Decolonizing Carbon

Deconstructing power relations to elevate Indigenous and local knowledge in de-forestation projects to improve outcomes for forests and communities

Introduction

Steadily increasing greenhouse gas (GHG) emissions entering the atmosphere (Lan, Tans and Thoning, 2025) are likely to have catastrophic effects on the global economy and people (Guo, Kubli and Sanner, 2021; Almulhim *et al.*, 2024). Deforestation, when forests are eliminated for non-forest purposes such as agriculture, accounts for 11% of global emissions (Forest Stewardship Council, 2024). Halting deforestation was identified as the lowest cost option to reduce climate risks (Stern, 2007). This resulted in the development of projects to reduce deforestation, such as Reducing Emissions from Deforestation and Forest Degradation (REDD) and REDD+ (plus Conservation and forest management) (United Nations (UN), no date).

GHG emissions are an externality of colonially driven economic systems, meaning they are a byproduct of commercial activity unaccounted for in costs of doing business (Cambridge Dictionary, no date). Neoliberal ideology created carbon markets as a cost-effective way to internalize these externalities. Forestry offset projects (FOP) like REDD+ are funded by selling deforestation avoidance carbon credits on voluntary carbon markets (VCM) (Morita and Matsumoto, 2023). VCMs differ from compliance markets which operate under regulatory requirements to cap or reduce emissions (Montel, 2024).

However, these market-based solution face challenges. Imbalanced power relationships have prioritized colonial knowledge systems in institutional governance and decision making, resulting in little effectiveness in carbon reduction through reducing deforestation and reinforced inequities in benefit distribution (Romm, Lezak and Alshamsi, 2025). To address these challenges, we examine an alternative approach to preventing deforestation through conservation led by local peoples, elevating Indigenous and local knowledge (ILK) referred to from here as community-led conservation (CLC) (Charnley and Poe, 2007).

A case study approach will demonstrate our thesis that when power dynamics are deconstructed in a way that allows ILK to be valued at parity with colonial knowledge systems, more effective solutions to deforestation and equitable outcomes are achieved. We will use two case studies to demonstrate our thesis, with a primary focus on interaction between key actors of governments and Indigenous peoples.

We begin with context on the importance of forests, carbon credit markets and CLC. We move on to critically analyze a REDD+ scheme in Brazil according to whose knowledge was valued in creating the scheme and outcomes of the project. Next, we explore the same themes through a case of CLC efforts in Canada. Finally, we compare the two approaches, reflecting on how power relations affected the knowledge valued and used and the effectiveness of each solution regarding deforestation and equitable outcomes before reaching our conclusion.

Context and Background

Trees absorb more carbon than they emit, making them carbon sinks (Climate Impact Partners, 2024). When land is deforested, trees stop absorbing carbon and emit stored carbon back into the atmosphere, creating a carbon source (Climate Impact Partners, 2024). Tropical rainforests have the highest ability to store carbon(Climate Impact Partners, 2024) which resulted in FOP's like REDD+ which provides financial incentives partly funded by carbon credits in developing countries to prevent deforestation (UN, no date).

Carbon credits are generated by demonstrating additionality of projects, subtracting GHG emissions with the project in place from a baseline (potential outcome without the project) (Lelechenko, 2025). These credits are then purchased to effectively 'offset' the equivalent emissions of the credit purchaser. The goal is to aid individuals and organizations in achieving net-zero targets in a flexible manner, allowing economic rationales to drive conservation decisions (Ervine, 2018; Shapiro-Garza *et al.*, 2020)

Although our alternative approach CLC can have various forms, the definition we will use is conservation rooted in ecological sustainability and building benefits for local communities with communities having some level of formal forestry management authority built-in (Charnley and Poe, 2007). CLC approaches put local knowledge at the forefront of conservation (Charnley and Poe, 2007).

Critical Analysis of FOP in VCMs

Whose Knowledge Counts

Commoditizing nature is built upon colonial knowledge which has minimized ILK in creating solutions for forest preservation (Collins *et al.*, 2021). For example, in Acre Brazil, home to 14 Mha of rainforest (Global Forest Watch, no date) the State System of Incentives for Environmental Services Act (SISA) was created by the state government, which enabled the ability to sell carbon credits through REDD+ (Hawkins, 2010). A benefit to carbon trading is the built-in ability for revenue generation. However, with the rainforest being a protected area, the state retained control over carbon credit trading, limiting Indigenous constitutional rights to benefit from their land (Santos Rocha da Silva and Correia, 2022).

