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Private Sector Investment and the Green Economy: The Local Consequences of Tree Plantations in Southern Tanzania

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Abstract

Increasing interest and investment on privately funded carbon finance and neoliberal conservation sees capital transforming landscapes across the global south. With this transformation and movement of capital are concerns of land grabs, dispossession, exploitation and loss of access to resources. Understanding these concerns requires understanding investments, responding to markets, changing ecologies, changing livelihoods and land-use practices, power dynamics and social structures.

This research explores the direct and broader consequences of large-scale private sector investment in carbon forestry on the society, ecologies and economies of two rural communities in Kilombero, Morogoro, Tanzania. These communities have over the last two decades, seen the establishment of large tree plantations by a private-sector company: Green Resources Ltd (GRL). Fieldwork in the two rural villages, Uchindile and Kitete, was undertaken in 2013, and utilised mixed qualitative methods, including focus group discussions, semi-structured interviews, household surveys.

The presence and activities of GRL have brought about immediate and more gradual fundamental shifts in the economies and society of Uchindile and Kitete. These impacts have affected all parts of local society, to varying degrees. Some have opened up new opportunities for welcome change, while others have deepened inequalities. The impacts are significant and far reaching but are not straightforward. Nor are they viewed as such by local residents.

Findings suggest we should pay more attention to the economic and employment opportunities created by such investments relative to the attention placed in the literature on land alienation. I argue the indirect, broader consequences of private sector investment are as important as the direct consequences because of the changes that it sets in motion. I argue that the degradation and multi-win narratives we see in the literature are sticky locally, and that local people (re) appropriate these narratives and leverage fire as a tool to further their own interests.

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1. Introduction

There has been increased global interest and investment in carbon finance and neoliberal conservation, which sees capital transforming landscapes across the world, and particularly in Africa. With this transformation and movement of capital, we see concerns of land grabs, of capital dispossessing local people, of exploitation and loss of access to resources. Understanding these concerns requires understanding investments, responding to markets, changing ecologies, changing livelihoods and land-use practices, power dynamics and social structures.

As recent media coverage (Monbiot, 2022) has shown, the market for carbon credits has experienced significant recent growth, projected to reach an annual market value of $1bn in 2021. Global energy companies such as Shell and Total purchase these voluntary carbon credits on the market to offset their emissions. These carbon offsets are also purchased by everyday consumers of, for example, air travel. These offsets are often funding carbon offset projects across the world. The transfer of capital and offering concordant environmental and development opportunities is often presented as the only way to make meaningful progress on combatting climate change and global deforestation rates. However, concerns of carbon-colonialism and moral hazards abound, particularly relating to violations of local land rights and dispossession of rural populations.


Carbon offsetting is not warding off environmental collapse – it's accelerating it

George Monbiot

Wed 26 Jan 2022 12.33 GMT

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Wealthy companies are using the facade of 'nature-based solutions' to enact a great carbon land grab

'Last year, forests being used as corporate offsets were incinerated by the wildfires raging across North America.' Photograph: Noah Berger/EPA

Figure 1.1: Screenshot of recent news article relating to carbon offsets in Monbiot (2022) Carbon offsetting is not warding off environmental collapse – it's accelerating it. Photograph shown in screenshot by Noah Berger/EPA. Used under a UK Copyright Exception.

Figure 1.1. above is illustrative of the type of imagery the critiques of carbon finance and neoliberal conservation offer. In the article, as we can see from the figure above, Monbiot (2022) also links carbon offset forests to wildfire, showing the relevance of fire ecologies, narratives surrounding fires, and narratives relating to carbon forestry. This connects to neoliberal conservation and forms of global market capital 'fixes' to environmental problems. The article also references an academic article by Lyons and Westoby (2014) who examine the case of Green Resources in Uganda and argue that the company's private investment in carbon forestry there involves what they term 'carbon colonialism', as well as neoliberal land grabs, with 'profound adverse local livelihood outcomes' (Lyons and Westoby, 2014: 13). Here we also see stories of environmental degradation and of crisis. We see neoliberal stories of multi-wins being turned on their head and revealed as self-defeating ruthless exploitations of land and people for profit under the guise of environmental salvation. These narratives and counter-narratives are powerful and polarising.

Monbiot (2022) presents his own set of answers to these critical issues. I do not set out to prove or disprove his arguments or his set of solutions. Instead, I argue that what emerges these arguments and solutions are in fact a set of further questions. It is these questions that I attend to in this thesis.

While on my scoping trip for my thesis fieldwork, in rural Tanzania, I was envisioning a very different PhD topic to the thesis I present today. I was planning to evaluate trade-offs in ecosystem services, particularly focussing on tensions between carbon and water. Chapter 3 explains this re-orienting of focus in more detail. Two villages I had been hoping to visit on my scoping trip to do a village level survey were inaccessible within the constraints of the time that I had at that point due to weather conditions. In conversation with local colleagues, the village of Uchindile was suggested as a possible site of interest due to some large-scale tree plantations nearby. Following this recommendation, my research assistant and I travelled to the area and through conversations and consultations locally, determined that Uchindile and the nearby Kitete would be appropriate sites, and that I was welcome to undertake research there. It emerged that these villages were also home to Green Resources Limited (GRL) who managed the tree plantations. GRL are a sister company to the Green Resources referenced in the article above – both are owned by the same parent company, Green Resources AS.

I did not arrive in these villages announcing (or indeed intending) my research to be 'on GRL'. Even during my extensive period of fieldwork I did not always recognise it as such. I initially broadly described my research as seeking to understand local relationships between people and the environment and the dynamics that arise. And indeed, these relationships remain central to my thesis. Yet when I spent time with, spoke with, and learnt from local people, the presence and influence of GRL in people's lives was striking. The spectre of a large fire in recent years, which had badly affected the company's plantation, loomed large. As is often the case, and as I demonstrate in chapter 3, much of the value of person-centred, grounded qualitative research comes from the fact that it listens and reflexively responds to what local people identify as important.

This thesis thus seeks to give insight to the question: *what does private sector investment in carbon forestry do to rural society, ecologies, and economies in Southern Tanzania? And how do these impacts unfold?*

To offer insight to this question, I explore the different aspects of these consequences through several sub-questions:

- What are the direct impacts of this private investment, particularly in reference to employment opportunities and other investments?
- What are the broader social, economic, and ecological dynamics that arise, and how do they unfold?
- How are the politics relating to the investment discussed and negotiated?
- How can we understand the narratives that sustain and challenge these investments, and how are they reproduced and used by various actors?

These questions are important because, as described above, we are seeing a global expansion and transfer of capital into neoliberal conservation and carbon offset programmes, and heated debate as to their consequences. There is a proliferation of funding and expansion of the physical scope of these projects. People everywhere are becoming more aware of the critical importance of understanding the impacts of the neoliberal agenda and international climate finance on the lives of people who live amongst and against 'project locations' (the landscapes that they are part of). These questions also matter because people matter. Yet we do not have sufficient nuanced understanding of how and why these consequences can unfold and how carbon investments often do not have clear black or white outcomes but instead exist in shades of grey.

The analytical framework, or the ideas and conceptual building blocks I put in place to understand my data in respect to these questions, are set out in the literature review in chapter 2: each section lays one of these foundational bricks. Broadly speaking, I explore these questions in relation to the construction and manipulation of narratives by diverse actors to construct favourable positions for their interests. I argue that capitalism and neoliberal conservation are re-writing landscapes. The consequences of these investment produce a variety of complex and evolving changes which include benefits not always foreseen in the literature, as well as various misfortunes. I argue that we should pay more attention to the economic and employment opportunities created by such investments relative to the attention placed on land alienation. I argue that the indirect, broader consequences of this private sector investment are as important as - if not more important than – the direct consequences because of the changes that it sets in motion. I argue that the degradation and multi-win narratives we see in the literature are sticky locally, and that local people (re) appropriate these narratives and leverage fire as a tool to further their own interests.

This thesis proceeds as follows:

Chapter 2 reviews the literature relevant to understanding the claims GRL makes about the problems they say they address, and to situate the thesis in its scholarly context. I argue that the claims GRL and others make are plausible because they connect with a set of simplified stories, or narratives, relating to the environment, ideas of degradation and crisis, and concepts of multi-win neoliberal fixes. We explore debates in the literature around neoliberal conservation, the commodification of nature carbon, land alienation and how local people respond to and resist these often top-down or foreign interventions. The burgeoning literature reveals a polarised debate around these interconnected issues, with the virtues of private sector investment in 'triple-win' projects extolled on the one hand, and the vices of re-colonization on the other, where foreign investment in agricultural modernization is leading to the dispossession of smallholders and limited wider benefit. The debate suffers from a lack of study of the actual consequences of such investments, and as such I establish the need for this research and the context within which it sits. I argue that between the sometimes polarised positions

presented in the literature are rather messy realities on the ground, and that to better understand the dynamics of change arising from carbon investments we must examine them within their broader contexts and look carefully at how their social, ecological and economic consequences unfold.

Chapter 3 explains the origins and journey of the thesis; a long and winding road with ups and downs and numerous obstacles which have altered the course of progress. I set out what I did before, during, and after undertaking fieldwork and how and why I did these things. I critically reflect on the methods used and the associated limitations of the research, including what this thesis omits. I discuss the positionalities and privileges I held as a researcher in Tanzania, and explore the relationship between mental health and fieldwork.

Chapter 4 sets the scene for the subsequent chapters and findings. I situate the study sites and GRL's activities within broader Tanzanian policy. I describe the wider Morogoro region and the Kilombero district in order to situate the study sites of Kitete and Uchindile. I construct a broad-brush picture of the economy and society in this part of Tanzania and then compare this to the study site villages using descriptive statistics and fieldwork data, arguing that they represent relatively typical rural Tanzania villages, although they appear to have a relative surplus of land. Finally, I describe the history of the company GRL's presence in the area, including the acquisition of land for tree plantations.

Chapter 5 explores the role played by GRL in the two rural communities of Uchindile and Kitete. First, I consider the environmental framings of GRL's investment. Then I consider their direct impacts on the development of local communities. Finally, I consider the contribution of carbon payments to village life.

Chapter 6 examines the broader impacts of GRL's investment, exploring the wider dynamics that have been unleashed. I first look at the consequences for local economies and land use, before turning to the possibility of villagers receiving personal carbon payments. I explore GRL's impact on migratory dynamics within and beyond the communities before considering distributed fire management and concerns around land. Finally, I discuss concerns and anxieties around food security, looking at how multiple drivers and effects have impacted on the availability of food.

Chapter 7 further explores the nature and practices of local politics through the lens of a severe fire that occurred in 2009, destroying a significant proportion of the GRL plantation in Uchindile and Kitete. I use the fire to examine the forms of power and agency exerted by different groups, and specifically how the fire was used by these groups to re-negotiate power dynamics and terms of engagement. First, I outline the general context of attitudes to fire. Then I explore the nature and impact of the 2009 fire. I subsequently examine three prevailing perspectives that emerged during fieldwork as to the cause of the fire, and then turn to a discussion of reactions to the fire and how it was used to (re) negotiate power and interactions between and within the company and the surrounding local communities.

Finally, in **chapter 8** I consider the broader significance of my findings in relation to the literature discussed in the thesis. I review the argument presented in the thesis chapter by chapter. I then draw out key themes that run throughout the thesis. I summarise the contribution of my thesis to the

literature, consider the generalisability of my findings, and offer recommendations for future research.

2. Literature Review

An imagined pitch

*We are CTR: Carbon Timber Resources: the number one forestry company in Africa. We are here to show you that you **can** make money for shareholders **while also** helping to avert the looming climate crisis **and** creating jobs and income for poor African farmers living in poverty in a land scourged by drought and overexploitation. Furthermore, our work will be self-sustaining because there's a growing market and demand for our products. Sound too good to be true? It's not - it's what we call a win-win (win-win-win) scenario. Here's how.*

We all know the world is on fire. The climate crisis is almost upon us: but it can be averted with your (and our) help. The vociferous release of carbon into the atmosphere - by industry, irresponsible population growth, people buying lots of things, foolish slash-and-burn agriculture in the global south, aeroplane travel, and - most crucially and cruelly - the destruction of our pristine natural forests and jungles by cattle herders and unproductive small-scale farmers who cut down trees in order to try and grow their measly crops in order to feed their too-large families who aren't educated enough - is causing the world to heat up, melting ice caps, and could kill all our great-grandchildren.

We must turn the tide on this before it is too late. We need to re-absorb some of the carbon that has been released into the atmosphere. And do you know what the most effective way to do this is? Plant. More. Trees. Makes sense right?! The deforestation of our pristine forests is not only releasing carbon into the atmosphere, but is also depleting the earth's lungs: trees. We breathe in oxygen and breathe out carbon, but trees? They breathe in carbon and breathe out oxygen. Without them how will our children breathe?

Another great thing about trees, is that they produce timber. Now timber is one of the fastest growing commodity markets in Africa, and particularly in East Africa. It brings in some serious money. Moreover, Africa is crying out for employment opportunities; people are desperate to modernise their lifestyles and are very hard workers (more on this later). Africa also needs better business models - we know how much corruption and unproductiveness there is, with these so-called 'aid development projects' that only serve to hamper genuine economic growth and innovation. But we are a business; and we understand how businesses work, long-term.

Yet another advantage of planting trees is that in planting these trees, we can create by-products that local residents can use for firewood and their other tree product needs, like building fences and buildings. In providing these 'off-cuts' (if you will) we create a supply of necessary local products that means the precious remaining natural forest is not cut down.

The land that we plant the trees on? Unproductive, unused, degraded grassland - nay, wastelands. Years ago these areas used to be lush, green forest, but these foolish, shortsighted, and - in fairness - desperately impoverished people, laid waste to this beauty by burning fires

indiscriminately (both from lack of care, lack of education, and because of unproductive farming practices - so-called 'slash and burn'), hunting wild animals, and using up the precious water sources. These practices cause a vicious cycle of soil degradation, low productivity and poverty - which will eventually lead to desertification of the area that will inevitably give rise to dangerous extremism, much like Boko Haram in Nigeria.

What trees do we plant? We are reforesting these areas, and admittedly it's not with the native tree species of the area, but they are fast growing trees that have been carefully selected for the soil type of the area and our ability to make profit from them. And their carbon-sequestering potential of course. We are aware of the risks to water sources, but we are careful, we are educated, we monitor this, and we would never allow such a precious resource to be jeopardised.

The other thing that we do, as CTR, the leading forestry company in Africa, is bring order and logic to an area where land rights just previously did not exist. People have been fighting over land and using these ethereal, nonsensical ideas of land tenure that have resulted in these sorts of problems. And what we do is: create jobs, generate income, pass on education, allow people to improve their living standards, but also enable a formalisation of property and land rights and encourage people to start to sell land formally, with certificates and lawyers.

We also invest money in local communities - we actually take money out of our profits and reinvest them in local community projects like building schools and improving roads. And most impressively? We do this while engaging in newly created 'carbon markets' - where we use efficient market-led mechanisms to enable airlines and companies with high-levels of carbon emissions to use their profits to offset the carbon they are emitting by investing in our tree planting via a verified 'carbon credits' market. This is an efficient and sustainable private sector response to social and environmental inefficiencies.

We are solving so many issues at once with this elegant solution: saving local people, the world, and our shareholders one tree at a time. So join us. Join the Good Fight. The Good Fight that makes money and saves the world.

I initially wrote this account with the intention of focussing my own thinking (and had no intention to include it) but it is not so far removed from the language and arguments used in reality. But in some ways this is not fiction. Rather it is a stylised account. Different aspects of its content are included in a wide variety of companies and organisations who are investing in green forestry in Africa. Figures 2.1 – 2.7 give some examples of what people – and companies – are saying. The company I am studying – GRL (figure 2.7) – is but one of many working, and making representational claims, in this space.

We see for example that companies can invoke the prospect of ecological disaster: Miro projects the complete disappearance of all trees in Ghana (Miro Forestry, 2021). Ecologi (2021) locates tree planting as crucial in 'preventing ecological collapse'. Treecycle (2021) paints a picture of dead landscapes that need to be resuscitated, claiming their reforestation 'brings fallow areas back to life'. TreeCoin highlights the 'tragic case' of Paraguay where 90% of their eastern forests have been lost causing 'irreversible damage to ecosystems' (PRNewswire, 2021). We see companies painting images of foreign landscapes as naturally fertile spaces awaiting rescue from unproductive use: the New

Forests Company (2021) describe East Africa as 'one of the most fertile places in the world' despite, as they take pains to emphasise, their failure to develop their own sustainable timber resources relying instead on imports. TreeCoin (PRNewswire 2021) describe their mission as being prepared to put in the long and hard work to return woodlands 'to their former glory'. We also see that companies invoke win-win narratives in the solutions they propose: Treecycle (2021) identifies its work as 'good for everyone involved' and proclaims the result 'a real win-win situation' with their investors 'earning money without harming man nor nature'; in fact, their investments are 'good for nature...[and] good for people'. NCX (2021) offer investors the opportunity to support landowners, improve habitats for wildlife, and 'strengthen treasured forests'. The New Forests Company (2021) describes themselves as a company that 'maximises our social, environmental and economic impacts while making a competitive return for our stakeholders'.

All the arguments included relate to claims which several organisations make or imply. They make these arguments consciously and reflectively. These arguments are important because they show what organisations (and the people behind them) think, and what they think others are thinking. Why might such an account as that above be plausible? Why would a company think these are persuasive things to be saying? Answering these questions, and exploring the narratives and ideas they involve, provides a basis for the review of the literature I present below.

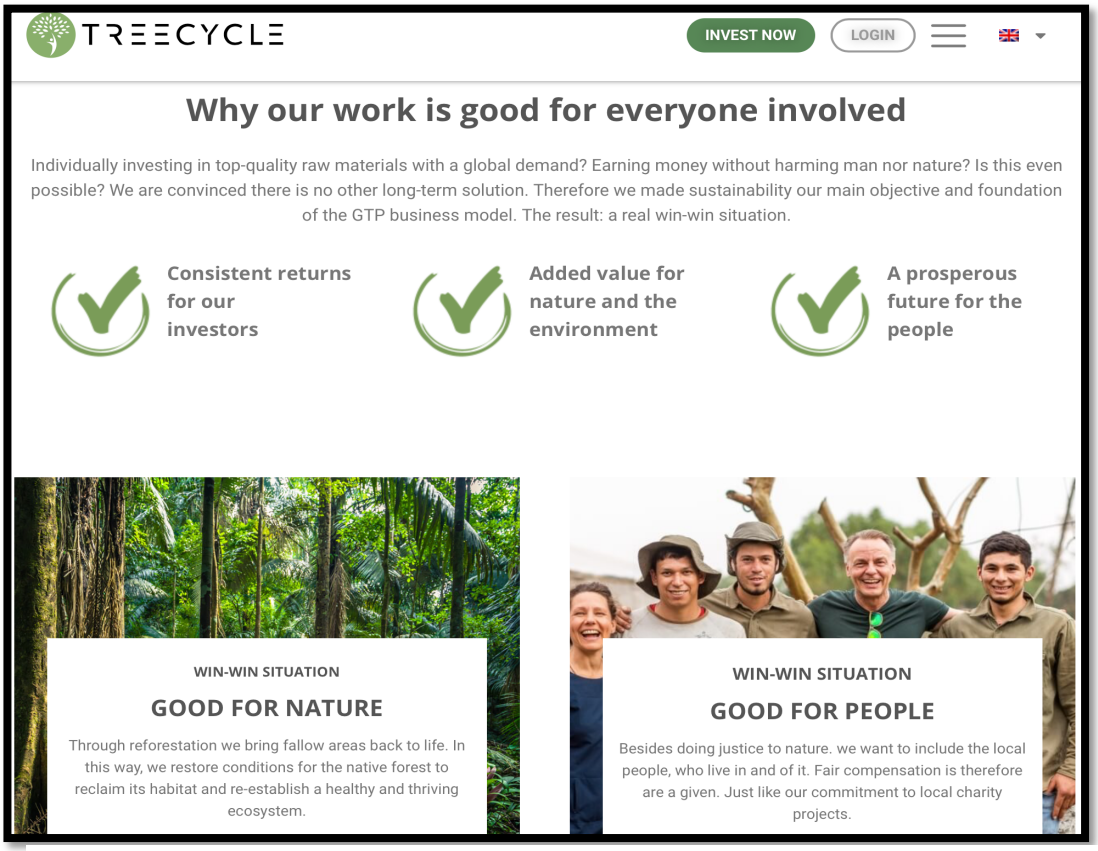


Figure 2.1. Screenshot of Treecycle website. Treecycle (2021). Used under a UK Copyright Exception.

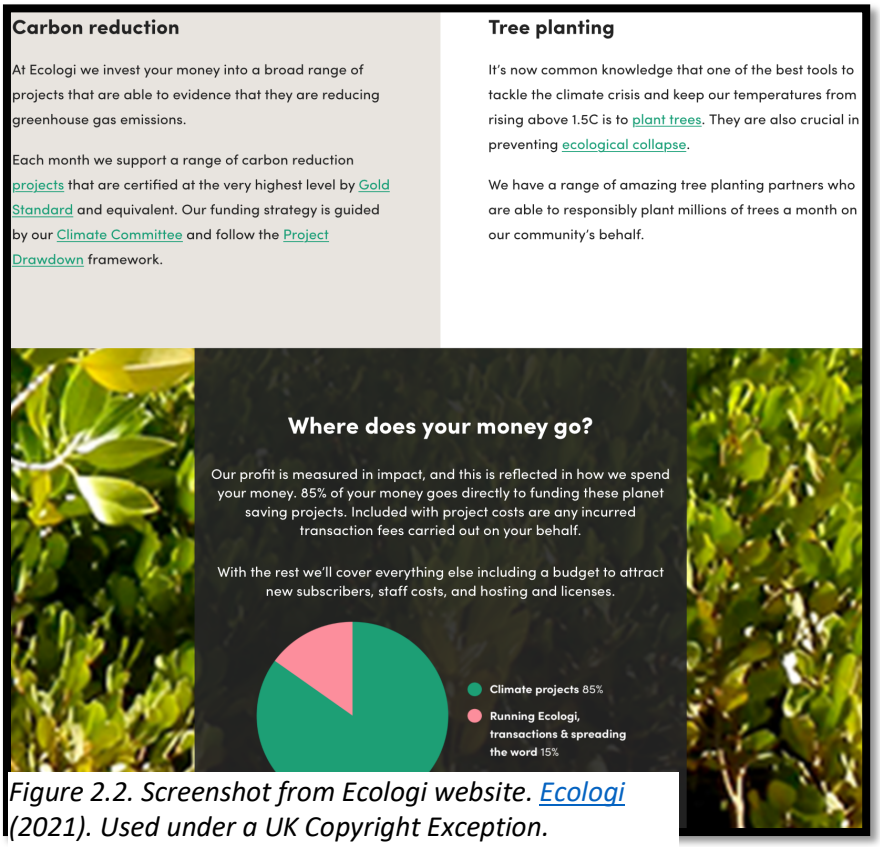


Figure 2.2. Screenshot from Ecologi website. Ecologi (2021). Used under a UK Copyright Exception.

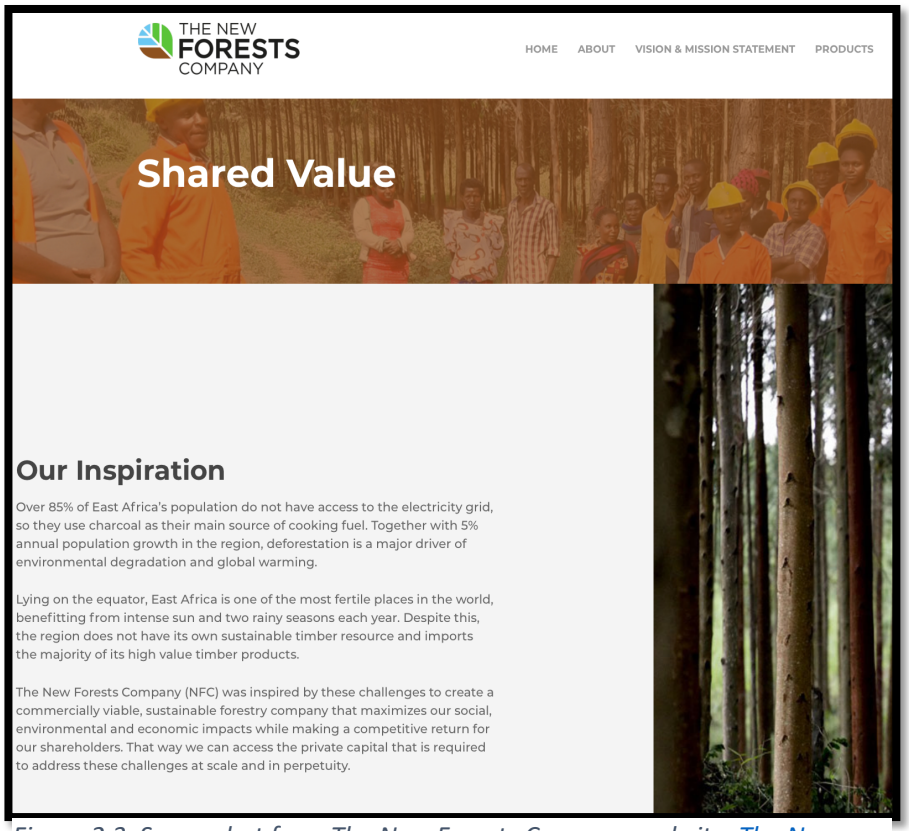
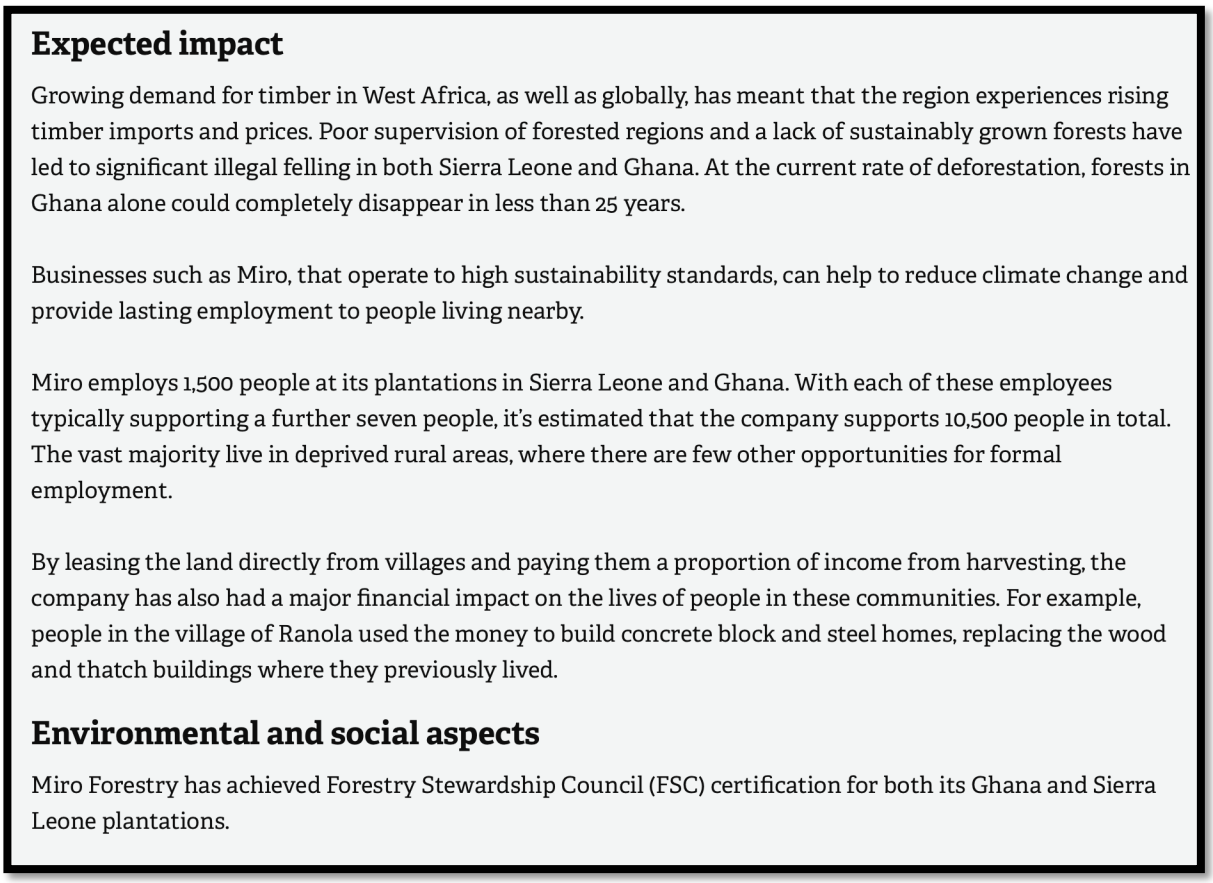


Figure 2.3. Screenshot from The New Forests Company website. The New Forests Company (2021). Used under a UK Copyright Exception.



Expected impact

Growing demand for timber in West Africa, as well as globally, has meant that the region experiences rising timber imports and prices. Poor supervision of forested regions and a lack of sustainably grown forests have led to significant illegal felling in both Sierra Leone and Ghana. At the current rate of deforestation, forests in Ghana alone could completely disappear in less than 25 years.

Businesses such as Miro, that operate to high sustainability standards, can help to reduce climate change and provide lasting employment to people living nearby.

Miro employs 1,500 people at its plantations in Sierra Leone and Ghana. With each of these employees typically supporting a further seven people, it's estimated that the company supports 10,500 people in total. The vast majority live in deprived rural areas, where there are few other opportunities for formal employment.

By leasing the land directly from villages and paying them a proportion of income from harvesting, the company has also had a major financial impact on the lives of people in these communities. For example, people in the village of Ranola used the money to build concrete block and steel homes, replacing the wood and thatch buildings where they previously lived.

Environmental and social aspects

Miro Forestry has achieved Forestry Stewardship Council (FSC) certification for both its Ghana and Sierra Leone plantations.

Figure 2.4. Screenshot from the Miro Forestry (CDC group) website. Miro Forestry (2021). Used under a UK Copyright Exception.

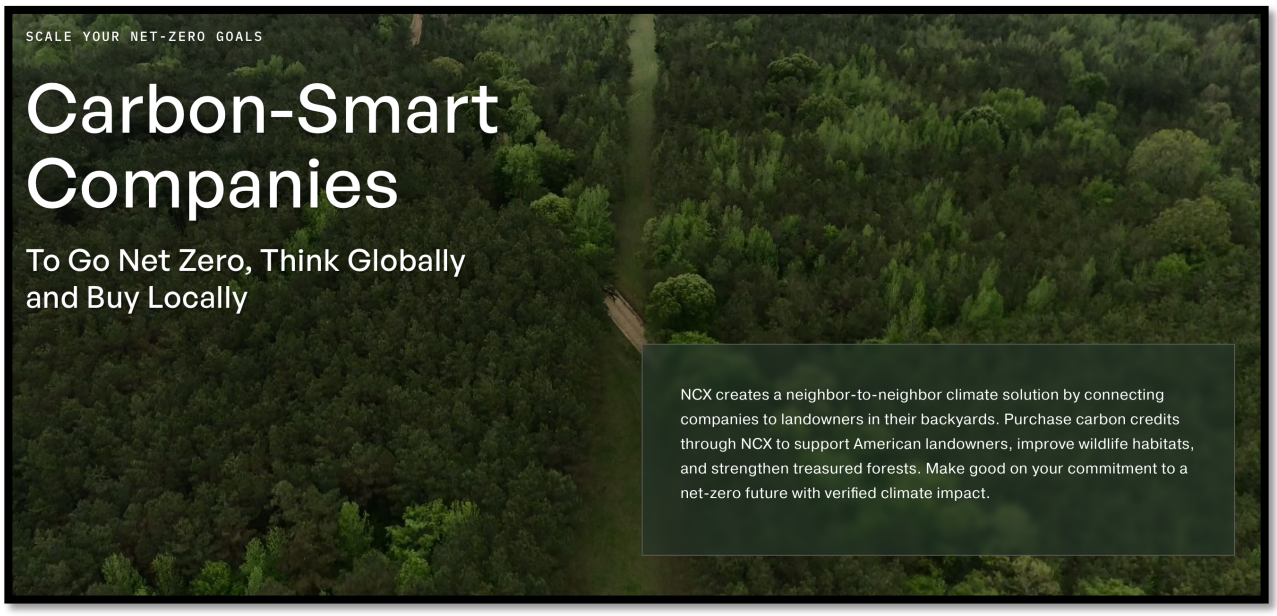


Figure 2.5. Screenshot from NCX website. NCX (2021). Used under a UK Copyright Exception.

Sustainable. Ethical. Profitable.

The world's thirst for timber has led to severe deforestation over the past few decades, with forest reserves rapidly declining the world over.

TreeCoin's CEO Jörg Schäfer, himself a long-time advocate of green initiatives speaks about TreeCoin's ambitions of developing a sustainable, scalable timber production model that can be easily adopted by other environmental protection/conservation enterprises. He explains:

"We consumed roughly 340 million metric tonnes of timber last year, and each year, this will only increase. Soon we will need one and a half of our planet to satisfy this, which is simply not sustainable. Many countries have already paid the price of deforestation.

"Paraguay is a particularly tragic case, having lost almost 90% of its eastern forests - causing irreversible damage to the ecosystem. Realistically it will be decades before its woodlands can return to their former glory. But this reforestation initiative is worth the investment, on both a local and global level."

According to Schäfer, the project has already spent several years of research on the ground working with a local reforestation partner. TreeCoin even operates a training facility, hiring local Paraguayans to care for eucalyptus seedlings in nurseries. The facility is led by TreeCoin reforestation specialist Andreas Jelinek of Grupo Empresarial La Rivera S.A. Paraguay, who have successfully seen 3,000 hectares of land into development and 2.5 million harvested trees under their management.

After the HTO and throughout a 23-year cycle, the company estimates harvest revenues - after profit distribution - will enable reinvestment to purchase new land and new trees to a total value of $546 million. In total, 59,650 hectares of land will provisionally be acquired for reforestation, the outcome of which will generate a projected profit of USD 1.1 billion.

Figure 2.6. Screenshot from PRNewswire website/TreeCoin. PRNewswire (2021). Used under a UK Copyright Exception.

Figure 2.7. Screenshot from Green Resources website. Green Resources (2022). Used under a UK Copyright Exception.

Introduction

In order to understand the claims made about the problems GRL purports to address, and the reasons why they advocate the solutions they do, and the criticisms that have been voiced of both, we must explore several literatures. These are:

1. Narratives, especially degradation narratives and the ways environmental problems are framed;
2. Market-based solutions, and the narratives that connect to them;
3. Carbon Forestry;
4. Land Alienation and Green Grabs; and
5. Commodification and Rural Impoverishment.

These literatures will allow us to situate the empirical and theoretical contributions of this thesis.

Narratives

The claims made about the problems GRL (and other companies) purport to address, the reasons why they advocate the solutions they do, are plausible because they match with a certain set of beliefs and expectations about how environments (and socio-environmental interactions) in Africa function. They are part of a set of narratives that both declaim alleged destruction that is taking place (degradation narratives) and profess to know their solution. We must explore how such narratives work. But we must also, reflexively, consider how critiques of these narratives (the problems and the solutions) also display their own narrative elements.

Gerald Prince defines a narrative, as 'the representation of at least two real or fictive events or situations in time sequence, neither of which presupposes or entails the other' (Prince 1982: 4). His work on 'Narratology' synthesised a long body of work encompassing linguistics, logic, folklore and anthropology. When there is a temporal series (two or more) of things that have taken (or are taking) place (one before, and one after), and a connecting 'because' between the two, this construction can be understood as a narrative (Sconfienza, 2021: 4).

I use the term 'narratives' rather than 'discourses', because narratives are typically present, or are connected to, a particular set of solutions and involve storytelling (Leipold et al., 2019; Tomaselli et al., 2017, D'Amato, 2021). Discourse can involve stories (but not necessarily so) and often relate to a more Foucaultian conception of how language produces knowledge, subjects and objects, which do not relate to a particular ending, resolution or solution (e.g. Foucault, 1970; Macgilchrist, 2021). Put simply: a narrative is a story, and a discourse is (more broadly) communication.

The classic text on narratives for the purpose of this thesis is Roe's work on 'development narratives' (1991), which describes development narratives as 'stories or arguments' which "*tell scenarios not so much about what should happen as about what will happen according to their tellers - if the events or positions are carried out as described…In addition, the narratives…are treated by many of their tellers and hearers as continuing to retain some general explanatory or descriptive power even after a number*

of the specific conventional wisdoms upon which they are based are understood to be subject to serious qualification" (Roe 1991: 288).

As Scoones articulately summarises, these stories have '*a beginning (the definition of the problem), a middle (the elaboration of its implications) and an ending (the proposed solutions)*' (Scoones, 2019: 234; Roe, 1991; Roe, 1994). Examining the narratives surrounding developmental and environmental issues provides a way of understanding *what* are defined as problems, *how* they are framed in the way that they are (the interlocking of science and politics), *who* frames them this way, and *why* (Taylor and Buttel, 1992).

Beymer-Farris & Bassett (2012) define environmental narratives in particular as '*simplified explanation[s] of cause and effect relationships that assigns roles to different actors who are implicated (or not) in an environmental problem*' (2012: 334). Essentially, they are **simplified stories** that are used by various actors to further their interests or aims, and can be examined to uncover the underlying politics, political economic conditions, and production of knowledge that generate and shape these narratives (Roe, 1991; Beymer-Farris & Bassett, 2012; Scoones, 2009; Scott, 1998; Scoones, 2019).

These narratives are underpinned by various core beliefs and framings ('*the conceptual constructs that inform and drive narratives*' (Scoones, 2019: 234; see also Druckman, 2011 and Entman, 1993), and are created, promoted and utilised by powerful actors and interests. In other words, they are the creature of political debates and serve political ends. For example, Scoones (2019) unpicks how narratives of scarcity in the global land rush discussion are dominated by a '*set of narrative themes…constructed through a range of mechanisms and promoted by a powerful group of actors, and underpinned by a framing that draws on theoretical concepts of absolute and relative scarcity*' (Scoones, 2019: 238). They '*simultaneously simplify and stabilize complex and uncertain processes such as 'deforestation causes biodiversity loss''* (Forsyth and Walker, 2008, as quoted in Beymer-Farris & Basset, 2012).

There are popular and powerful environmental crisis narratives that have long shaped discourse around environment and development discussions within and beyond academia (Peters, 1994; Leach and Mearns, 1996; Hutton et al., 2005; Scoones, 2019). The use of narratives of crisis by development institutions and experts often serve to consolidate ideas, wisdoms and power structures (Roe, 1995: 1006; Leach and Mearns, 1996: 457). The effects of claims to crisis are to force certain questions to the top of agendas (while shutting others down), and to evoke moral demands for change or action (Roitman, 2013; Roitman et al., 2020). These environmental narratives can also be either inaccurate, partial, or wrong and yet many of them persist today. We can see these narratives persisting in the examples shared above, as well as in the context of this thesis.

The classic text on environmental narratives is Leach and Mearn's work, published more than 25 years ago. It has inspired and sustained a lot of important scholarship since its publication (see e.g. Agrawal, 2001; Martinez-Alier, 2003; Reynolds et al., 2007; Blaikie, 2014; Scoones et al., 2015; Adams, 2019; Francis, 2019; Svarstad & Benjaminsen, 2020). It has become ever more relevant as its thesis is applied to increased corporate interventions and their justifications (as opposed to state and colonial misreadings of landscapes).

As Leach and Mearns comprehensively explicate, the creation of environmental narratives (and others, such as the idea that certain landscapes, such as grasslands or drylands, are unproductive) involve the over-simplification and abstraction of experiences outside of their complex contexts, and the binaried transformation of multi-dimensional, diverse realities and histories into unhelpful two-dimensional dichotomies:

> *"the representation of the experiences of those who are seen to be "the problem" outside their specific historical and geographical contexts…[that] reduce the world to two dimensions in a simplified and ultimately unhelpful way. Environment and development discourse is replete with examples, frequently taking the form of "bad/good" dichotomies: "tragedy of the commons" versus common property resource management; farmer's ignorance versus "indigenous technical knowledge"; Malthusian degradation versus Boserupian intensification, and so on"* (Leach and Mearns, 1996: 466).[1]

These environmental and development crisis narratives can also marshal the consolidation of institutional or bureaucratic power (Leach and Mearns, 1996: 547). They depoliticize social or ecological injustices in order to portray complex socio-ecological-historical issues as a set of 'technical problems' ready to be solved by development 'experts' (Ferguson, 1990; Leach and Mearns, 1996; Li, 2007; West, 2007; Dressler et al., 2010). Often these solutions are market-based or involve further neoliberalization (Dressler et al., 2010: 19, and see for example Pagiola et al., 2005 on payments for ecosystem services). We will return to this later.

Combining with colonial power structures, and the structure of the development process itself (in particular the tangled connections between development institutions, the analyses and evaluation of development problems, solutions, and programmes, and connected power structures 'on the ground' where policies are implemented (Leach and Mearns 1996: 456), the knowledge and power relations embedded in science and development institutions "help account for the persistence of received ideas about African environmental change" (ibid: 543). The environmental and degradation narratives are so pervasive because of the way in which scientific theory and method – and what is considered legitimate knowledge (or who is seen to generate and pass on legitimate knowledge) - has been intimately shaped by colonial history and rule, particularly of Africa.

Degradation narratives are pervasive within environmental narratives. They have several constituent elements. These elements are interlock and overlap, but for the purpose of this thesis they can be understood and organised as the following:

1. Ecological

   These are truth claims made about the ecology of land, soils, vegetation and wildlife. They might suggest that certain types of land are unproductive, that certain type of land management, such as fire is destructive, that planting any trees is 'good' for the environment

[1] This echoes Chimamanda Ngozi Adichie's 'danger of a single story': that a single story or an insistence on negative stories (or a particular set of narratives) flatten the diverse reality of experiences, people and places (Adichie, 2009).

and the 'destruction' of trees is 'bad' for the environment; that dryland areas are fragile; that slash and burn practices deplete soil fertility and so on.

2. Social

These are the social corollaries of ecological problems and describe the ideas, thinking and social practices that must accompany any societies which are wilfully or blindly destroying the environments on which they depend. This includes thinking that certain social or environmental practices are unproductive, various environmental or socially racist views that suggest ethnicity is tied to poor land management, that systems of common property must automatically tend towards 'overuse'.

3. Environmental histories

Coupled with the ecological and social thinking are ideas of how land and land uses have changed and how former 'natural' or 'pristine' states have been destroyed or degraded.

4. Solutions

With the characterisations above, particular ways of solving these problems are suggested. These can entail introducing new forms of expertise that recognise ecological realities, new social thinking and organisation which can cope with degrading social practices, and new visions for restoring environments in the image of imagined pristine pasts. These can often be combined with 'win-win' market solutions that save the environment, grow economies and transform society through the market.

Returning to Scoones' (2019) depiction of a beginning, middle and end of a story, we can see how elements 1-3 of degradation narratives constitute the beginning and middle of the story (problem definition and its implications) and element 4 is the ending – the 'win-win' solution offered (Scoones, 2019; Roe, 1991; Roe, 1994). What has scholarship around these narratives and their underlying framings and beliefs revealed? I will explore each of these in turn.

The Problems: the Ecological

Ecological aspects of these narratives have covered diverse aspects according to the environment in which they're found. These include truth claims about the ecology of drylands, the ecology of trees of water and irrigation, wildlife, soils, and many more (see for example, Leach and Mearns, 1996; Sullivan and Homewood, 2003; Bassett and Crummey, 2003; Walker, 2004; Behnke and Mortimore, 2016).

Leach and Mearns (1996) explored how a small set of ideas have been influential on debates around environmental change and human-environment interactions in Africa. These include ideas around climatic vegetation community (i.e. what vegetation would exist in a climatic zone without human 'disturbance'); the "link between devegetation and declining rainfall"; and carrying capacity (i.e. that

"every set of ecological conditions can support a given number of people and/or livestock which, once exceeded, will lead to a spiral of declining productivity") (Leach and Mearns, 1996: 448)[2].

These ideas become institutionalised, in part due to received wisdoms relating to the scientific method, which sets out what evidence is acceptable or valid. "[B]y defining what is acceptable as evidence, certain privileged methods also act to exclude other sorts of data. It is in this way that certain questions remain unasked, and certain types of evidence are ignored or dismissed as invalid" (Leach and Mearns, 1996: 451). This can be seen in the exclusion of historical data from ecological sciences and the tendency to take 'snapshots' of ecological systems and then extrapolate back into the past to generate a sense of urgency or crisis (Fairhead and Leach, 1996; Schuetze, 2015). As Schuetze (2015) illustrates through her work on the Gorongosa Mountain in Mozambique, environmental crisis narratives are powerful in part because they often transform complex socio-ecological realities into simple, familiar stories (Schuetze, 2015: 144).

Of particular interest to this thesis are narratives about the ecology of fire (cf. Kull, 2004; Kull & Laris, 2009; Holmes, 2007). Fire is overwhelmingly portrayed as a problem in landscapes in policy documents (e.g. Bruenig (1992); Kull and Laris, 2009). Often fire management practices are not recognised – this is also apparent in Australia where fire ecologies are very contested. A simple tale is told: fire is bad. But the ecology of fire is a lot deeper and more complicated than this.

Today, agricultural expansion and fire suppression means the area of land burned globally has decreased (around 25% since just before the turn of the century - Andela et al., 2017: 1356; Nikolakis and Roberts, 2020) while we are seeing increased incidences of uncontrolled or destructive fires, not least as a result of climate change and poor management practices. "The world is not seeing more fire, but is experiencing the wrong type of fire, in the wrong place, at the wrong time" (Nikolakis and Roberts, 2020: 1; Pyne, 2016).

Diverse social and historical influences (underpinned by mythology and religion) shapes how fire is perceived. It is seen as a destructive and dangerous force – particularly in western societies – yet is also transformative and central to human development (Nikolakis and Roberts, 2020; Weibe, 2008; Pyne, 2016; Butz, 2009; Wrangham, 2009). Fire has been used as a tool to manage landscapes throughout much of humanity's history (Archibald et al., 2012; Huffman, 2013), as a tool to build food security (Nikolakis and Roberts, 2020; Jones, 2012), and as a tool for resistance (Holmes, 2007; Kull, 2004; Scott, 1985).

Fire is at once 'a long-standing livelihood practice and…a major enemy of conservation' (Holmes, 2007: 195; see also Kull, 2004). Conservationists widely consider fire to be a dangerous force of destruction (Holmes, 2007; Kull, 2004). In Kull's seminal work, which analyses the perceived 'fire problem' of Madagascar, Kull provides persuasive alternatives to what he terms 'anti-fire received wisdom': the pervasive view that 'fires are ruining the island's natural heritage and preventing efficient use of

[2] Bernstein and Woodhouse (2001) offer an important critique of Leach and Mearns as lacking analysis of social differentiation, class, and processes of commoditization which are central to social and environmental change in rural Africa. They highlight the importance of work such as Berry (1993) which demonstrates the connection between (and importance of) social differentiation and commoditization in rural African agrarian change.

natural resources, and that something must be done to stop the burning' (Messerli, 2007: 92; Kull, 2004).

Fairhead and Leach (1996) challenge the narrative of fire as only a force for destruction through an examination of burning practices in West African forest-savannah landscapes. Inhabitants of these landscapes engage in the setting of bush fire as 'early-burning strategies' which serve to prevent more dangerous fire in the late dry season. They describe how the burning prohibitions externally imposed on local populations in fact risks greater fire damage and have adverse ecological consequences (Fairhead and Leach, 1996; Leach and Mearns, 1996: 458; Pyne, 2016).

Similar dynamics are revealed by other historical analyses (Pyne, 1997; Pyne, 2016; Laris, 2002). When indigenous burning patterns were prevented, negative consequences ensued:

> *"[T]he attempt [to abolish burning] was enough to unsettle biotas and destabilize the fire regimes that had previously supported them…any place that underwent regular rhythms of wetting and drying felt the impact. A kind of ecological dry rot set in. Once abundant but benign fires went feral. For the past few decades major efforts by the agents of state-sponsored conservation have sought to distinguish good fire from bad and to restore good fire in order to enhance ecological integrity and reduce the unruly fuels that feed a growing population of conflagrations." (Pyne, 2016: 6)*

Historical analyses also reveals that often suppression of fire regimes shifts the vegetation in savanna environments from grass cover towards an increase in bush or shrub cover and range conditions (Trollope 1982; Oba et al. 2000; Sheuyange et al. 2005; Butz, 2009: 443). Sheuyange et al. (2005) in their study of the impact of anthropogenic fire in north-eastern Namibia using anthropogenic fire histories and ecological data revealed that *"[f]requent fires reduced shrub cover temporarily and promoted herbaceous cover…[f]ire history…improved savanna conditions."* (Sheuyange et al., 2005: 189).

Homewood and Rodgers (1991) additionally demonstrate that – without shifts in grazing to offset it – temporary suppression of fire can lead to an increase of herbaceous species that are fire-sensitive and unpalatable. Research on indigenous fire practices in West Africa and Australia suggests that seasonal burning can also increase plant biodiversity, as well as protecting against more damaging late-season fires (Butz, 2009: 442; Mbow et al., 2000).

The global and national social narratives that in many regions fire is overwhelmingly destructive, particularly for trees, and is a driving force for land degradation, deforestation and desertification, persist (Butz, 2009; Barlow et al., 2012; Kull and Laris, 2009). Despite evidence to the contrary and to the reality of fire as a complex, contradictory beast which for many centuries has been used as a tool to effectively manage landscapes, the loudest story of fire – particularly in government and policy spaces, is that it destroys land and trees. And trees being burnt is seen as a problem, particularly in Tanzania, where there is a distinct narrative around trees and rain. Put simply, this narrative says that trees attract clouds, and therefore that trees bring rain (Brockington, 2005).

> *"Trees are thought to cause rain by 'dragging in' clouds. The theory is central to widespread notions that irresponsible farming practices are causing degradation. Charcoal burners, and farmers practising slash and burn agriculture, are accused of leaving treeless wastes which generate no rain. Such practices and the degradation resulting are feared to be driving a large-scale migration of people and livestock from the north of the country to the south. The wastes are expanding, and people are bringing them by chopping down trees."* (Brockington, 2005: 97-8).[3]

The firmly held narrative of trees attracting clouds and rain also feeds into another clear-cut binary ecological narrative that is important for this thesis: that cutting trees is (wholly, inevitably) bad; and that tree-planting is (wholly, inevitably) good. Lankford et al.'s 2004 paper on the case of integrated water resources management in the Usangu basin of Southern Tanzania, demonstrates just how firmly some narratives are believed. Despite evidence to the contrary, various stakeholder groups remained convinced that deforestation and overgrazing were the predominant causal factors for water scarcity, rather than downstream abstraction from water sources (Lankford et al., 2004).

When applied to this thesis, the implications of this review are that we need to be wary of claims that fire in the landscape is necessarily a sign of mismanagement and a harbinger of degradation. Rather we need to see concerns about fire as, in part, reflecting a set of socio-economic interests that may or may not have an ecological base.

The Problems: the Social

Degradation narratives are intimately connected to a set of ideas about society: ideas that certain social or environmental practices are unproductive or else intimately bound up in problematic or flawed land use. One of the most (in)famous, and pervasively influential works that connect social organisation, environmental management and environmental degradation is Garrett Hardin's work on the 'tragedy' of the commons (1968).

[3] Despite scientific community(ies) historically understanding otherwise, it is entirely possible that these beliefs and knowledges around trees attracting clouds and rain contains some truths. Many forms of local knowledges in different societies say the same thing; and furthermore, newer research suggests that forest cover might play a more significant role in generating rainfall than previously thought (Sheil and Murdiyarso, 2009; Ellison, 2017), with higher altitude forest having a "special ability to intercept fog and cloud droplets" (Ellison, 2017: 54). There is disagreement between observational on the impact of forests on cloud cover (Teuling *et al*., 2017: 2), with some evidence suggesting that trees' emissions of biogenic volatile organic compounds (BVOCs) can promote cloud cover (Spracklen et al., 2008; Teuling et al., 2017). The type of tree cover could also matter: Trabucco et al. (2008) show that plantation forests or exotic species of trees can unbalance evapotranspiration regimes and negatively impact local water availability, although the impact of this is shown to be highly site-specific (Trabucco et al., 2008; Teuling et al., 2017).

There is a long history of powerful narratives connecting trees and water that have influenced science and policy; from colonial ideas connecting lush green forested landscapes to high rates of rainfall (see Grove (1996)), to a shift in scientific understanding following extensive studies into the impact of exotic species of planted trees on water availability in South Africa (see Bennet and Kruger (2015) for a comprehensive study of this).

Hardin's paper involved a critique of Adam Smith's 'invisible hand' of the market - arguing that individuals' self-interested actions would not actually result in a collective good, particularly in the context of 'population control'. Instead, building on a pamphlet written by a mathematician, William Forster Lloyd, in 1833, Hardin utilised Malthusian ideas to produce a chilling argument for population control. In relation to environmental problems Hardin describes an inevitable slide towards mankind (sic) and nature's ruin without intervention, contending that when people reach relative social stability, '*the inherent logic of the commons remorselessly generates tragedy*'*—each man is locked into a system that compels him to increase his herd without limit—in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all.'* (Hardin, 1968: 1244).

Hardin's logic appears inescapable. Benefits of resource exploitation are enjoyed privately, but the costs are shared publicly, therefore resources use escalates beyond reason. By extension he presents humankind's slide into ruin as inevitable and inescapable. He then offers a limited suite of solutions to this problem, which he himself characterises as objectionable: privatisation of commons or the allocation of property/access rights on various bases (Hardin, 1968: 1245).

However, as many subsequent scholarly works have pointed out, Hardin's seductive reasoning and alarming conclusions, are based on several unstated and questionable assumptions: namely that herders (users of the commons) do not talk to each other; that all agents are rational human beings; that "common property" and open access are one and the same; that cattle are only ever individually owned (when in fact ownership or property rights over cattle are far more complex and nuanced - see for example Khazanov & Schlee (2012)) (e.g. Ostrom, 1990; Leach and Mearns, 1996; Harvey, 2011; Shepherd, 1989; Bromley, 1992).

The problem is not, as Hardin articulates, an inherent overexploitation of open commons, but is instead a problem of individualised private property rights and individualised utility-maximising behaviour:

> *'The real problem...is the failure of individualized private property rights to fulfill our common interests in the way they are supposed to do. Why, for instance, do we not focus in Hardin's metaphor on the individual ownership of the cattle rather than on the pasture as a common?'* (Harvey, 2011: 104)

Another critique Harvey highlights relates to scale. He sets out that Hardin's work contains an "*unanalysed 'scale problem'… As we 'jump scales' (as geographers like to put it), the whole nature of the common-property problem and the prospects of finding a solution change dramatically. What looks like a good way to resolve problems at one scale does not hold at another scale. Even worse, good solutions at one scale (say, the local) do not necessarily aggregate up, or cascade down, to make for good solutions at another scale (say, the global).* ***This is why Hardin's metaphor is so misleading: he uses a small-scale example to explicate a global problem****.'* (Harvey, 2011: p 102, emphasis added)

Elinor Ostrom uses empirical studies to show that there are more solutions to the problem of overgrazing that those offered by Hardin; and that these solutions (of the privatisation of commons and / or the allocation of formalised property rights) can also fail (Ostrom et al., 1999: 278). She also

explores the issue of scale, demonstrating that local or regional 'commons problems' likely require different management responses to global problems.

> *'Some experiences from smaller systems transfers directly to global systems, but global commons introduce a range of new issues, due largely to extreme size and complexity…Empirical studies show that no single type of property regime works efficiently, fairly and sustainably in relation to all CPRs'' (Ostrom et al., 1999: 278-9)*

While Ostrom's scholarship still comes from a traditional economist way of thinking, she challenges the underlying assumptions of Hardin's logic:

> *The assumption that 'all individuals are selfish, norm-free, and maximisers of short-run results' does not allow for situations where people are 'able to communicate, sanction one another or make new rules'. (Ostrom et al., 1999: 279)*

Furthermore, she also asks the question of who is excluded from or assigned property rights (Ostrom et al., 1999: 280), thus highlighting issues of equity thrown up by Hardin's proposed solutions. Ostrom's body of works demonstrates that commons can and have been well managed by community institutions (Ostrom, 1990).

Peters (1994) in her work on herding commons in Botswana, demonstrates that analyses of politics, policy and culture (and implicitly, the local ecology of herding) are crucial to understanding the dynamics of commons and consequently in understanding why Hardin's prophesied tragedy does not always unfold. While Ostrom argued that effective institutions for more equitable natural resource management could be *designed* (e.g. Ostrom, 1990; 2008; 2009), others argued that they could *come into being*. Cleaver's work on 'bricolage' within institutions and natural resource management (2002) reveals how those who seek to craft institutions and the crafting itself is often based on concepts that are 'inadequately socially informed and which ill-reflect the complexity, diversity and ad hoc nature of institutional formation' (Cleaver, 2002: 11). She concludes 'socially informed analysis of the content and effects of institutional arrangement' must form the basis of institutional building. (Cleaver, 2002: 11). Her work shows that much of academic and development analyses engages in polarising binaried views of 'weak' vs 'robust' institutions and in 'instrumentalist views' where social capital is a resource 'rationally' exploited or maximised by utility-maximising individuals (Cleaver, 2002: 14). Rather than seeing 'dynamic social relations and the changing cultural milieu as the very stuff of people's lives, they are seen as a social cement which can be consciously utilised to strengthen institutions' (Cleaver, 2002: 15).

Despite these robust critiques, Hardin's logic is often found underpinning conservation or common pool resource management ideas. Swift (1996) demonstrates how the narrative of global desertification has been bolstered by consistent use of the Hardin's 'tragedy of the commons' (Leach and Mearns, 1996: 450-1).

Beyond Hardin's logic, these social ideas or representations – of certain land uses, states, or changes – involve implicit notions of 'value' that are closely tied to the particular bias(es) of a scientific discipline or the particular priorities of resource users (Leach and Mearns, 1996: 449-50). We can see

this illustrated in the way closed-canopy forests have been so prized by foresters and ecologists that any conversion of such landscape is perceived as degradation, despite local resource users or inhabitants seeing the conversion as positive (Fairhead and Leach, 1994; Leach and Mearns, 1996; Davies and Richards, 1991).

The Imagined: The Past

Landscape changes are perceived and valued differently by different groups: 'what is "degraded and degrading" for some may for others be merely transformed or even improved (cf. Beinart, 1996)' (Leach and Mearns, 1996: 450). These perceptions are often also applied to an imagined or romanticised version of the past, where 'pristine', 'untouched' or 'natural' landscapes have been 'degraded' by humans.

These 'received wisdoms' of histories of degradation, as typically espoused by colonial and western scientists – often as the uncontested histories of African landscapes as justifications for particular conservation policies, have been critically examined and called into question by other scholarship (e.g. Beinart, 2000; Stott and Sullivan, 2000). Beinart (2000) summarises the challenges to these previously accepted environmental histories and their roots in colonialism (while also touching on the environmental impacts of colonialism in Africa itself). Bringing together much important scholarship, he argues that the commonly held histories of degradation in African landscapes can and should be rejected as a singular or whole truth, illustrates the 'inextricable link' between environmental and social control (Beinart, 2000: 273), and instead invites us to invert and critically question colonial ideas about environmental degradation and explore alternative African environmental histories.

A corollary of this is the emergence of research around the importance and validity of local environmental knowledges (Richards, 1985; Beinart, 2000). Work such as Solomon et al. (2016) on 'African Dark Earths' which describes a highly productive West African indigenous soil management system, dispels the tired tropes of arid soils, unproductive or overly extractive farming practices, and degradation and finds ingenuity and hope in African farming.

Many of these degradation narratives have colonial origins we need to recognise. For example the demonisation of pastoralists and their perceived inevitable deforestation, soil erosion, and the spectre of desertification; or the image of the 'inefficiency of the African peasant scratching away at the thin red soil [which] has encapsulated the continent's ever-looming environmental tragedy' (Death, 2015: 123). And yet they also persist in post-colonial circumstances. By appreciating these origins and their current influence we can understand how these imagined pasts came to be and the power that the associated narratives wield.

The Imagined: The Solutions of win-win discourses

Thompson (1984: 207) urges us to remember that "narrative[s] should be seen…also as a medium through which...events are produced". Fortmann (1995: 1054), in her work on land disputes in Zimbabwe, reminds us that our understanding of current events and past trajectories, as shaped by

narratives or stories, form "a discursive strategy through which struggles are waged". Narratives perform at least three functions: they "create meaning and validate action, …mobilize action, and…define alternatives" (Fortmann, 1995: 1054). Understanding the social, historical and ecological roots of these environmental degradation narratives of these ecological problems allow us to better understand the framings of the proposed solutions to or futures of these problems. It is to these future stories and imagined solutions that we now turn.

Proposed solutions to narratives of environmental degradation have come in waves: from fortress conservation at the turn of the 20th century (Brockington, 2002); to community conservation in the 1980s-90s (as can particularly be seen in the policies of community-based natural resource management (CBNRM) in Southern Africa, with ideas seeding from the 60s-70s; and then a revival of fortress conservation in the 2000s - a 'back to the barriers' approach (Hutton et al., 2005).

More recently came waves of market-based solutions influenced by neoliberalisation and the notion of a 'green economy' and neoliberal conservation. We see the discourse of win-win solutions illustrated in these more recent waves of approaches to conservation. For example, with the concept of a green economy (a successor of sustainable development, and often used interchangeably with 'green growth' (Loiseau et al., 2016), and defined by UNEP as an economy resulting in "well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP, 2011), the proposed way forward is presented as being both good for the economy and the environment: a win-win approach. Fundamentally these concepts are underpinned by the assumption that growth is compatible with environmental sustainability (Loiseau et al, 2016; Porter and Van der Linde, 1995).

As Cavanagh & Benjaminsen argue in their paper 'Virtual nature, violent accumulation' (2014), these win-win (or 'triple-win') narratives are both a 'product of' and a 'solution to' environmental and development degradation or scarcity 'problems'. Cavanagh & Benjaminsen's paper is valuable as a specific case study - where wins are extracted and presented but not found in reality – and as a way of presenting how solutions are marketed more generally. They demonstrate how (market-based) strategies are presented as a 'solution to' degradation or scarcity discourses, but this discourse is also a fundamental part of proposed neo-liberal fixes such as carbon offsets. Solutions are presented as win-win-wins for, variably: environment, economy, society (or people, planet and business); climate change mitigation, climate change adaptation, socio-economic development; climate change, biodiversity conservation, and socio-economic development; or biodiversity, climate mitigation and local livelihoods.

These 'triple wins' are often extended, particularly in the context of neoliberal conservation, to multi-win solutions or win[7] solutions that are supposed to "benefit: corporate investors, national economies, biodiversity, local people, western consumers, development agencies and the conservation organisations that receive funding from those agencies to under-take large interventions" (Igoe & Brockington, 2007: 435; see also Grandia, 2007). Cavanagh and Benjaminsen (2014) argue persuasively – particularly in relation to carbon-sequestration projects – that:

> *"[T]he maintenance of a 'triple win' spectacle is itself integral to the management of carbon sequestration projects, as it provides consumers with a form of 'ethical' use value, and greatly*

enhances the capability of carbon market brokers to generate exchange value by attracting 'green' investors." (Cavanagh and Benjaminsen, 2014: 55)

The problem with this 'spectacle', or imagined world, is the extent to which it imagines the transformation of the world into a neoliberal economy.

Neoliberalism – the political economic project (that drives environmental change[4]) – is, like many others, a 'fuzzy concept' (Castree, 2006) broadly understood as both a structural force and an ideology of governance (Ganti, 2014). Many scholars have undertaken important work that unpacks and examines how neoliberalism, the neoliberal agenda and neoliberalisation were born, evolved, and are used as concepts (see for example, Barnett 2005; Harvey, 2005; Castree, 2006; Ong, 2006; Peck, 2008; Ferguson, 2010; Plant, 2010; Ganti, 2014; Venugopal, 2015). I do not seek to closely examine or contribute to this work here.

Building on the idea of primitive accumulation in Marx's work, Harvey (2005) argues that under neoliberalism, the global expansion of capital is built on 'accumulation by dispossession', resulting in environmental degradation and social inequity (Harvey, 2005; Thompson, 2005; Lee, 2016). It is worth using Harvey's own words to explain the concept of accumulation by dispossession:

"By [accumulation by dispossession] I mean the continuation and proliferation of accumulation practices which Marx had treated of as 'primitive' or 'original' during the rise of capitalism. These include the commodification and privatization of land and the forceful expulsion of peasant populations…; conversion of various forms of property rights (common, collective, state, etc.) into exclusive private property rights…; suppression of rights to the commons; commodification of labour power and the suppression of alternative (indigenous) forms of production and consumption; colonial, neocolonial, and imperial processes of appropriation of assets (including natural resources); monetization of exchange and taxation, particularly of land; the slave trade (which continues particularly in the sex industry); and usury, the national debt and, most devastating of all, the use of the credit system as a radical means of accumulation by dispossession." (Harvey, 2005: 159)

This concept is powerful and has 'reignited interest' in the combination of dispossession and capital accumulation concepts across geography and development studies (Glassman, 2006: 608). It is relevant here because it also underpins much of the literature's arguments relating to the resulting land loss (or dispossession) of rural peasantry in Southern Africa, and of the 'green grab' literature touched on below (e.g. Benjaminsen and Bryceson (2012)).

Neoliberal imagined solutions to environmental problems extend to forms of neoliberal conservation and market-based solutions for environmental services. In basic terms, neoliberal conservation describes a process of organisations with conservation goals increasingly seeking to reconcile

[4] See Castree (2006) for a clear explanation of 'why neoliberalism is *necessarily* an environmental project' (Castree, 2006: 143) and for an instructive summation of how influential ideas (such as the work of Polanyi (1944) and O'Connor (1994)) help us understand the rationality of capital's neoliberal approach to nature.

economic development with conservation objectives, often by utilising economic markets, or market-based instruments, as ways to finance or incentivise conservation (Fletcher, 2020). There has been lively scholarly debate over the last two decades, which situates neoliberal conservation within the broader global process of neoliberalisation since the 1980s and identifies some common features or principles of neoliberalism and neoliberal conservation including (among others[5]): privatization (assigning private property rights), marketization (assigning prices set by markets, often global ones), deregulation (roll back of state involvement); and/or arguably reregulation (use of state policies to encourage privitisation and marketisation), and commodification (Harvey, 2005; Castree, 2008; Castree, 2010a; Fletcher and Büscher, 2017; Fletcher, 2020). Academic work on the neoliberalisation of nature have tended to form two strands (Bridge and Jonas, 2002; Fletcher and Büscher, 2017):

- Analysis influenced by Foucault's notion of 'governmentality' (where the neoliberalisation of nature is understood as a form of 'governmentality' seeking to modify people's behaviour by creating and influencing an incentive structure) (Foucault, 2008; Fletcher, 2010; Fletcher and Büscher, 2017); and
- Analysis typically influenced by Marxist thinking and/or adopting an institutional political economy approach (which tends to understand neoliberalism as a form of capitalism intent on 'accumulation by dispossession') (Harvey, 2005; Castree, 2008; Fletcher and Büscher, 2017).

Despite the divergence in analysis, and the extent of analysis, there is broadly consensus within the literature that neoliberal conservation '*reflects an orchestrated attempt to further integrate nature and its conservation into capitalism…[typically]…linked to the introduction of market mechanisms, principles and/or logics to non-human natures that were previously governed by the state or were under communal ownership'* (Apostolopoulou et al. 2021: 244). As Büscher et al. (2012: 4) put it, neoliberal conservation 'shifts the focus from how nature is *used* in and through the expansion of capitalism, to how nature is *conserved* in and through the expansion of capitalism' (emphasis added).

As with the degradation narratives that frame environmental issues described earlier, the neoliberal conservation mechanisms presented triple-win (or win[7]) solutions involve over-simplifications, with the multi-wins often not realised 'on the ground' (e.g. Cavanagh and Benjaminsen, 2014; Svarstad and Benjaminsen, 2017), and often mask – or serve to drive – the appropriation of resources, dispossession, and continued/neo-processes of colonialization (Agrawal, 1997; Nelson, 2003; Murphy, 2009; Peterson, *et al.* 2016; Musavengane and Leonard, 2019; Apostolopoulou et al. 2021). This is also seen in discussions of climate colonialism (see e.g. Sultana, 2022) and carbon colonialism (Bachram, 2004; Bumpus and Liverman (2011); Lyons and Westoby, 2014)). Yet as with degradation narratives, these multi-win solution narratives persist.

Igoe and Brockington (2007) argue that the almost irresistible appeal of neoliberal conservation is because it offers

[5] Others include e.g. the use of markets as a proxy for state processes, decentralisation, use of civil society mechanisms encouraged by the state (Castree, 2008). See Holmes and Cavanagh (2016: 201, table 1) for a useful overview of the constituent processes of neoliberalisation.

> *"a simple solution to complex and difficult problems. In the words of Grandia…[2007]…it promises a world in which it is possible to 'eat one's conservation cake and have development desert too.' This is an apt metaphor, since neoliberal discourses often present the world as a pie that can grow bigger and bigger until everyone can have a piece."* (Igoe & Brockington, 2007: 434).

The logic is that we should 'sell nature to save it' (McAfee, 1999), and that markets do a better job at protecting assets than states or people do. Given we live in an increasingly globalised and capitalistic world, and that multiple social and environmental values of nature (or 'natural capital') are historically invisible or unseen by markets, if we can get capital to recognise nature, then we can get money for conservation. Castree (2008) provides a categorisation of various neoliberal environmental 'fixes' to the problem of sustained economic growth that fit inside this framework. His analysis comes from a perspective that many of these environmental 'fixes' address problems that fractions of capital face in sustaining economic growth (or in accumulation). Fractions of capital use "specifically neoliberal measures to gain commercial advantage in and through the domain of the physical environment…[or]…state bodies us[e]…neoliberal environmental measures to solve problems arising within the state apparatus or the wider economy and society" (Castree, 2008: 146). The different logics behind neoliberal environmental polices are thus:

1. That any trade-off between nature and economy can be offset and overcome by placing the conservation of nature within the control of the private sector (or by the state managing it in 'market-mimicking' ways);

2. That previously protected or state-control aspects of nature should be exposed to markets and commercial investment, thus 'extending capital's formal and/or real subsumption of nature without any overtly 'ecofriendly' motivations' (Castree, 2008: 147);

3. That firms should be able to degrade nature for profit in order to sustain economic growth; and

4. That the state should have minimal intervention in the management of natural resources from the outset, or that it should 'hollow out' its management by devolving responsibilities to the private sector or civil society groups (Castree, 2008).

With neoliberal conservation's appeal, and the proliferation in projects and programmes across the world[6] (see e.g. the proliferation of PES and PES-like initiatives (Shapiro-Garza et al., 2019; Salzman et al., 2018; and the commodification of nature (see e.g. Fairhead et al., 2012)), has come substantive academic critique. The rise in academic literature on neoliberal conservation – as well as more broadly

[6] It is worth noting here, as Holmes and Cavanagh (2016) do, that '[m]any projects labelled as neoliberal conservation also bear the imprint of much longer histories of environmental regulation and its relationship to state formation…[and therefore]… 'neoliberal' and 'non-neoliberal' forms of conservation do not exist in binary opposition, but rather constitute opposite ends of a messy and complex spectrum' (Holmes and Cavanagh, 2016: 202).

on neoliberalism and its critiques - has been steep (Holmes and Cavanagh, 2016); so steep in fact that it appears to have given rise to an academic fatigue of sorts (see for example Springer, 2016).

