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Land-Based Mitigation Strategies and Their Implications for Local Communities in the Global South

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Abstract

Land-based carbon mitigation strategies are receiving considerable interest for their potential to sink carbon or provide sources of alterative clean energy. The actors and agencies in this sector are many and include corporations seeking to offset their carbon emissions, experts who design and implement measurement protocols, national governments who facilitate carbon offset programs, conservation agencies who work with governments and local communities to set land aside for conservation and carbon sinks, and members of local communities who seek to gain revenue from their land conservation practices. This paper focuses on the possible implications of nature-based solutions (NbS) on local communities and is based on a review of the available scholarly literature, grey literature, and reporting on the topic emerging from international news agencies. The power dynamics in these offset programs reveal huge gaps between global corporate interests and those of rural, mostly Global South communities. Governance, benefit sharing, distributive and procedural justice, and complex land dynamics emerge as key themes requiring attention in order to make land-based mitigation strategies fairer and more equitable to local communities who may live on and manage the lands on which carbon offsetting is proposed. Findings in this paper conclude that a more holistic approach to planning, design, and implementation of land-based carbon mitigation strategies is essential for achieving both equity and environmental benefits beyond just carbon.

Keywords: nature-based solutions, governance, benefit-sharing, equity, landscape dynamics

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Introduction

As scientists, civil society, business leaders, and activists push for increased and committed climate action, there have been calls to ramp up investment in land-based mitigation strategies. Land-based mitigation strategies can take many forms, from investments in biofuels, solar and wind-based energy infrastructure, to nature-based solutions (NbS). These NbS encompass a wide variety of initiatives - from ecosystem-based adaptation, sustainable land management, agroforestry, agroecology, forest and land restoration, and natural capital, to name a few (Seddon et al. 2021). This paper focuses on NbS investments and implications in the Global South. As countries and corporations seek to comply with demands to reduce their emissions and meet agreed-upon targets and commitments, many are investing in voluntary carbon markets and other land-based investments. The number and scale of these investments are increasing dramatically, as are the actors who are entering the space. There is a global Taskforce on Scaling Voluntary Carbon Markets[1] that includes 250 members (multinational corporations, investment banks, think tanks, scholars, and conservation agencies). Non-governmental organizations, governments, and corporations have all stepped up their investment and pledges to NbS. Some of these corporate actors include Amazon, Apple, Delta Airlines, Mastercard, Microsoft, Shell, Unilever, and Heathrow airport (Seddon et al. 2021).[2] Most of this investment is taking place not in the countries where these companies are located, but in the Global South, on land that has been used, controlled, and invested in over generations by local communities. Some of these lands are formally recognized under the 'ownership' of these communities, but vast amounts are not.

As reported in The Land Gap Report (2022), countries' climate pledges include carbon dioxide removal (CDR) on approximately 1.2 billion ha of land around the globe. This land is targeted for a variety of land uses, from large-scale forest plantations to reforestation and restoration of degraded forests, wetlands, and rangelands. More than half of the land pledged (633 million ha) intends to convert land use to forests (Dooley et al. 2022). They also point out that most forest-based offset projects are based in the Global South (Dooley et al. 2022).

Several analyses have suggested that the greatest potential for carbon sinks resides in managing intact existing forests, croplands and grazing lands, and restoring native forests and wetlands. While the total mitigation potential of all these NbS strategies may be significant, it still pales in

[1] For more information visit TSVCM (iif.com).

[2] The UNDP defines carbon markets as "trading systems in which carbon credits are sold and bought. Companies or individuals can use carbon markets to compensate for their greenhouse gas emissions by purchasing carbon credits from entities that remove or reduce greenhouse gas emissions" (https://climatepromise.undp.org/news-and-stories/what-are-carbon-markets-and-why-are-they-important).

comparison to the impacts on climate that could be achieved from phasing out fossil fuel use (Seddon et al. 2021).

Investment in NbS, while encompassing a variety of land-use strategies, is still focused largely on forests and tree planting. As a land-based mitigation strategy, REDD+, which was enacted in 2013 and aims to reduce emissions from deforestation and forest degradation, and to promote the sustainable management of forests to conserve and increase forest carbon stocks, offers some lessons for the design and implementation of land-based mitigation strategies as a whole. Seddon et al. (2021) list several tree-planting initiatives at the global, regional, and national scales which are run by such actors as the World Wide Fund for Nature (WWF), Birdlife International, World Resources Institute (WRI), and the EU, as well as the governments of China, Ethiopia, New Zealand, and the Philippines. The Lowering Emissions by Accelerating Forest finance (LEAF) Coalition, made up of major multinational corporations and the UK and US government, and Norway's International Climate and Forest Initiative mobilized over 1bn USD in 2021 to protect tropical forests. The focus of these initiatives is on planting trees, halting deforestation and on rehabilitating degraded forests and landscapes (Seddon 2021).

These approaches to climate mitigation are similar to many approaches to sustainable development. They emphasize a technical solution – say tree planting or rangeland restoration – with little attention to the social, economic, or political context in which these solutions are proposed to take place, or which drive the problem of climate change in the first place. The emphasis on technical solutions draws attention away from the possible impacts that these solutions might have on the countries and communities expected to implement them. If issues around land tenure, community participation, or benefit-sharing emerge, they are often also approached in a technical manner which can lead to box ticking, but not the real and messy engagement that needs to take place to truly address equity and rights issues.

Many of the land-based mitigation strategies, such as forest carbon or grassland carbon projects, involve payments to communities for capturing and storing carbon in their landscapes. Calculating carbon stored and appropriate payments is a highly technical skill, one that is usually not present in the communities storing the carbon. So, they must rely upon and trust external actors to carry out these calculations.

As a report by Rights and Resources (RRI) has pointed out, most land-based mitigation strategies taking place in the Global South are inhabited by often quite poor rural and marginalized populations who depend primarily on the land for their livelihoods and well-being: "most of the lands and territories targeted for greenhouse gas (GHG) mitigation action overlap with areas customarily held by Indigenous Peoples, local communities, and Afro-descendant Peoples" (RRI 2021, 1). Yet, the rights to these lands, and the carbon they hold, now or in the future, are rarely described in projects. As RRI argues, failure to "recognize their rights and role in the realization of global climate ambitions poses fundamental risks for communities, investors, and governments alike" (RRI 2021, 1). The RRI study of 31 countries in the Global South found that these countries hold nearly 70 percent of the world's tropical forests and contain at least 62 percent of potential for nature-based emission reductions and carbon-offset opportunities. Yet,

within these countries, few laws or policies recognize communities' rights to land, much less to their rights to carbon in these lands. Without formal recognition of land and carbon rights, these communities are at risk of losing both their land, and the economic benefits that may come from selling carbon credits. Land and carbon can be captured by the state, but also by non-state actors.

RRI has also illustrated that while REDD+ has been in existence for more than a decade, few countries have legal frameworks to regulate carbon transactions, nor do they have in place principles and practices for implementation and benefit-sharing with local communities. While inclusion, fairness, and benefit-sharing are part of the narratives embedded in many of these carbon mitigation initiatives, few provide detail on the specifics of these aspects. In addition, there are insufficient mechanisms in place for monitoring, reporting, or verifying what has been done to implement and measure these promises.

A central problem inherent in the strategies and initiatives in land-based mitigation is the highly uneven balance of power among interested actors. Rural smallholder farmers, pastoralists, or fishers in the Global South are very vulnerable to pressures from interested and powerful global and national actors who seek financial benefits in the lands of these rural communities. The lives and livelihoods of these communities are already made more vulnerable by the effects of climate change. While they have contributed little to global emissions, it is now with their land and resources that the Global North will attempt to address the problem it has created. As Fairhead et al. (2012) observe, this strategy amounts to an "economy of repair" in which the Global South is being asked to repair the damage to the planet produced by the Global North's growth and unfettered capitalism.

Rural populations in the Global South are dependent on their lands for their livelihoods and for their cultural heritage and sense of place and identity. While these populations are perceived as vulnerable, efforts to address their vulnerability have often been narrowly economic in focus (Hulme and Shepherd 2003). While improving incomes is central to aspirations of rural communities, they are also concerned with how to preserve their way of life, adapt to the climate variability and shocks they are faced with, and maintain the assets they have to buffer shocks and address shortfalls in food security, now and for the future generations. Much of their security also comes from their engagement in social networks that serve as social security. Thus, focusing narrowly on improving incomes is not sufficient to meet the many and varied needs of local communities for both short and long-term resilience. Climate mitigation projects focus heavily on the potential for economic benefits to rural community members, but the need for a more holistic view is required to truly make these communities less vulnerable both to global markets and to climate risks. Examining past and present land-based investments, both for expanding food production, sequestering carbon, or for producing alternative fuels illuminates some of the central tensions in these approaches and the risks that local communities and Global South countries face in engaging with them.

