A Literature Review of the Trees for Global Benefits Project in Uganda

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1. Background

During May 2024, Aftonbladet published 'Hunger Skogen', an investigative series of articles focused on the Plan Vivo certified project Trees for Global Benefits in Uganda and Max Burgers financial investments in the project through Zeromission. The series included 15 articles, some of which focused on the personal stories of 9 farmers from Hoima, less than 5 articles referred to the actual operations of the project, while many gave different people's opinions on the situation and what MAX should do next. Swedish researcher Elina Andersson contributed to at least one article and highlighted their research: "Where Forest Carbon Meets Its Maker: Forestry-Based Offsetting as the Subsumption of Nature" (2017a).

The articles published inflicted damage on the reputation of MAX, ZeroMission, EcoTrust, Plan Vivo and the carbon market broadly.

During the summer of 2024, various actions were taken to assess the credibility of the claims made by Aftonbladet and ensure any problems with the project were swiftly identified and acted upon. Key activities included:

- ZeroMission had multiple conversations with ECOTRUST to get the details of farmer payments and understand how the payments worked as well as get a better understanding of the individuals presented in the Aftonbladet article series.
- ZeroMission visited the geographical areas highlighted in the Aftonbladet article and interviewed the individuals presented in the Aftonbladet articles. ZeroMission staff were joined by Klara Fischer, a researcher from SLU and David Tumusiime and Patrick Byakagaba, both researchers from Makerere University in Uganda (Patrick Byakagaba is also from Hoima), both helped with the interviews and provided an independent perspective during the field visit.
- MAX Burgers commissioned EY to authenticate the carbon credits purchased by MAX, assess the traceability and transparency of the carbon credit supply chain between EcoTrust, Zeromission and MAX and finally assess compliance by all contracted parties. EY audited the economic flows from MAX to the participating farmers; inspected the contracts between EcoTrust and participating farmers and interviewed 10 participants to get a better understanding of how farmers view the project.

The field visit conducted by ZeroMission and supporting researchers had the following key findings that are contrary to the claims made by Aftonbladet:

- Of the 9 people included in the Aftonbladet articles, only 7 are participating in the project.

- No children were married off due to negative consequences caused by the project.
- The project has not caused nor increased risk of starvation.
- Payments from EcoTrust to farmers listed in the articles have been made as required in their contracts.

2. The Assignment

In June 2024, MAX Burgers asked ZeroMission, to conduct research in a scientific manner to improve understanding of the Trees for Global Benefits (TGB) project that MAX has been supporting since 2008. After initial plans to interview researchers who have studied the project became untenable, a literature review was undertaken to assess the existing peer reviewed, academic literature on the TGB project.

The research will be used by MAX and ZeroMission to better understand the project, request improvement if appropriate and highlight the nuance in perspectives around TGB. The latter is a particular focus as the corporate use of carbon credits is a divisive topic, and some studies from researchers at Swedish universities have been critical of TGB and other carbon projects.

3. Literature Review

To deepen understanding of the TGB project, ZeroMission has conducted a literature analysis using 11 peer reviewed academic papers that are specific to the TGB project. There are 7 documents that have been excluded from the literature analysis as while they are specific to TGB, they are not in peer reviewed academic journals and consist of book chapters or independent reports. A full list of these 7 documents is provided in Appendix 1.

The papers included in this analysis are listed below, including the focus, findings, critical analysis and the key themes of the paper. The critical analysis only includes reflections and compares the papers to each, other literature is brought in the discussion and conclusion section to increases contextual understanding.

3.1 General Literature

Carton, W. (2020). Rendering Local: The Politics of Differential Knowledge in Carbon Offset Governance. Annals of the American Association of Geographers, 110(5), pp.1353–1368.

Focus: Explores how global carbon market knowledge is translated into local contexts for the TGB project.

Findings: This paper explores the politics of knowledge in carbon project governance, focusing on the TGB project. It reveals how global carbon market standards have the potential to conflict with local socio-ecological knowledge. The process of *rendering local*[1] leads to governance tensions and contradictions that affect project outcomes. The study emphasizes the importance of understanding how local communities interpret and adapt to concepts grounded in carbon projects, which can either facilitate or hinder project success.

[1] Rendering local is the process of translating global complexities into a local context. In this study referring to how climate change is explained to project participants and the impact this has on their behavior and the success of the project.

Critical analysis & reflections: Given their lack of basic education, it sets a very high bar to expect project participants to fully understand the complexities of climate change, who is most responsible and how carbon markets work. Given the state of play in which the TGB project operates in, it feels important to educate participants on climate change through basic models, simplifying it into ways they can understand and engage with, even if this simplification leads to an inaccurate understanding. The question may then become, "Is it better if project participants take part without full understanding of the complex scientific and political nature of climate change or that they do not participate at all?"
Because participants lack understanding of the wider mechanisms the project operates in, it could theoretically be raised as an issue regarding Free Prior Informed Consent. Participants lack understanding is highlighted by Fisher *et al* (2018) as an aspect that impedes justice, finding that participants do not clearly understand the project rationale. Their research also found that the 'rendering local' done by ECOTRUST staff defines participants as 'Helping people in the US, Europe… All over the world' without highlighting the disparity in consumption or emissions of these people. This aligns with the idea that the process of translation and education received by participants does serve the interests of the project and keeps important truths from the participants. However, if this is done to cynically drive credit sales or a genuine reflection of their understanding is unclear.

Key Themes: Social and Environmental Justice, Knowledge Politics.

Fisher, J. (2012). No pay, no care? A case study exploring motivations for participation in payments for ecosystem services in Uganda. Oryx, 46(1), pp.45–54.

Focus: Investigates why TGB participants join the project.

Findings: The study finds that financial incentives are the primary driver for joining TGB. There is concern that reliance on payments fosters a "no pay, no care" ethic, threatening the long-term sustainability of conservation efforts. However, interviews found many participants are planting trees to provide an inheritance for their children, marking that the front-loaded payment system is functioning correctly, and they have accounted for investing in larger future returns. This research highlights the complex interplay between economic and non-economic incentives for environmental stewardship while finding that payments were the main motivating factor to plant trees.

Critical analysis & reflections: As TGB only pays farmers for the first 10 years of participation (ECOTRUST, 2020 p46.), the findings of this study highlight a potential risk that when payments cease, participants may withdraw from the project. Moreover, the front-loaded payments could be seen to coerce people into long term agreements that have negative impact on their livelihoods. However, there is no evidence of high participant attrition after payments stop, so this concern remains hypothetical.

If the project was open to poorer farmers with less land, it is likely that the attrition upon cessation of payments would be higher as they have more concerns in meeting their immediate needs. By only working with comparatively wealthy farmers, the project increases resilience to attrition by ensuring they are only working with those who are safely able to participate in the project without confliction with their own food security.

Key Themes: Drivers of Participation and Sustainability, Social and Environmental Justice.

Fisher, J., Cavanagh, C.J., Sikor, T. and 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, pp.259–268.

Focus: Compares two carbon forestry projects in Uganda to analyse the role of justice in project success.

Findings: This paper compares two carbon forestry projects in Uganda, Uganda Wildlife Authority – Forests Absorbing Carbon Emissions (UWA-FACE) and TGB, to analyse how local notions of justice influence project outcomes. The TGB project succeeded in addressing distributional and procedural justice concerns, leading to higher acceptance and positive impacts. In contrast, the UWA-FACE project faced significant resistance due to controversies over land rights and governance. The study underscores the importance of considering local justice perspectives to ensure the success and fairness of environmental projects.

Critical analysis & reflections: This paper uses 'empirical justice[2]' as the key foundation to understand how participants feel about the project, in doing so the authors are seeking to avoid putting their opinions and/or values into their understanding of justice and the project, stating "participants interpret the project in their own ways, and it is important to examine the notions of justice they apply".