McAfee's (1999) examination of 'green developmentalism' with its promise of market-based solutions to environmental problems argues that by 'valuing local nature in relation to international markets' neoliberal conservation interventions 'abstract…nature from its spatial and social contexts' and 'reinforces the claims of global elites' to nature and its spoils (McAfee, 1999: 133). Martinez Alier in his 2002 book 'Environmentalism of the Poor' sets out how the commodification of conservation – imposing monetary values on nature (or 'the gospel of eco-efficiency') – and the associated resource-use logic can be counterproductive (Martinez Alier, 2002). He also argues that sometimes the 'cult of wilderness' (narratives of the preservation of a pristine nature) and the 'gospel of eco-efficiency' (multi-win narratives of neoliberal conservation) can 'sometimes become bedfellows', even giving the example of global eucalyptus plantations via a WWF and Shell partnership (Martinez Alier, 2002: 10). This offers a neat demonstration of how the narratives set out above can connect and reinforce each another.

Critical geographers have argued that neoliberal conservation involves the *reregulation* rather than *deregulation* of nature (Castree, 2008) via commodification, giving rise to new forms of territorialisation, which in turn creates new types of value (often most accessible to elites) and new networks of actors (Igoe and Brockington, 2007). These arguments are important and warrant attention.

Commodification is often used as 'a general term…related to a large variety of phenomena: monetization, privatization, financialization, marketization, itemization, etc.' (Smessaert et al., 2020: 5). Hahn et al. (2015) offer a useful analytical framework for the varying degrees of commodification, but here I make use of the definition provided by Holmes and Cavanagh (2016):

> *the legal or institutional re-inscription of 'things', interactions, processes or services as commodities rather than gifts, entitlements, or rights. Commodities are generally obtained by monetary payment, but not always via markets, and are not always privately owned.* (Holmes and Cavanagh, 2016: 201[7])

Issues arising from the commodification of nature under neoliberalism have been well explored in the literature[8]. For example, Robertson (2005) argues that the scientific 'valuation' of ecosystem services for markets – a newer commodification of nature – is likely unable to provide the stability of data required for meaningful trade. In other words, capital (and the state)'s increasing demands for science to make visible the aspects of nature previously unseen by markets ('to describe a nature that capital can 'see'' (Robertson, 2005: 367)), is pushing science to undertake unstable activities, which could in

[7] This definition draws on the work of Harvey (2005), Büscher (2013), Castree (2010b), Fairhead et al. (2012), Sullivan (2013).

[8] In Smessaert et al. (2020)'s review of the neoliberalisation and commodification of nature literature, they found that within the 153 article data set used, 'commodification processes are almost exclusively addressed in a critical way' (Smessaert, 2020: 12).

turn destabilise capital itself. Commoditisation (or commodification[9]) via market-based instruments in the context of neoliberal conservation (such as PES, REDD+ and offset-funded carbon forestry) can deepen existing inequalities and perpetuate ongoing colonialization and territorialisation processes (Matulis, 2014; Dunlap and Sullivan, 2019).

Much scholarly work has offered examples and analyses of the processes and impacts of capital accumulation within neoliberal conservation in practice. Kelly (2011) demonstrates how protected areas can function as a form of primitive accumulation (Marx, 1906), can result in dispossession, and may threaten the very environment it claims to protect (Kelly, 2011: 694-5). Bumpus and Liverman (2008) describe a process of 'accumulation by decarbonization' in the context of carbon offsets, arguing this is a new form of Harvey's 'accumulation by dispossession' (Harvey, 2005), and that the political economy of carbon offsets '[(re)]produces highly unequal geographies' within the voluntary (and non-voluntary) carbon offset markets (Bumpus and Liverman, 2008: 142). Dunlap and Sullivan (2020: 566-7) provide a succinct overview of various conceptualisations of the forms of accumulation that can play out within neoliberal conservation (what they term 'accumulation-by-X' conceptions), which range from 'naturalisation by dispossession' (Cavanagh and Benjaminsen, 2014), 'accumulation-by-conservation' (Büscher and Fletcher, 2015) and 'accumulation by restoration' (Huff and Brock, 2017), to 'accumulation-by-alienation'. This draws attention to how commodity fetishization within in neoliberal conservation market mechanisms (such as PES, REDD+ and offsetting) can serve to alienate people from non-human nature and can perpetuate processes of territorialization (Dunlap and Sullivan, 2020: 569).

Payments for environmental services

Amongst the most prevalent mechanisms for seeking to extend market-based mechanisms into the environmental realm are plans to increase payments for environmental services. Like many narratives, the logic for these is once again compelling – at least at first sight. They are particularly relevant to this case study because the commodified carbon of green forestry, and carbon offsets, constitute a form of market-based payments for environmental services.

Humans are reliant on ecosystems and the goods and services they provide for survival, and these are closely linked to well-being. In less-developed rural areas, this dependence is even more pronounced. Despite this, almost two-thirds of global ecosystems are being degraded or used unsustainably (MEA, 2005). It is difficult to measure the full cost of this, but it is likely to be substantial and growing, and evidence suggests there is a real risk of potentially irreversible changes in ecosystems that would have a pronounced impact on human well-being (MEA, 2005).

Integrated management, careful consideration of trade-offs and scale and a flexible response to uncertainties is required in any attempt to address these issues (Biggs et al., 2004). Incentive- or market-based instruments can be used to implement mitigation or adaptation strategies; incentivising

[9] Note that I use the terms commodification and commoditisation somewhat interchangeably in this thesis, although I recognise that while there has been much overlap in these terms, they do have different origins (respectively in Marxist political theory and in business theory) and can be used to distinctly refer respectively to 'fundamental transformations of value' and to the treatment of 're-valued goods…as simple commodities traded in markets' (Fairhead, Leach and Scoones, 2012: 238).

socially optimal activities and discouraging activities that generate negative externalities. Examples of such instruments include payment for ecosystem services (PES) schemes, carbon trading, and reducing emissions from deforestation and forest degradation (REDD+) mechanisms.

Ecosystems services are defined as 'the benefits people obtain from ecosystems' (MEA, 2005: v). These services are often categorised into four groups: provisioning services (such as food and fuel); regulating services (such as climate regulation and water purification); cultural services (including recreational and spiritual benefits); and the underpinning supporting services (such as nutrient cycling and soil formation). The concept of PES can be broadly understood as the process of offering payments or incentives to the 'providers' of ecosystem services (typically land-owners or land-users) to maintain or improve the provision of these ecosystem services. PES is, essentially, a mechanism designed to change peoples' behaviour. A more formal definition identifies the central features of PES as: a voluntary transaction where a well-defined ecosystem service is exchanged between at least one service provider and at least one service buyer where the payment is conditional on the provision of the ecosystem service (Wunder, 2005). Few PES schemes meet all criteria (Farley and Costanza, 2010; Sommerville et al, 2009), and this reality results in the use of 'PES-like' terminology.

The 'solutions' provided by PES and other market-based instruments are argued to be efficient, internalising externalities that have not previously been priced or valued. They are seen as flexible and working within the current system of economics; and are argued to be a step towards prompting individuals or organisations to face economic sanctions for any damage they are inflicting on the environment. The crux of the argument is that putting a price on nature demands that its value is factored into decision-making (Farley and Costanza, 2010; Kosoy and Corbera, 2010; McCauley, 2006).

Payments for watershed services and payments for carbon-sequestration are key examples of PES mechanisms. The former is a local-local PES where both the buyers and sellers of the ecosystem services are either local or regional. In contrast, payments for carbon-sequestration is a global-local PES where the buyers are 'global' and likely to be far removed from the project implementation. This kind of PES scheme can be used as a tool for REDD+, a key component of international action to reduce carbon emissions (Bond et al., 2009). Essentially, PES aims to 'mak[e] trees worth more standing than cut down' (Salzman, 2011). Many scholars and policymakers are optimistic about the potential to design PES schemes to maximize the positive poverty alleviation impacts, while minimizing negative impacts (e.g. Mohammed, 2011). This is particularly relevant where high levels of poverty are spatially correlated with the provision of ecosystem services, which tends to be the case in more rural areas (Pagiola, 2007). PES schemes are argued to have the potential to contribute to improving livelihoods of participants by increasing income, strengthening land tenure claims and improving environmental conditions while providing mitigation or adaption impacts, delivering win-wins or triple-wins. As well as being an efficient market solution to variously conceptualised environmental problems, they are seen as beneficial from the perspectives of both rural development and social equity (e.g. Blignaut et al., 2010).

However, there are many who have expressed concerns about PES schemes (both in general, and in relation to pro-poor PES schemes in particular). These critiques can broadly be divided into two camps: those that critically examine the designs and impacts of PES schemes, and broadly try to 'make PES work' (Büscher, 2012: 29), to those that fundamentally contest the neoliberal logic that PES entails. I

provide a brief overview of some of the debate within the first tranche of critiques, before turning to the second, more fundamental, collection of criticism.

Many questions have been raised about the extent to which participation in a PES scheme is truly voluntary (e.g. Ma et al., 2010). The logic of PES says that if involvement is optional, then participants are at least no worse off than they would be without the intervention (Engel et al., 2008; Pagiola, 2007). However, this is often an overly optimistic and simplistic view. For example, where PES negotiations are with collective groups or on a high-level scale, underrepresented groups can lose out or can be subject to coercion (Corbera et al. 2007). The level of 'voluntariness' within a PES scheme is therefore dependent on the institutional and social context, on the participant's ability to control the provision of the ecosystem service in question, and on their ability or position to negotiate with those involved (Engel and Palmer, 2008; Sommerville et al., 2009).

Conditionality is argued to be a crucial feature for the definition and effectiveness of PES (Engel et al., 2008) but it can erode trust and undermine intrinsic motivations (Farley and Costanza, 2010). Verifiable baselines, needed to ensure conditionality, can be difficult to establish in practice (Engel et al., 2008; Deal et al., 2010). There are ethical considerations around making payments conditional in PES programmes with development objectives, while equity issues (Engel et al., 2008) and power asymmetries (Frost and Bond, 2008; Kosoy and Corbera, 2010) can emerge from benefit sharing, in terms of both inter- and intra-community distribution. The risk of leakage can undermine PES and is typically due to a shifting of unsustainable practices to land not covered by the scheme, which may be down to the failure of PES scheme to adequately adapt to the local context (Engel et al., 2008; Alix-Garcia et al., 2010; Deal et al., 2010). This is particularly relevant to REDD+ success in developing countries (Milner-Gulland, 2012). A further issue with PES schemes is how to ensure the continuation of PES scheme benefits in the long-term (Deal et al., 2010; Engel et al., 2008).

Opponents of market-based instruments (and of neoliberal conservation more broadly) argue that the true value of nature is infinite and consequently market mechanisms will consistently undervalue nature; that pricing the environment allows its exploitation at the 'right' price; or that market mechanisms are inherently flawed (e.g. Brockington et al., 2008). The commodification of nature debate raises questions: do we as humans know enough about ecosystems to understand how ecosystem functions are 'of value' to humans, and about how they work in order to ensure they are protected? Is managing ecosystems through the lens of 'value to humans' the right (or even optimal) thing to do? (Farley and Costanza, 2010; McCauley, 2006). Other debates centre on land-tenure issues. Where de jure and de facto property rights often diverge, so too can rights to land and to other natural resources, and therefore to the ecosystems services that they provide. Disparities between what is globally and locally environmentally optimal invoke the complexities of global politics and power dynamics between different geographies and across different scales (Kosoy and Corbera, 2010; Farley and Costanza, 2010).

Kosoy and Cobera (2010: 1234) argue that PES 'represent a symptom and a consequence' of what Marx terms commodity fetishism: the 'masking of the social relationships underlying the process of production' (Kosoy and Corbera, 2010: 1228; Marx 1867). They highlight three 'invisibilities' that exist in the commodification of ecosystem services through PES and PES-like mechanisms. Firstly, the reductionist process to market a single service masks the complexity inherent in ecosystems, giving

rise to technical, ethical and relational difficulties. Secondly, the assignment of a single value for exchange and trading masks the multiplicity of values related to ecosystem services. Thirdly, the commodification processes (production, exchange and consumption) masks institutional and power asymmetries within and surrounding these processes, which risks reproducing or exacerbating inequalities. As Norgaard (2010: 1219) puts it, PES functions as a 'complexity blinder', masking political, economic, ecological and human complexity.

Despite the heated scholarly debate, market-based carbon-sequestration policies are attracting significant international attention and finance from both the private and public sectors (Landell-Mills and Porras, 2002; Ebeling and Yasue, 2008), with REDD+ strategies constituting a major part of international carbon emission reduction action (Milner-Gulland, 2012). Notwithstanding eagerness from many camps to integrate pro-poor PES features into policy (Bond et al., 2009; Mohammed, 2011; Grieg-Gran and Bishop, 2004; Zilberman et al., 2008), there is limited empirical evidence about the impact PES mechanisms and their different designs have on poor people (Engel et al., 2008; Landell-Mills and Porras, 2002; Angelson et al., 2011).

There are a multitude of trade-offs that can arise from the provision of different ecosystem services (Milner-Gulland, 2012), and that are associated with the aims and implementation of PES-like mechanisms (Van de Sand, 2012; Gross-Camp et al., 2012). There is need for a better understanding of the trade-offs and synergies associated with ecosystem services, and their consequences for PES schemes (Muradian et al., 2010, Zilberman et al., 2008; Kosoy and Corbera, 2010; Porras, Grieg-gran and Neves, 2008), particularly in terms of their impact at the local level (Van de Sand, 2012). Recognising and evaluating these trade-offs is difficult due to the multitude of stakeholders, but critical to the effectiveness of PES mechanisms (Campbell et al., 2010; Tognetti et al., 2003). Little is known about the de facto processes for negotiating competing claims over ecosystem services (Kosoy and Corbera, 2010) and about how the provision of ecosystem services, resource-use decisions, and ecosystem management policies interact with and impact on each other (Milner-Gulland, 2012).

PES programmes may present opportunities for development but their success, however defined, is far from guaranteed (Van de Sand, 2012; Robertson and Wunder, 2005). Many recognise that local contexts are key to how incentive-based mechanisms will work outside of theory (Bulte et al., 2008; Villamor and van Noordwijk, 2011), and therefore that in-depth knowledge of local contexts is crucial to the effective design and management of PES or PES-like strategies (Van de Sand, 2012; Pagiola, 2007; Bulte et al., 2008; Sommerville et al., 2009; Villamor and van Noordwijk, 2011). These voices maintain that local social and cultural norms should be built into incentive-based strategies (Chen et al., 2009; Cranford and Mourato, 2011; Vatn, 2010) with the close involvement of local stakeholders (Robertson and Wunder, 2005) and adequate consideration of power relations (Landell-Mills and Porras, 2002) in order to increase the strategies' effectiveness. They argue that PES mechanisms should complement relevant local decision-making processes (Van de Sand, 2012; Smit and Wunder, 2006; Muradian et al., 2010, Zilberman et al., 2008), and must reflect how key ecosystem services are valued in local communities (Rosa et al., 2004). While there is discussion of the importance of local contexts, and the need to involve local stakeholders in the design and implementation of PES mechanisms, the PES literature has not yet demonstrated how new environmental commodities like carbon can be embedded in socio-economic change.

While the more fundamental critiques of PES as neoliberal conservation, and of neoliberal conservation more generally, are for many compelling and urgent, the recent decades have seen a proliferation of PES programmes and investments. In a recent review of the global status and trends in PES, Salzman et al. (2018) found over 550 PES programmes in active existence across the world, generating an estimated annual transaction value of US$36–42 bn (Salzman et al., 2018: 136). Much of the literature critiques PES conceptually or theoretically (Büscher, 2012), but we must also look at what these initiatives entail in practice. What sorts of changes does such commodification bring? What class relations does it create? What new resources and institutional arrangements arise, how do they unfold, and what impact do they have on the fortunes of the rural communities and individuals that they co-exist with?

Carbon forestry

The most prominent PES sector is the forest and land-use carbon market (Salzman et al., 2018). In 2018, US$2.8bn had been spent on forest and land-use carbon offset practices in just under a decade, and the voluntary forest and land-use carbon market size grew from US$46m in 2009 to US$74.2m in 2016 (Salzman et al., 2018: 139, based on data collected by the Ecosystem Marketplace[10]). This growth has continued, with reports in 2021 that the value of voluntary carbon markets had grown by at least 60% in the first 8 months of 2021 compared to the previous year, putting the annual market value on track to reach $1bn for the first time (Ecosystem Marketplace, 2021).

There is much scholarly debate that focusses on carbon forestry projects in Tanzania in particular. Some evidence is emerging to help understand local dynamics of change; but not much. Most of it is focussed on REDD+ related projects. Several themes emerge from the literature: the costs and benefits that arise from carbon forestry; how these are distributed; the changes in forest governance that are required, or in which carbon forestry is embedded; and how this takes on a particular texture locally.

The forestry sector in Africa has seen two major transitions over the last three decades. Firstly, a devolution of forestry governance, where reforms have been introduced, implementing participatory forest management (PFM) and the formation of village (owned and managed) forest reserves with a view to improving local livelihoods, forestry conservation outcomes and governance (Wily, 1997; Jacob and Brockington, 2020); and secondly, a re-birth of the sector which views and monetises forests as carbon and carbon credits (Angelsen, 2009; Jacob and Brockington, 2020). These reflect broader trends of decentralisation, neoliberalisation, and commodification in conservation.

In Tanzania, much participatory forest management has been implemented over the last 25 years, to some limited success. Estimates suggest that the area of land under PFM has risen from around 3.6m ha in 2006 (URT, 2006) to over 7.7m ha in 2012 (URT, 2012). Carbon forestry has a more recent history in Tanzania, with REDD+ launched in 2009 after a Norwegian-funded support for REDD+ pilot and

[10]The authors of this research define the forest and land-use carbon PES market as '*global transactions of offsets generated from the sequestration or avoidance of carbon emissions from forestry projects (carrying out such activities as improved forest management, tree planting or avoided deforestation) and other land-use projects (such as restoration of wetlands)*' (Salzman et al., 2018: 142).

framework projects in 2008 (Jacob and Brockington, 2020). Treue et al., (2014) found in their evaluation of PFM in Tanzania that forests that are sufficiently large and far enough away from major urban areas, can achieve sustainable use under PFM. However, other evaluations and reviews have revealed mixed outcomes. Lund et al. (2018) unpicks four main strains in (a somewhat siloed) literature, finding that forestry decentralisation and PFM:

1. are generally associated with relatively lower rates of deforestation and degradation, generating mixed livelihood impacts, with poorer and more forest-dependent households carrying the burden of the adverse impacts (see also Corbera et al., 2017);

2. often do not achieve the democratic decentralisation they aim for due to elite capture or a lack of downwards accountability in organisations that hold power (see also Ribot, 2006; Chomba et al., 2015; Das, 2019);

3. tend not to be 'pro-poor', with much elite capture of benefits and decision-making (see also Green and Lund, 2015; Lund and Saito-Jensen, 2013; Jacob and Brockington, 2020; Magessa et al., 2020); and

4. need to be contextualised and historicised, as the processes involved 'reiterat[e]..repackag[e]..and adapt' past claims to participation, and have important unintended consequences (Lund et al., 2018: 20; see also Mabele, 2020).

Within the REDD+ carbon forestry literature, we see a mirroring of the previously explored critiques of neoliberal conservation and the persistence of degradation and multi-win narratives. Beymer-Farris and Bassett (2012) argue that REDD+ carbon forestry projects are reorientating resource management away from community-based management to fortress conservation. In a case study of a REDD-readiness project in the Rufiji Delta of Tanzania, they reveal a rewriting of local environmental histories with narratives of forest loss which are attractive to global carbon market demand and strengthen certification and verification processes. In their qualitative case study of a REDD project in Tanzania, Svarstad and Benjaminsen (2017) highlight the mismatch between the success narratives propagated by project donors and other actors, and a lack of evidence on the ground to support claims of 'multi-wins'. They raise concerns over the apparent prioritisation of safeguarding a reputation of success by key project actors over genuine engagement with local dynamics of change and on generating evidence of impact in order to learn (Svarstad and Benjaminsen, 2017).

Cavanagh and Benjaminsen (2014) go further, arguing that the maintenance of a façade of triple-win success (even faced with evidence to the contrary) is in fact an integral part of managing carbon-sequestration projects, given the structures of the global carbon market and the philosophies it is predicated on. They conclude 'precisely despite evidence of the dispossession and impoverishment of rural populations, organizations…continue to enjoy sterling reputations among Western publics, and are generally presumed to secure environmental management outcomes that conform to their official, allegedly socially responsible rhetoric' (Cavanagh and Benjaminsen, 2014: 63).

Corbera et al. (2017) find substantial improvements to forest governance arising from a REDD+ PFM project in Tanzania. However, the anti-politics (Ferguson, 1994) and 'rendering technical' (Li, 2007) of

carbon forestry represents a failure to acknowledge and address political notions of social justice which can result in a 'messiness' of carbon forestry governance systems, and is often (unsuccessfully) addressed from a technical perspective, thus further perpetuating the issues (Myers et al., 2018). The increasing prominence and value of carbon payments are likely to emerge as a critically powerful force in forestry governance structures, constituting 'more temptation for local elites [as well as district and central officials] seeking to control the benefits of devolved governance' (Jacob and Brockington, 2020). With the increased role and power of global carbon market, carbon forestry 'must address forest people's agency in the makings of landscapes' as the control of resources tips once again away from local actors and towards global ones (Beymer-Farris and Bassett, 2012: 332), opening what Wright (2016) terms 'turbulent terrains' and effectively constituting a process of recentralization.

The literature demonstrates that conflicts can and do arise from REDD+ governance processes, particularly in relation to the formalization of land rights, and in the way in which narratives of multi-wins can mask losses, and prevent those who lose out from being adequately compensated (Scheba and Rakotonario, 2016). Even in those REDD+ projects which can be understood as 'inclusive' forms of neoliberal conservation, where meaningful efforts are made ensure 'inclusivity', evidence suggests that we see new forms of exclusion arising for resource users, as a result of structural inequalities and the commodification of carbon (Scheba and Scheba, 2016).

There remains a scarcity of empirical evidence and critical nuanced analyses of the impacts of market-based carbon forestry programmes on local people, particularly that which add to our understandings of the broader impacts and dynamics of change that can arise from carbon-sequestration projects.

Land Alienation and Green Grabs

Critiques of carbon forestry and PES schemes can be about the changing social and economic relationships that they entail. But they can also be about a much more profound threat, and a much more damaging prospect – the threat of land loss.

There is a large and rapidly growing body of literature around land grabs or land alienation in Africa. This is particularly pertinent for Tanzania, where conservation efforts (land grabs for REDD+ (Svarstad and Benjaminsen, 2017) and wildlife conservation (Fairhead, Leach and Scoones, 2012)) and economic investment opportunities (in mining and agriculture corridors) are interlocking around large areas of rural Tanzania (Bluwstein et al., 2018; Brockington, 2019: 4).

There were initially very high levels of concern about large-scale land grabbing, particularly in the context of agricultural commercialisation in Africa, with an explosion of literature – indeed a 'literature rush' as termed by Oya (2013) – debating the perceived revolution in land grabbing and the consequences for rural societies (e.g. Cotula et al., 2009; von Braun and Meinzen-Dick, 2009; Oya, 2013). Subsequently, greater scrutiny of data and evolving methodologies led to suggestions that that some of this concern was more portended than real, and the concern has somewhat receded. Scoones et al. (2013) discuss flaws in methodologies for understanding the global land rush: uncertainty about what is being counted; and the often-unreliable methods used to aggregate land deals. They call for scholars to focus efforts on developing and utilising more grounded and transparent methods to

explore land grabs, rather than a hyper focus on establishing the total areas of land acquired. Locher and Sulle (2013) took strides towards this, offering a cautious lay of the land (investments) in Tanzania as of 2012, acknowledging the significant data limitations. They note that the priorities of foreign investments had shifted away from biofuels and towards investments in land for food crops and forestry plantations (Locher and Sulle, 2013; 2014).

Fairhead et al. (2012) explore what green grabs – 'the appropriation of nature for green ends' (Fairhead et al., 2012: 254) – constitute; how they manifest; and implications for people and environments. They argue that 'green grabs' follow patterns of past interventions, but also tread new paths of accessing global market mechanisms, such as international carbon markets, in unprecedented ways (Fairhead et al., 2012).

But what are the consequences of these land grabs for local people? Brockington's study (2002) of the impacts of eviction on pastoral livelihoods around the Mkomazi Game Reserve represents one of the more extreme cases of familial and local economic impoverishment – but it is an extreme case. More generally we must recognise the variety of forms that the phenomenon can take. Hall (2011) argues that terms like 'land grab' (or 'green grab') disguise a diverse constellation of investments and their manifestations. This therefore suggests a diversity of implications and impacts: not all green grabs are created equal. The author proposes a framework for typifying different land investments and calls for examinations of not just the details of deals, displacement and livelihood impacts, but also 'what land grabbing *produces*: that new social relations, land politics, labour markets and modes of accumulation are being produced?' (Hall, 2011: 208).

Bluwstein et al (2018) start to look at more broader dynamics of change in the face of land being squeezed from multiple different directions in Tanzania, and consider how individuals and communities seek 'to maintain control over their means of production' (Bluwstein et al., 2018: 806). They identify and look at some of these strategies, which include migration, land transfers, and land tenure formalisation. However they caution that these responses can feed into narratives for policies that can serve to fuel further land alienation (Bluwstein et al., 2018).

Hall et al. (2017) examine 9 cases of agricultural commercialisation in Africa, looking at three models of agricultural commercialisation across Ghana, Kenya and Zambia, moving between oil palm, agroforestry, sugarcane and fruit. They find that plantations and estates produce the most jobs of these three models, but warn that these jobs are 'low quality and mostly casual' (Hall et al, 2017: 515). They start to explore how dynamics of gender and generations emerge in response to demand for labour. Critically, they point to local contexts and relations as being fundamental to how the outcomes and impacts of agricultural intensification unfold. They suggest 'a simple conclusion is not possible' (ibid., 532). Indeed, with such polarised debates overlaying the complex realities of local contexts, a simple conclusion is unlikely to be possible or helpful: as they caution, moving 'beyond simplistic narratives on land grabbing and commercial agriculture is...vital' (ibid, 533). They start to unpick some of the dynamic and evolving interactions that arise out of such investments, highlighting issues of elite capture, impacts on class, gender and generational dynamics, how spatial relationships can influence impacts on the communities living and working around and within areas of commercialisation, and how different co-existing models can create or shut down space for communities and individuals to

navigate opportunities. They end with advocating for policy frameworks that are grounded in local contextual evidence and that embrace nuance.

Some of the findings around employment, land and livelihood impacts of plantation models[11] of agricultural intensification are of particular interest to this thesis. They emphasize that findings are heterogeneous across the different studies, and discuss that in some of the cases they explored, while there was some elite capture of permanent, higher paid jobs being taken by outsiders, temporary jobs still tended to pay more than local wages, and employment opportunities had opened up for women, and were attractive to young people who would seek work with the plantation companies. There were exclusions, and entrenchments of existing inequalities. Of note, is their discussion of 'straddling' of livelihood opportunities: combining wage employment with small-holder farming (Hall et al., 2017: 527; Cowen, 1981). Their work suggests that the potential for straddling is predicated on – amongst other elements – how plantations and local settlements and smallholdings are spatially arranged.

We must also note that amid concerns of land loss and expropriation there are also reports of general rural economic uplift. Jayne et al. (2018) examine the diverse drivers of economic growth transformation across sub-Saharan Africa, suggesting that agricultural growth remains an important common driver of transformation, creating more labour opportunities in non-farm sectors (Jayne et al., 2018). Beegle et al (2011) examine migration and living standard improvements. They make a striking finding using 13-year panel data, showing that migration in Tanzania almost always improves people's living standards: everyone's incomes grew when they migrated. Brockington and Noe's collection of case studies (2021) – albeit explicitly in the absence of cases of land loss – reports generally rising trends in prosperity as measured according to rural assets.

The persistence of narratives

Despite the critical and seminal bodies of work that challenge and disrupt the degradation and multi-win narratives described above, showing how misplaced their analyses are, how is it then that these narratives persist? Haas's concept of 'epistemic communities'[12] can shed some light on this. Epistemic communities are communities of 'experts sharing a belief in a common set of cause-and-effect relationships as well as common values to which policies governing these relationships will be applied' (Haas, 1989: 384). These epistemic communities exist within and across academic, policy, private and state spheres, involve the inherent intertwining of science and politics (see e.g. Latour, 2005), and can work to reinforce narratives that (consciously or unconsciously) serve the agendas of those involved.

Büscher (2012) paints an illuminating picture of this phenomenon relating to a PES programme in South Africa (the Maloti-Drakensberg Transfrontier Project), where scientific narratives and

[11] The authors define plantations / estates "as large, self-contained agribusiness farms that are vertically integrated into value chains…often associated with one major crop, …[although] not always the case" (Hall et al., 2017: 519)

[12] Haas's concept of epistemic communities is grown out of a body of work within the sociology of knowledge literature around epistemic communities (see Holzner and Marx, 1979), and is similar to Fleck's (1979) 'thought collective'.

representations of PES are '*marketed through epistemic communities that already support and/or depend on the success of these same PES models*'. This marketing builds a *'seemingly convincing case, backed by scientific evidence'*, but Büscher's work reveals that much of this evidence is *'tenuous and/or one-sided'* and is cultivated to '*present a convincing picture that guarantees…resources…and inscribes actors' careers within a particular popular paradigm'* (Büscher, 2012: 30).

As Büscher points out, this is reminiscent of David Mosse's work on interpretive communities in development policy more broadly. He argues that within the complex multi-layered networks of relationships and organisational cultures that drives development practice, '*development actors work hardest of all to maintain coherent representations of their actions as instances of authorized policy, because it is always in their interest to do so*', particular to secure a '*flow of resources*' (Mosse, 2004: 639). The 'multi-wins' of neoliberal conservation initiatives are intimately connected to the degradation narratives they rely on, and often the epistemic communities that surround these initiatives are incentivised to make these projects a success. Market-based mechanisms such as PES and carbon offsets offer an attractive 'solution' for institutional and private actors who face a constellation of socio-political and institutional pressures, and that these processes (as well as the underlying conceptual frameworks) are an inherent part of – and response to - neoliberal conservation (Büscher, 2012: 39-40). At the same time, neoliberal conservation – and PES and carbon offsets in particular – can involve an extension of the 'anti-politics' of development (cf. Ferguson, 1994), 'rendering technical' (cf. Li, 2007) and de-politicising the context of interventions (Büscher, 2010; Myers et al., 2018).

Beyond the binary: agency and resistance

The shiny narratives of multi-win neoliberal conservation initiatives (more broadly), and PES and carbon-offset programmes (more specifically), often fail to deliver their multi-win, zero-losses promises in practice. But we also cannot simply dismiss these market solutions – or neoliberal conservation – solely as processes of commodification resulting in alienation, dispossession and misery (Van Hecken et al., 2018). The picture is much messier, and less simplistic than a choice between rejecting or accepting neoliberal conservation, or whether it should be designated 'a good thing' (multi-wins) or 'a bad thing' (disempowering re-territorialization and alienation under the neoliberal agenda). This false dichotomy is not the full story. Holmes and Cavanagh (2016) review the published evidence on the impact of conservation's neoliberalisation on its social outcomes and find that neoliberal conservation typically involves a reliance on 'spectacle' (Igoe, 2010) and narratives as part of the commodification and marketisation processes (Holmes and Cavanagh, 2016: 204-5). This can both generate negative social impacts such as evictions or displacements to maintain the associated representations of these environments, while also offering new opportunities for local people to shape, contest or resist conservation initiatives, and to accrue various benefits.

The agency of local people to respond to new configurations within neoliberal conservation, and to (re)create and (re)define novel opportunities to shape, contest or resist the development of – and unfolding consequences from – neoliberal conservation is important and yet can sometimes be overlooked in the literature (sometimes in an apparent haste to critique neoliberalism and its discontents). Ferguson (2010: 174-5) posits that neoliberal market techniques can be 're-appropriated' by people or groups and used as tools of resistance against marginalization. Unexpected

dynamics can unfold as local actors 'learn to play the game' (Wright, 2017: 158; Green and Adams, 2014: 113) and make use of the political spaces that open within the 'turbulent terrains' emerging from processes of decentralisation (and/or recentralisation) in neoliberal conservation (Wright, 2016; Wright, 2017; cf. Rosenau, 1997). In fact, we see processes of local authorities or communities resisting recentralisation (Wright, 2017), enacting what Larson (2005) terms 'decentralisation from below'. Asiyanbi et al. (2019)'s present a powerful argument in this vein:

> *We differ…[from Bluwstein (2017) who argues that] "those who have to live with…[neoliberal conservation]…often do not have…[a] choice"…Rather, we argue that non-binary complexities are not merely (at least, not always) foisted on docile communities; they are rather actively co-constituted – no doubt, asymmetrically – by communities as part of their technologies for living politically with powerful neoliberal conservation interests and structures…[T]hese local complexities are not arbitrary…[but are] underpinned by enduring rationalities and repertoires for regularly struggling against congealing forms of domination whenever and wherever they emerge – whether from the state, market-based conservation interests or even local community elites.* (Asiyanbi et al., 2019: 136).

Scott, in his 1985 seminal text 'weapons of the weak' broadly defines resistance to include less formal/organised everyday acts of resistance to show how those in the 'subordinate class' often resist and challenge their domination in heterogeneous ways that are not always recognised or seen. The study of resistance and struggles against domination has grown into a large field of academic study, although the scholarly examination of everyday resistance has historically tended to lack focus on resistance to conservation (Neumann, 1998; Jacoby, 2001; Holmes, 2007). This is despite the brutal reality of the history of conservation, its intimate connection to colonialism, its associated exclusions and the many forms of resistance that have been enacted in response (Neumann, 2000; Holmes, 2007). In fact, scholars have argued that it is the 'historical dispossession in the name of nature protection and wildlife conservation that helped fuel anti-colonial movements in Africa' (Neumann, 2004: 195; Beinart, 2000).

More recent scholarly attention has therefore sought to understand how reactions and resistance to conservation initiatives unfold. In his instructive review of 34 case studies of explicit resistance to conservation regulations, Holmes (2007) highlights the importance of two aspects of resistance to conservation: the active continuation of livelihood practices that have been banned or regulated (such as hunting, burning or farming) as a form of resistance; and the significance of the physical features of the natural resources in question, as well as social dynamics, in shaping the particular nature and form of resistance that unfolds (Holmes, 2007: 184). Within this, he highlights the popularity of fire as a tool of protest conservation (see also Kull, 2004), and reveals the 'potential political content of…fires, timber cutting and hunting' as tools of resistance (Holmes, 2007: 198) often misinterpreted and mislabelled by policy makers, leading to reactions to resistance that can further entrench conflict or exclusionary social outcomes. Kull (2004) also cautions against sentimentalising acts of resistance, demonstrating that protest may not always be the sole or 'threshold' motivating factor, but that politics of resistance may be more implicit in illicit acts which are undertaken primarily for material gain (Kull, 2004; Holmes, 2007).

The pervasive multi-win narratives associated with neoliberal conservation described earlier (such as those surrounding carbon offsetting initiatives), and the need for these multi-win representations to be maintained, can also generate opportunities for communities or individuals involved to seek redress where promises haven't been kept or expectations haven't been met (Holmes and Cavanagh, 2016: 205). More fundamentally, collective and/or individual decisions to participate in – or support – neoliberal conservation initiatives despite the inequities and risks they may pose, may quite simply arise from weighing up the risks against the economic opportunities the initiative may offer within the context (Gardener, 2012), or to exploit new opportunities for contesting and resisting territorialisation (Holmes and Cavanagh, 2016).

Conclusion

The commodification of carbon, and of nature more broadly, inherently involves abstraction. This means that we (and markets) often only see the carbon and other commoditised aspects of forests (such as timber). Neoliberal conservation doesn't make visible other inherent socio-ecological values of nature or biodiversity. Pricing nature is fundamentally a reductive and abstractive process. However, while this does represent a tremendous (and reductive) transformation, and can be resisted or contested, it is not necessarily exclusively harmful. It can also be something that local people can welcome in many aspects.

The stories peddled by advocates of market-based environmentalisms reproduce well-worn tropes about the condition and dynamics (or lack thereof) of Tanzanian environments and societies. They hinge upon certain assumptions, and on ways of characterising how people use and interact with the environment. These stories make it easier to appear to interpret apparent change because it makes it easier to explain what we see. GRL and other organisations explain their visions of their own work in ways that make them recognisable. Equally the critiques of these stories, of neoliberal conservation, can also constitute narratives – stories which come together to make coherent representations of unwelcome change.

Between these sometimes polarised positions are rather messy realities on the ground. If we are to better understand the dynamics of change arising from carbon investments, when we come across them being produced, we must examine them within their broader contexts and look at how their social, ecological and economic consequences unfold. It is this exploration of the immediate and broader implications of large-scale private investments in Tanzania and the dynamics of change that are unleashed, that I try to attend to in this thesis. What does private sector investment in carbon forestry do to rural society and economies in Tanzania? And how do people respond?

3. Methods: How I came to do, and produce this PhD

"I love deadlines. I love the whooshing sound they make as they fly by."
Douglas Adams

Introduction

'Events dear boy, events'. So Harold MacMillan explained why the best laid plans of governments can go so badly wrong. My PhD is a history of unforeseen and unpredictable events that have completely re-shaped what I did, what I was able to write up, and why I did so. This is not the PhD I set out to write; it is not quite the thesis I wanted to finish. The process has been imperfect but has taught me much in the way of resilience, expectations and humility. In this chapter I explain how this thesis has come to exist and the bits of it that did not quite appear. I describe the methods used to collect and analyse my data, and reflect critically on these processes and my own undertaking of this research.

Origins

The ESRC funding for this research was applied for by my first supervisors: Professor John Wainwright; Dr Chasca Twyman, and Steve Cinderby (based at the Stockholm Environment Institute (SEI) in the University of York). The original design of the research was developed by my three initial thesis supervisors in order to secure PhD funding for the research, and it was envisaged to be a comparative study of Tanzania and Kenya, examining competing demands for ecosystem services, and the trade-offs and synergies between differing land-uses and the ecosystem services (and disservices) associated with these land-uses. The study design was originally planned to utilise quantitative and qualitative participatory data methods (ranging from household surveys to participatory mapping, focus groups, semi-structured interviews, and other activities such as participant observation and transect walks) to feed into a participatory agent-based model (ABM). This project took place in Tanzania as specified in the grant application.

I applied for the PhD as I was completing an MSc in Environmental Technology at Imperial College London specialising in Environmental Economics and Policy. My master's thesis was quantitative and economics-focused, using input-output modelling to explore the potential employment and economic impact of retrofitting the existing UK housing stock to make it more energy efficient. I wanted to do research that involved people *and* economics *and* the environment. I had no experience in Tanzania, but was eager to learn and excited at the prospect of undertaking fieldwork in East Africa. I think I had quite a romanticised idea of what fieldwork would entail, and underestimated the challenges that overseas fieldwork - and further years of student life as an adult - can involve. The allure of exploring how payments for ecosystem services - something I perceived at the time to be something of a 'triple-win' silver bullet - operated in a far-flung country with sunnier climes than the UK was irresistible. The yearning for achieving the perceived intellectual superiority of having a PhD was persistent. The naivety and unexamined privilege and perspectives of 'development' was strong.

Clearly I had (and still have) a lot to learn and this thesis presents the current stage of that learning process. Part of that learning is visible in the fact that the actual thesis I have written is quite different from the one originally proposed. The supervisor supporting the ABM development, Professor John Wainwright, left the university towards the start of the PhD, and as the research progressed it was decided that it would be prudent to contain the research to study sites within Southern Tanzania, rather than a cross-country comparison with Kenyan sites as well, and that a less ambitious methodological design, including removing the ABM component, would generate more helpful insights for the particular research objectives.

To implement the research I went to Tanzania and spoke to a few academics and researchers at the University of Dar es Salaam (UDSM) and the Sokoine University of Agriculture (SUA) (as well as some at other institutions whose research focused on Tanzania). These included: Prof. George Jambiya (UDSM); Dr Gimbage Mbayale (SUA); Professor Pål Vedeld at Norweigan University of Life Sciences (NMBU); Dr Jummane Abdallah (Department of Forestry and Environmental Economics, SUA); Prof. Pius Yanda at the Institute of Resource Assessment (IRA) at UDSM; Prof. Pantaleo Munishi (SUA); Jacqueline Senyagwa (SEI-Africa); as well as several postgraduate researchers at SUA and NMBU. Prior to travelling to Tanzania, I had also consulted with academics at the Universities of Leeds, York and Sheffield who had undertaken research in the region. From these discussions, Morogoro, and Kilombero specifically, emerged as a suitable area for the research.

I spoke to regional, and subsequently district, government officials, who offered their insights and perspectives on areas to conduct the research, including providing some specific villages they thought could be interesting to undertake fieldwork in. I went on a short scoping visit to around 10 villages in the Kilombero district, having some very brief discussions and group interviews with village leaders to gain some initial characteristics about the villages and to discuss if they would be willing to accommodate me within their communities to undertake research. I started to realise the huge value that opening up space for change within research design during and after interactions with people with lived experience in the context of the research, and in including research participants in the process of developing research proposals. This was not, in its origins, a co-created research project, but there has been a lot of influence from the people I have met while changing it.

Originally, I intended to compare dynamics in two lowland and two highland villages. Accordingly I chose two lowland villages (Ngombo and Merera) that had land-use plans and competing land uses, and exhibited what I thought was an interesting farmer-agropastoralist dynamic, and intriguing relationships with private sector investment and protected areas. I then chose another two villages (Kitete and Uchindile) on the recommendation of my research assistant as he had heard of the interesting involvement of a company planting trees for carbon credits, and thought they provided a good contrast to the lowland villages, and avoided more floodplains (a practical consideration when travelling to study sites to undertake the fieldwork research).

I applied for my research permit with the support of SEI / SUA, and as per the official process, I applied for the appropriate residency visa and research permit. I sought and gained approval at each administrative level in Tanzania (national, regional, district, ward/village), and received letters of introduction and recommendation to take to the next level. I undertook the fieldwork for this research

during an 8-month spell in 2013[13], having undertaken a scoping trip and three months of Swahili language training in Tanzania in 2012, with a short return follow-up trip in 2014 alongside an overseas institutional visit to the SEI-Africa centre in Nairobi, Kenya.

This research used mixed qualitative methods, including focus group discussions, participatory rural appraisal exercises, semi-structured interviews, and qualitative household survey questionnaires. Across the four villages, I administered 135 in-depth household survey questionnaires to household heads, using a random stratified sampling according to livelihoods; 35 focus group discussions were conducted with the help of a local facilitator and translator, grouped according to livelihoods, with at least one all-women focus group in each village; 40 semi-structured interviews were undertaken with key informants and individuals identified during the surveys and focus groups. I generated further data from participatory tools such as transect walks and wealth ranking exercises. I conducted additional follow-up semi-structured interviews in 2014 with targeted national and regional key contacts (in Tanzania and Kenya) with a view to understand the broader policy and political contexts of the changes that I had witnessed on the ground.

I hired and worked with three Tanzanian research assistants / translators across the duration of the fieldwork and data collection. Masanja Joram (who could not work for the entirety of the fieldwork process due to his own work commitments, but supported with a large portion of the research, particularly with the undertaking of all household surveys), Enock Tumbo (who supported me with undertaking interviews and focus groups discussions), and Paul Mwita (who helped with interviews after Enock became unwell towards the end of the fieldwork and wished to return to Dar es Salaam to recover). Their contribution to the research was invaluable, and I could not have done it without them. They guided (and chided me when I needed it!) and provided much insight and context to the data collected. I also had a had a local facilitator in each study site - their contribution was also invaluable.

Masanja and Enock both spoke some *Kisukuma* as per their families, which was particularly helpful in navigating speaking to respondents from pastoralist communities in Ngombo and Merera (although for some interviews and focus groups I also worked with a local translator). The short swahili course I undertook, and the subsequent informal improvement in my swahili through conversing with the people I lived with and asked research questions of, was extremely helpful in being able to understand much of what was said by respondents. Sometimes, interviews were undertaken partially in English - for example with a GRL representative, with some government officials, and with some village residents. The latter of these tended to be men who had grown up in more urban areas and relocated to the study sites for work, particularly for religious or teaching positions. Occasionally during interviews or surveys, I required 'double translations' - requiring a local translator as well as my research assistant.

Table 3.1 below provides a summary of the data collection methods, which were supplemented with field notes capturing reflections, experiences and informal conversations I had throughout the fieldwork period.

[13] Over a 10-month period

Method	Village 1 (Ngombo)	Village 2 (Merera)	Village 3 (Uchindile)	Village 4 (Kitete)	Total
Household Surveys	34	31	35	35	135
Semi-structured interviews	8	9	10	8	35
Key informant interviews	SSIs with 5 key informants in 2012, then 5 key informants in 2014 (at village, district, regional, & national level)				
Focus groups	10	9	8	8	35
Participatory mapping	7	6	5	5	23
Transect Walk	1	1	1	1	4
Wealth ranking	1	1	1	1	4
Village-level interview	1	1	1	1	4

Table 3.1. Summary of data collection methods

My work in these contrasting study sites was hard but fascinating. I was, originally particularly keen on contrasting two important events that were seminal for the village communities I worked in, as well as more widely. For Uchindile and Kitete, the highland villages, this was the fire of 2009 that burnt over 2,000 ha of the large-scale tree plantation project and was understood to be an act of arson. For Ngombo and Merera, the lowland villages, this was the large-scale eviction of livestock from the Kilombero valley in 2012 (see Berguis et al., 2020). The eviction had a dramatic impact on the dynamics and politics within Ngombo and Merera, from my outsider's perspective. Witnessing the tail end of these wave of evictions and learning of their far-reaching impacts and consequences on the lives of some people within (agro)pastoralist communities (including for some, loss of life) was emotional - indeed traumatic and that was just as an observer. These events were woven into many of the discussions I undertook with research participants, and they serve as an illuminating lens through which perspectives and experiences of issues of land use, acquisition and alienation can be examined.

Between 2015 and 2019 I had to take intermittent periods (and then a longer continuous period) of time off from my PhD for a combination of health reasons and difficult personal circumstances. This meant there has been a significant gap between the collection of my data and the preparation and presentation of my thesis. My actual write-up was squeezed into a 7-month period from August 2019 to February 2020, while I was also working part-time to support myself and in itself required last minute extensions. Also by then, my entire supervisory team had changed again as my lead supervisor - Dr. Chasca Twyman - also left the University while I was on a leave of absence. My third supervisor, Steve Cinderby, who is based in York was no longer able to engage when the original Sheffield team disbanded. I was allocated a new supervisor, Professor Dan Brockington, who along with Dr Julie Jones would remain my supervisory team until submission.

I was forced, purely for the pressing reason of not having enough time, to take the decision not write up the work from the lowland villages here. Instead I have focused on data from the highland villages of Uchindile and Kitete. This was a painful. There was a clear story emerging from the highland villages which examined the balance of power and negotiation of terms between different interests within and beyond the highland villages and the private sector company whose trees were devastated by the

fire, viewing interactions and attitudes through the lens of this fire (see chapters 6-7, especially 7). I wanted to use the lens of the large-scale livestock eviction across the Kilombero Valley to examine how different interests within and beyond Ngombo and Merera viewed the competing demands on land - particularly agriculture and pastoralism, conservation areas, and the increasingly prominent interests of private investment. I would have explored how the eviction was used by different groups and individuals to further their differing agendas, and how narratives around the eviction, livestock, and livestock keepers have become enmeshed with ideas of progress, development, land (availability and degradation), conservation and climate change. I would have drawn this together with the wider context of Tanzanian policies focussing on harnessing private sector investment in land-based resources in Kilombero and Morogoro.

It remains my ambition to write this work up. I think that there are important stories to tell that need to be brought into the public domain. This is underlined by the recent publication by Bergius *et al*. (2020) which connects narratives of land degradation ascribed to pastoralism with increasing pressure on land in Kilombero through the expansion of agricultural investments and environmental conservation. The paper argues that these narratives are entangled within initiatives like the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) and concepts of 'Green Economy', and with political decisions such as the 2012 eviction of livestock and pastoralists known as 'Operation Save Kilombero'. They suggest that the motivations behind these evictions were both to conserve the wetlands and to open up space for agricultural investments such as those envisaged through SAGCOT, and were shaped by (and reinforced) degradation framings of (agro)pastoralism. The paper "demonstrates how degradation narratives may themselves be a key driver of conflicts...to legitimise and pave the way for agricultural investments and environmental conservation under a 'green economy'" (Bergius *et al*., 2020: 1).

However events have forced me to choose between telling all the stories I could from my data and completing the requirements of a PhD. My understanding from reading other theses is that a comparison of two sites, and one intervention, can suffice for a PhD. I have therefore, with regret, chosen not to write up all four villages and both interventions.

Methodology

There has been some retrofitting in the course of this PhD. As explained above, I started doing this research for a different set of reasons, that were designed to produce a different story from the one that has now emerged. This means that I have not, as might normally be the case, put my methodology before the methods. The thesis is more strongly shaped by the accidents and alterations that befell it, and its author, than it is by any pre-determined methodology. Nonetheless the methods that I have ended up using do have a methodology. They are defendable on a number of methodological grounds, and I outline that defence here[14].

[14] I also consider it important to be transparent about the reality of doing research, especially as a doctoral candidate. Others will have dealt with a shifting focus and methodology more skilfully, and I am not unique in the difficulties posed by the realities of fieldwork, events and life interrupting a thesis, but I aim to share this in a way that might be supportive and constructive for others.

Spash (2012: 37) describes methodology as having two aspects:

1) 'the principles and practices that underlie research'; and
2) 'the appropriateness of the methods'

With respect to the underlying principles and practices, Spash' work on critical realism provides a helpful starting point. He writes:

> *"Critical realism accepts that we can never demonstrate that we have discovered the truth even if we have (fallibilism), but does not reject the idea of there being an underlying objective reality."* (Spash, 2012: 43)

This position comprises two principles:

- Embeddedness – "everything is governed by the laws of physics, all biological entities are physical but not vice versa, so biological sciences are embedded within the physical and likewise the social within the biological and the economic within the social" (Spash, 2012: 43); and
- Irreducibility – "society is not merely a collection of individuals and cannot be understood by simple aggregation on the basis of knowledge about individuals." (Spash, 2012: 43-44)

This position means that social science methods, like those I have used here, do not produce 'facts' per se, but interpretations of social realities that go through multiple constructions. I have collected information, the data presented here, by asking questions. This involves people interpreting their own social reality and giving an answer. I then interpreted these answers to understand what they were saying, and you the reader are interpreting this again. This process involves extra layers of interpretation of reality/ies when there is language interpretation involved. Even quite seemingly straightforward numbers or yes/no answers involve interpretation. Interpretation is a necessary part of research that involves people (which I would argue is all research, when there are humans involved as researchers).

Spash sets out ontological, epistemological, methodological and ideological positions for ecological economics that reflect well my thinking and approaches. The accompanying table, reproduced and amended from Spash' work explains how critical realism applies in my work.

Ontology

- "An objective reality exists independent of humans"
- Social reality is constructed by humans
- Values are inherently connected to "facts about social reality".
- "Biophysical and social realities are distinct but are interconnected"
- "A hierarchical ontology is accepted in which there is an ordered structure (e.g. biophysical, social, economic)" – they are nested within each other
- "Society and the individual are distinct in that the former cannot be reduced to the latter nor the latter merely aggregate to create the former";

• "Complex systems and their interactions create emergent properties and are inherently unpredictable" • "Systems are continually subject to change and interaction"
Epistemology • Scientific knowledge is subject to uncertainty • Proving beyond doubt that we have 'discovered the truth' is not achievable • "Understanding and interpreting reality are in part social processes in which knowledge is often contested" • Knowledge exists in different forms and "is subject to reasoned critique and empirical investigation" • A plurality of methods is valuable, as critique can be made in many different forms. • In order to advance knowledge, we need to be open to changing beliefs and involve a process of information acceptance and rejection.
Methodology • An interdisciplinary approach • To do this successfully requires a structured shared understanding and integration of the epistemological and ontological underpinnings of different forms of knowledge across different fields. • This also requires shared generation and understanding of concepts • "Methods of evaluation must match the requirements of value pluralism.

Source: Spash (2012: 45) – setting out key aspects for a possible direction for ecological economics[15]

It is important to note to the major change in my ontological and epistemological position that has developed as my work, and life, have proceeded. When I started I prized 'objectivity' and did not understand the relationality of research. That is to say I did not realise the way that the social facts I research emerge through relationships and interaction and become apparent to the researcher through further relationships and interactions.

With the initial research design being centred around agent-based modelling and integrated (participatory) GIS, I started with a more positivist approach to my methodology and methods. This related not only to the initial PhD proposal with three supervisors who are no longer involved in the PhD or with the University, and the associated ideas of potential research questions, but also to my more quantitative, economics background. I viewed people as (ir)rational agents whose behaviour and interactions with an environment could be predicted if the right formulation of rules could be uncovered and codified. Inherent in this approach is the conceptualisation of humans as distinct from their environment.

My starting and end points therefore are remarkably different. In important and sometimes difficult ways that epistemological fact is reinforced everyday in my current profession – working by and with

[15] Spash (2012) also sets out a proposed ideology for ecological economics. I have not included this here, other than to acknowledge that he argues for an inseparability of facts and values which demonstrates a distinction between more radical ecological economics compared to "orthodox economics, which pretends to give objective value free advice while actually supporting the existing institutional structures." It is worthwhile reading.

survivors of sexual assault to support other survivors. Through that I truly appreciate how relational every interaction and exchange is. There is no 'observing' – you are there in it, with your own perspectives and history and experiences, and co-producing an exchange of ideas[16].

As a result of the changes described above however a different overarching research question emerged from this thesis. It is:

> *What are the local consequences of private investment in carbon forestry for rural society, ecology and economies in Southern Tanzania? And how do these consequences unfold?*

The key contributions I am seeking make for a more empirical than conceptual thesis. I shed light on this question by using a qualitative mixed methods approach (Creswell, 2011) and a single case study (cf Thomas, 2007) centred around private carbon forestry investment in Kilombero, Tanzania. I explored the direct and indirect consequences of a large-scale investment by a private company, Green Resources Limited (GRL), on rural society, ecology and economies, and the dynamics of these unfolding consequences. Taking a case study approach offered a great level of flexibility that other approaches (such as phemonology or grounded theory) do not provide (Hyett et al., 2014: 1[17]).

There are several justifications for the choice of GRL as a case study. It is the self-proclaimed largest carbon forestry company in Africa. There is some published work on their activities elsewhere but not on this specific plantation in Tanzania (Fischer et al., 2016; Lyons and Westoby, 2014; Nel and Hill, 2013; Olwig et al., 2015). And the location, in Kilombero, is also the lens used to explore the confluence of other policies (see Sulle, 2017; Sulle et al., 2014; Sulle, 2020). But there was an element of luck in the emergence of this as a case study. The villages I focussed on were recommended by local experts and contacts during my scoping study. It seemed to be relatively 'doable' logistically. So, while the case study is a good one to choose, I have 'stumbled upon' GRL in some ways. While focussing on two villages has given me rich empirical data and understanding of contextual factors, it is important to remember that this research is not representative (Laws *et al.*, 2003). I was not testing hypotheses. Caution should be taken to not assume that my findings are generalisable beyond the specific context (Thomas, 2007).

I have been upfront about the evolving nature of this PhD. If I had this thesis (as it stands now) in mind when I was designing my methodology, I would have used a different mix of methods because of the greater importance of observing social realities and their contexts and a desire for my research to be less extractive. The balance of methods would have skewed more heavily to a more ethnographic approach. I would have designed shorter questionnaires that focussed on more multi-dimensional

[16] I did not think as critically about my feminism and politics before – and even during parts of – my PhD. I would have loved to have approached my research from an explicitly feminist perspective with intersectionality and anti-racism consciously embedded throughout, and to have focussed more on gender. Alas, I cannot impose this retrospectively, although it is worth noting that my evolving perspectives will have impacted my later (re)interpretations and analysis of my data.

[17] The article mentioned that its page numbers are not for citation purposes but I was unable to find the correct page numbers for citation purposes, so the page numbers provided on the pdf accessed online were used.

aspects of prosperity. My focus groups and semi-structured interviews would have been more relaxed and less structured, and more targeted around how life had changed since the arrival of the company and the rush of different groups of people to plant trees in the area. I would have explore what it means to plant trees; and the inter- and intra-household dynamics relating to this, with a focus on class and gender dynamics. I also would have spent time within the workings of the tree plantations – in the 'labour camps'. And I would have had to be much more careful when coping with the politics of research in order not scare people off. Explicitly researching the company and the fire (or the livestock evictions in the lowlands) could have shut down conversations, due to the ever present 'threat' of the company leaving.

Perhaps every thesis would have been done differently. The upshot here is that there has been an element in this work of trying to reinterpret materials that were designed for a different use. The methodology for my methods does not quite fit as closely as I would have liked. Acknowledging this, I still believe the research I have produced (using the methods and approach I did) provides valuable insights to my research question, and to the field. Thus, even though I did not have an optimal recipe of methods, I would still have used elements of the design I used. Or to put this slightly differently, even though the methodology was wonky, the methods are still useful. However, they need to be critically examined. As such, I offer a rationale and defence of the chosen methods (in relation to Spash's second aspect - "the appropriateness of the methods"), while still critically reflecting on their limitations.

Critical Reflections on my methods

This research took a qualitative mixed methods approach (Creswell, 2011). Participatory tools, and more traditional methods such as household surveys and semi-structured interviews, were employed during fieldwork in order to collect qualitative and quantitative data, and to draw comparisons across four rural communities in Tanzania. The interdisciplinary methodological approach taken reflects both the movement of the research methods literature towards more integrated approaches, and the pressing need for interdisciplinary research in climate change and development studies (Hulme, 2008). Despite the risk of 'tyranny' and of inflaming conflicts (Cooke and Kothari, 2001), the participatory approach complements a central strand of the research, seeking to gain an in-depth understanding of participants' experiences and perspectives, and allowing space for issues that are important to individuals and groups to emerge. It facilitates the integration of interdisciplinary knowledge and multiple perspectives (Bousquet et al., 2002; Castella et al., 2005) and reflects the importance of engaging with and representing views of local stakeholders (Menzel and Teng, 2010). By analysing stories, narratives and accounts, qualitative approaches can be particularly effective way to understand people's experiences and interpretations of events and arrangements (Bernard, 2011; Quandt, 2020).

Qualitative analysis fundamentally involves "discerning, examining, comparing and contrasting, and interpreting meaningful patterns or themes." (Berkowitz, 1997). I took an inductive and deductive reflexive, iterative approach to qualitative analysis of the data collected, where themes both emerged from the data and were informed by my perspectives, frameworks and intuitive understandings from the field (Srivastava & Hopwood 2009). I undertook iterative thematic analysis which involved

'repeated interaction among existing ideas, former findings and observations, and new ideas.' (Coffey & Atkinson 1996: 156). This was a process of 'visiting and revisiting the data and connecting them with emerging insights, progressively leading to refined focus and understandings' (Srivastava & Hopwood 2009: 77).

Data was transcribed and analysed using iterative thematic coding, with responses to feedback provided to participants integrated into the final analysis (Heckbert et al., 2010). Interview transcriptions, field diary entries, and notes from discussions during focus groups, participatory mapping, and other activities were thematically coded (Glaser and Strauss, 1967; Strauss and Corbin, 1990) in a sequential fashion, progressing from descriptive codes that recognise key words and phrases used by participants, to more analytical coding. This aimed to minimise biases and avoid premature drawing of conclusions (Jackson, 2001). Thematic coding included both a priori and a posteriori codes, that is, both anticipated themes I expected to emerge from the study, and unanticipated themes that emerged from the research during the data collection and analysis process. (Cope, 2005). Essentially, this involves grouping themes or ideas that are present in the interview transcripts, focus groups notes, and in qualitative data from the SSIs. This process of thematic analysis was iterative and continuous throughout the data collection, analysis and writing stages of the thesis.

All of these methods require critical scrutiny properly to understand the sorts of insights they can yield.

Surveys

Semi-structured survey questionnaires, "combine some structured questions to obtain basic information with others that permit more flexible answers to convey ideas or perceptions in an open-ended manner" (Simon, 2006: 166). Surveys can generate detailed information about household compositions and functioning, and help to form a picture of household livelihoods (Slocum et al., 1998). The surveys I used were originally designed for agent-based modelling. I piloted and adjusted the surveys accordingly – several questions that were poorly worded were rephrased, some questions were removed, and others were re-ordered to improve the logical flow and user-friendliness of the survey. All surveys were undertaken face-to-face, typically at people's homes, and (excepting three of the surveys in Ngombo) all surveys were undertaken by myself with translation and research support provided by my research assistant. See Appendix 1 for a copy of the household survey I developed and used; table 3.2 below provides a brief description of the survey sections to give a flavour of the content covered.

The survey progressed from shorter, closed questions establishing more basic information to longer, more open and sensitive questions: this helped with putting both the respondent and researcher at ease and building rapport (Simon, 2006; Overton and van Diermen, 2003). While surveys can generate useful quantitative *and qualitative* data (Lockwood, 1992, quoted in Overton and van Diermen, 2003), issues of representation, interpretation and assignment of meaning to data, data overwhelm and survey length, and questionable data input are just some of the drawbacks of surveys as a method, as well as issues of power, positionality, and language that cut across all different types of research methods (Overton and van Diermen, 2003; Simon, 2006). Babbie (2013) succinctly states that "survey research has the weakness of being somewhat artificial, potentially superficial, and relatively

inflexible" and cannot provide sufficient understanding of social processes (Babbie, 2013: 300). These challenges were borne out in my surveys. They were long (the average survey completion time was 1 hour 28 minutes, ranging from 40 minutes to 2 hours 35 minutes); people got bored, and they were far less engaging than the other research methods used, for both respondents and the researchers. Crucially, they were far less flexible in terms of capturing data about the issues that emerged as important from the dialogues I had with different people throughout the research process.

Section	Name	Description
0	Survey metadata	Information about the interview itself e.g. date and time undertaken; and sensitive data such as household name.
A	Key Demographics	Basic information about the respondent (and the household head if not the same) and their household.
B	Livelihoods	Information about household income and assets; and questions about livelihood activities such as farming and livestock keeping. Also includes questions relating to other income and social capital.
C	Natural Resource Use	Questions about natural resource availability, management and conflict; more detailed questions about use of each type of natural resource identified.
D	Natural Resource Health	Questions about the health of local natural resources, any changes, perceived causes and impacts of these changes.
E	Decision-making	Questions about processes behind natural resource use
F	Climate	Questions about understandings and perceptions of weather, climate, and carbon.

Table 3.2. Descriptions of survey sections

Qualitative Interviews

Key-informant interviews are an important source of data, providing insights into an individual's perceptions and priorities (Woodhouse, 2007). Semi-structured interviews are typically the most popular form of interview, offering a compromise between directing the conversation towards the research topics and opening up space for key issues to emerge (Willis, 2006: 145), and offering slightly more by way of an exchange of ideas. While they are in some ways more time efficient than observations in terms of gathering similar data (Bryman, 2015), interviews are a non-neutral process between interviewer and interviewee; and are limited to what the interviewee choses to share, which does not necessarily accurately represent actions (Creswell and Poth, 2017; Laws *et al*., 2003: 297). I undertook semi-structured interviews, with key topics defined in advance, utilising open-ended questions to attempt to minimise bias (Mikkelsen, 2005), and I tried to create space for other issues to emerge and to respond to interviewees' priorities. Where appropriate and after gaining the interviewees consent, interviews were recorded with some notes taken during the interview itself; occasionally recordings were paused at the request of interviewees while more sensitive matters were discussed. Interviews were transcribed and translated with the help of my research assistant. Transcribing interviews was time consuming (Willis, 2006; Brockington & Sullivan, 2003) and recording is likely to have made interviewees more guarded at times, but it allowed me to engage more

responsively with the people I was speaking to without the need to feverishly write down everything that was said, and was helpful with checking language translations.

Focus Groups

Focus group discussions (FGDs) are group-based interviews and discussions lasting for up to several hours with typically between 6 to 8 participants. FGDs fundamentally can generate "understanding [of] *collective social action* and accessing group beliefs, understandings, behaviours, and attitudes that might be overlooked in in-depth interviews" (Lloyd-Evans, 2006: 154). Advantages of FGDs include that they provide insights into typically unspoken group norms and processes, offer opportunities for witnessing social interactions, and are a useful tool for complementing other methods (Bloor et al., 2001). Individuals or powerful voices can dominate in FGDs (Mikkelsen, 2005; Laws et al., 2003). My presence as a researcher and moderator, setting the topics for discussion and interacting in the discussion by asking structured, follow-up and clarification questions means that data arising from FGDs are skewed towards being researcher-directed (Morgan, 1997). FGDs are not typically considered robust methods of data collection on their own and they are best used alongside other methods for triangulation, which is how I elected to use them. They can give context for interpretation of findings from other methods and offer opportunities for feedback on findings from relevant stakeholders, however they cannot be relied upon for validation of findings with any degree of certainty (Bloor et al., 2001; Morgan, 1997).

Participant Observation

To underlie my interview, survey and focus group methods, I undertook various forms of participant observation to gain a deeper understanding of the day-to-day life of local residents in the study sites. Participant observation at its core refers to observing and participating – to varying degrees – in a social situation which consists of three key elements: place, actor(s) and activit(ies) (Spradley, 1980). Participant observation can provide a holistic picture of contexts (Jorgensen, 1989), offering opportunities for corroboration of verbal messages with demonstrated actions and behaviours. It was crucial to critically reflect to the best of my ability on my position in these contexts; how my presence – and the presence of my research assistant(s) or local facilitators - might affect interactions and behaviours (Laws *et al*., 2003), and therefore on my observations. This is something I would discuss after conversations and interactions with the people that I worked with to glean insight from their perspectives too. This method mostly offered context, texture, and some triangulation to my findings from surveys and interviews; and reflections on earlier interactions gave rise to ideas for questions to ask in informal contexts and in semi-structured interviews (Krauss, 2015).

Qualitative data is fundamental to understanding what is meaningful for people. It requires awareness and reflection on positions, power and politics held and used by researchers and respondents. Critical reflexivity, openness to people and learning, and a welcoming attitude to unexpected changes are crucial to generating the rich insights that qualitative methods can bring (Brockington & Sullivan, 2003: 72-73).

Ethical issues

In terms of presenting evidence and quotes to support my findings, I have preserved anonymity where respondents are villagers, referring to the source of quotes with a unique ID: e.g. SSI-U5 refers to semi-structured interview #5 in Uchindile. Where someone's position is relevant and gives important context to the quote, I have tried to give a generalised indication of that position e.g. 'company representative'. It should also be noted that this thesis is intended to be embargoed as research and debate around GRL's investments in Tanzania - and Uganda particularly - have been the subject of angry debate, official complaints to university ethics committees and possible legal proceedings[18]. I went through the ethics approval process for this research via the University of Sheffield Ethics Review Procedure and received ethics approval in June 2012. It is important to recognise that a university ethics approval process is not necessarily a determinant or guarantee of the ethics of a research project. While the ethics approval process may aim to safeguard research participants, and the researcher, it serves primarily to highlight risks, rather than guarantee their mitigation. In that respect, while working with an interpreter generates issues of its own, one of the many benefits of working with a Tanzanian to provide research assistance and interpretation is that they are able to advise on contextual and cultural issues, helping me to navigate social and institutional processes and interactions in a way that I would not have been able to without them.

Positionality & Privilege: Decolonising research into Tanzania

My research is inevitably steeped in 'white gaze'; it is irretrievably interconnected with my identity as a white British woman, and thus closely coupled with the prejudices with which I grew in, continue to live with and have often benefited from. Not least of these are the academic institutions within which this thesis has been facilitated and shaped. While I continue to try to unlearn these intersecting systems of oppression, this is an ongoing process of disentanglement, and as such they are still very much part of the way in which I move, interact with and understand the world, and to the way in which I communicate my perceptions and interpretations. It is important to acknowledge here the layers of privilege which have allowed this thesis to be written.

I think it worthwhile to take a moment to acknowledge some of the considerable privileges inherent in my identity and place in the world that have afforded me the opportunities to undertake and complete this research. It should also be noted that so much of this privilege has operated before I even got to the commencement of my PhD. An acute example of this is my securing a place on this PhD programme, particularly when I had no prior experience working in Tanzania. This in itself was - at least partly - a function of my privilege, and the access and power that it affords me.

I am a white cisgender thin able-bodied woman with postgraduate education. While my family has working-class roots and I attended comprehensive state schools, I have mostly occupied and operated within middle-class privileged spaces, particularly securing an Oxford education. My privileged position(s) has benefitted me throughout my life, not least in my educational experience. While sexuality is typically less outwardly visible than race and gender, it should also be acknowledged,

[18] See for example REDD-monitor (2014).

especially in the context of feelings of safety during fieldwork in Tanzania, where homosexuality is illegal and the oppression and persecution of LGBTQIA+ people in Tanzania has worsened in recent years (Human Rights Watch, 2020). It is also worth acknowledging that I typically do not face any prejudices for my religious beliefs.

My gender had complicated consequences. During fieldwork (as throughout my life) and there have been countless times when I have felt - and been - unsafe because of my gender. However there have also been times, especially on fieldwork, where my intersecting identity as a white woman allowed me access to people and spaces in a way that a white or non-white man may not have been able to. While my femininity sometimes led to me being ignored, dismissed or minimised, and meant I had to accommodate considerations of personal safety - particularly the risk of sexual violence - as a lone woman doing fieldwork in ways that my male colleagues did not, it also meant that I was often perceived as less of a threat, and given certain leeways. I think the intersection of whiteness and perceived femininity while undertaking fieldwork in Tanzania is interesting. I suspect my feelings of vulnerability as a woman was - rightly or wrongly - part of a mostly unconscious decision to work with men as research assistants. I felt somewhat protected by their Tanzanianness *and* their gender. Yet I also recognise that this is not the only way to feel safe. Working with Tanzanian women as research assistants would have provided me access to different forms of knowledge and different ways of interacting with the world and the people in it, and may have afforded me safety in different ways.

I am a woman, yet I have also been shaped by the patriarchy and have internalised sexism[19]. This was borne out in ways in which I would unconsciously turn to men in Tanzania as sources of authority (it should be recognised that this internalised sexism overlays the patriarchal structures that operate within Tanzanian society). Indeed, in writing up this thesis and listing the academics I spoke to for advice on possible study sites for my research, I was immediately struck by how almost all of these were men. Part of this will be due to the fact that there are fewer women in academic spaces - both globally and in Tanzania - but another part of this will be that I unconsciously turned to men for advice, and certainly didn't actively seek out women's perspectives in the processes shaping and surrounding the research and fieldwork development and set up[20].