Land and Green Grabbing

The 2007-2008 food crisis led to price hikes and a global crisis in food security which pushed many in Global South countries deeper into poverty and hunger. This period saw a "convergence of global crises in food, energy, finance, and the environment" (Borras et al. 2011, 209) and a renewed interest in, and rush to obtain land by investors, to produce biofuels or food for their own countries and to trade on global markets. Structural adjustment policies in the 1990s, promoted by the International Monetary Fund, the World Bank, and donors such as USAID promoted the liberalization, privatization, and commoditization of land in the Global South. This process paved the way for both internal and external investors to obtain access more easily to land. This large-scale investment in Global South countries has been described by scholars at length as "land grabbing" (c.f. Zoomers 2010; Borras et al. 2011; Edelman and Leon 2013; Edelman 2013; de Schutter 2011; Benjamin and Bryceson 2012). This term has been adopted to refer to global large-scale commercial land transactions. Borras et al. report that:

> "…the International Food Policy Research Institute (IFPRI) suggest that roughly 20 million hectares exchanged hands in the form of land grabs between 2005 and 2009 (von Braun and Meinzen-Dick 2009). The World Bank report on land grabs (or, as the Bank calls it, agricultural investment), released in September 2010, estimated this global phenomenon at 45 million hectares (World Bank 2010). Sub-Saharan Africa is the site of the most speculative major land deals." (2011, 209)

These land grabs share many similarities today with what is being called "green grabbing" in which investors are rushing to cash in on carbon markets by investing in land-based mitigation strategies in countries around the globe. These "green grabs", or the "the appropriation of land and resources for environmental ends" (Leach et al. 2012, 237), are marked by imbalances in power and capital, and thus threaten the livelihoods of rural communities living on the lands that investors target for their carbon mitigation. These power imbalances build upon the complex histories of resource extraction and marginalization of rural populations that have been a thread running through colonial to post-colonial development. Indeed, green grabbing today builds upon a template devised in the colonial era in which rural peoples were evicted from their lands to establish national parks and forest reserves. The narratives that justified these evictions have not changed much over time. They put forward the view that poor, illiterate rural populations are "unaware" of how to best care for their land and are irresponsible stewards, their practices resulting in land and resource degradation. To protect the land, and the resources on it (whether it be wildlife or forests), it was argued, rural communities must be excluded, and experts put in charge. Today, this denigration of rural communities persists but is also countered by a narrative that, on the surface appears more positive, that of the "green primitives" (Fairhead et al. 2020, 251). Yet, these romanticized labels do not result in any changes in power relations on the ground. Outside interests still define the terms and collect the lion's share of the value in green initiatives.

Another common narrative thread in both land and green grabs is that land in these countries is abundant and unoccupied. Colonial governments used this misrepresentation to seize land and to create parks and reserves. Officials conveniently interpreted farmers' fallow fields and pastoralists' seasonal movements across the landscape in search of water and grazing as indicators that the land had been abandoned or was unoccupied. The resulting dispossession led to loss of livelihoods, cultural identity, and heritage. These risks appear again in new efforts to gain control over lands in poor countries where agriculture and natural resources form the backbone of the economy and livelihoods of the citizens. In an interview with an investor, Engstrom et al. (2022) reveal the continuity of these ideas: "There is no lack of land. If you travel around the country or fly over it, there is no lack of land. There are vast tracts of land that are not used, or used very little" (Interview agro-investor CEO, 2016) (2022, 8).

While land grabbing for large-scale crop production focused on specific lands deemed productive and available (by governments) in Global South countries, green grabbing commoditizes the carbon stored in land resources, from the soil to the vegetation it supports. While green markets promote land, forest, and resource conservation, and so are dissimilar to land grabs which drain lands of resources, both investment strategies rely upon the economic logic of comparative advantage. In one, crop production can be expanded to Global South landscapes with cheap labor and cheap land. For carbon trading, projects target areas where mitigation costs are ostensibly less than in Global North countries and where resources are perceived to be widely available. Thus, imbalances in power and capital are entrenched where poorer nations are selected by richer ones to repair the mistakes produced by industrial capitalism. The ecological and social costs they incur to do so are largely ignored in the win-win narratives that accompany these investments.

Brazil: In Brazil, land and green grabbing, mostly in the Amazon, have taken an interesting twist. There, in efforts to fight deforestation, landowners are supposed to keep a portion of their land under a "nature reserve". A loophole in this guideline is that land must be in a similar biome, not necessarily contiguous to the land undergoing farming or deforestation. This has led some farmers who produce and sell soy to multinational corporations like Cargill and Archer-Daniels-Midland to obtain land in already protected areas which they have no intention of deforesting so that they can clear more land on their existing farms. Often state agents who are tasked with monitoring and ground truthing these deals are not even aware that the land designated as private was actually a state reserve. These lands are often occupied by Indigenous communities. Farmers who have acquired the land often move to evict Indigenous people and prevent them from pursuing their livelihoods, often involving livestock keeping, because they see these land uses as threatening their "reserve" status (What is 'green land grabbing' - and why is it surging in Brazil? (trust.org)). This case underscores the necessity of providing communities with legally recognized tenure on their traditional lands to protect themselves from these kinds of deals and the sometimes drastic consequences which follow.

While land investments for crop production, either for food or for energy, often resulted in rural communities being pushed off their land, carbon storage projects have more complex effects that threaten community access to their land and resources in new ways (c.f. Benjamin and Bryceson 2012). While they may not be moved off their land to plant biofuels, how they choose to use their land and resources may be given over to the dictates of investors or the governments with whom investors have made these deals. While nature-based solutions that commodify nature are pitched as positive strategies for development, they gloss over the contradictions in these approaches. For example, it may make more economic sense to local communities to intensify agriculture or increase livestock holdings rather than preserve resources that will not improve their food security.

One common argument in support of land investments for carbon mitigation is that, due to lack of capital themselves, Global South countries must rely on foreign capital and investment to achieve their development goals (Larson 2022; German et al. 2013). Governments in the Global South are pressed to pass policies that pave the way for these capital investments, from both external and national investors. These policies may address the needs and interests of the investors but do little to address the constraints and needs of rural communities. It is important to emphasize that these rural communities have received very little investment and support from national governments from the colonial era onwards. This situation got even worse during the era of structural adjustment when government services were cut back drastically due to the demands of donors and the major financial institutions (World Bank and IMF). As De Schutter – former UN Special Rapporteur for the Right to Food – has stated, these policies resulted in agriculture largely being abandoned by state institutions leaving farmers with no support (De Schutter 2011).

While these processes of globalization and capitalist investment shape national and local level dynamics, there are also many contextual factors that influence both the success of land-based mitigation strategies and the impacts on local communities. Each country and local context in which these projects take place, has unique dynamics that shape the consequences on the ground. These include tenure and governance arrangements, financial and knowledge capacity around carbon storage, ecological dynamics in targeted landscapes, social and political circumstances within and among rural communities, and social and economic differentiation within the country.

Governance and land rights

One of the most important factors shaping outcomes of land-based mitigation strategies is international, national, and local governance structures, policies, and practices. A central challenge – and an opportunity for future efforts – concerns land rights and the recognition of community and individual land tenure to farmlands, but also forests and communal lands (grazing areas, wetlands, unfarmed watersheds, etc.). In the study carried out by Rights and Resources, they found that across the countries included in their research, “Only half of the total area traditionally held by Indigenous Peoples, local communities, and Afro-Descendant Peoples is legally recognized” (RRI 2021, 2). States in the Global South have a complex array of tenure

and land rights according to each country. In some, all land is owned by the state. In others, it is a mix of customary tenure, state ownership, and individual ownership.

While legally customary tenure may be recognized, it also often requires specific administrative and legal procedures to give full recognition of rights. In many instances, these procedures can be costly and outside of the capacity of local communities. In Tanzania, which has a very progressive national land law in the Village Land Act, local communities can obtain tenure over their land through a Village Land Certificate. To obtain such a certificate however, they must carry out and submit a Land Use Plan. Land use planning is costly and requires specific skills that local communities do not usually have. Therefore, they must often rely on outside assistance. This assistance has been provided by NGOs in the past, but now investors are often stepping in and paying for these procedures. These plans are supposed to be carried out with the full participation of local community members. However, as Engstrom et al. (2022) find, this participation is often minimal. In their study, local government officials argued that local people are unable to carry out such work effectively as they "lack capacity" or "awareness" (repeating the common narrative noted earlier). Indeed, one official stated: "but in the end, the government is the only legitimate authority when it comes to land. If people do not understand what is good for them, the government must use its power for the public good (interview Rufiji District, 2016)" (2022, 8). Not only were villagers not actively involved in designing the land-use plans, but district officials then modified plans afterward to allocate more land to "general" land, meaning it could be allocated to outside investors. In many cases, outside investors paid the costs to carry out these land-use plans.