In this research, the project is perceived by participants as being just, which contrasts with the understandings put forward by Carton and Andersson (2017) when utilizing Marxist subsumption. This highlights how the research method and analytical framework used can have a significant impact on the conclusions drawn. However, it is noted by the authors that participants do not fully understand the project, and thus their belief that they are in a just situation should be interpreted with caution.

Authors argue that a potentially problematic aspect is that the project *"is offered to participants, to adopt or not, with little space for negotiati*on". The reality is that while there is some room for manoeuvre when it comes to drawing up individual land use plans, many of the parameters are narrowly predefined by Plan Vivo and ECOTRUST,

[2] Empirical justice is defined as an approach that seeks to understand the notions of justice asserted by people, and how some notions gain support and come to be considered legitimate.

reducing the scope of procedural justice[3] available to participating farmers. But in practice, what are the options? If TGB and other projects give each participating farmer unlimited flexibility to create their own conditions, the standardisation required for an effective PES[4] project is reduced to heterogeneity that is unmanageable. The lack of control and negotiation afforded to participating small holders is a trade-off occurring in this type of project.

Key Themes: Social and Environmental Justice, Project Outcomes.

Löfqvist, S., Kleinschroth, F., Bey, A., Ariane de Bremond, DeFries, R., Dong, J., Fleischman, F., Lele, S., Martin, D.A., Messerli, P., Meyfroidt, P., Pfeifer, M., Rakotonarivo, S.O., Navin Ramankutty, Ramprasad, V., Rana, P., Rhemtulla, J.M., Ryan, C.M., Célia, I. and Wells, G.J. (2023). How Social Considerations Improve the Equity and Effectiveness of Ecosystem Restoration. BioScience, 73(2).

Focus: Discusses the importance of integrating social considerations into ecosystem restoration projects to enhance both equity and ecological outcomes.

Findings: The paper emphasizes that global restoration initiatives often fail to account for local social dynamics, which are crucial for the success and sustainability of projects. Case studies show that inclusive governance, recognition of local values, and fair distribution of benefits improve restoration outcomes. The authors propose five action points for promoting equity-centred restoration: (1) placing equity at the centre of restoration efforts, (2) ensuring adaptive and inclusive governance, (3) prioritizing local well-being, (4) addressing power imbalances, and (5) acknowledging trade-offs and diverse stakeholder values. The paper highlights the risks of exacerbating social inequities if restoration projects are implemented without a focus on local social realities.

Critical analysis & reflections: By taking place in rural Uganda, the project inherently faces challenges. On the surface this is mostly the low level of education along with food and economic security issued faced by participants. However, we must also include the conflicts and following developmental issues that have arisen through Uganda's colonial history.

The project was found to have an explicit and successful focus on improving livelihoods which also benefited environmental outcomes. However, this research identified a lack of equity incorporated within the project, and insufficient equity outcomes as a result.

[3] Procedural justice relates to how decisions about environmental management are made, including governance structures and how stakeholders are included or not in the decision-making process.
[4] PES stands for Payment for Ecosystem Services and is a term broadly used to define nature-based carbon project as participants are paid to create/protect ecosystem services.

This is because participants have a relative narrow set of parameters to negotiate their terms in the project, for example participants can decide how to plant on their land but cannot negotiate a price for their carbon. Further, the project does not allow participation of the poorest households which can in turn result in greater inequality and potential conflict within and between communities.

Issues around who should be able to participate in the TGB project are part of a trade-off, partly identified in research by Wells *et al* (2020) who suggest that the poorest households lack resilience to shocks and thus allowing them to become carbon farmers would be irresponsible when all their land is needed to grow food. Here, TGB is in a lose-lose situation where poorer households cannot be included (because participation will conflict with household food security), but this also means the poorer households are excluded from the economic wins of participating. It's important to note that this is not because of poor project design, but that the concept of wealth generating more wealth is as true in rural Uganda as it is on very large scales.

Key Themes: Social and Environmental Justice, Drivers of Participation and Sustainability.

Wells, G., Fisher, J.A., Porras, I., Staddon, S. and Ryan, C. (2017). Rethinking Monitoring in Smallholder Carbon Payments for Ecosystem Service Schemes: Devolve Monitoring, Understand Accuracy and Identify Co-benefits. Ecological Economics, 139, pp.115–127.

Focus: Evaluates monitoring strategies for smallholder PES schemes, interviewing TGB stakeholders to collect data were needed.

Findings: The paper examines various monitoring strategies for smallholder carbon payment schemes, analysing trade-offs between accuracy, cost, local equity, and legitimacy. It concludes that devolving monitoring responsibilities to local communities enhances both the legitimacy and cost-efficiency of projects. The research demonstrates that greater local participation in monitoring processes can lead to better outcomes, while highly complex methodologies do not necessarily improve accuracy or performance. The study emphasizes the importance of balancing technical precisions with local engagement to achieve sustainable project benefits.

Critical analysis & reflections: The generation of carbon credits occurs through the compromise of many trade-offs to compute a representation of $1tCO_2e$. This paper refers to the money generated by the sales of PES that (?) fills the hole created by government cuts in many areas. This helps to understand the PES system as an imperfect solution occurring in an imperfect world, where optimal is not equal to perfect.

The assumption held by many that digital satellite monitoring gives greater accuracy is not supported by this study. Moreover, by having visits from field technicians the

project becomes more likely to succeed as the local social relations are built and maintained. However, as raised by Carton (2020), how the field technicians engage with participants is not a neutral exchange and has the potential to result in outcomes that benefit the project while being detrimental to the participant.

Key Themes: Monitoring and Effectiveness, Social and Environmental Justice.

Wells, G., Fisher, J., Jindal, R. and Ryan, C.M. (2020). Social as much as environmental: the drivers of tree biomass in smallholder forest landscape restoration programmes. Environmental Research Letters, 15(10), pp.104008–104008.

Focus: Analyses social and environmental drivers of tree biomass in Plan Vivo projects in Mexico, Mozambique and Uganda.

Findings: The research investigates how social and environmental factors influence tree biomass accumulation in smallholder restoration projects. It finds that social drivers, such as farmers' material well-being and access to agroforestry knowledge, are as critical as environmental factors like water availability. Adaptive capacity and flexible governance play crucial roles in project success. The study highlights the need for forest restoration programs to invest in building local capacity and adaptive management to enhance ecological outcomes.

Critical analysis and reflection: Participants with greater assets are more resilient to stochastic shocks which gives reason to the critique made by Löfqvist *et al* (2023) that the project may increase inequality due to elite capture. Working with farmers who have very little land would mean that when vulnerabilities are exposed (poor harvest, growth of family etc), they do not have a buffer of land to fall back on. By only working with farmers that have surplus land, it builds in resilience that is better for the sustainability of the project but also the food security of the household. Moreover, the payments and benefits accruing to the landowners rather than community are perceived by participants and non-participants as having greater distributional equity[5], as those facing the costs of the project activity also benefit more from the rewards (Löfqvist *et al* 2023).

Research from Carton (2020) and Carton & Andersson (2020, 2017) suggests that the information given to participants is shaped by the aim of supporting market dynamics, potentially at the expense of what is best for the individual farmer. This would mean that participants may not be receiving the training that this study highlights as important, or it may be that the information given to TGB participants is good for the participants, but only in the way that it is also beneficial to the project's larger goals. There may be points of conflict where information and training that benefit the

[5] Distributional equity refers to even distribution of costs and benefits to communities – those who incur greater costs should receive equally greater benefits.

participants but not the project are left out, leading to only competence building for the sake of the project that could cause harm to the individuals. However, interviews with TGB field technicians in this paper give evidence that landowners are supported to choose a land management plan that is best for them, implying the project does have a level of flexibility which is broadly in conflict with the ideas of control and dominance given by Carton & Andersson (2017).

Key Themes: Drivers of Participation and Sustainability, Monitoring and Effectiveness.