I want to take a moment to demonstrate with a few real examples how I perceive these privileges to have benefitted me in my fieldwork experience. Firstly, my whiteness, education, passport and accent gave me connections to 'expat[21]' spaces in Tanzania, where I was more easily able to meet with people in positions of influence and power, or those who had connections with people who could help me chase up official applications, provide me with places to stay, and put me in touch with researchers working on similar topics. While achieving the temporary resident status and the research permit required for undertaking research in Tanzania was by no means a quick or easy process, it was

[19] Note that much of this discussion here is based on a binaried concept of gender, but I would like to acknowledge that I understand gender to be on a spectrum, with multiple valid forms of gender identities, including - but not limited to - those who identify as non-binary and/or trans (recognising that some define non-binary as falling under the trans umbrella while others do not), gender fluid, gender non-conforming and gender-queer.

[20] I did make an effort to create space to hear women's voices in the data collection process.

[21] It is worth noting that the term 'expat' is arguably problematic, as it is a term that only people with race, nationality and wealth privilege have access to. It often signifies a space dominated (and 'gatekept') by whiteness and is endemic with anti-blackness.

undoubtedly easier for me because of my whiteness and British passport than for many other PhD students. My British passport also afforded me relatively easy initial entry to the country, and I was able to exit and re-enter the country with ease. I suspect my whiteness granted me access to people and places that non-white colleagues may not have been gifted. At the same time, my nationality and race will have also created distance between myself and the communities I undertook research in and with. Not being a Tanzanian or East-African national meant that when it suited me, I could claim ignorance to understanding Swahili. This was often useful when my whiteness meant that I would sometimes be stopped more frequently in some contexts by police or other officials. My nationality and whiteness also meant (due to a combination of experiences over my lifetime and specifically during my time in Tanzania, feelings of security in and knowledge of how to access support from the British Embassy and the University) that I was less fearful of the police and immigration and other government officials than I might have otherwise been.

A brief discussion of the able-bodied thin privilege I hold is also relevant. I could not have easily done the fieldwork I did with certain physical disabilities - particularly ones relating to mobility. That is not to say that it would have been impossible, or that the alternative fieldwork would not have been equally valuable (or possibly more in terms of different insights that may have been gained), but it would have been likely more difficult, expensive and slower. My thinness meant that I was able to travel more easily in small aeroplane seats, on buses and on the back of motorbikes, which often meant that getting around was cheaper and quicker than if I had not been able to do so. Being able-bodied was of particular relevance in terms of the specific geographies of the villages I worked in: travelling to Ngombo, situated in a remote area in a floodplain, involved several stints of more than 45 minutes on the back of a moped, and crossing a river in a dug-out canoe. Speaking to research respondents in Ngombo and Merera involved long walks or cycles to their homes, as local residents - and particularly those who were part of more marginalised communities, such as members of (agro)pastoralist or fishing communities - lived far away from village centres and scattered across large areas. In Uchindile and Kitete, moving around the village centre as well as travelling to the homes of those living further afield involved steep, sometimes slippery, climbs; and for Kitete, just reaching the village centre and available accommodation meant a 15 minute steep descent on foot.

I also want to recognise that this acknowledgement and brief discussion of my privileges (particularly my white privilege) and its impacts could be to some extent an exercise in assuaging feelings of guilt[22] triggered by white fragility that typically arises from difficulty tolerating racial stress (DiAngelo, 2018), which can occur with a confrontation of white privilege. While there is likely an element of this operating, I also feel that acknowledging intersecting privileges and power, especially without defensiveness, is a critical and minimum first step to working to decolonise development research and to unlearn the oppressive biases and prejudices I have internalised and been shaped by throughout my life. It is to my shame that I did not start doing this earlier in my life, and particularly earlier in the PhD process, but I am thankful for the learning experiences over the last few years that have allowed me to grow in this respect.

All of this is not to say that I – or others who share some of the privileges and positionalities I hold – have nothing of value to say. We do. But when we speak, we need to be part of networks, creating

[22] See Iyer *et al*. (2003) for a discussion of the benefits and limits of self-focus and white guilt.

space for and amplifying the voices of those with lived experiences of what we talk about, as well as those whose perspectives and voices are not yet being heard, or even spoken. Research is, fundamentally, an exchange of ideas and a learning process, and the greater the diversity of people, perspectives and positionalities involved in this process, the more we stand to learn. The isolating process of writing up a PhD is often at odds with this, and I have struggled with a deep feeling of discomfort with the responsibility of communicating the narratives and perspectives of the people I spent time with during fieldwork and about whom this research is ultimately about. Navigating this, as well as the fieldwork experience itself, has been hard.

Mental health and fieldwork

The thesis I have produced, and the process of producing, can only be understood in the context of the mental health issues which arose before and during it. PhDs can frequently be stressful. There is some evidence around the broader experience of undertaking a PhD and mental health, with studies suggesting that PhD students experience high levels of depression and suicidal ideation. A 2015 University of California study found that 47% of PhD students exhibited signs of depression (UoC Graduate Assembly, 2015), and in 2005 the same university released a study which found 10% of their graduate students had experienced suicidal thoughts (referenced in Jaschik, 2015).

Mental health issues can be particularly prominent during fieldwork, particularly long periods of fieldwork which can be rather isolating. Yet it is surprising how little mental health is mentioned in academic writing on about fieldwork. Some authors have discussed it. Pollard (2009) provides an excellent and sensitive discussion of the personal experiences of 16 PhD students who undertook ethnographic fieldwork. While the accounts shared are vulnerable and deeply personal, the paper demonstrates an extent of commonality of experiences that the author argues creates opportunity, and underlines the need, for further exploration of the issue. Fitzpatrick (2018) talks about their experience of depression during archaeological fieldwork, trying to open up conversations which have predominantly focussed on issues of physical safety during excavation digs. Sultan (2019) offers a beautiful and creative reflection on her personal experiences of mental health issues on ethnographic fieldwork through fieldnote excerpts, poetry, and conversations with two other women and anthropology academics.

Both Pollard (2009) and Sultan (2019) give insights from the field of anthropology. Tucker and Horton (2018) focus on the field of geography. The authors examine the mental health, wellbeing and fieldwork experiences of 39 UK academic staff who self-identify as disabled with a mental health condition, working in the fields of Geography, Earth and Environmental Sciences (GEES)[23]. They argue that critiques of ableism in fieldwork within GEES is focussed on "physical aspects of accessibility" (ibid: 2) and neglects non-physical aspects and mental health considerations. They explore narratives of fieldwork as 'an ordeal' and something to be coped with, alongside considering the implications of a workplace culture of "the show must go on" (ibid: 5). The authors begin to ask how we can move away from the idea that fieldwork *should* be hard, and towards thinking about how fieldwork *could* be different.

[23] The paper focuses on academic staff and their experiences running undergraduate fieldwork.

Valeix (2016) explores the need for more mental health support for those undertaking fieldwork as part of the PhD process, asking 'how can we institutionalise more organised and systematic support for PhD students?'. While improving provision of and access to support for mental health issues is critical, particularly in the context of fieldwork, I find the framing of 'mental health as an important research skill' problematic. While there are certainly strategies and coping mechanisms that could be taught, reducing mental health to a taught research skill minimises the complex nature, causes and consequences of mental illness and its relationship with trauma, genetics, medication, and intersecting experiences of oppression. This is particularly the case when PhD students may have experienced long-term mental health conditions[24] that pre-exist and were compounded by fieldwork. More needs to be done here to recognise that some mental health issues can also often be a symptom of - or even a way of coping with – other traumas (Schnurr and Green, 2004).

What is common across the discussions that do exist in the literature is an identification of the need for – and calls for – more frank conversations about mental health and fieldwork. So much of the experience of fieldwork is often sanitised, 'tidied up' or suppressed in conversation (Sultan, 2019). Methodological discussions (both in write-ups and in preparative support for fieldwork) are focussed on the intellectual and practical elements of fieldwork and neglect the emotional and mental aspects. Genuine, kind and empathic conversations taking place in both formal and informal contexts, and flexible confidential structures of support in universities could reduce the stigma and shame associated with experiencing and talking about mental health issues. While this speaks to a larger need to address the ableism endemic in academia, it would also require a willingness from academics – and academic institutions – to be more vulnerable and open and real in conversations about fieldwork and mental health.

I began this project having already experienced depression and anxiety. Fieldwork compounded these conditions. During fieldwork I oscillated between heightened states of anxiety and extended periods of heavy depression that I struggled to continue under. The binary distinction between mental and physical health is also somewhat arbitrary: mental health issues, on which fieldwork inevitably impacts, often has very physical symptoms. They can affect quality of and ability to sleep; can cause eating issues; affect energy and memory, the latter of which has significant implications for research.

Notwithstanding the facts above which mean that even being able to undertake fieldwork is a privilege, it is also hard. Separation from family and friends, feelings of isolation, pressure, fear, guilt and shame, financial burdens, and a cultural shock of living in an entirely different context, are just some of the feelings and challenges that typically arise (Pollard, 2009; Valeix, 2016). Living within parts of the communities I was doing research on and with was also challenging. I never felt like I was able to switch off. My depression and anxiety worsened. The pressure and guilt of the inherently extractive nature of a PhD, coupled with my incessant asking questions of everyone around me, meant that I felt

[24] This is beyond the scope of the thesis, but note that a discussion and disentanglement of the different terms used around what I have referred to as mental health would be eminently helpful and could perhaps unpick some of these issues. The term 'mental health' in the limited studies summarised in this discussion, refers to a diverse range of mental health issues. A clearer understanding of the terms 'mental health', 'mental illness', 'psychiatric disorders' and how these overlay and intersect with wider definitions of disability, health and illness, along with a discussion of the rather arbitrary distinction between the mental and the physical and the differing attitudes towards the two, would be insightful.

under extreme pressure to be friendly and happy and accommodating all of the time. And I wanted to be - the people I met were by and large incredibly kind and hospitable to me, and I felt a great desire to please them and entertain them. But I also wanted to hide away. I was not able to perform the persona I wanted to all of the time. I was exhausted, sleeping for long hours but never feeling rested.

Once my fieldwork had finished, I still couldn't relax. My anxiety got worse. Events took control. Eventually I suspended my studies in order to attend to my health for a period of, effectively, four years. This, therefore, is a disrupted thesis.

Conclusion

The thesis I have ended up writing is radically different from that which I originally set out to do. Some of these changes I would end up being supremely glad to see. One such change was the 'softening' of my research methods: in particular dropping the agent-based modelling element; relaxing my desire to cling to numbers and statistics; and learning that data are so much more than numbers and models. Having the length of time built into the fieldwork periods, along with the privilege of staying within the study sites, meant there was time and space for less structured - and more human - conversations with local residents and those that I had developed relationships with, many of which provided valuable insights, texture and context that I would not have otherwise gleaned. Another was the associated opening up of space for the different issues, phenomena, priorities and experiences important to people living in the study sites to emerge and shape the research. The 2009 fire and 2012 evictions, and their centrality to the themes of this thesis, are examples of this. Another change I am grateful for is the fundamental shift in my perspective on PES and other Green Economy strategies as triple-wins. Gaining a greater understanding of the messy yet beautiful complexity and nuance that defines research with humans has been transformative.

Still, some of these changes have been harder. I have struggled with the representation of Tanzanian views from my position as a white foreign researcher. The privilege and power inherent within many of my identities as described earlier are significant and are enmeshed within my interpretations of the data and will ultimately have shaped my findings.

Another difficult change has been in the timeline and content of the PhD post-fieldwork. For the reasons I've described above I had to take a significant period of time was taken away from the thesis. Returning to the PhD part-time, while working has been practically, financially, and mentally necessary and an opportunity I am grateful for. It has also been challenging. This combination of circumstances and changes led to the difficult decision not to write up data and findings from the lowlands villages and the experience of the 2012 evictions.

I did not and could not have foreseen how this research would be shaped by the internal and external circumstances described above, and the form it would ultimately take. I began this chapter with an epitaph quoting Douglas Adams on deadlines, because deadlines, often for reasons beyond my control, have been a defining experience of my thesis. For the sake of symmetry, I'd like to paraphrase another of his statements to end this chapter: *'I may not have gone where I have intended to go, but I think I have ended up [on my way to] where I needed to be'*. I hope that I – and this thesis - can eventually reach that place.

4. Study Sites

Introduction

This chapter sets the scene for the subsequent chapters and findings. First, I describe broader Tanzanian strategies, specifically the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) policy and situate GRL's presence and activities within this. Next, I describe the Morogoro region and the Kilombero district to situate the study sites within their wider geographic context as well as Mufindi district of Iringa which are functionally close to my main study sites. I use agricultural census survey data from 2007/2008 to construct a broad-brush picture of the economy and society of this part of Tanzania, and then compare this to the villages of Uchindile and Kitete using descriptive statistics from household surveys undertaken during fieldwork. Finally, I describe the history of the company GRL's presence in the area, including the acquisition of land for tree plantations.

SAGCOT and the policy context in Tanzania

Tanzania is a REDD+ pilot country that has payments for watershed services (PWS), a form of payments for ecosystem services (PES), embedded in national water policy, refers to incentive mechanisms in the Environmental Management Act (2009), and considers the sale of carbon credits to increase revenues in the National Forest Program (2001) (Lopa et al., 2012; Katoomba, 2007). The fact that policies or concepts related to PES are talked about in national policy is important because it demonstrates the political and legislative understanding of the potential contribution of PES to Tanzanian economic and environmental activity. This is relevant to the thesis because as described above, GRL's investment in Kitete and Uchindile involves the generation and sale of carbon credits through the VCS programme - offering payments for carbon sequestration, an ecosystem service.

GRL's considerable investment in Tanzania and its powerful presence in these villages has to be understood within a broader policy context that has sought to encourage foreign investment, and in particular sought to encourage green investment. It is helpful to review the main elements of these policies in order better to appreciate the potential implications of GRL's investment, for similar investments and for the rest of the country. Table 4.6 below summarises some of the key policies in Tanzania, giving some wider policy context within which this research - and the data and narratives that will be presented and discussed in the subsequent chapters - sits. I then discuss one particularly relevant policy in more detail: the Southern Agricultural Growth Corridor of Tanzania.

	Policy	**Date**	**Overview**
Agricultural Development	Vision 2025	1999	Long-term multi-sector vision for development in Tanzania
	CAADP: Comprehensive Africa Agriculture	2003 [25]	Pan-Africa initiative to invest in African agriculture to boost economic growth and reduce poverty. (Cooksey, 2013)

[25] Date of endorsement by African Union heads of state; phase 1 planned for 2006-2013

	Development Programme		
	ASDP: Agricultural Sector Development Programme	2006	Tanzanian policy to "increase agricultural productivity and profitability, generate employment in rural areas and ensure household and national food security" (Hella et al., 2013). Aims to: improve farmers' access to and uptake of agricultural knowledge and technology; and increase private sector investment in agriculture. (Cooksey, 2012)
	Kilimo Kwanza	2009	National effort to transform agriculture through private investment. Led by Tanzania National Business Council (TNBC).
	SAGCOT: Southern Agricultural Growth Corridor of Tanzania	2010	Strategy to 2030 to engage the private sector in agricultural development
	TAFSIP: Tanzania Agriculture and Food Security Investment Plan	2011	Policy to enhance national and household food and nutrition security 2011-2021. Enshrines CAADP. Expands/extends ASDP. (WHO, 2012)
Forestry	NFP: National Forest Policy	1998	Aims to "enhance the contribution of the forest sector to the sustainable development of Tanzania and the conservation and management of her natural resources for the benefit of present and future generations" (URT, 1998: 14)
	FA: Forest Act	2002	"Provides for the conservation and management of forest resources in Tanzania and regulates the trade of forest produce" (Ecolex, 2020)
	Both the NFP and the FA "strengthened [the] role of the private sector and carbon-based forestry initiatives in management of forests" (SAGCOT, 2013: 30)		
Land	LA: Land Act	1999	These Acts regulate Tanzania land tenure. The VLA specifically sets out the law surrounding the management and control of village land. Note that a critical discrepancy between the two acts is how they define General Land (Boudreaux, 2012): Section 2 of the Land Act stipulates that General Land is "all public land which is not
	VLA: Village Land Act	1999	

			reserved land or village land [and] includes unoccupied or unused village land" (URT, 1999a: 24-25[26]); Section 2 of the VLA defines General Land as "all public land which is not reserved land or village land" (URT, 1999b: p14).

Table 4.1: Overview of relevant policy landscape. Sources: adapted from Cooksey 2012, 2013; Boudreaux 2012; Sulle 2015, 2017; URT 1998, 1999a, 1999b.

SAGCOT is a public-private initiative established in 2010 and due to run until 2030. It aims to "boost agricultural productivity, improve food security, reduce poverty and ensure environmental sustainability through the commercialisation of smallholder agriculture ... by catalyzing private sector-led agricultural development within an ever improving business environment" (SAGCOT, 2017a). It targets a large corridor within the southern part of Tanzania, with both Iringa and Morogoro regions, and Mufindi and Kilombero districts specifically, being key areas of focus for SAGCOT. SAGCOT refers to these key geographic areas of focus as clusters: "geographic concentrations of interconnected companies, specialized suppliers, service providers and associated institutions" (SAGCOT, 2017b). The initiative identified six clusters for the initiative: the Ihemu cluster covers the Iringa and Njombe regions and includes the Mufundi district; and there is also the Kilombero cluster in Morogoro[27]. This policy exemplifies the concerted policy effort to encourage private investment and large-scale acquisition of land rights in Tanzania as a whole, and specifically regions such as Morogoro and Iringa. These large-scale land acquisitions by private investors in Tanzania, while championed through government policy and government-backed initiatives, including SAGCOT, are not without strong critiques: "since the large-scale land acquisitions have displaced and continue to displace most of the rural poor in different parts of Africa, this form of investment remains contested" (Sulle, 2017: 6).

When I was undertaking my research SAGCOT was envisaged as a critical instrument for the implementation of Kilimo Kwanza ('Agriculture First'), and has been branded 'Kilimo Kwanza in Action' (Sulle, 2017). Kilimo Kwanza is a Government of Tanzania (GoT) policy launched in 2009 which declared a national focus on the transformation of agriculture in Tanzania, and established agriculture[28] as a priority across all government ministries (TNBC, 2009). It has also been used as something of a catchphrase by the private sector in Tanzania in order to galvanise investors and enhance productivity in agriculture in order to transform the sector and consequently the country's economy (Sulle, 2017).

In 2011, SAGCOT partners developed a framework for agricultural green growth within SAGCOT, publishing their 'SAGCOT Greenprint' in 2013. The authors describe the framework as "defining the key elements and parameters of a strategy for coordinating investment and development in

[26] Note that I was unable to find page 25 of the URT Land Act online which contains half of the relevant definition of General Land - so I am here relying on multiple secondary sources that quote this definition.
[27] Note that according to the SAGCOT website (which looks to have been last updated in 2017), it is only the Ihemi and Mbarali clusters that have been formally established so far, with Kilombero in the remaining four clusters to be rolled out in a phased approach.
[28] Within the context of Kilimo Kwanza, agriculture includes crops, livestock and forestry, as well as bee-keeping and fisheries (Ngaiza, 2012: 4).

agricultural production, processing, and distribution that is efficient, profitable, sustainable and resilient to climate change, while protecting key natural resources and providing social benefits broadly to the population" (SAGCOT, 2013: 4). The Greenprint argues that "a central premise of Green Growth [is] that forests, water and other critical resources are 'investable assets' that are the focus of private sector investment" (SAGCOT, 2013: 30).

The Greenprint sets out various investment strategies, relating to private small-scale tree nurseries, sequestering carbon through plantations, providing training for local communities on small-scale tree plantations and management, and encouraging collaboration between small-scale foresters and forest product companies in an environmentally and socially responsible way. It argues that "there is considerable opportunity for investment, particularly for operations to work with small-scale forestsers, and to develop processing facilities" (SAGCOT 2013: 31).

SAGCOT, and its Greenprint framework, is relevant to the subject of this thesis for several reasons. Firstly, it is a key contemporary strategy focusing on land-based private sector investment in Southern Tanzania, and features in discussions of private investment and land alienation in the area (cf. Bluwstein et al., 2018; Cooksey, 2013; Sulle, 2015; Sulle, 2017; Smalley *et al.,* 2014; Maganga *et al*. 2016). SAGCOT exemplifies the lively discussion around land tenure as introduced earlier, particularly in relation to concerns around the recategorization of village land into general land. This recategorization is a stated objective of SAGCOT (Bluwstein et al., 2018), and it was "confirmed that the government's target is to transfer 17.9% of village land into the general land category, raising the overall percentage of general land to approximately 20% (from the current 2%) to facilitate commercial development in SAGCOT." (Boudreaux, 2012: 3).

Secondly the 'Greenprint' for SAGCOT looks to integrate agricultural productivity with sustainability, climate change mitigation, and the protection and restoration of natural resources. It posits that "private investment is...essential for improving the management if the two-thirds of the Corridor that is not designated as a conservation management area" (SAGCOT, 2013: 30). It is therefore a policy which is shaping the intersection of climate change, sustainability and economic growth and development through private investment spaces.

Thirdly, the SAGCOT Greenprint specifically references GRL: it refers to Sao Hill Industries / Sao Hill Mill which is an industrial subsidiary of Green Resources AS (of which GRL is a plantation subsidiary), and to GRL itself in its discussion of opportunities for "sustainable commercial and community forests" (SAGCOT, 2013: 30):

> *"Small-scale foresters would value collaboration with socially and environmentally responsible forest product companies to improve commercial quality and business management. Sao Hill Industries in southern Tanzania is an example of [a] company with forest plantations and a processing facility striving to align with sustainable operating practices. A subsidiary of the forest product and carbon offset company Green Resources Ltd., Sao Hill mill is also utilizing co-generation (see section on biomass energy) to power its facility and is exploring methods (including short rotation community forestry) to sequester more carbon on their lands". (SAGCOT, 2013: 31).*

GRL's investments are therefore precisely the type of private investments SAGCOT (and its Greenprint) envisaged. An examination of the impacts and implications of one such investment - UFP - on the surrounding landscape and communities, can therefore generate relevant insights for the future direction of green investment strategies such as SAGCOT.

Finally, SAGCOT has been portrayed by its proponents across government, donors and investors as "a model for the green economy in Africa combining investments in large-scale farming with environmental conservation…[and the implementation of such green economy strategies] are currently rearranging space in significant ways" in Tanzania (Bergius et al., 2020). Even if the political will behind SAGCOT is currently weakening, it is still potentially emblematic as the sort of model that could promote private investment towards a 'green economy'.

Regional and District settings

The highland villages I worked in were part of Kilombero District. Kitete and Uchindile - the two villages focused on for this thesis - were in the Uchindile ward of the Kilombero district of Morogoro. Figure 4.1 below shows the different wards in the Kilombero district.

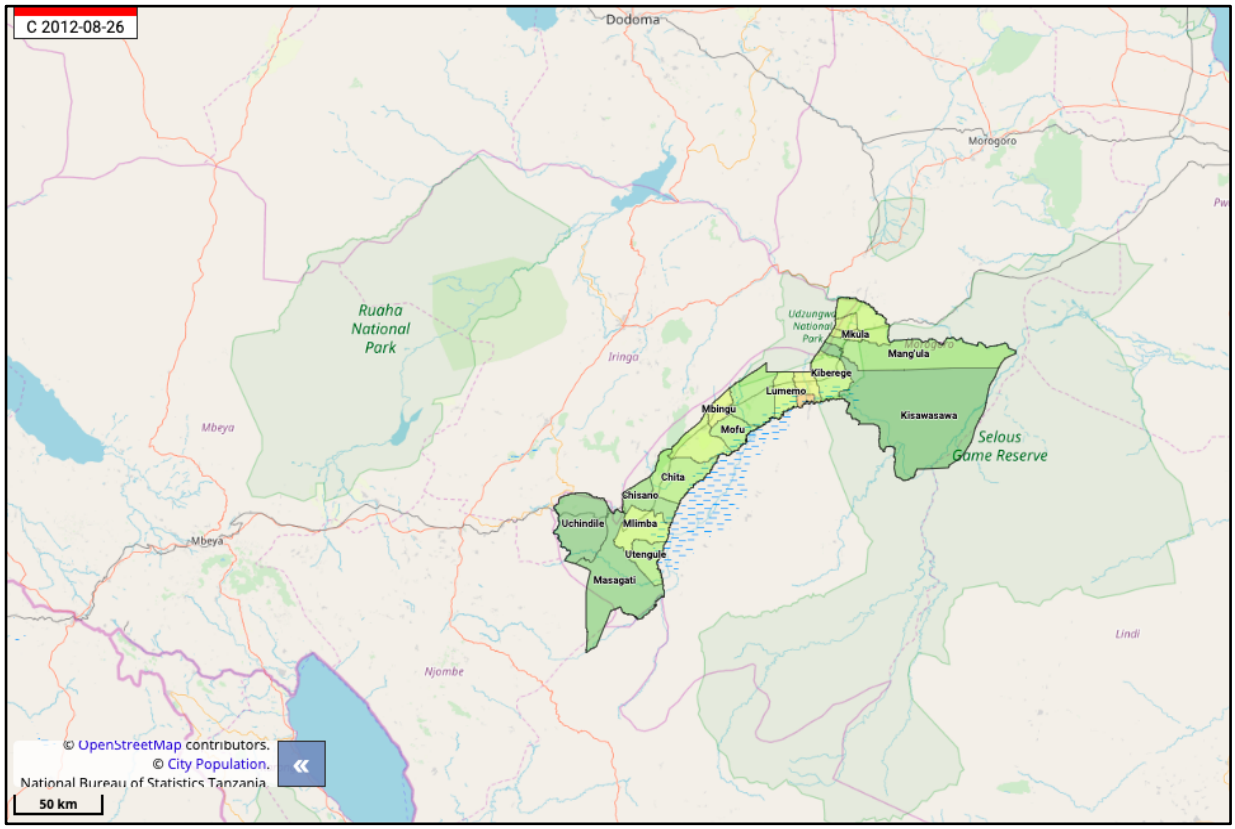


Figure 4.1 - Wards in the Kilombero district of Morogoro, Tanzania. Darker green shows a lower population density. Source: (Brinkhoff, 2020: CC BY 3.0)

Uchindile and Kitete are on the border of the Kilombero district in Morogoro, and the Mufindi district (Iringa region). While they are administratively and geographically based within the Kilombero district, they have very strong connections to, and are influenced by, the wider Iringa region. In fact they are closer, geographically and ecologically to Iringa District. In terms of infrastructure, roads are limited in

the area but have been developed slightly by GRL - these roads are connected more to the Iringa region. And there are important differences in terms of agriculture between these villages and much of the rest of Morogoro. A key aspect here is whether annual crop production is practiced in one or two seasons per year. This is dependent on the rainfall pattern: Morogoro areas are planted with annual crops during both the long (*masika*) and short (*vuli*) rains; for Iringa it is only the long rains when annual crops are planted. The long rains happen in regions all across the country, however the short rains are limited to certain areas. Iringa is not described as being a region that utilises the short rains for annual crop production. The agricultural census explains that '[I]n some regions such as Morogoro, the area planted with annual crops both during *Vuli* and *Masika* was comparable'. (URT, 2012a: 31). During the short rains for the years 2007-08, Morogoro planted 236,848 ha (43% of its total planted area), compared to just 0.2% (1,116 ha) in Iringa. (URT, 2012a). In describing the study site therefore I will describe characteristics of both regions, in order better to situate my study site within the national context.

Morogoro

The Morogoro region in South Central Tanzania lies between the central highlands and the coastal lowlands (Paavola, 2004; Devisscher, 2010). After Arusha and Tabora, it is the third largest region in the country, occupying a total of 72,939 square kilometres, which represents just over 8% of the Tanzanian mainland (URT, 2002). It is bordered by Manyara and Tanga to the north; Pwani and Lindi to the east, Ruvuma and Njombe[29] to the south, and Iringa and Dodoma to the west. There are several prominent features across the region: the Uluguru and Rubeho mountains, which constitute the southern part of the Eastern Arc mountain range, classed as a biodiversity hotspot (Burgess et al., 2002); the watersheds of the Great Ruaha and Rufiji rivers; two national parks (Mikumi and Udzungwa); and part of the Selous Game Reserve (Paavola, 2004). Despite a relatively low population density (31 persons per square kilometre (URT, 2013a)), there is significant pressure exerted on land due to a high proportion of protected areas in contrast to the low proportion of arable land (Paavola, 2004).

Morogoro has a large variation of altitudes, temperature and rainfall across the region. It has an average temperature of 24°C (from a low of 18°C in mountainous areas and a high of 30°C in lowland areas); and rainfall varies from 500mm in lowland areas to 2,200mm in mountainous areas. (URT, 2007)[30]. According to the 2012 Census, the average household size in the Morogoro region was 4.4, falling from 4.6 in 2002 (URT, 2013a): Morogoro had a total population of 2,218,492 people and 506,289 households. The agricultural census data collected in 2007-08 identified a total of 298,421 agricultural households, with 85% of these households naming crop production as their major agricultural activity (URT, 2012a). Tree planting was practiced to a very limited extent, with just 2,581 ha used for this purpose by smallholders in the region (0.4% of the land available to smallholders) (URT, 2012a).

The Morogoro region is comprised of 7 districts: Kilosa, Morogoro (rural), Kilombero, Ulanga, Morogoro (urban), Mvomero, and Gairo. Kilombero district had a total population of 407,880 in 2012,

[29] The Njombe region was created in March 2012, from an area that was previously part of the Iringa region.
[30] This data is taken from the earlier agricultural census for 2002-03 published in 2007 rather than 2012 because the relevant section (1) of the 2012 Morogoro report contains data about the Dar es Salaam region rather than the Morogoro region.

with an average household size of 4.3 and a sex ratio of 99 males per 100 females (URT, 2013a). Kilombero, with its large areas of irrigable land suitable for rice cultivation, is something of a rice basket. Out of 84,682 total households, Kilombero had 58,515 agricultural households (URT, 2007). The total usable land area for the district was 154,516 ha, of which 70% was planted in the census year. This gave the district an average usable land area as 2.7 ha/hh, with 1.9ha/hh actually planted (URT, 2012a). 87.2% of households named crop production as their main activity; and the remaining 12.8% described their main activity as mixed crop and livestock production. Cereals were the main crop type for the district, and crops were mostly planted during the long rainy season. Kilombero had the highest yields in the region for maize (1.45 tonnes/ha), paddy (1.94 t/ha), cassava (3.8t/ha), and sweet potatoes (4.1t/ha). Around 24% of households reported participating in selling crops. Just 907 ha of land available to smallholders was used for tree planting in Kilombero, with 722 households practicing tree planting (URT, 2012a).

The two villages I worked in are located in the Uchindile ward, described as having a total population of 2,271, making it the smallest ward in terms of population in the Kilombero district. The ward had an average household size of 3.9, and a sex ratio of 108 males per 100 females (URT, 2013a).

Iringa[31]

The Iringa region is in South Central Tanzania and together with the Mbeya and Njombe regions, forms the Southern Highlands of Tanzania. Iringa is one of the smaller regions in the country (13th largest), occupying a total of 35,743 square kilometres (of which 92.4% - 33,038.8 km^2 - is land), which represents just over 4% of the Tanzanian mainland (URT, 2013c). It is bordered by Dodoma and Singida to the north; Morogoro to the east, Njombe to the south, and Mbeya to the west. Iringa has a relatively low population density (27 persons per square kilometre) (URT, 2013a).

The region is home to the Ruaha National Park, with the Udzungwa Mountains running down its east border, separating the region from Morogoro. Altitudes, temperature and rainfall vary across the region and form three relatively distinct climatic zones: the Lowlands zone, Midlands zone, and the Highlands zone. Overall, Iringa's temperature ranges from 10°C in May/June to 25°C in October; and rainfall varies from 500mm to 1600mm with high variation across seasons, geography and altitudes. The rainy season runs from November to May, with the dry season typically lasting from June to September (URT, 2013c).

The major economic activities in Iringa fall within the agricultural sector, with small-scale farming the primary activity, although commercial farming is also practiced. Agriculture makes up around 85% of the Iringa's GDP, with most of the region's cash income coming from tea, beans, maize, groundnuts, potatoes, paddy and sunflower. The next most significant sector for the region's economy is trade and repairs (7.1% GDP) and livestock keeping (around 4.5% of GDP) (URT, 2013c). Iringa is one of the regions in Tanzania that generate the highest volume and value of forest products, with timber being

[31] In March 2012, the Njombe region was established as an independent region. Previously Njombe had been part of the Iringa region, and because of this, statistics from data collected pre-2012 refer to the larger Iringa region, whereas data from 2012-onwards are relevant to the smaller Iringa region. Fieldwork for this research was undertaken in 2012-2013, after the point at which the independent Njombe region had been established. The 2012 population and housing census, and the Iringa region socio-economic profile (2013) both use data from after the independent regions were established.

a key output, although note that official economic reports lack reliable data around forest production and production values due to laws prohibiting felling trees from natural forests, and therefore the data is likely to underestimate the total production, including illegal production (URT, 2013c). The government's socio-economic regional profile describes "the people of Iringa region have developed a habit of planting trees whereby various groups have been involved in raising and planting trees" (URT, 2013c: 104). Others also reference timber business - along with crop cultivation - as being one of the main economic activities in the region, commenting on the "precipitous increase in tree planting activities in the Southern Highlands involving pine and eucalyptus species" (DISS 2019: 6). 71,831 ha of land available to smallholders in Iringa is used for tree planting, with 62,027 households participating in tree planting (URT, 2012b).

According to the 2012 Census, the average household size in the Iringa region is 4.2, falling from 4.3 in 2002 (URT, 2013a): Iringa had a total population of 941,238 with 223,028 households. The sex ratio of Iringa was 92 males per 100 females. The agricultural census data collected in 2007-08 identified a total of 306,629 agricultural households in Iringa[32], with 71% of these households naming crop production only as their major agricultural activity, and the remaining 29% involved in crop production and livestock keeping (URT, 2013a). The main crops grown in Iringa were maize (246,908 ha planted, with a yield of 384,273 tons or 1.56t/ha), accounting for 90% of cereal production in the region; and beans (56,116 ha planted, with a yield of 37,518 tonnes or 0.67 t/ha), accounting for 78.9% of total regional pulse production[33] (URT, 2013a).

In 2013, there were 3 (administrative) districts in Iringa region: Iringa, Mufindi, and Kilolo. These are managed by 4 district councils - Iringa District Council, Iringa Municipal, Mufindi, and Kilolo. The district within Iringa that borders the villages studied for this thesis is Mufundi, which covers 7,123 km2 (6,177 km^2 land), accounting for 20% of the region's total surface area. In 2013, Mufindi district had a total population of 317,731; with an average village population of 2,542. Average household size in the district is 4.2; for agricultural households this is estimated to be 4.8-5 members per household[34]. There were a total of 64,248 rural households involved in agriculture, representing 99.3% of total rural households, or 89% of total households in the district (rural and urban). 73% of agricultural households in Mufindi were involved in crop production only; with the remaining 27% being involved in both crop production and livestock holding. 63,930 households in the district grew maize, planting 52,609 ha, or 0.82ha/hh; while only 318 households planted a total of 467 ha of paddy (1.47ha/hh). 38,644 households in Mufindi planted beans across 12,200 ha, generating a total of 8,339 tonnes of beans with an average yield of 0.68 t/ha. Around 67% of households reported participating in selling crops (URT, 2012b). Mufindi also had the highest sales of timber products in the region, with

[32] 2007-08 data so refers to Iringa region before establishment of Njombe region.
[33] Note that the figures for crop production in the 2007-08 agricultural census were at times inconsistent - with different parts of the report suggesting different values for hectares planted for a certain crop, and the volumes produced. The figures used here are my best guess as to which are the most accurate, but should be treated with caution. E.g. the area in the region planted with maize was given as 246,908 ha and also 296,112 ha, in relatively close succession. It is very possible that there is good reason for the discrepancy in these figures, but I was not able to surmise the reason why from the information available in the report.
[34] In the narrative district profile, the average (agricultural) household size is given as 5, however calculations based on the figures given for number of household members for the district's agricultural households generates a figure of 4.84 members per household.

78,376 m^3 of timber sold in 2012, at an estimated value of 27,431,600,000 TSH[35] (URT, 2013c). 14,154 households in Mufindi were involved in tree planting activities on their land (URT, 2012b).

Table 4.1 below summarises the key characteristics described above for Morogoro, Kilombero, Iringa and Mufindi, as well as providing details for Tanzania more broadly and Uchindile ward more specifically, where available.

Characteristic	**Tanzania**	**Morogoro**	**Kilombero**	**Iringa**	**Mufindi**	**Uchindile (ward)**	**Data year**
Population	43.27m 44.93m [2012]	- 2,218,492 [2012]	- 407,880 [2012]	1,679,828 941,238 [2012]	- 265,829 [2012]	- 2,271 [2012]	2007-08 [2012]
Population density	47.2	31	30.11	26.51	35.38	2.293/km2	2012
Sex ratio [#m/100f] [2012 pop census]	-	97m/100f	99m / 100f	92m/ 100f	90m/100f	108m/100f	2012
# Households (rural & urban)	9.36m [2012 pop census]	442,791	84,682	390,665	72,761	583	2007-08
Ave HH size (all hhs)	4.8	4.4	4.3	4.2	4.2	3.9	2012
# rural HHs	-	303,737	60,069	309,416	64,725	-	2007-08
# rural HHs involved in agri	5.84m	298,421	58,515	306,629	64,248	-	2007-08
% rural HHs involved in agri	-	98.2%	97.4%	99.1%	99.3%	-	2007-08
Sex of HHH (rural agri)	M = 80% F = 20%	M = 80% F = 20%	M = 86% F = 14%[36]	M = 70% F = 30%	M = 72% F = 28%	- -	2007-08
Average HH size (rural agri)	5.3	4.4	4.3	4.4	4.8-5	-	2012

[35] Based on a value of 350,000TSH/m^3

[36] Had to infer these from table 3.7 p123 as no individual pivot table for this data in this regional report

Usable land area (ha)	**14,642,284 ha**	655,471 ha	154,516 ha	745,315 ha	-	-	2007-08
Ave usable land per hh	-	2.2 ha/hh	2.7 ha/hh	-	1.4ha/hh	-	2007-08
Actual planted area	6,121,360 ha	547,212 ha	108,112 ha	551,403 ha	117,666 ha	-	2007-08
Planted area per hh	2 ha/hh	1.6ha/hh	1.9 ha/hh	1.13ha/hh	1.1 ha/hh	-	2007-08
Utilisation of land area (% of available utilised)	-	86.5%	84.8%	74%	76.6%	-	2007-08
Ave temp/range	-	24°C 18-30°C	-	<15°C most of year; up to 25% in midlands.	-	-	2002-03 Morogoro; 2013 Iringa
Rainfall range	-	Bimodal rainfall 500-2,200mm	-	Unimodal rainfall 500-1,600mm	-	-	2002-03 Morogoro; 2013 Iringa
Land area of planted trees	-	2,581 ha	907 ha	71,631 ha (highest region)	-	-	2007-08
#HHs planting trees	-	3,932	722	62,027	14,154	-	2007-08

Table 4.2: key regional and district characteristics for study sites context, including data source year. Sources: URT, 2012a; URT, 2013a; URT, 2013c; URT, 2002

Uchindile and Kitete

As set out in chapter 3, Uchindile and Kitete were two villages chosen as study sites for this research. I now provide a brief description of these villages and their geography. I develop a picture of different households in the villages, and compare these to typical agricultural households in the region, constructed from Tanzanian agricultural census data.

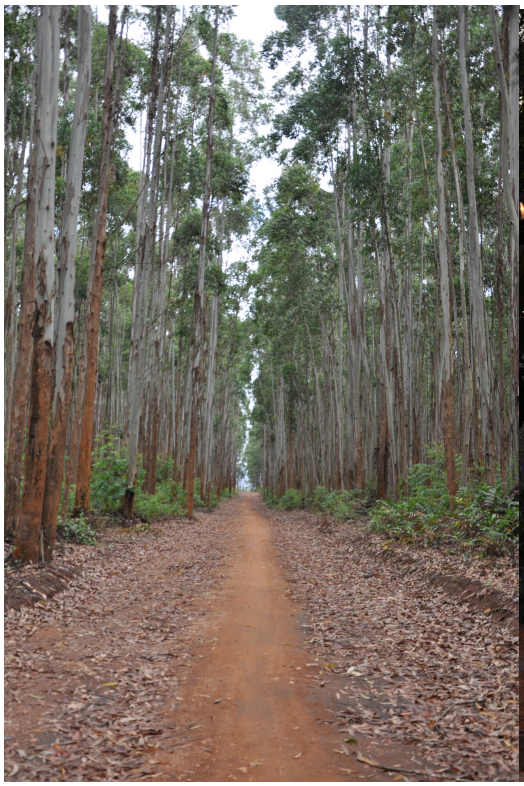
Uchindile and Kitete are small rural villages situated along the TAZARA railway line in Southern Tanzania, right on the border of the Kilombero district, Morogoro and the Mufundi district of Iringa. As described above, while they are located in the Kilombero district, they share many similar characteristics with the wider Mufindi district of Iringa.

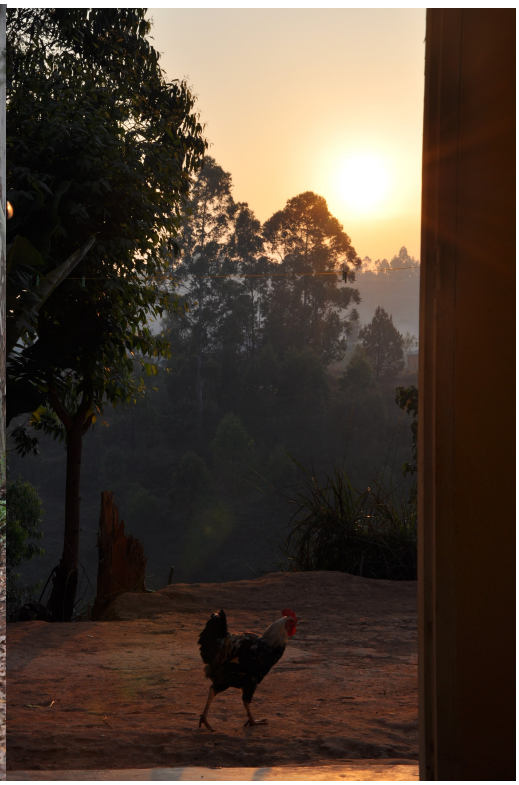
The following is a highly subjective description of my impression of Uchindile and Kitete - based on memories, photos and fieldnotes from my PhD fieldwork experience. Note that as discussed in chapter 3, this account is of necessity steeped in 'white gaze'; it is irretrievably interconnected with my identity as a white British woman, and thus closely coupled with the prejudices with which I grew in, continue to live with and have often benefitted from. Not least of these are the academic institutions within which this thesis has been facilitated and shaped. While I continue to try to unlearn these intersecting systems of oppression, this is an ongoing process of disentanglement, and as such they are still very much part of the way in which I move, interact with and understand the world, and to the way in which I communicate my perceptions and interpretations. I hope that this description provides an impression of how Kitete and Uchindile appeared to me, giving the reader a flavour of both life (as I see it) in the study sites, and a sense of the way I perceive the world.

To reach Uchindile, I drove west along the highway from Dar es Salaam, past Morogoro and through Mukumi national park, crossing the edge of the Udzungwa mountain range on steep curving roads with sharp drops to the side, until reaching Iringa. From Iringa, I then took the road south towards Njombe, turning off the main road at Mafinga, travelling through or around the Sao Hill Forest Reserve, before reaching Mufindi. The views are beautiful. The road is typically well tarmacked from Iringa southwards with the exception of around 80km of gravel road covering, before eventually tapering off into a mud road somewhere around the Sao Hill Forest Reserve. This becomes challenging for a smaller vehicle when there is rain, with deep grooves cut into the mud by the industrial trucks (usually carrying cut trees or timber). The route to become impassable at times during the rainy seasons.

Picture 4.1: a view of the journey between Mufindi and Uchindile

From Mufindi I continued on smaller roads southeasterly crossing the regional border back into Morogoro immediately before driving through GRL's Uchindile Forest Plantation (UFP) and then along some steeper roads which eventually arrived into Uchindile village.





Picture 4.2: a road through part of UFP Picture 4.3: a morning view in Uchindile

Uchindile is the larger and more urban village of the two - although it is very much still a small rural Tanzanian village. Residents are more densely populated around the center of the village, which I understood to be a stretch of road running from the new teachers quarters (in which I was fortunate enough to rent rooms for myself and my research assistant for the duration of our stay), past water pumps, a primary school, a health dispensary, several small shops, multiple homes, down to the railway tracks, with the Uchindile train station building and several buildings originally constructed as accommodation for railway employees. The landscape is steep and undulating, with many valley bottoms being used for small areas of farming, particularly vegetables and fruits.

Picture 4.4: view of the teachers quarters in Uchindile

Picture 4.5: buildings around the railway track

Travelling by car between Uchindile and Kitete was slow despite their relative proximity (around 10 km as the crow flies). It involved a bumpy drive along a narrow and muddy road carved onto the edge of the steep sloping hills, with a sheer drop to the other side. The road stops a little before Kitete village proper, requiring a steep walk down to the village centre, along the railway line.

Picture 4.6: the end of the road to Kitete. Fieldwork vehicle parked next to one of the buildings constructed and funded by GRL

Picture 4.7: a home on the hillside of Kitete

Picture 4.8: TAZARA railway line in Kitete. Old train carriages were used as accommodation.

Kitete has a much smaller population than Uchindile, with an estimated 54 households to Uchindile's 257 (according to village statistics as of 2009), and as such, to my outsider's perspective the village has more of a close-knit community feel. The two villages have football teams which play regularly, and travel between the two villages is often by means of walking along the railway line, or occasionally getting a lift in GRL company vehicles, although this is more common for travel from Uchindile to surrounding areas.

Table 4.3 below shows some characteristics of the two villages in the study site of the research:

Characteristic	**Uchindile**	**Kitete**
Area of village	53,532 ha	25,661 ha
Number of households	257	54
Average household size	4.0	3.6
Village population	1,025	195
Number of men	227	56
Number of women	247	42
Number of children (aged 0-18)	551 (298 boys, 253 girls)	97 (43 boys, 54 girls)
Land Use Plan (LUP)	2009, sponsored by GRL	2009, sponsored by GRL

Sources: 2009 data from village LUPs obtained during fieldwork [VLUP, 2009a; VLUP, 2009b]

In many respects the villages I worked in Morogoro are 'typical' of other agricultural Tanzanian settlements with respect to their economy and socio-economic infrastructure. I now provide some summary descriptive statistics from the household survey data to describe these villages.

Table 4.3.1 shows the sex of household heads for respondents in Uchindile and Kitete. Unsurprisingly, the majority of household heads were male.

	Kitete	Uchindile	Total
Female	8	11	19
Male	27	24	51
Total	35	35	70

Table 4.3.1 Sex of household head. Source: HHS data, QA201

Table 4.3.2 shows the primary occupation of the household head. The majority of respondants indicated that their primary occupation was farming, with a number of household heads indicating that some form of employment, or casual labour is their primary occupation. This is important, and I will return to this in the forthcoming chapters.

	Kitete	Uchindile	Grand Total
farming	20	30	50
TAZARA	7	1	8
small trade		1	1
employment	1	1	2
casual labour	1		1
GRL	6	2	8
Total	35	35	70

Table 4.3.2 Primary occupation of household head. Source: HHS data, QB202-1

Table 4.3.3 shows the average age of household heads, and the average household size. Kitete had a younger average age of household heads, and a much smaller average household size. As can be seen in the comparative statistics summarised in table 4.1, the average household size of Uchindile, 4.3, was typical of Tanzania, and in particular, typical of Kilombero rural average household size. Kitete's average household size is lower than the typical rural Tanzanian household, although this is to be expected given its small population and history of people moving away from the area. This is discussed further in chapter 6.

	Kitete		Uchindile	
	Average age	Average household size	Average age	Average household size
Total	36.8	3.4	42.3	4.3

Table 4.3.3 average age and household size. Source: HHS data, QA202; QA301.

Table 4.3.4 shows the frequency of common categories of land ownership in Uchindile and Kitete; table 4.3.5 shows the size of average land ownership for each village. 40% of households surveyed own more than 5 acres, with 35.7% owning more than 2 but less than 5 acres. 24.3% of households surveyed own 2 acres or less. Kitete had markedly more households surveyed who owned larger areas of land than Uchindile, and had an average land ownership of 9.3 acres per household compared to

Uchindile's 4.5 acres. Does this hint at relatively more land pressure in Uchindile relative to Kitete? Later chapters explore this question when considering concerns around land.

(acres)	**Kitete**	**Uchindile**	**Total**
Up to 2	5	12	17
>2 to 5	10	15	25
>5	20	8	28

Table 4.3.4 frequency of land ownership sizes. Source: HHS data, QB301

	Kitete	Uchindile	**Total**
Total	9.3	4.5	6.9

Table 4.3.5 average land ownership. Source: HHS data, QB301

Almost everyone in Uchindile and Kitete grows maize. Table 4.3.6 below show the reasons households plant maize: most households plant maize for food only, with a smaller number planting maize for both food and to sell for cash. There are fewer households who plant maize for both food and cash in Kitete. Later, table 4.4 sets out how this compares to the percentage of households growing maize in Kilombero and Iringa districts, and the Mufindi ward – the study sites are typical in this respect of Mufundi, where almost all households report growing maize.

	Kitete	**Uchindile**	**Total**
Don't plant	3	1	4
2 = food	26	22	48
3 = both	6	12	18
Total	35	35	70

Table 4.3.6 reasons for planting maize. Source: HHS data, QB309-B

Table 4.3.7 below shows that the majority of people in Uchindile and Kitete never hire anyone for help farming. A smaller number of people hire labour for help in their farms very occasionally. Note that those who do hire labour to help on farms often specified that this was for their tree farms. The phenomena of villagers planting trees is discussed more in the subsequent chapters.

	Kitete	**Uchindile**	**Total**
Never	20	21	41
Very occasionally	12	6	18
Sometimes	2	6	8
Frequently	1	2	3
	35	35	70

Table 4.3.7 hire labour patterns. Source: HHS data, QB315

Table 4.3.8 below shows that very few households in Kitete or Uchindile keep cows or goats/sheep for livestock.

Livestock	**Quantity**	**Kitete**	Uchindile
cows	none	31	28
	>1	4	7
shoats	none	35	34
	>1	0	1

Table 4.3.8 Livestock keeping. *Source: HHS data QB401, QB402, QB403*

It is important to establish these facts because they demonstrate that in many respects these villages are normal, usual and typical. But they differ in one crucial respect from many other rural communities in the country – and that is because of the role of GRL in changing land use, economies and society.

Table 4.4 below compares various characteristics of households across Uchindile and Kitete villages from household survey data to typical household characteristics in Tanzania nationally, Morogoro and Iringa regions, and Kilombero and Mufundi districts.

Household characteristics	Tanzania	Morogoro	Kilombero	Iringa	Mufindi	Uchindile/Kitete (from 70HHS)
Crop growing - Maize (planted area) (yield) (area/hh)	4.086m ha 1.3 t/ha	 232,377 ha 1.0 t/ha 0.9 ha/hh	35,831 hhs (61%) 23,673 ha 1.47 t/ha	296,112 hhs (60%) 246,947 ha 1.6 t/ha 0.8 ha/hh	63,930 hhs (99.5%)	% grown 94% of hhs
Crop growing - Paddy	0.906m ha 1.6 t/ha	154,132 hhs (51.6%) 169,762 ha 1.7 t/ha 1.1 ha/hh (for those growing)	56,925 hhs (97.2%) 80,207 ha 1.98 t/ha	9,837 hhs (3.2%) 6,527ha 3.7 t/ha 0.7ha/hh	318 hhs (0.49%)	9% of hhs reported planting rice, however all of these were planted in alternative locations (Mlimba, Ifakara, Mbingu etc).
Crop growing -	0.553m	11,530 ha	-	4,365 ha	-	-

Sorghum	ha 1.0 t/ha	0.8 t/ha 0.6 ha/hh		1.0 t/ha 0.5 ha/hh		
Crop growing - Cassava	-	28,535 hhs (9.5%) 10,646 ha 2.2 t/ha 0.2 ha/hh	- 3.8 t/ha	8,325 hhs (2.7%) 3,897 ha 0.2 ha/hh	- 0.29 t/hh 0.23 ha/hh	20% of hhs surveyed
Crop growing - Sweet potatoes	0.446m ha 2.0 t/ha	12,575 hhs (4.2%) 5,125 ha 3.2 t/ha 0.41 ha/hh	3,179 hhs (5.4%) 839 ha 4.1 t/ha 0.3 ha/hh	8,431 hhs (2%) 1,135 ha 2.32 t/ha 0.15 ha/hh	-	6% of hhs surveyed
Crop growing - Beans	0.571m ha 0.8t/ha	15,469 ha 0.6 t/ha 0.4 ha/hh	 117 ha 1.05 t/ha 0.3 ha/hh	161,209 hhs (52.6%) 56,152 ha 0.7 t/ha 0.3 ha/hh	 12,200 ha 0.68 t/ha 0.32 ha/hh	57% of hhs surveyed (n = 40)
Crop growing - Sugarcane	-	12,215 ha 5.0 t/ha 1.4 ha/hh	4,751 ha 2.14 t/ha 2,138 kg/ha 1.8 ha/hh	3,414 hhs 473 ha 12.6 t/ha 0.1 ha/hh	-	3% (n = 2)
Selling crops (% of crop growing hhs)	~80%	76% (72-79%) 24%?	85-87% (short-long rains)	81%	-	53%
% of hhs using	-	2.10%	-	0.60%	-	13%

non manual implements for farming						(9% = plough & animals; 4% = tractor (out of area)
Roofing (of rural agri hhs) Iron sheets Natural (Grass/leaves; Grass/mud)	(Main-land Tz) 48.9 % 49%	 52.3% 44%	 55% 39%	 59% 39%	 51% 43%	 61.4% 38.6%
Wall materials (% rural agri hhs) Bricks (baked & dried) Poles and mud Grass	 53.1% 32.6%	 51% (dried = 11%; baked = 40%) 37% 10%	 68% (dried = 4%; baked = 64%) 21% 9%	 63% (dried = 17%; baked = 46%) 30% 6%	 64% (dried = 32%, baked = 32%) 32% 3%	60% (dried = 1.4%, baked / cement = 55.7%; 3% timber) 40% 0%
Source of energy for cooking Firewood Charcoal	 94.5% 3.9%	 89.8% 8%	 87.7% 10.6%	 97% 1%	 97% 1%	Both: 27% 64.3% 8.5%
Sufficient land for hh?	37% yes 63% no	38% yes 62% no	36% yes 64% no	45% yes 55% no	46% yes 54% no	-
HHs with land for planted trees	187,150 hhs 3.2% 146,199 ha	3,932 hhs 1.3% 2,581 ha	722 hhs 1.3% 907ha	62,027 hhs 20.2% 71,631 ha	14,154 hhs 22%	60 hhs (85.7%)
Uncultivated usable land (spare land?)	1.036m ha (7%)	42,079 ha (6.3%)	7,946 hhs (13.6%) 9,081 ha	48,857 ha (6.3%)	4,930 hhs (8%)	-
Use of tractor	9.13%			2.3%		2.8% [but

						used elsewhere]
Use of irrigation	6%	7%	-	10%	8%	5%
Problem with erosion	13.4%	8.2%	1.7%	16.1%	15.3%	11.4%
Main source of income Food crop sales Livestock/livestock product sales Sale of cashcrops Sale of forest products Business income Wages/salaries Other casual cash earnings	 61.6% 6.4% 9.9% 1.1% 6.0% 2.8% 7.8%	 76.7% 3.7% 4.4% 1% 4.9% 2.5% 5.6%	 77.28% 1.48% 2.72% 0.73% 4.94% 3.7% 8.4%	 64% 4% 5% 2% 7% 4% 11%	 51% 6% 5% 1% 9% 6% 17%	 68.5% 0% - - - 25%
Access to credit		4,105 hhs access (1.4%) Friend/family = 29.1% Bank = 10.8% SACCOS = 22.1% Private = 8.6% NGO/dev = 21.8% Trader = 2%	1,589 hhs (2.7%) Friend/fam = 45.5% Bank - 9.1% SACCOS = 0% Private = 9.1% NGO/Dev = 36.4%	8,076 hhs accessed credit (2.6% agri hhs) Friend/family = 21% Bank = 12.4% Coop = 9% SACCOS = 35% Private = 12% Trader/trade store = 7.7%	1,749 hhs (2.7%) Those that accessed credit: Friend/family = 27% Bank = 27% SACCOS = 18% Private = 27%	21 hhs (30%) Friend //fam = 52% Bank = 10% SACCOS = 33% Trader = 5%

Main source drinking water - dry season		Piped water (24.9%) Surface (23.6%) Protected well (23.1%) Unprotected well (15.7%)	Piped water (32.6%) Unprotected well (29.9%) Protected well (23.5%) Surface (5.9%)	Piped water (37%) Unprotected well (22%) Surface (17%) Unprotected spring (12%)	Unprotected well (23%) Unprotected spring (20%) Piped water (20%) Protected well (16%)	Well (40%) Tap (27%) Surface (river) (19%) Pump (10%) Spring (4%)
Distance to main source of drinking water (dry)		<100m (37.8%) 1-1.99km (17.6%) 100-299m (16.5%) 500-999m (16.4%)	<100m (63%) 100-299m (22.2%) 500-999m (7.4%) 1-1.99km (7.4%)	<100m (28%) 500-999m (23%) 1-1.99km (23%) 100-299m (15%)	1-1.99 (41%) 500-999km (19%) 300-499m (15%) <100m (11%) 100-299 (11%)	-
Main source drinking water - wet season		Piped water (24.2%) Protected well (23.1%) Surface (23%) Unprotected well (15.7%)	Piped water (31.9%) Unprotected well (28.9%) Protected well (24%) Surface (5.9%) Uncovered rainwater catchment (5.9%)	Piped water (39%) Unprotected well (18%) Surface (14%) Unprotected spring (12%)	Unprotected well (22%) Unprotected spring (19%) Piped water (17%) Protected well (13%) Surface (13%)	Well (40%) Tap (27%) Surface (river) (19%) Pump (10%) Spring (4%) Rain (1%)
Distance to main source of drinking water (wet)		<100m (38.7%) 500-999m (19.6%)	<100m (59%) 100-299m (19%)	<100m (37%) 500-999m (25%)	1-1.99 (33%) <100m (26%)	-

		1-1.99km (16.7%) 100-299m (13.7%)	500-999m (11%) 1-1.99km (7%)	100-299m (16%) 1-1.99km (16%)	500-999km (19%) 100-299 (11%)	

Table 4.4 Comparison of household characteristics across Morogoro, Kilombero, Iringa and Mufundi

There are three companies that warrant a brief introduction as they form a part of life in Uchindile and Kitete: TAZARA, Mufindi Paper Mill (MPM), and Green Resources Ltd (GRL). Table 4.5 below sets out the number of household survey respondents who identified each of these three companies.

Company identified	**Uchindile**	**Kitete**	**Total**
GRL	29	34	63
MPM	15	1	13
TAZARA	10	7	17

Table 4.5: number of household survey respondents who identified companies in Uchindile and Kitete

GRL is by far the company identified by most respondents, in each village individually as well as across the two study sites: it was identified by 29 respondents in Uchindile, and 34 respondents in Kitete (83% and 97% respectively 90% across both study sites). Here, I briefly introduce TAZARA, MPM and GRL, before setting out a more in-depth description of GRL and its investment.

TAZARA is the Tanzania-Zambia Railway Authority - a bi-national railway linking Zambia and Tanzania (TAZARA, 2020). TAZARA is a key part of life in these villages. The railway runs through both Uchindile and Kitete, with the village centers and key village buildings often clustered around the railway line, or the railway station. Bi-weekly trains connect these villages to other locations along the TAZARA railway, and local residents walk or along the railway track in order to travel between Uchindile and Kitete without having to climb up and down multiple steep (and in the rainy seasons, extremely muddy and slippery) hills. In both villages, there are smaller parts - hamlets - of the village referred to as 'Tazara', with housing apparently constructed by or for TAZARA at some point, often occupied by residents who work in some capacity for TAZARA. TAZARA provides some employment for adjacent villages along the line, for both Uchindile and Kitete. Research respondents raised the repeated issue of delayed salary payments for TAZARA employees, which caused difficulties. This issue has also been reported in news reports, and unpublished research articles (Zajontz, 2017)[37].

Mufindi Paper Mills (MPM) is a paper mill in nearby Mgololo (previously known as Mgololo Southern

[37] News reports refer to repeated strikes over unpaid wages see e.g. (Fallon, 2013) and (BBC, 2015)

Paper Mills), supplied with raw materials by the Sao Hill forest plantation (a government industrial forest plantation established in the 1950s) (Akyoo, 2017). I draw attention to MPM here as it was identified by multiple research participants in Uchindile as being a significant local company or investor (mentioned by 43% of respondents in Uchindile (n=15); and by 1 respondent in Kitete) but I do not focus on MPM in the rest of the thesis, not least because while respondents in Uchindile identified the presence of MPM, no surveyed respondents identified MPM as a source of employment for themselves.

GRL

Green Resources Ltd (GRL) is a Norwegian company, a subsidiary of Green Resources AS (GRAS), funded by private and institutional investments. Figure 4.1.1. below shows the history of GRAS.

Figure 4.1.1. History of GRAS. Source: Green Resources (2022).

Established in 1995, it describes itself as "a sustainable forestry company aiming at growing plantation forests across East Africa in a sustainable and socially just manner" (GRL, 2020). In a company report specific to its activities in Kitete and Uchindile, GRL describes itself as:

> *"the leading plantation, carbon offset and renewable energy company in Eastern Africa. Green Resources conducts reforestation activities in a number of locations in Tanzania, Uganda and Mozambique deriving revenue streams from the sales of carbon offset and high quality timber and transmission poles, whilst simultaneously bringing community and environmental benefits"* (GRL, 2012a: 3).

GRL manages three plantation sites in Tanzania - Idete, Mapanda and Uchindile, in the Morogoro and Iringa regions. Their parent company also has operations elsewhere. Figure 4.1.2. below shows the current Green Resources structure. The company first acquired the plantations in Southern Tanzania in 1997. As we shall see GRL has played a key role in life in the study sites, after their arrival to the area in 1997 and their establishment of the Uchindile Forest Project. I now describe this project and GRL's activities in Uchindile and Kitete.

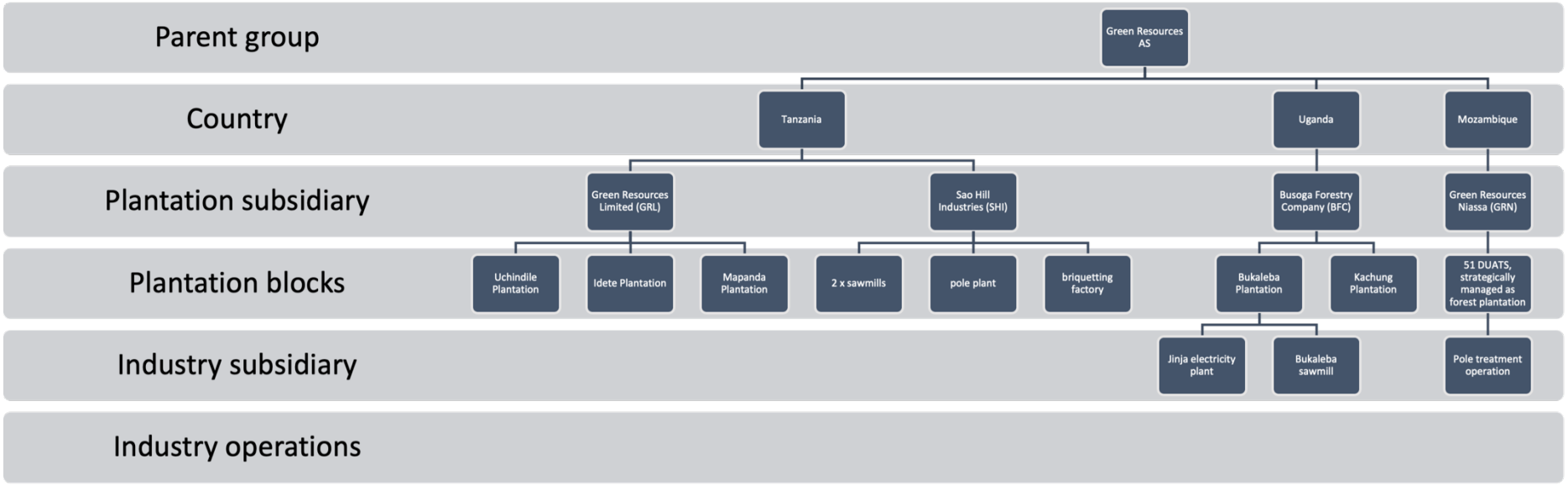


Figure 4.1.2. Current Green Resources Structure. Source: Green Resources (2022).

GRL's Uchindile Forest Project (UFP), along with their Mapanda Forest Project (MFP), makes up their broader project entitled 'Reforestation in grassland areas of Uchindile, Kilombero, Tanzania & Mapanda, Mufindi, Tanzania'. This is a Verified Carbon Standard (VCS) project - one of the world's most widely used voluntary greenhouse gas (GHG) programmes (Verra, 2020a).

For context, VCS programmes are described as follows on the Verra[38] website:

> *"By using the carbon markets, entities can neutralize, or offset, their emissions by retiring carbon credits generated by projects that are reducing GHG emissions elsewhere. Of course, it is critical to ensure, or verify, that the emission reductions generated by these projects are actually occurring. This is the work of the VCS Program – to ensure the credibility of emission reduction projects.*
>
> *Once projects have been certified against the VCS Program's rigorous set of rules and requirements, project developers can be issued tradable GHG credits that we call Verified Carbon Units (VCUs). Those VCUs can then be sold on the open market and retired by individuals and companies as a means to offset their own emissions. Over time, this flexibility channels financing to clean, innovative businesses and technologies.*
>
> *….VCS projects cover a diverse range of sectors, including renewable energy (such as wind and hydroelectric projects), forestry (including the avoidance of deforestation), and others. Emission reductions certified by our program are eligible to be issued as VCUs, with one VCU representing one metric tonne of greenhouse gas emissions reduced or removed from the atmosphere." (Verra, 2020a)*

Three[39] VCS projects are listed on the VCS project registry for Tanzania, of which two are AFOLU projects: *Mjumita Community Forest Project* and GRL's *Reforestation of degraded grasslands in Uchindile and Mapanda, Tanzania* (Verra, 2020a). GRL's Uchindile and Mapanda project has an estimated annual emissions reduction of 25,000 tCO^2 [40].

GRL provides a good description of the study site area in their VCS Project Description document, which worth quoting at length. It also serves to provide more context as to the physical geography of the site:[41]

> *"The...two areas [Uchindile and Mapanda]...have similar characteristics of being grassland with scattered shrubs and pockets of indigenous trees along river valleys and gullies. The present environmental conditions have not changed from the conditions before the project*

[38] Verra is the company that "develops and administers" the VCS programme.
[39] The third Tanzanian VCS project is a waste handling and disposal project focussing on landfill gas recovery and electricity generation in Dar es Salaam.
[40] The website does not specify the units here but I have assumed tCO^2 as the most likely units they would have been using.
[41] (VCS, 2009) - based on an Social/Environmental Impact Assessment (EIA/SEIA) undertaken by Orgut consultancy, 1999

started and the climate, hydrology, soils, ecosystem is being monitored. The environmental conditions of each land before the project started are described respectively as follows:

...

UFP area has a bi-modal climate, characterised by a long dry season and a bi-modal rainfall distribution in short and long rain periods. On average, it receives an annual rainfall of about 1000mm. The project area is located in a zone of potential evaporation varying between 800 - 1200 mm/year. The yearly variation in potential evaporation is smaller and steadier as compared to rainfall. The short rainy season occurs during November-December and a long one between March and May. The area is predominantly dry between July and October. The average climate temperature is around 16oC with the coldest months between May to August/ September. Winds normally blow from North-East.

…

The hydrological condition of the area is characterised by several rivers and small streams flowing through the area including the ones making the borders of the project. Almost every valley bottom consists of swampy grounds portraying springs and rivers flowing out of the valleys. The major rivers flowing through Uchindile/Lugala are Ngokomiche, Kihata, and Luiga whose banks are covered with natural vegetation. A few small streams have their sources at this planned forest plantation. Most of the streams flow into the Kilombero Valley which is to the south of the area.

…

[T]he soils are in most of the areas originated from granites which are deeply weathered. These soils are moderately acid, poor, freely drained and markedly compacted near the surface where there is often a very high coarse grained soil fraction. Top soil have been exposed to annual fires and therefore exhausted in humus content. The soil pH varies between 4.4-6.5. Erosion is more realized on bare soil. The soils are generally red loamy sand soils (latosolic). The slopes of the ridges are high where in some places range from 20-40%.

…

Within the boundary of the project area there are existing patches of naturally growing shrubs and trees vegetation cover which are observed along river bottoms, valleys and steep slopes... These are left to protect the areas from erosion by rainwater, also protect the rivers and streams from drying. The main species dominating primary vegetation cover are Combretum sp. Nuxia congesta, grasses dominated by species of hyperenia, aristida and themada and shrubs species. The lands are not used due to poor soils and grasses are not suitable for grazing.

...

The local community in the neighbourhood are small scale farmers, just for subsistence with limited livestock grazing close to the villages where cattle is kept mainly in kraals. The most crops grown are annuals such as maize, beans, peas, potatoes and vegetables (cabbages). Bananas are also grown in the area. Recently they have been involved in cultivation of cash crops such as pyrethrum and coffee. Maize is the main food and cash crop.

...

On hill tops and along the hills slopes which are covered by grass the natural undergrowth is composed of patches of scattered trees and shrubs. The common species found in these slopes are Prothea angolensis, Syzygium cordatum, fern (Tyelypteris confluens). In river valleys, tree species include Syzygium cordatum, Bridelia micrantha and Gardenia imperialis and fern

(Tyelypteris confluens). Based on the assessment conducted within the project boundary in 1999, the wildlife in the area is limited due to its topography. Few small animals such as wild pigs, moles, rodents, birds found within the project boundary along rivers."
(VCS, 2009: 14-16)

UFP is classed as an 'Afforestation, Reforestation and Revegetation' (ARR) type of VCS project, within the Agriculture, Forestry, and Other Land Uses (AFOLU[42]) sectoral scope. It uses a Clean Development Mechanism[43] (CDM) methodology for afforestation / reforestation (type AR-AM005 v3)[44]. The project gained Forest Stewardship Council (FSC) certification in 2008, and this was received annually 2009-2013 (GRL, 2014a). The project started in 1997. It was initially intended to be CDM eligible, but this was disallowed as the CDM does not cover projects that started before the turn of the century (pre-2000). The project achieved VCS validation on 17th July 2009, and the earliest carbon credits were from 2002. The project crediting period will run for 99 years, from 2002 to 2101. GRL intends to maintain "sustainable forestry and harvesting activities at the project sites on a long-term basis - beyond the 99 year crediting period." (GRL, 2014a: 4). In 2013, UFP also received a Climate, Community and Biodiversity (CCB) standard verification status. CCB standards were developed by the Climate, Community, and Biodiversity Alliance (CCBA) and are managed by Verra. CCB standards "identify projects that simultaneously address climate change, support local communities and small holders, and conserve biodiversity'' (CCBA, 2019).

Two areas, UFP and MFP, constitute the project, which undertakes 'reforestation' on a multitude of discrete land parcels at these two areas. Figure 4.2 below shows the location of UFP and MFP in the Kilombero and Mufundi districts (respectively).