Further complexities arise regarding tenure when the internal community power dynamics around rights to access and use are examined. For forests, different members of communities may have use rights but not land rights. Forest and tree tenure may be different from land tenure. Rights of access and use to forests, or wetlands, or other resources on the land within rural communities are also highly differentiated by age, gender, wealth and sometimes ethnicity. In Ghana for example, elder Indigenous men gave out land for carbon trees to investors which led to the dispossession of women, youth, and migrants from the land where they were growing crops (Hashmiu 2015). Thus, underlying power dynamics within these communities can lead to greater inequity if not properly understood and mediated. Powerful external investors have little incentive to address these issues as long as they are seen to engage local "stakeholders" and "community representatives" in something resembling participation.

Pastoralists, fishers, and other groups who move in and out of landscapes in search of livelihood opportunities are particularly vulnerable to dispossession. This history has been well-documented by scholars of pastoralist communities around the globe. In Northern Kenya, the Northern Rangelands Trust (NRT), which receives considerable funding from external donors, established a Northern Grassland Carbon project to increase carbon storage in the soil of the savanna grasslands. It would do so by managing grazing patterns of livestock. It won awards at COP27 and was praised by Kenya's President Ruto as being an excellent example of a carbon project. However, recently, both the measurement of carbon savings and the rights of pastoralists to follow their traditional grazing practices has come under question. The project has already

generated substantial credits to such organizations as Netflix and Meta, but Verra, which "sets the world's leading standards for climate action", has suspended issuance of credits to NRT until more investigation can be carried out.[3] Herders in northern Kenya regularly move their herds over large distances, sometimes outside of their own conservancies depending on the resources in any given time of year. This movement makes analysis of herding practices' impact on carbon difficult to measure owing to the considerable uncertainties around spillover effects (relating to unmeasured carbon impacts in other areas) and permanence of claimed results.

This project in Kenya illustrates well the governance and rights issues that emerge in such strategies. They take place in geographic and cultural contexts with complex political and social divisions and can easily exacerbate or create new tensions and conflicts. In the NRT example, some members of the community supported the project, while others did not. Many of these conflicts arise because only a minority of community members are involved in the planning and decision-making in these projects, and often the benefits that may result. This sows discontent and misunderstandings and builds upon existing rivalries and discord. Another element seeding discontent is the narrative that these pastoralist communities need guidance on how to manage their rangelands well. As an anthropologist studying livelihoods and herding strategies in Northern Kenya emphasized: "the Borana pastoralists that I've been researching for the last four years have a very sophisticated and organized way of managing grazing patterns."[4]

Another important governance component is the lack of procedures, laws and regulations, and capacity at the national level to measure outcomes and impacts and to enforce contracts with investors that safeguard national public and local concerns. This limited technical as well as financial capacity limits the ability of state agencies to assess performance and protect local communities. German et al. (2013) observe that in Ghana and Mozambique environmental permits were often not obtained by companies and there was little assessment carried out on performance and adherence to guidelines. Building capacity at the national level requires financial investment.

Benefit-sharing and distributive and procedural justice

An important way to ensure equity and achieve local development objectives is to put in place effective and equitable benefit-sharing arrangements. Yet, again, while discourses in carbon projects acknowledge benefit-sharing potential, the specifics and amounts of these benefits, who they are shared with and for what, remain murky. Plans for benefit sharing should be designed from the outset and careful and continual communication with local community members carried out throughout the project. While distributive justice through benefit-sharing with local

[3] See https://news.mongabay.com/2023/03/carbon-credits-from-award-winning-kenyan-offset-suspended-by-verra/.
[4] Cited in https://news.mongabay.com/2023/03/carbon-credits-from-award-winning-kenyan-offset-suspended-by-verra/.

communities is key, so is procedural justice where community members are actively involved in the planning, implementation, and decision-making around carbon resources.

The importance of procedural justice cannot be overstated as it is critical for current landholders, as well as future ones, and influences distributive justice. However, it is time consuming and possibly costly to engage communities and work out the process of decision-making. The power imbalances engrained in projects make it difficult for community members to challenge, question, or demand better communication and thorough explanations. Carbon projects and the green economy are not concepts rural community members are familiar with. As German et al. (2013) note about foreign investments in land, in depth community consultations are rare and in many of these populations' literacy is low. German emphasizes that it is not just written literacy which is critical but rather legal literacy as well. Understanding the complex contracts that are presented to them, and understanding the benefits that may, or may not come from them, and when over time they might realistically materialize, are enormous challenges. For more marginal members of the community, such as women or poorer households, these challenges are particularly acute. When communication about projects, contracts, and benefits are communicated by powerful actors from both within and outside the community, such as, the state, NGOs, or by private investors, it may be very intimidating to actively engage. Following the principles of free and informed consent is important, but it assumes that community members fully understand what they are consenting to, for how long, on what land, and why. They have very limited, to no, exposure to such principles so obtaining consent cannot be assumed to signal actual agreement.

Carbon sinks and carbon offsets are quite alien concepts to most communities. Their understanding is usually framed by past experiences in different kinds of land deals and extractive processes. As Leach and Scoones observe "Carbon…is just the latest in the long line of bits of nature that foreigners have come to extract and sell" (2015, 22). Indeed, these projects are "easily dismissed as the bizarre ideas of ignorant, though clearly profit-seeking outsiders" (2015, 22).

Providing benefits to local communities is key to ensuring their agreement and participation in carbon offset projects. However, from the perspective of local communities, these benefits must be weighed against the needs for present benefits in the form of food or the use of other resources from their land (agriculture, wood for fuel, or building materials, etc.). Waiting to receive often uncertain financial benefits that may make up for losses of income or food production is beyond the ability of most rural farming and pastoralist communities, and not necessarily even sensible. Opportunity costs may be so high as to deter participation or compliance with the stipulations of carbon projects. As Leach and Scoones underscore: "benefit flows are over such long time frames compared with the day-to-day and seasonal nature of livelihood decisions. Thus, the high-sounding objectives of carbon projects are often meaningless to local people" (2015, 39).

In their volume on *Carbon Conflicts and Forest Landscapes in Africa*, Leach and Scoones find that there is very little information on how much money actually goes to communities for caring

Mozambique: The scramble for land in Mozambique has reached almost feverish proportions. First driven by the food crisis in 2008, 60,000 km^2 were given in a concession to 40 Brazilian farmers to plant soy to meet the demand for the crop from China. Then, 180 km^2 was given as a concession to a South African firm to produce sugarcane for biofuel. Under REDD+, land totalling 150,000 km^2, equivalent to 15 million ha or 19% of the country was identified for private investment. Existing plantations are also working to get their plantations certified as carbon sinks. NGOs and conservation agencies are also jumping on the carbon train looking for opportunities. Looking at land investments for agriculture, large-scale investments have not proven to generate jobs or tax revenue in countries where they are located. And what is to prevent lands being put under large-scale monoculture of trees, which threaten country-level biodiversity as well as local livelihoods (REDD+ in Mozambique: new opportunity for land grabbers? | International Institute for Environment and Development (iied.org))?

for the resources that capture carbon. The winners and losers in these green commodity chains remains opaque. These commodities have, however, given rise to many opportunities for elite capture, either from local elites within the countries or the communities, or the elite experts who must measure, account for, and report on the carbon stored. In addition, there are legal experts hired to negotiate deals with local communities and design and execute contracts. After all these experts are paid, what is left for local communities?

Landscape dynamics

The landscapes within which carbon projects take place are complex social, political, and ecological spaces. They are laden with competing rights, obligations, uses, and flows of resources and people. What takes place in one part of a landscape has ripple effects across it. Actions on land and land-based resources have impacts across both space *and* time. In Ethiopia for example, a sustainable land management project instituted an enclosure on a degraded rangeland site. The intention was to allow the landscape to regenerate, and people and their livestock were kept out of this space. Before enclosure, the livestock were kept in this rangeland area by some households to keep them from wandering into neighbors' farms. Poor women collected the livestock dung to use both for their own cooking fuel and to sell if they had enough to spare. Landless youth also cultivated small plots in the space. None of these land users' losses were considered when experts designed the enclosure. So, livestock owners had to move their cows to another area, potentially resulting in overstocking. Women lost access to fuel and income, as did landless youth (unpublished NBDC report, 2012).

In the highlands of Tanzania, seedlings in a state forest of fast-growing pine species were planted right near springs and streams, causing downstream farmers to lose sufficient water for irrigation of their high-value horticultural crops on which they depend for income. Due to the many and vested interests in this forest, farmers were unable to obtain a solution to this problem, no matter

how many times they raised the issue in local government meetings (unpublished AGORA project report, 2015).

However, positive benefits can also be achieved at a wider landscape scale. For example, in addition to carbon sequestration, restoring mangroves or forests can provide flood protection and erosion control. Adding organic matter to soils can increase soil carbon but also increase crop productivity and soil moisture. Social, ecological, and spatial landscape dynamics are rarely considered in the design and planning of projects. Enclosing landscapes for carbon sequestration should consider local landscapes as areas where people live and work and have deeply embedded ties and histories. Yet, mostly, these landscapes are seen as an opportunity for new green markets.