Purdon, M. (2015). Opening the Black Box of Carbon Finance 'Additionality': The Political Economy of Carbon Finance Effectiveness across Tanzania, Uganda, and Moldova. World Development, 74, pp.462–478.

Focus: Investigates the concept of "additionality[6]" in carbon finance across multiple countries.

Findings: The study reveals that the effectiveness of carbon finance projects, particularly under the Clean Development Mechanism (CDM), is highly dependent on political and economic contexts. Projects are more likely to be genuinely additional when driven by a combination of developmental and economic interests. The research emphasizes that at low global carbon prices, project developers often lack the incentive to implement meaningful mitigation efforts, highlighting the limitations of relying solely on market mechanisms to achieve climate goals.

Critical analysis and reflection: This research highlights that additionality is not binary and is impacted by national policy along with the structure of the project developer and the project itself. It categorizes TGB has a highly additional, small-scale project but infers that with a different style of national governance, the project may not have been additional or not have been possible at all. It refers to Uganda as a Neo-patrimonialism[7] government which presents both challenges and opportunities for creating and running PES projects, the biggest opportunity being that Uganda has chosen to focus on exports as part of the neo-developmentalism agenda set by the 'borderline authoritarian regime'.

Key Themes: Carbon Market Mechanisms, Monitoring and Effectiveness.

[6] Additionally, is a term frequently used with carbon projects to understand if the benefits claimed by the project would or would not have occurred in the absence of the incentive created by carbon credit revenues.

[7] Neo-patrimonialism refers to a governance system where formal state institutions and legal frameworks coexist with, and are often undermined by, informal and personalistic practices of rule which leads to corruption and weaker institutional effectiveness.

3.2 The Subsumption Theory Saga

From 2017, three papers were published on subsumption theory, the first from Carton and Andersson, then a reply from Purdon before another reply from the original research duo. Each is listed in order of publication below.

At the time of publishing, ZeroMission had multiple meetings with the authors Carton and Andersson and heavy email correspondence with Plan Vivo and ECOTRUST.

Carton, W. and Andersson, E. (2017a). Where Forest Carbon Meets Its Maker: Forestry-Based Offsetting as the Subsumption of Nature. Society & Natural Resources, 30(7), pp.829–843.

Focus: Applies subsumption theory to analyse the TGB project.

Findings: The paper argues that nature-based carbon projects force ecological processes to conform to market logics. This commodification leads to unintended ecological and social consequences, such as the disciplining of smallholder farmers and reduced biodiversity, they find examples of both in TGB. The study highlights how market-based solutions can create conflicts between conservation goals and local livelihoods, complicating the achievement of genuine climate benefits and equitable outcomes.

Critical analysis & reflection: As the paper is using subsumption theory to begin with, the findings should not be taken as a result of independent analysis, but the outcome of using a specific lens to understand a given situation; an idea which is detailed in full by Purdon (2018). The personification of nature, in that it is being forced to 'work harder, faster, and better' in order to meet market demands sets the tone for the paper in that it is inherently critical of market-based activity, particularly the commodification of nature.

The paper criticizes TGB for avoiding eucalyptus plantations (the Plan Vivo standard only allows for native species), despite farmers favouring eucalyptus for its fast growth and economic benefits. The authors argue that avoiding eucalyptus plantations is a marketing strategy to appear 'boutique' and charge higher prices, yet they also previously criticized projects using eucalyptus, while failing to mention anything about the negative environmental impacts of eucalyptus, such as allelopathy[8], high water use, and soil nutrient depletion. This contradictory critique—faulting the project for both using and not using eucalyptus—reflects a consistent negative framing aligned

[8] Allelopathy is the process of plants secreting chemicals that alter the growth and survival of other plants. The chemicals secreted by eucalyptus suppress growth of other plants.

with subsumption theory rather than an objective assessment of the project's goals and outcomes.

The aspects of standardization in the project are problematised with the 'unruliness of nature that will not bow to the requirements of the project'. This does raise questions around what the optimum level of standardising could be, how much flexibility is possible when parameters must be clearly defined by the standard in order to be eligible to issue credits. The technical specification does include 9 native tree species and 3 species of fruit tree, allowing participants to customise their species to suit their needs ECOTRUST (2020). However, Carton and Andersson (2018) find that 80% of species planted are from only 4 of these species, meaning that the diversity of the technical specification may not be being realised in practice.

Fisher *et al* (2018) research identified that farmers are unhappy with the payments and see they are paid very poorly for 'helping the whole world' and that ECOTRUST staff are regularly challenged on the price.

Key Themes: Knowledge Politics, Social and Environmental Justice.

Purdon, M. (2018). Finding Common Ground: A Critique of Subsumption Theory and Its Application to Small-Scale Forest Carbon Offsetting in Uganda. Society & Natural Resources, 31(9), pp.1082–1093.

Focus: Critiques the application of subsumption theory to TGB by Carton & Andersson (2017).

Findings: The author argues that Carton and Andersson's application of subsumption theory to the TGB project may overlook some actual benefits to local farmers. While subsumption theory suggests that market-based interventions subjugate nature and labour to capitalist logic, Purdon's field research reveals significant alignment between the interests of Ugandan smallholders and global carbon markets. The TGB project delivers economic benefits, but these benefits tend to favour wealthier farmers with surplus land. The study highlights a need for more nuanced empirical and theoretical analysis, recognizing the agency of rural farmers who may willingly engage with carbon markets if they perceive tangible benefits.

Critical analysis and reflection: Generally, this paper provides the other 'side of the coin', picking up what was left out by Carton & Andersson (2017). The author notes that the project 'tends to benefit relatively wealthy farmers with surplus land available', which is seen as a problem in itself but can be seen as a critique of Carton & Andersson's 2017 research which suggests participants are victims of the market economy. In reality, project participants are relatively skilled in negotiating a market and working with the best land use practice for their land.

Key Themes: Social and Environmental Justice, Carbon Market Mechanisms.

Carton, W. & Andersson, E. (2018) Recognizing Carbon Forestry's Uneven Geography: A Response to Purdon and the Structure-Agency Dichotomy That Never Was, Society & Natural Resources, 31:9, 1094-1102.

Focus: This paper is a reply to Purdon's 2018 reply to the original 2017 research.

Findings: The authors repeat their argument that carbon forestry projects like TGB are embedded in uneven power dynamics and structural inequalities that constrain the agency of smallholder participants. They reject Purdon's claim that their analysis denies participant agency, instead emphasizing that smallholders operate within a context shaped by global carbon market demands. The paper highlights the dual role of ecological challenges and socio-economic constraints in complicating project implementation. While participants derive some benefits, the lack of informed consent, unrealistic assumptions about local capacity, and the disciplining nature of market demands reveal significant barriers to equitable outcomes.

Critical analysis and reflection: The main focus of this paper is a heavy critique of Purdon's 2018 response to the original, referring his response as using 'stereotypical generalizations of Marxist analysis', creating a false dichotomy between structure and agency and implying he lacks understanding of Marxist scholarship.

A useful perspective put forward is the living situation eligible farmers are situated in before they join the project. As these individuals are relatively poor and with few options available to them, it is possible that participation in the project is optimal, yet still imperfect; they may be participating due to lack of other options rather than the project being exceptionally good. However, the exponential growth of the project combined with relatively low rates of attrition over the past 20 years would indicate that the project is attractive to many, while still being flawed.

This idea raises questions about what standards we should hold carbon projects to more broadly. Globally, most people have sub-optimal employers, they work in a job for lack of better options, they are constrained by their environment and opportunities are limited due to a variety of uncontrollable factors. While it is appropriate to identify the TGB project as being an imperfect system, it should not be held to a higher standard that the rest of the imperfect world around it.

Key Themes: Knowledge Politics, Social and Environmental Justice.