[42] AFOLU projects "allocate a portion of their emissions reductions units to a buffer account to ensure against the risk of stored carbon losses" (Verra, 2020b)
[43] CDM is a mechanism set out in the Kyoto Protocol which allows countries to meet their emissions reduction (or limitation) target by earning certified emissions reduction (CER) credits by implementing an emissions-reduction project in a developing country (UNFCCC, 2020a) - essentially it is a way of offsetting emissions. The Kyoto Protocol "operationalizes the United Nations Framework Convention on Climate Change [UNFCCC] by committing industrialized countries to limit and reduce greenhouse gases (GHG) emissions in accordance with agreed individual targets" (UNFCCC, 2020b). The protocol was adopted in 1997 and ratified in 2005.
[44] See VCS project database project #142 for further details
https://www.vcsprojectdatabase.org/#/project_details/142

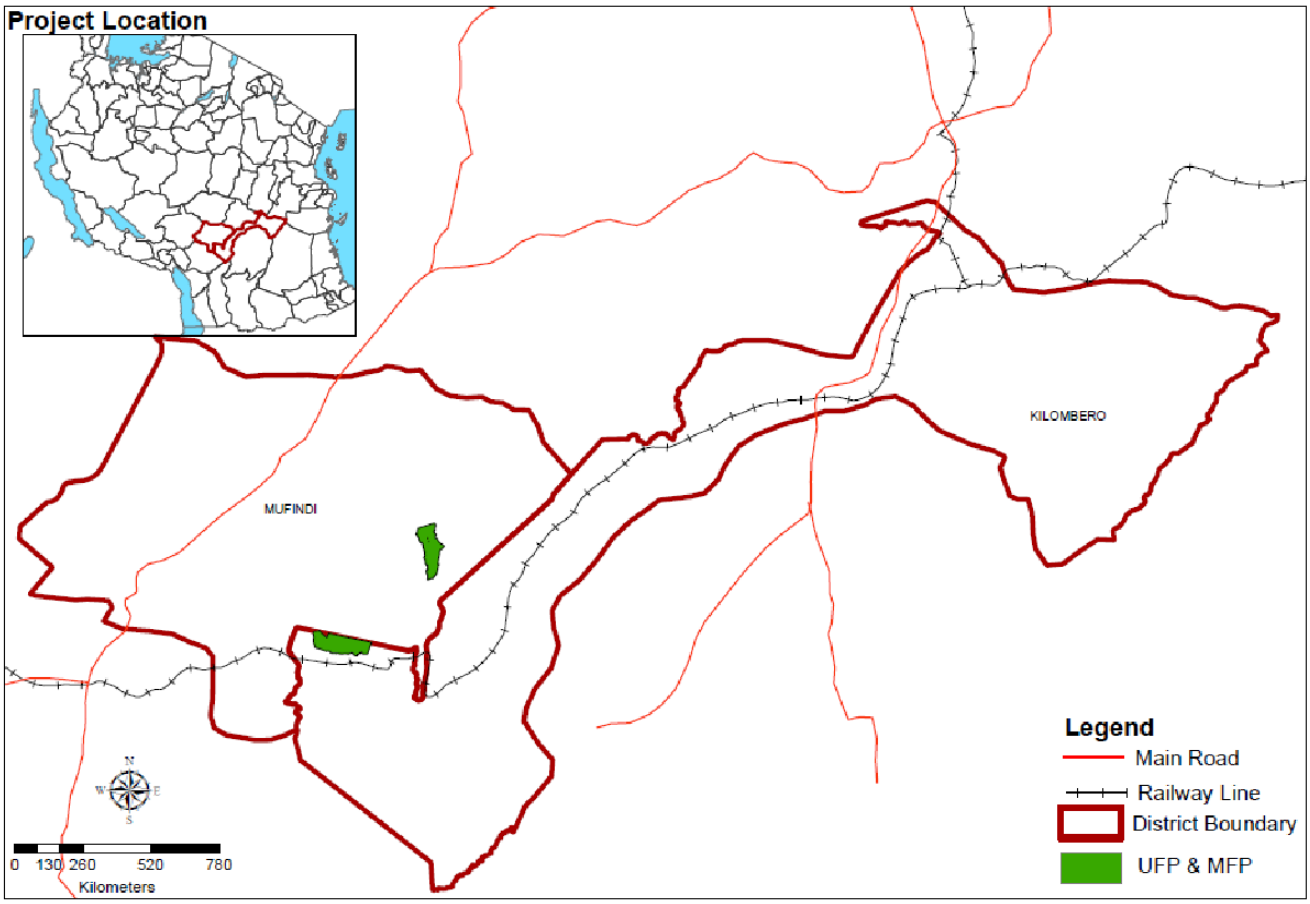


Figure 4.2. Map of GRL's UFP location, in GRL/Verra, VCS Monitoring Report, 2013b, p.6. Used under a UK Copyright Exception.

GRL was granted the title to 18,379 ha on a 99-year lease, issued by the Ministry of Lands and Human Settlements of Tanzania. It was acquired through what the company described as a 'bottom-up participatory' process, where permission for the lease was granted first by village assemblies and government, and then by district, regional and finally national government (GRL, 2014a). This process is described by others (e.g. Bluwstein et al., 2018; Walwa, 2017; Maganga et al, 2016; Locher, 2016) - see their work for more detail and a critical analysis of land governance in Tanzania. However, it is useful here to briefly outline a few salient points about the leasing of land in Tanzania.

According to the Land Act and Village Land Act of 1999 (URT, 1999a; URT, 1999b), while ultimately the President is the title holder of all land, there are three categories of land in Tanzania: Village Land; General Land; and Reserved Land. Village land is, broadly, land that falls within the agreed boundaries of a village, administered by a Village Council. General Land is land administered by the Central Government - land that is neither reserved or village land, including urban areas and areas used for large-scale investment[45]. Reserved Land covers areas designated for protection or conservation, such

[45] Critically, the definition of General Land in the relevant acts includes unused or unoccupied village land - in other words, village land that is seen to be 'spare'. Who deems this land 'spare' is of importance, and it should be noted that the issue of which category of land certain areas fall under can be viewed as controversial. (e.g. Bluwstein et al, 2018; Odgaard, 2002; Boudreaux, 2012)

as national parks. In Kilombero, the Kilombero Valley Ramsar site is an example of an area classed as Reserved Land.

Estimates of the percentages of land in Tanzania that fall under each category vary: a Ramsar (2017) report estimates around 50% of land in Kilombero is Reserved Land, with just under 10% being classed as General Land, and around 40% being Village Land (Wilson et al., 2017); whereas others place the percentage of General Land nationally, and within the SAGCOT corridor, as being around 2% (Bergius et al., 2020; Tenga & Kironde (2012) referenced in Bergius et al. (2020)). This is important because the only category of land officially open to investment is General Land.

'Spare' or 'unused' Village Land can be identified for investment through the undertaking and agreement of a Village Land Use Plan (VLUP). While these can only officially be approved by the national government (through the National Land Use Planning Commission), and they must be reviewed by district government planning officials, they are often facilitated (and effectively undertaken) by the prospective investors (Walwa, 2017). Once this has been agreed[46], a land transfer process takes place, where the land legally shifts from being categorised as Village Land to General Land, and thus shifts from being legally controlled by a Village Council to by Central Government (specifically through the Tanzanian Investment Centre (TIC)), who then officially leases the land to the investor for up to 99 years. Note that this re-categorisation to General Land - and the associated shift of control away from village-level - is a permanent change, even once the 99-year lease to the investor has expired, and even if the investor does not end up leasing the land (Bluwstein et al., 2018).

With this land tenure context in mind, I return to the land leased by GRL in Uchindile. The total leased land area is split between MFP (6,258 ha) and UFP (originally 12,121 ha, reduced to 7,076 ha). A 2013 validation report explains the reasons behind this reduction:

> "*The land of the project area at the (Uchindile Forest Project) UFP and the (Mapanda Forest Project) MFP belongs to the villages and is leased by GRL. Since late 2008 there is an on-going dispute regarding the land tenure at the UFP. The area of the UFP is partly located in the districts of Mufindi and Kilombero. In total the area covers 12,121 ha and was approved by the Lands Commission with the Title deed No. 50742. Nevertheless the area in the Mufindi district, in total 5,045 ha is falling under the Government forest reserve (Saohill forest project) which was not clear at the time of the issuance of the Land title deed. Thus GRL remains with 7076 ha for the UFP. At present GRL is not utilizing the area in dispute … A new land lease title for the remaining 7076 ha is in the process of being issued meanwhile the old Land lease title is valid." (TÜV SÜD 2013b: 3)*

The total VCS project area is 6,241 ha, split relatively evenly between MFP (3,818 ha) and UFP (3,230 ha) (GRL, 2014a). The 2012-13 reporting period returned a total of 3,079 ha planted at UFP; 1,006 ha of this was included for carbon accounting.

[46] Villagers, through Village Assemblies, are only able to veto this process if the area being leased is less than 250 ha; above this size they only have advisory input. Local communities therefore have less power the larger the area of land being leased (Bergius et al. (2020)).

Figure 4.3 below shows a map of GRL's Uchindile Forest Project (UFP) and illustrates the location of the project: within the Uchindile ward of the Kilombero district (Morogoro region) and adjacent to the Mufundi district, Iringa region. It situates the villages - Uchindile and Kitete, described earlier in this chapter - in relation to UFP as described above.

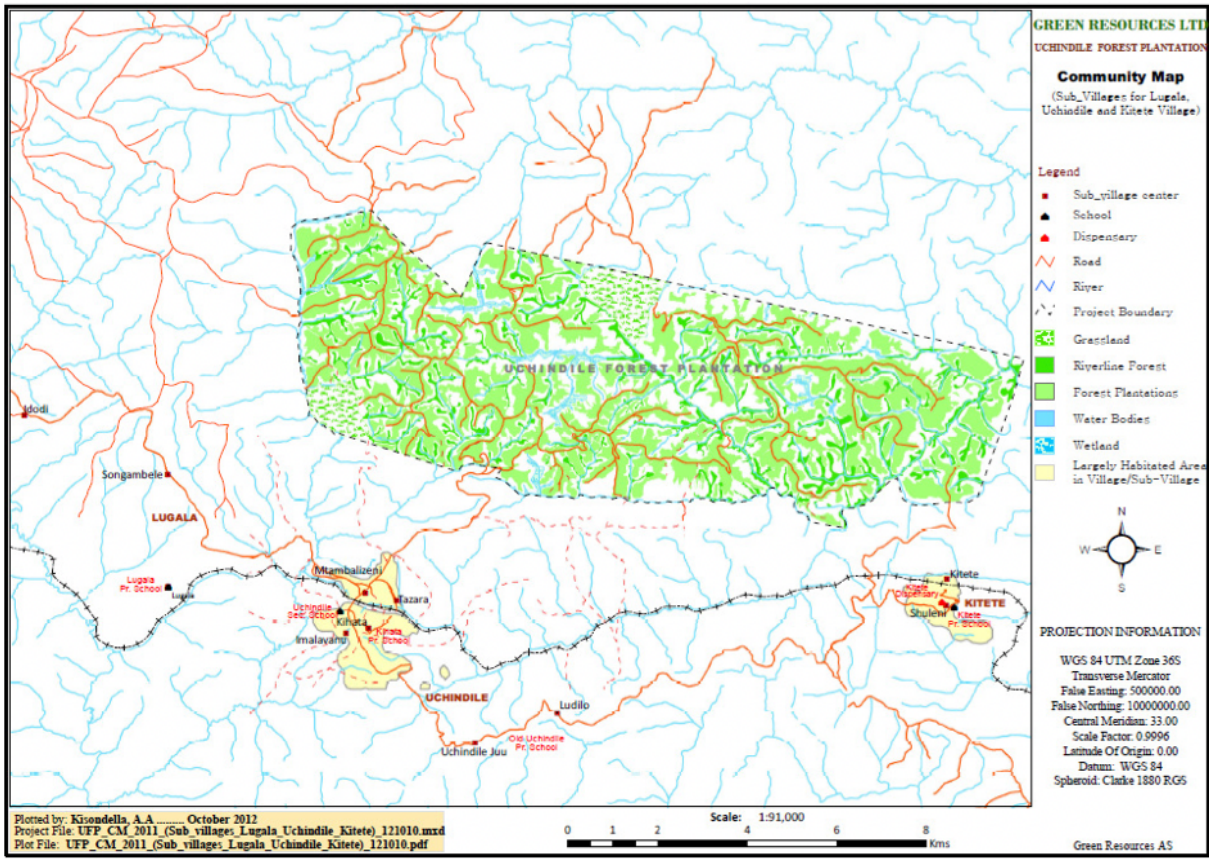


Figure 4.3 - Map of UFP location in relation to Uchindile and Kitete villages, in GRL/Verra, VCS Monitoring Report, 2013b, p.7. Used under a UK Copyright Exception.

Various species of pine and eucalyptus are planted in UFP: the dominant species are *Pinus Patula* and *Eucalyptus Saligna*. They are grown "on a rotation that creates a permanent carbon sink, which is established with sustainable harvesting." (GRL, 2013b: 4). For the period 1997-2013, 3,206.7 ha were planted,[47] of which 1557.7 ha are Eucalyptus and 1647.6 ha are Pine.[48] Figure 4.4 below shows the areas of UFP planted with Eucalyptus and Pine between 1997 and 2013. It illustrates the most extensive planting period for both pine and eucalyptus was 2011-2013. These areas are highlighted in teal (eucalyptus 2011-2013) and in pink (pine 2011-2013).

[47] This figure is slightly higher than the 3,079 ha total planted as it includes just over 100 ha due to be planted.
[48] There were also 1.4 ha of 'other' species planted for testing.

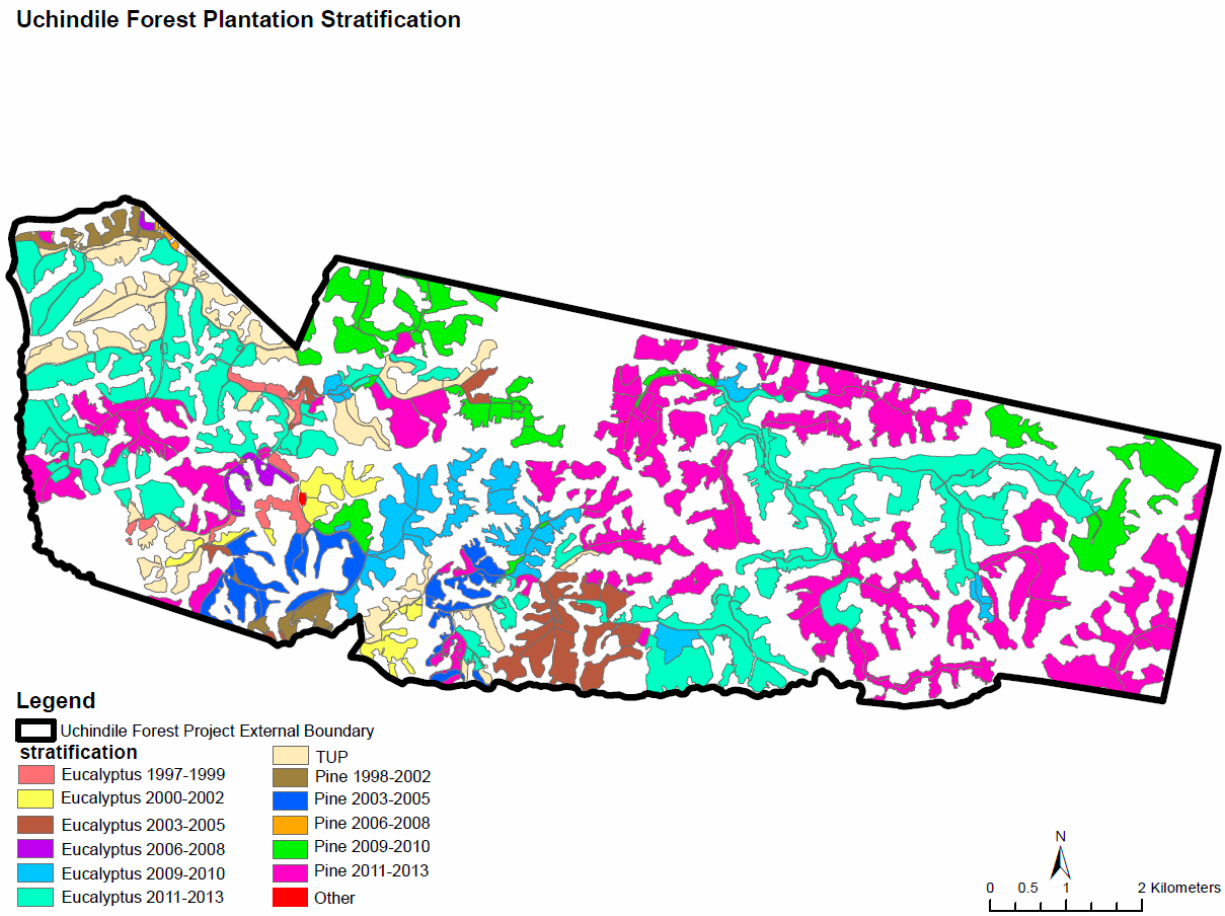


Figure 4.4 - Tree types and period of plantation in UFP. In GRL/Verra, VCS Monitoring Report, 2014a, p.11. Used under a UK Copyright Exception.

These pine and eucalyptus trees in UFP are grown for timber, timber-related products, and for carbon credits through the VCS programme described above.

Conclusion

In this chapter I have situated Uchindile and Kitete - the study sites for this thesis - in their wider district and regional geographic and socio-economic contexts in Tanzania. I described a snapshot of village life and established basic facts about the study sites from household surveys undertaken during fieldwork and secondary sources including GRL reports and village land-use plans. This painted a picture of relatively typical rural Tanzanian village life and livelihoods, apart from the presence of GRL and their UFP. I began to explore the difference that the presence of this company and their investment in a large-scale tree plantation for timber, timber-related products, and carbon credits through the VCS programme. Chapter 5 examines the implications and perceived impacts of GRL's investment in more detail. I have described GRL's history and activities in the local area, and provided some relative policy context, in particular giving a brief outline of land tenure context in Tanzania and describing the SAGCOT initiative, demonstrating its relevance to the thesis. GRL's investment in Uchindile and Kitete sits at the intersection of land alienation narratives, debates around private sector investment in the green economy, and discussions around the incentives and efficacy of the enabling policy environment.

5. GRL: The Munificence of Capital?

This chapter explores the role played by large-scale private sector investment. Kitete and Uchindile, have over the last two and a half decades seen the establishment of large tree plantations by private-sector companies for timber, paper, charcoal making, and carbon-credits. These cover large areas – 13,334 hectares, approximately 9% and 27% of village lands[49].

I discuss in this chapter and the subsequent two chapters, the perceived impacts of the private sector presence on both the communities they work in, and on the local environment. I show that local actors observe a complex network of interactions and impacts that have arisen in their communities since the arrival of GRL and implementation of the vast tree plantations. In particular, I focus on issues surrounding changing local prosperity, perceived land availability, fire and food security. The chapter explores the different understandings and framings of the impact of the private investment on local livelihoods, arguing that the impact on livelihoods experienced by local communities is varied, and can be framed in several ways.

I show that the private investment in these areas can be seen to have provided an alternative, and some would argue sustainable, livelihoods for the local communities. These are first through the employment opportunities brought directly from GRL's activities, and indirectly from the new opportunities for employment with small investors that have arisen after GRL has attracted other investors to the area. Second, there is the stimulation of local residents to farm their own personal tree plantations, to be typically sold for timber, electricity poles, or whole trees.

However things are not that simple. We must see the arrival of this large company as setting in play complex dynamics that benefit some people but cause problems to others. In particular, the private investment is also seen as posing a threat to food security. It leads to heightened anxiety and concern in the local communities about the availability of, and their access to, land and food. Throughout these framings, themes of expectation, anxiety and risk emerge.

[49]The two villages together cover 79,191 ha of land. According to VCS documentation, 13,334 ha is leased by GRL in the area, split between Mufindi Forest Project (MFP) and Uchindile Forest Project (UFP). UFP extended over an area of 12,121 ha representing 15.3% of the total land area within Uchindile and Kitete village boundaries. GRL note that this was subsequently reduced to 7,076 ha, which represents approximately 9% of Uchindile and Kitete land. However village land use plans (VLUPs) detail that approximately 21,130 ha is the area of investment across Uchindile and Kitete (26.7% of village land). In Kitete VLUP, 10,555 ha of a total of 25,660 ha was stated as allocated to GRL for investment as of 2009, representing approximately 41% of the total area within the village boundaries. In Uchindile VLUP, 10,575 ha of a total of 53,531 ha was stated as allocated to GRL and MPM for investment as of 2009, representing approximately 19.8% of the total area within the village boundaries. Note that this VLUP for Uchindile recommended that the area for investment for GRL and MPM be increased to 25,257 ha (representing 47% of the area of Uchindile), which would have significantly increased GRL's area of investment. A 2018 GRL report suggests substantial increases in the area of investment in Uchindile and Kitete, with the status of 'Uchindile II' (an area of 10,880 ha) and 'Kitete' (an area of 10,505 ha) described as 'Final survey and EIA completed in October 2015, awaiting EIA certificate issuance. Title deed processing is expected to start as soon as confirmation provided by the government' (Green Resources, 2018: 12). Together with the 6,647 ha for 'Uchindile I' (ibid: 12) – and assuming these areas fall within Uchindile and Kitete boundaries, this would see GRL's investment area for Uchindile and Kitete total 28,032 ha, representing 35.4% of land in those villages.

The chapter has three sections. First, I consider the environmental framing of these investments. Then I consider their direct impacts on the development of local communities. Finally, I consider the contribution of carbon payments, before turning towards the larger and wider dynamics that have resulted, discussed in chapter 6.

The Company that saved the Environment?

In chapter 2 we saw how degradation narratives and multi-win neoliberal narratives are pervasive and often used to strengthen one another. We see these stories are deeply embedded and deployed as tools in the private sector company GRL's presence and activities in Kitete and Uchindile. One of the framings used by GRL here is that they are an *environmental steward* of the land - providing a 'triple-win' for the company, their shareholders, the local community and for society as a whole - by generating profit, providing community benefits or 'development' and delivering environmental benefits.

From their own website and company documents, GRL is described as:

> *'the leading plantation, carbon offset and renewable energy company in Eastern Africa. Green Resources AS are conducting reforestation activities in a number of locations in Tanzania, Uganda and Mozambique, with the purpose of deriving revenue streams from the sale of carbon offsets and timber, whilst simultaneously bringing community and environmental benefits.' (GRL 2012: 3)*

Note firstly that GRL make explicit claims of 'reforestation' specifically, as opposed to afforestation or tree planting. They claim to be restoring trees that have been lost to the landscape. I explore this further below. Additionally, here the generation of revenue appears to be centred as the primary purpose, with community and environmental benefits mentioned as simultaneously arising, but the implication is that these are secondary benefits.

GRL use narratives of repairing and restoring 'degraded' land - in an area of 'unproductive grasslands':

> *"The area is degraded grassland from frequent anthropogenic caused fires" (GRL, 2013a: 8)*

> *"Approximately 40-50% of the total area will be converted to plantations; these areas are currently unproductive grasslands with no prior economic activity". (Green Resources, 2012: 12)*

Similarly, the project description on the VCS website cites 'anthropogenic-led wildfires' as being the leading cause of 'dying trees' reducing the area to grassland:

> *"The area has been degraded grassland due to frequent anthropogenic-led wildfires that have plagued the area resulting over time in the trees dying leaving only grassland" (VCS project database, 2020)*

GRL positions itself as providing a multi-win remedy to this environmental decline: rehabilitating the local ecosystem; educating and encouraging the local community to participate in this caretaking of the local environment; and actively restoring the past health of the landscapes. The scale of this is important, as GRL are tapping into narratives that operate both at a local landscape level by regenerating degraded grasslands, and at a global level by tackling climate change through the carbon-sequestering properties of trees (formally captured through the carbon credit mechanism).

A central part of understanding the framing of land in Uchindile and Kitete, is understanding the different perspectives on the status or nature of the land being used by GRL. Whether the nature of the land is perceived or framed as 'degraded', 'underused' or 'spare' plays a large role in the way GRL's investment, activities, and consequent impacts are interpreted and represented. According to GRL, the Uchindile Forest Plantation is part of a VCS certified project that is 'reforesting degraded grasslands' (GRL, 2013) or converting 'unproductive grasslands' to plantations.

There are two aspects of these claims that warrant our attention. First note how the language used attributes blame for the problem to local communities. Several choices of words are significant here. '*Frequent anthropogenic-led wildfires'* is the phrase that hints at blaming the local communities for causing fires which have 'degraded' the land and resulted in trees 'dying'. Similarly *'plagued'* – is an emotive word, with negative connotations, that gives the impression of a 'diseased' or 'ill' landscape that needs to be 'treated' or 'cured'. *'Only grassland'* [my emphasis] – implies that grassland is without value - especially as they apparently hosted '*no prior economic activity*'.

The claim of 'no prior economic activity' is starkly reminiscent of the narratives of 'unproductive' grasslands described in the literature (see e.g. Leach and Mearns, 1996). My data suggest this is unlikely to be true. For example, collecting grasses for roofing, and hunting are economic activities associated with grasslands. There was mention of the uses of grassland during focus group discussions, such as for roofing materials:

> *"people depend on grasses to roof their houses." (FGD K3, R2)*

From the household survey data, 67% of households surveyed across Kitete and Uchindile indicated that they collected thatching grasses (n=70). There was substantial discussion around hunting[50] in grasslands being a major cause of fire across various data collection methods (SSIs, FGDs, HHSs, TWs):

> *'Hunters…burn grasses to clear [the] area to see animals clearly' (HHS U082)*

> *'it is the hunters who burn in the lowland areas' (SSI U03)*

> *'another cause of fire…is that there are still people…hunting; people might burn somewhere so that they can easily get small animals' (SSI U10)*

[50] Hunting was typically talked about in the context of its illegality, or when discussing illegal activities. It is therefore important to consider the possible limitations of this data due to potential discomfort with discussing illegal activities.

'sometimes small hunters…start fires to get animals to run so they can hunt them' (Discussion with key informant, TW U1)

'lots of hunters there [in grasslands] because lots of animals there' (FG U5, R5)

From these statements we can clearly see that hunting is a form of economic activity that takes place in grasslands. This does not mean that local villagers were necessarily the actual hunters using these lands - indeed they may have resented hunters' work and their burning. But the point remains that grasslands were being used by some rural groups and therefore GRL's claim that the grasslands were 'unproductive' with 'no prior economic activity' is incorrect.

The second aspect of GRL's framings is the assertion that fire is a problem. We will return to this in more detail in chapter 7. But note here that the statements highlighted above show clearly that fire is recognised by local people as being used as a resource management tool (or a livelihood tool). The statements also show that the value of fire as a management tool is contested locally: what's good for hunters is not necessarily good for people collecting grasses (or indeed for those growing trees). It is also worth noting here the othering of those who use fire as a livelihood tool visible in the statements just quoted above. The statements above explicitly position those who use fire as being hunters – other people but not the person speaking. This distancing and othering is characteristic of conversations relating to fire, and we explore this further in chapter 7. One respondent suggested that those using fire for hunting purposes are in fact people (specifically men) both from outside *and* from within the village:

'hunting start[s] bush fires which can destroy the environment.…men from inside and outside [the] village…start bush fires to clear land and see animals better' (HHS U077)

This hints that at least some of those engaging in hunting activities, and using fire as a livelihood tool, are likely to be closer to home than many feel comfortable letting on[51].

Also note here the assertion from GRL that, because of fire, the area has changed from land with some kind of forest cover, to grassland (and the negative connotations associated with this shift). However local environmental histories dispute this idea. The topic was probed at various points throughout the FGDs and SSIs where the issue arose in conversation without prompting (typically in the context of discussing the changes GRL has had on the environment). There seems to be a tentative consensus that the 'grassland' areas have always been 'bare' or without trees – at least in the collective memory of the community.

'Before planting trees, the land itself was bare, had no trees from those slopes, and therefore it was not the way it is today, after planting trees' (SSI K5)

"In the past the whole area did not have trees" (FGD U1, R1)

[51] We will touch on potential reasons for this othering later but for now suffice to say they are likely to be layered and will of course be informed by people's levels of (dis)trust and (dis)comfort when speaking with myself as a foreign white outsider undertaking research.

These local histories matter. GRL describes its work as 'reforestation' - i.e. a return of land to its previous state (cover), to some extent undoing the problems of unwelcome anthropogenic change. It a quite different activity from afforestation, which signifies a new and not necessarily 'natural' land use on a landscape. Afforestation, when connected to foreign investment (particularly in relation to carbon credits, or carbon offsets) runs more of a risk of invoking connotations of foreign private, national or international actors imposing a 'foreign' change on local environments and local communities. Reforestation provides a more sympathetic and benevolent framing than afforestation. It helps to elide over the problem that whatever the recent histories of landscape change, the species now being planted are exotic species, and usually planted in extensive monocultures. These practices are not so consistent with the notion of an environmentally friendly company returning the landscape to its former glory.

Irrespective of its historical validity 'reafforestation' is part of a framing by GRL of its activities as environmentally beneficial, suggesting that the company's activities will improve the ecological status of a previously degraded landscape. Note the audiences of this particular framing. They are clearly not local as it is unlikely that many of the local residents would have either the access to, the inclination to seek out, or the ability to understand GRL's website and documents, which are written in English. Rather this material is more likely to be targeted towards national, or more likely, international actors, and will have been carefully formulated to fit in with the 'triple win' environmental-developmental hero narrative they present to shareholders, governments, NGOs and environmental interest groups[52]. Specifically, many of their publicly available reports are geared towards achieving FSC accreditation, reaching carbon-credit status approval and presumably promoting their self-proclaimed status as 'Africa's leading forestation company'.

Some observers have been concerned about the veracity of GRL's claim to be reforesting degraded grassland. TimberWatch, in their 'CDM carbon sink tree plantations in Africa: A case study in Tanzania' report, argue that the term 'degraded' is deliberately misused by GRL in order to disguise the destruction of a natural ecosystem by converting much of it to monoculture tree plantations.

> *"The word 'degraded' has been used repeatedly in documentation and publicity material pertaining to GRL's tree plantation projects in East Africa to describe the grasslands there. But is its use appropriate for the Uchindile, Mapanda and Idete grassland areas?…The Blue Swallow (Hirundo atrocaerulea) can be seen as an indicator of healthy montane grassland. These birds are dependent on healthy grassland for feeding, and the destruction of their habitat by tree plantations will guarantee their local extinction…the meaning of 'degraded' as intended by GRL is not applicable…words like 'subclimax', 'recovering', or 'disturbed' could better describe those grasslands"[53] (TimberWatch, 2011: 62).*

[52] Indeed, a presentation given by Mads Asprem (founder of Green Resources in 1995 and CEO from 2007-16) to a workshop on Large-scale Land Acquisitions in the South hosted by the Centre for Land Tenure Studies (CLTS) NMBU, Norfund and Statens Kartverket in November 2012, was entitled: Plantation WIN-WIN (Asprem, 2012).

[53] Although this report is focused on the Idete area of investment (and is geared towards preventing the land acquisition in Idete), it refers to 'Uchindile, Idete, and Mapanda' together and seemingly interchangeably. GRL

But, while there may be inconsistencies and contradictions in these framings, the most important point is to consider what these framings can mean. The key questions here are '*unproductive for whom*?' and '*How is unproductive defined?'.* Uses of land, and intentions for it, are multiple. These framings work because they are generalisations, but may, for that reason, fail to reflect the variety of village practices.

The Company that brought 'Development'?

There seems to be a strong case that the presence of GRL has significantly contributed to the some aspects of prosperity in the two communities I studied. There is widespread recognition of direct and indirect individual benefits from GRL, including: salaries from employment, and attendant improvement of houses; transportation; increased demand for goods or services sold; education; health services; seedlings; and building community infrastructure such as classrooms and a dispensary. Appendix 2 houses an exhaustive list of the different responses detailing the direct and indirect benefits received, and the frequency with which they occur. I discuss some of these in more detail below.

A key specific indicator mentioned by both GRL and local residents is housing structures in villages – specifically the number of houses that now have *bati* (corrugated iron) roofs and improved wall materials. Respondents talked about how income provided by employment opportunities with GRL, or from planting their own trees, has enabled them to invest in housing improvements as a point of development in the communities. Several key aspects can be drawn out. Firstly, that because of GRL's activities, people are able to build improved houses, or make improvements to their existing homes:

> *"People have improved [the] standard of houses" (FGD U6, R3)*

> *"they have got employment – people around have got employment, which has improved their living standard, including building good houses compared to before the coming of GRL." (SSI U2)*

> *"GRL has helped…a lot, changing [our] situation – the whole life of Uchindile giving work and getting salaries so people can build better houses…" (SSI U9)*

> *"Because the salaries or the wages that they get from GRL, the community have improved either – they had no corrugated iron sheets for roofing, burnt bricks, solar, good houses…" (SSI U6, GRL representative)*

We see that people are able to do this as a direct result of the wages they receive through employment or casual labour from GRL directly, but also from income derived from planting their own trees:

project documentation corroborates the existence of this particular (endangered ICUN red list) bird species in the Uchindile area.

"[people] have got knowledge from the GRL company, and given the advantage of planting trees, people have planted trees and got a lot of profit [money] from the trees. For example, previously there were not a lot of good – iron sheet – houses, but today you can see there are a lot of good houses which are iron sheet roofed." (SSI U5)

"Tree planting has brought so much change because changed from traditional huts to semi-permanent houses" (FGD U5)

Young people were identified particularly as perceiving to benefit as they are now able to build *good* houses as a result of GRL's activities:

[In discussion of impact of GRL]: "villagers, young people, are building good homes" (FGD U1, R6, village official)

Young people could have been singled out here due to the fact that they are most able to take advantage of opportunities for employment or wages for what is often very physically difficult or tiring work, or because young people are at the stage of their lives where they are building houses to start their own households and so can make use of the capital acquired from their labour into building improved housing, rather than relying on more traditional housing materials.

Improved housing was an impact that was discussed markedly more in Uchindile compared to Kitete. This difference makes sense: as outlined in Chapter 4, while Kitete and Uchindile are adjacent villages and share many similar characteristics, they are also quite different. Kitete is more remote and less well connected in terms of transport, roads and access to markets. It has far fewer residents and households: an estimated 54 households as of 2009, compared to 257 in Uchindile. It covers a geographically smaller area (roughly half the size: 25,660 ha compared to 53,531 ha in Uchindile), and given just how much smaller its population is, Kitete also has a much lower population density.[54] The landscape in Kitete appeared hillier and more difficult to traverse, with smaller valley bottoms for farming. GRL arrived much later in Kitete compared to Uchindile: many respondents reported that where GRL started involvement in Uchindile in 1997, it was not for another 5-10 years until they expanded operations to Kitete. Notes from discussions with key informants in both Kitete and Uchindile highlight these differences:

"The difference between Uchindile and Kitete's development is because GRL arrived earlier here [Uchindile] which stimulated development" (Discussion with key informant, TW U1)

This is the difference between here [Kitete] and Uchindile; there are very few farmers here. Most people here are not indigenous; they come here for 2-3 years for work and then leave. Compared to Uchindile, people farm here less because GRL came and they stopped farming to do work [for GRL] and for the small investors that came afterwards. … There are more opportunities there [Uchindile] for business – here, who will buy? … [in Kitete] hills are much steeper and closer together here than in Uchindile." (Discussion with key informant, TW K1)

[54] Based on simple calculations from data in Uchindile and Kitete VLUPs obtained during fieldwork (VLUP, 2009a; VLUP, 2009b)

This contrast is also borne out in analysis of survey data. Table 5.1 below shows a summary of the housing materials used by households in Uchindile and Kitete, and compares house quality in the study sites with the national average from Tanzania Household Budget Survey (HBS) data.

	Kitete	**Uchindile**
Walls		
traditional	18	13
modern	17	22
% modern	49%	63%
HBS % modern 2011/12	46%	46%
Roofing		
traditional	16	11
modern	19	24
% modern	54%	69%
HBS % modern 2011/12	68%	68%

Table 5.1 – comparative house quality. Source: HHS data QB101, QB102; HBS data (URT, 2013).

As can be seen in the table above, house quality in Uchindile is marginally better than in Kitete. The HBS comparison gives a national average for urban and rural areas together - this suggests that Uchindile is above average for rural Tanzania in both wall and roofing respects, and that Kitete is above average with respect to wall construction. The quality of housing (as measured by housing materials) is an important indicator of household wealth in Tanzania (Brockington, 2021; Howland et al., 2021). This was also borne out in the wealth ranking exercises, where housing materials were identified as key indicators for each of the main wealth groups[55]. Data from multiple different sources in my fieldwork (surveys, focus group discussions, and semi-structured interviews) suggests that improved housing quality has already been a significant material gain from the presence of GRL in Kitete and Uchindile, and therefore that there has been a positive impact on the wealth of local residents.

Another key indicator of development arising from GRL's activities is arguably the improved infrastructure. Roads were improved (widened and levelled, in some areas gritted) thus developing communication networks and physical connectivity to surrounding areas and more major roads connecting the area to the rest of the district:

> *"[GRL] also have built roads" (FG U6, R2)*
>
> *"GRL has helped us get transport out of the area." (FGD K7, R2)*
>
> *"The road was built by GRL, it's important for transport because it connects us with other villages." (FGD K5, R2)*

[55] Other key indicators included: the number of meals people were able to consistently eat per day; ability to send children to school; household assets such as owning a solar panel, mobile phone, sofa, bicycle, etc; other household quality indicators such as improved internal flooring, painted walls; size of land have planted trees

"[GRL] built roads to Mgololo and [the] school" (FG U8, R5)

They also built community buildings including the construction of a dispensary, school classrooms, and living quarters for those delivering services in the area (doctor's quarters and teachers' residence).

"GRL came to the area in 1997…they built classrooms, help with health [and] improved the roads" (FGD U1. R1, R3, R4, R6. FGD with village officials).

"They built a dispensary, quarters for doctor, village office. We are doing well from GRL." (FGD K1, R3. FGD with village elders / village officials)

"GRL has helped…a lot, changing [our] situation – the whole life of Uchindile, giving work and getting salaries so people can build better houses and also to build the teachers quarters" (SSI U9)

"Because the salaries or the wages that they get from GRL, the community have improved…[before GRL] they had no corrugated iron sheets for roofing, burnt bricks, solar, good houses…for institutions like secondary schools or primary schools or the dispensary, therefore the GRL being in Uchindile particularly, they have improved those structures and…the livelihood of the community." (SSI U6, GRL representative)

We must recognise that 'community' buildings and roads will not benefit everyone equally. Schools benefit school children and their parents most directly. The location of schools and health facilities are also significant: if you live further away from where these facilities are built, it is harder for you to access them. Improved roads benefit most those with their own transport or access to it. Wealthier individuals both within the villages, visitors or prospective investors from outside the villages, and company executives or workforces themselves are likely to be able to make most use of (and stand to gain the most from) the improved connections to the areas for tree plantations and for travelling out of the village, as they are most likely to have access to vehicles to make use of the roads.

While many referenced the company putting on transport for workers needing to get to GRL plantations, for teams addressing the risk of fires, and also for those needing to access hospitals, all these uses are either beneficial for the company (in the case of picking up workers and transporting the fire squads), or are dependent on the good will of the company. Having the option of quicker transport in the case of emergencies is powerful, but it can also amplify the power of those with access to cars and attendant inequalities for those without. Additionally, which roads are developed and which places they connect is going to be largely determined by the routes that will support the company's economic activities. So even the improvement of roads is not as straightforward or universal as might first appear.

Having witnessed the changes described above, respondents also expressed hopes and expectations for continued development of the area into the future:

"[A]s you can see, they [GRL] have improved the roads, building school, dispensary… In the future there will be a great development in this particular area." (SSI K4)

"GRL has helped [us] a lot, changing the situation – the whole life of Uchindile" (SSI U9)

As highlighted in the illustrative quotes above, some local residents viewed GRL as bringing widespread change to their environs (changing the 'whole life' of the village). Chapter 6 explores the broader impacts of GRL's investment and how they have unfolded but for now it is worthwhile noting that GRL are perceived by a vast majority of respondents to have brought significant widespread change to the circumstances within with Kitete and Uchindile residents live.

One of the means by which these changes were brought about was through the employment the company offered. Employment and wages are a central benefit of the presence of GRL identified across the vast majority of respondents spoken to in Kitete and Uchindile:

"There has been a big benefit for people. First, they have got employment – people around have got employment which has improved their living standard." (SSI U2)

"[the main impacts of GRL being here are] good because people...are getting employment. Before people were getting trouble because they had no money, but GRL… are giving money after working." (SSI K3)

"Through GRL [people] get employment" (FGD K2, R5)

"GRL has helped us get…employment for all people." (FGD K7, R2)

"because of income – [GRL is] so important to people here" (FGD U5, R1)

The employment offered by GRL represents a dramatic change in the livelihood options open to the local communities. The company's need for large amounts of casual labour provides some diversification to livelihood portfolios for communities that were previously focussed on small-holder farming. Employment, work and jobs were discussed and emphasised as being a major impact of GRL: these discussions took place across the majority of focus group discussions,[56] as well as being identified as a benefit from GRL in many household survey responses. Table 5.2 below shows a summary of the numbers of respondents who detailed the direct or indirect benefits that they received from GRL.

	Kitete	**Uchindile**	**Total**
Identified benefit(s)	29	24	53
No / don't know	5	10	15
Didn't identify company	1	1	2
Total	35	35	70

Table 5.2 Individual benefits from GRL. Source: HHS data QB807-A

[56] Employment or paid labour was raised as a key benefit of GRL's presence in the following focus group discussions: FGD K1; FGD K2; FGD K4; FGD K6; FGD K7; FGD K8; FGD U1; FGD U4; FGD U5; FGD U6; FGD U7; FGD U8.

Respondents reported that GRL offered the opportunity to work and earn an income for anyone who was able and willing to work. While paid labour is not completely new to the area – TAZARA offered limited labour too, such as repairing the railroads – it was unprecedented on the scale that the work was offered (much more was demanded than previously), and that no particular skills were required for the most basic casual labour. While it was not possible for the sick or old to take advantage of these opportunities many people seemed generally happy and satisfied with the fact that GRL's presence gave them the opportunity to get paid work.

Survey data gives us another snapshot of the uptake of employment or labour with GRL across Uchindile and Kitete. Table 5.3 below sets out the main occupation of the household head for each household surveyed in the study sites.

Main occupation	**Kitete**	**Uchindile**	**Total**
Farming	20	28	48
GRL	6	3	9
Tazara	7	1	8
Other	2	3	5
Total	**35**	**35**	**70**

Table 5.3 Main occupation of household head. Source: HHS data QA205

Initially, although there are a number of people who main occupation is given as being GRL, the majority of respondents have indicated that the main occupation of their household head is farming. However, when we look at people who say they have received income from different sources, without or without being employed, the picture shifts slightly. This is probably a more reliable measure, especially given the often casual nature of work provided by GRL. Table 5.4 sets out different sources of income reported for households by respondents.

Source of income	**Kitete**	**Uchindile**	**Total**
None	2	17	19
GRL	19	12	31
Tazara	11	2	13
Other	3	4	7
Total	**35**	**35**	**70**

Table 5.4 Income from paid work. Source: HHS data QB801-1

We can see that, while farming remains the main livelihood, GRL provides a source of income for a significant proportion of households, particularly in Kitete, where over half of surveyed households reported earning income from GRL over the 12-months prior to the survey.

	Kitete	**Uchindile**	**Total**

About the same	12	12	24
Much poorer	0	2	2
Poorer	2	10	12
Richer	21	11	32
Total	**35**	**35**	**70**

Table 5.5 has life improved? Source: HHS data QB213

Table 5.5 shows how the wealth of households are reported to have changed over the last 10 years. While the picture in Uchindile is mixed, what is striking here is that a majority (60%, n=35) of households surveyed in Kitete viewed themselves as having grown wealthier over the preceding 10 years. Only 6% reported that they were poorer (n=35). Five of these respondents explicitly attributed this increase in wealth to either GRL specifically or to tree planting.

These data suggest that life has improved for much of Kitete, with many respondents reporting that they consider their households to be richer. This evidence appears to demonstrate that having a company like GRL operating as an employer, particularly in a more remote village like Kitete, can make a positive difference to wealth and life. These changes in wealth appear to fall across a variety of different households – ones that with indicators of being poorer and ones that have indicators of being richer – households across the spectrum of wealth in both Uchindile and Kitete reported being better off.

Many respondents sought to emphasise that there was no discrimination on the part of GRL in terms of who they gave work to:

> *"GRL is a big company which involves experts, skilled and unskilled people to be employed there, so there are people who are experts on forest, and there are villagers who have no knowledge, who are not experts…and therefore these two people differ in salary…and for example, the supervisor - he gets more salary compared to the person who maybe has very difficult work…[for] those departments, there is no education; it's just the appearance of a person…[it's] the experience of a person and their accountability of an individual person - hardworking person." (SSI-K1)*

> *"Everyone is affected [by GRL] in the same way. GRL is there – if you are strong enough to work, if not, maybe out of illness, [but] the option is there." (FGD U6, R3)*

> *"Employment to do with planting trees: employment is very important. Any person, even without education can be employed – skilled or unskilled – for example can plant trees for GRL or for small investors." (FGD K7, R3)*

However even within these illustrative statements emphasising the equality of opportunity in earning income from GRL, we can see hints of inequity. These statements suggest that within the 'skilled' roles available a certain level of education is likely required, and that within these role and in comparison to more 'unskilled' roles, there will be hierarchies of compensation. These hierarchies will typically not only involve the level of compensation for labour, but also the type of contract offered (if any) and the rights that a worker will be entitled to, both from a GRL policy perspective but also under Tanzanian

labour laws. Further, mention of 'the appearance' of a person or their accountability in reference to how much someone might be paid suggests a level of discretion available to management hiring people. These sorts of arrangements could then be open to influence by well-connected or locally powerful individuals, which could indicate a level of elite capture for working opportunities. Again, these are not factors that are unique to GRL, but instead are common struggles faced by workers across Tanzania and beyond. But they are important and worth noting because they add texture to the seemingly straightforward benefits brought by GRL.

Respondents also pointed to GRL's presence and activities as being particularly beneficial to young people, by providing them with employment:

> *"[The] youth got employment and even increased [the] economy so people were able to send their children to school" (FGD K1, R5. FGD with village elders/government)*

> *"most of the workers, the manpower over there [at GRL], are youths" (SSI K7)*

> *GRL play a big role. First of all the young people have got jobs. They have been employed with the company. (SSI U1)*

> *It has helped much with young people to get employment from GRL, which has helped to improve their life standard. (SSI U7)*

Furthermore, GRL was identified as being a key driver in retaining young people in the area by providing them with jobs and opportunity:

> *"Without GRL the youth could run from this place, they could move from this area maybe to search for employment somewhere else." (SSI U9)*

> *People have got employment…and people have got knowledge on planting trees, and even the indigenous – the youth are not moving out of this place because they know there are jobs – after maybe going to GRL, they can get a job. (SSI U3)*

This is explored further in chapter 6, but here note that while on the one hand this selection of quotes demonstrates how the presence of GRL can impact migratory patterns by keeping young people settled in the area by providing them with work, it also hints at uneven distribution (or take up) of employment or labour opportunities. Younger labourers might be attractive to companies, perhaps because they may work for lower wages or because they may be able to do more physically demanding work (including travelling longer or more gruelling distances to get to work). One possible corollary of the majority of workers being young people is that those that are older, or less physically able, are not able to similarly exploit these opportunities offered by GRL.

The narrative of a previous tendency of young people to move away from the area is supported by village statistics as quoted in NGO reports:

"roughly 1500 people were counted…in the Uchindile Project area population (Uchindile and Kitete)…in the 1994 EIA, compared to 1,274 in the 2006 Village Executive Committee count due to out-migration as young people seek new cropland (NomoGaia, 2009: 14)

There were some concerns raised by respondents about low pay and the substantial difference between the status and treatment of casual and permanent workers:

"These people who are employed there [at GRL], the money which they get is little [compared] to the reality of life – which cannot sustain their life." (SSI U3)

"There are people who are not satisfied with salaries" (FGD K8, R1. GRL worker)

"Lots of hard work…and low salary compared to cost of life" (FGD K8, R2. GRL worker)

There were some more critical takes on this particular aspect of GRL's impact expressed, emphasising respondent's understanding of GRL as a (private sector) company with the power to:

1) Withdraw employment opportunities to specific individuals:

"GRL is a company and can sack or fire you" (FGD K2, R4)

and

2) Withdraw employment opportunities from the community as a whole (by ceasing their operations or leaving the area):

"[if the investor leaves] they [local residents] can get no money! Where can they get money!?" (SSI-K3)

"GRL made lots of people come here to get employment. If the company leaves, the people will migrate away again and leave a very few indigenous people here and will stop development" (FGD U6, R6)

This recognition of GRL's power to hire and fire 'at will' is something further discussed in the in-depth analysis of employment rights (or lack of as the report views it) undertaken by NomoGaia, a human rights charity. In their report 'Green Resources Human Rights Impact Assessment' they discuss what they term "negative human rights impacts" (NomoGaia, 2009: 5) and "rights violations" (NomoGaia, 2009: 67) in the Kitete and Uchindile area.

"The Rights to Favorable Working Conditions, Health, Nondiscrimination, Freedom of Association, Housing, Adequate Standard of Living, and Education are negatively impacted by the project." (NomoGaia, 2009: 5)

As part of the human-rights analysis they undertook in 2009, NomoGaia concludes that one of the key human rights issues they identified was around hiring contract workers:

"Contract workers are not entitled to the same benefits as full employees. With neither sick leave nor maternity leave, workers are essentially penalized for becoming ill or pregnant. Additionally, workers have no job security." (NomoGaia, 2009: 84)

"The vast majority of the Company's workers are considered contract laborers. The Company has stated that this is a cost-cutting measure, but it was less forthcoming about the extent to which these laborers are full-time workers. That the same workers get rehired systematically, work for months and years on end, have housing on site and consider themselves GRL workers creates a gap between the reality of their situation and their treatment as laborers. Pay is naturally low in weeding, watering, and plant care work, but laborers expressed concern about certain conditions that seem particularly onerous, more in sum than individually. Workers endure job insecurity as temporary laborers but are additionally dislocated from families and support networks, all while lacking the stability of a full time job and the more inclusive entitlements that accompany. Collective bargaining is not effective for a workforce that can be laid off at any time – it is possible that workers hesitate to ask for too much out of fear that a less demanding worker will replace him/her in the coming harvest season. Additionally, contract laborers receive no sick pay, maternity leave or termination benefits. Workers are paid for the days they work – a sick or pregnant worker loses all income for the days missed. Furthermore, promotion to "permanent employee" is something that happens seemingly arbitrarily (though only to longstanding workers). Laborers do not know how long they must work as "temporary" hires before they can enjoy the small benefits of permanent employment, including a steady income." (NomoGaia, 2009: 67)

"Workers have expressed fear that speaking ill of the Company will cost them their jobs." (NomoGaia, 2009: 61)

"At Uchindile, we've found that many of the human rights risks we identified in 2009 are remedied in one location but relocated to another. At Uchindile workers sleep one-to-a-bed. At Kitete II, 12 men are stuffed into each room, sharing grimy mattresses with at least one other person. Some of the remedies instituted by the company (supplying two meals to workers per day and regular transport to work sites, to respect the right to food and favorable working conditions) are only instituted for part of the year...[one worker] walks 10 km each way to the fields every day (on rain-slick mud, in the dark) to avoid sleeping there. Beyond the partial-remedies which need to be monitored, new rights risks are also arising. As forestry acreage increases, land stresses have developed in local villages. At one community, eight land disputes are now running between longtime residents and new arrivals over who holds the right to use lands. In another, the massive expansion of forestry (both by Green Resources and new copy-cat businesses) has pressed wild animals closer to village crops, resulting in major crop losses". (Salcito, 2014)

The allegations above can be summarised as follows:

- The creation of an uneven, two-tier system when it comes to benefits workers receive, with temporary workers having no paid sick leave, maternity leave, or termination compensation;

- a practice of systematically rehiring contract workers who are in effect acting as part- or full-time employees but without the rights and job security permanent contracts would provide;
- a culture of fear of speaking out against working conditions – both individually and collectively; the existence of ad hoc and untransparent promotion processes or pathways to more permanent employment;
- inadequate food and rest provisions for those who relocate to temporary accommodation provided by GRL as the work requires it; and,
- the generation of land stresses and crop loss as a result of forestry expansion from GRL's activities.

There may well be substance in these allegations. The latter issues of land stresses and crop loss are explored in more detail in chapter 6. However at the same time the labour conditions described here are common to casual labour in much of Tanzania (and indeed globally). When poor Tanzanians work for their wealthier neighbours they are paid minimal rates (2-8000/- per day) with no job security. Workers who live on the farms where they work are given only rudimentary accommodation and food. GRL has replicated existing working conditions, rather than introduced them.

My point is not that these practices are acceptable, simply that if we were to gauge the impact of this employment it is important to view it from the perspectives of the Tanzanians who are performing the work, as well as these international standards. Local perspectives are more likely to be shaped by prevailing local practices. In this respect it is important to emphasise that respondents were generally positive about the employment opportunities provided by GRL for the local communities[57]. Although it was widely acknowledged that tree planting work was often hard physical labour and long hours with traveling to sites, they viewed the private investment as being the key catalyst for development in the villages, and to improvements to their lives. This is demonstrated clearly in Kitete, which – due to differences outlined earlier – experiences an 'exaggerated version' of what is experienced by Uchindile. So while GRL has had presence for almost a decade more in Uchindile, and there has been more time for the impacts from their activities to be realised, in Kitete their presence appeared to be relatively more significant, although impacts such as the effect of the opportunity to earn wages with GRL and then invest in improved housing, were at an earlier stage.

Recent data from GRL on the number of workers in Tanzania undertaking different types of employment suggests there may have been a shift from directly employing workers via casual labour to employing workers for this sort of work through a third party or contractor agreement (GRL, 2018, 2021a). Table 5.6 shows the number of workers under different employment types with GRL in 2018 and 2021[58].

[57] It is worth caveating this with the note that while I tried to speak to as many GRL workers as I could, they tended to be more difficult to coordinate speaking with due to their work and the distance to the GRL tree farm, and there were likely more marginalised groups of workers who did not reside in the village who I was not able to speak to. This was particularly pertinent as at the time of fieldwork the focus of the research was still evolving, as discussed in chapter 3, so speaking to GRL employees had not initially been a priority. This therefore limits the extent to which I can comment with authority on workers satisfaction with GRL employment, beyond those that I spoke to.

[58] These numbers are for Tanzania as a whole, and therefore aggregate data for Uchindile Forest Plantation along with that from GRL's other Tanzania operations. No further disaggregated data was publicly available at the time

Employment type	2018	2021
Permanent	114	56
Seasonal/temporary	186	2
Contractor/third-party	No data	169

Table 5.6. GRL employment type in Tanzania. Source: GRL (2018, 2021a)

We can see a significant contrast in the number of temporary workers employed by GRL in Tanzania in 2021 (2 temporary workers compared to 169 employed via third party contracts). Compare this to the 2018 company report (GRL, 2018: 14) where there was no disaggregation of third-party labour, but the temporary numbers were 186. The comparison between permanent employees of GRL in Tanzania between 2018 and 2021 were also quite different: the number of permanent employees with GRL in Tanzania in 2018 was 114; in 2021 this had fallen to 56 (GRL, 2021a: 24).

In their 2021 report, GRL explains the third-party contracting arrangements as follows:

> *"the company indirectly employs…people during peak season through a system of contractors. [C]ompanies (contractors) provide various services to the company (indirectly employed by the company). The contractors' employees fluctuate due to seasonal activities such as planting, weeding and/or fire protection services. Most of the contractors' employees are from the surrounding communities with some contractors, this number is as much as 100%; however, this number is typically lower for specialised work." (GRL, 2021a: 24).*

There is no mention of such arrangements in the 2018 report. Of course, we cannot assume that the figures relating to seasonal/temporary workers in 2018 did not include workers contracted through third-parties or contractors, but not categorised in reporting as such. This may have been the case, although there was no mention of third-party contractor arrangements by GRL or local residents during conversations in my fieldwork (which doesn't necessarily mean that they didn't exist in 2018 or previously, but is worth noting). It also may be the case that there has been a significant restructuring of the types of employment arrangements that GRL has with its workers.

Either way, it seems that the vast majority (75%) of GRL workers in Tanzania are now under third party/contractor arrangements. Whether this constitutes a material change in labour arrangements is impossible to know for sure without further detail and investigation locally. If there are material changes, these may be positive for workers and may constitute improved working conditions and / or employment rights. It may not alter them on a day-to-day basis for workers at all. It may negatively impact them. If changes do exist, they could be mixed, or uneven for different workers. These material changes matter. However, what also matters is the way that GRL represents themselves. Reporting lower numbers of workers on direct temporary contracts, and more on indirect outsourced contracts, essentially outsources the responsibility for labour conditions and contracts to a third party. This could

of writing; but I don't believe this undermines the point I make here. Also note that the figures for permanent employment appear to be FTE numbers.

perhaps represent an attempt by GRL to distance themselves from any further labour condition critiques, and/or represent another cost-saving device.

One group who were perceived themselves as particularly benefitting from GRL was, interestingly, women. This was an observation that was raised by respondents in the female FGD in Kitete, and was then followed up on in one of the SSIs. The women talked about how this was the first work that was open to them too, (in contrast to the TAZARA work which appears to have been only or more primarily for men). They pointed out that it allowed them to earn their own money and do work outside of the household work and meant that they have money to do what they choose with it. Particular reference was made to how it enabled women to buy materials for or build their own homes, send their children to school and pay school fees, and buy things for the home.

> *"Individually, women here – especially here – had no source of money. Now we can get money from employment at GRL and other people employing permanently and temporarily…. A woman within a couple can share or even a woman can build her own house." (FG K6, R2. FGD with women)*
>
> *"We can now send [our] children to school." (FGD K6, R5. FGD with women)*
>
> *"GRL has helped a lot for women, because previously women had no capital. And after the coming of GRL, women now have employment with GRL - and at least they have capital." (SSI K4)*

New opportunities for earning money via paid labour opportunities is seen by some women to shift the balance of intra-household gender dynamics. This was seen as a consequence of women gaining their own stream of income or access to capital from working for GRL or other smaller investors, and was viewed by some women as giving them greater independence within their relationships and households:

> *"Previously women have had no work to do outside the house – but now it is equal between men and women." (FG K6, R1. FGD with women)*
>
> *"Women used to be dependent on their husbands - now more independent" (HHS 102, Kitete)*

Other respondents explained that the reason for their (female-headed) household's increase in wealth over the last 10 years was explicitly because of GRL[59]. Women reported now being able to send their children to school.

But this only reveals some of the complex picture. It does not tell us about the conditions of labour faced by women, or if they have similar opportunities at securing supervisory, managerial, or more skilled employment positions with GRL. Women are typically the primary caregivers for children in the home and this responsibility will undoubtedly limit their ability to exploit opportunities offered by GRL and the ensuing socio-ecological dynamics that have unfolded. Hard physical labour when pregnant

[59] E.g. HHS 109, HHS 103

or after childbirth is difficult and dangerous, if not impossible, and casual workers will not have access to paid maternity leave. Women may have benefitted from some aspects of GRL's activities, but these impacts will not affect all women in the same way, and they may not be able to benefit as much as men for a multitude of reasons.

This connects with evidence presented by the NomoGaia report, which flags up unequal opportunities for women within GRL, and argues that the company risks perpetuating the sexism inherent in the patriarchal rural Tanzanian society. Specifically, they noted the lack of opportunities for women in more senior positions in GRL, such as managers. However, the report does note that rather than specifically discriminating against women, or actively worsening their relative positionality and power, they risk having a more indirect role, reinforcing pre-existing norms.

> *Women also are more likely to miss hours of work to conduct farming and care for children. The disparity in income is significant. In August 2009, women comprised approximately 20 percent of the contract labor workforce at Uchindile and earned only 17 percent of the salary (August 2009 Payroll). (NomoGaia, 2009: 38)*
>
> *"Equalizing staff gender – highly imbalanced. GRL-employed women are sometimes empowered by the job (particularly single mothers), and sometimes oppressed by the low salary and mundane, hard work, which is compounded by responsibilities at home" (NomoGaia, 2009: 76-77)*

This gender imbalance in terms of senior positions is borne out by GRL documentation. For example, the 2021 GRAS Sustainability Report shows that 100% of management positions in GRL in Tanzania are held by men (GRL, 2021a: 24). The report also suggests that a similar percentage of women and men have permanent employment contracts (around 25-27%) in GRL's Tanzanian operations[60]. This report does not offer breakdowns of salaries earned.

However, the NomoGaia report did concede that some women were able to use labour opportunities to their advantage - particularly single mothers. This resonated with the data collected during fieldwork on this issue, particularly in Kitete, where a few individuals suggested that GRL's presence has been (or had the potential to be) capitalised on by some women, giving them opportunities to undertake paid employment or casual labour that hadn't previously been available to them.

A full gender analysis is not possible here. This aspect is, regrettably, not something that was built into the research design. But such dynamics warrant further exploration and disaggregation. It would also be valuable to explore how women who are heads of their household experience the impact of GRL, and how they are able to exploit the opportunities and respond to the challenges generated by the company's presence, compared to women living within male-headed households.

Despite this, these findings are still valuable as they show that some women felt their own fortunes had been improved by GRL's activities. It is my responsibility as a researcher, and a woman, to include

[60] The report does not provide a breakdown at the project level – only aggregated national operation figures are available.

and amplify the voices of the women I spoke with. These voices (particularly in Kitete) expressed that GRL had given them novel access to employment and capital, which had improved their level of independence and agency, as well as giving them money to invest in schooling and their own tree planting.

Carbon Livelihoods?

GRL has also given rise to forms of carbon-based livelihoods in these villages. This has manifested in two forms: firstly, as money channelled into village infrastructure investments arising from a percentage of revenue raised from the carbon credits element of GRL's tree planting activities; and secondly, in opportunities for local residents to leverage carbon markets through their own tree plantations. The first of these is discussed here, with the second discussed in chapter 6. Legitimate concerns are raised around the trust and transparency of payment calculations, and around who can access these opportunities.

GRL's plantation activities in the Uchindile ward involved accessing international carbon finance through the Verified Carbon Standard (VCS). GRL's Uchindile Forest Plantation (UFP) was registered under the VCS in 2009, and under this carbon certification GRL are "reforesting...7,000 ha of land…[in]...Uchindile...the project has shared 10% of the carbon revenues from the first carbon sale with local communities, which has been used for additional community development initiatives" (GRL, 2019). Uchindile and Kitete are mandated to receive 10% of GRL's carbon revenues from the UFP. A GRL Implementation Report (2013) explains

> *"GRL sold its first carbon credits from the Uchindile and Mapanda project in 2011, selling VCUs from the monitoring period of 2002-2008 under the VCS. 10% of the revenue from the sale of the credits was channelled directly back into the communities which have given land to the project. The communities involved decided what they would like to put the money towards and GRL then implemented this. There were some criteria which must be followed in this decision process; one of the criteria is that the asset must be a fixed asset which serves the whole village community" (GRL, 2013a: 50)*

It details that the final project for Uchindile was "two duplex teachers' houses at Uchindile primary school to accommodate four teachers…handed over to the community: September 2012" (GRL 2013a: 51-52).[61] For Kitete the agreed project was a "village office, including offices for village government members, land registry and village meeting space…handed over September 2012". (GRL, 2013a: 54).[62] The report acknowledges that there were some delays in the process, citing difficulties setting up village bank accounts. This chimes with some expressions of frustration about GRL being slow to deliver on their promises, and narratives of 'unfulfilled promises' that were heard during fieldwork. The report also explains that community carbon money was also used to carry out training and capacity building activities for different audiences in the communities – including HIV and AIDS awareness, occupational health and safety, gender awareness, and educational seminars on

[61] Picture 4.4. in chapter 4 shows a view of the newly constructed teachers' houses in Uchindile.
[62] Picture 4.6 in chapter 4 shows a view of the newly constructed village office in Kitete.

community woodlots and plantation management (GRL, 2013a: 61). It is not immediately clear from GRL reports as to the exact monetary value of this 10% of carbon revenues.

As well as statements made in GRL documentation, local residents and GRL employees referred to either 'a percentage' or sometimes specifically '10%' of money from carbon payments being received by villages.

> *"When the company entered into the business of carbon, I think that 10%...is given to the village, and I think that….that money they get from the carbon trading they have to invest in a community projects." (SSI U6, GRL representative)*

Table 5.7 summarises the number of respondents in household surveys who reported benefits from the carbon project.

	Kitete	**Uchindile**	**Total**
No / don't know	7	10	17
Yes	27	24	51
Yes, later	1	1	2
Total	35	35	70

Table 5.7 Collective benefits from GRL – payments or in-kind benefits from carbon project. Source: HHS data QC307-B

From the above we can see that there is generally widespread recognition that the village collectively has benefitted in the form of contributions to infrastructure from GRL. Appendix 3 provides an exhaustive list of the descriptions given by respondents about the payments or in-kind benefits they had understood to have received from GRL for carbon. While there was lack of clarity from some local residents as to exactly what form this had been received in, the broad consensus was that a lump sum of that money had been channelled into community development projects - such as the construction of a village office and teachers' quarters. Many respondents, particularly in Kitete, were quite precise about the building constructed being a village office. However, as GRL has also been involved in construction of other community infrastructure outside of the 10% carbon payments, sometimes these were (understandably) conflated.

Most residents surveyed were unclear as to the exact percentage of money that GRL was paying the communities under this carbon revenue and the value of this percentage. Two respondents mentioned 10% explicitly in the HHS; 5 respondents in Kitete referenced a figure of 10m/- for village building construction; and 3 respondents in Uchindile referenced a figure of 75m/-.

Some within the local communities expressed frustration about the balance of benefit distribution between the company and themselves:

> *"GRL benefit a lot; villagers do not benefit enough." (FGD K5, R1)*

"GRL have planted trees and what they provide to the community does not match up with what they have got [from the community]" (FGD K5, R2)

These concerns suggest there may be underlying or emerging concerns around how compensation for company land acquisition and operations are negotiated – not only initially, but also as time goes on. Who determines what is acceptable from GRL? How are they held to account for their actions? How can local communities (re)negotiate terms of engagement once initial terms are agreed? Chapter 7 looks at how terms of engagement with GRL are contested, resisted, and re-negotiated. They also raise questions around how the 10% of carbon payments directed to the local communities was negotiated, and by whom.

The figure of 10% of carbon revenues being shared with local community appears to be set by GRL themselves, as this is their stated policy across their sites in East Africa. They write that '*10% of all proceeds from carbon sales will be invested back into the communities around its carbon projects*' (GRL, 2021a: 50). We can infer from this that the 10% figure is determined by GRL prior to engaging with local communities, as it is their policy across different sites and countries. Therefore, the agreement of a 10% carbon payment was likely less a negotiation, and more a fixed term of GRL's activities.

Sharing a percentage of carbon payments with the nearby communities has multiple functions for GRL. Firstly, it is on one level a financial decision, as ensuring community benefits from carbon sequestration activities is often a stipulation of certification via VCS, thus a requirement of GRL being able to access international carbon finance. It also serves to demonstrate that material gain can be made from carbon forestry for local residents through this carbon offset mechanism, which might encourage people to plant more trees, further aligning incentives between the company and local residents, and simultaneously locating the power to access this finance within the hands of the company who position themselves to broker access to carbon finance. This is further discussed in chapter 6. It also reinforces the narrative of a multi-win solution, and, by inference, the associated degradation narratives underlying this – both on a local and a global level.
However, one local resident explicitly questioned the transparency of the carbon payment process:

"How will we know, exactly that it is 10% of the full amount?" (SSI K1)

This question is powerful. It suggests that coexisting with the widespread welcoming of the material benefits and opportunities brought by GRL are undertones of doubt and questions about the processes connected to benefit sharing and of the continued operations of GRL undertaking large-scale plantation activities. It can be interpreted as questioning the transparency of GRL's communications around the distribution and sharing of carbon payments. It can also be interpreted as questioning the transparency of local village governance structures (and by extension, the power of local elites) who co-facilitate these carbon investments in local infrastructure projects.

This concern is a window into the wider issues of trust and anxiety around GRL activities and the relationship between the company, village leaders, and the other people who live in the communities around the company's plantations. Complaints and narratives of existing 'unfulfilled promises', such as around the slow progress in completion of school buildings, one of the key community development

projects touted by the company as evidence of its contribution to community development, highlight a cautious atmosphere of uncertainty and sometimes even scepticism and dissatisfaction from some people. These concerns were referenced in the previously cited NomoGaia report, and also discussed by some local residents on fieldwork undertaken for this thesis:

> *"Once [GRL and small investors] came to invest, they are given some condition maybe to build schools, but still they are hesitating, they have not…fulfilled what maybe they were supposed to do…to fulfil before maybe…planting [trees] and something like that. They are not doing in such a way, they are doing it slowly…or reacting slowly to their promises. At this time, what they promised, they have not yet fulfilled that promise…they are moving slowly toward that matter, or toward their promises." (SSI K8)*

Note that it was not only GRL identified as being slow to deliver on promises, but also other small investors. When they want to acquire a parcel of land for planting trees, any investor must follow the formal process of acquiring land facilitated by the village leadership. Who then, is responsible for ensuring that these investors fulfil their promises? For small investors, who are also required to contribute to community development projects, these contributions are facilitated directly by the village government. Local residents can raise complaints relating to GRL formally through GRL's grievance processes, anonymously via a suggestion box, or they can publicly raise concerns at village meetings attended by GRL. Therefore these concerns about unfulfilled promises or lack of transparency may ostensibly be directed at GRL or the other small investors themselves, but may conceal a broader questioning of village governance structures and local leadership who facilitate these agreements and are involved in the management of community development projects, and therefore hold at least some responsibility for holding investors to account.

Discussion

As anticipated in chapter 2, we see a clear, familiar narrative being constructed by GRL. We are first told by GRL that there was a degradation problem in the areas surrounding Kitete and Uchindile, with acres of unproductive grasslands that are at once both unused, disregarded, 'spare' land and also degraded land that is no longer usable due to the wanton setting of fires by hunters and other local people. These stories are clearly reminiscent of Leach and Mearn's work on environmental narratives. The narratives of fires having degraded historical woodlands into unproductive grasslands is similar to those described by Kull (2004) in his analysis of fire ecologies in Madagascar (cf. also Holmes 2007).

When these narratives are held up against local environmental histories, we see that these externally constructed environmental histories are likely misplaced. The narratives rely on a snapshot of an ecological system which is then extrapolated backwards to generate a sense of crisis and urgency (Schuetze, 2015; Fairhead and Leach, 1996) and therefore provide legitimacy for GRL's activities. A complex socio-ecological reality has been transformed into a simple, familiar story (Schuetze, 2015).

This narrative is coupled with the global problem of carbon emissions and the need to avert the ecological catastrophe they cause. We are presented with a need for 'development', employment and improved housing in rural Tanzania. We also find narratives of market salvation and of multi-wins: where benefits arise because of market failures that have been addressed. The narratives of multi-

wins are supported to an extent by the findings presented here, although the narratives do not allow for the greyness, unevenness or complexity of how these benefits are distributed (nor do they account for disbenefits).