Climate change costs the world trillions of dollars. Countries in the Global South, who have very limited resources to address climate change, are severely affected by climate disasters. Droughts and floods have become regular occurrences in the lives of rural communities. How will these events affect carbon stocks in these carbon project landscapes? If carbon stocks decline because of weather events, who will bear those costs to the investments? If contract farming is any indication, it is rural communities who bear the risks and suffer the financial losses, more than the investors. Oya (2012) notes about horticultural contract farming in Kenya, the risks of cultivation and harvesting (weather, pests, etc.) are borne by the smallholder not the contracting company. These environmental and accompanying social risks do not receive sufficient attention in the discussions and rush to invest in carbon.

Conclusion: the politics of carbon

This review of contextual factors shaping the success, outcomes, and potential impacts of land-based mitigation strategies has highlighted key concerns revolving around power and rights, as well as important institutional issues that demand attention. What is central to these strategies is the commoditization of carbon – a specific and narrow part of nature – that is taking place under a conventional market-driven rubric, sometimes dubbed “green capitalism”. Green markets are giving rise to new players and entrepreneurs eager to cash in on the “extraction” of this commodity from the natural and social settings in which it is currently embedded in complex ways. The processes that emerge are driven by and reproducing power disparities between and within countries and communities, leading to new forms of appropriation of resources and the potential to greater marginalization for local communities. New de facto alliances are being formed which include such diverse groups as pension funds, venture capitalists, green activists, consumers, and national and local elites to name a few. This new global green economy is big business, accelerating with the urgency and momentum of the climate crisis itself (Fairhead et al. 2015). This commoditization is not only of present resources but of future projections. Nature is now linked to a “tradeable and financialized world” (Fairhead et al. 2015, 243). Moving beyond such a narrow view of the value of nature is necessary if land-based mitigation actions are to yield greater benefits and equity to local communities.

Clearly, a more holistic approach to planning, design, and implementation of land-based carbon mitigation strategies is critical for achieving both equity and environmental benefits beyond just carbon. Primary to all projects should be the active involvement of local communities on whose land and resources these initiatives take place. Seddon et al. (2021) nicely summarise the important elements of a more holistic approach. It should include participatory design and implementation and build upon different forms of knowledge so local knowledge is represented; it should adopt a landscape approach that includes the interconnectedness of habitats; the full range of benefits, costs, and conflicts within these landscapes, communities, and wider society must be evaluated and managed and finally; NbS must be integrated with sustainability strategies (Seddon et al. 2021). In addition, as Seddon et al. (2021) also argue, there needs to be greater attention to other ecosystems beyond forests, such as seascapes, savannas, grasslands, and wetlands. Incorporating this diverse range of ecosystems will require new measures and standards.

There are several standards, principles, and guidelines that have been produced to enable investors at all levels and in all sectors to better design, plan, and implement carbon projects. IUCN's (2020) Global Standard for Nature-based Solutions, which is a framework for the verification, design, and scaling up of NbS, contains many of the ideas and principles that have emerged from this review. However, ultimately, guidelines and standards require enforcement. Very few countries have feedback or grievance mechanisms in place (RRI 2021). In countries with fairly weak governance systems and where citizens have limited rights, enforcing standards is more than a little challenging and unlikely. There are few institutions tasked to serve this monitoring, evaluation, and enforcement role or who have the capacity to do so. There are many powerful actors at the national and global level who have little interest in seeing standards and guidelines implemented or enforced.

It is important to place land-based mitigation strategies in the context of overall development strategies for Global South countries and their citizens. A holistic approach to planning, design, and implementation of land-related policies that focuses on equitable development, and which incorporates community engagement can address some of the pitfalls raised in this paper. This approach requires the commitment and support of international climate finance to realize a more fair and just approach to climate mitigation and to equitable development.

Bibliography

Abramson, Allen. "Mythical, Land Legal Boundaries: Wondering About Landscape and other Tracts." Pluto Press, 2000.

Acevedo, Sara E., Hannah Waterhouse, Felipe Barrios-Masias, Janina Dierks, Leah L.R. Renwick, and Timothy M. Bowles. "How Does Building Healthy Soils Impact Sustainable Use of Water Resources in Irrigated Agriculture?" *Elementa: Science of the Anthropocene* 10, no. 1 (November 25, 2022): 00043. https://doi.org/10.1525/elementa.2022.00043.

Adhikari, Bhim, and Arun Agrawal. "Understanding the Social and Ecological Outcomes of PES Projects: A Review and an Analysis." *Conservation and Society* 11, no. 4 (2013): 359. https://doi.org/10.4103/0972-4923.125748.

Adotey, Joshua, Emmanuel Acheampong, Denis Worlanyo Aheto, and John Blay. "Carbon Stocks Assessment in a Disturbed and Undisturbed Mangrove Forest in Ghana." *Sustainability* 14, no. 19 (October 7, 2022): 12782. https://doi.org/10.3390/su141912782.

Antwi-Agyei, Philip, Andrew J. Dougill, Lindsay C. Stringer, and Samuel Nii Ardey Codjoe. "Adaptation Opportunities and Maladaptive Outcomes in Climate Vulnerability Hotspots of Northern Ghana." *Climate Risk Management* 19 (2018): 83–93. https://doi.org/10.1016/j.crm.2017.11.003.

Araos, Malcolm, Kripa Jagannathan, Roopam Shukla, Idowu Ajibade, Erin Coughlan De Perez, Katy Davis, James D. Ford, et al. "Equity in Human Adaptation-Related Responses: A Systematic Global Review." *One Earth* 4, no. 10 (October 2021): 1454–67. https://doi.org/10.1016/j.oneear.2021.09.001.

Arhin, Albert, and Joanes Atela. "Forest carbon projects and policies in Africa." In *Carbon Conflicts and Forest Landscapes in Africa* edited by Melissa Leach, and Ian Scoones, Taylor & Francis Group (2015).

Arndt, Channing, Rui Benfica, and James Thurlow. "Gender Implications of Biofuels Expansion in Africa: The Case of Mozambique." *World Development* 39, no. 9 (September 2011): 1649–62. https://doi.org/10.1016/j.worlddev.2011.02.012.

Askew, Kelly, and Rie Odgaard. "Deeds and Misdeeds: Land Titling and Women's Rights in Tanzania." *New Left Review* 118 (2019): 68-85.

Astuti, Rini, and Andrew McGregor. "Indigenous Land Claims or Green Grabs? Inclusions and Exclusions within Forest Carbon Politics in Indonesia." *The Journal of Peasant Studies* 44, no. 2 (March 4, 2017): 445–66. https://doi.org/10.1080/03066150.2016.1197908.

Bailis, Robert, and Jennifer Baka. "Constructing Sustainable Biofuels: Governance of the Emerging Biofuel Economy," 2023.

Barbesgaard, Mads. “Blue Growth: Savior or Ocean Grabbing?” *The Journal of Peasant Studies* 45, no. 1 (January 2, 2018): 130–49. https://doi.org/10.1080/03066150.2017.1377186.

Baudron, Frédéric, Aynalem Mamo, Dereje Tirfessa, and Mekuria Argaw. “Impact of Farmland Exclosure on the Productivity and Sustainability of a Mixed Crop-Livestock System in the Central Rift Valley of Ethiopia.” *Agriculture, Ecosystems & Environment* 207 (September 2015): 109–18. https://doi.org/10.1016/j.agee.2015.04.003.

Benjaminsen, Tor A., and Ian Bryceson. “Conservation, Green/Blue Grabbing and Accumulation by Dispossession in Tanzania.” *Journal of Peasant Studies* 39, no. 2 (April 2012): 335–55. https://doi.org/10.1080/03066150.2012.667405.

Benjaminsen, Tor A., and Christian Lund. “Formalisation and Informalisation of Land and Water Rights in Africa: An Introduction.” *The European Journal of Development Research* 14, no. 2 (December 2002): 1–10. https://doi.org/10.1080/714000420.

Bersaglio, Brock, and Frances Cleaver. “Green Grab by Bricolage – The Institutional Workings of Community Conservancies in Kenya.” *Conservation and Society* 16, no. 4 (2018): 467. https://doi.org/10.4103/cs.cs_16_144.

Bezner Kerr, Rachel, Catherine Hickey, Esther Lupafya, and Laifolo Dakishoni. “Repairing Rifts or Reproducing Inequalities? Agroecology, Food Sovereignty, and Gender Justice in Malawi.” *The Journal of Peasant Studies* 46, no. 7 (November 10, 2019): 1499–1518. https://doi.org/10.1080/03066150.2018.1547897.