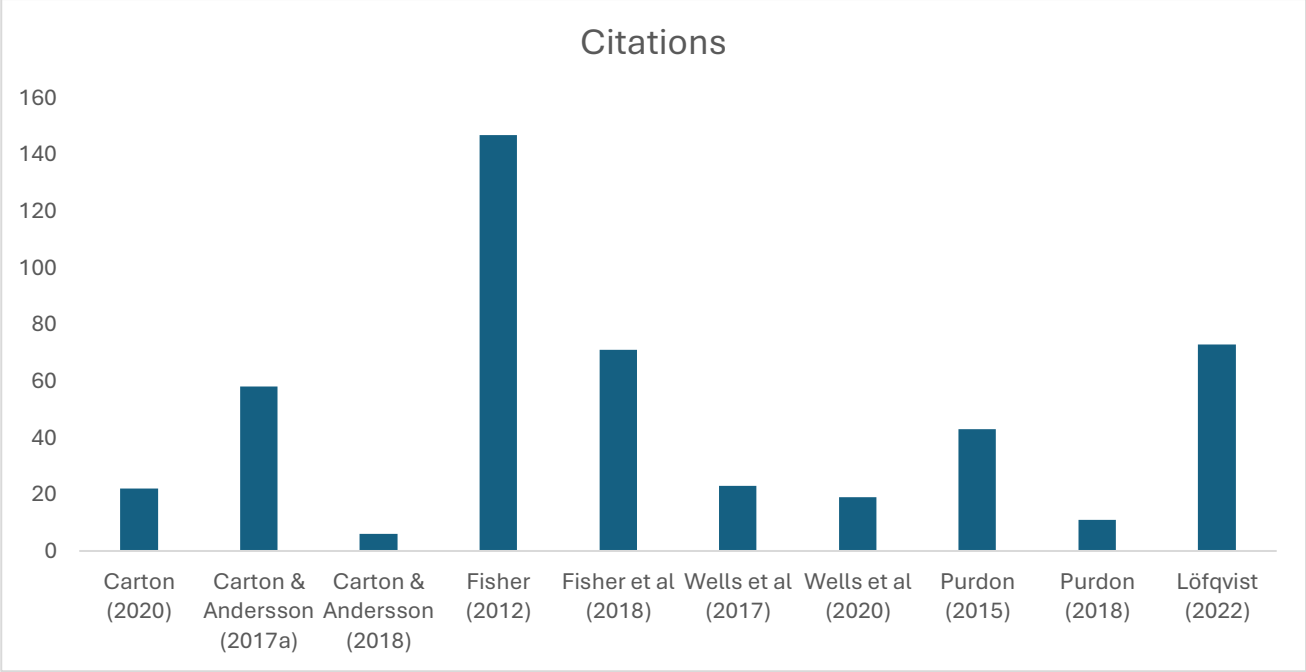

Figure 1 The number of citations each paper has received since publication.

4. Key Theme Categorisation

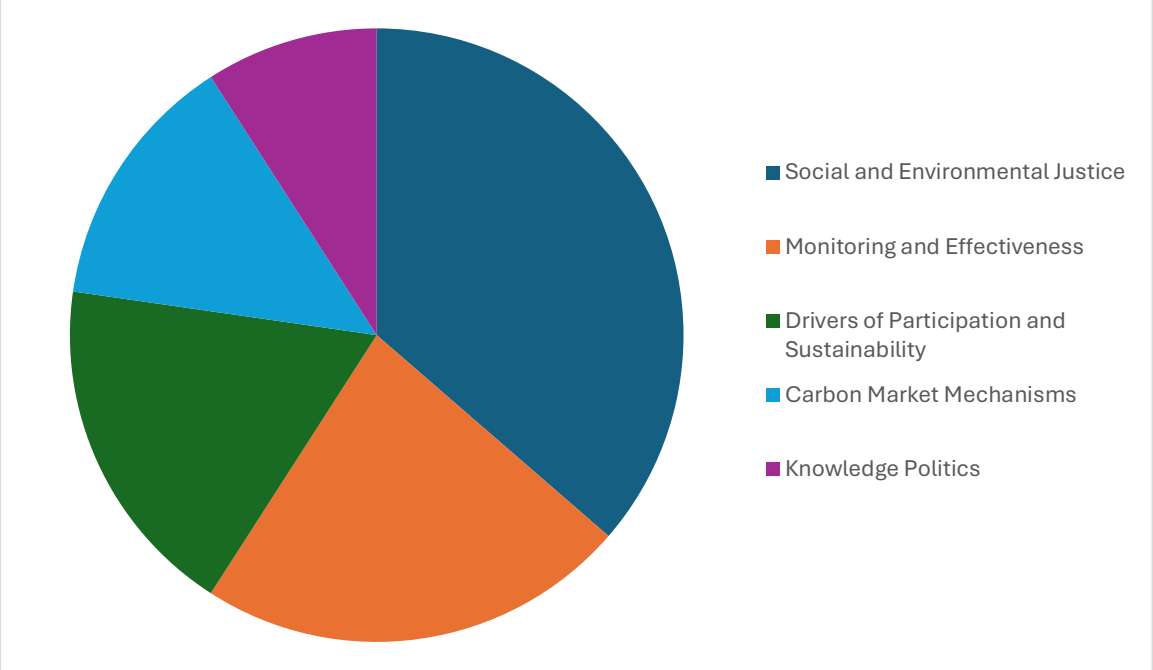

Figure 2 Relative proportions of the themes investigated by researchers into the Trees for Global Benefits project.

4.1 Key Theme Definitions

Social and Environmental Justice: This theme addresses the fairness and equity of the TGB project. It examines how benefits and burdens are distributed among different stakeholders and considers the ethical implications of environmental interventions.

Monitoring and Effectiveness: This theme focuses on the methods used to monitor the impacts of the project, such as carbon sequestration and forest restoration. It evaluates the trade-offs between technical accuracy, cost, local equity, and legitimacy, emphasizing the importance of reliable and efficient monitoring to ensure project success.

Carbon Market Mechanisms: This theme explores the structure and functioning of the TGB project, including how carbon credits are generated, verified, and traded. It

examines the economic, regulatory, and operational factors influencing the effectiveness and efficiency of the project.

Drivers of Participation and Sustainability: This theme investigates the factors that motivate or discourage individuals and communities from participating in the TGB project. It examines both financial and non-financial incentives and explores how these influence the long-term sustainability of conservation efforts.

Knowledge Politics: This theme examines the dynamics of knowledge production and power in environmental governance. It considers how different forms of knowledge—scientific, local, or traditional—are valued or marginalized in the design and implementation of the TGB project, and how these dynamics shape project outcomes.

4.2 Key Theme Comparative Analysis

Here is a comparative analysis of the 10 papers, organized by how they address each of the identified themes:

Carbon Market Mechanisms	
Papers Included	Purdon (2015), Carton & Andersson (2017a, 2018), Purdon (2018),
Key points	• Purdon (2015) investigates the effectiveness of carbon finance mechanisms, particularly focusing on additionality and how political and economic conditions shape outcomes. It highlights the impact of low carbon prices on project success. • Carton & Andersson (2017) apply subsumption theory to analyse how market-based environmental mechanisms influence ecological and social processes, arguing that these projects often lead to unintended consequences. • Purdon (2018) critiques the application of subsumption theory, emphasizing that the alignment of local farmer interests with global carbon markets can provide tangible benefits, which contrasts with more critical structural analyses.
Key Differences	Purdon (2018) challenges the purely negative view of market mechanisms presented by Carton & Andersson (2017a, 2018) emphasizing the complexity and potential benefits

Social and Environmental Justice	
Papers Included	Fischer (2012), Carton (2020), Purdon (2018) Wells *et al* (2017), Löfqvist *et al* (2022) Carton & Andersson (2017a, 2018)
Key points	• Fischer (2012) highlights how financial incentives drive participation in ecosystem service schemes but warns that monetary motivations may undermine long-term engagement.