These narratives are interwoven and layered together to generate GRL's carbon forestry plantations as the 'solution to' these degradation and 'development' issues, while also being a 'product of' these underlying narratives (Cavanagh & Benjaminsen, 2014). These narratives are reproduced across different scales (from the local level in discussions with residents and village government, and in government documents (such as Village Land Use Plans), to company narratives in GRL's literature, business reports, marketing materials and verification reports, to accreditation and monitoring reports for international verification companies, and to end-user narratives with organisations who purchase carbon credits). For example, BP have previously invested in carbon offset via the purchase of VCS carbon credits for GRL's Uchindile Forest Plantation.

The multi 'wins' listed on the project description are extensive, ranging from reducing carbon emissions through sequestration, benefiting local communities via carbon revenues, "conserving rare and endangered trees species", "promoting wealth generation", "empowering villagers", "providing long term and seasonal employment", transferring skills through training and education, and developing local infrastructure (BP, 2022). We also see a reproduction of degradation narratives, with BP stating that the "reforestation" project was established "in an area that was classified as degraded grassland" (BP, 2022).

Tracing this multi-win narrative through to the 'green' investors of carbon credits demonstrates Cavanagh and Benjaminsen's observation of the importance of maintaining what they refer to as the ''triple win' spectacle' to carbon forestry projects (Cavanagh and Benjaminsen, 2014: 55). Third-party monitoring organisations (such as Verra, an organisation which develops global standards for voluntary carbon markets; and TÜV Nord, a certification organisation) are part of an 'epistemic communities' (Haas, 1989) arranged around multi-win carbon forestry market salvation narratives, and have a vested interested in maintaining these stories and the neoliberal conservation models they support (cf. Büscher, 2012). TÜV Nord was commissioned by GRL to undertake the 4th verification of their carbon forestry project with regards to the requirements of VCS for the period 2013-2020. The verification report identified actions and clarifications required for GRL successfully to achieve verification. One of these was related to concerns around the transparency and communication of the percentage of carbon payments shared with local communities, which was a concern raised locally. 'Local stakeholder consultation' can thereby reduced to a tick-box exercise in a verification report, rendering technical (Li, 2007) issues of community relations and meaningful participation. At the same time, the need to maintain the 'spectacle' of multi-win narratives puts pressure on GRL, accreditation organisations and their intermediaries to keep up appearances.

Sulle (2020) shows how the corridor-making in SAGCOT agricultural investments are contested political processes as well as investments in a geographical area, and are 'reshaped through local agency and contested negotiations on the ground'. The 'grand-modernist' ideas and narratives seen in corridor investments (Sulle, 2020; Chome et al., 2020) have parallels with the ideas of market salvation through neoliberal conservation, carbon offset programmes and carbon forestry that we see

in Uchindile and Kitete – not only in their multi-win top-down narratives but also in the way that the realities of these ideas unfold and are contested on the ground.

Within the context of SAGCOT in Kilombero, Bergius et al. (2020) argue that these degradation narratives may be a key driver of dispossession and conflicts, by legitimising investments, neoliberal conservation, and elite capture of benefits and resources (Bergius et al., 2020). While here we do indeed see how degradation narratives serve to legitimise investments, neoliberal conservation through carbon offset programmes, and in places, some elite capture of benefits and resources (see chapter 6), we do not in these contexts, see land conflicts in the way we have elsewhere. The land that was taken here was used, but sparingly, and by a weak minority.

This is in contrast with other researchers' findings. Nel & Hill (2013) find significant, continual marginalisation of communities around two carbon forestry projects in Uganda, one of which is a plantation run by another subsidiary of Green Resources AS, Busoga Forestry Company (BFC). Lyons and Westoby (2014) identify the exclusion and conflicts that have unfolded in Green Resource's operations in Uganda and describe 'the arrival of Green Resources [as] associated with brutal and sometimes violent evictions, often undertaken by company staff, or the state or national police' (Lyons and Westoby, 2014: 20). It should be noted that Fischer et al. (2016) provide a critical commentary of this particular paper, arguing that Lyons and Westoby conflate the contexts of two separate plantations, exaggerate and over-extrapolate instances of violence as characterising the overall situation around the plantations, and underplay the benefits accrued by some local residents. They argue instead that the lack of rural livelihood benefits is a wider symptom of the carbon market rather than a specific failure or fault of Green Resources (although that they do hold some responsibility for local outcomes), and that the case study demonstrates the challenges in striving for multi-wins for rural livelihoods and global carbon sequestration (Fischer et al., 2016: 268).

My findings contrast with this critical literature, and supports findings such as that of West and Haug (2017) who find that, within the context of large-scale agricultural investments in SAGCOT, large-scale investments are 'rarely as glamorous or as gloomy in practice as the polarised narratives…suggest' (West and Huag, 2017: 418). They suggest that not all large-scale investments constitute 'land grabbing' and local contexts matter for this, and they challenge the 'simplified risk narratives' that are reproduced in critical scholarly debates and that often portray 'smallholder farmers, rural communities, and the environment as being victims of large-scale agricultural investment' (ibid: 428).

Going further, Degnet et al. (2020) undertook a comparative quantitative study of community participation in plantations of households in villages adjacent to private, FSC-certified plantations with those adjacent to non-certified, state-owned plantations in Tanzania. They found that households next to private certified plantations are more likely to participate in plantation activities, and compared to the state-owned plantations, private certified plantations were more likely to respond to complaints and grievances from local communities (Degnet et al., 2020: 1). Thus private plantations can in some circumstances be more responsive to the concerns of local residents than state forest enclosures. This could reflect the need to perpetuate win-win narratives – or demonstrate how these win-win narratives can sometimes work for the benefit of some residents of communities co-existing with carbon forestry plantations.

Much focus in critical literature is given to 'dispossession by accumulation' and issues of land scarcity, and the 'badly paid plantation work' (Bergius et al., 2018; Nel & Hill, 2013; Bumpus & Liverman, 2008). Far less attention is given to the significance placed locally on the benefits and opportunities presented by paid labour with GRL. Li (2011) shows using (Deininger et al. 2011)'s work that smallholders working their own land make significantly higher returns to labour compared to working on a plantation. She argues that 'poverty reduction is a very unlikely result' of large-scale land acquisition (Li, 2011: 281). Bergius et al., 2018 argues that 'far more jobs are lost (through loss of land and livelihoods) than created' (2018: 843), and that the expansion of (Scandinavian) capital in large-scale land investments in 'Green Economy' initiatives in Africa (such as GRL and other SAGCOT adjacent investments) 'comes at a great cost to local livelihoods' (2018: 844).

In contrast my findings suggest that the presence of private investment within the broader context of neoliberal conservation brings employment opportunities and infrastructure development that materially improve people's lives in rural Tanzania, in the particular context of this case study. The paid labour offered by GRL have restructured livelihoods and wealth for people who, alongside farming, now also undertake a lot of casual labour in order to receive cash payments. Coupled with many local residents starting their own (small-scale) tree plantations, as we see in chapter 6, we see hints of emerging new class relations. This is reminiscent of what is described in literature around contract farming generally, and sugarcane outgrower schemes in Kilombero specifically, which can lead to social differentiation within rural communities with new groups of 'rural capitalists' (Isager et al., 2022; Sulle, 2017; see also Veldwish, 2015; Clapp, 1988).

However, benefits from employment are not always evenly distributed. For example, Kadigi et al. (2017) found from empirical research on land fragmentation in the Ihemu cluster of SAGCOT that fragmentation did not in fact reduce land productivity, but revealed an increased likelihood of consolidation of agricultural land under rich farmers and investors. Sulle and Dancer (2020) from their empirical research on an 'inclusive business' estate-outgrower model of sugarcane production in Kilombero argue that privatisation has increased gender differentiation and consolidated power for local elites. The legacy of ujamaa has created opportunities for rural women to participate in economic activities, but are complex and context-specific (Mblilinyi, 2016; Sulle and Dancer, 2020). In Kilombero specifically, land tenure issues are typically less gendered than in other parts of rural Tanzania, and it is common for both women and men to own land. However, despite ujamaa's legacy, gender-differentiation in land tenure still exists and men are more likely than women to solely acquire land and own larger plots of land (Sulle and Dancer, 2020).

My findings tentatively suggest that young people in particular were perceived to have benefitted from the work opportunities offered by GRL, and that some women found GRL had given them novel access to employment and capital, which had improved their level of independence and agency, as well as giving them money to invest in schooling and their own tree planting. However as Sulle and Dancer (2020) argue, it is important to acknowledge that women's increased access to capital and wealth can create tensions within households and careful negotiation and management may be needed to integrate these shifting economic gender balances with social and cultural power balances as shifting controls over resources may be tricky to navigate. Further, as Mdee et al. (2021) articulate in the context of agricultural livelihoods in East Africa, while gender and youth are important factors in understanding dynamics of exclusion and inclusion, 'they cannot be universalised and need to be

understood as contributory and integrated into dynamics of differentiation, along with many other factors' (Mdee et al., 2021: 1266). They argue that such identity-centred inclusions to address inequality and differentiation is based on a neoliberal understanding that frames poverty as an individual identity-based problem rather than arising from structural inequities in power, access to and control over resources, and class relations. Individuals can perceive they are benefiting but still be collectively exploited. This is borne out in the overwhelming casual nature of employment offered by GRL, with little permanent employment available (almost none of which is taken up by women).

Conclusion

GRL spins narratives of triple-win solutions. They frame themselves as an environmental steward, restoring degraded land, sequestering carbon and safeguarding landscapes from harmful traditional ecological livelihood practices, while also positioning themselves as significantly contributing to local community 'development'. These multi-win claims are not groundless but there are fault lines in these stories, and in the data. We see that their activities have brought improved housing quality and community infrastructure funded by carbon payments. They provide employment opportunities previously not available in the surrounding villages, and keep young people in the village by providing jobs and opportunities. Findings cautiously suggest that the gender impact of GRL's presence is experienced by some women as positive – giving women opportunities to access capital and earnings that didn't exist locally prior to GRL's presence. They have brought collective, with promises of individual, benefits from carbon finance. We have seen complaints of lack of transparency and accountability from GRL and the social systems through which they engage with the local community, and of unfulfilled (or slow to be realised) promises from GRL and other smaller copy-cat investors. We see how benefits exclude hunters, those less able to work in plantations, and those that live further away. The multi-win claims are assertions, but my findings demonstrate that there are cracks in the critiques of neoliberal conservation too: primarily that employment opportunities *are* important for local people.

GRL seems to have brought some welcome changes to the villages of Uchindile and Kitete. Many people recognise individual and collective benefits arising from GRL's activities. Having a company like GRL operating as an employer, particularly in a more remote village like Kitete, can make a beneficial difference to wealth and life. Community infrastructure development has been funded by a first round of carbon payments. However these changes are not straightforward, and are sometimes contested. We see narratives – particularly the degradation and the multi-win narratives – that are well established in the literature play out in this case study. The case of GRL both illustrates the power of such narratives, and demonstrates how having an understanding of these narratives help us to understand what's taking place. We see that they make claims of degradation without evidence, but that the beneficial 'win-win' aspects may have substance, because people say they do. However communities (and people) are heterogenous and must not be treated as single entities. Not all people are able to benefit from the investments and opportunities created by GRL in the same ways. Just because people perceive themselves to be benefitting, it does not necessarily follow that they are not being collectively exploited. GRL has unleashed far-reaching dynamics that distribute fortune and misfortune unevenly through village society. It is to these broader impacts that we now turn.

6. The Broader impacts of Economic Investment

The direct and immediate impacts of GRL's activities that I discussed in the previous chapter are important, but it would be misleading to leave the analysis at this point. In order properly to understand the impacts of GRL on the economy and environments of these highland villages, we have to examine the broader forces of economic and environmental change which their presence unleashed. This chapter looks first at the wider consequences of GRL's investment for local economies and land use in section 6.1. Building on the collective carbon payments discussed in chapter 5, section 6.2. considers the potential for local communities to engage with carbon payments directly, through their own tree planting. In section 6.3. I outline GRL's impacts on migratory dynamics. Section 6.4 looks at the distribution of responsibility for the management of fire risks and explores concerns around land, and section 6.5 examines the dynamics resulting in heightened anxiety around food security. I argue that the scale and reach of GRL's impact can only be appreciated by exploring these indirect effects. These again suggest that there has been a complexifying and growth of local economies which have served to distribute more prosperity to many people, as well as greater risks for some.

Wider Consequences for Local Economies and Land Use

The land acquired by and used by GRL was often referred to by local residents, local elites, and GRL as 'spare land'. This implies that there was an excess of land in the area, and that not all the land was needed. However, this conceals important social, geographical and temporal dynamics with respect to the need for land by different groups within the study sites, and the mechanisms behind these dynamics.

In the first instance, there is an important contrast in survey responses between Kitete and Uchindile. Whereas almost all survey respondents in Kitete asserted that there was no shortage of land in their village, in Uchindile the responses were much more mixed. Although a majority of survey respondents said there was no shortage of land in Uchindile, a number of respondents suggested either that there was a shortage, that there was likely to be a shortage later, or that although they didn't consider there to be a shortage there was a problem of some kind to do with land availability.

> *"Last village meeting, people were complaining that people had been requesting land but hadn't been given any." (HHS 074, Uchindile resident for 11 years)*

One Uchindile resident commented on delays in residents being given land they had requested, with the implication of this quote in the wider context of the conversation being that this delay concealed a lack of availability of land.

Table 6.1 below summarises the responses given in household surveys about whether there was a shortage of land.

	Kitete	Uchindile	Total
Yes	0	8	8
No	33	21	54

No, but…	2	6	8

Table 6.1 Is there a shortage of land? Source: HHS data, QB320.

This difference between the two villages is striking, but not altogether surprising. This is a repeated theme throughout the analysis, as already discussed in chapter 5. Uchindile has a larger population and has better transport and connections for both migrants who want to move to the area, and for investors who wanted to plant trees in the area (who would prefer land that is easier to access). Comparatively, Kitete is more difficult to reach than Uchindile, and has a markedly smaller population. GRL also arrived and started work in Uchindile a lot earlier than in Kitete (1997/2000 compared to just before 2009), which could mean that there has been more time for consequences of the investment to unfurl, particularly cf. attracting smaller investors to the area and then increasing pressure on land availability.

But it is misleading to focus solely on the spatial issue of land availability and land alienation in the two study sites. The impact of GRL is not just in the land it uses, but in the knock-on effects that this has had to the broader village economy, and in particular in the economic opportunities that have arisen because of tree planting. In the first instance the company's investment has improved access to the surrounding area in terms of transportation and infrastructure. This was established in the previous chapter.

More broadly a narrative that emerges that GRL 'opened the floodgates' for investment in land in the area – for both 'outsiders' and insiders. GRL has encouraged a much broader participation in the tree farming economy in several ways. First, they showed how profitable trees could be for the company itself. Second, the company provided seminars and other insights as to which trees are the best to plant in a particular area, how to prepare the land for planting, and how to manage the trees as they develop. GRL has actively and explicitly encouraged the local community to plant trees of similar species to their plantations.

> *"[GRL] have even - regardless of whether they are planting trees for the GRL, they [local residents] are given seedlings to plant in their own farm." (SSI K1)*

> *"Even GRL are educating their employees that it's not good to see benefit offered by planting trees from GRL and you're left with nothing. [You] will reach a time when you don't have the energy for GRL and so should plant [your own trees]." (FGD K7, R3)*

The above extracts demonstrate how GRL are characterised as 'gifting' local residents with seedlings of specific tree species varieties to plant their own trees, and that they are encouraging residents to consider the personal financial rewards they could reap from cultivating their own tree farms. These particular quotes could suggest that this is the interpretation of GRL's actions and persuasions – what we know is that GRL are encouraging local residents to plant their own trees, and the interpretation of some is that this is to help people to realise (both psychologically and financially) the benefit of planting trees. However, this encouragement could come from a more self-interested position on the part of GRL, as I will touch on later.

Third is the demonstration effect of early adopters in their community starting to profit from planting their own tree farms. Encouraged, facilitated or prompted by GRL, these 'early adopters' planted their

own tree farms and were able to gain financial pay-outs for this, years later. Other people were able to materially see these benefits, which were often demonstrated through investment in modern housing materials, building new additional houses, and even on occasion investing in solar panels. It should be noted that the ability to be an 'early adopter' is likely influenced by people's initial wealth: planting trees requires land, labour and capital, so those who were able to benefit very initially may have been those who were more well off at the outset. A further key driver for this was local residents seeing even 'outsiders' coming in to buy up their land in order to plant trees – such was its profitability.

Table 6.2 below gives a snapshot of the extent to which planting trees has become almost ubiquitous. We see that almost 80% of households surveyed in Kitete, and over 70% of those surveyed in Uchindile were engaging in tree planting on their own farms as households.

	Kitete	**Uchindile**	**Total**
Yes – pine and/or eucalyptus	27	25	52
Planted other trees	4	5	9
No	4	5	9
Total	**35**	**35**	**70**

Table 6.2 Have you planted any trees on your farm? Source: HHS data QC308, QC308-A.

While we have established in chapter 5 that employment from GRL had made an important material difference to many people's lives, there is also a clear impact on farming activity too, with a large majority of those surveyed having planted trees, specifically eucalyptus and pine (as per GRL's species choice). As a result of GRL's presence and activities many local residents have been prompted to invest in their own private tree plantations. In Uchindile the average reported area of land household survey respondents had for tree planting was 2.2 acres (n=35), while in Kitete this was 6.7 acres (n=35). The range of reported areas of land households had for tree planting was wide: in Uchindile reported household land plots for tree planting ranged from 0-30 acres, while in Kitete this was 0-50 acres, demonstrating a large potential for social differentiation[63]. In Uchindile, 3 respondents held plots of over 5 acres for planting trees; in Kitete there were 11 respondents who reported over 5 acres for planting trees. This suggests a level of differentiation in wealth and ability to access or acquire land to plant trees. Respondents emphasised the importance of this alternative livelihood, directly drawing a comparison between income from employment with GRL, and livelihood support from planting their own trees:

> *"Planting trees is more important than employment from GRL because when you plant trees for GRL, they are not yours - you just get a wage, you don't benefit in any other way." (FGD K2, R4)*

> *"Planting your own trees is for your benefit completely." (FGD K2, R5)*

[63] Data from HHS QB301 and QB301-A (How much land do you own? (ask for details)). The median size of land owned for tree planting in respondents surveys in Uchindile was 1 acre, in Kitete this was 5 acres. The average overall household land holding (i.e. for farming food crops as well as tree planting) was 4.5 acres for respondents in Uchindile, and 9.3 acres for Kitete. This means that for respondents in Uchindile, an average of 50% of household land holdings were used or designated for tree planting, and in Kitete this was a striking 73%.

We can see from these quotes a recognition of the limits of wage employment: 'you *just* get a wage, you don't benefit in any other way' (emphasis mine). In contrast, tree planting is seen as an investment of sorts: planting trees for GRL is something that will bring future benefits for the company, whereas planting trees for *yourself* is something that will bring future benefits for you and your family.

Tree-planting however is expensive. It requires capital. Those who can benefit from this additional livelihood option is limited by their access to capital - by their original social class and wealth:

> *"[You] can't start a [planted] forest without money" (FGD K2, R3)*

> *"One thing is capital. Because if you like to plant trees - to plant a big area you need the capital….they need the capital for...to get the labour...also the transport...to carry the seedlings...another thing is to buy the seedlings...GRL can help the people, but for few…for example, GRL can help you for one hectare, or two hectares: this is not enough." (SSI-K3)*

> *"[Richer people] can use land more – the other groups don't know or aren't able to use the land [in the same ways] because of lack of capital." (FGD U9, R2. Wealth ranking discussion.)*

The quotes above illustrate not only the need for capital in order plant trees, but also what that capital is required for: labour, transport, and physical inputs such as seedlings. We are also told that there is a contrast between planting small and large areas of trees. Planting a small area of trees is likely to be much less capital-intensive, without necessarily a need to hire labour, or transport physical materials. Additionally, it might be easier to acquire a plot of land in close proximity to an existing home or farm if it is relatively small, or to use part of your existing land holdings. However, if someone wants to make serious money from tree planting, they will require a bigger area of land. We also see that the size of an area of land that is granted to a person (although this is likely in reference to outsiders coming to the area to acquire land for tree planting, rather than existing local residents themselves) is dependent on their wealth:

> *"[in order to get land to plant trees on] they [the local government] give you a piece of land depending on the person's wealth...the land is the government's - it belongs to the government, but you give the small money...to help [the process] - small money, not a lot." (SSI-K3)*

So for some, the capital requirement for tree planting will also be in relation to the acquisition of a plot of land. The size of the land someone can acquire is dependent on their wealth, and there are also payments involved to smooth this process of acquiring land. Residents also identified the cumulative effects of local economic growth, linking an increase in wealth with greater ease of planting trees, thus emphasising the requirement for wealth, or capital, for tree planting:

> *"The economy will increase and it will be easier to plant trees" (FGD-K3, respondent (4))*

Smaller investors did bring some attendant benefits. The crowding in of investment has further increased employment opportunities. Respondents identified a further related benefit of smaller investors, attracted to the area by the presence of GRL, also offering employment opportunities - particularly of a casual labour form, allowing local residents to undertake tree planting and maintenance activities as required. A significant minority of respondents, especially in Kitete, referenced reliance on casual labour in other people's tree farms as one of the key strategies they

used to help them cope with household expenses that exceed what their standard livelihood activities provided for, or to cover unexpected expenses. We see this illustrated in table 6.3. below:

	Kitete	**Uchindile**	**Total**
Yes – undertake casual labour on small investors' tree farms	9	2	11
No – don't undertake casual labour with small investors	26	33	59
Total	35	35	70

Table 6.3 casual labour on small investors' tree farms. Source: HHS data QB205, QB801-1, QB807-B

Nevertheless, because of its costs, the growth of tree-planting is likely to become an engine of inequality.

Personal Carbon payments

While local residents typically pointed to selling trees whole or for timber and electricity poles, there was some discussion of expectations that residents would be able to access carbon markets through their personal tree plantations in the future, after learning of the process of carbon sequestration and that polluting factories, industries or companies in other countries would pay for this process from GRL's activities.

It is likely that GRL have enhanced the understanding of local communities around the nature of carbon and the functional relationships between trees and carbon. Appendix 4 houses an exhaustive list of the responses given by respondents in Kitete and Uchindile in the household survey explaining their understandings of carbon or *hewa ukaa*. They are varied, ranging from 'gas' or 'air', to 'dirty gas', 'smoke produced by factories', to 'air produced by trees and sold' and more complex understandings of the processes of carbon sequestration. Discussions with respondents across the two villages unpicked further understandings of the carbon sequestration and carbon credits processes connected to GRL's tree planting activities:

> *GRL…are harvesting the carbon, carbon dioxide, for their benefit. (SSI U1)*
>
> *Planting trees is important because it reduces this carbon dioxide in the atmosphere, and the carbon dioxide it normally comes from the industrialised countries. (SSI U3)*
>
> *"'Hewa ukaa' means absorbing dirty air and giving out good air, in the atmosphere…[got this understanding] particularly from the education provided by GRL. (SSI K6)*

We see that GRL both directly and indirectly provided education on how planting trees functions as a carbon sink, the wider context of climate change, and how planting trees can be commoditised beyond selling for local products such as timber, electricity poles, and paper milling; for carbon credits on the international market. Many respondents conceptualised carbon as a 'crop' that was grown by the trees and then 'harvested'. Because the carbon economy is premised on being paid for carbon (sequestered), in a primarily agricultural society, it seems logical to understand carbon as something that is produced by trees and then sold off. People were educated by GRL about the concept of trees

'cleaning the air', which corresponds and fits in with understandings of trees bringing 'fresh air' and 'a pleasant breeze'.

A few local residents referred to discussions with GRL about the possibility or hope of local residents forming groups in order to qualify for carbon credit payments for the trees that they collectively (privately) grew. Survey data revealed that at least 20% of people surveyed in Uchindile were part of a tree planting group, and at least 40% of residents surveyed in Kitete were part of a tree planting group[64]. Almost 20% of households surveyed across both villages stated that they were planting their own trees (at least in part) for carbon payments[65]. People anticipated that the company would manage any carbon finance process, due to its complexity.

> *The manager…educated us, saying that because there is time of harvesting 'hewa ukaa', therefore he advised us saying 'make groups so that you plant more trees'…those who are coming to harvest this 'hewa ukaa' will make some measure – there is some cubic they measure – on taking that 'hewa ukaa', and therefore we will benefit from the money which will come from the harvested 'hewa ukaa'….because GRL has been given the land by these people – the Uchindile people – and therefore they say it is better you plant more so that once this harvest happens, of 'hewa ukaa', we'll help you to develop from one stage to another. It is just the benefit that they get from the land, now they encourage the local people to. (SSI U5)*

> *"through this they encouraged the community to form…groups to grow trees for carbon credits and maybe for timber…I think there is a seminar to the village, and later on those who were sensitised, were…agreed to form groups, tree growing groups." (SSI U6, GRL representative)*

We see from the above that local people understood that they need to form groups in order to see planted trees for carbon credits because of the scale at which trees need to be planted to access this carbon finance. We see hopes and expectations of being able to access this finance in the future, and GRL are framed as both *having a responsibility* to share their wisdom with local residents and provide education as part of the implicit debt GRL are perceived to owe the village from their acquisition of land; and also as *having a more altruistic desire* for the local community to share in the benefits that GRL are modelling and have received from selling carbon credits for the company's trees planted. There is thus a tension between perceived benefits from GRL being seen as altruistically 'granted' by GRL while simultaneously being seen as something that GRL have a responsibility to provide for the surrounding communities, as compensation for the land they are using. This tension is typical of the multiplicity of positions that GRL plays, and of the fluidity and complexity of the perceptions of and relationships with surrounding communities. People see them at once both as generous benefactors, and as extractive capitalists who owe them a debt.

[64] HHS question B905 explored people's memberships of any groups. Tree planting groups were not explicitly asked about, but these figures (14 respondents in Kitete, and 7 in Uchindile, n=35 for each village) represent the number of people who specifically named their membership of a tree planting group. Therefore, we can conclude that this number represents a minimum, as other respondents not included in this number expressed their intention to join one, and others may have been a member but not thought to name it in response to this question.

[65] HHS question C308-A and C309 looked at which trees people had planted, and what they had planted them for. 6 respondents in Uchindile, and 7 in Kitete, identified 'for hewa ukaa', 'to sell hewa ukaa', for 'carbon' or 'carbon credits' as one of (or the) reasons they had planted pine or eucalyptus trees.

But what is the benefit for GRL here? There is also a third layer here, an undercurrent of GRL's motives. By encouraging local people to band together to plant trees collectively, this furthers the narratives of multi-wins and community benefits that we saw unfold in chapter 5. It also aligns incentives for local communities to protect trees from fire. This is important, and is explored in more depth in chapter 7. While collective community tree planting for carbon payments bolsters GRL's green credentials, encouraging collective tree planting could also be tied to generating additional supply of poles and timber products for GRL's downstream industrial operations. GRL has a business model in Tanzania that is vertically integrated. They describe this as follows:

> *"Green Resources operates through two primary business units. The "upstream" unit surrounds the forest plantations and its associated activities, while the "downstream" unit contains the industrial operations where the products from the upstream operations are processed. The raw materials for the downstream units are sourced from the company's own plantations as well as from third-party suppliers including smallholder tree farmers."* (GRL, 2021b: 6)

We can see this illustrated in figure 4.1.2. in chapter 4, with the two subsidiaries of Green Resources AS in Tanzania: GRL forms the 'upstream unit', including the Uchindile forest plantation (UFP); and Sao Hill Industries (SHI) forming the 'downstream unit', which consists of two sawmills, a pole plant and a briquetting factory. Of particular relevance here is the fact that the materials for the downstream industrial operations are sourced not only from GRL's plantations, but also from smallholder tree farmers. This not only refers to the other smaller investors, but also the plantations belonging to residents of Kitete and Uchindile. Encouraging groups of local people to work together to plant trees, could additionally benefit GRL by generating further local supply of trees for their industrial operations. It is not clear what the terms of such an arrangement would be – neither for the timber and tree material products, nor for the facilitation of carbon payment. Would carbon prices be set by GRL? Would they take a percentage for 'brokering' the carbon deals? Would prices track global carbon prices? The negotiation and brokering of collective local resident carbon plantations could give rise to new terms of engagement, or they could represent a further consolidation of power in the hands of local elites and GRL.

It is also clear that that carbon is seen as an unattainable livelihood for many. This is evidenced by comments such as:

> *"in order to harvest hewa ukaa it's necessary to have a very large area, so very difficult for individuals to do this" (FGD U6, R2)*

> *"people in the village do not sell [trees] for hewa ukaa, but GRL do. GRL have followed all the procedures, but it is a long process – for villagers, they cannot follow all the procedures" (FG U1, R1)*

> *"The expert, when he came, he said that there are many industries that produce bad air, so in order to reduce this, we should plant lots of trees. Big company sells hewa ukaa – not [individual] people because it's a long process and in order to harvest hewa ukaa it's necessary to have a very large area, so very difficult for individuals to do this." (FGD U6, R2)*

These comments reflect views on both the side of the local residents and of GRL representatives, and could be understood as representing an 'elite capture' of carbon as a commodity. On the other hand,

it could also reflect the lengthy and complex processes involved in the accreditation and delivery of carbon credits, not least in terms of literacy, mathematics, and technical understanding required. This could not only constitute the reality of the technical, financial and temporal difficulties in accessing carbon finance through mechanisms used by GRL, but could also represent an attempt by GRL to manage expectations of local residents about the feasibility of realising these forms of carbon livelihoods.

Given the requirements for capital to plant a large area of trees described above, and existing disparities in wealth, it could be that only wealthier people are able to access this form of carbon livelihoods, thus representing another form of elite capture, or the creation of a new 'carbon' class of tree planters. Alternatively, the formation of groups collectively to reach thresholds to access carbon finance could represent a levelling of sorts. The governance of these groups (how they are managed and how group decisions are made) alongside the role GRL plays in the brokering of access to such carbon markets will be instrumental in determining how the power and wealth dynamics of these arrangements will unfold. Such novel constellations could very easily replicate current power structures and serve to consolidate the power of those individuals who have the wealth to plant large areas of land with trees, and those who have close relationships with key players in the village government and GRL, as well as the positions of those key players themselves.

So while introducing these novel forms of income are broadly seen as beneficial opportunities, some more critical concerns have been raised: specifically, a lack of trust and transparency in the financial accountability processes; and inequitable access to some of these opportunities, both by virtue of the capital (and accessible land) required for personal tree plantations, and because of the gatekeeping of accreditation processes by the company[66].

Migration

GRL's activities have impacted on migratory dynamics within the Uchindile and Kitete communities: firstly by attracting new people to the area with the availability of paid employment and investment opportunities, and secondly through the retention of youth in the area. GRL's activities, with its stimulation of development and demand for paid labour, was understood by local residents to both attract and retain people in the area. Prospective workers seeking paid work have relocated to both Kitete and Uchindile.

> "*due to the GRL arrival, it caused a lot of people to migrate, to come to this area" (SSI U2)*

> *"GRL made lots of people come here to get employment – if the company leaves, the people will migrate away again and leave very few indigenous people here, and will stop development….We depend on the GRL company for this area and it's why a lot of people have come here – for work and for money matters, and to get seedlings." (FG U6, R6)*

[66] It is not my intention here to imply that this gatekeeping is nefarious on the part of GRL; as previously discussed, the technical, financial and temporal requirements of a VCS accreditation process may render this close management of the process a practical necessity. However, these processes can always be made (more) inclusive and I think it important to consider to what extent an institution is able, willing, and has a responsibility to educate, include and seek to embed local communities within these processes.

There was a clear perception that it was GRL's presence specifically that prompted a wave of people moving to the area, and that people came for employment, because of increased local economy, and for tree planting activities. Table 6.4 below summarises the reasons people surveyed in the household surveys gave for moving to the area. People are moving (or returning) to Kitete in particular, and then seem to be finding life better.

	Kitete	Uchindile	Total
born here	13	24	37
employment	18	7	25
other	4	4	8

Table 6.4 reasons for living in the area. Source: HHS data QA208

This move would sometimes be made with their families, and sometimes they would set up a second home and leave their children with their partners or other family members nearby to their children's schools. Occasionally, on top of undertaking paid work for GRL or other small investors, new arrivals to the villages would set up small businesses, such as shops or stalls selling chai and mandazi, seeing opportunity in the increase in footfall in the villages due to GRL's presence and to the increased cash in the local economy. This increase in population, and in cash available to spend locally, also benefitted long-standing residents with small businesses.

Those who directly worked for GRL had more money to spend in local businesses, such as shops, carpentry businesses and selling of locally brewed alcohol:

> *"People working for GRL etc. come and buy stuff from [my] shop." (HHS 066, Uchindile)*
>
> *"[I am] a businessman and employees of companies will come and spend money at my shop." (HHS 070, Uchindile)*
>
> *"[I] get money from those employed - through increasing carpentry business." (HHS 095, Uchindile)*
>
> *"[Benefit of] selling local brew to GRL/MPM employees" (HHS 101, Uchindile)*

The increased wealth of people from employment, combined with the increased population of the area with people migrating in due to the availability of paid work and employees who moved to the area for permanent jobs with GRL, meant demand for locally produced goods and services increased, thus further boosting the local economy. One focus group collectively articulated the effect of GRL's presence in this way:

> *"It's important because people can get work [Respondents R2]*
>
> *…and money returns to the village [Respondent R6]*
>
> *…and people get a salary and use in local markets [Respondent R1]." (FGD U4)*

Small investors starting their own tree plantations generated casual work for those who could take it up in the local community, and was also seen to boost the local economy, including bringing more business for local community businesses. These small investors were also asked to contribute to a community project – such as buying bricks or other resources for building school classrooms.

It is important to note that there is another group of people drawn to the area by GRL: transitional (seasonal) workers - those who come from outside local villages, don't move to the village but instead stay in the GRL worker on site accommodation and then return to their homes. As 'outsiders' they are likely to have been more marginalised people, or at least with different marginalizations - i.e. without the backing of local elites such as village government, or local business people. This is reflected in discussions after a fire, where local government suggested to GRL that if they employed local people of their choosing, rather than 'strangers' or 'outsiders', then their compliance and non-resistance could be ensured. See chapter 7 for discussion of this.

Another subsect of people attracted to the area, more indirectly by GRL's extensive activities and the more entrepreneurial activities of new small investors and local residents planting their own trees, is the return of families or individuals who had previously moved away from the villages, or where previous generations of their families had moved away, or those with ancestral links to the area. The narrative surrounding this issue is that people both inside and outside of the Kitete, Uchindile and surrounding communities see a perceived increased value of land as demonstrated by returns achieved by GRL and small investors through tree planting. Simultaneously, parcels of land assigned to local residents for the purposes of tree planting, and with more people coming to the area for work, some of them go through a process to be given some land to use for farming, and more frequently, for their own tree plantations. These shifts attract more people to the area to acquire land and use for tree planting. Some of these people are completely new to the area, some are returning to family, and some are returning to ancestral ties to the area. With these new arrivals and 'returnees', competing claims over land have started to arise. Multiple local residents referred to this issue and discussed its implications. I refer to this issue here as the 'inherited land issue'.

> *The inherited land issue - some people moved away but then heard about getting money from trees, so returned and found people using their land. The solution was [that the] 'invaders' were given land to use." (HHS 079, Uchindile, resident whole life)*
>
> *Maybe newcomers like me might buy a piece of land but then later someone might return and say that piece of land should not have been sold (HHS 081, Uchindile, resident for less than a year)*
>
> *"Due to impact of people planting more trees, we've lost our land – other people are claiming land was theirs from ancestors years ago" (FGD U4, R2, resident 15 years)*

As we can see above, this was perceived as an issue for both newer residents, who expressed concern that any land they were given or bought might be reclaimed by someone who has ancestral claims to the area at a later date, and for lifetime residents. Some respondents mentioned that they had lost land that they had had claim to for years, as people returning to the village asserted their historic right to the piece of land. Others referenced the inherited land issue as a risk which had to be factored into their decisions related to land acquisition and use. The popularity of tree planting was cited as the primary causal factor for this issue, with many people explicitly naming that there was no inherited land issue before the introduction of tree planting to the area

> *"Before introduction of new trees to plant, there was no [inherited land] problem. Now seems to be an issue because of tree planting." (HHS 099, Uchindile, resident whole life)*

Given that GRL is the key local player in initiating and making popular widespread tree planting (specifically of pine and eucalyptus), we can tentatively link the arrival, presence and activities of GRL to this inherited land issue. This should not be seen in isolation, as the extensive history of tree planting more broadly in the region (Kangalawe and Swart, 2021) coupled with the nascent global carbon forestry economy, and the value of the timber market in Tanzania,[67] will be acting as broader drivers of the increased uptake of tree planting. But it is important.

Note that the inherited land issue was only flagged as a significant issue in Uchindile. Table 6.5 shows a summary of household survey respondents' perspectives on land conflicts in the area.

	Kitete	**Uchindile**	**Total**
Yes – inherited land issue	0	7	7
Yes – other issue	1	12	13
None	34	14	48
Don't know	0	2	2
Total	35	35	70

Table 6.5 Conflicts over land. Source: HHS data, QC107-A, C108A

We see that 54% of people surveyed in Uchindile saw there to be land issues in the area, with 20% describing the inherited land issue specifically. In Kitete 97% of those surveyed said that there were no land issues or conflicts. This again highlights the contrast between Uchindile concerns around land availability and issues, and the current relative lack of these in Kitete, at the time of fieldwork. When asked about land shortages, one respondent commented

> *"No - people are welcome to get land here so more people will come here and there will be development!" (HHS 119, Kitete)*

The migratory patterns described above were viewed as both a negative and a positive thing: new arrivals were seen as bringing new ideas, bringing business to the area, and contributing to the economic and social development of the area; while at the same time, immigration was sometimes associated with increased risks of crime and diseases, and fracturing of social cohesion. People were also conscious of the inherited land issue compounding over time.

Distributed fire management and land concerns

An important aspect of local tree planting is that it increases collective vigilance against fire which is the primary risk posed to trees and provided seedlings. GRL has provided considerable didactic advice about the problems of fire.

> *"People have got knowledge now, after GRL came and educated them on how to conserve the environment – because what destroyed the environment a lot was fire – now…they were given knowledge to make fire lines, which…once maybe unfortunately or in bad luck the fire happens, …when it reaches the stage where there are fire lines it may stop. Because they have given*

[67] The forest sector in Tanzania is estimated to contribute around 20% of the country's GDP (Ngaga, 2011: 70)

knowledge and people are making fire lines around their portion, to the area where they are planting trees." (SSI K5)

"There is education on…making fire lines for your plantations, and how will you make good fire lines which…if the fire…maybe it's burning, the fire won't got to your plantation, or to your trees". (SSI K7)

We can see above the emphasis on making fire lines around your own plantations, with local people framing the primary purpose of this to be protecting their own plantations from any accidental fire. Note two things here. First, GRL are framed have having bestowed a gift of education on people – here we see the narrative of GRL rescuing the environment from degradation explored in the previous chapter show up once again at the local level, and also note that this is framed as education GRL is providing altruistically. Second, that an incidence of fire is explicitly framed as 'unfortunately or in bad luck' – something that is not a deliberate act, but a consequence of misfortune. We will return to this later.

The proliferation of private plantations in the landscape provides even more insurance. More tree owners mean more people share the common goal of avoiding fire outbreaks. When asked why they thought GRL would want local communities to plant lots of trees, one interviewee suggested

"If the people are planting the trees, …the fire can also burn their trees! They trick, yes, good trick!" (SSI K3, Kitete)

This particular quote framed the strategy of encouraging community tree planting as a 'trick'. Other respondents from across Uchindile and Kitete described similar perceptions.

"People are worrying so much because they know that once there is fire, definitely they will perish [lose] what they planted" (SSI U1)

Here people are characterised as now worrying about fire because they have a heightened vested interest in terms of the impact of fire and what they could personally lose in terms of their own investments in tree planting. Others described how they were instructed to plant their own trees in particularly fire prone areas, in order to give them an incentive to take action to prevent fire:

"People have been told a lot to plant trees in that area [Uchindile Juu, an area the focus group identified as having a lot of fires] so they get incentive to prevent fire" (FGU7, R2)

Others explained that people were sticking to laws about fire because of the desire to keep investors – particularly GRL – happy, so they will not withdraw their investment in the area, as GRL are a primary (often the only) source of paid income.

"[People are sticking to the laws about fire] because…GRL are putting the many capital in…the big capital, …the investment is big, so they say if you burn these trees, then 'mwekezaji' [investors] they go on…they go! …And they can get no money! Where can they get money?" (SSI K3)

A GRL representative framed this discussion from a starting point of everyone having trees and therefore being able to 'fight together' for a common cause.

"Maybe if it happened that [there is] the fire, there is a 'cooperation' which works together: this is villagers and GRL. Once it happens that there is fire somewhere, they go together and deal with that incidence by stopping the fire maybe, together in order not to destruct the forest, which they have planted." (SSI K6)

"Since the community have trees and we have trees that is why we fight together. We don't like someone to lose" (SSI U6, GRL manager).

This narrative of 'fighting together' was geared towards both the prevention of fire outbreaks, and the literal fighting of fire if and when outbreaks happened – with GRL and local people fighting together united against a common enemy, fire.

Others regarded GRL's encouragement of local communities to plant trees as purely altruistic – for the good of the local community, either to strengthen their relationship with the community, or as a kind of 'payment' for the land they are using.

"GRL are the experts and they have educated people to plant trees. Maybe they are inspiring the people so that they can enjoy even the small cake – they can benefit a little… Because we have provided them with land, that's why maybe they are emphasizing us to plant trees in order to benefit from these trees". (SSI K4)

Whatever mix of motivations inspired it, the success of these measures meant that the availability and use of suitable land was a live and tense issue in the highland villages. When land use is re-organised or formalised through a process such as a Land Use Plan, particularly when this process is undertaken and facilitated by a company intending to invest in the area and wanting to lease land, the allocation of land to different uses, and consequently, to different people, is important not just in terms of the amount of land that is reserved for certain uses or for 'future generations' but also in terms of the quality and location of those parcels of land.

"There is no shortage, but it is difficult to get good land that is close by." (HHS 095, Uchindile)

"Yes [there is a shortage] because most of the land has low soil fertility" (HHS 094, Uchindile)

As we see in the illustrative quotes above, in Uchindile respondents variously stated that there was no shortage, but that it was a challenge to either get 'good' land (in terms of soil fertility) at all, or that any available 'good' land is less accessible in terms of distance from the village centre areas and people's homes. This suggests there is competition for the more sought-after, well located or quality parcels of land, and that there is a shortage of desirable land, if not land in general. This dynamic of competition for land in combination with the inherited land issue increasing the distance to available land was outlined by a resident of Kitete

"[There] are people who migrated out of this area, they come back and they started planting nearby, those who have nearby lands along the…the settlement, and others are the indigenous who have nearby…land, they plant trees in this particular land. And therefore the land which has been left is very far from….from those indigenous land, and then maybe for those people

who were [moved] out of this area and came back to plant their trees, and the land which has been left [is that] which is far away from the settlement. (SSI K4)

We see here that not all land is equal. This matters, because it gives us more context to understand the availability of land in the area. It is not sufficient to only look at the quantity of land available; the 'quality' and location of the land must also be considered in order to understand the dynamics of land availability that continues to unfold from GRL's acquisition and utilisation of land for their plantations.

Another limiting factor is that while there is availability of 'unused' land, often it is viewed as belonging to a particular family or clan, and passed down within that family. As a result, land is particularly hard to access for (poor) newcomers.

"There is a culture in this village that there are farms that are inherited – passed on from generation to generation. So if you are new to the village, it can be difficult to get land. Even if the land is not being utilized, if it is inherited by someone, no one else can use it." (HHS 078 – Uchindile, resident for 35 years)

This relates to a broader point: even if land *appears unused* to outsiders, this does not mean that it is *actually unused* (as we saw in chapter 5, GRL's characterisations of 'unused and unproductive' grasslands does not necessarily reflect the reality and plurality of uses that are less visible to outsiders, companies, or indeed to capital), nor does it mean that it is *spare* (i.e. that no-one has rights to or claim over it, or might intend to use it in the future).

We also see that available land in Uchindile is expensive for newcomers:

"Land is inherited generation to generation, and has a very high price. It is difficult to get land if you are new to the village." (HHS 068, Uchindile, resident for 7 years)

"There is a difference because the people who are able to get land are indigenous to this area. For people coming, you have to buy and if you don't have money it is very difficult for outsiders to get land" (FGD U6, R1, resident for 8 years).

Others referenced newer residents forming groups in order to access land for tree planting:

"There is the inheritance issue for newcomers. Sometimes you need to form groups in order to get land for trees" (HHS 082 – Uchindile, resident for 4 years)

These difficulties faced by newcomers can be seen as a disparity in access to land between newer arrivals and longer-term residents, but it could also be understood as a way of protecting indigenous land rights. However when we take wealth into account, we start to understand this more. Wealthy outsiders faced fewer restrictions. Some local people felt that there were questionable practices involving payments from small investors to ease the way for their purchases and cover the cost of administration.

"[there is lack of land for farming because] leaders like to get money from the hewa ukaa, the benefit is for everyone, for example with schools." "But also there is corruption." (FGD K5, R2, R1)

"There is no area for farming. Just for land. Leaders are given money and give areas to investors, but indigenous [people] lack areas." (FGD K5, R1)

Local leaders were identified by some as accepting payments in exchange for granting access to land for new small investors who had the wealth to facilitate this. This could therefore represent a further consolidation of the power of local elites who are positioned – politically and practically – to broker such land access, for a price. One respondent linked what they perceived as local elite's appetite for money from carbon offsets, with a lack of land available for farming.

This is wrapped up with the inherited land issue, where people who have emigrated are starting to return to the villages, or use land within them now the land has become more attractive or valuable. In some instances this leads to conflict where they argue that land sold to other villagers or immigrants is actually their inherited land. The tensions and fears that surrounded trees taking over land were also expressed in surveys. This issue is becoming compounded over time with the existence and operation of the company, together with the increasing popularity and visible profitability of tree planting, encouraging in-migration to the area means that land is becoming scarcer.

Respondents from Uchindile explicitly linked this inherited land issue to be driven or exacerbated by the rise in tree planting:

"Yes, the inherited problems with land. Before the introduction of new trees to plant there was no problem, but now there seems to be an issue because of tree planting". (HHS 099 – Uchindile, resident whole life)

"No problem now, but maybe later as people plant more trees and there is less land to farm on." (HHS100 – Uchindile, resident whole life)

Others linked the pressure on land to a population increase:

"Yes [there is a shortage] due to population increase" (HHS077 – Uchindile resident whole life, HHS075 – Uchindile resident 2 years)

While some explicitly referenced the arrival of companies to land shortages:

"Yes [there is a shortage], because of the introduction of companies" (HHS069, Uchindile resident whole life)

Others highlighted the more recent increased pressure on land as attributable to the increase in tree planting:

"Recently there is a shortage of land compared to before, because of the 'revolution' of tree planting, no one will give you land freely" (HHS101 – Uchindile resident whole life)

The use of the word 'revolution' here is notable, as it implies a significant change, or even a previous system having been overthrown. The widespread engagement in tree planting is seen as a revolution in village economic and environmental dynamics. We saw in the preceding sections that planting trees has become almost ubiquitous. The impact of this tree planting revolution as described here is specifically identified as being that people are less willing to 'give up' or loan someone their land than before. This could be related to the perceived shortage - or expectation of a future shortage – of land.

It could be related to a recognition of the value of land (or indeed, an increase in the value of land) as a result of a 'demonstration effect' of GRL and other 'copy-cat' investors planting trees, and of other local villagers who have been 'early adopters' of tree planting who are now reaping the gains from their investments. It could be both. Either way, the 'revolution' of tree planting has changed the way access to and rights to land is viewed, valued, exchanged and negotiated locally.

Other agencies have identified the inherited land issue. The most recent update from NomoGaia, who undertook a HRIA on the Uchindile Forest Plantation in 2009, states:

> *"Beyond the partial-remedies which need to be monitored, new rights risks are also arising. As forestry acreage increases, land stresses have developed in local villages. At one community, eight land disputes are now running between longtime residents and new arrivals over who holds the right to use lands. In another, the massive expansion of forestry (both by Green Resources and new copy-cat businesses) has pressed wild animals closer to village crops, resulting in major crop losses." (NomoGaia, 2014)*

There was also anxiety within the communities about land availability for future generations. Although there were provisions made in the Land Use Plans developed by the villages and GRL by setting an area of land aside for the village's 'future use', respondents expressed concern that this would become a problem in the future:

> *"For future, the land, because GRL they are taking a big area, and the people here, children they are growing, but you can get trouble in the future. Not now….maybe the solution is to not allow the other company to come, because there is a place which is there [for the future generations] but if they allow another company to come, it will take all the land." (SSI K3)*

This final quote highlights the perceived causal link between the presence of private investors and future land issues that seemed to be keenly felt locally. The anxiety and expectation of a future problem with land represents a key temporal trade-off brought about by this kind of large-scale private investment. GRL's plantation, and the 'revolution' in tree planting it has prompted, has set in motion far-reaching consequences for local land use and availability. A perceived availability of land now does not preclude future shortages. Land that appears 'idle' or 'unclaimed' may in fact be in use or have ancestral claims. Not all land is created equal, and the quality and location of available land must be considered alongside the simple amount of land available for use.

Concerns about food security

Another major theme that emerged from fieldwork was the concern and sense of anxiety about food security linked to private investment in tree plantations, primarily on the part of GRL, but also of other small investors.

The key channel through which this appeared to operate was through a shift in livelihoods from subsistence farming to reliance on casual employment with GRL and other small investors, and a focus on planting trees rather than food crops. Figure 6.1 below illustrates the different pathways through which the risk of, anxieties around, and perceptions of weakened food security were understood to be operating. This diagram was developed during fieldwork to try and make sense of the multiple

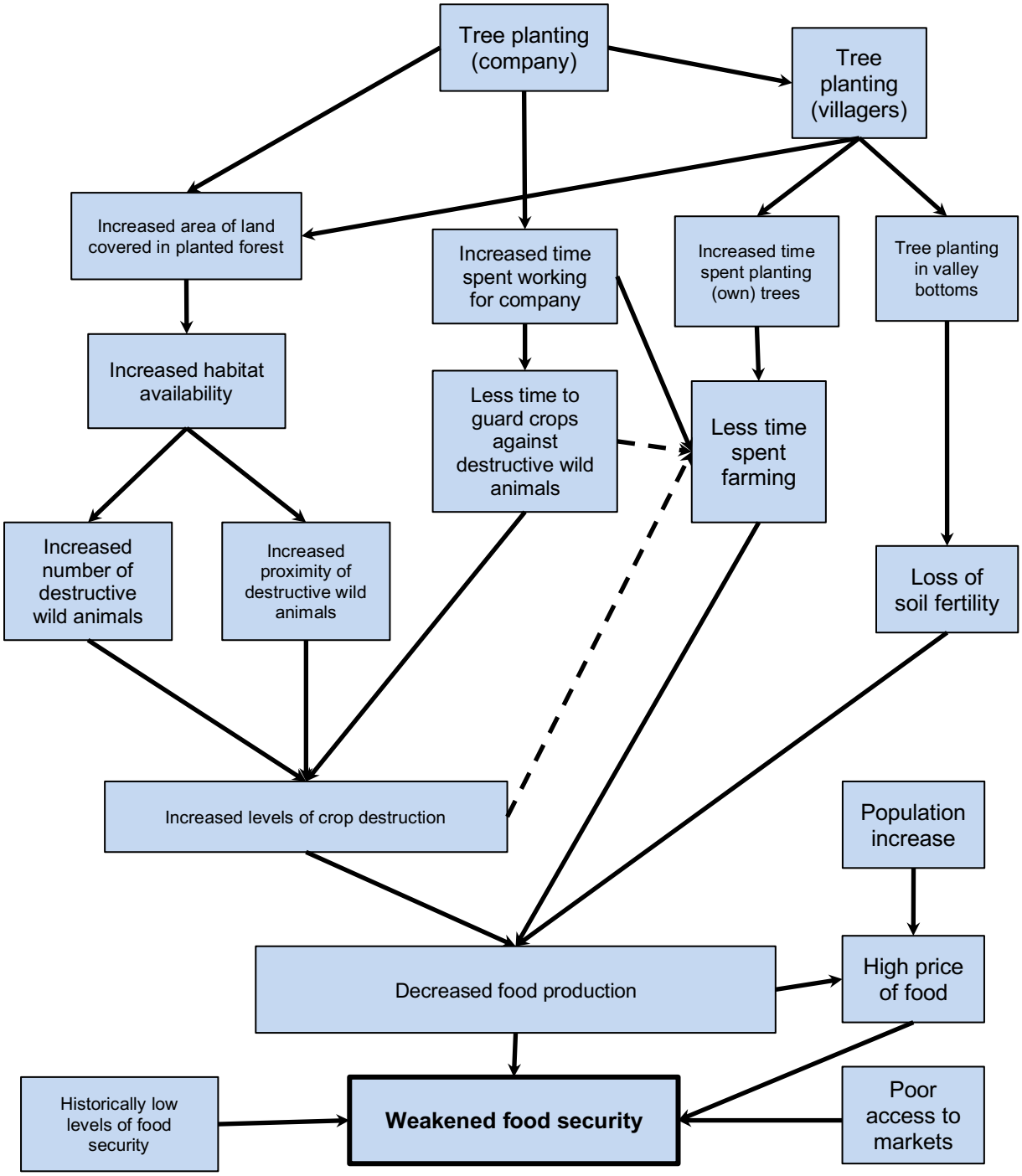
drivers and overlapping effects that were being discussed by respondents during the initial period of fieldwork, bringing together the different impacts, changes and anxieties being expressed as a result of GRL's tree planting activities. It was grounded with data, and then revisited in FGDs and conversations with key informants in the latter stage of fieldwork to try and ensure it adequately captured the dynamics taking place.

In the diagram below we see multiple channels through which the presence of GRL and their tree plantations has had a knock-on effect on perceived food security. Firstly, note that as already discussed, GRL's tree planting has attracted a wave of small investors to invest in smaller tree plantations, and has sparked local people to start their own tree plantations. This has resulted in an increased area of land covered in planted forest in the area. This has increased the habitat availability for wild animals, which has led to an increase in the number of wild animals that destruct crops, and due to the locations of the tree plantations has often meant a closer proximity of wild animals to people's crops. This has resulted in an increased level of crop loss by wild animals, and therefore decreased local food production.

Secondly, the employment opportunities created by GRL and other small investors, has meant people spend more time involved in tree planting activities or paid employment, which means there is less time available to guard crops against wild animals. It also means people have less time available to spend farming food crops. This lack of time available for farming is compounded by the increased time spent tending to their own tree plantations and on supporting other community members with their tree plantations. Less time spent farming and protecting crops from wild animals also results in decreased food production. These two channels work to reinforce one another, as the perceived cost-to-benefit ratio of food crop farming increases. Another trend that was identified was a perceived reduction in soil fertility due to people planting trees in valley bottoms, or too close to crops, which also contributed to lower levels of food production.

Finally, the employment and tree planting opportunities has had migratory impacts described above, meaning a local population increase which also adds pressure to food prices as demand rises. This decreased food production, combined with increased demand for food, historically low levels of food security, and relatively poor access to is seen to have led to a higher price of food and to weakened food security. These dynamics are further explored below.

Fig 6.1. Pathways to increased anxiety around food security



Much anxiety was expressed through concerns about the lack of time people spend on farming activities. This shift in time spent on different activities was seen as being due to multiple intersecting factors. The first factor identified was the significant time working for GRL required:

"They do work a lot – they spend a lot of time working in GRL company, without working in their own farm of crops, and therefore leads to shortage of food." (SSI U3)

"The farmers themselves have not much emphasized themselves or engaged much on cultivation. Rather they base much on the work in the companies like GRL…This one leads to a shortage of food because most of them they will not – there will be a lack of food because most of them they spend a lot [of time] or work for a company without producing food." (SSI U2)

People felt they no longer needed to rely on subsistence farming as they can earn a wage to buy food instead of growing it themselves, yet at the same time there was a collective sense of neglect in this approach, with farming seen as being 'forgotten', leading to food shortages and hunger:

"Most of their time, 8 hours, they spend working at GRL, and forgetting farming. Sometimes they get transport for going to work, and the other times there is no transport, and that's why it has…makes people – other people to stay…to make camps nearby GRL plantations, and leave, or forget farming crops – and this one results in shortage of food – leads to farmer 'njaa'." (SSI K1)

In the context of a traditionally agricultural economy, this feeling of loss should not be underestimated, as the shifting of livelihoods away from subsistence farming represents a fragmentation and disintegration of a way of life and a collective historical identity. But it should also not be overstated. New livelihood, fortunes and ways of life are evolving, and while they bring challenges with them, they also bring opportunities.

The distance people had to travel to work, and the lack of transport, was also identified as compounding the disincentives to spend time farming. Then there is the perceived lucrativeness of tree planting, for timber products and with a view to maybe accessing carbon finance, and thus the draw towards choosing to spend time planting and tending to personal tree plantations rather than farming subsistence food crops:

"because of the inspiration of planting trees, they know that trees are more important than food or crops" (SSI U5)

People characterised almost a trade-off between time spent cultivating food crops, which could sustain you but wouldn't further your position in life, or planting trees, which was seen as an investment in your and your family's future, and which could allow you to progress. The short-term downside of this is shortages of food, and rising food prices:

"Most of the people around are much based on planting trees rather than farming crops, especially food crops, and therefore there has been a shortage of food. …[Also] the presence of GRL has led to…high price of food. Instead of engaging in cultivation of food crops, they…the people they engage more in working at GRL so as to plant trees". (SSI K5)

The scarcity of time available for farming activities was also an issue highlighted by a third-party observer:

"Locals were intended to continue subsistence farming but have found it impossible to tend large enough fields for subsistence and work at GRL" (NomoGaia, 2009: 72)

Linked to this was a concern that some people would not comprehend that the 'payoff' from planting trees takes years to get, and so there were worries about what people would do in the meantime:

> *"After the coming of GRL, people were inspired to grow a lot of trees…without remembering that trees is after 10 or more than 10 years to harvest" (SSI U5)*

Another factor discussed was the low productivity of farming activities. This was suggested to be both pre-existing and worsening. Respondents pointed to the 'nature of the land': undulating with lots of hills and valleys meaning it is difficult to find a large area to farm on, and lots of small areas are more difficult to manage.

> *"The farmer faces a problem during cultivation – to the side of the nature of the land, how it looks like – mountains – it's not good for the using of machines, or ploughs and ox, because of the nature of the steep slopes, so it becomes more difficult for the farmers to cultivate big areas" (SSI U2)*

Poor soil quality, soil erosion and the impact of fire were also identified as possible causes of low yields. These were talked about in the context of historical 'inherent' limitations of the village land, and worsening as an effect of planting trees:

> *"The fire destroys the fertility of the soil" (SSI U3)*

> *"Now people are not planting crops anymore, they are planting trees – even in their farming areas in the valleys…[this] will absorb all of the nutrients in the valleys – reduce the soil fertility – and therefore lead to a shortage of food." (SSI K5)*

> *"After the coming of GRL, people were inspired to grow a lot of trees, and [this] even led them to shift from where they were planting previously in the highlands, and going down to the lowlands…without considering the way of conserving the water sources – they have planted…even to the lowlands which has dried up some of the water sources" (SSI U5)*

We see here that GRL's presence is seen to have prompted people to plant trees in the lowlands, thus risking impacting on water availability and on soil fertility in areas typically used for farming food crops.

Another key factor affecting food production in Kitete and Uchindile was an increase in the destruction of crops by wild animals, as a direct result of tree planting activities. This was identified as being both in terms of the increased number of destructive animals and their increased proximity to the tree plantations, as well as a lack of time to guard crops against wild animals:

> *"People are planting lots of trees, which provides a habitat for the animals. There is less farming, and so less food, so they have to move closer." (FGD K3)*

> *"Now people are not even farming, fearing the destructive animals will destroy all the crops…It will get even worse – if you don't take care, they will even take the food cooking in the kitchen!" (FGD K3, K15)*

The reduced areas of land farmed for food crops was identified as intensifying wild animals search for food in smaller and closer areas, leading to higher levels of crop destruction, and further discouraging

people from investing time in farming food crops – the benefits from spending time farming have decreased, and the costs are increasing, which makes farming crops less and less attractive.

> *"[this] will limit development, or even revert the development [to the previous state] because it will be difficult to get food. For example, that Mzee over there with a pineapple farm – wild animals entered his farm and destructed everything – it will limit development." (FGK3, K7)*

As the above quote highlights, many people expressed serious concern that crop loss from wild animals would halt or even undo the economic development they had seen over the last few years. This crop loss was having a significant and material impact on people's lives, which leaves farming as a less and less appealing livelihood, but at the same time, it is perceived as integral to life.

It is interesting to note here that two seemingly competing effects of the establishment and growth of tree plantations in the area on wild animals were identified. Initially this was difficult to disentangle - sometimes respondents would point to a decrease in wild animals due to increased human activity from the tree plantations scaring them away, and others would emphatically talk about the rise in numbers of wild animals due to the creation of new habitats that encouraged them closer to the village and to farming land. However, it became clear that the tree planting activities has had different impacts for different wild animals in relation to their habitats, and that specifically it was numbers of monkeys, wild pigs and birds that had increased their destruction of food crops, while larger wild animals (particularly those caught and eaten for food) had become much scarcer.

> *"The GRL plantation has collected the destructive animals to have a habitat in these planted trees, which mostly affect the crop growing" (SSI U7)*[68]

Local residents - both longstanding and newer arrivals, and across wealth groups - talked about their concerns about current and future lack of availability and variety of food in Kitete and Uchindile.

> *"They believe much in maybe getting money from these companies, rather than saying that maybe they see the production from agriculture is little compared to maybe what they get from the company, and that's why still this has been a great problem to them…to improve their agricultural production". (SSI U2)*

While concerns were raised in both highland villages, there was a distinct contrast between Uchindile and Kitete here. Kitete has much poorer access to markets, and poorer transportation and infrastructure than Uchindile. Furthermore, something noted by many respondents was the absence of a milling machine (used to mill maize flour) in Kitete. This could be acting as a disincentive for farmers in Kitete, as to mill flour, they would need to transport the maize to Uchindile, likely by foot along the railway track (a 4-hour journey) with a heavy sack of maize to carry.

> *"[One of the big barriers to development is] there's no milling machine" (SSI K6)*

> *"We have no milling machine, maybe if we want to get flour, we have to ask for transport" (SSI K2)*

[68] Ngedere and Nguruwe (monkeys and pigs) were specifically mentioned here as destructive animals which found a habitat in the GRL plantation

This is compounded by the increase in food prices in the villages, possibly due to both the increase in demand for food with new arrivals moving to the villages and the decrease in food production as discussed above.

> *"the presence of GRL has led to…high price of food. Instead of engaging in cultivation of food crops, they…the people they engage more in working at GRL so as to plant trees". (SSI K5)*

> *"You can get money from employment so can buy food- (R3) -but you can have money but then no food to buy- (R2) -or [food is] a very high price" (R5) (FGD K6, women FGD)*

We see again that there are a longer-term more complex set of impacts and interactions that have been set in motion, have started developing and are already having reinforcing and sometimes contradicting effects. In the case of food security, these shifts are generating significant anxiety for local people. GRL's activities have led to a dramatic shift in both the landscape and economy of the villages and in how people choose to spend their time and energy. These shifts, along with increased crop destruction by wild animals given habitats in tree plantations and increased village populations due to migration by those seeking jobs and investment opportunities, have consequences on the availability of food in Kitete and Uchindile. Compounded with pre-existing low farming yields, poor access to markets and rising food prices, there is widespread concern expressed around local food security for local residents both now and in the future. This concern is one that was echoed across the spectrum of wealth and class.

Discussion

The preceding sections have explored the broader forces of economic and environmental change that GRL's presence has unleashed. Planting trees has become almost ubiquitous for those living in Uchindile and Kitete, with a large majority of residents having planted eucalyptus and/or pine. This has created opportunities for securing novel forms of income and diversifying livelihoods away from subsistence farming, for those who have access to capital, land, and time for labour. The ability to capitalise on these opportunities is dependent on wealth, as tree planting requires time and money. This has diversified livelihoods, leading them to 'straddle' planting trees, farming, and undertaking paid employment.

We see evidence of this smallholder woodlot boom elsewhere in the literature. Kimambo (2020) found in her study of smallholder woodlots in Tanzania that by 2018, smallholder woodlots (<1 Ha) constituted around 50% of tree planting in Tanzania, and covered an area comparable to corporate and government plantations combined. She found that these woodlots were recent (54% of their sample were planted in the period 2012-2015), suggesting a recent boom in smallholder tree planting, and the vast majority of these plantations consisted of non-native pine and eucalyptus (Kimambo et al., 2020: 1). Other studies have also found that the majority of tree plantations in the Southern Highlands in Tanzania are smallholder woodlots (e.g. Koskinen et al., 2019). Also referred to as a 'Timber Rush' elsewhere in the literature (Lusasi et al., 2020; Koskinen et al., 2019; Lusasi and Mwaseba 2020; Kimambo et al., 2020), the woodlot boom of rural tree planting has been encouraged by the growing demand for timber. My findings reinforce this, showing how this tree planting rush has taken root for those who can afford to do so within Kitete and Uchindile, and also offer insights how

a large-scale privately managed plantation can affect smallholder tree planting activities and therefore local livelihoods and broader landscape ecological changes.

It is helpful to consider how similar outgrower models are discussed in the literature here. In their exploration of the future of tree plantations in Africa, Jacovelli (2014) outlines how companies provide technical (sometimes through 'demonstration fields') and financial assistance to smallholder tree growers in South Africa to support them to establish their own tree farms in exchange for a guaranteed market for the final product. They show how these companies benefit from this arrangement by securing a further local supply of raw materials for mills, 'as well as gaining support for commercial plantations amongst the local communities, something which is crucial for success in commercial plantations everywhere', also making reference to GRL and other large corporate investors in Tanzania who are 'supporting out-growers surrounding their estates, often by providing free (or subsidised) seedlings' (Jacovelli, 2014: 151). We see elements of such an outgrower model developing in the study sites of this thesis, with local people relying on the sharing of knowledge, transport, and even physical inputs from GRL, with some tree planters planning to sell (or even in some cases, having sold) their physical outputs to GRL for their vertically integrated industrial operations, and with GRL positioning themselves to facilitate access to carbon accreditation for groups of local smallholder tree planters looking to access carbon finance.

In the context of smallholder tree growers in Uchindile and Kitete, we can see hints of a process of differentiation emerging, as in Sulle and others' work around sugarcane outgrowers in Kilombero (Sulle, 2017; Sulle and Dancer, 2020). Those who have sufficient capital (or land and labour) are able to plant their own tree farms and exploit the more financially rewarding opportunities created by the presence of GRL and the broader changes they have brought. They also position themselves as more able to access carbon finance for their own – or collective – tree plantations, to be brokered through GRL. The poorest in these rural society are less able to access such opportunities.

This process of differentiation is also seen in the different size of land held by different households for tree planting. For example, there was a sharp contrast in average landholdings used for farming food crops revealed in the survey data: those with land for planting trees tended to have on average over twice as much land for farming as those who didn't have land for planting trees[69]. When total landholdings (for both farming food and for planting trees) are compared, this contrast is even starker: in Kitete those with their own tree farms had almost three times as much total land as those without, and in Uchindile this was a multiple of over five[70]. There is significant variation in size of land holdings, and data tentatively suggests that those with stable, better paid jobs (such as foresters with GRL), wealthy individuals with ancestral ties who have returned to the village after moving away, and local elites (such as village executive officers) having significantly large areas of land planted with trees. This chimes with literature such as Lusasi et al. (2020) who explored the diversity of domestic private investment in tree plantings, developing a typology of domestic investors in tree planting in the Southern Highlands. They typified 5 groups of domestic investors and the authority by which they

[69] Source: HHS QB301 How much land do you own (and what for). Across Kitete and Uchindile, the average size of landholdings for food crops for respondents who had their own tree farms was 2.43 acres, for those with no personal tree plantations it was just 1.06 acres (n=70).

[70] Source: HHS QB301 (as above). For Kitete, respondents with tree farms reported an average of 10.83 acres of landholdings compared to 3.91 acres for those without. In Uchindile, respondents with tree farms reported an average of 5.82 acres of landholdings, compared to 1.13 acres for those without.

access land for tree planting: urban-based investors without local ties; resident villagers; urban-based investors originating in the area; government organizations and religious organizations; and local leaders. Within resident villagers, they explored several sub-types: those with surplus land, those who receive land through allocations from local (village) government; and those who buy land from other villagers. They reveal a greater diversity within domestic private investment in tree planting than suggested elsewhere in the literature, and suggest that these sorts of investments are 'likely to spur processes of social differentiation…[and] the intensification in tree-planting activities may also change the use of some land from food crops [regardless of investor type, which]…could potentially undermine food security' (Lusasi et al., 2020: 170).

This is important because it shows how those with wealth and various forms of capital (social, financial and otherwise) are able to exploit opportunities presented by tree farming more readily. The benefits of tree planting are significant, but they are distributed unevenly. This differentiation, along with likely associated distribution of uneven benefits from the commodification of carbon, reinforces this critique of market environmentalism seen in the literature as we saw in chapter 2: with the political economy of carbon offset markets reproducing 'highly unequal geographies' (Bumpus and Liverman, 2008) and deepening existing inequalities (Dunlap and Sullivan, 2019). Access to capital (and therefore, class structures) affect people's ability to exploit opportunities presented by GRL's investment and the consequent changes in the local economy and landscape. Unsurprisingly, evidence in the literature also suggests that richer people perceived (and were able to exploit) greater benefits from private plantations (Degnet et al., 2018: 77, Lusasi et al, 2020), but some also found that female-headed households were more likely to perceive privately-run tree plantations to provide material benefits (Degnet et al., 2018), which echoes findings presented in chapter 5.

We see high levels of class dynamism, patronage, and social differentiation within outgrowers associations in the context of the Kilombero sugarcane market, where high levels of competition between local suppliers and pre-existing social and wealth inequality means that smaller outgrowers have been marginalised by large-scale outgrowers who speedily captured the most lucrative opportunities and land, and groups formed have replicated power dynamics and marginalisation (Sulle, 2017). However, while this thesis is not a comparative study, we can highlight some immediately apparent distinctions between the sugarcane and timber markets. For example, the time requirements for crop maturity are significantly different, domestic demand and market structures are likely different, as well as the potential opportunity for access to international carbon finance, and likely different contract agreements for selling matured trees to GRL's vertically integrated industrial operations). These distinctions, as well as differences in local contexts, particularly in the (at least at the point of research) relative land surplus in the study villages and the availability and local importance of employment opportunities offered by GRL, do not mean that the same outcomes would inevitably arise from tree planting groups here.

But the inequality of these consequences does not mean that the consequences themselves are wholly gloomy. In fact, many have benefited from the attendant broader changes GRL's presence has brought. We know this because people say so, and what people say – and their perceptions – matter. This is not only true in and of itself, but also because as others have shown, perceptions affect how communities relate to companies and plantations (Degnet et al., 2018). Further, forming collective groups could offer opportunities to redress some of the inequalities that threaten to grow. Jacovelli (2014: 156) describe the incentives for small tree farmers for working in an out-growing arrangement

– their need for information in planning the financial and technical aspects of tree planting, for nurseries for seedling supplies, and market availability of matured trees. They argue that by forming a grower's association, or tree planting group, they can foster solidarity, grow power under a common voice and further benefit from economies of scale. This could also extend to the groups forming around tree planting with a view to accessing carbon finance via GRL.