Borras, Saturnino M., Jennifer C. Franco, Sergio Gómez, Cristóbal Kay, and Max Spoor. “Land Grabbing in Latin America and the Caribbean.” *The Journal of Peasant Studies* 39, no. 3–4 (July 2012): 845–72. https://doi.org/10.1080/03066150.2012.679931.

Borras Jr, Saturnino M., Ruth Hall, Ian Scoones, Ben White, and Wendy Wolford. "Towards a better understanding of global land grabbing: an editorial introduction." *The Journal of Peasant Studies* 38, no. 2 (2011): 209-216.

Bowman, Andrew, Tomas Frederiksen, Deborah Fahy Bryceson, John Childs, Emma Gilberthorpe, and Susan Newman. “Mining in Africa after the Supercycle: New Directions and Geographies.” *Area* 53, no. 4 (December 2021): 647–58. https://doi.org/10.1111/area.12723.

Braun, Yvonne. “Lesotho’s White Gold: The Political Ecology of Temporality and the Economy of Anticipation in Resource Extraction and Large Dam Infrastructural Projects.” *Journal of Political Ecology* 27, no. 1 (January 21, 2020). https://doi.org/10.2458/v27i1.23250.

Brownell, Emily. “Environmental Crisis and Development,” In *Landscape, Environment and Technology in Colonial and Postcolonial Africa*, (2013): 328.

Brugnach, Marcela, Marc Craps, and Art Dewulf. “Including Indigenous Peoples in Climate Change Mitigation: Addressing Issues of Scale, Knowledge and Power.” *Climatic Change* 140, no. 1 (January 2017): 19–32. https://doi.org/10.1007/s10584-014-1280-3.

Bumpus, Adam G., and Diana M. Liverman. "Accumulation by Decarbonization and the Governance of Carbon Offsets." *Economic Geography* 84, no. 2 (April 2008): 127–55. https://doi.org/10.1111/j.1944-8287.2008.tb00401.x.

Büscher, Bram, and Robert Fletcher. "Under Pressure: Conceptualising Political Ecologies of Green Wars." *Conservation and Society* 16, no. 2 (2018): 105. https://doi.org/10.4103/cs.cs_18_1.

Corson, Catherine, and Kenneth Iain MacDonald. "Enclosing the Global Commons: The Convention on Biological Diversity and Green Grabbing." *Journal of Peasant Studies* 39, no. 2 (April 2012): 263–83. https://doi.org/10.1080/03066150.2012.664138.

Cotula, Lorenzo. "The International Political Economy of the Global Land Rush: A Critical Appraisal of Trends, Scale, Geography and Drivers." *The Journal of Peasant Studies* 39, no. 3–4 (July 2012): 649–80. https://doi.org/10.1080/03066150.2012.674940.

———. "The New Enclosures? Polanyi, International Investment Law and the Global Land Rush." *Third World Quarterly* 34, no. 9 (October 2013): 1605–29. https://doi.org/10.1080/01436597.2013.843847.

Cotula, Lorenzo, Sonja Vermeulen, Paul Mathieu, and Camilla Toulmin. "Agricultural investment and international land deals: evidence from a multi-country study in Africa." *Food Security* 3 (2011): 99-113.

Cross, Jamie. "The Solar Good: Energy Ethics in Poor Markets." *Journal of the Royal Anthropological Institute* 25, no. S1 (April 2019): 47–66. https://doi.org/10.1111/1467-9655.13014.

Da Costa Oliveira Neto, Adolfo. "Dispossession and Agricultural Commodities: The Case of Oil Palm Farming in the Brazilian Amazon." In *Agriculture, Environment and Development*, edited by Antonio Augusto Rossotto Ioris and Bernardo Mançano Fernandes, 265–80. Cham: Springer International Publishing, 2022. https://doi.org/10.1007/978-3-031-10264-6_12.

De Pinto, Alessandro, Man Li, Akiko Haruna, Glenn Graham Hyman, Mario Andrés Londoño Martinez, Bernardo Creamer, Ho-Young Kwon, Jhon Brayan Valencia Garcia, Jeimar Tapasco, and Jesus David Martinez. "Low Emission Development Strategies in Agriculture. An Agriculture, Forestry, and Other Land Uses (AFOLU) Perspective." *World Development* 87 (November 2016): 180–203. https://doi.org/10.1016/j.worlddev.2016.06.013.

De Schutter, Olivier. "How Not to Think of Land-Grabbing: Three Critiques of Large-Scale Investments in Farmland." *Journal of Peasant Studies* 38, no. 2 (March 2011): 249–79. https://doi.org/10.1080/03066150.2011.559008.

Dell'Angelo, Jampel, Paolo D'Odorico, Maria Cristina Rulli, and Philippe Marchand. "The Tragedy of the Grabbed Commons: Coercion and Dispossession in the Global Land

Rush." *World Development* 92 (April 2017): 1–12. https://doi.org/10.1016/j.worlddev.2016.11.005.

Devine, Jennifer A. "Community Forest Concessionaires: Resisting Green Grabs and Producing Political Subjects in Guatemala." *The Journal of Peasant Studies* 45, no. 3 (March 19, 2018): 565–84. https://doi.org/10.1080/03066150.2016.1215305.

Dittmer, Kyle M., Sabrina Rose, Sieglinde S. Snapp, Yodit Kebede, Sarah Brickman, Sadie Shelton, Cecelia Egler, Milena Stier, and Eva Wollenberg. "Agroecology Can Promote Climate Change Adaptation Outcomes Without Compromising Yield in Smallholder Systems." *Environmental Management*, April 1, 2023. https://doi.org/10.1007/s00267-023-01816-x.

Djoudi, Houria, Kate Dooley, Amy E. Duchelle, Antoine Libert-Amico, Bruno Locatelli, Michael Bessike Balinga, Maria Brockhaus, et al. "Leveraging the Power of Forests and Trees for Transformational Adaptation." *SSRN Electronic Journal*, 2022. https://doi.org/10.2139/ssrn.4268299.

Dooley K., Keith H., Larson A., Catacora-Vargas G., Carton W., Christiansen K.L., Enokenwa Baa O., Frechette A., Hugh S., Ivetic N., Lim L.C., Lund J.F., Luqman M., Mackey B., Monterroso I., Ojha H., Perfecto I., Riamit K., Robiou du Pont Y., Young V. *The Land Gap* Report 2022. Available at: https://www.landgap.org/

Dooley, Kate, Ellycia Harrould-Kolieb, and Anita Talberg. "Carbon-dioxide Removal and Biodiversity: A Threat Identification Framework." *Global Policy* 12, no. S1 (April 2021): 34–44. https://doi.org/10.1111/1758-5899.12828.

Dooley, Kate, and Sivan Kartha. "Land-Based Negative Emissions: Risks for Climate Mitigation and Impacts on Sustainable Development." *International Environmental Agreements: Politics, Law and Economics* 18, no. 1 (February 2018): 79–98. https://doi.org/10.1007/s10784-017-9382-9.

Edelman, Marc. "Messy hectares: questions about the epistemology of land grabbing data." *Journal of Peasant Studies* 40, no. 3 (2013): 485-501.

Edelman, Marc, and Andrés León. "Cycles of Land Grabbing in Central America: an argument for history and a case study in the Bajo Aguán, Honduras." *Third World Quarterly* 34, no. 9 (2013): 1697-1722.

Engström, Linda, Joanny Bélair, and Adriana Blache. "Formalising Village Land Dispossession? An Aggregate Analysis of the Combined Effects of the Land Formalisation and Land Acquisition Agendas in Tanzania." *Land Use Policy* 120 (September 2022): 106255. https://doi.org/10.1016/j.landusepol.2022.106255.

Fairhead, James, Melissa Leach, and Ian Scoones. "Green Grabbing: A New Appropriation of Nature?" *Journal of Peasant Studies* 39, no. 2 (April 2012): 237–61. https://doi.org/10.1080/03066150.2012.671770.

FAO. *Forest-Based Adaptation: Transformational Adaptation through Forests and Trees*. FAO, 2022. https://doi.org/10.4060/cc2886en.

FAO. *Carbon Rights in the Context of Jurisdictional REDD+: Tenure Links and Country-Based Legal Solutions*. FAO, 2022. https://doi.org/10.4060/cc2694en.

Farage, P, J Ardo, L Olsson, E Rienzi, A Ball, and J Pretty. "The Potential for Soil Carbon Sequestration in Three Tropical Dryland Farming Systems of Africa and Latin America: A Modelling Approach." *Soil and Tillage Research* 94, no. 2 (June 2007): 457–72. https://doi.org/10.1016/j.still.2006.09.006.

Favretto, Nicola, Lindsay C. Stringer, and Andrew J. Dougill. "Cultivating clean energy in Mali: policy analysis and livelihood impacts of Jatropha curcas." Leeds/London: *Centre for Climate Change Economics and Policy Working Paper 84* (2012).