Stevenson (2006) indicates that it is difficult to have true inclusive management of land 'without critical skills to deconstruct western European epistemologies and ontologies' (p. 175). Agreements are written in western law and languages which often dismisses Indigenous knowledge as 'anecdotal, unscientific or incompatible with … western law' (Stevenson, 2006,p. 170). The market-driven, colonial-based knowledge and language that kickstarted the Acre program undermined intentions to align with socio-environmentalism that existed in the region previously (Santos Rocha da Silva and Correia, 2022).

Formally, Indigenous communities were included in the SISA act development, however, language in the act was vague and lacking formal safeguards for Indigenous rights (Santos Rocha da Silva and Correia, 2022). In this regard, the language ignored free prior and informed consent in the program and reasserted government authority over Indigenous populations with prioritized value on western technical expertise from international organizations like the United Nations, pushing their version of commoditized conservation approaches (Shields, 2020; Santos Rocha da Silva and Correia, 2022).

With SISA lacking mechanisms to ensure Indigenous participation in program outcomes, power imbalances were created in governance mechanisms. The state government controlled the program, limiting the power of Indigenous populations to influence resource management for conservation and community benefit outcomes (Santos Rocha da Silva and Correia, 2022).

When Indigenous peoples are not empowered in resource management decisions, with missing context, ILK risks misinterpretation (Shields, 2020).

Given issues with additionality and the impermanence of emissions reductions, many REDD+ initiatives remain in less regulated VCMs with more volatile carbon prices (Mulder, 2024; Financial Markets Standards Board, 2025). Specifically, where forest stewardship has been a way of life, there is little additionality, leading to exclusion from the benefits REDD+ promises (Stickler *et al.*, 2018; Santos Rocha da Silva and Correia, 2022). Combined with carbon price volatility in VCMs, the limited funding received has been insufficient to meet community needs (Santos Rocha da Silva and Correia, 2022).

Conservation Outcomes

Between 2011 and 2019, tree cover loss in Acre grew to an average of 72.8 kha annually, an increase from an annual average of 63.2 kha for the previous ten years, resulting in the forests being a carbon source (Global Forest Watch, no date).

Due to imbalanced power which comes from governance structure that reinforce colonial discourses and underpin biases against ILK, rebalancing whose knowledge counts is challenging. Due to the complexity of players involved locally, state-wide, nationally and internationally, it is complex to challenge REDD+ governance (Korhonen-Kurki *et al.*, 2013). In examining polycentric climate governance in the global south, including Acre, de Wit and Mourato (2022) emphasize there is no intercultural training among public officials, limiting their ability to empathize and appreciate the value of ILK in climate solutions.

Analysis of CLC

With formal forestry management authority and community benefits as a foundation, CLC has foundations to address the shortcomings of market-based approaches. To illustrate, we use the case of the Haida peoples in British Columbia (BC), Canada.

Whose Knowledge Counts

With a worldview shaped by a deep understanding of the ecosystem, the Haida's knowledge of the land led to concern for preserving this delicate ecosystem with increasing timber harvesting

rates and unsustainable harvesting methods (Natural Resources Canada, 2025). Their voices were elevated by activists and NGOs that participated in successful campaigns to boycott wood from these temperate rainforests that developed from partnerships between Indigenous communities in Haida Gwaii and environmentalists (Shields, 2020). The boycott reshaped power relationships by placing significant economic pressure on the provincial government, forcing all stakeholders together for a solution.

The elevation of Indigenous voices resulted in CLC by 'establishing a collaborative, ecosystem-based land use planning process' between the BC government and Haida peoples in 2007 (Shields, 2020, para. 15).

Challenges, Benefits and Conservation Outcomes

From 1997-2007, 21,734 ha of forest was lost to logging with nearly 99% being old growth trees that hold significantly more carbon than second growth (Graham, 2024). From 2007-2017, a comparable ten-year period where the Haida people's knowledge was elevated in forest management, this decreased to 15,321 ha with around 87% being old growth forests[1] (Graham, 2024).

