Institute. (2014). The darker side of green: Plantation forestry and carbon violence in Uganda. https://www.oaklandinstitute.org/sites/oaklandinstitute.org/files/Report_DarkerSideofGreen_hirez.pdf
- Oakland Institute. (2017). Evicted For Carbon Credits Norway, Sweden, And Finland Displace Ugandan Farmers For Carbon Trading. https://www.oaklandinstitute.org/sites/oaklandinstitute.org/files/evicted-carbon_0.pdf
- Oakland Institute. (2020, March 11). Swedish Energy Agency Terminates Carbon Credits Agreement with Green Resources. <https://www.oaklandinstitute.org/swedish-energy-agency-terminates-carbon-credits-agreement-green-resources>
- Ojambo, H. (2012). Decentralisation in Africa: a critical review of Uganda's experience: conference paper. *Potchefstroom Electronic Law Journal*, 15(2), 69-88. <https://doi.org/10.4314/pej.v15i2.4>
- Okereke, C., & Coventry, P. (2016). Climate justice and the international regime: before, during, and after Paris. *Wiley Interdisciplinary Reviews: Climate Change*, 7(6), 834-851. <https://doi.org/10.1002/wcc.419>
- Okiror, J. J., Hansen, E. F., Bashaasha, B., & Nakendo, I. (2017). A white elephant in a changing climate: a territorial approach to climate change adaptation in Uganda. In *Decentralized governance of adaptation to climate change in Africa* (pp. 51-59). Wallingford UK: CABI.
- Pagop, S. C., & Savard, L. (2024). Voluntary Carbon Markets in Africa: A Deep Dive Into Opportunities and Challenges. *Research papers & Policy papers*, (1980). https://www.policycenter.ma/sites/default/files/2024-04/PP_05-24%20%28Sabrina%20Camelia%20Pagop%20%26%20Luc%20Savard%29.pdf
- Paris Agreement. (2015). https://unfccc.int/sites/default/files/english_paris_agreement.pdf
- PDD. (2012). Design, P., Form, D., & Afforestation, F. O. R. (2012). UNFCCC/CCNUCC CDM – Executive Board Project Design Document Form for Afforestation And Reforestation Project Activities (CDM-AR-PDD) - Version 05, 1–150.
- Plan Vivo. (2020, May 12). Our History. *Plan Vivo*. <https://www.planvivo.org/history>
- Ploechl, C., Sammut, F., Crus, L., Spalding-Felder, R., Zhezherin, V. (2023). SPARC6 Guide 5 – Screening and developing Article 6 Activities. *Global Green Growth Institute*. <https://ggi.org/wp-content/uploads/2023/12/SPARC6-Guide-5-Screening-and-developing-Article-6-activities.pdf>
- Pollak, M., & Wilson, E. J. (2009). Risk governance for geological storage of CO₂ under the Clean Development Mechanism. *Climate Policy*, 9(1), 71-87. <https://doi.org/10.3763/cpol.2008.0528>
- Purdon, M., & Byakagaba, P. (2022). Evaluating the transformational impact of a forest carbon offsetting programme in Uganda: Lessons from a ten-year investigation into the Trees for