Filer, Colin. "Why Green Grabs Don't Work in Papua New Guinea." *Journal of Peasant Studies* 39, no. 2 (April 2012): 599–617. https://doi.org/10.1080/03066150.2012.665891.

Fischer, Klara, Flora Hajdu, and Filippa Kavallin Giertta. "Commentary on the Paper by Lyons and Westoby 'Carbon Colonialism and the New Land Grab: Plantation Forestry in Uganda and Its Livelihood Impacts.'" *Journal of Rural Studies* 47 (October 2016): 267–68. https://doi.org/10.1016/j.jrurstud.2016.06.014.

Fletcher, Robert, Wolfram Dressler, Bram Büscher, and Zachary R. Anderson. "Questioning REDD+ and the future of market-based conservation." *Conservation Biology* 30, no. 3 (2016): 673-675.

Franco, Jennifer C., and Saturnino M. Borras. "Grey Areas in Green Grabbing: Subtle and Indirect Interconnections between Climate Change Politics and Land Grabs and Their Implications for Research." *Land Use Policy* 84 (May 2019): 192–99. https://doi.org/10.1016/j.landusepol.2019.03.013.

Gasparatos, A., G.P. Von Maltitz, F.X. Johnson, L. Lee, M. Mathai, J.A. Puppim De Oliveira, and K.J. Willis. "Biofuels in Sub-Sahara Africa: Drivers, Impacts and Priority Policy Areas." *Renewable and Sustainable Energy Reviews* 45 (May 2015): 879–901. https://doi.org/10.1016/j.rser.2015.02.006.

German, Laura, George Schoneveld, and Esther Mwangi. "Contemporary Processes of Large-Scale Land Acquisition in Sub-Saharan Africa: Legal Deficiency or Elite Capture of the Rule of Law?" *World Development* 48 (August 2013): 1–18. https://doi.org/10.1016/j.worlddev.2013.03.006.

Gippner, Olivia, Saroj Dhakal, and Benjamin K. Sovacool. "Microhydro Electrification and Climate Change Adaptation in Nepal: Socioeconomic Lessons from the Rural Energy Development Program (REDP)." *Mitigation and Adaptation Strategies for Global Change* 18, no. 4 (April 2013): 407–27. https://doi.org/10.1007/s11027-012-9367-5.

Gocking, Roger. “Ghana’s Bui Dam and the Contestation over Hydro Power in Africa.” *African Studies Review* 64, no. 2 (June 2021): 339–62. https://doi.org/10.1017/asr.2020.41.

Green, Kathryn E., and William M. Adams. “Green Grabbing and the Dynamics of Local-Level Engagement with Neoliberalization in Tanzania’s Wildlife Management Areas.” *The Journal of Peasant Studies* 42, no. 1 (January 2, 2015): 97–117. https://doi.org/10.1080/03066150.2014.967686.

Grima, Nelson, Simron J. Singh, Barbara Smetschka, and Lisa Ringhofer. “Payment for Ecosystem Services (PES) in Latin America: Analysing the Performance of 40 Case Studies.” *Ecosystem Services* 17 (February 2016): 24–32. https://doi.org/10.1016/j.ecoser.2015.11.010.

Griscom, Bronson W., Justin Adams, Peter W. Ellis, Richard A. Houghton, Guy Lomax, Daniela A. Miteva, William H. Schlesinger, et al. “Natural Climate Solutions.” *Proceedings of the National Academy of Sciences* 114, no. 44 (October 31, 2017): 11645–50. https://doi.org/10.1073/pnas.1710465114.

Gwenzi, Willis, Nhamo Chaukura, Fungai N.D. Mukome, Stephen Machado, and Blessing Nyamasoka. “Biochar Production and Applications in Sub-Saharan Africa: Opportunities, Constraints, Risks and Uncertainties.” *Journal of Environmental Management* 150 (March 2015): 250–61. https://doi.org/10.1016/j.jenvman.2014.11.027.

Haller, Tobias. “Institution Shopping and Resilience Grabbing: Changing Scapes and Grabbing Pastoral Commons in African Floodplain Wetlands.” *Conservation and Society* 18, no. 3 (2020): 252. https://doi.org/10.4103/cs.cs_19_104.

Hashmiu, Ishmael. "Farming Carbon in Ghana's Transition Zone: Rhetoric versus reality." In Carbon Conflicts and Forest Landscapes in Africa, pp. 163-179. Routledge, 2015.

Hill, Samantha L. L., Andy Arnell, Calum Maney, Stuart H. M. Butchart, Craig Hilton-Taylor, Carolyn Ciciarelli, Crystal Davis, Eric Dinerstein, Andy Purvis, and Neil D. Burgess. “Measuring Forest Biodiversity Status and Changes Globally.” *Frontiers in Forests and Global Change* 2 (November 29, 2019): 70. https://doi.org/10.3389/ffgc.2019.00070.

Holland, Margaret B., Yuta J. Masuda, and Brian E. Robinson, eds. *Land Tenure Security and Sustainable Development*. Cham: Springer International Publishing, 2022. https://doi.org/10.1007/978-3-030-81881-4.

Hulme, David, and Andrew Shepherd. “Conceptualizing Chronic Poverty.” *World Development* 31, no. 3 (March 2003): 403–23. https://doi.org/10.1016/S0305-750X(02)00222-X.

Hultman, Nathan E., Emmanuel B. Sulle, Christopher W. Ramig, and Seth Sykora-Bodie. “Biofuels Investments in Tanzania: Policy Options for Sustainable Business Models.” *The Journal of Environment & Development* 21, no. 3 (September 2012): 339–61. https://doi.org/10.1177/1070496511435665.

Humpenöder, Florian, Alexander Popp, Carl-Friedrich Schleussner, Anton Orlov, Michael Gregory Windisch, Inga Menke, Julia Pongratz, et al. "Overcoming Global Inequality Is Critical for Land-Based Mitigation in Line with the Paris Agreement." *Nature Communications* 13, no. 1 (December 2, 2022): 7453. https://doi.org/10.1038/s41467-022-35114-7.

Hunsberger, Carol, and Stefano Ponte. "'Sustainable' Biofuels in the Global South." *Geoforum* 54 (July 2014): 243–47. https://doi.org/10.1016/j.geoforum.2014.02.005.

Ioris, Antonio Augusto Rossotto. "Agriculture, Environment and Development: International Perspectives and a Critical Agenda of Investigation." In *Agriculture, Environment and Development*, edited by Antonio Augusto Rossotto Ioris and Bernardo Mançano Fernandes, 1–25. Cham: Springer International Publishing, 2022. https://doi.org/10.1007/978-3-031-10264-6_1.

Jat, M.L., J.C. Dagar, T.B. Sapkota, Yadvinder-Singh, B. Govaerts, S.L. Ridaura, Y.S. Saharawat, et al. "Climate Change and Agriculture: Adaptation Strategies and Mitigation Opportunities for Food Security in South Asia and Latin America." In *Advances in Agronomy*, 137:127–235. Elsevier, 2016. https://doi.org/10.1016/bs.agron.2015.12.005.

Jones, Michael B., Frank Kansiime, and Matthew J. Saunders. "The Potential Use of Papyrus (*Cyperus Papyrus* L.) Wetlands as a Source of Biomass Energy for Sub-Saharan Africa." *GCB Bioenergy* 10, no. 1 (January 2018): 4–11. https://doi.org/10.1111/gcbb.12392.

Kartha, Sivan, and Kate Dooley. The risks of relying on tomorrow's "negative emissions" to guide today's mitigation ambition. *Stockholm Environment Institute Working Paper* presented at COP21, 3 Dec, 2015.

Kauffman, J. Boone, and Rupesh K. Bhomia. "Ecosystem Carbon Stocks of Mangroves across Broad Environmental Gradients in West-Central Africa: Global and Regional Comparisons." Edited by Just Cebrian. *PLOS ONE* 12, no. 11 (November 13, 2017): e0187749. https://doi.org/10.1371/journal.pone.0187749.

Kiffner, Christian, Zoe Arndt, Trent Foky, Megan Gaeth, Alex Gannett, Madeline Jackson, Georgie Lellman, et al. "Land Use, REDD+ and the Status of Wildlife Populations in Yaeda Valley, Northern Tanzania." Edited by Tim A. Mousseau. *PLOS ONE* 14, no. 4 (April 4, 2019): e0214823. https://doi.org/10.1371/journal.pone.0214823.

Klooster, Daniel, and Omar Masera. "Community Forest Management in Mexico: Carbon Mitigation and Biodiversity Conservation through Rural Development." *Global Environmental Change* 10, no. 4 (December 2000): 259–72. https://doi.org/10.1016/S0959-3780(00)00033-9.

Koizumi, Tatsuji. "Introduction." In *Biofuels and Food Security*, by Tatsuji Koizumi, 1–12. SpringerBriefs in Applied Sciences and Technology. Cham: Springer International Publishing, 2014. https://doi.org/10.1007/978-3-319-05645-6_1.