	• Carton (2020) explores how global environmental governance frameworks clash with local understandings, creating power imbalances and tensions in project implementation. • Löfqvist *et al* (2023) emphasizes that inclusive governance and aligning projects with local social contexts improve both equity and effectiveness in ecosystem restoration. • Purdon (2018) explores the justice dimensions of carbon offset projects, arguing for a more balanced view that recognizes both challenges and opportunities for local communities. • Wells *et al* (2017a) addresses social and environmental justice by emphasizing the need for equitable monitoring practices that involve local communities, ensuring fair distribution of benefits and legitimacy in decision-making processes. • Carton & Andersson (2017a, 2018) discusses social and environmental justice by critiquing how forestry-based carbon offset projects often commodify natural processes, creating disparities that disproportionately impact local communities and undermine ecological integrity.
Key Differences	Fischer (2012) focuses on financial motivations, while Carton (2020) and Löfqvist *et al* (2023) stress governance and knowledge disparities. Purdon (2018) provides a more optimistic view of justice outcomes.

Monitoring and Effectiveness	
Papers Included	Carton & Andersson (2017a), Wells *et al* (2017), Wells *et al* (2020) Purdon (2015).
Key points	• Carton & Andersson (2017) explores monitoring and effectiveness by analysing how market-driven carbon offset projects impose rigid monitoring frameworks that may overlook ecological complexities and hinder the projects' ability to adapt to local environmental and social conditions. • Wells *et al* (2017) evaluate different monitoring methods, emphasizing that higher complexity does not always translate to better outcomes. They recommend integrating local participation to enhance project success. • Wells *et al* (2020) addresses monitoring and effectiveness by demonstrating that successful restoration projects require adaptive, locally managed monitoring strategies that balance precision with community engagement to achieve long-term ecological benefits. • Purdon (2015) discusses the challenges of proving additionality in carbon finance projects, linking monitoring effectiveness to political and economic factors.
Key Differences	Wells (2017) and Fischer, Wells, Ryan (2017) emphasize participatory monitoring, while Carton & Andersson (2017a) suggest that no project can create sufficiently inclusive and just

	projects as they rely on global capitalist systems. Purdon (2015) takes a broader perspective and focuses on institutional and economic aspects influencing monitoring success.

Drivers of Participation and Sustainability	
Papers Included	Fischer (2012), Wells *et al* (2020), Löfqvist *et al* (2023)
Key points	• Fischer (2012) examines how economic incentives motivate participation but warns that such incentives may not be sustainable without intrinsic environmental values. • Wells *et al* (2020) identify adaptive capacity and access to knowledge as crucial for successful ecological outcomes, advocating for flexible governance structures. • Löfqvist *et al* (2023) emphasize that projects are more likely to succeed when they incorporate inclusive governance and address local socioeconomic factors, thereby motivating sustained community involvement.
Key Differences	Fischer (2012) emphasizes financial motivations, while Wells *et al* (2020), Wells (2023) and Löfqvist (2022) highlight the importance of adaptive governance and social considerations.

Knowledge Politics	
Papers	Carton (2020)
Key points	• Carton (2020) uniquely focuses on the politics of knowledge in carbon governance, discussing how global carbon market standards often disregard local understandings and contribute to governance challenges.
Key Differences	This paper stands out as the only one that specifically addresses knowledge politics, making it a critical contribution to understanding how knowledge disparities influence environmental governance

Key Takeaways from the Comparative Analysis

This comparative analysis highlights the diversity of approaches and findings across the literature, providing a comprehensive understanding of key issues in carbon finance and ecosystem restoration that are specific to TGB, but may be applicable to other projects in some cases. Key findings are:

1. The Interconnectedness of Research Themes:
Many research papers overlap in themes, highlighting the interconnected nature of carbon market activities with social justice, project sustainability and much more. Due to the complexity of the VCM and the projects within it, multidisciplinary research is beneficial to create best understanding. It also highlights that trade-offs are apparent, the optimal outcome or process for one aspect of the project may have negative impacts on other aspects of the project – for example costs may be

saved in the long term by replacing field technicians with satellite imaging, but this will result in reduced local legitimacy and the dissolution of social bonds between participants and field technicians (Wells *et al*, 2017).

By understanding that different pieces of research seek to investigate different aspects of the project, it helps to build a holistic understanding of those different aspects rather than thinking of the whole project in binary terms.

2. The Divergence in Methods, Results and Perspective:
Different research findings present more positive or negative pictures of TGB. This can be seen as a reflection of the research methods used and each piece of research should be seen as contributing to a particular perspective that helps generate a holistic understanding of the project's operations, strengths and weaknesses. This is important as no one piece of research could ever fully investigate and understand the project from all possible angles, all methods and resulting conclusions should be seen as useful but incomplete representations of the project.

5. Discussion & Conclusions

The 11 papers described above each provide different layers of understanding the TGB project. The different questions answered, and variety of research methods used, allow for a rich understanding of how the project works, the challenges faced and, in some cases, how TGB compares to similar projects. Overall, research on the project highlights that it is largely a good project, that it has been designed and continuously adapted with best practice in mind while also highlighting problems with the project, some within ECOTRUST's control, others beyond their control, and some just an uncontrollable factor of operating in rural Uganda.

Below is a discussion of the two most significant themes brought up from the literature analysis using additional resources and critical thinking to create a debate and display diversity of viewpoint. This is followed by the final conclusion.

5.1 Operating in Areas of Low Education

Literacy and Written Communication

One key and seemingly unsolvable challenge is the problems that arise when working with people with very low education. Research from 2017 found that 32.4% of Uganda's rural community were illiterate, increasing to 39.8% for rural women (UBOS, 2017). This means that many participants are unable to take notes in training sessions and are thus likely to forget key bits of information, they may also be unable to fully understand their contracts without support.

As complex information cannot be recorded and passed on to participants, in person meetings are paramount for learning, sharing news, getting feedback and creating shared understanding and community. In 2023, the project conducted 409 community engagement meetings which were accessed by 29 183 people (ECOTRUST, 2024). These meetings include community engagement for understanding and creating FPIC; education using the GALS (Gendered Action Learning System) to improve gendered related inequality; feedback meetings where farmers can request improvements from the project; farmer led meetings to share agroforestry techniques; and business

development meetings where community owned businesses are supported to develop plans and build capacity.

Since 2019, ECOTRUST has also partnered with Farmers Voice Radio, which broadcasts talks from experienced TGB farmers, researchers and local councillors to advise on agricultural best practice, promote alternative livelihood strategies and improve health. Communal listening sessions are facilitated by 'Radio Guardians' and listeners can provide feedback to shows and engage in discussions with relevant actors. From 2024, TGB is developing 'Centres of Excellence' that will allow exemplary participants the ability to train others on their agroforestry, silvicultural or business practices to further community co-learning and continue building strong social cohesion.

The meetings are conducted through farmer owned institutions and are often in conjunction with other organisations such as the National Forestry Authority, Uganda Wildlife Authority and Communal Land Associations. The collaboration has enabled community groups to re-negotiate their agreements with the National Forest Authority after receiving training from ECOTRUST for how to improve their resource management, identify potential challenges and generate long term income through a 10-year work plan (ECOTRUST, 2024).

Culturally, Uganda has found solutions to low literacy rates through having verbal contracts which are legally recognised and enforceable. It is common that witness testimonies are used when needed to clarify terms of the contracts which could be used for employment, short term land leases or trade of livestock and vehicles. It is possible that the Plan Vivo contracts are the only written contracts participants interact with, and they are created and signed with a trusted and independent community leader as witness.

The project tries to resolve issues associated with low literacy rates by utilizing visual tools where possible such as the Gender Distribution Tree and the Multi- Lane Highway. The multi-lane highway (shown below) is a visual representation of how the Ndangara and Nyakiyanja Parishes want to develop over the next 5 years, including the challenges and opportunities they expect. All members of the group can discuss and record what they agree upon visually and these plans are taken out during community meeting to discuss progress towards goals.