- Global Benefits Programme. *Chair of Decarbonization Working Paper Series*.
https://decarbonisation.uqam.ca/wp-content/uploads/sites/10/2022/05/ChaireWorkingPaper_2022-1_Purdon-Byakagaba-Final.pdf
- Republic of Uganda (RoU). (1995, May 19). The National Environmental Act, Cap. 153.
https://nema.go.ug/sites/all/themes/nema/docs/national_environment_act.pdf
- Republic of Uganda. (2003). The National Forestry and Tree Planting Act.
https://ugandatrades.go.ug/media/National_Forestry_and_Tree_Planting_Act_2003.pdf
- Republic of Uganda. (2007). Climate Change – Uganda National Adaptation Programs of Action.
<https://unfccc.int/resource/docs/napa/uga01.pdf>
- Republic of Uganda. (2010a, April 28). The Physical Planning Act.
<https://faolex.fao.org/docs/pdf/uga140395.pdf>
- Republic of Uganda. (2010b). Uganda Strategic Investment Framework for Sustainable Land Management 2010-2020. <https://faolex.fao.org/docs/pdf/uga169607.pdf>
- Republic of Uganda. (2010c). National Development Plan I (2010/11-2014/15).
<https://faolex.fao.org/docs/pdf/uga152507.pdf>
- Republic of Uganda. (2013). Vision 2040. <https://faolex.fao.org/docs/pdf/uga155949.pdf>
- Republic of Uganda. (2017). Strategic Program for Climate Resilience: Uganda – Pilot Program for Climate Resilience. https://ccd.go.ug/wp-content/uploads/2019/10/Uganda-Strategic-Programme-for-Climate-Resilience_May_2017.pdf
- Richmond, A. K., Malcomb, D., & Ringler, K. (2015). Household vulnerability mapping in Africa's Rift Valley. [Image]. *Applied Geography*, 63, 380-395.
<https://doi.org/10.1016/j.apgeog.2015.07.013>
- Rodrik, D. (2017). What Will Not Work. *Straight talk on trade: Ideas for a sane world economy*. (pp. 202-221).
- Sassen, S. (2016). Land grabs today: Feeding the disassembling of national territory. In *Land Grabbing and Global Governance* (pp. 25-46). Routledge.
<https://doi.org/10.1080/14747731.2013.760927>
- Scherr, S. J., Shames, S., & Friedman, R. (2012). From climate-smart agriculture to climate-smart landscapes. *Agriculture & Food Security*, 1, 1-15.
<http://www.agricultureandfoodsecurity.com/content/1/1/12>
- Schreckenber, K., Mwayafu, D. M., & Nyamutale, R. (2013). *Finding Equity in Carbon Sequestration: a case study of the Trees for Global Benefits project, Uganda*. Espa/UCSD.
<https://www.espa.ac.uk/files/espa/Case%20Study%20Trees%20for%20Global%20Benefits%20Project,%20Uganda.pdf>
- Shames, S., Heiner, K., Kapukha, M., Kiguli, L., Masiga, M., Kalunda, P. N., ... & Wekesa, A. (2016). Building local institutional capacity to implement agricultural carbon projects: participatory action research with Vi Agroforestry in Kenya and EcoTrust in Uganda. *Agriculture & Food Security*, 5, 1-15. <https://doi.org/10.1186/s40066-016-0060-x>

- Shedrak, W. A. (2022, Oct 9). Uganda's Wildlife and Protected Areas. [Image]. <https://storymaps.arcgis.com/stories/13ac7f5b2ad24d0c9191e7051dee23f9>
- Shishlov, I., & Bellassen, V. (2012). 10 lessons from 10 years of the CDM (Research Report, auto-saisine). <https://hal.science/hal-01151437v2>
- Stevis, D., & Felli, R. (2020). Planetary just transition? How inclusive and how just?. *Earth System Governance*, 6, 100065.
- Streck, C., Dyck, M. & Trouwloon, D. (2021, December). The Voluntary Carbon Market: Explained. *Climate Focus*. https://climatefocus.com/wp-content/uploads/2021/12/20230118_VCM-Explained_All-Chapters_Compressed_final.pdf
- Sultana, F. (2021). Critical climate justice. *The Geographical Journal*, 188(1), 118-124. <https://doi.org/10.1111/geoj.12417>
- Sultana, F. (2023). Whose growth in whose planetary boundaries? Decolonising planetary justice in the Anthropocene. *Geo: Geography and Environment*, 10(2). <https://doi.org/10.1002/geo2.128>
- The Nature Conservancy. (2024, Feb 19). Article 6 Explainer. https://www.nature.org/content/dam/tnc/nature/en/documents/TNC_Article_6_Explainer.pdf
- The Marxist Project. (2021, May 25). Fundamentals of Marx: Three Circuits of Industrial Capital. [Video]. Youtube. <https://www.youtube.com/watch?v=V4Oxe17GV0w>
- Tramel, S. (2016). The road through Paris: Climate change, carbon, and the political dynamics of convergence. *Globalizations*, 13(6), 960-969. <https://doi.org/10.1080/14747731.2016.1173376>
- Trisos, C. H., Adelekan, I. O., Totin, E., Ayanlade, A., Efitre, J., Gameda, A., Kalaba, K., Lennard, C., Masao, C., Mgaya, Y., Ngaruiya, G., Olago, D., Simpson, N. P., & Zakieldean, S. (2022). Africa. In H.-O. Pörtner, D. C. Roberts, M. Tignor, E. S. Poloczanska, K. Mintenbeck, A. Alegria, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, & B. Rama (Eds.), *Climate Change 2022: Impacts, Adaptation, and Vulnerability* (pp. 1285–1455). *Intergovernmental Panel on Climate Change (IPCC), Sixth Assessment Report*. Cambridge University Press. https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter09.pdf
- Tukahirwa, J. M. (2002). Policies, people and land use change in Uganda: A case study in Ntungamo, Lake Mburo and Sango Bay sites. *LUCID Working Paper*. <https://cgspace.cgiar.org/server/api/core/bitstreams/86ab2456-f7d0-4352-a9d0-0b9f63349356/content>
- UNDP. (2015, Nov 29). The Clean Development Mechanism: A User's Guide. <https://www.undp.org/publications/undp-cdm-manual>
- UNDP Uganda Team. (2024, August 1). Uganda Annual Report 2023. <https://www.undp.org/uganda/publications/undp-uganda-annual-report-2023>
- UNEP Copenhagen Climate Center. (2024, Feb). Analysis: CDM Transition to Article 6. [Video]. Youtube. <https://www.youtube.com/watch?v=iMCGtY8feL8&t=3s>