Lambin, Eric F., and Patrick Meyfroidt. "Global Land Use Change, Economic Globalization, and the Looming Land Scarcity." *Proceedings of the National Academy of Sciences* 108, no. 9 (March 2011): 3465–72. https://doi.org/10.1073/pnas.1100480108.

Larson, Anne M. "Land Rights of Indigenous Peoples and Local Communities: Chapter Four" in Dooley K., Keith H., Larson A., Catacora-Vargas G., Carton W., Christiansen K.L., Enokenwa Baa O., Frechette A., Hugh S., Ivetic N., Lim L.C., Lund J.F., Luqman M., Mackey B., Monterroso I., Ojha H., Perfecto I., Riamit K., Robiou du Pont Y., Young V. *The Land Gap Report* 2022, pp. 52-67. Available at: https://www.landgap.org/

Larson, Anne M., Maria Brockhaus, William D. Sunderlin, Amy Duchelle, Andrea Babon, Therese Dokken, Thu Thuy Pham, et al. "Land Tenure and REDD+: The Good, the Bad and the Ugly." *Global Environmental Change* 23, no. 3 (June 2013): 678–89. https://doi.org/10.1016/j.gloenvcha.2013.02.014.

Leach, Melissa, James Fairhead, and James Fraser. "Green Grabs and Biochar: Revaluing African Soils and Farming in the New Carbon Economy." *Journal of Peasant Studies* 39, no. 2 (April 2012): 285–307. https://doi.org/10.1080/03066150.2012.658042.

Leach, Melissa, and Ian Scoones. "POLITICAL ECOLOGIES OF CARBON IN AFRICA," n.d.

Leach, Melissa, and Ian Scoones. "Political Ecologies of Carbon in Africa"in *Carbon Conflicts and Forest Landscapes in Africa* (2015). Routledge.

Lesutis, Gediminas. *The Politics of Precarity: Spaces of Extractivism, Violence and Suffering*. 1st ed. London: Routledge, 2021. https://doi.org/10.4324/9781003178569.

Lipper, Leslie, Celine Dutilly-Diane, and Nancy McCarthy. "Supplying Carbon Sequestration From West African Rangelands: Opportunities and Barriers." *Rangeland Ecology & Management* 63, no. 1 (January 2010): 155–66. https://doi.org/10.2111/REM-D-09-00009.1.

Lowder, Sarah K., Jakob Skoet, and Terri Raney. "The Number, Size, and Distribution of Farms, Smallholder Farms, and Family Farms Worldwide." *World Development* 87 (November 2016): 16–29. https://doi.org/10.1016/j.worlddev.2015.10.041.

Lyons, Kristen, and Peter Westoby. "Carbon Colonialism and the New Land Grab: Plantation Forestry in Uganda and Its Livelihood Impacts." *Journal of Rural Studies* 36 (October 2014): 13–21. https://doi.org/10.1016/j.jrurstud.2014.06.002.

Lyster, Rosemary. "REDD+, Transparency, Participation and Resource Rights: The Role of Law." *Environmental Science & Policy* 14, no. 2 (March 2011): 118–26. https://doi.org/10.1016/j.envsci.2010.11.008.

Margulis, Matias E., Nora McKeon, and Saturnino M. Borras. "Land Grabbing and Global Governance: Critical Perspectives." *Globalizations* 10, no. 1 (February 2013): 1–23. https://doi.org/10.1080/14747731.2013.764151.

Matondi, Prosper B., Kjell Havnevik, and Atakilte Beyene, eds. *Biofuels, Land Grabbing and Food Security in Africa*. Zed Books Ltd, 2011. https://doi.org/10.5040/9781350218673.

McMichael, Philip. "The Land Grab and Corporate Food Regime Restructuring." *The Journal of Peasant Studies* 39, no. 3–4 (July 2012): 681–701. https://doi.org/10.1080/03066150.2012.661369.

Meyfroidt, Patrick, Eric F Lambin, Karl-Heinz Erb, and Thomas W Hertel. "Globalization of Land Use: Distant Drivers of Land Change and Geographic Displacement of Land Use." *Current Opinion in Environmental Sustainability* 5, no. 5 (October 2013): 438–44. https://doi.org/10.1016/j.cosust.2013.04.003.

Mgalula, Michael Elias, Oliver Vivian Wasonga, Christian Hülsebusch, Uwe Richter, and Oliver Hensel. "Greenhouse Gas Emissions and Carbon Sink Potential in Eastern Africa Rangeland Ecosystems: A Review." *Pastoralism* 11, no. 1 (October 21, 2021): 19. https://doi.org/10.1186/s13570-021-00201-9.

Molony, Thomas., and James Smith. "Biofuels, Food Security, and Africa." *African Affairs* 109, no. 436 (July 1, 2010): 489–98. https://doi.org/10.1093/afraf/adq019.

Moret, Whitney. "Vulnerability assessment methodologies: A review of the literature." Washington, DC: FHI 360 (2014).

Morrison, Tiffany H., William N. Adger, Arun Agrawal, Katrina Brown, Matthew J. Hornsey, Terry P. Hughes, Meha Jain, et al. "Radical Interventions for Climate-Impacted Systems." *Nature Climate Change* 12, no. 12 (December 2022): 1100–1106. https://doi.org/10.1038/s41558-022-01542-y.

Moyo, Sam, Dzodzi Tsikata, Yakham Diop, and Codesria, eds. *Land in the Struggles for Citizenship in Africa: Le Foncier Dans Les Luttes Pour La Citoyenneté En Afrique*. Codesria Book Series. Dakar, Senegal: Council for the Development of Social Science Research in Africa, 2015.

Nightingale, Andrea, and Helene Ahlborg. "Theorizing Power in Political Ecology: The 'where' of Power in Resource Governance Projects." *Journal of Political Ecology* 25, no. 1 (January 3, 2018). https://doi.org/10.2458/v25i1.22804.

Nightingale, Andrea Joslyn, Siri Eriksen, Marcus Taylor, Timothy Forsyth, Mark Pelling, Andrew Newsham, Emily Boyd, et al. "Beyond Technical Fixes: Climate Solutions and the Great Derangement." *Climate and Development* 12, no. 4 (April 20, 2020): 343–52. https://doi.org/10.1080/17565529.2019.1624495.

Nunez, Sarahi, Jana Verboom, and Rob Alkemade. "Assessing Land-Based Mitigation Implications for Biodiversity." *Environmental Science & Policy* 106 (April 2020): 68–76. https://doi.org/10.1016/j.envsci.2020.01.006.

Oyhantçabal, Gabriel, and Ignacio Narbondo. "Land Grabbing in Uruguay: New Forms of Land Concentration." *Canadian Journal of Development Studies / Revue Canadienne d'études*

Du Développement 40, no. 2 (April 3, 2019): 201–19. https://doi.org/10.1080/02255189.2018.1524749.

Patterson, Rubin. "13 Growing a Global Green Economy." Landscape, Environment and Technology in Colonial and Postcolonial Africa 6 (2013): 311.

Peluso, Nancy Lee, and Christian Lund. "New Frontiers of Land Control: Introduction." *Journal of Peasant Studies* 38, no. 4 (October 2011): 667–81. https://doi.org/10.1080/03066150.2011.607692.

Peters, Pauline E. "Land Appropriation, Surplus People and a Battle over Visions of Agrarian Futures in Africa." *Journal of Peasant Studies* 40, no. 3 (May 2013): 537–62. https://doi.org/10.1080/03066150.2013.803070.

Ramos-Castillo, Ameyali, Edwin J. Castellanos, and Kirsty Galloway McLean. "Indigenous Peoples, Local Communities and Climate Change Mitigation." *Climatic Change* 140, no. 1 (January 2017): 1–4. https://doi.org/10.1007/s10584-016-1873-0.

Rasolofoson, Ranaivo A., Paul J. Ferraro, Clinton N. Jenkins, and Julia P.G. Jones. "Effectiveness of Community Forest Management at Reducing Deforestation in Madagascar." *Biological Conservation* 184 (April 2015): 271–77. https://doi.org/10.1016/j.biocon.2015.01.027.

Raw, J.L., L. Van Niekerk, O. Chauke, H. Mbatha, T. Riddin, and J.B. Adams. "Blue Carbon Sinks in South Africa and the Need for Restoration to Enhance Carbon Sequestration." *Science of The Total Environment* 859 (February 2023): 160142. https://doi.org/10.1016/j.scitotenv.2022.160142.

Renewable Energy and Jobs Annual Review 2021. Abu Dhabi, Geneva: International Renewable Energy Agency International Labour Organization, 2021.

Resnick, Danielle, Finn Tarp, and James Thurlow. "The Political Economy of Green Growth: Cases from Southern Africa." *Public Administration and Development* 32, no. 3 (2012): 215-228. https://doi.org/10.1002/pad.1619.