As this chapter has shown, GRL's presence has given rise to migratory impacts, and landscape and livelihood changes which has boosted the local economy, but also generated competing claims of land and resulted in anxiety over future shortages of land. The migratory impacts are similar to those found by other literature, such as Kangalawe and Swart (2021: 86) who found that a large private forest plantation had reduced youth urban migration due to employment opportunities, and the provision of seedlings, encouraging opportunities to grow their own tree farms. There are anxieties around future land availability, and some issues arising already related to the 'inherited land issue' described. My findings suggest that GRL's presence has exacerbated insider-outside dynamics, through the inherited land issue, which are overlayed by wealth and class differences in terms of access to land use for planting trees. Broadly speaking, those without current or ancestral village ties faced higher barriers to acquiring land, meaning outsiders who did buy land tended to be wealthier ones. It also meant that people who had been living in the villages for years – decades even – but who didn't have ancestral ties to the area, or the wealth or social capital to compensate for this – found it harder to acquire nearby land in order to take opportunity of the local tree planting boom. These dynamics likely serve to reinforce positions of local elites, who are able to act as brokers and gatekeepers for land acquisition. When speaking about the ability of outsiders to acquire land, it is also important to keep in mind my position as an outsider here, as respondents could have a particular interest in framing the land available in the area as difficult to acquire when speaking to an outsider, emphasising the rights that they as longer-term residents have to land. However, this issue was something that was described similarly by both newcomers and residents with long-standing ancestral ties to the village.

While there are undoubtably issues with land, as expressed through the 'inherited land issue', in an area where there are relatively small population compared to the availability of land, land availability does not appear to be as stark an issue as is suggested in the green grab and large-scale land acquisition literature we saw in chapter 2. This literature suggests a picture of dispossession of local residents 'ruthlessly exploited' by large-scale private investments and smaller outside copy-cat investors (e.g. Benjaminsen and Bryceson, 2012; Dunlap and Sullivan, 2020; Bergius et al., 2018; Bergius et al., 2020; Bluwstein et al., 2018; Kangalawe and Swart, 2021). While some of the literature frames private companies and smaller outside investors as 'ruthlessly exploiting' villagers unaware of the true value of their land in the early 2000s in the Southern Highlands (cf Kangalawe and Swart (2021: 96), the dynamics that are unfolding in Kitete and Uchindile is less straightforward than dispossession of local residents by large scale private investments. Such exploitation may or may not have taken place. But the picture that my thesis reveals is one where local people are protective of their claims to land, are not willing to give land away freely or for cheap. New issues have arisen such as the inherited land issue, where people with ancestral links to land who have moved away, are now returning having seen the value of land and of the tree planting activities many are undertaking on this land, giving rise to disputes over any ancestral land that has been used by others. Competing claims to land do arise – but the overriding sense from the study sites was not one of land shortage. Concerns around dispossession therefore seem to be of less relevance (in this case, at the time of research) than the literature critical of neoliberal conservation, carbon offsets and large-scale land

acquisitions would suggest. Rather than concerns around land availability or dispossession, what emerges as more prominent are concerns about *functional* availability of land (particularly the location of spare land, and its proximity – or more pertinently, distance – from village centres, housing and transport links), and the broader impacts large-scale investment in tree-plantations has on people's livelihoods and time available for farming, which coupled with the migratory impacts on local population dynamics, generates concerns around food security.

The concerns around knock-on impacts of large-scale investments on food security discussed in this chapter are also seen in the literature around SAGCOT (West and Haug, 2017; Sulle et al., 2014), which also emphasises fears of land fragmentation leading to consolidation of land in the lands of large-scale farmers and further loss or fragmentation of smallholder agriculture land holdings (Kadigi et al., 2017). Talleh Nkobou et al., (2021) in their rights-based analysis of marginalised livelihoods and food insecurity in the context of large-scale land investments in Tanzania found that experiences of food insecurity corresponded with lack of land ownership, employment and other income-generating activities, arguing that in Tanzania, access to land is a crucial requirement for achieving food security (Talleh Nkobou et al., 2021: 185). In contrast to the wider literature, pressures on food security were less as a result of a decline in land for food crops or difficulties in acquiring farmland (as per Sulle et al., 2014; Talleh Nkobou et al., 2021), but more a result of other issues mentioned in reference to food security: that of lack of time or energy for food farming (Sulle et al., 2014), and changing landscape dynamics created by widespread eucalyptus and pine tree planting and other shifting livelihood activities (which has consequences for - amongst other things - crop losses through wildlife destruction). Concerns about food security and reduced crop production were expressed more in relation to temporal rather than spatial constraints. Further, the context of the land is important. As scholarly work such as Bluwstein et al., (2018) and Brockington (2002) have shown, when considering the impacts of large-scale land acquisition, whether by the state or by private forces, we have to pay careful attention to the specific forms of landscape ecologies at work, and to the particular historic livelihood dynamics that existed in the local area.

Conclusion

Much of the existing literature has focussed its attention on concerns around dispossession by accumulation and land alienation and has not paid as much attention to the broader context and wider changes that large-scale and smallholder investment brings about. The findings established in this chapter and the preceding chapter 5 offer new insight to this. I have demonstrated the role of GRL in stimulating the migration of people seeking paid employment with the company; prompting an influx of small investors seeking to plant their own trees, capitalising on the growing local economy and 'spillover' impacts of GRL's activities; and bringing about a perceived slowdown in the emigration of youth from the area with growing prospects of paid work and investment opportunities. These migratory impacts, and the resulting population dynamics, bring with them an intersecting and developing network of implications for local residents and the village community as a whole: increased opportunities for work with new small investors planting their own tree farms, with simultaneous increased competition for jobs with differing levels of security, status and benefits; the bringing of new ideas and fresh perspectives, at the same time as fears around how these new ways of living might disrupt community norms; increased economy and population increasing demands for local businesses while bringing increased anxiety around the impact on the availability of food in the area.

These impacts are not viewed simply by local residents: their hopes and fears are complex, nuanced and evolving. None are quite so complex as the relationships and interactions surrounding fire; and it is to the ecology of fire in this landscape, specifically the fire of 2009, that I now turn.

7. Fire

The previous chapters have shown how the presence and activities of GRL have brought about immediate and more gradual fundamental shifts in the economies, society and landscape of Uchindile and Kitete. These impacts have affected, and continue to affect, all parts of local society, to varying degrees. Some have opened up new opportunities for welcome change, while others have deepened inequalities. The impacts are significant and far reaching, but are not straightforward. Nor are they viewed as such by local residents. In contrast to the polarized and often oversimplified wider debate around privatization and large-scale tree plantations, local realities are nuanced, complex and evolving.

This chapter explores further the nature and practices of local politics through the lens of a severe fire that occurred in 2009, destroying a significant proportion of the GRL plantation in Uchindile and Kitete. I use the fire to examine the forms of power and agency exerted by different groups, and specifically how the fire was used by these groups to re-negotiate power dynamics and terms of engagement. Critically, I argue that the interactions between and within the community, local leaders and the company in the aftermath of the fire reveal how different individuals and groups leveraged the fire in order to reassert their agency, and challenge and renegotiate the dynamics of power.

Here, I first outline the general context of attitudes to fire. Then I explore the nature and impact of the 2009 fire. I subsequently examine three prevailing perspectives that emerged during fieldwork as to the cause of the fire, and then turn to a discussion of reactions to the fire and how it was used to (re) negotiate power and interactions between and within the company and the surrounding local communities.

To construct this account, I draw on information from company records, and third-party reports, as well as anecdotal evidence gathered during fieldwork. Respondents seemed reluctant and uneasy in talking about the fire. There was a sense of anxiety and even danger around even just talking about fire, or being associated with fire or with behaviours that risked fire. This makes sense, both for the reasons set out below, and likely due to my positionality - as an outsider, a white foreign researcher asking questions about an event that posed serious risk to many residents' livelihoods. Furthermore, the impact of this 2009 fire - as discussed subsequently in this chapter - is likely to have contributed to uneasiness in talking about the fire, particularly its cause.

Role, threat and management of fire in this landscape

Generally speaking, fire is mistrusted and disparaged in official circles in Tanzania. It is emblematic of perceived inefficient, slash and burn agriculture and forest destruction. Fire is particularly feared in places which are heavily dependent on exotic tree plantations.

These plantations favour eucalyptus and pine which are grown because they mature quickly, yield relatively high returns, can be easier to maintain and have a ready market for their timber. Yet they are also particularly flammable, especially when grown in intensive plantations. As the local region is heavily involved in tree plantations, timber, and paper production, anxieties around fire should be

understood in this context of the historic and economic importance of forestry and timber to the region. Fire, and the destruction to trees and therefore to an investor's, company's or community's assets, poses a risk to the economic development in the area, and to people's jobs and futures. Activities such as hunting, that can pose a high fire risk, are therefore no longer seen as socially acceptable, despite any historic or traditional use.

Whereas in some parts of Tanzania it is common for mob justice to be meted out on thieves caught on the street, there are instances of severe beatings that arise in response to someone starting a fire. This is something that was alluded to in conversations and observations throughout the fieldwork undertaken:

> *At one point [during fieldwork], when I took my research assistant to hospital after he came down with malaria, there was a dead body brought into the hospital while I was outside. One of the policemen who was accompanying the body came over and spoke to me for a little while. He told me that the man had been beaten to death because he was suspected of starting a fire. (Fieldwork diary notes, March 2013)*

These vigilante attacks against fire starters, suggest misbehaviour with fire is seen as the equivalent of destroying or stealing property. A fire starter is viewed as a *mwizi* (thief). This violence has to be understood for its economic context. This is a region where incidences of fire are seen as a particular threat to or deterrent for investors in the region, and many people's livelihoods are closely interlinked with these investors, the wider tree-planting or timber industries, or would be greatly affected by an outbreak of fire. Residents view fire, and those that start it, as a grave threat to their livelihoods and future. Specifically of GRL, informants said that:

> *"Due to the fires burning trees, if the Mzungu owner of GRL comes and sees fires he will stop the company working here. The GRL made lots of people come here to get employment – if the company leaves, the people will migrate away again and leave very few indigenous people here, and will stop development." (FGU6, R6)*

The ecology of the danger of fire, along with the historic social and economic importance of forestry and timber in the region and the socially reinforced fear of fire and anger towards those that engage in fire-risky behaviours, demonstrate multiple reinforcing factors that render fire a particularly risky and sensitive phenomenon in the local area. In focus groups and interviews, respondents explicitly expressed this fear and anxiety around the risk fire posed, identifying fire as one of the biggest negative impacts associated with their environment in terms of the impact it had on their lives:

> *"Fire – if there is a fire, it can destroy years of work, and can take years of work to get back to the previous position" (K13, FGK2)*

> *"Fire…destroys even crops. Fire can destroy everything" (K12, FGK2)*

> *"Fire is a great problem, not only for GRL who plant trees in this particular area, but for even the indigenous who are living in this area, because they have their own trees, therefore once*

fire starts, it never selects where to burn. It burns everything, even the indigenous' trees." (SSI K5)

We can see in these statements several different aspects of the spectre of fire, and why it causes such great concern. Firstly, we see how fire can lay to waste years of labour – this is explicit in the first statement, and implicit in the others. Secondly, we see in the second statement how fire threatens food security, by destroying crops. Thirdly, from the last statement, we see how fire threatens cash crops. Fourthly, fire is indiscriminate, posing a threat not only for GRL's plantations, but also for people indigenous to this area who have planted their own trees. This last point, elicited from the final statement, also hints at a relative weighting of different people's interests: the phrase *'even* the indigenous' trees' implies an acknowledgement that fire is not just an affliction that affects outsiders such as small investors, GRL, or those newer arrivals without ancestral ties to the area, but one that equally impacts 'insiders', and therefore this must be taken seriously by all. Fifthly and finally, these statements show how the destruction fire brings is not permanent, but it can bring significant losses: it can take years of work for people to get back to their previous positions.

The fire of 2009

In October of 2009, there was a large fire that had significant impact on the landscape, company, local community, and relational interactions between these entities. The fire burned for 2 days, from 31 October to 01 November 2009 and burnt 2,368 ha[71] of planted forest [GRL, 2011: p3]. At the time of fieldwork it was still unclear who started the fire, although broadly there seemed to be consensus around the idea that the fire had been deliberately started.

Compared to previous incidents of fire, the 2009 fire was locally perceived to be unprecedented. Residents described the extent of the fire:

"There was a very big fire which burnt all the plantation of GRL." (SSI U8)

"There was a big fire outbreak for the GRL forest" (FGU1, R3)

"The village forest was burnt and the fire spread up to Mufindi" (FGU1, R6)

These statements are not surprising realities given that the fire was so large, and they suggest that both GRL and the village plantations were affected, with the fire spreading far. Figures 7.1 and 7.2 below, taken from GRL VCS documents, illustrate the extent of the 2009 fire and its dramatic size compared to the area of forest and subsequent burnings. Figure 7.1 depicts the burnt areas of the UFP plantation forest (in pink) with the areas of plantation forest that were not burnt (in green). Figure 7.2 compares the extent of fire in 2009 (in pink) with the extent of fire in 2011 (in red)[72]. Again, the comparison is striking.

[71] 31 October - 01 November 2009 from GRL VCS documents. A Timberwatch report also refers to "a large part of the Uchindile plantation (2 000 ha.) was recently destroyed by a fire." (Timberwatch, 2011: p47.)

[72] An illustration of the extent of fire in 2011 is useful here to contrast the extent of the 2009 fire with that of a more typical year.

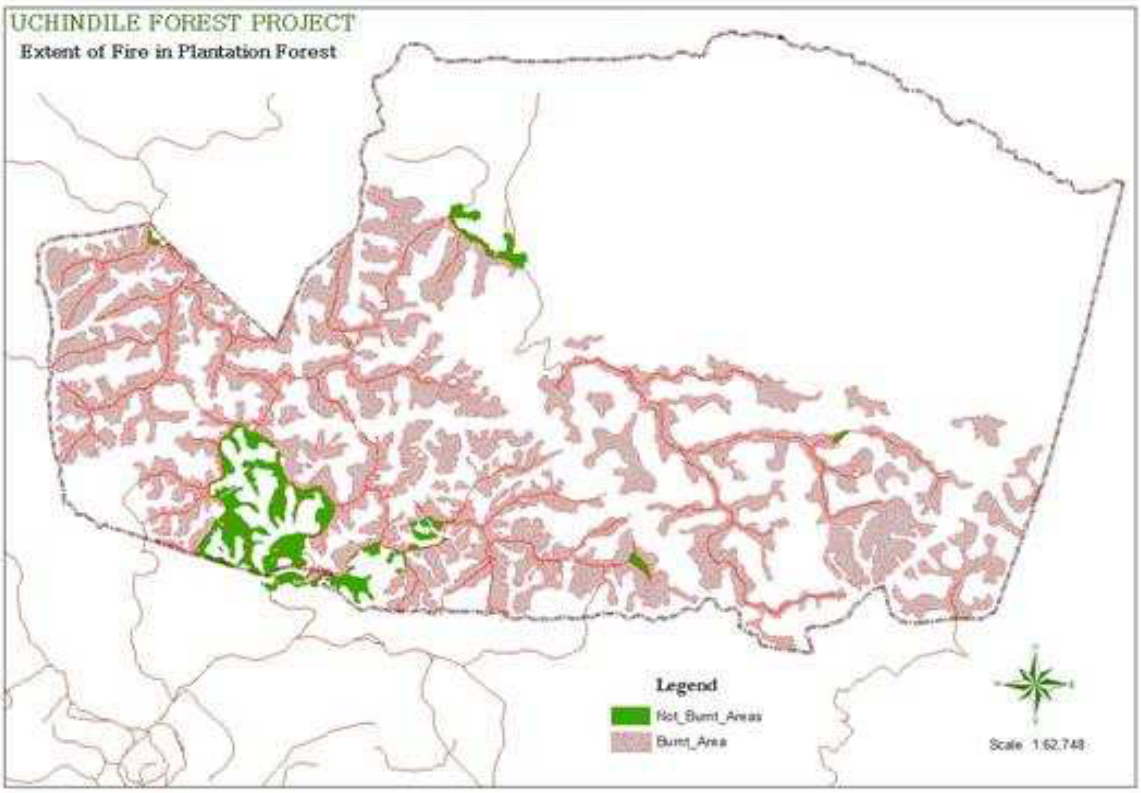


Figure 7.1 - Extent of 2009 fire in UFP plantation forest, in GRL/Verra, VCS Loss Event Report, 2011, p.3. Used under a UK Copyright Exception.

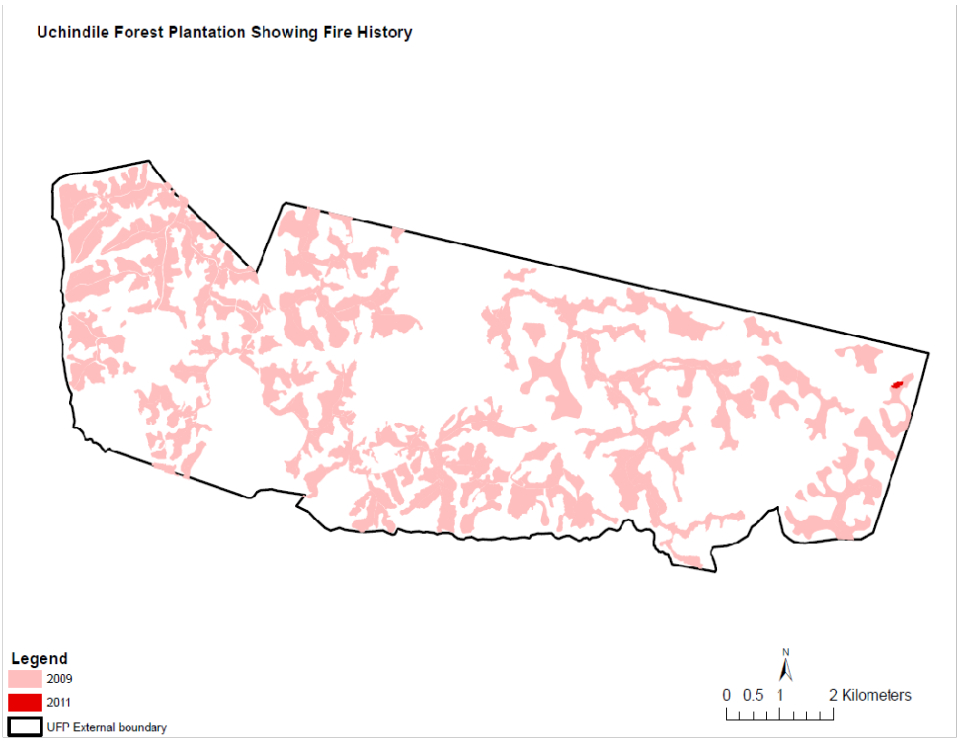


Figure 7.2 – Extent of fire in UFP plantation forest in 2009 vs. 2011. In GRL/Verra, VCS Monitoring Report, 2013b: p.52. Used under a UK Copyright Exception.

It is evident that the damage caused by the fire was significant and extensive. It devastated a considerable proportion of the trees planted by the company, releasing thousands of tonnes of carbon dioxide. The net carbon loss from the fire was estimated to be greater than 76,000 tonnes of CO^2, with the carbon stock estimated to have fallen from 2,325 ha to 468 ha in UFP after the fire (GRL, 2011:7). It impacted significantly on the landscape, wildlife, and local people - risking limited crop production and resulting in a halting of the company's activities and therefore to many residents' sources of income, and worsened relations between the company and the local communities.

It was unclear whether any of the residents' personal tree plantations were affected, although there is some suggestion from interviews and focus groups that some were. It is also unclear whether there was any loss of life or physical injuries sustained by any company workers or local residents. Also, although GRL does not refer to them in the loss report, other documents map the existence of 'high conservation forest' and 'graves and ritual sites' within the Uchindile Forest Plantation. Figure 7.3 below shows these areas in red and with red dots. It is unclear whether these areas sustained any damage by the fire.

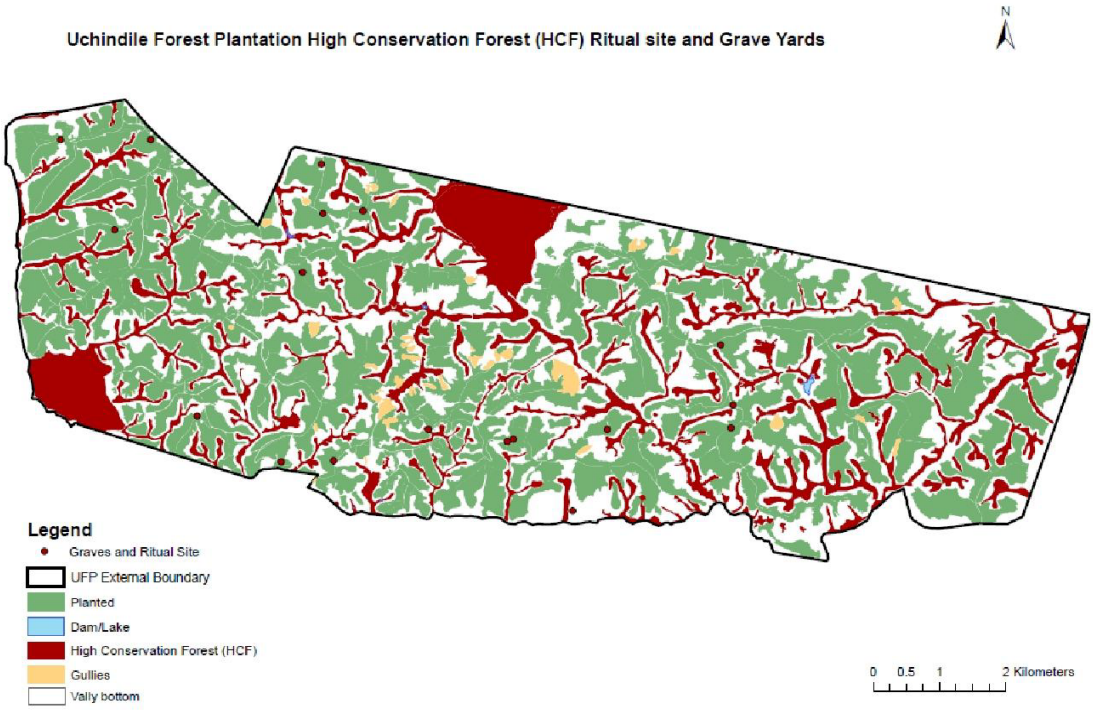


Figure 7.3 – UFP conservation forests, ritual and grave sites. In GRL, CCBA Implementation Report for Verification, 2012a, p17. Used under a UK Copyright Exception.

The contested explanations of the fire

There were broadly two narratives given by respondents within the local community and third-parties claiming to represent the community's interests: a strong assertion that the fire was set as a

direct protest to a failure of the company to adequately address workers' concerns; and a distancing from and othering of an apparently unknown fire setter.

The initial loss report did not describe the cause of the fire as arson – it was described as a 'widespread fire event' with no discussion of the cause of the fire (GRL 2011: 3). But in subsequent verification and monitoring reports the fire was described as arson, and was classified by GRL as an illegal activity:

> *"a big fire occurred in 2009 on the Uchindile Forest Project by arson."*
> *(TÜV SÜD, 2013: 31)*

> *"**There is limited evidence that fires set to the project area were intended** neither was it for the purpose of extracting any illegal material from the project area. However, interviews indicate that setting fires to the area by the local community was common as land preparation tool; which at times got out of control and escaped to burn the vast grassland areas before the project started. The project area is grassland at the start of the project with very few pockets of tree of little value. Furthermore, t**he 2009 fire occurred at Uchindile was related to arson which is considered an illegal activity**." [emphasis my own] (GRL, 2014b: 32-33)*

This latter extract reveals that GRL recognise that fire is part of normal landscape management practices, while implying that fire is now a danger (or more of a danger) because of the changing ecology brought about by tree plantations.

The narrative implicit here is that whereas before GRL established their plantations, the times that fire 'got out of control and escaped' the consequence would be that the fire would burn grasslands. GRL explicitly name these ecologies as being 'of very little value'. In contrast, now GRL's plantations and other smaller tree plantations have been established, and have what GRL recognise as 'value', the consequences of fire are seen as far more costly. From this perspective, either fire has always been dangerous and 'bad for the environment', but the previous environment was not as valuable so did not matter so much; or fire was not as dangerous back then, as it is now (due to the changing landscape); or a combination of these scenarios (where the local fire ecologies (their frequency, impact, intensity and ability to spread) has changed because of the shifting landscapes, and these landscapes have more value now that they have been recognised by capital). The underlying narratives here link to the pervasive degradation narratives around fire, grasslands, and what (and who) determines 'productive' or 'valuable' landscapes that are seen in the literature (as shown in chapter 2) and that connect to those we saw in the findings discussed in chapter 5.

While the company does acknowledge that it is important for community relations to be strengthened, the central narrative around the fire presented by the company in its official documents is one of an illegal activity. This framing places the responsibility of the fire squarely onto the individual(s) and distances the company from any responsibility. The implication is that the company cannot be held responsible for the activities of criminals.

NGOs saw the fire as a clear response to poor treatment of company staff. Their reports also shed an alternative light on the company's explanation as to any motivation behind starting the fire.

NomoGaia, a human rights NGO that undertook a human rights impact assessment (HRIA) of GRL's Uchindile Forest Plantation activities, states that

> *"In October 2009, arson was committed on the Uchindile plantation. The Company reports that frustration was over social security deductions, a longstanding point of confusion and contention between the Company and workers. In interviews, workers also listed inadequate wages and safety standards, defaulted promises, and a clear failure to commit to worker health as causes for the violent outburst." (NomoGaia, 2010: 5)*

> *"Specifically, the community says that the arsonists claimed that they set the fire because GRL deducted NSSF* [National Social Security Fund] *fees from their pay, and accused GRL of stealing this money. This money is of course with NSSF. There were of course also a number of other problems in Uchindile, but this was claimed to be the 'direct reason'." (NomoGaia, 2010: 87. Comments from GRL representative in Nov 2010 to author of NomoGaia follow-up report.)*

We see from the above extracts that according to NomoGaia, the incidences of fire were a deliberate act of arson by a worker as a protest against the company's failure to address the concerns of their workers, and the findings of NomoGaia's HRIA report. They, alongside GRL, identify a source of frustration from workers as being the deduction of social security contributions from wages. The GRL representative frames this as workers mistakenly accusing the company of stealing their wages, simply not understanding that this money is held by the national social security fund (NSSF). However, NomoGaia reject GRL's claim that frustrations around these deductions is the only concern, and additionally list poor wages, poor health and safety standards, and broken promises as being key concerns for workers. Note here that we can already see how different organisations are making different representations of the 2009 fire in order to strengthen the particular narratives they present and the interests they seek to protect.

A Timberwatch report undertaking a case study of CDM carbon sink plantations in Tanzania also reported 'disgruntled workers' as the cause of the 2009 fire:

> *"A large part of the Uchindile plantation (2 000 ha.) was recently destroyed by a fire allegedly started by disgruntled workers." (Timberwatch, 2011: 47)* [73]

It is clear from their reports that these third parties firmly believe that it is the company's implementation of their specific recommendations that led to a subsequent improvement in company-community relations (and therefore reduced risk from future incidents of arson).

> *"The company initially disregarded these findings. Several months later (October 2009), arson affected over 100 ha of plantation. Shortly thereafter, assessors' major recommendations were implemented, including revival of the union, increase of wages to levels specified in the HRIA and improvements in worker housing. These changes were visible during a monitoring*

[73] It is worth noting that although this particular part of the Timberwatch report does not explicitly reference a NomoGaia report as the basis for this statement, it does rely heavily on NomoGaia work throughout other discussions of the Uchindile case study, and it is therefore likely that this assertion of the fire being started by a disgruntled employee originates from NomoGaia.

survey 18 months later (in November 2010). The visit had been intended to verify earlier observations and found that conditions had improved considerably." (Salcito et al., 2013: 45)

"The company anticipated a positive [HRIA] assessment and reacted coolly to numerous negative impact scores at Uchindile. This initial skepticism was overridden several months later when a disgruntled worker set fire to 100 acres of eucalyptus trees, citing numerous concerns from assessment as the impetus. Management swiftly implemented recommendations issued by NomoGaia's team. A follow-up assessment 18 months later revealed that worker dissatisfaction had reduced markedly with the increase of wage rates to levels recommended in the HRIA. Provision of midday meals, improvement in worker transportation, and improvement in worker access to water had increased energy levels, morale and goodwill within the workforce." (Wielga, 2012: 2)

These two extracts, when read alongside the preceding extracts show that whereas NomoGaia set out a wide range of complaints that members of the local communities had with the company, they paint a picture of the company minimising these complaints and restricting them to concerns about National Social Security Fund (NSSF) contributions. GRL representatives suggest that this is a misunderstanding on the part of workers, but it appears that this concern was not easily allayed, and the workers did not readily accept this explanation from the company[74]. In fact, more in depth analysis of the concerns over NSSF contributions in the NomoGaia report suggest that workers' concerns were not simply a misunderstanding around the deduction of NSSF from their wages, but instead a concern around the complexity of accessing those contributions once their - often short-term, temporary - work assignments with the company were completed. NomoGaia positions the 2009 fire as the unsurprising result of the company's refusal to acknowledge or address worker concerns. It serves to minimise, if not absolve the individual of blame, and frames a deliberate setting of the 2009 fire as a legitimate and justified form of protest.

In conversations and interviews with local residents during the course of fieldwork, discussions around the cause of the fire were often a tense and uncomfortable moment in conversations. Respondents would position themselves and their local communities as distant from and unconnected to the fire.

Some did this by re-iterating that they didn't know the cause of the fire or that the cause of the fire was generally unknown and far away:

"We don't know [the cause of the fire] – it started very far away" (FGU1, R6)

"*We don't know until today" (FGU1, R4)*

Others stated that the fire was started by unknown or unspecified outsiders:

"Fire source [was] from Kitete in 2009 – it spread up to GRL from the border between Kitete and Uchindile and spread all over the GRL plantation. [It was] people unknown who started it, and then it spread." (FGU4, R6)

74

"There are people, unknown people, who burnt the area from Kitete and the fire was so dangerous, it burnt the whole area of Kitete, Uchindile, even to Mgololo, the other side" (SSI U8)

There were also conflicting accounts as to *where* the fire started. The above quotes (from Uchindile residents) suggest the fire started in Kitete, then spreading up to the GRL plantation, however others suggested that the outbreak started in GRL's plantation itself:

"The fire outbreak was in the middle of the GRL tree farm" (FGU1, R3)

The quotes on this page illustrate a clear literal and metaphorical distancing, with people insisting that they don't *who* started it, do not know *where* it began; they havve *never* known, and *never will*. It is quite possible that some or all of the people spoken to have a clear idea of where and how the fire started – which could even suggest subterfuge and cover up – but regardless, what is important here is the repeated distancing from the cause of the fire that people engaged in.

There was some suggestion that the fire might have been started by a hunter. Hunters were often pointed to in discussions around who or what type of people were involved with negative behaviours or consequences in these communities.

"the problem with fire here is the hunter" (SSI-K3)

"another cause of fire around this area is that there are still people…hunting, people might burn somewhere so that they can easily get small animals" (SSI-U10)

We see references to people 'still' hunting, with the underlying implication that those practices were no longer acceptable or modern, or that people were refusing to cease these practices. Hunters were characterised as acting *carelessly*, without adhering to rules or placing boundaries around their behaviours:

"it is the hunters…who burn in the lowland areas carelessly or with no specific time to burn" (SSI-U3)

There were also suggestions that the fire had been started by an individual who came from outside the villages, and the explicit connection made between hunters and illegal activities:

"illegal hunters using fire…[we] sen[t] information to Mufundi district [as] caused by their people" (HHS-K113)

This distancing and othering seen in the above comments was a common perspective expressed by both local residents and local community leaders, those newer to the village and more long-standing residents alike. It represented a credible marginalisation of groups of people, particularly hunters and those lacking in close historic ties with the community. Respondents were unable (or unwilling) to provide details on who, how, or why the fire was started. Whether this was due to a genuine

uncertainty as to the individual(s) responsible for starting the fire, a way of protecting the fire setter, a feeling of (entirely legitimate) distrust or unease in sharing this information with a white, foreign researcher, or a combination of these factors, is largely immaterial to the argument. What is clear is that everyone distanced themselves from whoever started the fire. They were direct: whoever was responsible, it was not them.

Local community leaders suggested that the fire was started by one of the company's temporary workers who came from outside the villages of Kitete and Uchindile. They strongly emphasised that the fire was not started by someone from within their own communities. Typically, discussions of who was responsible for starting the fire were closely followed by reframing (partial) responsibility for the fire around the company's choices to employ people from outside of the village. These were individuals that the local leaders couldn't vouch for, because they didn't 'know their history'.

Responses to the fire

The overall sequence of events after the fire is that the company initially halted activities in Uchindile and Kitete, expressed an intent to leave, and subsequently decided to stay after negotiations with the local community. Multiple local residents described how the company expressed an intention to permanently withdraw their investment in Uchindile and Kitete after the 2009 fire, expressing anger at the devastation that had been wrecked on their tree plantations:

> *"After the fire, the investor was going to leave the area, but then decided not to." (FGU1, R6)*

> *"After the big impact [of the 2009 fire], the GRL company decided to leave. It was the effort of the local people to get them to stay…because of income – it is so important to people here." (FGU5, R1)*

> *"There was a lot of problems – most people working at GRL lost their jobs and GRL were saying they would leave [their] investment here if the problem happened again." (FGU1, R3)*

> *'Because the GRL are putting the many capital in…the big capital, …the investment is big, so they say if you burn these trees, then mwekezaji [investors] they go on…they go! ….And they [local community] can get no money! Where can they get money?'* (*SSI K3*)

It is not clear on what facts these views are based. It is not clear whether the employment layoffs were intended to be permanent or whether they were the simple outcome of there being no longer enough trees to provide work after the fire. It is striking, however that, real or not, the *perceived threat* of the withdrawal of the investor and the resulting loss of jobs was clearly uppermost in the minds of the people I talked to. This speaks to the significance of employment and the ability to earn wages in large-scale land acquisition for tree plantations and carbon offsets. We can see several aspects of this in the selection of quotes above. Firstly, that people were motivated to and made concerted efforts to persuade the company to stay in the area and continue offering these opportunities because of the importance of the income they were earning, and of the job losses that happened (or that people were facing). Secondly, that the significant size of GRL's investment corresponds to the magnitude of

the impact their presence and activities have had on the local economy, livelihood options, and broader consequences for rural life and landscapes that has unfolded.

There is no suggestion of this intent to cease activities in Uchindile in the available company reports. The company's primary concern in these reports is on assessing the extent of the loss of plantation trees, and on how this fire might impact their assessment of risk to the project. This is understandable given the audience of these reports: the VCS, by whom they are accredited and are obliged to provide ongoing evidence of the success of their project. Additionally, the company's model is predicated on the triple-win narratives explored in chapters 2 and 5, which includes contributing to sustainable development and employment opportunities for local people. As such, both for accreditation purposes and for their international image for investors and those choosing to purchase carbon offsets via their projects, it makes sense that this intent to cease activities would not make it into official, publicly available GRL documentation.

The company's response to the fire emphasised not the social and political issues that might have driven arson as protest but, unsurprisingly, the technical and practical ways in which new fires could be tackled. The report sets out the 'special fire management concerns in Uchindile' under a section on 'Description of Impact of Project Activities and Monitoring Plan', which illustrate the changes the fire made necessary:

> *"The special fire management concerns in Uchindile are:*
>
> - *The importance of local assistance in fire fighting/community support*
> - *Further training of the management staff*
> - *Better firefighting equipment and training*
> - *Bearing in mind the prevailing winds in Uchindile, the south-eastern part of the plantation must be of extra concern when it comes to early fire spotting*
>
> *The company has established water points, either artificial sources represented by water tanks or natural ponds. These water points will have visible signs to secure quick response and to minimize damages in case of fire (see map below).*
>
> *In Uchindile, the management has put in place water tanks at every fire tower, dormitory and lookouts that will serve as water reserve for firefighting purposes. In addition, the company has established 6 water tanks of 3000 litres each: three on the eastern side and three on the western side.*
>
> *If any fire is observed, there will be sirens in the surrounding villages to the forest project for the purpose of alerting the communities. These sirens are mainly to alert the surrounding communities in Uchindile Forest Project, such as Uchindile, Lugala and Kitete villages. But also alert other neighboring villages.*
>
> *For preventive actions, firefighting training shall be conducted twice a year: one up front of the season (April-May) and one in the dry season (September-October). For more details please review GRL's Fire Management Guidelines and Fire Management Plan for Uchindile."*

(GRL, 2011: 5-6.)

This extract is included at length as it encapsulates key measures implemented after the 2009 fire. These measures support the evidence gathered during fieldwork around the eventual post-2009 emphasis placed on fire prevention training, local regulations, and firefighting training by GRL in the local community in response to the extent and severity of the fire. We see that these measures include identifying 'hotspots' for fire outbreaks and spreading given the ecology of the area; better and more frequent training provision for management, other staff and local residents; upgrading firefighting equipment, agreeing and communicating clear processes to follow, and an emphasis on the importance of local assistance and community support. The report reveals that improved relations with local communities is seen by GRL to be of critical value if the company is to continue its activities. But if the fire caused the company to renegotiate aspects of its relations with local people, or their staff, these are not prominent changes, nor are they easily accessible for a researcher to document.

My informants however made it quite clear that local leaders used to the fire to renegotiate access to the benefits of employment that the company offered. Respondents described how community leaders utilised discussions with the company in the aftermath of the fire to try and secure more favourable employment opportunities and terms for people within their communities:

> "*In the past, GRL were employing people from different areas, and so GRL did not know about the historical background of these people – their personal history. The village government said that in the future, they should employ people who they knew the personal history of so that something like the fire wouldn't happen again." (FGU1, R3)*

They explained that if the company offered more work for the local community, then the leaders would be able to 'safeguard' these workers. Leaders expressed that they couldn't guarantee or vouch for people who they didn't know personally; whose background and history they weren't aware of and if they had no knowledge of where they came from. It was unclear exactly whom within the community would fall within these personal guarantees of local leaders: whether they would vouch for all permanent residents of the village, or just those with whom they were closer, or those already with the means to influence leaders. Even the question of who would count as a permanent resident of a village, or how long someone would need to have lived in an area in order to be seen as a 'real' part of that community is not clear cut.

Note that according to GRL's community involvement policy, preference was already given to the local communities in terms of employment, although the company refers to this in terms of 'residents of the project zone' (GRL, 2013a: 33). Notwithstanding, local leadership leveraged the 2009 fire event in order to secure more favourable terms of employment for those their communities, including themselves. It is also possible that the fire was also leveraged to secure more personal input into the company's hiring decisions for local leaders, thus potentially exacerbating local inequalities of class, wealth and power. There is not sufficient evidence to assess with confidence the extent to which any greater personal sway was an intended or unintended consequence of these negotiations, or whether this greater influence has been realised. However, this leveraging likely represents a strengthening of local leader's position of power, highlighting (and solidifying) the importance of social capital, power and relationships within the communities of Kitete and Uchindile.

Changes resulting from the fire

The company worked together with the local community and local leaders to implement measures to mitigate and manage fire risk.

> *"The village government and GRL came together to sort the fire problem, and provided education on the effect of fire, as well as how to prevent future outbreaks" (FGU1, R1)*

These measures included: introducing local regulations, such as prohibiting any fire burning between certain hours, particularly during the dry season; setting up fire patrols to establish an 'early warning system' in the case that a fire did start; and offering education and training around the risk of fire and how to prevent it:

> *"During these months [around August to December], you are supposed to burn during the night, maybe from 7pm until maybe 11pm, and not otherwise. If you burn during the daytime, there is a lot of strong wind which is blowing due to these high mountains around, which can spread the fire, speed, and go affect the whole area. This is during the dry season." (SSI U3)*

> *"People got education on the impact of fire from GRL so they know better than to start a fire, and to protect the tree farms" (K16, K7, FGK3)*

> *"GRL will control the fire which could come…every time there will be a patrol man and a fire crew who are watching all along, throughout the time,...therefore this one will reduce the number of fires" (SSI U5).*

We see in the above quotes that this education was intended to teach people to 'know better' rather than to start fires, and to further clamp down on 'fire risky' behaviours. Protecting the tree farms became the concern of the highest order. Note the language of GRL 'controlling' the fire and sense of constant vigilance of fire patrollers. There is a sense of hypervigilance towards the ever-present spectre of fire, destruction and the risk of losing GRL and its attendant benefits.

Another key part of this post-2009 strategy was to further align the incentives of the local community with those of the company:

> *"People have been told a lot to plant trees in that area, so they get incentive to prevent fire" (FGU7, R2)*

> *"Since the community have trees and we have trees that is why we fight together. We don't like someone to lose" (SSI U6, GRL representative)*

> *"If the people are planting the trees, …the fire can also burn their trees! They trick, yes, good trick!" (SSI K3)*

The first quote above demonstrates the strong emphasis – which could be interpreted as encouragement or direct instruction – that has been placed on people planting their own personal tree plantations. It also suggests that people were encouraged to plant their own trees in particular areas. It is not clear whether these areas were the particular fire 'hotspots', or areas adjacent to GRL's plantations. Either way, this would galvanise people to protect their own trees in these areas, thus either generating more protection for high risk areas, or additional vigilance and protection around areas connecting to GRL's plantations. In this way, GRL would be able to guarantee people within the community are strongly motivated to protect these strategic areas from fire and to help effectively contain or fight fires if there is an outbreak.

The second quote uses languages of fighting together around a common cause to protect, neatly articulating the increased shared incentive between those in the community with trees and GRL. At the same time, it illustrates how GRL frame this shared incentive as a form of altruism: as they 'don't liking anyone to lose'. This again connects to the multi-win narratives of GRL as a benevolent force caring for the interests and needs of all parties discussed in chapter 5. This is juxtaposed with the third and final illustrative quote above which frames the shared incentives as a 'good trick' on the part of GRL: if a fire burns GRL's trees, they also burn local people's trees; or in other words, if we lose, you lose.

The increased alignment of incentives, as well as the knowledge of a real risk of the company leaving if there was another serious outbreak of fire led to an increased fear of fire in the local communities:

> *"Because so many people have planted trees, so they are worried about fire…about the impact of fire, because everyone has got a piece of land with trees…people are worrying so much because they know that once there is fire, definitely they will perish [lose] what they planted" (SSI-U1)*

This statement reveals the real sense of anxiety left with many in Kitete and Uchindile after the 2009 fire, and connects the fear of fire to the act of planting their own trees. Fire is no longer a natural part of this landscape's ecology but is something to be feared and avoided at all costs.

Respondents understood the incidences (and the severity of those incidences) of fire to have reduced. These changes were widely attributed to GRL's influence. Some respondents spelt this out simply. Others were more nuanced:

> *"Since [GRL] arrived, the number of fires is decreasing" (SSI-U1)*

> *"Then GRL came to Uchindile and people were saying you were not allowed to burn fire, but still people were ignoring – but it did reduce a bit, because a village law was introduced and people were scared. Now you can't find a person burning a fire – only accidentally." (K15, FGK3).*

The above quotes reveal more detail of the ways by which GRL's presence and activities contributed to a reduction in fire outbreaks and severity. Firstly, is the idea that GRL directly told people not to burn fires. This appears to have been only somewhat successful. We next see that they engaged with

local leaders and local governance structures to introduce village laws relating to burning fires, which – along with the company's rhetoric – scared people away from burning fires.

> *"There has been a decrease in fire, because people have much engaged in planting trees and they have knowledge on how to control the fire." (SSI U3)*

We also see that GRL provided education around the risks of fire, and how to fight them, as well as laws and other measures that were introduced and changed the behaviours of local residents. As outlined in the statement above, with many local people having planted their own (and others trees), they have meaningfully connected (physically through the act of planting, and financially through their own investments) to the desire to protect all trees from the dangers of fire.

> *"Since I came here last year, we had [a] fire in Kitete, but it didn't destroy the forest. So I can say that even the community are aware of the impact of fire, so when it happens that there is an incidence of fire, the community are participating fully to extinguish the fire, … and if the fire is in the forest here, they participate. If the fire is in the village we participate … We work together." (SSI U6, GRL representative)*

The quote above illustrates GRL's position that they have 'educated' local people on (from their perspective) the devastating impact of fire, so that people across local communities are strongly motivated to work with GRL to prevent and fight any outbreak of fires. This is communicated in a narrative of mutual support and cooperation around shared interests in preventing fire.

We thus see suggestions that GRL contributed to a shift in the local fire burning practices, and what fire behaviours are considered locally acceptable: now, people report it is hard to find anyone openly burning fires.

> *"People are not burning 'carelessly' as they did" (SSI U1)*

> *"Fire has reduced, because maybe if it happens that the fire explodes, there is a fire group which stops the fire." (SSI K2)*

> *"The change is now the fire is going down…people they are learning to get the honey from their 'mizinga' [beehives]. [And] the rule. If you fire you get trouble…you can get…go to prison." (SSI K3)*

People engage in any fire burning that does take place more carefully, and are conscious of fire in different ways. There has been an active effort to organise people around effective response teams to tackle fire outbreaks, changes in livelihood activities (such as collecting honey from beehives rather than using other methods that involve fire to collect honey) and we see that breaking fire rules have serious consequences and punishment.

It is worth noting that incidences of fire were seen to have reduced not only since the new measures were introduced after the 2009 fire, but also since the initial arrival of GRL. Either way, these changes represents a meaningful shift in fire ecologies of the broader landscapes.

Discussion: Leveraging fire

It is possible to see the responses to the fire as emblematic of the powerlessness that communities can experience in the face of large investors. If the company threatens to leave, then this provokes distress because many local residents view their community as dependent on the company. The community then make promises to control individuals and prevent future fire outbreaks; the company agrees to stay, and the community is relieved.

However this would be an oversimplification and misleading. We have seen far more complex dynamics arise. Figure 7.4 shows the three main categories of actors involved in the (re)negotiation of power: the individual resident within the Uchindile and Kitete communities; the community as a whole; and the private investor, or company. The 2009 fire event is the central tool in the interactions between these actors, which they each used to wield power and (re)negotiate power dynamics.

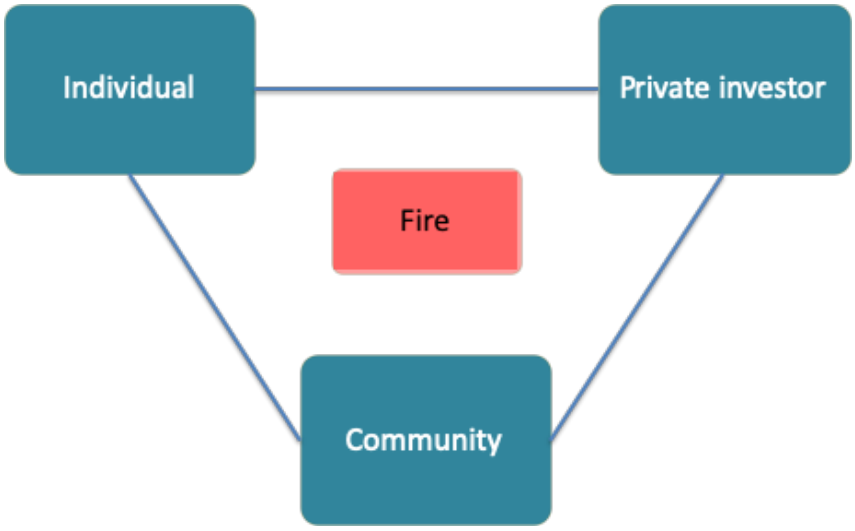


FIG 7.4: actors and interactions utilising the 2009 fire event to (re)negotiate power

The preceding examination of the 2009 fire illuminates multiple stories. One story is that GRL has built itself up as the community's single hope for development and a better life, leaving the local community in a seemingly powerless position, with a distinct vulnerability to a threat of leaving by GRL after the 2009 fire. Note that this threat was particularly effective because of the significant shift in livelihoods away from small-scale agriculture to include employment and casual labour offered by GRL, both directly through jobs they provided, and indirectly through jobs created by other smaller investors attracted to the area by the company's investment, as demonstrated in previous chapters. However, this very same event also demonstrates GRL's vulnerability to a single individual's discontentment by starting a fire - using arson as a form of resistance, and then illustrates the local community's ability to capitalize on an event to renegotiate power dynamics. It also shows a resulting ramped up effort on the part of GRL to align incentives and manoeuvre the people who make up local communities into a situation where they have as much to lose as the company in the face of fire (which is simultaneously framed as an environmentally and socially altruistic motive).

The 2009 fire is both an event that encapsulates and illustrates these competing narratives, but also is used as a way to contest these framings by the actors present in the narratives themselves. The individual, the company, and the community through local leaders, each utilised the fire to further their own interests.

The individual's action of setting a fire is a way of exercising power over the (powerful) company, and could also reveal an attempt to protest (and therefore exert power over) the community's (and/or local elite's) complicity with company policies and the resultant inequitable access to employment and benefits. Indeed, in a focus group discussion with GRL workers during fieldwork, one respondent posited

> *"Due to GRL, maybe if workers are not satisfied with salaries, they might burn the trees they've planted." (FGD K8, R1. FGD with GRL workers)*

With fire, an individual can destroy significant company (and community) resources through one act of arson, exerting power over both the company and the community.

The company leveraged the fire event using threats of withdrawal from the community, and therefore threatening the loss of community investment and employment, in order to quieten discontentment with unfulfilled promises and unfavourable employment opportunities and terms within the community. Coupled with the subsequent increased emphasis on community and individual tree planting, and on education and training geared towards preventing future incidences of fire, the company was able to further align incentives between itself and local residents. The community then had a greater personal interest in protecting the company's assets (as well as their own), leading to an increased community fear of fire. Along with the increased local regulations controlling fire-risky behaviours, this stoked the shared fear of fire - and of the repercussions that would arise from starting one.

Local communit(ies) used the fire to renegotiate employment terms, strengthening GRL's preference to employ people from the local communities (those with established connections to the area, as opposed to workers who migrated into the area). Local leaders in particular were able to leverage the fire to secure greater influence on hiring decisions. Collectively, through different means, communities used the fire to speed up the realisation of promises made to them, forcing the company to recognise that community relations were of more critical importance than it had previously recognised, and that unfulfilled promises and dismissal of community concerns were harmful not only to local people but also to its own interests. By making arson and fire-risky behaviours more socially unacceptable and stigmatised, local communities themselves (and the company by influencing the communities) exercised power over an individual, increasing the personal cost of starting a fire.

We must also recognise the divisions and difference within local communities, particularly the class dynamics entailed. By recognising the benefits of job creation, I am not ignoring the new class relations that will ensue. In fact, the opposite is true. Precisely because of the job creation, new forms of class dynamics arise which we need to understand if we are to appreciate the whole nuanced impact of these tree plantations on societies and economies. In creating employment opportunities both directly and indirectly tree plantations create groups of people who are well-connected to these job

opportunities, and others who are distanced from them, and more likely to feel grievances that might result in arson.

It should also be noted that **third-parties**, such as an NGO working in the area, were able to use the fire to frame themselves as a legitimate and representative voice of the community. They communicated clearly that they believed it was the company's implementation of their specific recommendations that led to a subsequent improvement in company-community relations and therefore of management of future fire risks that could threaten GRL's investments. The message was clear: listen to us, as the external and authoritative voice protecting the interests of local people, and things will improve.

These dynamics reflect some of those I explored in the literature in chapter 2. The responses to the 2009 fire provide a clear example of how unexpected dynamics can unfold as local actors 'learn to play the game' (Wright, 2017: 158; Green and Adams, 2014: 113). The particular configuration of a large-scale private investment in tree plantations for timber and carbon (which stimulated further investment in private forestry from those local individuals who had the capital and means to plant their own trees, and from attracting secondary 'copy-cat' smaller investors to the area) can be seen as creating a form of what Wright terms 'turbulent terrains' (Wright, 2016; Wright, 2017) within processes of de/re-centralisation in neoliberal conservation. Local actors, particularly local elites, make use of these political spaces that open up, with fire being used as a tool to renegotiate power dynamics, benefit distributions, and terms of engagement between GRL and local communities (as well as within these communities themselves).

As work such as Kull (2004) and Holmes (2007) suggests, we see fire being used as a form of resistance. With GRL maintaining narratives of conservation or restoration of a locally degraded landscape, the active continuation of livelihood practices that have become strictly regulated or banned (such as hunting and burning) can be seen as an everyday act of resistance (Scott, 1985; Holmes, 2007) to the new hegemony of tree planting. Coupled with the widespread adoption of tree planting by local people and outsider investors alike, to the extent seen such that planting eucalyptus or pine for timber and/or carbon has become almost ubiquitous, the physical landscape locally has been transformed, making fire more dangerous, and therefore a more powerful (if fraught) tool to be wielded. This supports Holmes' argument that the particular nature and form of resistance that unfolds is shaped by the physical features of the natural resources in question (Holmes, 2007: 184). Moving further beyond Holmes (2007) and Kull (2004)'s works, we also see how the devastating 2009 fire event allowed the aftermath of the fire - and the spectre of fire itself - to be used as a tool to resist and renegotiate existing employment arrangements with GRL, and to speed up the fulfilment of investor's promises to the nearby villages.

The significance of the 2009 fire, and the extent of loss incurred by GRL from the fire meant that the fire was something that had to be acknowledged in their publicly available company documents (e.g. the loss report, and monitoring documents required for the plantation's accreditation and carbon-offset valuations). Here GRL faced a real threat to the maintenance of the multi-win narratives of their plantations that are so integral to the nature of their investments, on a local, national and international scale, and its connection with the neoliberal conservation representations the carbon offset market relies on. The 2009 fire threw a spotlight on these narratives, and this presented an

opportunity for both third-party NGOs and the local communities and individuals to further their own agendas by exploiting GRL's need to maintain these multi-win narratives in order to sustain their business model. This corresponds with Holmes and Cavanagh (2016)'s arguments presented in chapter 2: we saw communities and their leaders take this opportunity presented by the need for multi-win narratives to be maintained to exert pressure on GRL to redress their unfulfilled promises.

The powerful and pervasive narratives of fire we saw in the literature in chapter 2, where fire is seen solely as a problem, and something to be avoided at all costs (cf. Bruenig, 1992; Kull and Laris, 2009; Butz, 2009; Barlow et al., 2012;), are clearly perpetuated by GRL and others in Uchindile and Kitete. Fire is seen as destructive and dangerous; it burns indiscriminately and leaves utter devastation and loss in its wake. This 'anti-fire received wisdom' (Kull, 2004; Messerli, 2007) is at once persistent and also not the whole picture: findings have shown that GRL recognise that fire is part of normal landscape management practices, while implying that fire is now a danger (or more of a danger) because of the changing ecology brought about by tree plantations.

The simple anti-fire narratives overlook the fact that GRL, and the widespread tree planting, they stimulated have fundamentally reshaped the landscapes surrounding Uchindile and Kitete. We saw in chapter 2 how suppression of fire regimes can risk greater fire damage and have adverse ecological consequences (Fairhead and Leach, 1996; Leach and Mearns, 1996: 458; Pyne, 2016), and how seasonal burning can offer benefits for plant biodiversity while safeguarding against more damaging late-season fires ((Butz, 2009: 442; Mbow et al., 2000). At the same time, the landscape has shifted from grasslands areas to widespread (eucalyptus and pine) tree plantations, which has implications for the ecology of fire. While this thesis is not a comparative study of grassland and tree plantations fire regimes, evidence from elsewhere suggest that pine and eucalyptus forests are some of the most fire prone forest-types (see Silva et al., 2009, who assessed the relative fire proneness of different forest types in Portugal). The unilateral 'fire is bad and to be avoided at all costs' story does not reflect the complexity and nuance of these changes, nor does it account for the fire regimes of the historical grassland ecology of the area, nor for the multiple productive uses of fire for various livelihood and land management practices. It does however, serve to effectively protect GRL's assets, and thus the perceived security of paid labour opportunities for those who have come to rely upon them and the other benefits GRL have brought for many Uchindile and Kitete residents.

A key part of GRL's post-2009 fire strategy was to further align the incentives of the local community with those of the company by strongly encouraging people to plant their own trees. We see this strategy described elsewhere in the literature. Kangalawe and Swart (2012) in their work on the nearby Sao Hill state-owned plantation, show how the plantation managers took actions to encourage and enable local people to develop their own village-run forests and individual woodlots. They show how in this way:

> *'the villagers gradually became part of the forest project: directly and indirectly. They were directly involved in putting out fires whenever they occurred because they were protecting their own woodlots. The result of these efforts was remarkable, reducing fire incidents to zero by 2015.' (Kangalawe and Swart, 2021: 87)*

My findings complement this, showing how similar dynamics unfolded in and around the privately-run GRL plantation. This chapter reveals the real sense of anxiety left with many in Kitete and Uchindile after the 2009 fire, and connects this intensified fear of fire to the act of planting their own trees. Fire has become more of a spectre: it is no longer a natural part of this landscape's ecology but is something to be feared and avoided at all costs.

The pervasive environmental degradation narratives seen in this thesis, both in this chapter and in the preceding ones, are widely seen in the critical literature to disempower local voices and knowledges, utilised by governments, foreign interests, and capitalists, to further a neoliberal agenda and dispossess local populations. However, local communities – and the heterogenous people and power dynamics that constitute them – are able to respond to and wield these narratives to further their own interests, and often to resist those that are attempted to be imposed on them by outsiders (of various forms). We saw how the narrative of fire as a dangerous, destructive force, was used by multiple actors to further their own positions in the wake of the 2009 fire. This perpetuation of the 'anti-fire' narrative serves to further marginalised some of those already most marginalised within the local communities: hunters and the poorest farmers who may rely on slash and burn techniques and do not have their own tree plantations. However, it was also deployed by local leaders to (re) negotiate more favourable employment arrangements and terms of engagement between GRL and Uchindile and Kitete.

We also see how employment and labour opportunities (rather than land concerns) were of primary concern to local people when faced with the withdrawal of GRL. This is significant, as the large-scale land acquisition and land grab literature, which dominates critical scholars work relating to neoliberal conservation, carbon forestry and large-scale tree plantations, needs to consider the impacts of the employment opportunities (although class relations those opportunities bring have long been a key concern). Real or not, the *perceived threat* of the withdrawal of the investor and the resulting loss of jobs was uppermost in the minds of the people I talked to. This speaks to the significance of employment and the ability to earn wages in large-scale land acquisition for tree plantations and carbon offsets. At the same time, we saw that even though wages from labour for GRL are clearly beneficial, these wages are only what you get day-to-day and they do not provide other protections.

Furthermore, the dynamic of the local community leaders post-2009 fire attempting to leverage controls on employment opportunities speaks to the importance that these employment opportunities hold. This is connected in several ways to the tensions over migration and land we saw earlier in this chapter and in chapter 6. Firstly, we have seen how GRL's presence and activities, and the related presence and activities of smaller copy-cat investors, has impacted on migratory patterns. For people who have made decisions about moving on the basis of the employment opportunities – and wider economic impacts – of GRL and other investors (particularly new arrivals to the villages, or younger people who decided against emigrating to urban areas), they have made life-changing decisions about where to put down roots. These labour and economic opportunities will therefore hold very specific significance for them.

Secondly, for those who have invested in their own planted trees – sometimes at the expense of engaging in much food crop farming – the loss of employment and income they have come to rely upon could be devastating. With investments tied up in planted tree crops (which do not mature for

a number of years), people – especially those who could only just afford to take advantage of these opportunities (or who took out loans to do so) – may be left vulnerable in the event GRL ceased local operations. Those who were not able to access employment or plant their own tree plantations (typically those with least access to capital), and thus were not able to benefit from the individual benefits presented by GRL's activities and the spill-over effects, may actually be most protected from negative impacts of them leaving. Conversely, those who have bought or sold land, or who have been affected by the so-called inherited land issue, are likely to have a particularly vested interest in GRL and the myriad copycat investors remaining in the area. If the plantations were abandoned, the change in the local ecologies may have a greater impact on local people (particularly in reference to food security concerns) if they do not have continued access to paid labour. In this way the efforts of local leaders and elites to leverage control on employment opportunities may represent attempts to divert employment opportunities to those with whom they have social and ancestral ties, and to consolidate their own finances and influence to safeguard against future uncertainties.

Conclusion

This chapter has shown how the presence of GRL has brought about a changing fire ecology. People report there are fewer fires, due to new regulations, a fear of fire deeply embedded locally, pressure from GRL and their provision of education and campaigning around fire risks, as well as the further development of fire prevention and firefighting teams, equipment, and processes. When fires do breakout, as we saw in 2009, they are intense. The cost of fire is bigger due to the changing landscape, stimulated by GRL's activities. The widespread planting of pine and eucalyptus means that fire can spread more easily than across grasslands, and threaten the investments (of people, small investors, and GRL) that take years to realised yields and payoffs from. Having shifted their livelihoods away from subsistence agriculture, people have become more dependent on income from working for GRL and other small investors, and fire threatens these often-precarious working arrangements, with people risking losing their employment if a fire results in investors abandoning their investments locally.

It is not really adequate to view this pattern of interactions as one of simple domination of the local community as it capitulated to the company's demands for fear of losing the presence of the company and the employment that it provides. This analyses in this chapter has suggested local power structures to be more complex, dynamic, and evolving, and demonstrate how the 2009 fire was used by the individual, the company, and various people representing their local communities as a tool to renegotiate power and further their own interests. Fire is thus used as a tool for resistance. It has also been used by local elites as a way to strengthen their positions of influence and gain.

The 2009 fire and its aftermath illustrate that tension arising from the company's presence is not necessarily about removing land from the local community, but may instead be about the employment opportunities that the company's investment and activities bring to the area. The responses of the community (and of its local leaders in particular) in the aftermath of the fire represents a means of contesting the distribution of benefits that arise out of having large-scale investment and plantations on their doorstep. This challenges the land alienation narrative seen in the literature, which focuses best on the land lost, and less on job creation resulting.

8. Conclusion

In this thesis I have examined the unfolding consequences of large-scale private investment in carbon forestry in Tanzania through a case study of two rural communities in the Kilombero district of Morogoro, which has seen the establishment of large-scale tree plantations by GRL. I have argued that the presence and activities of GRL has brought about direct changes and more gradual broader shifts to the economy, society and ecology of rural life in Uchindile and Kitete. These impacts have affected many parts of local society, to varying degrees. Some have opened up new opportunities for welcome change, while others have deepened inequalities. The impacts are significant and far reaching, but are not straightforward. Nor are they viewed as such by local residents. In this conclusion I review the argument chapter by chapter and then draw out some of the broader conclusions.

I began with **chapter 1** which introduced the context and rationale for the study and provided an overview of the content of the thesis. I set the aim of this thesis, which is to provide insight to the question '*what does private sector investment in carbon forestry do to rural society, ecologies, and economies in Southern Tanzania? And how do people respond?*' and to explore how these changes unfold.

Chapter 2 provided an overview of the literature in order to understand the claims about the problems GRL say they address and to situate this thesis within its scholarly context. I argued that the claims made about the problems GRL (and other companies) purport to address, and the reasons why they advocate the solutions they do, are plausible because they match with a set of pervasive narratives – simplified stories used by various actors to further their own agendas – about African environments.

These environmental narratives include claims to crisis and degradation narratives, which often involve the over-simplification of experiences outside of their complex contexts, transforming diverse realities into binaries (Leach and Mearns, 1996) and depoliticising social or ecological injustices into technical problems waiting to be solved by the right experts (Li, 2007). These degradation narratives can be understood as having several constituent parts which interlock: ecological stories such as fire is bad, and tree planting is good; social stories relating to unproductive practices and the inevitability of systems of common property automatically tending towards overuse; environmental histories which portray a particular story about the degradation of landscapes from their former pristine glories; and the proposed solutions to these problems, typically presented as neoliberal multi-win solutions that simultaneously save the environment, grow economies and transform society through the market.

For each of these constituent parts I argued that these stories are flawed and incomplete, yet they are pervasive and persistent. They are found frequently; they do not go away, and they persist in the absence of evidence. For example, we saw how fire is a complex, contradictory beast that has been used as a tool to effectively manage landscapes for centuries, yet the loudest story of fire that remains is a story of fire as wholly destructive, dangerous, and to be avoided at all costs. Similarly, we saw robust and effective critiques of Hardin (1968)'s story of the tragedy of the commons, and how degradation narratives have colonial origins, ignoring the local expertise and hope that exists in African farming, yet we still see these logics and stories underpinning conservation ideas today.

The more recent waves of neoliberal conservation and market-based solutions to environmental problems are presented as 'solutions to' degradation or scarcity discourses. Yet these discourses are also a fundamental part of proposed neoliberal fixes such as carbon offsets and are wrapped up in narratives of multi-wins, where no one loses. I argued that the problem with this imagined world is the extent to which it imagines the transformation of the world into a neoliberal economy, and – as with the degradation narratives that frame environmental issues described earlier – these multi-win solutions involve oversimplifications, are often not realised in practice, and often serve to mask (or drive) appropriation of resources, dispossession and neo-processes of colonialisation (Cavanagh and Benjaminsen, 2014). We saw that critical geographers have argued that neoliberal conservation involves the reregulation of nature via commodification, giving rise to new forms of territorialisation, which in turn creates new types of value (often most accessible to elites) and new networks of actors (Igoe and Brockington, 2007; Castree, 2008), and that much scholarly work has offered examples and analyses of the processes and impacts of capital accumulation within neoliberal conservation in practice. Commodity fetishization within neoliberal conservation market mechanisms (such as payments for ecosystem services, REDD+ and offsetting) can serve to alienate people from non-human nature and can perpetuate processes of territorialization (Dunlap and Sullivan, 2020). We saw that despite the heated scholarly debate around market-based carbon-sequestration policies, for example connected to the multitude of tradeoffs and alienation that they can generate, they have – and continue to – attract much international attention and finance from both public and private sectors.

The forestry sector in Africa have seen major transitions over recent decades, which reflect the broader trends of decentralisation, neoliberalisation and commodification in conservation. I argued that the carbon forestry literature mirrors critiques of neoliberal conservation and the persistence of degradation and multi-win narratives. We saw that much attention in the literature relating to carbon offsets and large-scale land acquisitions is given to concerns of dispossession, and how multi-win narratives can mask losses. This literature can be polarised. I argued that there is a scarcity of empirical evidence and critical nuanced analyses of the impacts of market-based carbon forestry programmes on local people, particularly that which add to our understandings of the broader impacts and dynamics of change that can arise from carbon-sequestration projects. We saw how amid concerns of land loss and expropriation there are also reports of general rural economic uplift (Jayne et al., 2018; Brockington and Noe, 2021), but that this literature is sparse, and sometimes does not connect to critiques of neoliberalisation.

Despite extensive scholarly work that challenges and disrupts the degradation and multi-win narratives described above, we see that these narratives persist. The multi-wins of neoliberal conservation initiatives are intimately connected to the degradation narratives they rely on, and often the epistemic communities that surround these initiatives are incentivised to make these projects a success (Haas, 1989; Büscher, 2012). However, while the narratives of neoliberal conversation and carbon-offset programmes often mask the reality that they fail to deliver multi-wins, I argued that we cannot simply dismiss them solely as a process of commodification resulting in dispossession and misery. The stark division between rejecting or accepting neoliberal conservation, or whether it should be designated ‘a good thing’ (multi-wins) or ‘a bad thing’ (disempowering re-territorialization and alienation under the neoliberal agenda), is not the full story. The picture is much messier and nuanced. I argued that the agency of local people – and how they respond to, exploit, and sometimes resist the

new configurations of life that unfold with large-scale land acquisitions and neoliberal conservation investments – is important, and is sometimes overlooked in the literature.

I concluded by arguing that while the commodification of nature and carbon inherently involves abstraction and often brings about reductive processes of transformation, these processes can be resisted and yet can also be welcomed in many aspects by the local people whose lives are affected. Advocates of market-based environmentalisms reproduce and rely upon multiple degradation environmental narratives. Equally the strident critiques of these positions can also constitute narratives. Between these sometimes polarised positions are rather messy realities on the ground. I argued that to better understand the dynamics of change arising from carbon investments we must examine them within their broader contexts and look carefully at how their social, ecological and economic consequences unfold.

In **chapter 3** I set out and critically reflected on my methods and the origins and journey of the thesis. I argued that more attention should be given to the interaction between fieldwork and mental health. As I discussed, writing this thesis has been a difficult experience. It has made me confront various structural inequalities during the course of my research and forced me to recognise the part that I play in them. It has led me to critically reflect on my positionality and privileges, from which I have learnt a lot. I look forward to being a part of research networks that amplify the voices of more marginalised individuals and communities and to learning more.

Chapter 4 set the scene for the findings in the subsequent chapters. I situated Uchindile and Kitete in their broader socio-economic and geographic context in Tanzania. I offered a snapshot of village life and established basic facts about the lives of people within the study sites, arguing that they represent relatively typical rural Tanzania villages, with the key difference of the presence of GRL. I also suggest that the two villages, particularly Kitete, has a relative surplus of land, possibly due to low populations and remote locations. I introduced GRL's history and presence in the study sites and argued that their presence is part of a wider pattern of increasing private investment in the green economy in Tanzania.

Chapter 5 looked at the role played by GRL in Kitete and Uchindile and explored the immediate impacts of the private sector investment on local communities and their environment. I argued that GRL has contributed to the development of Kitete and Uchindile. Key markers of development that can be seen are improvements in house quality and construction of roads and provision of transport. Data from across focus group discussions, semi-structured interviews and household surveys suggested that the local communities understood the presence of GRL to have enabled people to start making material improvements to their houses. Survey statistics suggest that Uchindile in particular appears to have above average quality of both roof and wall housing materials. I showed that GRL had brought employment opportunities which were largely viewed by people as welcome opportunities. I explored more critical takes on the provision of employment opportunities by GRL, expressed by both external NGOs and some community members. These concerns may have substance, but I argued that my data shows that the majority of people within Kitete and Uchindile welcomed the employment opportunities brought by GRL. I demonstrated that there was widespread recognition across the villages that Uchindile, and particularly Kitete has benefitted collectively in from infrastructure benefits funded by carbon payments. Many people recognise individual and collective benefits arising from GRL's activities. I argue that these changes are not straightforward, are not evenly distributed, and are sometimes contested, yet they are broadly welcomed.

I argued that we saw clear and familiar narratives constructed by GRL (both to the outside world and locally) as anticipated in chapter 2. We saw narratives of unproductive and degraded landscapes, but saw that local environmental histories contest these narratives. GRL positions itself as engaging in reforestation through their tree plantations, but I argued that the establishment of large-scale mono-culture plantations of eucalyptus and pine is somewhat incongruous with the spirit of reforestation. These narratives are interwoven with narratives of market salvation to position GRL's carbon forestry plantations as a multi-win solution and are reproduced across different scales. I argued that, like Cavanagh and Benjaminsen (2014) observed, GRL needs to maintain a multi-win 'spectacle' of its project to investors, local powers, and third-party observers, including monitoring and certification bodies, as part of the interpretive communities (Mosse, 2004) convened around carbon forestry market salvation narratives. I argue that GRL's multi-win claims are not groundless, but that there are fault lines in these stories.