- United Nations Framework Convention on Climate Change (UNFCCC). (n.d.). *CDM: Project activities*. <https://cdm.unfccc.int/Projects/projsearch.html>
- UNFCCC. (n.d.-a). *CDM: Kachung Forest Project: Afforestation on Degraded Lands*. <https://cdm.unfccc.int/Projects/DB/TUEV-SUED1301918616.32/view>
- UNFCCC. (2007). *The Kyoto Protocol Mechanisms: International Emissions Trading Clean Development Mechanism Joint Implementation*. <https://unfccc.int/resource/docs/publications/mechanisms.pdf>
- UNFCCC. (2013). *Clean Development Mechanism - Executive Board Annual Report 2013*. https://unfccc.int/resource/docs/publications/pub_cdm_eb_annualreport_2013.pdf
- UNFCCC. (2014). *Clean Development Mechanism - Executive Board Annual Report 2014*. https://unfccc.int/resource/docs/publications/unfccc_cdm-eb_annual_report2014.pdf
- UNFCCC. (2018). *Achievements of the Clean Development Mechanism: Harnessing Incentive for Climate Action*. https://unfccc.int/sites/default/files/resource/UNFCCC_CDM_report_2018.pdf
- UNFCCC. (2023, Dec 31). *Project Activities*. <https://cdm.unfccc.int/Statistics/Public/CDMinsights/index.html>
- UN-Habitat. (2007, Dec). *A Guide To Property Law in Uganda*. <https://unhabitat.org/sites/default/files/download-manager-files/A%20Guide%20to%20Property%20Law%20in%20Uganda.pdf>
- UN-Habitat. (2016). *Uganda Country Programme Document 2016-2021*. https://unhabitat.org/sites/default/files/documents/2019-05/un-habitat_country_programme_document_2016-2021_-_uganda.pdf
- University of Notre Dame. (2022). *Rankings – Uganda Country Profile. Notre Dame Global Adaptation Initiative*. <https://gain.nd.edu/our-work/country-index/rankings/>
- University of Notre Dame. (2024). *Country Index. Notre Dame Global Adaptation Initiative*. <https://gain.nd.edu/our-work/country-index/>
- Van Abel, C. (2014). *Carbon Offset Credit Hurdles for Municipal Solid Waste Projects. Waste Advantage*. <https://wasteadvantagemag.com/carbon-offset-credit-hurdles-for-municipal-solid-waste-projects/>
- Vieira, R. S., & Bauer, L. (2023). *Climate neocolonialism: the carbon metric under the intergenerational justice. Sequência (Florianópolis)*, 44(95), e98530. <https://doi.org/10.5007/2177-7055.2023.e98530>
- Wang, X., Huang, J., & Liu, H. (2022). *Can China's carbon trading policy help achieve Carbon Neutrality?—A study of policy effects from the Five-sphere Integrated Plan perspective. Journal of environmental management*, 305, 114357. <https://doi.org/10.1016/j.jenvman.2021.114357>
- Wang, J., & Hao, S. (2023). *The spatial impact of carbon trading on harmonious economic and environmental development: evidence from China. Environmental Geochemistry and Health*, 45(8), 6495-6515. <https://doi.org/10.1007/s10653-023-01601-z>