Although this case demonstrates success in decreasing deforestation when Indigenous knowledge is valued on equal footing to colonial knowledge, unequal power distributions and varying sociopolitical situations globally create significant challenges achieving this knowledge parity at scale (Charnley and Poe, 2007) .

The Haida have fought for decades with federal and provincial governments in Canada. These court battles continued until 2024 in a groundbreaking ruling giving the Haida peoples full control over their lands. In this case, devolution of colonial power structures was achieved which is a success factor of CLC (Charnley and Poe, 2007).

However, CLC does not have the same built-in revenue generating ability as market-based solutions, creating challenges in supporting community growth. The Haida Nation have set up their own timber company, providing local employment and integrating ILK into forestry

[1] Statistics directly comparable to Acre unavailable

management (Taan Forest, no date). However, debates whether logging should still exist there continue, creating questions on the sustainable co-existence of economic development and conservation (Charnley and Poe, 2007; Graham, 2024).

Comparison

When it comes to reducing GHG emissions through reduced deforestation, neutralizing high carbon lifestyles in the global north with a monetary contribution to avoid deforestation elsewhere, as demonstrated, has not led to significant deforestation reduction and avoids confronting the urgent need to curb emissions in the global north (Constantine, 2024; Romm, Lezak and Alshamsi, 2025). Greenfield (2023) confirms FOPs sold in VCMs have not proven effective in our GHG reduction efforts.

Many FOPs operate in communities with different value systems, making projects difficult to fit into the neoclassical economic model (Shapiro-Garza *et al.*, 2020). These nuances require local knowledge in building a solution that fits multiple worldviews and definitions of conservation, as some communities hold vastly differing views of sustainable futures that are distinct from neocolonial visions of a sustainable version of capitalism (Cavanagh *et al.*, 2017).

Although notably, our CLC case took place in Canada, which has strong judicial effectiveness (North, 2025), Charnley and Poe (2007) discuss several cases that confirm lower deforestation in forests controlled by CLC. The authors also reflect CLC may be more effective given the vested interest communities have in the long-term sustainability of the forests they depend on as opposed to governments who are often driven by other factors like money and power.

Community benefits of carbon credit projects are often seen as co-benefits and not a main driver of the project, whereas in theory, CLC creates value by prioritizing environmental stewardship and community benefits over profiting from commoditizing nature. However, we have demonstrated that power relationships between state actors and local and Indigenous communities in both solutions impact whose knowledge is valued in determining forest governance, benefit and conservation outcomes. These power relations therefore have a significant impact on deforestation success and benefit distribution.

In this regard, regardless of the solution, institutional structures must be examined and challenged to ensure proper capacity, participation and understanding is undertaken to ensure ILK is elevated in environmental governance and policy. This can be difficult with nuances in local knowledge and the differences in global political economies, particularly in countries that lack effective judicial institutions to challenge power (although a colonial institution, ironically a key manner to challenge power). However, training for actors holding significant power in colonial governance systems like policy makers and government officials is an initial step to begin deconstructing power structures and valuing ILK at parity with western knowledge systems.

Conclusion

This paper has demonstrated that when power dynamics are deconstructed in a way that allows ILK to be valued at parity with colonial knowledge systems, more effective solutions to avoid emissions from deforestation and equitable outcomes for communities are achieved.

Although the underpinnings of CLC in theory create the conditions for a more effective alternative to conservation goals by prioritizing local forest governance, like FOPs in voluntary markets, effectiveness is influenced by ILK being valued at parity to colonial knowledge systems. Parity is significantly influenced by power relationships and the willingness of those in power to disrupt existing systems or in the case of the Haida peoples, to gain power through economic pressure and legal means. Per Bennett (2019) '… power shapes people's conduct' (p. 70) and further research should be conducted on levelling power relationships in various global socio-political contexts and whether the success of the solution selected is an outcome of power structures more so than the solution itself to help create scalable plural solutions. Particularly in the global south which can have more instability in the political economy to challenge power structures (Moneta, 2025). In the meantime, through increasing training of actors involved in conservation efforts to acknowledge the plurality of worldviews in executing deforestation solutions, we can begin to level how knowledge is valued in decision-making.

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