The wider literature emphasises how degradation narratives can be a key driver of dispossession and conflicts (e.g. Bergius et al., 2020). I argued that my findings suggest that while degradation narratives do server to legitimise investments, neoliberal conservation through carbon offsets, and even some elite capture of benefits, we do not (yet) in the context of Uchindile and Kitete see land conflicts and dispossession in the way we have elsewhere. This contrasts with other researchers' findings on GRL and similar company's investments elsewhere. This suggests that in places of relatively sparse population, and sparingly used land, land grabs and dispossession may not always be of such concern, and that therefore the local social and landscape context matters hugely. I argued that my findings support those of West and Haug (2017: 418) who find that the realities of large-scale investments in SAGCOT are 'rarely as glamorous or gloomy' as narratives predict; and that not all large-scale investments constitute land grabs.

I argued that my findings suggest that in the particular context of this case study, private investment in neoliberal conservation such as carbon offsets can bring employment opportunities and infrastructure development that materially improves rural Tanzania people's lives. We saw GRL's activities have brought improved housing quality and community infrastructure funded by carbon payments. We have seen complaints of lack of transparency and accountability from GRL and the social systems through which they engage with the local community, and of unfulfilled (or slow to be realised) promises from GRL and other smaller investors. GRL and other small investors have offered paid labour that was previously unavailable, and have altered local livelihood and wealth patterns for people who can take up these opportunities. These employment benefits are not always evenly distributed, as is demonstrated in the wider literature. I argued that my findings tentatively suggest young people were particularly seen to have benefitted from GRL employment opportunities, and that some women reported being able to access novel forms of employment and capital as a result of GRL's presence and activities. We saw how benefits exclude hunters, those less able to work in plantations, and those that live further away. Just because individuals perceive they are benefiting, it does not mean collective exploitation is not occurring. We see this to some extent in the overwhelming casual nature of GRL employment and the lack of access for women to the scant permanent and better paid roles that do exist.

Overall, in chapter 5 I argue that there have been meaningful benefits in the form of employment and infrastructure development from GRL's presence. The multi-win claims made by and about GRL's investments are imperfect assertions that serve GRL's interests, but my findings demonstrate that there are also cracks in the critiques of these forms of neoliberal conservation too: primarily that employment opportunities *are* important for local people.

In **chapter 6** I examined the broader forces of economic and environmental changes that GRL's presence has unleashed. I demonstrated the role of GRL in prompting migration to the area by way of people seeking employment, encouraging the return of young people who had left the area, and stimulating an influx of local small investors planting their own tree farms. The findings relating to migratory impacts complement those found by Kangalawe and Swart (2021) who found that a large forest plantation had reduced youth urban migration due to employment opportunities, and the provision of seedlings, encouraging opportunities to grow their own tree farms. These migratory impacts, and the resulting population dynamics, have an intersecting and developing network of implications for local people, including increased opportunities for work with new small investors planting their own tree farms; increased competition for jobs with differing levels of security, status and benefits; increased demands for local businesses from the local population and economic changes, while bringing increased anxiety around the impact on the availability of food in the area.

I argued that a further impact of GRL's presence was to encourage local residents to plant their own trees, thus representing a diversification, or 'straddling' of planting trees and undertaking paid labour. Planting trees has become almost ubiquitous for those living in Uchindile and Kitete, creating opportunities for securing novel forms of income and diversifying livelihoods for those who have access to capital, labour and land. Existing wealth is therefore a determining factor for those who are able to take advantage of these opportunities. I argued that my findings complement that of the timber rush literature (Lusasi et al., 2020; Koskinen et al., 2019), demonstrating how this rush to plant trees has taken root for those who can afford to do so, but additionally reveal how a private large-scale plantation can serve to kick-start this rush locally, thus contributing to wider livelihood and landscape ecological change, beyond the private plantation's borders.

I argued that in this personal timber rush, we saw the beginnings of a process of differentiation emerging, complementing work around sugarcane outgrowers in Kilombero (Sulle, 2017; Sulle and Dancer, 2020). The benefits of tree planting are significant, but they are distributed unevenly. The poorest in rural society were less able to take advantage of tree planting opportunities, while those with sufficient capital, land and labour were able to establish their own woodlots, benefitting from the opportunities brought about by GRL's presence and the broad changes they have wrought. These people are also able to position themselves as more able to be part of collective access to carbon finance, to be brokered through GRL. Through this future brokerage of carbon finance, and by selling the physical outputs of these tree plantations to GRL's vertically integrated industrial operation, we see elements of a tree planting outgrower model (Jacovelli, 2014) being developed by GRL. I argued this strengthens GRL's position, as well as the position of those most able (physically and financially) to invest in their own plantations. At the same time, forming collective groups to access carbon finance could offer opportunities to redress inequalities that threaten to grow, as Jacovelli (2014) argues. We also saw this process of differentiation through the lens of average landholding size: those with land for planting trees tended to have dramatically more land (both total and for food farming) than those

without tree farms. The work in this chapter supports findings of Lusasi et al. (2020) who argued that there is a great diversity in domestic private investment in tree planting, and that this investment is likely to stimulate processes of social differentiation, shift land use away from food crops, potentially threatening food security.

I also explored the significant concern and anxiety that was arising around concerns around food security, the pathways through which valid anxieties about a lack of availability of food had emerged, arguing that these concerns are both directly and indirectly linked to GRL's presence. These multiple intersecting impacts were not straightforward, nor were they viewed as such by local people.

I argued that while there were anxieties around future land availability, this does not appear to be as stark an issue as is suggested in the literature. Local people are protective of their claims to land, are not willing to give land away freely or for cheap. Rather than a picture of top-down dispossession of local people ruthlessly exploited by large-scale private investments and smaller copy-cat investors which the literature suggests (Benjaminsen and Bryceson, 2012; Dunlap and Sullivan, 2020; Bergius et al., 2018; Bergius et al., 2020; Bluwstein et al., 2018; Kangalawe and Swart, 2021), I argued that the dynamics unfolding is less straightforward. Exploitation has taken place. New issues have arisen such as the inherited land issue, where people with ancestral links to land who have moved away, are now returning having seen the value of land and of the tree planting activities many are undertaking on this land, giving rise to disputes over any ancestral land that has been used by others. Competing claims to land do arise – but the overriding sense from the study sites was not one of land shortage. Concerns around dispossession therefore seem to be of less relevance than the literature critical of neoliberal conservation, carbon offsets and large-scale land acquisitions would suggest. What emerges as more prominent are concerns about *functional* availability of land (particularly the location of spare land, and its proximity to people's homes), and the broader impacts large-scale investment in tree-plantations has on people's livelihoods and time available for farming. Together with the migratory impacts on local population dynamics, and shifting land use and temporal consideration, this has generated anxiety around food security.

I argued that pressures on food security emerged as a result of lack of time or energy for food farming (as per Sulle et al., 2014) and the changing landscape ecology created by widespread eucalyptus and pine tree planting and other shifting livelihood activities (which has consequences for - amongst other things - crop losses through wildlife destruction). This is in contrast to the wider literature, which often frames food security issues around land availability either related to a decline in land for food crops or difficulties in getting land for farming (Sulle et al., 2014; Talleh Nkobou et al., 2021). Concerns about food security and reduced crop production were expressed more in relation to temporal rather than spatial constraints. Further, the context of the land is important. As scholarly work such as Bluwstein et al., (2018) and Brockington (2002) have shown, we have to pay careful attention to the specific forms of landscape ecologies at work, and to the particular historic livelihood dynamics that existed in the local area when considering the impacts of large-scale land acquisition, whether by the state or by private forces.

Finally, in **chapter 7**, I argued that the presence and activities of GRL has brought change to local fire ecologies. I explored the aftermath of the 2009 fire to demonstrate how different local actors leveraged fire as a tool for resistance (in line with Kull, 2004; and Holmes, 2007) and to further their

own interests and agendas, including renegotiation of existing employment arrangements with GRL and attempts to reconfigure the distribution of other benefit. I argued that the fire and its aftermath demonstrate how unexpected dynamics can unfold as local people, institutions and companies engage in 'game playing' (Wright, 2017; Green and Adams, 2014) in the context of neoliberal conservation. We saw how local elites in particular were able to make use of the political spaces that open up in the 'turbulent terrains' (Wright, 2016; Wright 2017) that are created.

Moving beyond Kull (2004) and Holmes (2007), I also showed how the spectre of fire itself became an increasingly powerful tool for use by the company, local elites, and ordinary people. Given the wider landscape changes and the widespread planting of trees by local people (a trend that was actively encouraged by GRL post-2009 fire as both part of its multi-win narrative and also explicitly to incentivise the local community to fight fire 'as one' with the company), *actual* fire becomes a powerful tool that brings with it great risk of personal loss. Thus, the spectre – or threat – of fire can be a safer, but equally effective tool.

This connects to the powerful and pervasive narratives of fire as devastating, dangerous and to be avoided at all costs, as described in the literature in chapter 2. I argued that this anti-fire narrative (or an 'anti-fire received wisdom' as expressed by Kull (2004) and Messerli (2007)) is persistent across scales, and yet is not the whole picture: it does not reflect the complexity and nuance of the wider landscape changes GRL and the ensuing hegemony of tree planting have brought about, nor does it account for the past fire regimes and productive livelihood and land management practices in the historic grassland ecology. It is at once recognised by all parties as an incomplete narrative, and yet – much like multi-win narratives – it is appropriated and deployed by various actors to further their own interests. The anti-fire narrative does offer protection to GRL's (and now also local people's) assets, and thus bolsters the perceived security of the employment opportunities for the many Uchindile and Kitete residents who have come to rely upon them.

I explored the strategy of GRL to actively encourage local people to plant their own trees. This complements work by Kangalawe and Swart (2012) who showed how the nearby state-own Sao Hill plantation enabled and encouraged nearby residents to develop their own individual (and collective) woodlots. While GRL framed this as 'wanting everyone to win' as part of their multi-win narratives, and indeed their provision of seedlings, education, transport, training, and brokering access to timber and carbon market greatly facilitated many (but not all) people's ability to plant their own woodlots and take advantage of a timber (and carbon) rush , it was also a deliberate attempt to safeguard their tree plantations against fire, by ensuring that if they lose, so do many others in the nearby communities.

I argued that the fire, and the responses to the fire, illustrate that tension arising from the company's presence is not necessarily about land and its availability but may instead be about the employment opportunities that the company's investment and activities bring to the area. The responses of the community (and of its local leaders in particular) in the aftermath of the fire shows that it provided a means of contesting the distribution of benefits that arise out of having large-scale investment and plantations on their doorstep. This challenges the land alienation narrative seen in the literature, which has focused more on land and resource loss than on job creation and associated economic change.

There are several key themes that run across and connect these chapters. We see firstly, the significance of the employment opportunities that GRL and the smaller investors provide to local people, and people who move to (or return to) the nearby villages in search of economic opportunities that were not previously available. These have enabled many people to improve their household positions, both in terms of structural improvements and income. These opportunities were widely seen as positive by local people, but not everyone had equal access to these opportunities, and we saw the beginnings of processes of social differentiation and elite capture of these benefits (as we see elsewhere in Isager et al., 2022; Sulle, 2017; Sulle and Dancer, 2020). Findings suggested that younger, able-bodied people were best placed to benefit from these opportunities, but as Mdee et al. (2021) highlights, these dynamics are themselves differentiated and we must recognise broader structural inequities.

These economic opportunities and their unevenness (which complements work by Degnet et al., 2018; and Lusasi et al, 2020) resonated across the chapters, having implications for population dynamics and migratory patterns, and for anxieties around food security from the new structures of day-to-day life that emerge relating to people's time and energy for food crop farming. The responses to the 2009 fire further revealed the critical importance people placed on these locally available employment opportunities and the broader economic and development impacts that GRL's presence and activities have brought to the local rural economy and society. People's fear of the company's withdrawal, and the attempts by local government and elites to renegotiate the terms of employment represented both an effort to further consolidate power and control over the distribution of opportunities and benefits from GRL, and also a demonstration of the desire to maintain the provision of these opportunities (albeit potentially with improved terms).

Secondly, we saw that these employment opportunities appeared to be more prominent to my informants than the concerns around dispossession or resource loss that are often emphasised in the critical literature on neoliberal conservation and carbon forestry (e.g. Bergius et al., 2020; Lyons and Westoby, 2014; Nel and Hill, 2013; Bumpus and Liverman, 2008). Not all large-scale private investments necessarily constitute land grabs or lead to immediate land dispossession (West and Haug, 2017), restricted access to natural resources, and misery. That is not to say that concerns about land did not exist: in fact, there was clear anxiety about the future availability of land (and particularly, its functional availability in terms of its location and its quality) expressed, especially in Uchindile, and disputes over inherited land issues - competing claims to land used or sold to newer arrivals or small investors with those returning to the village with ancestral ties to land.

However, note two qualities of these anxieties. First, anxieties were typically expressed as concerns about what the future might bring given the change that has taken place over the preceding decades, rather than concerns about the situation there and then. Second, these concerns were not solely related to the direct large-scale acquisition of land by GRL, but instead to the broader landscape and land-use changes that emergence from the consequent local timber and carbon rush of tree planting from local people (collectively and individually) and from other smaller investors that had been attracted to the area. Taken together, this suggests that in places of relatively sparse population, and sparingly used land, land grabs and dispossession may not always be of such concern as emphasised

by the literature, and therefore local social and landscape context matters hugely to how the broader consequences of large-scale land acquisitions unfold.

A connected third theme that we see threaded throughout this thesis is the changing landscape ecologies that are taking place as a consequence of GRL's investment. We saw the establishment of large-scale mono-culture plantations of eucalyptus and pine trees that do not seem (as GRL sometimes suggest) to genuinely constitute reforestation, but instead signify afforestation, and the reshaping of historically grassland ecologies into planted forests. The new hegemony of tree planting by local people who can afford it and by other smaller copy-cat investors being attracted to the area, means that this landscape reshaping extends beyond the borders of GRL's private plantations (see also Kimambo et al., 2020; Koskinen et al., 2019; Lusasi et al., 2020; Lusasi and Mwaseba, 2020). This is an active risk management strategy on the part of GRL to safeguard against the risk of fire by encouraging the local community to engage in individual and collective tree planting of their own. It may also represent a genuine attempt on behalf of GRL to generate benefits beyond employment for local people. It also embodies the need for GRL to demonstrate the 'multi-wins' for local populations that are needed by carbon-offset programmes to bolster positive perceptions and garner support for their investment, both locally and further afield. It may also be a more pragmatic attempt to generate further raw materials for their vertically integrated business (Jacovelli, 2014), in the form of a timber (or even carbon) outgrower model.

Another dimension of the changing landscapes is the perceived impact on food security – from the reduced area of land planted with food crops (due to shifts in livelihood practices and time availability for food farming, rather than land availability issues which we see emphasised in literature such as Talleh Nkobou et al., 2021; Sulle et al., 2014) coupled with the changing ecology and the impact this is seen to have had on dynamics of crop destruction by wild animals. Furthermore, we also saw how GRL's presence and activities, and the consequent broader landscape changes described above, have led to changing ecologies of fire.

A fourth theme running across this thesis is that of the power and persistence of narratives, and how and by whom they are used to resist and renegotiate social and political structures. These narratives – particularly degradation, multi-win neoliberal conservation fixes (Igoe & Brockington, 2007; Grandia, 2007) and anti-fire narratives (as well as narratives of the panacea of tree planting) – are often explicitly or implicitly recognised as flawed or incomplete, and yet we find they are 'sticky' (Leach and Mearns, 1996; Walker, 2004) across scales, and particularly locally (even if they did not originate locally). That these narratives are sticky is in part because they are <u>partially</u> true. While these narratives may be imposed in a top-down fashion, initially serving perhaps to further neoliberal agendas (Cavanagh & Benjaminsen, 2014), we also see how they are (re)appropriated and used to exert pressure on those in positions of power (Holmes and Cavanagh, 2016), as well as being wielded by those in relative positions of power. We saw this in the need for GRL to demonstrate the 'multi-wins' for local people just as more broadly neoliberal conservation and carbon-offset programmes need to bolster positive multi-win perceptions and garner support for their investment, both locally and further afield. When there are voices of dissent – both of third parties, who claim to speak for marginalised local people, and by critical scholars and media coverage – these multi-win narratives can also be used by local leaders and various people within communities to hold GRL and other investors to account.

We also saw how different actors leverage fire, the spectre of fire and anti-fire narratives as forms of resistance (Homes, 2007; Kull, 2004; Scott, 1975) (on the part of the community and individuals) and control (on the part of local elites and GRL) to further their own interests and to attempt to renegotiate terms of engagement and to secure access to opportunities and benefits. This complements work such as that by Sulle (2020) and Chome et al. (2020) which shows how corridor-making in SAGCOT agricultural investments are contested political processes which are re-shaped and re-negotiated on the ground. At the same time, we saw how these narratives can intersect and reinforce one another, as multi-win narratives were used by GRL as a guise for their push to align incentives to safeguard against fire by encouraging local residents to plant trees and stand firmly behind anti-fire and degradation narratives. The pervasive environmental degradation narratives seen in this thesis are widely seen in the critical literature to disempower local voices and knowledges, wielded by governments, foreign interests, and capitalists, to further a neoliberal agenda and dispossess local populations. However, we see how local communities – and the different people and dynamics that constitute them – respond to and themselves wield these narratives to further their own interests and to resist control by others. We thus see the power of narratives to re-write expectations across scales and time.

When examining the direct, and indirect consequences of GRL's investments and the broader changes that have unfurled, and from viewing these changes through the lens of fire and of employment opportunities, we have seen how a large-scale private sector investment in tree plantations for timber and carbon have far reaching consequences that ripple across rural landscapes, economies, and society. This shows that the scale that we look at in order to understand the impacts of these sorts of investments is of great important – something that we have seen emphasised in the literature around how human-wildlife conflict changes as we look across scales.

The consequences we see are nuanced, and I argue that the impact of this investment has been far from the black and/or white picture much of the literature suggests. Instead, what we see is the *greyness* of these investments. Many people report significant benefits, collectively and individually. GRL appear to have contributed to the development of Kitete and Uchindile, although multi-win narratives do not allow for the greyness, unevenness or complexity of how benefits are distributed. Nor do they account for the negative consequences that unfold. There is also a credible marginalisation of already marginalised groups like hunters, those viewed as 'outsiders' and the poorest in rural societies. We have seen signs of processes of social differentiation unfolding and suggestions of elite capture and deepening of existing equalities.

As previous literature has shown, capitalism and neoliberal conservation, is re-writing landscapes. However, much of the wider literature can be polarised, emphasising either the perils and dangers of large-scale private investments in terms of land alienation, loss of access to resources, and dispossession, or focusses more on evaluating the potential for triple- or multi-wins. As many studies show (see for example, Oya, 2013; Fairhead et al., 2012; Bergius et al., 2018; Bluwstein et al., 2018; Beymer-Farris and Bassett, 2012; Cavanagh and Benjaminsen, 2014; Wright, 2016; Benjamin and Bryceson, 2012; Bumpus and Liverman, 2011; Lyons and Westoby, 2014), the threats posed to people's land and natural resource use by the expansion of capital through neoliberal conservation and the carbon finance are credible and tangible. My thesis paints a greyer picture. In an area with a relatively sparse population and few previous economic opportunities, we see changes to livelihoods and wealth, to local ecology and local land-use practices. We do not – in this specific case study - see

the dispossession the scholarly literature suggests we might expect. We do see changes in local resource use and resource use practice, and expose submerged anger, anxieties, and resistance. We see how international capital can sometimes ally with some local people – local people who want labour and want to participate in tree planting with a hope of accessing carbon finance – and how people can respond to the opportunities and challenges this international capital presents. We see that narratives are a form of politics, a game that people play (Wright, 2017; Green and Adams, 2014) in their struggles to (re)negotiate dynamics and opportunities, and exert control over jobs, investments and resources. My thesis emphasises that with large-scale investments, it is not just the private investor that is important, but also the contingent wider changes they bring economically and ecologically.

What my findings have shown – as much other research has clearly articulated (see for example Mabele, 2020a and 2020b on conservation and charcoal in Tanzania; Bluwstein et al., 2018; and Brockington, 2002) – is that context is key. This includes the ecology, economic and societal context, as well as the context of the particular forms of private investment that have been deployed. It is thus important to reflect on the limitations of my findings, specifically in terms of their generalisability. I have looked at a specific case study of two villages in rural Tanzania. Chapter 4 argued that these villages have many characteristics of typical rural Tanzania villages, however I do not suggest that my findings can be generalisable beyond their specific context. Other research that has looked at the impact of GRL's investments elsewhere (Fischer et al., 2016; Lyons and Westoby, 2014; Nel and Hill, 2013; Olwig et al., 2015) demonstrates that serious issues around land and dispossession can and do arise, and that exploitation and conflict can and does ensue from GRL's plantations. However, while my findings should not be generalised, what they do offer is an alternative example of how the consequences of such carbon investments can unfold. I argue they have significance for what they show in this particular context, and can offer insights into aspects to pay attention to in other contexts. They also only represent a snapshot in time, and should not be used to extrapolate into the future. Similarly, as explored in chapter 3, ultimately this thesis involves the interpretation of evidence through my eyes, which are shaped by my own positionalities, prejudices, identities and experiences.

Furthermore, my thesis suggests several key areas that I believe would be valuable for future research. Longitudinal research on large-scale private investment in carbon forestry and carbon-offset programmes could offer insights into how processes of social differentiation and class dynamics emerge and unfold, particularly in relation to the associated employment opportunities and local timber and carbon rushes. An in-depth qualitative exploration of how private companies like GRL broker access to carbon finance for local people engaged in outgrower-style carbon plantations, and how these dynamics play out, including focussing on the distributional impacts of these arrangements. More attention should be paid to the gender dynamics within longer-term impacts of personal tree plantings and employment opportunities that arise from large-scale private carbon investments, as in particular Sulle's body of work has contributed to understandings of sugarcane estate-outgrower models in Kilombero (Sulle and Dancer, 2020; Sulle, 2017; see also Mblilinyi, 2016). We have also seen in the literature (Kangalawe and Swart, 2021) that the Sao Hill state-owned plantation offers the provision of services that would typically be provided by local government, taking on a quasi-state function. We have seen hints in this thesis (see chapter 5, where we see GRL providing transport, infrastructure improvements, and funding the development of community structures such as healthcare and school buildings) that GRL sometimes performs some of the quasi-state functions.

Further research could explore this role further, as well as the implications of this arrangement for people's relationship with the state, and for local governance and political structures.

Bibliography

Adams, B. (2019). *Green development: Environment and sustainability in a developing world*. Routledge.

Adichie, C. N. (2009). *The danger of a single story*. Retrieved December 9, 2021, from https://www.ted.com/talks/chimamanda_adichie_the_danger_of_a_single_story?language=en

Agrawal, A. (1997) 'The Politics of Development and Conservation: Legacies of Colonialism', *Peace and change*, 22(4), p. 463.

Agrawal, A. (2001). Common property institutions and sustainable governance of resources. World development, 29(10), 1649-1672.

Akyoo, E. (2017) Comparative study between government and private forest plantations management practices: case studies of Sao Hill and Green Resource forest plantations, Mufindi Iringa Tanzania. *Masters Thesis.* SUA. [Online] Available from: http://suaire.suanet.ac.tz:8080/xmlui/bitstream/handle/123456789/2066/AKYOO%20RESEARCH%20_%20COMPLETED%20NOV%202017.pdf?sequence=1&isAllowed=y [Accessed 15-Feb-2020].

Alix-Garcia, J., Shapiro, E. and Sims, K. (2010) *Forest Conservation and Slippage: Evidence from Mexico's National Payments for Ecosystem Services Program*. *Ecological Economics*. Working paper, Department of Agricultural and Applied Economics, University of Wisconsin, Madison [Online]. Available from: https://ideas.repec.org/p/ags/wisagr/93045.html [Accessed 20 Feb 2020]

Andela, N. *et al*. (2017). A human-driven decline in global burned area. *Science* 356:1356-1362. https://doi.org/10.1126/science.aal4108

Angelsen, A. (Ed.) (2009) *Realizing REDD+. National Strategy and Policy Options*, Center for International Forestry Research

Angelsen, A. *et al.* (2011) *Measuring livelihoods and environmental dependence: methods for research and fieldwork*. Earthscan.

Apostolopoulou, E. *et al.* (2021) Reviewing 15 years of research on neoliberal conservation: Towards a decolonial, interdisciplinary, intersectional and community-engaged research agenda, *Geoforum*, 124, pp. 236–256. doi:10.1016/j.geoforum.2021.05.006.

Archibald, S., Staver, A.C. and Levin, S.A. (2012). Evolution of human-driven fire regimes in Africa. *Proceedings of the National Academy of Sciences* 109(3):847-852. https://doi.org/10.1073/pnas.1118648109

Arvola, A. et al. (2019) Mapping the Future Market Potential of Timber from Small-Scale Tree Farmers: Perspectives from the Southern Highlands in Tanzania. *Small-scale Forestry* 18, 189–212. https://doi.org/10.1007/s11842-019-09414-8

Asiyanbi, A.P., Ogar, E. and Akintoye, O. (2019) 'Complexities and surprises in local resistance to neoliberal conservation: Multiple environmentalities, technologies of the self and the poststructural geography of local engagement with REDD+'. *Political Geography*, 69. pp. 128-138. ISSN 0962-6298

Asprem, M. (2012) Large-Scale Land Acquisitions in the South: Plantation WIN-WIN. *Workshop Presentation.* Delivered at Workshop *Large-scale Land Acquisitions in the South* on 28 November 2012. Organised by Norfund, CLTSUMB, and Kartverket. Oslo, Norway. Available online: http://www.umb.no/statisk/clts/workshop/asprem_presentation.pdf [Accessed 20 Feb 2020]

Babbie, E. (2013). *The basics of social research*. (6th Eds). Wadsworth, Cengage learning: Belmont CA.

Bachram, H. (2004) Climate fraud and carbon colonialism: the new trade in greenhouse gases. *Capitalism Nature Socialism*, 15:4, 5-20, DOI: 10.1080/1045575042000287299

Band, L. (2010) Forest ecosystem processes at the watershed scale: ecosystem services, feedback and evolution in developing mountainous catchments. *Geographical Research Abstracts* Vol. 12. [Online]. Available from: http://meetingorganizer.copernicus.org/EGU2010/EGU2010-7150.pdf [Accessed 20 Feb 2020]

Barlow, J. *et al.* (2012) The critical importance of considering fire in REDD+ programs. *Biological Conservation*, 154, 1-8.

Barnett, C. (2005). The consolations of 'neoliberalism'. *Geoforum*, 36(1) pp. 7–12.

Bassett T., and Crummey, D. (eds.) (2003). *African Savannas: Global Narratives and Local Knowledge of Environmental Change*. Portsmouth NH: Heinemann; Oxford: James Currey.

BBC (2015) Tanzania-Zambia train route hit by strike. *News Report.* BBC: UK. Available online: https://www.bbc.co.uk/news/world-africa-30786039 [Accessed 20 Feb 2020]

Beegle, K., De Weerdt, J. and Dercon, S. (2011). "Migration and Economic Mobility in Tanzania: Evidence from a Tracking Survey." *The Review of Economics and Statistics* 93(3): 1010-1033.

Behnke, R. and Mortimore, M. (eds) (2016). *The End of Desertification? Springer Earth System Sciences.* Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-16014-1_1

Beinart, W. (2000). African history and environmental history. *African Affairs*, 99(395), 269-302.

Benjaminsen, T. and Bryceson, I (2012) Conservation, green/blue grabbing and accumulation by dispossession in Tanzania, *Journal of Peasant Studies*, 39:2, 335-355, DOI: 10.1080/03066150.2012.667405

Bennett, B., and Kruger, F. (2015). *Forestry and water conservation in South Africa*. ANU Press.

Bergius, M. *et al.* (2020) 'Green economy, degradation narratives, and land-use conflicts in Tanzania', *World development*, 129, p. 104850. doi:10.1016/j.worlddev.2019.104850.

Bergius, M., Benjaminsen, T. and Widgren, M. (2018) Green economy, Scandinavian investments and agricultural modernization in Tanzania, *The Journal of Peasant Studies* 45:4 825-852 DOI: 10.1080/03066150.2016.1260554

Bergius, M. *et al.* (2020) Green economy, degradation narratives, and land-use conflicts in Tanzania. *World Development*, 129, p.104850.

Berkowitz, S. (1997). Analyzing qualitative data. In J. Frechtling & L. Sharp (Eds.), *User-friendly handbook for mixed method evaluations.* Arlington, VA: Division of Research, Evaluation and Communication, National Science Foundation. Retrieved February 10, 2020, from http://www.nsf.gov/pubs/1997/nsf97153/start.htm

Bernard, H.R. (2011) *Research methods in anthropology: qualitative and quantitative approaches*, 5th edn. AltaMira Press, Lanham

Bernstein, H. and Woodhouse, P. (2001) 'Telling Environmental Change Like It Is? Reflections on a Study in Sub-Saharan Africa', *Journal of agrarian change*, 1(2), pp. 283–324. doi:10.1111/1471-0366.00009.

Berry, S. and American Council of Learned Societies (1993) *No condition is permanent [electronic resource]: the social dynamics of agrarian change in sub-Saharan Africa*. Madison, Wis.: University of Wisconsin Press.

Beymer-Farris, B.A. and Bassett, T.J. (2012) The REDD Menace: Resurgent Protectionism in Tanzania's Mangrove Forests. *Global Environmental Change*, 22, 332-341. https://doi.org/10.1016/j.gloenvcha.2011.11.006

Beymer-Farris, B.A., and Bassett, T.J. (2013) "Environmental narratives and politics in Tanzania's Rufiji Delta: a reply to Burgess, et al." *Global Environmental Change*, 23: 1355-1358.

Biggs, R. *et al.* (2004) *Nature Supporting People: the Southern Africa Millennium Ecosystem Assessment – Integrated Report.* A contribution to the Millennium Ecosystem Assessment. Pretoria, South Africa: Council for Scientific and Industrial Research. [Online] Available from: https://www.millenniumassessment.org/documents_sga/SAfMA_Integrated_Report.pdf [Accessed 20 May 2022].

Blaikie, P. *et al.* (2014). *At risk: natural hazards, people's vulnerability and disasters.* Routledge.

Blignaut, J. *et al.* (2010). Restoring and managing natural capital towards fostering economic development: Evidence from the Drakensberg, South Africa. *Ecological Economics* 69(6): 1313–1323.

Bloor, M. (2001). *Focus groups in social research*. Sage.

Bluwstein, J. (2017) 'Creating ecotourism territories: Environmentalities in Tanzania's community-based conservation', *Geoforum*, 83, pp. 101–113. doi:10.1016/j.geoforum.2017.04.009.

Bluwstein, J. *et al.* (2018). "Between dependence and deprivation: The interlocking nature of land alienation in Tanzania." *Journal of Agrarian Change* 18(DOI: 10.1111/joac.12271): 806–830.

Bond, I. *et al.* (2009) Incentives to sustain forest ecosystem services: A review and lessons for REDD. *Natural Resource Issues.* No. 16. [Online]. International Institute for Environment and Development (IIED), London, UK, with CIFOR, Bogor, Indonesia, and World Resources Institute, Washington D.C., USA. Available from: http://pubs.iied.org/pdfs/13555IIED.pdf [Accessed 20 Feb 2020].

Boudreaux, K. (2012). *An Assessment of Concerns Related to Land Tenure in the SAGCOT Region. USAID.* Unpublished. Available online: https://www.actionaidusa.org/wp-content/uploads/2015/05/an_assessment_of_concerns_related_to_land_tenure_in_the_sagcot_region.pdf

Bousquet, F., and Le Page, C. (2004) Multi-agent simulations and ecosystem management: a review. *Ecological Modelling*. 176:313-332.

BP (2022) Reforestation, Tanzania – Project Summary. Webpage – description of offset projects from previous portfolios. Available from: https://www.bp.com/en_gb/target-neutral/home/offsetting-projects/previous-portfolios-projects/reforestation--tanzania.html (Accessed 01.04.2022) [75]

Bridge, G. and Jonas, A. (2002) Governing nature: the reregulation of resource access, production, and consumption. *Environment and Planning A,* 34, 759-766.

Brinkhoff, T. (2020) *City Population.* [Online]. Available from: http://www.citypopulation.de/en/tanzania/coastal/admin/0503__kilombero/ [Accessed 20 Feb 2020].

Brockington, D. (2005) The Politics and Ethnography of Environmentalism in Tanzania. *African Affair*s, 105/418, 97–116. doi:10.1093/afraf/adi071

Brockington, D. (2019): Persistent peasant poverty and assets. Exploring dynamics of new forms of wealth and poverty in Tanzania 1999–2018, *The Journal of Peasant Studies*, DOI: 10.1080/03066150.2019.1658081. Available online: https://doi.org/10.1080/03066150.2019.1658081

Brockington, D. (2021) Persistent peasant poverty and assets. Exploring dynamics of new forms of wealth and poverty in Tanzania 1999–2018, *The Journal of Peasant Studies*, 48:1, 201-220, DOI: 10.1080/03066150.2019.1658081

Brockington, D. and Sullivan, S. (2003) 'Qualitative Research'. In Scheyvens, R. and Storey, D. (Eds) *Development Fieldwork: A Practical Guide*. Sage publications: London.

Brockington, D. *et al.* (2019): Assets and domestic units: methodological challenges for longitudinal studies of poverty dynamics, *The Journal of Peasant Studies*, DOI: 10.1080/03066150.2019.1658079. Available online: https://doi.org/10.1080/03066150.2019.1658079

Brockington, D., Duffy, R. and Igoe, J. (2008) *Nature unbound: conservation, capitalism and the future of protected areas.* Earthscan, UK.

[75] N.B. This is no longer available from BP's website but is accessible through an internet archive of previous webpages: https://web.archive.org/web/20210305165603/https://www.bp.com/en_gb/target-neutral/home/offsetting-projects/previous-portfolios-projects/reforestation--tanzania.html

Bromley, D.W. (1992) The commons, common property, and environmental policy. *Environ Resource Econ* 2, 1–17 https://doi.org/10.1007/BF00324686

Bruenig, E. (1992). 'J G Goldammer (ed) 1990 Fire in the tropical biota: Ecosystem processes and global challenges Ecological Studies, Vol 84 Springer Verlag, Heidelberg 497 pages ISBN 3-540-52115-1 Price: DM298 –(hardback)'. *Journal of Tropical Ecology*, 8(2), 180-180. doi:10.1017/S0266467400006313

Bryman, A. (2015). *Social Research Methods*. Oxford: Oxford University Press.

Bulte, E. H. *et al.* (2008) Payments for ecosystem services and poverty reduction: concepts, issues, and empirical perspectives. *Environment and Development Economics*. 13:245–254.

Bumpus, A.G. and Liverman, D.M. (2008) Accumulation by Decarbonization and the Governance of Carbon Offsets, *Economic geography*, 84(2), pp. 127–155. doi:10.1111/j.1944-8287.2008.tb00401.x.

Bumpus, A.G. and Liverman, D.M. (2011) Carbon colonialism? Offsets, greenhouse gas reductions, and sustainable development. *Global political ecology*, *203*, pp.203-224.

Burgess, N., Doggart, N. and Lovett, J. C. (2002) The Uluguru Mountains of Eastern Tanzania: The Effect of Forest Loss on Biodiversity. *Oryx*. (36) 140-152.

Büscher B. and Fletcher R. (2015) Accumulation by conservation. New Political Economy 20(2): 273–298.

Buscher, B. (2010) 'Anti-Politics as Political Strategy: Neoliberalism and Transfrontier Conservation in Southern Africa', *Development and change*, 41(1), pp. 29–51. doi:10.1111/j.1467-7660.2009.01621.x.

Büscher, B. *et al.* (2012) 'Towards a Synthesized Critique of Neoliberal Biodiversity Conservation', *Capitalism, nature, socialism*, 23(2), pp. 4–30. doi:10.1080/10455752.2012.674149.

Büscher, B., (2013). Nature 2.0. *Geoforum* 44, 1–3.

Butz, R. J. 2009. Traditional fire management: historical fire regimes and land use change in pastoral East Africa. *International Journal of Wildland Fire* 18(4):442-450.

Campbell, B., Sayer, J. and Walker, B. (2010) Navigating trade-offs: working for conservation and development outcomes. *Ecology and Society* 15:16. [Online]. Available from: https://www.ecologyandsociety.org/vol15/iss2/art16/ [Accessed 20 Feb 2020]

Castella, J., Trung, N. and Boissau, S. (2005) Participatory simulation of land-use changes in the northern mountains of Vietnam: the combined use of an agent-based model, a role-playing game, and a geographic information system. *Ecology and Society* 10(1): 27. [Online]. Available from: http://www.ecologyandsociety.org/vol10/iss1/art27/ [Accessed 20th May 2012]

Castree N. (2002) False antitheses? Marxism, nature and actor-networks. *Antipode* 34 111-146

Castree, N. (2006) 'From Neoliberalism to Neoliberalisation: Consolations, Confusions, and Necessary Illusions', *Environment and Planning A: Economy and Space*, 38(1), pp. 1–6. doi: 10.1068/a38147.

Castree, N. (2008) 'Neoliberalising Nature: The Logics of Deregulation and Reregulation', *Environment and Planning A: Economy and Space*, 40(1), pp. 131–152. doi: 10.1068/a3999.

Castree, N. (2010a) Neoliberalism and the biophysical environment: a synthesis and evaluation of the research. *Environ. Soc. Adv. Res*., 1 (2010), pp. 5-45

Castree, N. (2010b). Neoliberalism and the biophysical environment 1: what 'neoliberalism' is, and what difference nature makes to it. *Geogr. Compass* 4 (12), 1725–1733.

Cavanagh, C. and Benjaminsen, T.A. (2014) Virtual nature, violent accumulation: The 'spectacular failure' of carbon offsetting at a Ugandan National Park. *Geoforum*, *56*, pp.55-65.

CCBA (2019) CCB Standards. Website page*. CCBA The Climate, Community & Biodiversity Alliance.* Conservation International: Arlington, VA, USA. Available online: http://www.climate-standards.org/ccb-standards/ [Accessed 20 Feb 2020]

Chen, X. *et al.* (2009) Linking social norms to efficient conservation investment in payments for ecosystem services. *Proc Natl Acad Sci.* [Online] 106 (28) 11812–11817. Available from: http://www.pnas.org/content/early/2009/06/26/0809980106 [Accessed 20 Feb 2020]

Chisholm, R. (2010) Trade-offs between ecosystem services: Water and carbon in a biodiversity hotspot. *Ecological Economics*. 69 (10) 1973-1987.

Chomba, S.W. *et al.* (2015) 'Illusions of empowerment? Questioning policy and practice of community forestry in Kenya', *Ecology and society*, 20(3), p. 2. doi:10.5751/ES-07741-200302.

Clapp, R. (1988) Representing reciprocity, reproducing domination: Ideology and the labour process in Latin American contract farming, *The Journal of Peasant Studies*, 16:1, 5-39, DOI: 10.1080/03066158808438381

Coffey, A. and Atkinson, P. (1996) *Making sense of qualitative data: complementary research strategies.* London: SAGE Publications Ltd.

Cooke, B., and Kothari, C. (eds). (2001) *Participation: the new tyranny?* Zed Books, London, UK.

Cooksey, B. (2012) Politics, Patronage and Projects: The Political Economy of Agricultural Policy in Tanzania. *FAC Working Paper 040.* [Online]. Available from: https://assets.publishing.service.gov.uk/media/57a08a86ed915d3cfd0007ee/FAC_Working_Paper_040.pdf [Accessed 12th Feb 2020].

Cooksey, B. (2013) What difference has CAADP made to Tanzanian agriculture? *FAC Working Paper 074.* Available from: https://assets.publishing.service.gov.uk/media/57a08a45ed915d3cfd00069c/FAC_Working_Paper_074.pdf [Accessed 1st Feb 2020]

Cope M (ed.) (2005) Coding qualitative data. In: *Qualitative research methods in human geography*. Oxford University Press, Oxford

Corbera, E., Brown, K. and Adjer, W. (2007) The equity and legitimacy of markets for ecosystem services. *Development and Change*. 38:587–613.

Corbera, E. *et al.* (2017) Sowing the seeds of sustainable rural livelihoods? An assessment of Participatory Forest Management through REDD+ in Tanzania. *Land Use Policy*. Available from: https://doi.org/10.1016/j.landusepol.2017.09.037

Cotula, L. *et al.* (2009) *Land grab or development opportunity? Agricultural development and international land deals in Africa.* London: International Institute for Environment and Development, Rome; Food and Agricultural Organization, Rome: International Fund for Agricultural Development

Cowen, M.P. (1981) The Agrarian Problem: Notes on the Nairobi Discussion. *Review of African Political Economy*. 20: 57–73.

Cranford, M. and Mourato, S. (2011) Community Conservation and a Two-Stage Approach to Payments for Ecosystem Services. *Ecological Economics*. [Online] 71 (1) 89-98. Available from: http://www.sciencedirect.com/science/article/pii/S0921800911003405 [Accessed 20 Feb 2020]

Creswell, J. (2011) *Designing and conducting mixed research methods*. 2nd edition. Los Angeles, SAGE.

Creswell, J. W. (2009). Mapping the field of mixed methods research. *Journal of mixed methods research*, 3(2), 95-108.

Creswell, J. W., and Poth, C. N. (2017). *Qualitative inquiry and research design: Choosing among five approaches.* Sage publications.

D'Amato, D. (2021) Sustainability Narratives as Transformative Solution Pathways: Zooming in on the Circular Economy. *Circ.Econ.Sust*. 1, 231–242. https://doi.org/10.1007/s43615-021-00008-1

Das, B.K. (2019) 'Denial of Rights Continues: How Legislation for 'Democratic Decentralisation' of Forest Governance was Subverted in the Implementation Process of the Forest Rights Act in India', *European journal of development research*, 31(4), pp. 957–983. doi:10.1057/s41287-019-0195-2.

Davies, A. G. and Richards, P. (1991) Rain Forest in Mende Life: Resources and Subsistence Strategies in Rural Communities around the Gola North Forest Reserve (Sierra Leone). *Report to Economic and Social Committee on Research* (ESCOR), UK Overseas Development Administration. London: University College.

de Weerdt, J. (2010) "Moving out of Poverty in Tanzania: Evidence from Kagera." *The Journal of Development Studies* 46(2): 331-349.

Deal, R. *et al.* (2010) 'Ecosystem services and climate change: Understanding the differences and identifying opportunities for forest carbon' in Jain, T., Graham, R. and Sandquist, J (2009) *Integrated management of carbon sequestration and biomass utilization opportunities in a changing climate:*

Proceedings of the 2009 National Silviculture Workshop. Boise, ID. Proceedings RMRS-P-61. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. p. 9-25 [Online]. Available from: http://www.fs.fed.us/rm/pubs/rmrs_p061/rmrs_p061_009_025.pdf [Accessed 20 Feb 2020]

Death, C. (2016) Green states in Africa: beyond the usual suspects, *Environmental Politics*, 25:1, 116-135, DOI: 10.1080/09644016.2015.1074380

Degnet, M. *et al*. (2020) 'Do Locals Have a Say? Community Experiences of Participation in Governing Forest Plantations in Tanzania', *Forests*, 11(7), p. 782. doi:10.3390/f11070782.

Degnet, M.B. *et al.* (2018) 'Forest plantations' investments in social services and local infrastructure: an analysis of private, FSC certified and state-owned, non-certified plantations in rural Tanzania', *Land use policy*, 79, pp. 68–83. doi:10.1016/j.landusepol.2018.07.041.

Deininger, K. *et al.* (2011) *Rising Global Interest in Farmland: Can it yield sustainable and equitable benefits?* Washington, DC: World Bank

Denscombe, M. (2008). Communities of practice: A research paradigm for the mixed methods approach. *Journal of Mixed Methods Research*, 2(3), 270-283

Devisscher, T. (2010) Ecosystem based adaptation in Tanzania – the role of ecosystem services for human well-being and climate adaptation. *Ecosystems report for the economics of climate change in Tanzania project. DifD.* [Online]. Available from: http://economics-of-cc-in tanzania.org/images/Final_Tanzania_Report.pdf [Accessed 1st July 2012].

DiAngelo, R. (2011) White fragility. *International Journal of Critical Pedagogy*, *3*(3), 54-70.

DISS 2019: Danish Institute for International Studies (2019) A typology of domestic private land-based investors in Africa. Evidence from Tanzania's timber rush. Authors: Lusai, J., Friis-Hansen, E. and Pendersen, R. H. DISS Working Paper 2019: 4. Available from: https://www.econstor.eu/bitstream/10419/204629/1/1664512934.pdf [Accessed 20 Feb 2020].

Dressler, W. *et al.* (2010). From hope to crisis and back again? A critical history of the global CBNRM narrative. *Foundation for Environmental Conservation* 37(1): 5–15.

Dunlap, A. and Sullivan, S. (2020) 'A faultline in neoliberal environmental governance scholarship? Or, why accumulation-by-alienation matters', *Environment and planning. E, Nature and space (Print)*, 3(2), pp. 552–579. doi:10.1177/2514848619874691.

Dymond, J. *et al.* (2012) Trade-offs between soil, water, and carbon – A national scale analysis from New Zealand. *Journal of Environmental Management*. 95 (1) 124-131.

Ebeling, J. and Yasue, M. (2008) The effectiveness of market-based conservation in the tropics: forest certification in Ecuador and Bolivia. *Journal of Environmental Management*. 363 (1498) 1917-1924.

Ecolex (2020): Ecolex Legislation – Forest Act, 2002. Website. *ECOLEX.* IUCN, UNEP, FAO. Available online: https://www.ecolex.org/details/legislation/forest-act-2002-act-no-7-of-2002-lex-faoc034429/ [Accessed 1st Feb 2020]

Ecologi (2021) *About.* Available at: https://ecologi.com/about (Accessed 09 December 2021).

Ecosystem Marketplace (2021) *Voluntary Carbon Markets Rocket in 2021, On Track to Break $1B for First Time.* Press Release. Available from: https://www.ecosystemmarketplace.com/articles/press-release-voluntary-carbon-markets-rocket-in-2021-on-track-to-break-1b-for-first-time/ (Accessed 25 January 2022).

Ellison, D, *et al.* 'Trees, forests and water: Cool insights for a hot world.' *Global Environmental Change* 43 (2017): 51-61.

Engel, S., and C. Palmer (2008). Payments for environmental services as an alternative to logging under weak property rights: the case of Indonesia. *Ecological Economics*. 65:799–809.

Engel, S., Pagiola, S. and Wunder, S. (2008) Designing payments for environmental services in theory and practice: an overview of the issues. *Ecological Economics.* [Online] 65 (4) 663-674. Available from: https://doi.org/10.1016/j.ecolecon.2008.03.011 [Accessed 20 Feb 2020]

Fairhead, J., and Leach, M. (1996). Enriching the Landscape: Social History and the Management of Transition Ecology in the Forest. Savanna Mosaic of the Republic of Guinea. Africa: *Journal of the International African Institute*, 66(1), 14–36. https://doi.org/10.2307/1161509

Fairhead, J., and Leach, M. (1996) *Misreading the African landscape: society and ecology in a forest-savanna mosaic* (No. 90). Cambridge University Press.

Fairhead, J., Leach, M. and Scoones, I. (2012) 'Green Grabbing: a new appropriation of nature?' *The Journal of Peasant Studies* 39(2): 237-261. doi:10.1080/03066150.2012.671770.

Fallon, A. (2013) Throwing the Tanzania-Zambia Railway a Lifeline. *News report*. IPS News. Available online: http://www.ipsnews.net/2013/12/tanzania-zambia-railway-line-time-stands-still/ [Accessed 20 Feb 2020]

Farley, J. and Costanza, R. (2010) Payments for ecosystem services: From local to global. *Ecological Economics.* [Online] 69 (11) 2060–2068. Available from: http://pdx.edu/sites/www.pdx.edu.sustainability/files/Farley%20and%20Costanza%202010.pdf [Accessed 20 Feb 2020]

Farley, K., Jobbagy, G. and Jackson, R. (2005) Effects of afforestation on water yield: a global synthesis with implications for policy. Global Change Biology. 11 (10) 1565-1576.

Ferguson, J. (1994) *The anti-politics machine: "development," depoliticization, and bureaucratic power in Lesotho*. Minneapolis, MN: University of Minnesota Press.

Ferguson, J. (2010). The uses of neoliberalism. *Antipode*, *41*(1), 166–184.

Fischer, K., Hajdu, F. and Giertta, F.K. (2016) '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, pp. 267–268. doi:10.1016/j.jrurstud.2016.06.014.

Fitzpatrick, A. (2018) Digging While Depressed: Struggling with Fieldwork and Mental Health. *Blog post.* [Online]. Available from: https://animalarchaeology.com/2018/07/09/digging-while-depressed-struggling-with-fieldwork-and-mental-health/ [Accessed 18 Feb 2020].

Fleck, L. (1979) *Genesis and development of a scientific fact*. Chicago: University of Chicago Press.
Fletcher, R. (2010) Neoliberal environmentality: towards a poststructuralist political ecology of the conservation debate, Conserv. Soc., 8 (3) (2010), pp. 171-181

Fletcher, R. (2020). Neoliberal Conservation. *Oxford Research Encyclopaedia of Anthropology.* Doi: https://doi.org/10.1093/acrefore/9780190854584.013.300

Fletcher, R. and Büscher, B. (2017). The PES conceit: revisiting the relationship between payments for environmental services and neoliberal conservation. *Ecological Economics*, *132*, pp.224-231.

Forsyth, T. and Walker, A. (2008) *Forest Guardians, Forest Destroyers: The Politics of Environmental Knowledge in Northern Thailand.* Seattle: University of Washington Press.

Fortmann, L. (1995) Talking claims: discursive strategies in contesting property. World Development 23(6): 1053–1063. https://doi.org/10.1016/0305-750X(95)00024-7

Foucault, M. (1970). The order of things. Routledge.

Foucault, M. (2008) The Birth of Biopolitics: Lectures at the Collège de France 1978–1979. Translated by G. Burchell. Palgrave Macmillan, Basingstoke

Francis, E. (2019). Making a living: changing livelihoods in rural Africa. Routledge.

Frost, P. and Bond, I. (2008) The CAMPFIRE programme in Zimbabwe: payments for wildlife services. *Ecological Economics*. [Online] 65 (4) 776-787. Available from: https://doi.org/10.1016/j.ecolecon.2007.09.018 [Accessed 20 Feb 2020]

Ganti, T. (2014). Neoliberalism. Annual Review of Anthropology 2014 43:1, 89-104 https://doi.org/10.1146/annurev-anthro-092412-155528

Glaser, B. G. and Strauss, A. L. (1967). The Discovery of Grounded Theory: Strategies for Qualitative Research. Chicago, Aldine.

Glassman, J. (2006) 'Primitive accumulation, accumulation by dispossession, accumulation by 'extra-economic' means', *Progress in Human Geography*, 30(5), pp. 608–625. doi: 10.1177/0309132506070172.

Grandia, L. (2007) Between bolivar and bureaucracy: the Mesoamerican biological corridor. *Conservation and Society*, *5*(4), pp.478-503.

Green Resources (2012) *Company Report*. Available online: https://s3.amazonaws.com/giin-web-assets/iris/assets/files/impact-reports/Green%20Resources%20Company%20Report%202011.pdf [Accessed 20 Feb 2020].

Green Resources (2018) Sustainability Report 2018. *Company Report.* Available online: http://greenresources.no/wp-content/uploads/2019/11/GR-Sustainability-Report-2018.pdf [Accessed 20 Feb 2020].

Green Resources (2021) *Company Profile.* Available online: http://greenresources.no/wp-content/uploads/2022/02/GRAS-Company-Profile-January-2021.pdf (Accessed 01 April 2022)

Green Resources (2022) *Operations.* Available online: http://greenresources.no/operations/ (Accessed 21 April 2022).

Green, K. E., and Adams, W. M. (2014) Green grabbing and the dynamics of local-level engagement with neoliberalization in Tanzania's wildlife management areas. *Journal of Peasant Studies* 42(1): 97-117.

Green, K.E. and Lund, J.F. (2015) 'The politics of expertise in participatory forestry: a case from Tanzania', *Forest policy and economics*, 60, pp. 27–34. doi:10.1016/j.forpol.2014.11.012.

Grieg-Gran, M. and Bishop, J. (2004) How Can Markets for Ecosystem Services Benefit the Poor? IIED. [Online]. Available from: http://pdf.wri.org/ref/grieg-gran_04_how_can.pdf [Accessed 20 Feb 2020].

GRL (2011) *Loss Event Report: VCS Version 3 for 'Reforestation in grassland areas of Uchindile, Kilombero, Tanzania & Mapanda, Mufindi, Tanzania'*. Available online: https://registry.verra.org/mymodule/ProjectDoc/Project_ViewFile.asp?FileID=7512&IDKEY=kkjalskjf098234kj28098sfkjlf098098kl32lasjdflkj909k10359048 [Accessed 04 Feb 2020]

GRL (2012a) *Reforestation in grassland areas of Uchindile, Kilombero, Tanzania & Mapanda, Mufundi, Tanzania. CCBA Implementation Report for verification under the climate, community and biodiversity alliance, second edition*. [Online]. Available from: https://s3.amazonaws.com/CCBA/Projects/Reforestation_in_Grassland_of_Uchindile_Kilomber_Tanzania/UMFP_CCBA_IR_121112.pdf [Accessed 01-Feb-2020].

GRL (2012b) *CCBA Implementation Report for Verification under the Climate, Community and Biodiversity Alliance Second Edition: Version 1 for 'Reforestation in grassland areas of Uchindile, Kilombero, Tanzania & Mapanda, Mufindi, Tanzania'*

GRL (2013a) CCBA Implementation Report for Verification under the Climate, Community and Biodiversity Alliance Second Edition: Version 2 for 'Reforestation in grassland areas of Uchindile, Kilombero, Tanazania & Mapanda, Mufindi, Tanzania'. Available online: https://www.vcsprojectdatabase.org/services/publicViewServices/downloadDocumentById/24753 [Accessed 04 Feb 2020]

GRL (2013b) VCS Monitoring Report: VCS Version 3 for 'Reforestation in grassland areas of Uchindile, Kilombero, Tanzania & Mapanda, Mufindi, Tanzania'. For Monitoring Period: 01 Dec 2008 to 01 Sep 2012. Available online: https://registry.verra.org/mymodule/ProjectDoc/Project_ViewFile.asp?FileID=10571&IDKEY=oiofj09234rm9oq4jndsma80vcalksdjf98cxkjaf90823nmq3x14577409 [Accessed 20 Feb 2020]

GRL (2014a) VCS Monitoring Report: VCS Version 3 for 'Reforestation in grassland areas of Uchindile, Kilombero, Tanzania & Mapanda, Mufindi, Tanzania'. For Monitoring Period: 02 Sep 2012 to 27 Dec 2013. Available online: https://registry.verra.org/mymodule/ProjectDoc/Project_ViewFile.asp?FileID=14229&IDKEY=flksjoiuwqowrnoiuomnckjashoufifmln902309ksdflku098n19621791 [Accessed 20 Feb 2020]

GRL (2014b) CCBA Implementation Report for Verification under the Climate, Community and Biodiversity Alliance Second Edition: Version 1, for Implementation Period: 2nd September 2012 –

31st December 2013. For project 'Reforestation in grassland areas of Uchindile, Kilombero, Tanazania & Mapanda, Mufindi, Tanzania'. Available online: https://www.vcsprojectdatabase.org/services/publicViewServices/downloadDocumentById/24754 [Accessed 04 Feb 2020].

GRL (2018) GR Sustainability Report 2018. Available from: http://greenresources.no/wp-content/uploads/2022/02/GR-Sustainability-Report-2018.pdf (Accessed 01.04.2022)

GRL (2019) Tanzania Plantations. *Green Resources website*. Available online: http://greenresources.no/Plantation/Tanzania [Accessed 01 Jun 2019. Note that this version of the webpage is no longer available, but it is accessible through a web archive link: https://web.archive.org/web/20190709001303/http://greenresources.no/Plantation/Tanzania]

GRL (2020) Green Resources*. Company website.* Tanzania. Available online: http://greenresources.no/ [Accessed 20 Feb 2020]

GRL (2021a) GRAS Sustainability Report 2021. Available from: http://greenresources.no/wp-content/uploads/2022/02/GR-Sustainability-Report-FY2020-21-v2.pdf (Accessed 01.04.2022)

GRL (2021b) GRAS Company Profile January 2021. Available from: http://greenresources.no/wp-content/uploads/2022/02/GRAS-Company-Profile-January-2021.pdf (Accessed 01.04.2022)

Gross-Camp, N. *et al.* (2012) Payments for ecosystem services in an African protected area: exploring issues of legitimacy, fairness, equity and effectiveness. Oryx, 46(1), 24–33

Grove, R. (1996). Green imperialism: colonial expansion, tropical island Edens and the origins of environmentalism, 1600-1860. Cambridge University Press.

Haas, P.M. (1989) 'Do regimes matter? Epistemic communities and Mediterranean pollution control', *International organization*, 43(3), pp. 377–403. doi:10.1017/S0020818300032975.

Hahn, T. *et al.* (2015) 'Purposes and degrees of commodification: Economic instruments for biodiversity and ecosystem services need not rely on markets or monetary valuation', *Ecosystem services*, 16, pp. 74–82. doi:10.1016/j.ecoser.2015.10.012.

Hall, R. (2011). "Land grabbing in Southern Africa: the many faces of the investor rush." *Review of African Political Economy* 38(128): 193-214.

Hall, R., Scoones, I. and Tsikata, D. (2017) Plantations, outgrowers and commercial farming in Africa: agricultural commercialisation and implications for agrarian change, *The Journal of Peasant Studies*, 44:3, 515-537, DOI: 10.1080/03066150.2016.1263187. Available online: https://doi.org/10.1080/03066150.2016.1263187

Harvey, D. (2005). *A brief history of neoliberalism*. Oxford: Oxford University Press.

Heckbert, S., Baynes, T. and Reeson, (2010) Agent-based modeling in ecological economics. Annals of the New York Academy of Sciences. 1185: 39-53.

Hella, J., Sulle, E. and Kisusu, R. (2013) Drivers of Success for CAADP Implementation: Tanzania Case Study. Unpublished. [Online]. Available from:

https://static1.squarespace.com/static/5ab25f29aa49a13c2875f690/t/5af5c966f950b7ad7c9b84c0/1526057333933/Tanzania+CAADP+DOS+Study.pdf [Accessed 12 Feb 2020]

Hoddy, E. T. (2019) Critical realism in empirical research: employing techniques from grounded theory methodology, International Journal of Social Research Methodology, 22:1, 111-124, DOI: 10.1080/13645579.2018.1503400

Holmes, G (2007) Protection, Politics and Protest: Understanding Resistance to Conservation. Conservation and Society, 5 (2). 184 - 201. ISSN 0972-4923

Holmes, G. and Cavanagh, C.J. (2016) 'A review of the social impacts of neoliberal conservation: Formations, inequalities, contestations', *Geoforum*, 75, pp. 199–209. doi:10.1016/j.geoforum.2016.07.014.

Holzner, B. and Marx, J.H. (1979) *Knowledge application : the knowledge system in society*. Boston ; London (etc.): Allyn and Bacon.

Homewood, K. M. and Rodgers, W. W. (eds.). (1991) *Maasailand ecology. Pastoralist development and wildlife conservation in Ngorongoro*, Cambridge University Press, Cambridge, UK**.**

Howland, O., Noe, C. and Brockington, D. (2021) The multiple meanings of prosperity and poverty: a cross-site comparison from Tanzania, The Journal of Peasant Studies, 48:1, 180-200, DOI: 10.1080/03066150.2019.1658080

Huff, A. and Brock, A (2017) Accumulation by restoration: Degradation neutrality and the Faustian bargain of conservation finance. *Antipode Intervention*. Available at: https://antipodefoundation.org/2017/11/06/accumulation-by-restoration/ (accessed 01 Apr 2021).

Huffman, M. R. (2013) The many elements of traditional fire knowledge: synthesis, classification, and aids to cross-cultural problem solving in fire-dependent systems around the world. Ecology and Society 18(4):3. https://doi.org/10.5751/ES-05843-180403

Hulme, M. (2008) Geographical work at the boundaries of climate change. *Trans Inst Br Geogr*. 33: 5–11.

Human Rights Watch (2020) "If We Don't Get Services, We Will Die" Tanzania's Anti-LGBT Crackdown and the Right to Health. [Online]. Available from: https://www.hrw.org/sites/default/files/report_pdf/tanzania0220_web_0.pdf [Accessed 17 Feb 2020].

Hutton, J., Adams, W.M. and Murombedzi, J.C. (2005) Back to the Barriers? Changing Narratives in Biodiversity Conservation, Forum for Development Studies, 32:2, 341-370, DOI: 10.1080/08039410.2005.9666319

Hyett, N., Kenny, A. and Dikson-Swift, V. (2014). Methodology or method? A critical review of qualitative case study reports. Intl J Qual Stud Health Well-being. DOI: 10.3402/qhw.v9.23606

Igoe, J. (2010) 'The spectacle of nature in the global economy of appearances: Anthropological engagements with the spectacular mediations of transnational conservation', Critique of anthropology, 30(4), pp. 375–397. doi:10.1177/0308275X10372468.

Igoe, J., and Brockington, D. (2007). Neoliberal Conservation: A Brief Introduction. *Conservation and Society*, *5*(4), 432–449. http://www.jstor.org/stable/26392898

IPCC (2007): Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds. Cambridge, UK: Cambridge University Press.

Isager, L., Fold, N. and Mwakibete, A. (2022) 'Land and contract farming: Changes in the distribution and meanings of land in Kilombero, Tanzania', *Journal of agrarian change*, 22(1), pp. 36–57. doi:10.1111/joac.12456.

Iyer, A., Leach, C.W. and Crosby, F.J., 2003. White guilt and racial compensation: The benefits and limits of self-focus. *Personality and Social Psychology Bulletin*, *29*(1), pp.117-129.

Jackson, P. (2001). Making sense of qualitative data. In: Limb, M. and Dwyer, C. (eds.) Qualitative methodologies for geographers. London, UK: Arnold

Jackson, R. *et al.* (2005). Trading water for carbon with biological carbon sequestration. Science. 310 (5756) 1944-1947.

Jacob, T. and Brockington, D. (2020) 'Learning from the other: Benefit sharing lessons for REDD+ implementation based on CBFM experience in Northern Tanzania', *Land use policy*, 97, p. 103010. doi:10.1016/j.landusepol.2017.10.028.

Jacoby, K. (2001) *Crimes Against Nature: Squatters, Poachers, Thieves and the Hidden History of American Conservation*. University of California Press, London.

Jacovelli, P. (2014) 'The Future of Plantations in Africa', The international forestry review, 16(2), pp. 144–159. doi:10.1505/146554814811724748.

Jaschik, S. 2015 The Other Mental Health Crisis. *Inside Higher Ed.* Blog post. [Online]. Available from: https://www.insidehighered.com/news/2015/04/22/berkeley-study-finds-high-levels-depression-among-graduate-students [Accessed 18 Feb 2020]

Jayne, T. S., Chamberlin, J. and Benfica, R. (2018). "Africa's Unfolding Economic Transformation." *Journal of Development Studies* 54(5): 777-787.

Jones, R. 2012. Fire-stick farming. Fire Ecology 8:3-8. https://doi.org/10.1007/BF03400623

Jorgensen, D.L. (1989). Participant observation. A Methodology for Human Studies. Applied Social Research Methods Series 15. Newbury Park: Sage.

Kadigi, R. M.J. *et al.* (2017) 'Land fragmentation, agricultural productivity and implications for agricultural investments in the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) region,

Tanzania', *Journal of development and agricultural economics*, 9(2), pp. 26–36. doi:10.5897/JDAE2016.0797.

Kajembe, G.C. *et al*. (2006) *Community Participation in the Management of Protected Forest Areas in East Africa: Opportunities and Challenges* (Sokoine University of Agriculture, Morogoro).

Kangalawe, H.R. and Swart, S. (2021) '"Everyone is becoming a forester": From state monopoly to participatory forest management in Sao Hill Forest, Tanzania, c.1990–2015', *Historia (Three Rivers)*, 66(2), pp. 74–100. doi:10.17159/2309-8392/2021/v66n2a4.

Katoomba (2007): The Katoomba Group (2007). *Current 'state of play' of carbon water and biodiversity markets.* [Online]. Available from: http://www.katoombagroup.org/regions/africa/documents/Current%20State%20of%20PES%20Play.pdf [Accessed 20th May 2012].

Kelly, A.B. (2011) Conservation practice as primitive accumulation, *The Journal of peasant studies*, 38(4), pp. 683–701. doi:10.1080/03066150.2011.607695.

Khazanov, A., and Schlee, G. (Eds.). (2012). *Who Owns the Stock?: Collective and Multiple Property Rights in Animals.* Berghahn Books. Retrieved March 17, 2021, from http://www.jstor.org/stable/j.ctt9qcvkz

Kimambo, N.E. *et al.* (2020) 'The role of smallholder woodlots in global restoration pledges – Lessons from Tanzania', *Forest policy and economics*, 115, p. 102-144. doi:10.1016/j.forpol.2020.102144.

Koskinen, J. *et al.* (2019) 'Participatory mapping of forest plantations with Open Foris and Google Earth Engine', *ISPRS journal of photogrammetry and remote sensing*, 148, pp. 63–74. doi:10.1016/j.isprsjprs.2018.12.011.

Kosoy, N., and Corbera, E. (2010) Payments for ecosystem services as commodity fetishism. *Ecological Economics*. [Online] 69 (6) 1228–1236. Available from: https://doi.org/10.1016/j.ecolecon.2009.11.002 [Accessed 20 Feb 2020]

Krauss, J. (2015) 'Cocoa sustainability initiatives and the environment: mapping stakeholder priorities and representations.' *PhD Thesis*. University of Manchester.

Kuhn, T. (1970). *The structure of scientific revolutions*. Chicago: University of Chicago Press.

Kull C.A. and Laris P. (2009) Fire ecology and fire politics in Mali and Madagascar. In: *Tropical Fire Ecology*. Springer Praxis Books. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-540-77381-8_7

Kull, C. A. (2004). *Isle of fire: the political ecology of landscape burning in Madagascar* (Vol. 245). University of Chicago press.

Landell-Mills, N. and Porras, I.T. (2002). Silver bullet or fools' gold? A global review of markets for forest environmental services and their impact on the poor. *Instruments for sustainable private sector forestry series*, International Institute for Environment and Development (IIED), London, UK.

Lankford, B. *et al.* (2004) 'Entrenched views or insufficient science?: Contested causes and solutions of water allocation; insights from the Great Ruaha River Basin, Tanzania', *Agricultural water management*, 69(2), pp. 135–153. doi:10.1016/j.agwat.2004.04.005.

Laris, P. (2002). burning the seasonal mosaic: preventative burning strategies in the wooded savanna of southern Mali. *Human Ecology: an Interdisciplinary Journal* 30: 155–186. https://doi.org/10.1023/a:1015685529180.

Larson, A. M. (2005) Formal Decentralisation and the Imperative of Decentralisation 'from below': A Case Study of Natural Resource Management in Nicaragua. In: *Democratic Decentralisation through a Natural Resource Lens* (Eds. Ribot, J.C. and A.M. Larson). New York, NY: Routledge.

Laws, S., Harper, C., and Marcus, R. (2003). *Research for Development: a practical guide*. London: Sage.

Leach, M. and Mearns, R. (1996) *The lie of the land: challenging received wisdom on the African environment.* Oxford: The International African Institute in association with James Currey.

Lee, F. (2016) Book Review: A Brief History of Neoliberalism by David Harvey (2005). *Inquiries Journal/Student Pulse* [Online], 8. Available: http://www.inquiriesjournal.com/a?id=1353

Leipold S, *et al.* (2019) Discourse analysis of environmental policy revisited: Traditions, trends, perspectives. *J. Environ. Policy Plan*. 21:445–463. https://doi.org/10.1080/1523908X.2019.1660462

Li, T. (2007) *The Will to Improve: Governmentality, Development, and the Practice of Politics*. Durham: Duke University Press

Li, T.M. (2011) Centering labor in the land grab debate. *The Journal of Peasant Studies* 38 (2):281-98.

Lloyd-Evans, S. (2006) 'Focus Groups' in Desai, V. and Potter, R. (Eds.) *Doing Development Research.* SAGE Publications Ltd.

Locher, M. (2016). 'How come others are selling our land?' Customary land rights and the complex process of land acquisition in Tanzania. *Journal of Eastern African Studies*, 10(3), 393–412. Available from: https://doi.org/10.1080/17531055.2016.1250890

Locher, M. and Sulle, E. (2013) Foreign land deals in Tanzania: An update and a critical view on the challenges of data (re)production. LDPI Working Paper 31. *Institute for Poverty, Land and Agrarian Studies (PLAAS)*. Available from: https://www.africaportal.org/documents/10728/LDPI31LocherSulle_0.pdf

Locher, M. and Sulle, E. (2014) Challenges and methodological flaws in reporting the global land rush: observations from Tanzania, *Journal of Peasant Studies*, 41:4, 569-592, DOI: 10.1080/03066150.2014.919263 Available online: https://doi.org/10.1080/03066150.2014.919263

Lockwood (1992) Facts or fictions? Fieldwork relationships and the nature of data. In Devereaux, S. and Hoddinott, F. (Eds) *Fieldwork in Developing Countries.* Harvester Wheatsheaf: New York. pp164-78.

Loiseau, E. *et al.* (2016) 'Green economy and related concepts: An overview', *Journal of cleaner production*, 139, pp. 361–371. doi:10.1016/j.jclepro.2016.08.024.

Lopa, D. *et al.* (2012) Towards operational payments for water ecosystem services in Tanzania: a case study from the Uluguru Mountains. *Oryx*. 46(1), 34–44

Luhula, M. *et al.* (2019) Making land-based investments work for communities in Tanzania. *POLICY*. Available from: https://www.tnrf.org/files/pubs/policy_brief.pdf

Lund, J.F. and Saito-Jensen, M. (2013) 'Revisiting the Issue of Elite Capture of Participatory Initiatives', *World development*, 46, pp. 104–112. doi:10.1016/j.worlddev.2013.01.028.

Lund, J.F., Rutt, R.L. and Ribot, J. (2018) 'Trends in research on forestry decentralization policies', *Current opinion in environmental sustainability*, 32, pp. 17–22. doi:10.1016/j.cosust.2018.02.003.

Lusasi, J. and Mwaseba, D. (2020) 'Gender inequality and symbolic violence in women's access to family land in the southern highlands of Tanzania', *Land (Basel),* 9(11), pp. 1–14. doi:10.3390/land9110468.

Lusasi, J., Friis-Hansen, E. and Pedersen, R.H. (2020) 'A typology of domestic private land-based investors in Africa: Evidence from Tanzania's timber rush', *Geoforum*, 116, pp. 163–171. doi:10.1016/j.geoforum.2020.07.009.

Lyons, K. and Westoby, P. (2014) 'Carbon colonialism and the new land grab: Plantation forestry in Uganda and its livelihood impacts', *Journal of rural studies*, 36, pp. 13–21. doi:10.1016/j.jrurstud.2014.06.002.