- Wang, D., & Sun, M. (2024). The impact of the carbon trading market on urban coordinated development in China. *Environmental Science and Pollution Research*, 31(13), 20093-20116. <https://doi.org/10.1007/s11356-024-32428-5>
- WBG (World Bank Group) & KEPSA (Kenya Private Sector Alliance). (2024). "A Carbon Market Guidebook for Kenyan Enterprises", World Bank, Washington, DC. <https://admin.kepsa.or.ke/public/files/docs/17129173352.pdf>
- While, A. (2008). Viewpoint: Climate Change and Planning: Carbon Control and Spatial Regulation. *The Town Planning Review*, 79(1), vii–xiii. <http://www.jstor.org/stable/40112744>
- Williams, J. (2013, March). Toward a theory of spatial justice. In *Annual Meeting of the Western Political Science Association*. Los Angeles, CA "Theorizing Green Urban Communities". [Paper presentation]. <https://www.wpsanet.org/papers/docs/Williams,%20Spatial%20Justice,%20WPSA%202013.pdf>
- Winthrop, M., Kajumba, T., & Maclvor, S. (2018). Uganda Country Climate Risk Assessment Report. Irish Aid, Resilience and Economic Inclusion Team. *Policy Unit*, 1-41. <https://www.iied.org/sites/default/files/pdfs/2023-11/22091g.pdf>
- World Bank. (2024). *State and Trends of Carbon Pricing 2024*. Washington, DC: Author. <https://documents1.worldbank.org/curated/en/099081624122529330/pdf/P50228315fd8d1050186341ea02e1c107bc.pdf>
- World Rainforest Movement (WRM). (2000, June 18). Uganda: Carbon sinks and Norwegian CO₂ colonialism. *World Rainforest Movement*. <https://www.wrm.org.uy/other-information/uganda-carbon-sinks-and-norwegian-co2lonialism>
- Wyburd, I. (2023, Nov 9). REDD+ FAQ: Explaining the ins and outs of forestry climate projects. *Carbon Market Watch*. <https://carbonmarketwatch.org/2023/11/09/redd-faq/>
- Zhang, Y., Chen, N., Wang, S., Wen, M., & Chen, Z. (2023). Will carbon trading reduce spatial inequality? A spatial analysis of 200 cities in China. *Journal of Environmental Management*, 325, 116402. <https://doi.org/10.1016/j.jenvman.2022.116402>
- Zhao, Z., Zheng, Y., Ye, C., Chen, S., & Wu, T. (2024). The Impact of Carbon Emissions Trading System on Regional Green Innovation: A Perspective of Foreign Investment Agglomeration. *Polish Journal of Environmental Studies*, 33(4), 4973-4985. <http://dx.doi.org/10.15244/pjoes/176163>
- Zheng, Y., & Zhang, B. (2023). The impact of carbon market on city greening: Quasi-experimental evidence from China. *Resources, Conservation and Recycling*, 193, 106960. <https://doi.org/10.1016/j.resconrec.2023.106960>
- Zimm, C., Mintz-Woo, K., Brutschin, E., Hanger-Kopp, S., Hoffmann, R., Kikstra, J. S., Kuhn, M., Min, J., Muttarak, R., Pachauri, S., Patange, O., Riahi, K. & Schinko, T. (2024). Justice considerations in climate research. *Nature Climate Change*, 14(1), 22-30. <https://doi.org/10.1038/s41558-023-01869-0>