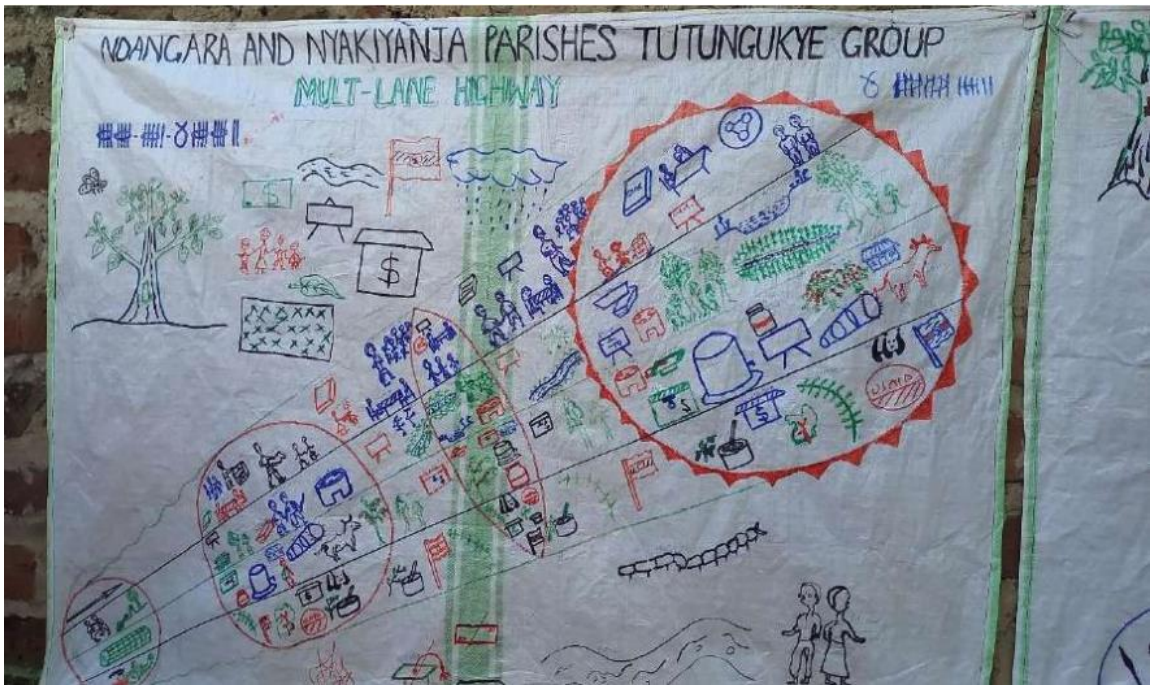

Image 1 A community vision created using the Multi- Lane Highway tool. (ECOTRUST, 2024)

ECOTRUST is trained how to work with visual tools like this by organisations such as Oxfam. While it does not solve all the problems faced by a community with high levels of illiteracy, it does meet people where they are and empower them to take control of their own lives in the way they see most fit.

Understanding Global Issues

Alongside the low literacy rates, rural communities have little understanding of different lifestyles globally. Research highlights that only 53% of rural Ugandans have heard of social media (Afrobarometer, 2021), 11% own a smart phone (preventing access to international media content) and the majority of rural Ugandans get most of their media from radio, which is primarily concerned with domestic issues (BBC Media Action, 2019).

This information helps to improve the understanding of the conclusion made by Fisher *et al* (2018) that participants perceived the project to be just, but potentially only because they did not understand the lives of the buyers and how the globalized carbon market works. It seems like a real-life example of Plato's Allegory of the Cave[9], where project participants are only seeing a distorted part of the whole true picture while not completely understanding their position in the wider world and more specifically how they do (or do not) contribute to climate change.

Moreover, a survey conducted with 2,622 Ugandans to find out how they understand climate change found that 62% see 'cutting down trees' as the main cause of climate change, while 9% believe it be 'God's punishment to humans'. 70% believe that tree

[9] An aspect of Plato's Allegory of the Cave is that people may thing they are seeing and understand reality, when they are in fact only seeing an incomplete and shallow representation of the whole reality.

planting is the best way to mitigate climate change. When asked what climate change is, 30% referred to changes in rainfall or sunshine, but nobody mentioned GHGs, CO_2 or the burning of fossil fuels and 28% of people reported the temperature has become colder over the last 5-10 years (Twaweza East Africa, 2022).

The results described above give greater context to the landscape that TGB operates within and hints at some of the challenges that may arise because of it. The findings described in the above paragraph challenge the critique made by Carton (2020) that the 'rendering local' of climate change is for the benefit of the project. Similarly, research from Carton & Andersson (2017b) highlight that participants "*justify their participation precisely in terms of global climate change being a big and worrying problem, but that rich countries lack their own land to plant trees"* which corroborates with the findings above that participants lack understanding of the causes and optimal solutions to climate change, nor do they likely to understand the lifestyles of 'rich countries'.

The research provided highlight that there is lack of understanding of the causes, consequences of, and solutions for climate change in participants, and possibly employees of ECOTRUST which may be positively impacting the willingness of smallholders to participate. However, there is no evidence that this low understanding is being exploited by ECOTRUST to increase participation as alluded to by Carton (2020) and Carton & Andersson (2017b).

It would be ideal to develop the competence of rural Ugandan communities and project stakeholders with regards to climate change, yet how this could be achieved is unclear. How could the project educate communities about the real causes of climate change when the educational foundation required to grasp the complex, global nature of climate change is non-existent for many participants and communities? It seems that this task is beyond both the capacity and the remit of ECOTRUST. This may be an opportunity for academics and NGOs to engage more with project stakeholders to ensure they understand how they really contribute to climate change along with their realistic mitigation potential. However, even here it seems like educating rural Ugandans about this topic must come second to ensuring food security, gender equality and more basic human rights are met.

5.2 Optimising Trade Offs for the Project and the Standard Within a Complex Market

The voluntary carbon market, the VCM, was created just after the turn of the millennium, following on from the Kyoto Protocol's Clean Development Mechanism and has scaled in the decades since. Research from Carton & Andersson (2017a, 2017b, 2018) Carton (2020), Fischer (2012) and others have highlighted some of the issues that come with market-based mechanisms, namely the need for standardisation, unequal power dynamics and the problems that arise when carbon sequestration is prioritised over local social and environmental sustainability.

Carton & Andersson's, book chapter broadly follows the same critique of power imbalances created by the voluntary carbon market (2017b). While aiming '*not to evaluate the TGB project',* it provides a critical assessment using interviews from project participants combined with critique of the VCM more broadly. They expressly do not claim the project has had no benefits to the local community, however they do see that the local people shoulder an unfair portion of the risk and costs.

One aspect raised is the idea of reforesting 'degraded' areas and it can be perceived that the authors question the definition of 'degraded' in the carbon market and see local people as being unfairly blamed for deforestation. The latter is supported by an interviewee who states '*it is not poor people who encroach forest, but those with political positions*' (Carton & Andersson, 2017b p.127). However, data from Global Forest Watch (n.d.) shows that shifting agriculture is responsible for 95% of forest degradation in Uganda this century, and in a country where 81% of people are subsistence farmers (FAO, n.d.), it seems that smallholder farmers are a key part of the problem and will be required in the solution to deforestation in Uganda. Moreover, a 2024 government investigation found the project had restored degraded areas and that tree planting was increasing connectivity between central forest reserves (Kikkuube District Local Government, 2024).

Fischer & Ryan (2018) investigated TGB in their book 'Ecosystem Services and Poverty Alleviation: Trade-offs and Governance' where they *observe that "The conservation and carbon sequestration objectives of the implementing organisation mean that farmers are only supported to plant indigenous species, although they might obtain greater short-term benefits from fast-growing exotics or improved varieties of fruit trees"* which is seen as prioritising environmental outcomes over local livelihood benefits.