Rights and Resources Initiative. "Who Owns the World's Land? A Global Baseline of Formally Recognized Indigenous and Community Land Rights." Rights and Resources Initiative, September 29, 2015. https://doi.org/10.53892/NXFO7501.

Rights and Resources Initiative and McGill University. "Status of Legal Recognition of Indigenous Peoples', Local Communities' and Afro-Descendant Peoples' Rights to Carbon Stored in Tropical Lands and Forests." Rights and Resources Initiative, June 2, 2021. https://doi.org/10.53892/KMMW8052.

Rights and Resources Initiative, Woods Hole Research Center, and Landmark. "Toward a Global Baseline of Carbon Storage in Collective Lands: An Updated Analysis of Indigenous Peoples' and Local Communities' Contributions to Climate Change Mitigation." Rights and Resources Initiative, November 2, 2016. https://doi.org/10.53892/ABQR3130.

Ripple, William J., William R. Moomaw, Christopher Wolf, Matthew G. Betts, Beverly E. Law, Jillian Gregg, and Thomas M. Newsome. "Six Steps to Integrate Climate Mitigation with Adaptation for Social Justice." *Environmental Science & Policy* 128 (February 2022): 41–44. https://doi.org/10.1016/j.envsci.2021.11.007.

Rousseau, Jean-François. "When Land, Water and Green-grabbing Cumulate: Hydropower Expansion, Livelihood Resource Reallocation and Legitimisation in Southwest China." *Asia Pacific Viewpoint* 61, no. 1 (April 2020): 134–46. https://doi.org/10.1111/apv.12247.

Russell-Smith, Jeremy, Catherine Monagle, Margaret Jacobsohn, Robin L. Beatty, Bibiana Bilbao, Adriana Millán, Hebe Vessuri, and Isabelle Sánchez-Rose. "Can Savanna Burning Projects Deliver Measurable Greenhouse Emissions Reductions and Sustainable Livelihood Opportunities in Fire-Prone Settings?" *Climatic Change* 140, no. 1 (January 2017): 47–61. https://doi.org/10.1007/s10584-013-0910-5.

Sánchez, Alberto, and Michela Izzo. "Micro Hydropower: An Alternative for Climate Change Mitigation, Adaptation, and Development of Marginalized Local Communities in Hispaniola Island." *Climatic Change* 140, no. 1 (January 2017): 79–87. https://doi.org/10.1007/s10584-016-1865-0.

Sapp, Meghan. "Can Biofuels Really Be Blamed for Food Insecurity in Africa?" *Biofuels, Bioproducts and Biorefining* 7, no. 5 (September 2013): 482–84. https://doi.org/10.1002/bbb.1444.

Scheidel, Arnim, and Courtney Work. "Forest Plantations and Climate Change Discourses: New Powers of 'Green' Grabbing in Cambodia." *Land Use Policy* 77 (September 2018): 9–18. https://doi.org/10.1016/j.landusepol.2018.04.057.

Seddon, Nathalie, Alexandre Chausson, Pam Berry, Cécile A. J. Girardin, Alison Smith, and Beth Turner. "Understanding the Value and Limits of Nature-Based Solutions to Climate Change and Other Global Challenges." *Philosophical Transactions of the Royal Society B: Biological Sciences* 375, no. 1794 (March 16, 2020): 20190120. https://doi.org/10.1098/rstb.2019.0120.

Sikor, Thomas, Graeme Auld, Anthony J Bebbington, Tor A Benjaminsen, Bradford S Gentry, Carol Hunsberger, Anne-Marie Izac, et al. "Global Land Governance: From Territory to Flow?" *Current Opinion in Environmental Sustainability* 5, no. 5 (October 2013): 522–27. https://doi.org/10.1016/j.cosust.2013.06.006.

Sjaastad, Espen, and Daniel W. Bromley. Indigenous Land Rights in Sub-Saharan Africa: Appropriation, Security and Investment Demand. No. 1800-2016-142275. 1996.

Snilsveit, Birte, Jennifer Stevenson, Laurenz Langer, Natalie Tannous, Zafeer Ravat, Promise Nduku, Joshua Polanin, Ian Shemilt, John Eyers, and Paul J. Ferraro. "Incentives for Climate Mitigation in the Land Use Sector—the Effects of Payment for Environmental Services on Environmental and Socioeconomic Outcomes in Low- and Middle-income

Countries: A Mixed-methods Systematic Review." *Campbell Systematic Reviews* 15, no. 3 (September 2019). https://doi.org/10.1002/cl2.1045.

Stefanakis, Alexandros I., Cristina S.C. Calheiros, and Ioannis Nikolaou. "Nature-Based Solutions as a Tool in the New Circular Economic Model for Climate Change Adaptation." *Circular Economy and Sustainability* 1, no. 1 (June 2021): 303–18. https://doi.org/10.1007/s43615-021-00022-3.

Streck, Charlotte. "Who Owns REDD+? Carbon Markets, Carbon Rights and Entitlements to REDD+ Finance." *Forests* 11, no. 9 (September 1, 2020): 959. https://doi.org/10.3390/f11090959.

Swallow, Brent M., and Thomas W. Goddard. "Value Chains for Bio-Carbon Sequestration Services: Lessons from Contrasting Cases in Canada, Kenya and Mozambique." *Land Use Policy* 31 (March 2013): 81–89. https://doi.org/10.1016/j.landusepol.2012.02.002.

Thornton, Thomas F., and Claudia Comberti. "Synergies and Trade-Offs between Adaptation, Mitigation and Development." *Climatic Change* 140, no. 1 (January 2017): 5–18. https://doi.org/10.1007/s10584-013-0884-3.

Tienhaara, Kyla. "The Potential Perils of Forest Carbon Contracts for Developing Countries: Cases from Africa." *Journal of Peasant Studies* 39, no. 2 (April 2012): 551–72. https://doi.org/10.1080/03066150.2012.664137.

Tilt, Bryan, Yvonne Braun, and Daming He. "Social Impacts of Large Dam Projects: A Comparison of International Case Studies and Implications for Best Practice." *Journal of Environmental Management* 90 (July 2009): S249–57. https://doi.org/10.1016/j.jenvman.2008.07.030.

Vierros, Marjo. "Communities and Blue Carbon: The Role of Traditional Management Systems in Providing Benefits for Carbon Storage, Biodiversity Conservation and Livelihoods." *Climatic Change* 140, no. 1 (January 2017): 89–100. https://doi.org/10.1007/s10584-013-0920-3.

Vigil, Sara. "Green Grabbing-Induced Displacement." In *Routledge Handbook of Environmental Displacement and Migration*, edited by Robert McLeman and François Gemenne, 1st ed., 370–87. Routledge, 2018. https://doi.org/10.4324/9781315638843-29.

Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security. FAO, 2019. https://doi.org/10.4060/i2801e.

White, Ben, Saturnino M. Borras Jr., Ruth Hall, Ian Scoones, and Wendy Wolford. "The New Enclosures: Critical Perspectives on Corporate Land Deals." *The Journal of Peasant Studies* 39, no. 3–4 (July 2012): 619–47. https://doi.org/10.1080/03066150.2012.691879.

Whitman, Thea, and Johannes Lehmann. "Biochar—One Way Forward for Soil Carbon in Offset Mechanisms in Africa?" *Environmental Science & Policy* 12, no. 7 (November 2009): 1024–27. https://doi.org/10.1016/j.envsci.2009.07.013.

Wily, Liz Alden. “Critical Next Step in the Decolonisation of Land Relations: Restitution of Protected Areas to Indigenous Communities,” n.d.

———. “Transforming Legal Status of Customary Land Rights: What This Means for Women and Men in Rural Africa.” In *Land Governance and Gender: The Tenure-Gender Nexus in Land Management and Land Policy*, edited by Uchendu Eugene Chigbu, 1st ed., 169–81. UK: CABI, 2021. https://doi.org/10.1079/9781789247664.0014.

Wittman, Hannah K., and Cynthia Caron. “Carbon Offsets and Inequality: Social Costs and Co-Benefits in Guatemala and Sri Lanka.” *Society & Natural Resources* 22, no. 8 (August 11, 2009): 710–26. https://doi.org/10.1080/08941920802046858.

Woroniecki, Stephen, Femke A. Spiegelenberg, Alexandre Chausson, Beth Turner, Isabel Key, Haseeb Md. Irfanullah, and Nathalie Seddon. “Contributions of Nature-Based Solutions to Reducing People’s Vulnerabilities to Climate Change across the Rural Global South.” *Climate and Development*, December 5, 2022, 1–18. https://doi.org/10.1080/17565529.2022.2129954.

Zoomers, Annelies. “Globalisation and the Foreignisation of Space: Seven Processes Driving the Current Global Land Grab.” *The Journal of Peasant Studies* 37, no. 2 (April 2010): 429–47. https://doi.org/10.1080/03066151003595325.