9. Annex

Annex 1: Policy Framework Analysis

Spatial Planning		Keyterms						
Main Topic		Climate change		Community engagement & Inclusivity				
Sub-topic		Climate change	UNFCCC	Inclusive	Community	Local government	Decentralization	Participation
1997	Local Government Act	-	-	-	2	337	5	2
2006	National Land Use Policy	4	6	-	6	17	3	6
2007	Comprehensive National Development (Devt.) Framework	-	-	3	-	33	2	4
2010	Physical planning act	-	-	-	1	37	-	-
2013	National Land Policy	18	1	-	10	24	10	1
2013	Vision 2040	26	1	1	5	12	5	17
2014	Local Government Devt.Planning Guidelines	11	-	-	-	290	3	36
2016	UN habitat program	9	4	26	18	43	10	7
2017	Uganda National Urban Policy	6	3	15	5	20	2	4
2019	National Physical Development Plan	7	-	1	2	15	1	1
2020	Local Government Devt. Planning Guidelines	12	-	1	10	330	6	36

Environmental Management&Climate Change		Keyterms									
Main Topic		Carbon market			International Agr.		Climate Change			Sectoral terms	
Sub-topic		Carbon related terms	CD M	REDD/ REDD +	UN, UNF CCC	Kyoto Protoc., Paris Agt.	Climate Change	Adaptation& Mitigation	Climate finance	Climate-smart agriculture	Agro-forestry
1995	National Environment Statue	-	-	-	-	-	-	-	-	-	-
1998	National Environment Action Plan	-	-	-	7	-	6	-	-	-	3
2001	Uganda Forestry Policy	1	-	-	1	-	1	-	-	-	3
2002	National Forestry Plan	5	7	-	3	2	1	2	3	-	69
2006	National Land Use Policy	1	-	-	4	-	4	-	1	-	1
2007	National Adaptation Programs of Action	-	2	-	9	3	161	28		-	-
2010	Strategic Investment Framework for Sustainable Land Management 2010-2020	24	7	5	10	1	107	64	9	-	21

Environmental Management&Climate Change		Keyterms									
Main Topic		Carbon market			International Agr.		Climate Change			Sectoral terms	
Sub-topic		Carbon rel. terms	CDM	RED/REDD +	UN, UNF CCC	Kyoto Protoc., Paris Agt.	Climate Change	Adaptation & Mitigation	Climate finance	Climate-smart agriculture	Agroforestry
2011	National Forest Plan	5	11	24	12	5	27	13	-	-	17
2012	Nationally Appropriate Mitigation Actions	2	19	18	22	1	68	27	-	-	2
2013	National Land Policy	-	-	-	1	2	13	7	-	-	-
2014	National Environment Management Policy	-	1	-	6	-	40	13	1	1	-
2015	National Climate Change Policy	3	6	14	6	7	447	117	2	-	3
2017	National REDD+ Strategy Action Plan	88	-	401	17	6	69	43	6	21	76
2017	Forest Investment Program in Uganda	3	1	78	6	-	91	55	12	4	6
2017	Strategic Program for Climate Resilience	3	5	11	-	9	535	155	15	22	13
2018	National Adaptation Plan for Agriculture Sector	-	-	5	2	2	359	126	13	42	4
2019	National Environment Act	-	-	-	-	10	12	12	-	-	-
2021	National Climate Change Act	7	-	-	33	15	297	125	4	-	-
2021	National REDD+ Strategy Action Plan	27	-	250	14	4	17	10	2	3	26

Spatial Planning & Carbon Market		Keyterms									
Main Topic											
Sub-topic		Climate finance	Carbon market	UN	UN Agr.	Low carbon	Local Gov.	Community based	Inclusivity/participatory	Climate-smart agr.	Agroforestry
2010	National Development Plan I	-	7	1	4	1	129	21	5	-	1
2011	East African Community Climate Change Policy	-	33	2	5	1	-	4	-	-	1
2011	EAC Climate Change Strategy	9	90	49	35	15	7	3	-	-	8
2011	EAC Master Plan	7	77	52	29	11	8	5	-	1	11
2015	National Development Plan II	2	6	2	1	4	106	4	103	-	1
2017	Vision 2040 Implementation Roadmap	1	0	0	4	3	4	1	3	2	3
2017	Vision 2040 Green Growth Strategy 2017-2030	4	9	6	2	9	17	-	-	4	4
2020	National Development Plan III	-	1	-	-	2	72	-	10	3	3
2022	NDC (Nationally Determined Contributions)	1	3	4	28	3	6	1	-	2	5