The Plan Vivo standard is social standard at its core and attempts to mitigate issues arising from trade-offs with safeguards and obligations projects must follow. The requirements for only native tree species to be used in woodlots and for 60% of proceeded from carbon credit sales to go directly to landowners makes it unique in its efforts to leverage carbon finance to work with social and environmental sustainability. Porras *et al* (2016) describes the standard as being designed *"to provide the farmer with a range of concurrent benefits – such as energy, food supply and the creation of new jobs – while also protecting water sources and biodiversity"*.

Again, it is important to understand the greater context as improved environmental outcomes are likely to benefit non-participants more than if participants are paid more money to plant species which degrade or do not improve the environment. It is true that only relatively elite people will become participants, as they have the surplus land required to join. By prioritising the improvement of environmental measures where spillover effects benefit the whole community over PES payments of individuals benefits exist. This design can reduce accelerating inequality and support the poor who are likely to be more impacted by any environmental degradation, through for example reduced success with bush meat or foraging. Research by Roe *et al* (2014) highlighted the difficulty to identify, quantify and understand the many linkages between

supporting subsistence needs, creating income generation, improving local biodiversity function and climate mitigation benefits.

TGB and other projects from the Plan Vivo standard are rare examples of trade mechanisms that are very closely aligned with aid. This causes some confusion and conflict around what should be expected of the project, and what critiques should be applicable. The participants effectively become employees of ECOTRUST, being paid for undertaking successful tree planting on their land resulting in carbon removal that international companies are paying for.

ECOTRUST has implemented the Plan Vivo standard since 2004 and holistically improved local ecological and social conditions. For example, seedling nurseries created by the project include four medicinal tree species that deal with illnesses from diabetes to malaria to cancer, which are distributed throughout the project area for the benefit of communities. The medicinal benefits of these species are shared by participants and non-participants alike, highlighting just one example of how the project is designed to benefit the whole community, despite also falling victim to elite capture. This idea was corroborated by a 2024 local government investigation that occurred since the Aftonbladet reporting. The report states that TGB is 'held in high esteem by both the leaders and the community in general' and highlights the benefits the project has provided regarding food security and community welfare and while payment carbon payments are small, they do still make a tangible difference to people's lives (Kikkuube District Local Government, 2024).

These benefits are only possible because of the funds raised by selling carbon credits as there is no other mechanism available to channel finance from wealthy companies in the global north to smallholder farmers in rural Uganda. More than that, it gives individuals and communities the power to decide how to use their land and allows them access to carbon market finance if they see it to be in their best interests. The catalytic nature of ex-ante carbon payments enables farmers to use their carbon agreements as collateral to access loan financing and use the subsequent payments to pay back loans. In most cases, the income from alternative livelihoods and non-timber forest product enabled by the carbon payments far outweighs that of the carbon payments themselves.

Purdon (2018) makes the point that all project participants are used to farming, selling surplus crops at the local market or engaging with larger markets such as sugar cane, tobacco or eucalyptus growing where they see fit. Individuals with enough land to join the project join because they perceive it to be the best use of their land based on comparative prices offered by other markets and how it affects their land use options. Participants give FPIC[10] before joining the project and are free to leave the project when they want to.

[10] FPIC stands for Free Prior Informed Consent which means that all participants are made aware of the project, how it will operate and their associated rights and responsibilities and that they consent (give permission) to take part in the project.

It is possible that after joining the project, the price of sugar cane or tobacco increases and at that time participants would have been able to make more profit with a field of sugar cane compared to a wood lot that is still 10-20 years away from being harvestable. However, this is not necessarily a fault of project design or implementation, just an example of one of the many trade-offs associated with any market activity.

The project has a built-in safeguard to ensure project activates does not conflict with food security by having a minimum land requirement. The trade off from this is that some people are unable to participate in the project because they do not have enough land, but this is justified as their food security is more important than carbon sequestration or carbon payments. In the Mt. Elgon region in Uganda, free land is scarce, and the project has allowed participants to parcel small amounts of land together to participate in the project without compromising on food security. For example, 5 neighbours may all give 0.1Ha of land to the project and then share the carbon payments between themselves. This is an example of the adaptive capacity required for success that is described by Wells *et al* (2020) as the project is finding ways to best suit the local context and enable win-win situations even though they may seem small to outsiders.

The VCM is frequently criticized in the media for the numerous shortcomings of various project, from: 'Causing conflict with local people' (Greenfield, 2023a) to 'Inaccurate baselines' (Greenfield, 2023b) to 'Concerns about incompatibility with biodiversity' (Greenfield, 2023c). These are all aspects that the Plan Vivo standard directly engages with, making the standard different from its peers and potentially above the broad-brush criticism the carbon market receives. For example, Plan Vivo is the only standard to require a minimum of 60% of carbon credit money to go directly to the landowners, planting of non-native monocultures has always been prohibited, and the most recent standard updates includes the verification of carbon sequestration to further mitigate the risk of over crediting. It is likely that these safeguards and requirements are what have prohibited Plan Vivo scaling as quickly as other standards (Plan Vivo credits are less than 2% of the VCM) while costing 73% more than the average Gold Standard and verra credit that make up 75% of the market by volume traded (Forest trends, 2024).

5.3 Final Conclusion

Different pieces of research shine a light on the trade-offs that have been taken by ECOTRUST to enable TGB to be where it is today: over 20 years old, working with over 41 000 smallholders and having removed almost six million tonnes of CO_2 from the atmosphere (ECOTRUST, 2024). Many participants feel they are benefitting the project, and the large growth in participation compared with relatively low rates of attrition would suggest people are seeing the success of their neighbours and choosing to sign up. While the project has not been transformative to the environment or social development at the national level, it has impacted the lives of tens of thousands and positively contributed to biodiversity at the landscape level (Purdon & Byakagaba,

2022). Expecting a single VCM project to transform landscapes and livelihoods may be too high of a bar to expect from this type of intervention.

If the project did not exist, it seems very unlikely that any other initiative would have taken its place. While aid to Uganda has been substantial (contributing up to 8% of the country's GNI over the last 20 years), there are still funding gaps that are filled by TGB, and the quantity of aid Uganda receives is expected to decrease significantly in coming years (Guyson, 2024). Moreover, ministers from 55 African countries calling for 'trade, not aid' (UNDP, 2021) and this project allows Uganda to have a product on the global market that supports climate mitigation and provides benefits to the local communities and environment.

Research highlights the key role of ECOTRUST to deliver payments and technical assistance while also forging alliances with governments and other local groups to build holistic benefits (Porras *et al*, 2016). ECOTRUST provides a valuable service to the communities, and in turn the communities plant trees to help the growth of the project and to bring more benefits to more people.

This is not to say that every participant has a perfect experience with the project, or that every action or procedure followed by ECOTRUST is perfect. ECOTRUST employs over 170 staff and organises payments, trainings and seedlings for over 41 000 small holder farmers, problems continuously arise and are mitigated, errors are made and corrected. Contrary to conclusions made by Carton & Andersson (2017a), there are situations where participants have influenced the management and governance of the project (Purdon & Byakagaba, 2022), evidence of a functional grievance mechanism and a willingness from ECOTRUST to improve and listen to participants. Further, the Plan Vivo standard is a work in progress that is always being improved, with five revisions occurring since the first was published in 2001 and the technical specifications are also updated to reflect the best new science.

Overall, the project has been incredibly impactful but continues to be imperfect. This is a reality of operating a complex project with diverse stakeholders with different priorities and aims. ECOTRUST has negotiated on behalf of small-scale farmers enabling them to benefit from a complex market while finding the right balance to pay participants fair prices while also being able to sell enough credits for the project to continue.

6. Potential Future Research Areas

Biodiversity & Climate Impact

- How does the biodiversity of farm plots compare between participants, non-participants and comparable areas?
- Does the mixed species woodlot provide sufficiently diverse conditions for biodiverse array of herbivores and tertiary consumer species?
- At what point to biodiversity restoration compete with social needs due to human wildlife conflicts?
- How does the project activity contribute to climate change resilience and adaptation?

Socioeconomic Situation

- Are there high levels of attrition when the payments end?
- Why do participants remain in the project after payments end?
- How do people who have been in the project for 20 years or more reflect on their time as a TGB farmer?
- What type of life does young people want in areas where TGB operates? Do they see being part of TGB as a part of their future land management plans or does the project hinder their ambitions?
- Does participating in TGB increase socioeconomic disparity between participants and non-participants more than other land use practices such as growing timber or tobacco?

7. References

Afrobarometer. (2021) *Ugandans want unrestricted access to social media despite its potential for fake news*. Afrobarometer Dispatch No. 480.

BBC Media Action. (2019) *Uganda Media Landscape Report: February 2019*

Carton, W. (2020). Rendering Local: The Politics of Differential Knowledge in Carbon Offset Governance. *Annals of the American Association of Geographers*, 110(5), pp.1353–1368. doi:https://doi.org/10.1080/24694452.2019.1707642.

Carton, W. and Andersson, E. (2017a). Where Forest Carbon Meets Its Maker: Forestry-Based Offsetting as the Subsumption of Nature. *Society & Natural Resources*, 30(7), pp.829–843. doi:https://doi.org/10.1080/08941920.2017.1284291.

Anderson, E. & Carton, W., (2017b). *Sälja luft? Om klimatkompensation och miljörättvisa i Uganda*.

ECOTRUST (2020) Project Design Document: Trees for Global Benefits, Version 2.1

ECOTRUST (2020) Technical Specification: Agroforestry Farming System: Mixed Native and Naturalized Tree Species, Version 1.2

ECOTRUST (2024) Annual Report January to December 2023

FAO, n.d. *Scaling up Climate Ambition on Land Use and Agriculture: Uganda*. [online] Available at: https://www.fao.org/inaction/scala/countries/uganda?utm_source=chatgpt.com

Fisher, J. (2012). No pay, no care? A case study exploring motivations for participation in payments for ecosystem services in Uganda. *Oryx*, 46(1), pp.45–54. doi:https://doi.org/10.1017/s0030605311001384.

Fisher, J., Cavanagh, C.J., Sikor, T. and 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*, [online] 73, pp.259–268. doi:https://doi.org/10.1016/j.landusepol.2017.12.055.

Forest Trends' Ecosystem Marketplace. (2024) State of the Voluntary Carbon Market 2024. Washington DC: Forest Trends Association.

Global Forest Watch, n.d. *Uganda: Causes of Deforestation*. [online] Available at: https://www.globalforestwatch.org/dashboards/country/UGA/?map=eyJjYW5Cb3VuZCI6dHJ1ZX0%3D

Greenfield, P. (2023a) *Forest communities in Peru's Alto Mayo pay high price for carbon offsetting*, in *The Guardian*.

Greenfield, P (2023b) Revealed: more than 90% of rainforest carbon offsets by biggest certifier are worthless, analysis shows, in *The Guardian*.

Greenfield, P (2023c) Tree-planting schemes threaten tropical biodiversity, ecologists say, in *The Guardian*.

Guyson, N. (2024) Africa's Uganda reports shrinking foreign aid, healthcare to be badly hit, in Development Aid.

Kikuube District Local Government, (2024) Inter-district (Kikuube and Hoima) Monitoring of ECOTRUST Project Report. Office of District Production Officer.

Löfqvist, S., Kleinschroth, F., Bey, A., Ariane de Bremond, DeFries, R., Dong, J., Fleischman, F., Lele, S., Martin, D.A., Messerli, P., Meyfroidt, P., Pfeifer, M., Rakotonarivo, S.O., Navin Ramankutty, Ramprasad, V., Rana, P., Rhemtulla, J.M., Ryan, C.M., Célia, I. and Wells, G.J. (2022). How Social Considerations Improve the Equity and Effectiveness of Ecosystem Restoration. *BioScience*, 73(2). doi:https://doi.org/10.1093/biosci/biac099.

Porras, I., Wells, G., Stephenson, C. and Kazis, P. (2016) Ethicalcarbon offsetting. Guidelines and lessons from smallholder andcommunity carbon projects. IIED, London

Purdon, M. (2015). Opening the Black Box of Carbon Finance 'Additionality': The Political Economy of Carbon Finance Effectiveness across Tanzania, Uganda, and Moldova. *World Development*, 74, pp.462–478. doi:https://doi.org/10.1016/j.worlddev.2015.05.024.

Purdon, M. (2018). Finding Common Ground: A Critique of Subsumption Theory and Its Application to Small-Scale Forest Carbon Offsetting in Uganda. *Society & Natural Resources*, 31(9), pp.1082–1093. doi:https://doi.org/10.1080/08941920.2017.1414908.

Roe D. (2014) Poverty and biodiversity: evidence about nature and the nature of evidence. IIED Briefing Papers, March 2014. London: IIED.

Twaweza East Africa. (2022) *Understanding Climate Change: Awareness, Attitudes, and Actions in Uganda*. Sauti za Wananchi Brief No. 27.

Uganda Bureau of Statistics (UBOS). (2017) *The National Population and Housing Census 2014 – Education: A Means for Population Transformation*. Kampala: Uganda Bureau of Statistics.

UNDP, (2021). Trade, not aid: Changing the narrative about Africa's borderlands through innovation.

Wells, G., Fisher, J., Jindal, R. and Ryan, C.M. (2020). Social as much as environmental: the drivers of tree biomass in smallholder forest landscape restoration programmes. *Environmental Research Letters*, 15(10), pp.104008–104008. doi:https://doi.org/10.1088/1748-9326/ab96d1.

Wells, G.J., Corbera, E., Fisher, J. & Ryan, C. (2020). Success at the farm-level in payments for ecosystem services: Monetary incentives, participatory processes and institutional adaptation all matter. Preprint submitted to EarthArXiv and Elsevier.

Wells, G., Fisher, J.A., Porras, I., Staddon, S. and Ryan, C. (2017). Rethinking Monitoring in Smallholder Carbon Payments for Ecosystem Service Schemes: Devolve Monitoring, Understand Accuracy and Identify Co-benefits. *Ecological Economics*, 139, pp.115–127. doi:https://doi.org/10.1016/j.ecolecon.2017.04.012.

8. Appendix 1

Non-peer Reviewed, TGB Specific

Anderson, E. & Carton, W. (2017). Sell air? On climate compensation and environmental justice in Uganda. Lund University, Centre of Excellence for Integration of Social and Natural Dimensions of Sustainability.

Fischer, J. & Ryan, C. (2018). Ecosystem Services and Poverty Alleviation: Trade-offs and Governance. Routledge Studies in Ecosystem Services. Taylor & Francis Group. ISBN: 978-1-138-58083-1.

Purdon, M. (2012). State and Carbon Market in Least Developed Countries: Performance of the Carbon Market in Tanzania, Uganda, and Moldova. Presented at the Annual Meeting of the American Political Science Association, 30 Aug–2 Sep.

Purdon, M. (2014). Land and Sustainable Industrial Policy in sub-Saharan Africa: The Relationship between Land Tenure and Foreign Investment Strategy in Uganda and Tanzania. London School of Economics, Department of International Development.

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 in Decarbonization Working Paper Series, Université du Québec à Montréal (UQAM).

Porras, I., Wells, G. & Schoof, E. (2016). Ethical Land-Based Community Carbon: Case Study Module 2. International Institute for Environment and Development (IIED).

Porras, I., Wells, G., Stephenson, C. & Kazis, P. (2016). Ethical Carbon Offsetting: Guidelines and Lessons from Smallholder and Community Carbon Projects. International Institute for Environment and Development (IIED). ISBN: 978-1-78431-317-3.