Annex 2: Consent Form



Politecnico
di Torino

Polytechnical University of Turin

Interuniversity Department of Regional and Urban Studies and Planning
M.Sc. in Territorial, Urban, Environmental and Landscape Planning

Consent Form for the Research Thesis “Geographies of Carbon Trading: Spatial Planning Strategies for Equitable Offset Projects”

This research is being conducted by Cemre Betul Ay, a master’s degree student in Territorial, Environmental, Urban, and Landscape Planning field at the Polytechnic University of Turin (Politecnico di Torino), under the supervision of Prof. Giancarlo Cotella and Asst. Prof. Erblin Berisha. The study aims to examine how environmental injustices arise through the carbon credit mechanism, with a particular focus on Uganda, and to explore how spatial planning tools can address these issues.

To provide a comprehensive understanding of the mechanism and its operationalization, interviews will be conducted with stakeholders, experts, and academics. Thank you for agreeing to participate in this research project. This consent form is provided to ensure that you are informed about the purpose of your involvement and that you agree to the conditions of your participation, in line with ethical standards for academic research.

The interview will be recorded, and a transcript will be produced for analysis by the researcher. The records and transcripts will be accessible only to the researcher and her supervisors and will be securely stored. Any information derived from the interview will be anonymized, and your confidentiality will be strictly maintained. For any questions or further information, please feel free to contact the researcher via s312536@studenti.polito.it or iamcemreay@gmail.com.

I, _____, hereby consent to participate voluntarily as requested in the interview in this research study.

- I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind.
- I understand that I can withdraw permission to use data from my interview within two weeks after the interview, in which case the material will be deleted.
- I have had the purpose and nature of the study explained to me and I have had the opportunity to ask questions about the study.
- I understand that the signed consent forms and interview transcripts will be retained for research analysis purposes and will be deleted afterward.
- I understand that in any report on the results of this research, my identity will remain anonymous, and extracts from my interview may be quoted in the thesis. In such cases, I would like to be referred to as:
 - Name of your organization and your role:*
 - Fully anonymized*
- I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

Signature of Participant and Date

Annex 3: List of Interviewees

No.	Date	Institution	Role
1	9.12.2024	UNDP	Spatial planner, High-level officer
2	9.12.2024	UNDP	Specialization in Environmental Management, Middle manager
3	18.12.2024	NFA	Public relations manager, High-level officer
4	19.12.2024	SEA	Specialization in Political ecology, Former scholar & Researcher
5	4.1.2025	A university in Uganda	Specialization in Land Use and Management, Academician
6	13.1.2025	International Development Agency of Germany (GIZ)	Specialization in Environmental Management, High-level Officer
7	15.1.2025	Ministry of Water and Environment	Environmental engineer, High-level Officer
8	23.1.2025	Ministry of Land, Housing and Urban Development	Physical planner, High-level Officer
9	29.1.2025	Napak District Local Government	Physical Planner, High-level Officer

Annex 4: Questions

Semi-structured Questions:

1. Are you familiar with the concepts of carbon markets/spatial planning/environmental justice?
2. Do you think the country has enough policy frameworks to regulate climate finance implementations? And have they been functioning effectively?
3. What are your thoughts on the role of carbon markets in contributing to Uganda's sustainable development goals and addressing environmental justice?
4. What would make the operationalization of carbon markets/climate finance better in Uganda?
5. Do you think public participation is enough for the decision-making processes? Does the country have any plans to operate the carbon markets to enhance community engagement and public benefit?
6. Do you think a better spatial planning mechanism would be helpful for the implementation of the project?
7. What are the key challenges and opportunities facing carbon markets in Uganda in the future?

Added Questions

8. Do you think a decentralized system affected the operationalization of the processes? (High-level officer from NFA)
9. Does the investor country have any policies about these investments? (Researcher from SEA)
10. *[About development partnership projects]* How have local governments been integrated into the process? (Officer from the Local Government)
11. *[About development partnership projects]* What are the examples of the projects conducted with the support of international institutions? (Officer from the Local Government)