Ma, S. *et al.* (2010) *Why Farmers Opt Not to Enroll in Payment-for-Environmental-Services Programs*. Presented at the Agricultural & Applied Economics Association's 2010 AAEA, CAES, & WAEA Joint Annual Meeting, Denver, 25–27 July 2010. [Online]. Available from: https://ideas.repec.org/p/ags/aaea10/61392.html [Accessed 20 Feb 2020]

Mabele, M.B. (2020a) 'In pursuit of multidimensional justice: Lessons from a charcoal 'greening' project in Tanzania', *Environment and planning. E, Nature and space (Print)*, 3(4), pp. 1030–1052. doi:10.1177/2514848619876544.

Mabele, M.B. (2020b) 'The 'war on charcoal' and its paradoxes for Tanzania's conservation and development', *Energy policy*, 145, p. 111751. doi:10.1016/j.enpol.2020.111751.

Macgilchrist, F. (2021) When discourse analysts tell stories: what do we 'do' when we use narrative as a resource to critically analyse discourse?, *Critical Discourse Studies*, 18:3, 387-403, DOI: 10.1080/17405904.2020.1802767

Maganga, F. *et al.* (2016) Dispossession through Formalization: Tanzania and the G8 Land Agenda in Africa. *Asian Journal of African Studies* Vol.40. August 2016. Available from: http://www.celep.info/wp-content/uploads/2016/12/2016-AJAS-40-Dispossession-through-formalization.pdf [Accessed 16 Feb 2020].

Magessa, K., Wynne-Jones, S. and Hockley, N. (2020) 'Does Tanzanian participatory forest management policy achieve its governance objectives?', *Forest policy and economics*, 111, p. 102077. doi:10.1016/j.forpol.2019.102077.

Malmer, A. *et al.* (2010) Carbon sequestration in tropical forests and water: a critical look at the basis for commonly used generalizations. *Global Change Biology*. 16 (2) 599-604.

Martinez-Alier, J. (2003). *The Environmentalism of the poor: a study of ecological conflicts and valuation.* Edward Elgar Publishing.

Marx, K. (1906). *Capital: a critique of political economy.* New York: Random House, Inc.

Matulis, B.S. (2014) The economic valuation of nature: A question of justice? *Ecological Economics* 104: 155–157.

McAfee, K. (1999) Selling Nature to save It? Biodiversity and Green Developmentalism. *Environment and Planning D: Society and Space*. 17(2):133-154. doi:10.1068/d170133

McCauley, D. (2006) Selling out on nature. *Nature*. 433.

Mdee, A. *et al.* (2021) Neither sustainable nor inclusive: a political economy of agricultural policy and livelihoods in Malawi, Tanzania and Zambia, *The Journal of Peasant Studies*, 48:6, 1260-1283, DOI: 10.1080/03066150.2019.1708724

MEA: Millennium Ecosystem Assessment (2005) *Ecosystems and Human Well-being: Synthesis*. Island Press, Washington. [Online]. Available from: https://www.millenniumassessment.org/documents/document.356.aspx.pdf [Accessed 20 Feb 2020]

Meadows, D. H. *et al.* (1972) *The Limits to Growth; a Report for the Club of Rome's Project on the Predicament of Mankind*, New York: Universe Books.

Menzel, S. and Teng, J. (2010) Ecosystem services as a stakeholder-driven concept for conservation science. *Conservation Biology*, 24, pp. 907-909

Messerli, P. (2007) Book Review of 'Isle of Fire: The Political Ecology of Landscape Burning in Madagascar' in *Mountain Research and Development*, 27(1): 92-93

Mikkelsen, B. (2005). *Methods for development work and research: a new guide for practitioners*. 2nd edition. London: Sage.

Milder, J. C., Scherr, S.J. and Bracer, C. (2010). Trends and future potential of payment for ecosystem services to alleviate rural poverty in developing countries. *Ecology and Society* 15(2): 4. [Online]. Available from: http://www.ecologyandsociety.org/vol15/iss2/art4/ (Accessed 20 Feb 2020).

Milner-Gulland E.J. (2012) Interactions between human behaviour and ecological systems. *Phil.Trans. R. Soc. B.* 367, 270–278

Miro Forestry (2021) *Miro Forestry Company*. Available at: https://www.cdcgroup.com/en/our-impact/investment/miro-forestry-company/ (Accessed 09 December 2021)

Mitchell, T. and Maxwell, S. (2010) Defining climate compatible development. *CDKN ODI policy brief*. November 2010/A.

Mohammed, E. Y. (2011). Pro-poor benefit distribution in REDD+: who gets what and why does it matter? *REDD Working Paper*. [Online]. IIED, London. Available from: http://pubs.iied.org/16508IIED.html [Accessed 20 Feb 2020]

Monbiot, G. (2022) "*Carbon offsetting is not warding off environmental collapse – it's accelerating it*". *The Guardian*, 26 Jan. Available at: https://www.theguardian.com/commentisfree/2022/jan/26/carbon-offsetting-environmental-collapse-carbon-land-grab (Accessed: 01 May 2022).

Morgan, D. L. (2007). Paradigms lost and pragmatism regained. *Journal of Mixed Methods Research*, 1(1), 48-76.

Morgan, D.L. (1997) Focus groups as qualitative research. *Qualitative Research Methods Series 16*. 2nd edition. London: Sage.

Mosse, D. (2004) 'Is Good Policy Unimplementable? Reflections on the Ethnography of Aid Policy and Practice', *Development and change*, 35(4), pp. 639–671. doi:10.1111/j.0012-155X.2004.00374.x.

Muradian, R. *et al.* (2010) Reconciling theory and practice: an alternative conceptual framework for understanding payments for environmental services. *Ecological Economics.* [Online] 69 (6) 1202–1208. Available from: https://doi.org/10.1016/j.ecolecon.2009.11.006 [Accessed 20 Feb 2020]

Murphy, J. (2009). Environment and imperialism: why colonialism still matters. *Sustainability Research Institute*, *20*, 1-27.

Musavengane, R. and Leonard, L. (2019) 'When Race and Social Equity Matters in Nature Conservation in Post-apartheid South Africa', *Conservation and society*, 17(2), pp. 135–146. doi:10.4103/cs.cs_18_23.

Myers, R. *et al*. (2018) 'Messiness of forest governance: How technical approaches suppress politics in REDD+ and conservation projects', *Global environmental change*, 50, pp. 314–324. doi:10.1016/j.gloenvcha.2018.02.015.

NCX (2021) *Carbon Buyers*. Available at: https://ncx.com/carbon-buyers/ (Accessed: 09 December 2021).

Nel, A. and Hill, D. (2013) 'Constructing walls of carbon - the complexities of community, carbon sequestration and protected areas in Uganda', *Journal of contemporary African studies*, 31(3), pp. 421–440. doi:10.1080/02589001.2013.802430.

Nelson, F., Sulle, E. and Lekaita, E. (2012) Land Grabbing and Political Transformation in Tanzania. *Paper presented to the Global Land Grabbing II Conference.* Cornell University, Ithaca NY, October

2012. Available from: https://landportal.org/library/resources/land-grabbing-and-political-transformation-tanzania

Nelson, R.H. (2003) 'Environmental Colonialism: "Saving" Africa from Africans', *The independent review (Oakland, Calif.)*, 8(1), pp. 65–86.

Neumann, R.P. (1998) *Imposing Wilderness: Struggles Over Livelihood and Nature Preservation in Africa*. University of California Press, London.

Neumann, R.P. (2000) Land, Justice and the Politics of Conservation in Tanzania. In *People, Plants, and Justice: The Politics of Nature Conservation* (ed. C. Zerner), pp. 117–143. Columbia University Press, New York.

Neumann, R.P. (2004) Nature-state-territory: Toward a critical theorization of conservation enclosures. In: Peet, R, Watts, M (eds) *Liberation Ecologies: Environment, Development, Social Movements,* 2nd ed. London and New York: Routledge, pp. 195–217.

Ngaga, Y. (2011). Forest Plantations and Woodlots in Tanzania. *African Forest Forum Working Paper Series*, 16, 1-80.

Ngaiza, R. (2012). Kilimo Kwanza Tanzania. Conference Presentation*. FAO – University of Nairobi Regional Workshop on an Integrated Policy Approach to Commercializing Smallholder Maiza Production.* 6-7 June 2012. Nairobi, Kenya. Available from: http://www.fao.org/fileadmin/templates/esa/Workshop_reports/Smallholders_2012/Presentations_1/Ngaiza_Kilimo_Kwanza_Tanzania.pdf [Accessed 20 Feb 2020]

Nikolakis, W. D., and E. Roberts (2020) Indigenous fire management: a conceptual model from literature. *Ecology and Society* 25 (4):11. https://doi.org/10.5751/ES-11945-250411

NomoGaia (2009): Salcito, K., Wielga, M. and Wise, E. for NomoGaia (2009) *Green Resources Human Rights Impact Assessment: Proposed CHP plant and Transition into Harvesting at Uchindile Forest*. Available online: https://www.business-humanrights.org/sites/default/files/documents/Tanzania_Green_Resources_HRIA.pdf

NomoGaia (2010): Salcito, K., Wielga, M. and Wise, E. for NomoGaia (2010) *Follow-up Monitoring Report for Green Resources Human Rights Impact Assessment: Proposed CHP plant and Transition into Harvesting at Uchindile Forest*. Available online: http://box5886.temp.domains/~nomogaia/green-resources-uchinidle-tree-farm-tanzania/

Norgaard, R.B. (2010) Ecosystem services: From eye-opening metaphor to complexity blinder. *Ecological Economics* 69(6): 1219–1227.

Notess, L. *et al.* (2018) *The scramble for land rights: Reducing inequity between communities and companies.* World Resources Institute, Washington, DC, USA. Available online: https://wriorg.s3.amazonaws.com/s3fs-public/scramble-land-rights.pdf

O'Connor J, (1994) 'Is sustainable capitalism possible?' in *Is Capitalism Sustainable? Political Economy and the Politics of Ecology* Ed. M O'Connor (Guilford Press, New York) pp 152-175

Oba, G. *et al.* (2000) Bush-cover and range condition assessment in relation to landscape and grazing in Ethiopia. *Landscape Ecology* **15**, 535–546. doi:10.1023/A:1008106625096

Odgaard R. (2002): Scrambling for land in Tanzania: Process of formalisation and legitimisation of land rights. *European Journal of Development Research*, 4(2), pp. 71–88. doi:10.1080/714000434.

Olwig, M.F. *et al.* (2015) 'Inverting the moral economy: the case of land acquisitions for forest plantations in Tanzania', *Third world quarterly*, 36(12), pp. 2316–2336. doi:10.1080/01436597.2015.1078231.

Ong, A. (2006). *Neoliberalism as exception: Mutations in citizenship and sovereignty*. Cambridge: Cambridge University Press.

Ostrom, E. (1990) *Governing the Commons: The Evolution of Institutions for Collective Action*, New York: Cambridge University Press.

Ostrom, E. (2008), Institutions and the Environment. Economic Affairs, 28: 24-31. https://doi.org/10.1111/j.1468-0270.2008.00840.x

Ostrom, E. (2009) *Understanding Institutional Diversity*, Princeton: Princeton University Press. https://doi.org/10.1515/9781400831739

Overton J. and van Diermen, P. (2003) 'Using Quantitative Techniques'. In Scheyvens, R. and Storey, D. (Eds) *Development Fieldwork: A Practical Guide*. Sage publications: London.

Oya, C. (2013). Methodological reflections on land databases and the land grab literature 'rush'. Global Land Grabbing II Forum. *Journal of Peasant Studies. 40(3), pp. 503–520. doi:10.1080/03066150.2013.799465.*

Paavola, J. (2004) Livelihoods, vulnerability and adaptation to climate change in the Morogoro region, Tanzania. *CSERGE Working Paper EDM 04-12.* UEA. [Online]. Available from: http://www.cserge.ac.uk/sites/default/files/edm_2004_12.pdf [Accessed 1st July 2012].

Pagiola, S. (2007) Guidelines for "pro-poor" payments for environmental services. *Environment Department*, World Bank.

Pagiola, S., Arcenas, A. and Platais, G. (2005) Can payments for environmental services help reduce poverty? An exploration of the issues and the evidence to date from Latin America. *World Development* 33 (2) 237–253.

Peck J. (2008) Remaking laissez-faire. *Progress in Human Geography*. 32(1):3-43. doi:10.1177/0309132507084816

Peters, P. (1994) *Dividing the commons: politics, policy, and culture in Botswana*. Charlottesville, VA: University of Virginia Press.

Peterson, M.N. *et al.* (2016) 'Illegal fishing and hunting as resistance to neoliberal colonialism', *Crime, law, and social change*, 67(4), pp. 401–413. doi:10.1007/s10611-016-9664-0.

Plant, R. (2010). *The neo-liberal state*. Oxford: Oxford University Press.

Polanyi, K. (1944) *The Great Transformation: The Political and Economic Origins of Our Time* (Beacon Press, Boston, MA)

Pollard, A. (2009). Field of screams: difficulty and ethnographic fieldwork. *Anthropology Matters, 11*(2). Retrieved from https://www.anthropologymatters.com/index.php/anth_matters/article/view/10/10

Porras, I., Grieg-Gran, M. and Neves, N. (2008). All that glitters. A review of payments for watershed services in developing countries. *Natural Resource Issues* No. 11, International Institute for Environment and Development, London, UK.

Porter, M.E. and Van der Linde, C. (1995) Green and competitive: ending the stalemate. *Harv. Bus. Rev.,* 73 (1995), pp. 120-134

Prince, G. (1982) *Narratology: The Form and Functioning of Narrative*. Berlin: Mouton.

PRNewswire (2021) *TreeCoin Launches Compliant Token Offering to Plant 10 Million Trees.* Available at: https://www.prnewswire.com/in/news-releases/treecoin-launches-compliant-token-offering-to-plant-10-million-trees-876313020.html (Accessed 09 December 2021).

Pyne, S.J. (1997) *Vestal Fire.* University of Washington Press: Seattle, WA

Pyne, S. J. (2016) Fire in the mind: changing understandings of fire in Western civilization. *Philosophical Transactions of the Royal Society B: Biological Sciences* 371(1696). https://doi.org/10.1098/rstb.2015.0166

Quandt, A. (2020). Contribution of agroforestry trees for climate change adaptation: narratives from smallholder farmers in Isiolo, Kenya. *Agroforest Syst* 94, 2125–2136 https://doi.org/10.1007/s10457-020-00535-0

REDD-monitor (2014) Dark Green? Response from Mads Asprem, CEO of Green Resources, to the Oakland Institute. *Online blog post*. Available from: https://redd-monitor.org/2014/11/05/dark-green-response-from-mads-asprem-ceo-of-green-resources-to-the-oakland-institute/ [Accessed 17 Feb 2020].

Reynolds, J. F. *et al.* (2007). Global desertification: building a science for dryland development. *Science*, 316(5826), 847-851.

Richards, P. (1985) *Indigenous Agricultural Revolution: Ecology and food production in West Africa* London, Unwin.

Robertson, M.M. (2006) 'The Nature That Capital Can See: Science, State, and Market in the Commodification of Ecosystem Services', *Environment and planning. D, Society & space*, 24(3), pp. 367–387. doi:10.1068/d3304.

Robertson, N. and Wunder, S. (2005): *Fresh Tracks in the Forest Assessing Incipient Payments for Environmental Services Initiatives in Bolivia.* CIFOR.

Rockström, J. *et al.* (2009). Planetary boundaries: exploring the safe operating space for humanity. *Ecology and Society* **14**(2): 32. [online] URL: http://www.ecologyandsociety.org/vol14/iss2/art32/

Roe, E.M. (1991) Development Narratives, Or Making the Best of Blueprint Development. *World Development* Vol. 19, No. 4, pp. 287-300

Roe, E.M. (1994) *Narrative Policy Analysis: Theory and Practice*. Duke University Press: Durham.

Roitman, J. (2013) *Anti-crisis*. Durham, NC: Duke University Press.

Roitman, J. *et al.* (2020) *Anti-Crisis*: thinking with and against crisis excerpt from interview with Janet Roitman, *Journal of Cultural Economy*, 13:6, 772-778, DOI: 10.1080/17530350.2020.1807388

Rosa, H. *et al.* (2004) Compensation for Environmental Services and Rural Communities: Lessons from the Americas. *Peri. Working Paper Series* No.96.

Rosenau, J. N. (1997). *Along the domestic-foreign frontier: Exploring governance in a turbulent world*. Cambridge and New York: Cambridge University Press.

Roth, P. (1989) "How narratives explain" *Social Research*, Vol. 56, No. 2, pp. 449-478.

SAGCOT (2013): Southern Agricultural Growth Corridor (2013) A framework for Agricultural Green Growth - Greenprint for SAGCOT. Report dated June 2013, authors: Milder, J., Buck., L., Hart, A., Scherr, S. and Shames, S. Available from: https://ecoagriculture.org/wp-content/uploads/2015/08/A-Framework-for-AGG-Greenprint-for-SAGCOT-June-2013.pdf [Accessed 20 Feb 2020]

SAGCOT (2017a): SAGCOT (2017) Who we are. *SAGCOT website.* Dar es Salaam. [Online] Available from: http://sagcot.co.tz/index.php/who-we-are/ [accessed 10 Dec 2019]

SAGCOT (2017b): SAGCOT (2017) SAGCOT clusters. *SAGCOT website.* Dar es Salaam. [Online] Available from: http://sagcot.co.tz/index.php/sagcot-clusters/ [accessed 10 Dec 2019]

Salcito, K. *et al.* (2013) Assessing human rights impacts in corporate development projects. *Environmental impact assessment review*, *42*, pp.39-50.

Salcito, K. (2014) Hi (again) from Uchindile: Why we keep coming back to the same project sites. Blog post*. NomoGaia*. Denver, CO, USA. Available online: http://nomogaia.org/author/ksalcito/page/6/ [Accessed 20 Feb 2020].

Salzman, J. (2011) What is the emperor wearing? The secret lives of ecosystem services. *Pace Environ. Law Rev.* 28, 591–613.

Salzman, J. *et al.* (2018) 'The Global Status and Trends of Payments for Ecosystem Services', *Nature Sustainability*. 1(3): 136–44

Scheba, A. and Rakotonarivo, O.S. (2016) 'Territorialising REDD+: Conflicts over market-based forest conservation in Lindi, Tanzania', *Land use policy*, 57, pp. 625–637. doi:10.1016/j.landusepol.2016.06.028.

Scheba, A. and Scheba, S. (2017) ‘REDD+ as 'inclusive' neoliberal conservation: the case of Lindi, Tanzania’, *Journal of Eastern African studies*, 11(3), pp. 526–548. doi:10.1080/17531055.2017.1357102.

Schnurr, P. P., and Green, B. L. (Eds.). (2004). Trauma and health: Physical health consequences of exposure to extreme stress. *American Psychological Association*. https://doi.org/10.1037/10723-000

Schuetze, C. (2015). "Narrative Fortresses: Crisis Narratives And Conflict In The Conservation Of Mount Gorongosa, Mozambique". *Conservation And Society*. Volume 13, Issue 2. 141-153. DOI: 10.4103/ 0972-4923.164193 https://works.swarthmore.edu/fac-soc-anth/145

Sconfienza, U.M. (2021) The "new" environmental narratives and the resurgence of old debates. *Global Cooperation Research Papers*, No. 27, University of Duisburg-Essen, Käte Hamburger Kolleg / Centre for Global Cooperation Research (KHK/ GCR21), Duisburg, http://dx.doi.org/10.14282/2198-0411-GCRP-27

Scoones, I. (2009) Livelihoods perspectives and rural development. *The Journal of Peasant Studies*, 36 (1), pp. 171-196

Scoones, I. *et al.* (2019) Narratives of scarcity: Framing the global land rush. Geoforum Volume 101, May 2019, Pages 231-241

Scoones, I., Newell, P., and Leach, M. (2015). *The politics of green transformations* (pp. 19-42). Routledge.

Scoones, I. *et al.* (2013). "The politics of evidence: methodologies for understanding the global land rush." *Journal of Peasant Studies* 40(3): 469-483.

Scott, J. (1998) *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. Yale University Press, New Haven, CT (1998)

Scott, J. (1985) *Weapons of the Weak: Everyday Forms of Peasant Resistance*. Yale University Press, New Haven.

Shapiro-Garza, E. *et al.* (2020) ‘Beyond Market Logics: Payments for Ecosystem Services as Alternative Development Practices in the Global South’, *Development and change*, 51(1), pp. 3–25. doi:10.1111/dech.12546.

Sheil, D. and Murdiyarso, D. (2009) How Forests Attract Rain: An Examination of a New Hypothesis. *BioScience*, 59(4):341 http://dx.doi.org/10.1525/bio.2009.59.4.12

Shepherd, G. (1989) The reality of the commons: Answering Hardin from Somalia. *Development Policy Review*, 7(1):51-63.

Sheuyange, A., Oba, G., and Weladji, R.B. (2005) Effects of anthropogenic fire history on savanna vegetation in north-eastern Namibia. *Journal of Environmental Management* 75, 189–198. doi:10.1016/J.JENVMAN. 2004.11.004

Shivji, I. G. (2017). 'The Concept of 'Working People''. *Agrarian South: Journal of Political Economy* 6(1): 1-13.

Silva, J.S. *et al. (*2009) 'Assessing the relative fire proneness of different forest types in Portugal', *Plant biosystems*, 143(3), pp. 597–608. doi:10.1080/11263500903233250.

Simon, D. (2006). 'Your Questions Answered? Conducting Questionnaire Surveys' in Desai, V. and Potter, R. (Eds) *Doing Development Research.* Sage publications: London.

Smalley, R., Sulle, E. and Malale, L. (2014) The role of the state and foreign capital in agricultural commercialisation: The case of sugarcane outgrowers in Kilombero District, Tanzania. *Future Agricultures Working Paper 106*. [Online]. Available from: https://www.africaportal.org/documents/12427/FAC_Working_Paper_106_1.pdf [Accessed 17 Feb 2020].

Smessaert, J., Missemer, A. and Levrel, H. (2020) 'The commodification of nature, a review in social sciences', *Ecological economics*, 172, p. 106624. doi:10.1016/j.ecolecon.2020.106624.

Smit, B., and Wandel J. (2006). Adaptation, adaptive capacity and vulnerability. *Global Environmental Change*. 16:282–292. http://dx.doi.org/10.1016/j.gloenvcha.2006.03.008 [Accessed 20 Feb 2020]

Snyder, K.A. *et al.* (2020) '"Modern" farming and the transformation of livelihoods in rural Tanzania', *Agriculture and human values*, 37(1), pp. 33–46. doi:10.1007/s10460-019-09967-6.

Solomon, D. *et al.* (2016). Indigenous African soil enrichment as a climate-smart sustainable agriculture alternative. *Frontiers in Ecology and the Environment*, *14*(2), 71-76.

Sommerville, M., Jones, J. and Milner-Guilland, E.J. (2009) A revised conceptual framework for payments for environmental services. *Ecology and Society*. [Online] 14(2) Available from: http://www.ecologyandsociety.org/vol14/iss2/art34/ [Accessed 20 Feb 2020]

Spash, C. L. (2012). New foundations for ecological economics. *Ecological Economics*, 77, 36-47.

Spracklen, D. V., Bonn, B. and Carslaw, K. S. (2008) Boreal forests, aerosols and the impacts on clouds and climate. *Philos. Trans. R. Soc. A.* 366, 4613–4626

Spradley, J.P. (1980). *Participant observation*. Fort Worth: Harcourt Brace Jovanovich College Publishers.

Springer, S. (2016) Fuck neoliberalism. *ACME Int. J. Crit. Geogr*., 15 (2) pp. 285-292

Srivastava, P. and Hopwood, N. (2009) 'A practical iterative framework for qualitative data analysis', *International Journal of Qualitative Methods*, 8 (1), pp.76-84.

Stott, P. A. and Sullivan, S. (2000). *Political ecology: science, myth and power*. Oxford University Press

Strauss, A. and Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Sage Publications.

Sulle, E. (2015) Land Grabbing and Agricultural Commercialization Duality: Insights from Tanzania's Transformation Agenda. In Davide Chinigo (ed.). *The New Harvest. Agrarian Policies and Rural Transformation in Southern Africa*.

Sulle, E. (2017) 'Social Differentiation and the Politics of Land: Sugar Cane Outgrowing in Kilombero, Tanzania', *Journal of southern African studies*, 43(3), pp. 517–533. doi:10.1080/03057070.2016.1215171.

Sulle, E. (2017) The State of Land-Based Investments in Tanzania: A Situational Analysis Report. *Tanzania Natural Resource Forum (TNRF).* Report dated 5th November 2017. Available from: https://www.tnrf.org/files/pubs/the_state_of_land-based_investments_in_tanzania_final_draft_05_nov._17_0.pdf [Accessed 20 Feb 2020]

Sulle, E. (2020) Bureaucrats, investors and smallholders: contesting land rights and agro-commercialisation in the Southern agricultural growth corridor of Tanzania, *Journal of Eastern African Studies*, 14:2, 332-353, DOI: 10.1080/17531055.2020.1743093

Sulle, E. and Dancer, H. (2020) 'Gender, politics and sugarcane commercialisation in Tanzania', *The Journal of peasant studies*, 47(5), pp. 973–992. doi:10.1080/03066150.2019.1632294.

Sulle, E. and Nelson, F. (2009) *Biofuels, land access and rural livelihoods in Tanzania*. IIED, London. Available online: http://www.taccire.suanet.ac.tz/xmlui/bitstream/handle/123456789/62/Biofuels%2C%20land%20access%20and%20rural%20livelihoods%20in%20Tanzania.pdf?sequence=1

Sulle, E., Smalley, R., and Malale, L. (2014). Opportunities and challenges in Tanzania's sugar industry: Lessons for SAGCOT and the New Alliance. *Future Agricultures Policy Brief 76*. Available from: http://hdl.handle.net/10566/4314

Sullivan, S. (2013). Banking nature? The spectacular financialisation of environmental conservation. *Antipode* 45 (1), 198–217.

Sullivan, S. and Homewood, K. (2003) On non-equilibrium and nomadism: knowledge, diversity and global modernity in drylands (and beyond…). *Working Paper.* Centre for the Study of Globalisation and Regionalisation, University of Warwick, Coventry, UK.

Sultan, A. J. M. (2019) "When Fieldwork Breaks Your Heart." *AnthroPod, Fieldsights*, February 14. https://culanth.org/fieldsights/when-fieldwork-breaks-your-heart

Sultana, F. (2022) The unbearable heaviness of climate coloniality. *Political Geography*, 102638. https://doi.org/10.1016/j.polgeo.2022.102638.

Svarstad, H. and Benjaminsen, T.A. (2017) Nothing succeeds like success narratives: a case of conservation and development in the time of REDD. *Journal of Eastern African Studies* 11 (3): 482-505.

Svarstad, H., and Benjaminsen, T. A. (2020). Reading radical environmental justice through a political ecology lens. *Geoforum*, 108, 1-11.

Talleh Nkobou, A., Ainslie, A. and Lemke, S. (2021) 'Broken promises: a rights-based analysis of marginalised livelihoods and experiences of food insecurity in large-scale land investments in Tanzania', *Food security*, 14(1), pp. 185–205. doi:10.1007/s12571-021-01195-3.

Taylor, P.J. and Buttel, F.H. How do we know we have global environmental problems? *GeoForum*, 23 (1992), pp. 405-416

TAZARA (2020) *TAZARA company website* https://tazarasite.com/ accessed 14-Feb-2020.

Tenga, W. R. and Kironde, L. J. (2012). Study of Policy, Legal and Institutional Issues related to Land in the SAGCOT Project Area (*unpublished*). New York: World Bank – quoted in [Berguis et al. (2020)].

Teuling, A. *et al.* (2017) Observational evidence for cloud cover enhancement over western European forests. *Nat Commun* 8, 14065. https://doi.org/10.1038/ncomms14065

The New Forests Company (2021) *Shared Value*. Available at: https://newforests.net/shared-value/ (Accessed 09 December 2021).

Thomas, A. (2007). Challenging Cases. In: A. Thomas and G. Mohan (eds.) *Research Skills for Policy and Development – How to find out fast.* London: The Open University, pp. 301-323.

Thompson, J. B. (1984) *Studies in the Theory of Ideology*. Oxford: Oxford University Press.

Thompson, M. (2005). *Review: A Brief History of Neoliberalism*. [Online]. Retrieved from: http://rebels-library.org/files/d3Thompson-1.pdf [Accessed 20 Feb 2022].

Timberwatch (2011): Karumbidza, K. and Menne, W. for The Timberwatch Coalition (2011) *CDM carbon sink tree plantations in Agrica: A case study in Tanzania.* Available online: http://unfccc.int/resource/docs/2011/smsn/ngo/293.pdf/. [Accessed 20 Feb 2020].

TNBC (2009): Tanzania National Business Council (2009) Proceedings of the 6th TNBC meeting on Kilimo Kwanza. *Meeting Report*. 2-3rd June 2009, Dar es Salaam. Available online: https://tnbc.go.tz/v2/wp-content/uploads/2015/06/6TH%20TNBC%20KILIMO%20KWANZA.pdf [Accessed 20 Feb 2020].

Tognetti, S. *et al.* (2003). Assessing the Effectiveness of Payment Arrangements for Watershed Ecosystem Services (PWES). *For presentation at the Third Latin American Congress on Watershed Management, Regional Forum on Payments for Environmental Services.* 9– 12 June 2003, Arequipa, Perú. [Online]. Available from: https://www.ecosystemmarketplace.com/wp-content/uploads/archive/documents/Doc_400.pdf [Accessed 20 Feb 2020].

Tomaselli, M.F. *et al.* (2017) The problematic old roots of the new green economy narrative: how far can it take us in re-imagining sustainability in forestry? *Int For Rev*. 19:139–151. https://doi.org/10.1505/146554817822407376

Trabucco, A. *et al.* (2008). Climate change mitigation through afforestation/reforestation: a global analysis of hydrologic impacts with four case studies. *Agriculture, ecosystems & environment*, 126(1-2), 81-97.

Treecycle (2021). *Treecycle.* Available at: https://treecycle.ch/en/ (Accessed: 09 December 2021).

Treue, T. *et al.* (2014) 'Does Participatory Forest Management Promote Sustainable Forest Utilisation in Tanzania?', *The international forestry review*, 16(1), pp. 23–38. doi:10.1505/146554814811031279.

Trollope, W.S.W. (1982) Ecological effects of fire in South African savannas. *Ecology of Tropical Savannas*. (Eds BJ Huntley, BH Walker) pp. 292–306. (Springer: Berlin)

Tucker, F. and Horton, J. (2018) "The show must go on!" Fieldwork, mental health and wellbeing in Geography, Earth and Environmental Sciences. *Area*, 51(1), pp.84-93.

TÜV Nord (2021) *Verification Report: VCS Version 4.0 for Reforestation in grassland areas of Uchindile, Kilombero, Tanzania & Mapanda, Mufindi, Tanzania*. Available from: https://registry.verra.org/app/projectDetail/VCS/142 (Accessed 01.04.2022).

TÜV SÜD (2013a): TÜV SÜD (2013) Verification of the Registered CCBA-Project: "Reforestation in Grassland Areas of Uchindile, Kilombero, Tanzania & Mapanda, Mufindi, Tanzania". First Monitoring Period: 01 Jan 1997 to 01 Sep 2012. *Verification Report* No. 600501038-10. Available online: https://www.vcsprojectdatabase.org/services/publicViewServices/downloadDocumentById/24751 [Accessed 04 Feb 2020].

TÜV SÜD (2013b): TÜV SÜD (2013) Validation of the CCBA Project Reforestation in Grassland Areas of Uchindile, Kilombero, Tanzania & Mapanda, Mufindi, Tanzania. *Validation Report* No. 600501038-20 Revision 03. Available online: https://www.vcsprojectdatabase.org/services/publicViewServices/downloadDocumentById/24757 [Accessed 20 Feb 2020].

Twomey, H, Schiavoni, C.M. and Mongula, B. (2015) *Impacts of large-scale agricultural investments on small-scale farmers in the Southern Highlands of Tanzania: A Right to Food Perspective.* Aachen: Misereor.

UNEP (2011) "*Towards a green economy: Pathways to sustainable development and poverty eradication.*" Nairobi, Kenya: UNEP

UNFCCC (2020a): UNFCCC (2020) The Clean Development Mechanisms [*Online website*]. Available from: https://unfccc.int/process-and-meetings/the-kyoto-protocol/mechanisms-under-the-kyoto-protocol/the-clean-development-mechanism [Accessed: 10 Feb 2020].

UNFCCC (2020b): UNFCCC (2020) What is the Kyoto Protocol?. [*Online website*]. Available from: https://unfccc.int/kyoto_protocol [Accessed: 10 Feb 2020].

UoC Graduate Assembly (2015): University of California, Berkley, Graduate Assembly (2015) *Graduate Student Happiness & Well-Being Report 2014*. [Online]. Available from: http://ga.berkeley.edu/wp-content/uploads/2015/04/wellbeingreport_2014.pdf [Accessed 18 Feb 2020]

URT (1998): United Republic of Tanzania (1998) *National Forest Policy*. Ministry of Natural Resources and Tourism. Tanzania.

URT (1999a): United Republic of Tanzania. (1999). *Land Act No. 4*. Dar es Salaam.

URT (1999b): United Republic of Tanzania. (1999). *Village Land Act No.5 of 1999*. Dar es Salaam.

URT (2006) *Participatory Forest Management in Tanzania Facts and Figures*. Ministry of Natural Resources and Tourism. Forestry and Beekeeping Division. Government Printer, Dar es Salaam, Tanzania.

URT (2012) *Participatory Forest Management in Tanzania Facts and Figures*. Ministry of Natural Resources and Tourism. Forestry and Beekeeping Division. Government Printer, Dar es Salaam, Tanzania.

URT (2013b): URT (2013) 2011/12 Household Budget Survey – Tanzania Mainland. *National Bureau of Statistics, Ministry of Finance.* Dar es Salaam. Available online: https://www.nbs.go.tz/index.php/en/census-surveys/poverty-indicators-statistics/household-budget-survey-hbs

URT (2002): United Republic of Tanzania (2002) Morogoro Region Socio-Economic Profile. *Joint publication by the planning commissions Dar es Salaam and Regional Commissioner's Office Morogoro.* Available online: http://www.tzonline.org/pdf/Morogoro.pdf [Accessed 20 Feb 2020].

URT (2007): United Republic of Tanzania. (2007) National Sample Census of Agriculture 2002/2003. Volume Ve: *Regional Report: Morogoro*. Available from: http://www.fao.org/tempref/AG/Reserved/PPLPF/ftpOUT/GLiPHA/DATA/Queue/Working/tanzania/MOROGORO%20REPORT.pdf [Accessed 20 Feb 2020]

URT (2012a): United Republic of Tanzania. (2012) National Sample Census of Agriculture 2007/08. Volume Ve: *Regional Report: Morogoro*. Available from: https://www.instepp.umn.edu/sites/instepp.umn.edu/files/product/downloadable/Tanzania_2007-8_Vol_5e.pdf [Accessed 20 Feb 2020]

URT (2012b): United Republic of Tanzania. (2012) National Sample Census of Agriculture 2002/2003. Volume Vk: *Regional Report: Iringa*. Available from: https://www.instepp.umn.edu/sites/instepp.umn.edu/files/product/downloadable/Tanzania_2007-8_Vol_5k.pdf [Accessed 20 Feb 2020]

URT (2013a): United Republic of Tanzania (2013) 2012 Population and Housing Census. Report by National Bureau of Statistics, Ministry of Finance, Dar es Salaam. Available online: http://www.tzdpg.or.tz/fileadmin/documents/dpg_internal/dpg_working_groups_clusters/cluster_2/water/WSDP/Background_information/2012_Census_General_Report.pdf [Accessed 20 Feb 2020].

URT (2013c): United Republic of Tanzania (2013) Iringa Region Socio-Economic Profile 2013. *Jointly prepared by Ministry of Finance, National Bureau of Statistics and Iringa Regional Secretariat.* Available online: http://www.iringa.go.tz/storage/app/uploads/public/591/32c/3b5/59132c3b52923799622512.pdf [Accessed 20 Feb 2020].

Valeix, S. (2016) Managing mental health on fieldwork: a research skill? *Institute of Development Studies.* Blog post. [Online]. Available from: https://www.ids.ac.uk/opinions/managing-mental-health-on-fieldwork-a-research-skill/ [Accessed 18 Feb 2020].

Van de Sand, I. (2012). Payments for ecosystem services in the context of adaptation to climate change. *Ecology and Society*. 17 (1) 11.

Van Hecken, G. *et al.* (2018) 'Silencing Agency in Payments for Ecosystem Services (PES) by Essentializing a Neoliberal 'Monster' Into Being: A Response to Fletcher & Büscher's 'PES Conceit'', *Ecological economics*, 144, pp. 314–318. doi:10.1016/j.ecolecon.2017.10.023.

Vatn, A. (2000) The Environment as a Commodity. *Environmental Values*. [Online] 9 (4) 493-509. Available from: https://doi.org/10.3197/096327100129342173 [Accessed 20 Feb 2020]

VCS (2009) *Project Description Template for the Voluntary Carbon Standard ARR project activity: Reforestation in grassland areas of Uchindile, Kilombero, Tanzania & Mapanda, Mufindi, Tanzania*. Available from: https://www.vcsprojectdatabase.org/services/publicViewServices/downloadDocumentById/20816 [Accessed 20 Feb 2020].

VCS (2020): VCS project database (2020) Reforestation of degraded grasslands in Uchindile & Mapanda, Tanzania. *Website.* Available online: https://www.vcsprojectdatabase.org/#/project_details/142 [Accessed 20 Feb 2020]

Veldwisch, G. J. (2015) Contract farming and the reorganisation of agricultural production within the Chókwè Irrigation System, Mozambique, *The Journal of Peasant Studies*, 42:5, 1003-1028. DOI: 10.1080/03066150.2014.991722

Venugopal, R. (2015) Neoliberalism as concept. *Economy and Society*, 44:2, 165 187. DOI: 10.1080/03085147.2015.1013356

Verra (2020a): Verra, (2020) Verified Carbon Standard – Overview. *Website page.* Verra. Available online: https://verra.org/project/vcs-program/ [Accessed 20 Feb 2020]

Verra (2020b): Verra, (2020) About The VCS Project Database. *Website page.* Verra. Available online: https://www.vcsprojectdatabase.org/#/vcs [Accessed 20 Feb 2020]

Villamor, G. B., and M. van Noordwijk. (2011). Social role-play games vs individual perceptions of conservation and PES agreements for maintaining rubber agroforests in Jambi (Sumatra), Indonesia. *Ecology and Society* 16 (3) 27.

VLUP (2009a): Kilombero District Council (2009) *Kitete Village Land Use Plan 2009-2019*, Kilombero District. *Sponsored by GRL.* Hard copy obtained during fieldwork.

VLUP (2009b): Kilombero District Council (2009) *Uchindile Village Land Use Plan 2009-2019*, Kilombero District. *Sponsored by GRL.* Hard copy obtained during fieldwork.

von Braun, J. and R. Meinzen-Dick (2009) *'Land grabbing' by foreign investors in developing countries: risks and opportunities*. Policy Brief 13, Washington, DC: IFPRI.

Walker, P.A. (2004) 'Roots of crisis: Historical narratives of tree planting in Malawi', Historical geography, 32, p. 89.

Walwa, W. (2017). Land use plans in Tanzania: Repertoires of domination or solutions to rising farmer–herder conflicts? *Journal of Eastern African Studies*, 1–17. Available from: https://doi.org/10.1080/17531055.2017.1359878 [Accessed 20 Feb 2020]

West, J. and Haug, R. (2017) 'Polarised narratives and complex realities in Tanzania's Southern Agricultural Growth Corridor', *Development in practice*, 27(4), pp. 418–431. doi:10.1080/09614524.2017.1307324.

West, P. (2007) *Conservation is our Government Now: The Politics of Ecology in Papua New Guinea*. Durham: Duke University Press.

WHO (2012): World Health Organisation (2012) *Policy - Tanzania Agriculture and Food Security Investment Plan (TAFSIP).* Website. WHO. Available online: https://extranet.who.int/nutrition/gina/en/node/36037 [Accessed 20 Feb 2020]

Wiebe, R. (2008) The metaphysics of fire hating: demonic creatures and devil winds. *Pacific Journal* 3:111-133.

Wielga, M. (2012) Corporate HRIA – Lessons from the Field. *Conference Paper presented at 32nd Annual Conference of the International Association for Impact Assessment* in Portugal, May 2012. Available online: https://conferences.iaia.org/2012/pdf/uploadpapers/Final%20papers%20review%20process/Wielga%2C%20Mark.%20%20Corporate%20HRIA%20-%20Lessons%20from%20the%20Field.pdf[Accessed 20 Feb 2020].

Willis, K. (2006) Interviewing. In: Desai, V. and Potter, R. (Eds) *Doing Development Research.* Sage publications: London.

Wilson, E. *et al.* (2017) Kilombero Valley, United Republic of Tanzania, Ramsar Site No. 1173 Ramsar Advisory Mission Report. Available from: https://www.ramsar.org/sites/default/files/documents/library/ram83_kilombero_valley_tanzania_2016_e.pdf [Accessed 20 Feb 2020]

Wily, L. (1999) 'Moving Forward in African Community Forestry: Trading Power, Not Use Rights', *Society & natural resources*, 12(1), pp. 49–61. doi:10.1080/089419299279885.

Wolford, W. *et al.* (2013). "Governing Global Land Deals: The Role of the State in the Rush for Land." *Development and Change* 44(2): 189-210.

Woodhouse, P. (2007). People as Informants. In: A. Thomas and G. Mohan (eds.) *Research Skills for Policy and Development. How to find out fast.* London: The Open University, pp. 159-179.

Wrangham, R. (2009). *Catching fire: how cooking made us human*. Profile Books, London, UK.

Wright, V.C. (2016) Turbulent times: fighting history today in Tanzania's trophy hunting spaces. *Journal of Contemporary African Studies* 34(1): 40-60.

Wright, V.C. (2017) 'Turbulent Terrains', *Conservation and society*, 15(2), pp. 157–167. doi:10.4103/cs.cs_15_33.

Wunder, S. (2005) *Payments for Environmental Services: Some Nuts and Bolts.* Occasional Paper No. 42. CIFOR, Bogor. [Online]. Available from: http://www.cifor.org/publications/pdf_files/OccPapers/OP-42.pdf [Accessed 20 Feb 2020]

Yin, R. (2004). *Case Study Research: Design and Methods.* Thousand Oaks, Sage.

Zajontz, T. (2017) *From the freedom struggle to a fight for economic survival – the Tanzania-Zambia Railway Authority (TAZARA).* [Online]. Available from: https://research-repository.st-andrews.ac.uk/bitstream/handle/10023/13206/Zajontz_2017_SAASUM_Vol3.pdf?sequence=1 [Accessed 14-Feb-2020].

Zhang, W. *et al.* (2007) Ecosystem services and dis-services to agriculture. *Ecological Economics*. 64 (2) 253-260.

Zilberman, D., Lipper, L. and McCarthy, N. (2008). When could payments for environmental services benefit the poor? *Environment and Development Economics* 13: 255–278

Appendix 1: Household Survey

Understanding Community-Environment Interactions to Inform Climate Compatible Development Strategies

								Day			Month			Year						
Survey no.						Date of Interview:			-			-		1	3	Start time:				
HH name:											Complete?					End time:				
HH GPS:	S					Elevation:					Interview assessment: (reliable/somewhat/unreliable)									
	E																			
Hamlet:											Post-interview comments:									
Village:																				
Ward:																				
Division:																				
District:																				

SECTION A – Key demographics

A1	Key informant		A2	Household head	
A101	Name:		A201	Gender:	
A102	Relationship to household head:		A202	Age:	
			A203	Ethnic group/tribe:	
A103	Gender:		A204	Highest level of education obtained: (1)	
A104	Age:				
A105	Ethnic group/tribe:		A205	Main occupation/livelihood:	
A106	Highest level of education obtained: (1)		A206	Religious affiliation:	
A107	Main occupation/ Livelihood:		A207	Length of time lived in village:	
A108	Religious affiliation:		A208	Reason(s) for moving to village: (2)	
A301	Number of people in hh:		A302	Number of adults	
			A303	Number of children	

(1) A106/A204: no formal; standard 1-7 (primary); form 1-4 (secondary), form 5-6, university.

(2) A208: 1 = Natural resource abundance; 2 = Farming; 3 = Livestock keeping; 4 = Look for work; 5 = Start a new job; 6 = Available land; 7 = Retirement; 8 = Close to…; 9 = Came with spouse; 10 = Born here; 11 = Other (specify).

SECTION B - Livelihoods

B1	Household assets				
B101	Predominant wall material:	(1)	B103	Number of buildings:	
B102	Predominant roofing material:	(2)	B104	Access to electricity:	(3)

(1) B101: 1 = Poles/branches/grass; 2 = Poles and mud; 3 = Mud; 4 = Mud brick; 5 = Burnt brick/cement

(2) B102: 1 = Thatch/leaves; 2 = Wood; 3 = Corrugated iron; 4 = Tile

(3) B104: 1 = Yes; 2 = Only generator; 3 = No

B2	Household income									
B201	Total household income for past 12 months?									
B202	What are your main activities you believe sustain your household? (rank) (1)	1st	2nd	3rd	4th	5th				
B203	Have these activities been sufficient to cover the needs of the household as you see them over the last 12 months?	More than sufficient	Sufficient	Mostly sufficient	Somewhat insufficient	Completely insufficient				
B204	If not: Why would you say this is?									
B205	If not: How did you cope with this?									
B206	Is it possible for you to save money?	Yes	No	Don't know	(If no) B207	Why not?				
B208	How do you save?	Bank	Cooperative		Savings & loan scheme		Pocket/tin box	Other (specify)	No savings	
B209	Is it possible for you to get a loan?	Yes	No	Don't know	(If no) B210	Why not?				
B211	Who from?	Bank	Cooperative		NGO	Government	Friend	Neighbour	Other (specify)	
B212	How well-off is your household compared to most others in the community?	Much poorer	Poorer	About the same	Richer	Much richer				
B213	How has the wealth of your household changed over the last 10 years?									
B214	Has your household faced any major income shortfalls or unexpected expenditures in the last 12 months? (Specify) See (2).									

(1) B202: 1 = Farming, 2 = livestock keeping, 3 = fishing, 4 = forest products, 5 = small trade, 6 = employment, 7 = other (specify)

(2) B214: 1 = serious crop failure; 2 = death/serious illness; 3 = loss of land; 4 = major livestock loss; 5 = loss of waged employment; 6 = climate shock (drought/floods); 7 = price change on products/consumer goods; 8 = protected area establishment; 9 = marriage; 10 = other (specify.)

B3	Farming						
B301	How much land do you own?	(total acres)					
B302	Distance from home?	(mins walk)					
B303	Susceptibility to erosion and flooding?						
B304	Do you use fertiliser?						
B305	Do you use slash and burn?						
B321	Is your farmland rain- fed or irrigated?						
B306	Which tools do you use?	Hand hoes	Plough + animal	Tractor	Other (specify)	Combination	
B307	What % of your total yield is:	Kept?		Sold?			

Which crops do you grow?

		B308	B309	B310	B311	B312	B313
	Crop	Grown?	For what? 1 = Cash; 2 = food; 3 =both	Total Yield? (last 12 months)	How much kept?	How much sold?	Income from crops sold?
A	Rice						
B	Maize						
C	Cassava						
D	Sweet potatoes						
E	Sorghum						
F	Sesame						
G	Groundnuts						
H	Banana						
I	Sugarcane						
J	Palm oil						
K	Cocoa						
L	Watermelon						
M	Coconut						
N	Garden fruits						
O	Garden vegetables						
P	Other 1						
Q	Other 2						
R	Other 3						
S	Other 4						
T	Other 5						

B314	What was the income from your total yield for the last 12 months?	(TSH)				
B315	Do you hire anyone to help with farming?	Never	Very occasionally	Sometimes	Frequently	All the time
B316	Is there any thing that limits your agricultural production?	Yes ☐	No ☐	Don't know ☐		
	What are the three most important factors?	1				
		2				
		3				
B317	How has the amount of land you use changed over the last 10 years?	Much less	Less	No change	More	Much more

B318	Why do you think this is?							
B319	If you were to expand your farm land, what type of land would you expand on to?	Forest	Wastel and	Wetland	Protected area	Spare land	Cannot expand	Other (specify)
B320	Is there a shortage of land in the village? (probe why)							

B4	**Livestock keeping**							
	Which animals do you keep? (probe how many)							
B401	Cows		B405	Pig		B409	Dog	
B402	Goats		B406	Chicken		B410	Cat	
B403	Sheep		B407	Duck		B411	Other (specify)	
B404	Donkey		B408	Guinea Fowl				

B412	How much income did you make over the last 12 months from livestock keeping?	(TSHs)				
B413	How has the number of cattle you own changed over the last 10 years?	Far fewer	Fewer	No change	More	Far more
B414	Where do you graze your cattle? See (1)	Dry season		Rainy season		
B415	How has this changed over the last 10 years? (probe why) (i.e. do you graze them in different place now?)					
B416	Where do your livestock get their water from?					
B417	Is there anything that limits your livestock keeping?	Yes ☐	No ☐	Don't know ☐		
B418	What are the three most important factors?	1				
		2				
		3				
B419	How could your livestock keeping be most improved?					

If own cattle:

(1) B414: 1 = own pastures; 2 = crop residues; 3 = communal land; 4 = plantation forest; 5 = forest; 6 = specially designated areas; 7 = wetland areas; 8 = RAMSAR site; 9 = other (specifiy); 10 = combination (specify)

B5	**Fishing**				
B501	Does your household do any fishing?	Yes ☐	A little ☐	No ☐	
B502	How much do you catch on average a year? (If month/week, specify)				
B503	What % of your catch is:	Kept?	Sold?		
B504	How much income did you derive from fishing over the last 12 months?	(TSHs)			
B506	Has where you fish changed over the last 10 years?				
B507	Why do you think this has changed?				
B508	How has the amount of fish you catch changed over the last 10 years?	Much less	Less	No change	More	Much more
B509	Why do you think this has changed?				

B510	Is there anything that limits your fishing?	Yes ☐	No ☐ Don't know ☐
B511	What are the three most important factors?	1	
		2	
		3	

B6	**Forest income**												
		Fuelwood	Charcoal	Timber	Building poles	Wild fruits, vegetables mushroom	Thatching grass	Medicine	Honey	Wildlife/ bushmeat	Bamboo	Other (specify)
B601	Do you collect any products from the forest?											
B602	Who collects these?											
B603	Do you sell any of these products?											
B604	If yes: How much is collected? (specify per week/month/year)											
B605	If yes: How much is sold? (% and price)											

B606	How has the amount you have collected changed over the last 10 years?	Much less	Less	No change	More	Much more
B607	Why do you think has this changed?					

B7	**Fuel source**			
B701	Which fuel source(s) do you use?	Firewood ☐	Charcoal ☐	Other (specify) ☐
B702	What do you use them for? (Only ask if use >1)			
B703	Why do you use these fuel source(s)?			

B8	**Other income**						
B801	Any income from paid work?	Yes ☐ No ☐	B802	How much? (total income from all paid work over last 12 months)	(TSHs)		
B803	Any income from other trade/business?	Yes ☐ No ☐	B804	How much? (Last 12 months)	(TSHs)		
B805	Are there any of the following in your village: (probe for details)	Companies	Other Investors	NGOs	Tourism	Government projects	Other organisations/projects
B806							
B807	Do you receive any income from them, either directly or indirectly?						
B808	Any other income over last 12 months? e.g. relatives, government payments, etc.						

B9	**Social Capital, access and representation**		Not at all	A little	Moderately	A lot	Extremely so
B901	How well would you say people in your community:	Relate to each other					
B902		Share the same values					
B905		Member		Leader			

	Are you involved in any any social, economic, or environmental organisations or committees in your village? See (1). (If yes, probe which)					
B906	Is there any bribing of officials?	Yes ☐		No ☐	Don't know ☐	
B907	If yes, by which group(s) of people?					
B908	Do you have any problems buying or selling goods? e.g. access, advance knowledge of price, transporting goods					
B909	How has demand changed for the goods you sell over the last 10 years?	Much less	Less	No change	More	Much more

(1) B904: e.g. Farmers' group, livestock keeping group, women's group, voluntary group, political group, religious group, neighbourhood committee, village committee, local NGOs, traditional council, educational group, environmental group, informal social group, credit union, savings group, others.

SECTION C – NATURAL RESOURCE USE

C1	Natural resource availability								
C101	What are the natural resources in the village?	Land	Forest	Rivers	Dams	Other water sources	Wetlands	Wildlife	Other
C102	Are they valuable to you? (use cards for ranking) Rank								
C103	What benefits do you get from these natural resources?								
C104	What disbenefits do you get from these natural resources?								
C601	By whom are the following natural resources managed?								
C107	Have there been any conflicts over the use of these resources?								
C108	If yes then: Who was the conflict between?								
C109	If yes then: How was it resolved?								

C110	How satisfied with the resolution were you?	Very unsatisfied	Unsatisfied	Neither satisfied nor unsatisfied	Satisfied	Very satisfied
C111	How would you describe your relationship with other natural resource users?	Very bad	Bad	Neutral	Good	Very good
C112	If bad/very bad, why?	No cooperation	Poor communication	Ethnic conflicts	Unequal distribution of rights/resources	Others (specify)

C2	Water use	(a) During the rainy season			(b) During the dry season		
C201	Which water sources do you use?	Primary	Secondary	Other	Primary	Secondary	Other
C202	How far is this water source from your home?	(mins walk)					
C203	How many times a day does you household collect water?						
C204	Who collects it?						
C206	What determines which water source you use? (why do you use one water source rather than another?)						
C207	What do you use this water for?						
C208	Do you treat any water from these sources?						

C213	How would you describe the availability of water? (1st)		Very bad	Bad	Neither good nor bad	Good	Very good
		Rainy season					
		Dry season					
C214	How would you describe the quality of water? (3rd)	Rainy season					
		Dry season					
C215	How has the availability changed over the last 10 years? (2nd)		Much reduced	Reduced	No change	Improved	Much improved
		Rainy season					
		Dry season					
C216	How has the quality changed over the last 10 years? (4th)	Rainy season					
		Dry season					
C217	Is there any collection of rain water for use?						
C218	What do you use it for?						

C3	**Forest use**										
C301	Which forests do you use?			C302	How far is it from your home to the edge of the forests you use? (mins walk)						
C303	Over the past 5 years have you cleared any areas of forested land?			C304	How much?						
				C305	What for?						
				C306	Type of forest cleared? (private/village/protected)						
C307	Over the last 5 years, have you received any payments or in-kind benefits from any forest projects?	Tourism	Carbon project	Water catchment project		Tree planting	Benefits from logging	Other (specify)			
C308	Have you planted any trees on your farm?										
C309	What do you use them for?										
C4	**Other land use – livestock keeping**										
C401	How would you describe the impact of livestock keeping on the environment?	Very negative	Negative	No impact	Positive	Very positive					
C402	Have there been any evictions of livestock from protected areas here?										
C403	If yes: How have the evictions affected you?										
C404	If yes: Do you think there will be any long term impacts? (probe)										
C5	**Wetlands**										
C501	What do you understand by wetlands?										
C502	How often does the wetland flood?										

C503	How does this affect you?	
C504	Have there been any changes in the frequency or severity of wetland flooding over the last 10 years?	

C6	Management of natural resources											
C607	How satisfied are you with how the natural resources in your community are managed?	Very unsatisfied		Unsatisfied	Neither satisfied nor unsatisfied			Satisfied		Very satisfied		
		Interests (not) taken into account	(Un)clear boundaries/outsiders (not) kept out	(Un)equal distribution of use/benefits	(Not) good access to resources	Rules are (not) followed	Local community is (not) involved with rule forming	Conflict resolution mechanisms (not) good	(Im)proper enforcement of rules / sanctions	(Not) good management/ coordination	Other (specify)	
C609	If very unsatisfied or unsatisfied, why?											
C610	If very satisfied or satisfied, why?											
C611	Do you feel the rules governing natural resource use apply equally to all?	Not at all		Not very much		Somewhat		Mostly		Completely		
C612	If not, which groups are exempt from these rules?											

C604	Does your village have a land-use plan?	Yes	In process	No	Don't know	C605	To what extent o you feel you were included in the making of the LUP?	Not at all	A little	Moderately	A lot	Completely
C606	How does the LUP affect you?											

SECTION D – Natural resource health

D101	How would you describe the health of the following natural resources? (1-5)	Land	Forest	Rivers	Dams	Other water sources	Wetlands	Wildlife	Other
		1 =Very bad health, 2 = bad health, 3 = neither good nor bad health, 4 = good health, 5 = very good health							
D102	Has there been any change in the health of these natural resources over the last 10 years? (1-5)								
		1 =Much worse, 2 = worse, 3 = no change , 4 = better, 5 = much better							
D103	What do you think are the main factors behind these changes?								
D104	What is the impact of these changes on your household?								
D105	How do you think the health of these natural resources will change over the next 10 years? (1-5)								
		1 =Get much worse, 2 = worse, 3 = no change , 4 = better, 5 = much better							

SECTION E – Decision-making

E1	**Household decision-making**								
	Thinking about your household's natural resource use…	Land	Forest	Rivers	Dams	Other water sources	Wetlands	Wildlife	Other (specify)
E101	Who in your household makes natural resource use decisions?								
E104	Is there any illegal use of natural resources in or around your community?								
E105	Which group(s) of people?								
E106	Why do think people might use natural resources in such a way?(1)								
E107	If someone else's cattle was being grazed on your land, what would you do?								

E108	If there was less water available next year, what would you do?	
E109	If you didn't grow enough food next year, what would you do?	

(1) F106: 1 = No control; 2 = Low fines/punishment; 3 = Have to survive; 4 = Lack of awareness, 5 = Other, 6 = Don't know

E202	In the last year, have you participated in meetings where decisions about the village were made?					
E203	Who do you mainly go to for advice about matters to do with:	Farming	Land-use	Water	Money	Other (specify)
E301	Are there any natural resource-use decisions made by other households in the village which impact on your own natural resource use decisions, or which impact on the benefits you get from the natural resources? (probe) Asked: How do decisions of resource use by others influence your resource-use decisions? (E.g. example of broadcasting and planting beans).					

SECTION F – Climate

F101	How would you say the rainfall has changed over:	The last 5 years?				Your lifetime?
F102	What do you think is the primary cause of these changes?					
F103	How would you say the temperature has changed over your lifetime?					
F104	What do you think is the primary cause of these changes?					
F105	Have there been any extreme weather events in: (drought/flooding etc.)					
F106	How did these events impact upon you?					
F107	What was your most effective coping mechanism?					
F109	What was the best source of help for you during this time? (1)					
F110	How aware are you of climate change? (If not aware at all, ask for weather change)	Not aware at all	A little aware	Moderately aware	Very aware	Completely aware
F111	What do you think are the main causes of climate change? (Weather change?)					
F112	What do you think are the main impacts of climate change? (Weather change?)					
F113	Do you feel you have been, or will be, affected by the impacts of climate change? (probe) (Weather change?)					
F114	How do you understand the relationships between forests and climate change? (Weather change?)					
F115	What is your understanding of carbon?					

(1) F109: 1 = Neighbours; 2 = friends; 3 = village committees; 4 = village leaders; 5 = local government; 6 = central government; 7 = NGO; 8 = other (specify); 9 = no help

Appendix 2: Individual benefits from GRL

Responses to HHS QB807-A: Do you receive any income from them [identified companies], either directly or indirectly?

Benefit	Kitete	Uchindile	Total
Building classrooms (primary and secondary)		1	1
Classrooms		1	1
Constructing classrooms, hostels and school cottage for teachers		1	1
Dispensary; transportation; salary	1		1
Don't know		4	4
Employment		3	3
Employment - but only occasionally		1	1
Employment and salary	2		2
Employment; big benefits for village - school and house		1	1
For village, school etc.		1	1
GRL = dispensary and transportation; TAZARA = transportation	1		1
GRL = dispensary & expecting classrooms & transportation	1		1
GRL = transportation; TAZARA = transportation and employment for village	1		1
GRL salary; TAZARA salary for some families; for village - employment, transportation (for people and luggage) (TAZARA)	1		1
Income from job		1	1
Indirect (school, dispensary)		1	1
Indirectly - people working for GRL etc. come and buy stuff from shop		1	1
Later. Indirectly - is a business man and employees of companies will come and spend money at his shop; and improved transportation		1	1
Money (salary)	1		1
Money from employment		1	1
Money from those employed - through increasing carpenting business; and transportation from TAZARA and GRL		1	1
No	2	5	7
No personal benefit	1		1
None	1		1
None for HH; don't know for village		1	1
None for HH; village got school and employment		1	1
Phone charging - GRL have solar. For village = transport for sickness	1		1

Presence of dispensary; expected classrooms	1		1
Provided with seedlings from GRL/MPM		1	1
Salary	2	1	3
Salary (employment); transportation; dispensary; and there is a Doctor	1		1
Salary & medication	1		1
Salary; build school; build roads; being given transport if someone is sick (to hospital)		1	1
Salary; education/knowledge - new ideas (maybe about tree planting)	1		1
Salary; school building	1		1
Salary; transport	2		2
Salary; transportation	1		1
Selling local brew to GRL/MPM employees		1	1
Sometimes get seedlings from GRL		1	1
TAZARA = transportation	1		1
TAZARA = transportation for household and for village; GRL = salary, employment for people, dispensary, expected classrooms	1		1
To do work		1	1
Transportation	3		3
Transportation - if someone is sick send to hospital		1	1
Transportation - if you’re a sick person, you're given transport		1	1
Transportation (for iron sheets); transportation (for village)	1		1
Transportation and salary	1		1
Transportation; dispensary	1		1
Transportation; salary	1		1
Transportation; village benefits - village office, dispensary, expected classrooms	1		1
TAZARA = salary; GRL = provision of seedlings, transportation. Village benefit = people get jobs	1		1

Appendix 3: Collective benefits from GRL

Responses to HHS QC307-B: Over the past 5 years have you received any payments or in-kind benefits from any carbon project?

Row Labels	Kitete	Uchindile	Total
Dispensary; village office	1		1
Don't know	2	3	5
GRL - school classroom, cottages & hostel		1	1
GRL but don't know	1		1
Hears people talking about this - that if plant trees can get money from carbon credits, but only later		1	1
No	5	7	12
Not yet - certain amount of money given to village	1		1
Village office	2		2
Ye - GRL. Village benefits (school)		1	1
Yes - village office	1		1
Yes - 10% of carbon credits money to village	1		1
Yes - 10m TSH to build village office	1		1
Yes - 2011, village got money from carbon credits		1	1
Yes - 2011/12 - money for village office. GRL also promised to construct school classrooms	1		1
Yes - at village level - although individuals have not started to get benefits yet. They have their name, and will in future receive payments for carbon, depending on size of plot and trees		1	1
Yes - better weather conditions; employment		1	1
Yes - building houses		1	1
Yes - built classrooms and houses		1	1
Yes - classrooms and houses from GRL		1	1
Yes - classrooms but don't know whether carbon project or tree planting or logging.		1	1
Yes - company. School etc.		1	1
Yes - for village (village office etc.). 3 years ago village got ~10% of carbon credit revenues. Will be every three years. ~75m (money used to construct village buildings)		1	1
Yes - GRL - 10mTSH for village house	1		1
Yes - GRL - building schools / buildings (houses) from 75m TSH		1	1
Yes - GRL - building village office (10mTSH)	1		1
Yes - GRL - classrooms (expected), teachers' quarters	1		1
Yes - GRL - money for village	1		1
Yes - GRL - office building	1		1
Yes - GRL - village got money but don't know	1		1

Yes - GRL - village office	1		1
Yes - GRL - village office; dispensary; expected classrooms	1		1
Yes - GRL (hewa ukaa) - 10m TSH for village office (last year)	1		1
Yes - GRL & small investors - village office	1		1
Yes - GRL tree planting - village office	1		1
Yes - GRL. Village got money from carbon project.		1	1
Yes - hospital; expected classrooms	1		1
Yes - payment to village		1	1
Yes - school		1	1
Yes - teachers houses		1	1
Yes - the houses for teachers		1	1
Yes - the village has benefitted		1	1
Yes - village - school and buildings		1	1
Yes - village benefits (classroom, houses)		1	1
Yes - village benefits as before (school etc.)		1	1
Yes - village dispensary (10m TSH)	1		1
Yes - village gets money		1	1
Yes - village got 75m from this - houses constructed		1	1
Yes - village got payment		1	1
Yes - village office	4		4
Yes - village office and quarters	1		1
Yes - village office; hospital	1		1
Grand Total	**35**	**35**	**70**

Appendix 4: Understanding of carbon / hewa ukaa

Responses to HHS QF115: What is your understanding of carbon? [asked with 'kaboni' & 'hewa ukaa'].

Responses	Kitete	Uchindile	Grand Total
Carbon = 'the used gas'; the 'air that has been used'. Hewa ukaa = produced by trees.		1	1
Carbon = a certain carbon paper you can put between other pages e.g. in receipt books - this is carbon. Hewa ukaa = for example, if planting trees, once they reach a certain age / height, they will produce clean air while absorbing dirty air - hewa ukaa is the air inside trees.	1		1
Carbon = a gas. Something like a smoke from the car/vehicles or if burn grass. Hewa ukaa = don't know for sure but the process is: GRL are planting trees (for lots of reasons) to remove (absorb) the carbon being produced by factories/industries and people.	1		1
Carbon = bad air (oxygen = clean air). Hewa ukaa = don't know.		1	1
Carbon = bad air; hewa ukaa = carbon gas		1	1
Carbon = bad air/gas; Hewa ukaa = don't know		1	1
Carbon = bad gas, we can maybe tell if this is bad air.		1	1
Carbon = bad gas; hewa ukaa = good gas / air produced by trees	1		1
Carbon = bad or dirty air. Negative and positive effects - carbon (CO2) helps trees to grow; when someone is in an area with excessive CO2 without oxygen, he can die. Hewa ukaa = bad air - bad or dirty air.		1	1
Carbon = clean air; hewa ukaa = carbon and is being harvested		1	1
Carbon = dirty air/gas being produced by factories/industries. Hewa ukaa = many industries /factories in other countries are producing CO2, and the company is planting trees - trees produce oxygen - these two gases have no boundaries. Oxygen can be produced here and transported to other countries. Hewa ukaa is the oxygen that is produced and can be transported.	1		1
Carbon = dirty air/gas. Hewa ukaa = not sure. Been told / taught it's the air from the trees being brought by people - especially those who are having a lot of industries / factories which pollute ozone layer.	1		1

Carbon = dirty air/gas. Hewa ukaa = whole process - rich countries with a lot of industries / factories pollute the environment, the weather and the climate. Two matters: trees absorb carbon and give out oxygen; and the rich countries with a lot of industries, they give money for the trees because they are polluting the weather/climate.	1		1
Carbon = dirty gas used by trees. Humans inhale oxygen and exhale carbon. Hewa ukaa = don't know.		1	1
Carbon = don't know; hewa ukaa = air produced by the trees	1		1
Carbon = don't know; hewa ukaa = produced by the forests/trees. GRL has given the village a percentage of money got by hewa ukaa.		1	1
Carbon = don't know; Hewa ukaa = smoke produced by factories	1		1
Carbon = don't know. Hewa ukaa = air produced by trees. The trees produce air which modifies the atmosphere; in the atmosphere there is unclean air from industries (in such a way people make money)	1		1
Carbon = don't know. Hewa ukaa = been to seminars but now have forgotten some of the issues. But - when you plant trees, you can later get money because the trees harvest hewa ukaa ['harvest' = 'take something from somewhere to use it']	1		1
Carbon = don't know. Hewa ukaa = planting trees and at a certain age the trees will absorb the bad gases/air. Because there are some people who will give money to them for absorbing the bad gas/dirty gas that is produced by industries / factories. Hewa ukaa = produced and goes into the atmosphere to clean the bad gas	1		1
Carbon = don't know. Hewa ukaa = the trees grow up and there is air being sold by GRL to other people. Don't know for sure what hewa ukaa is.	1		1
Carbon = don't know. Hewa ukaa = trees bring out hewa ukaa		1	1
Carbon = don't know. Hewa ukaa = trees produce oxygen. There are people with industries that pollute the environment and atmosphere (holes in ozone layer). Those people buy hewa ukaa from GRL and GRL give a percentage to the village. Don't know exactly what hewa ukaa is.	1		1
Carbon = don't know. Hewa ukaa = when the trees are large they produce clearn air (this is hewa ukaa) and they absorb dirty air.	1		1

Carbon = don’t know. Hewa ukaa = you plant trees and then can sell hewa ukaa to get money.	1		1
Carbon = gas - gas which affects humans - humans inhale oxygen and exhale carbon and so excess of carbon affects health of humans. 'Hewa ukaa' = don’t know, but know it's like harvesting air produced by the trees		1	1
Carbon = gas, the gas we inhale. Hewa ukaa = don’t know.		1	1
Carbon = gas; hewa ukaa = bad gas, produced by trees		1	1
Carbon = gas; hewa ukaa = carbon.		1	1
Carbon = gas; hewa ukaa = don’t know		3	3
Carbon = gas; hewa ukaa = gas produced by tees and is useful for something		1	1
Carbon = gas; hewa ukaa = good quality air		1	1
Carbon = gas; hewa ukaa = hears people talk about it but don’t know		1	1
Carbon = gas. Hewa ukaa = the forest / trees provide the hewa ukaa		1	1
Carbon = gas/air, dirty gas/air - causes decomposition. Hewa ukaa = the air/gas produced by trees and GRL mzungu is taking it.	1		1
Carbon = gas/air; hewa ukaa = don’t know but knows village gets money from it.	1		1
Carbon = gas/air; Hewa ukaa = don’t know. Been told to plant in groups and if plant and manage well will start to get hewa ukaa	1		1
Carbon = gas/air; Hewa ukaa = the one which is giving us money		1	1
Carbon = gas/air. Hewa ukaa = don’t know - just know the trees produce hewa ukaa which some investors buy.	1		1
Carbon = good air / gas. Hewa ukaa = trees produce hewa ukaa (a gas / air) to neutralise smoke (or chemicals) from industries / factories. If plant many trees then later there are benefits for the environment (these benefits are hewa ukaa).	1		1
Carbon = Hewa ukaa = a gas that is being sold		1	1
Carbon = hewa ukaa = the air produced by the trees and is brought by developed countries with a lot of industries - they measure the amount of hewa ukaa produced by trees and pay for it. Just like oxygen - produced by trees.	1		1
Carbon = hewa ukaa = when the trees grow up there is air around the trees which the investors / people harvest - but don’t know much.	1		1
Carbon = the air with smoke; Hewa ukaa = don’t know for sure, the air being sold to other nations e.g. USA, the air is transported to USA	1		1

Carbon = the dirty gas/air that cannot be utilised by humans and animals. Hewa ukaa = carbon dioxide or carbon - trees produce air which neutralises the carbon from the atmosphere. The gas from the trees are brought by people (e.g. from Europe) to help reduce or modify the amount of carbon in the atmosphere. People are given an incentive to plant trees to modify/reduce the carbon in the atmosphere.	1		1
Carbon = the gas / air you inhale. Oxygen = the air you exhale. Hewa ukaa = trees are producing hewa ukaa, and factories are producing unclean air. Hewa ukaa from trees is going to modify this unclean air.	1		1
Carbon = weather condition. Hewa ukaa = don't know		1	1
Carbon = weather; hewa ukaa = don't know		1	1
Dirty gas		1	1
Don't know	3	4	7
Don't know (for either carbon or hewa ukaa)	1		1
Don't know carbon. 'Hewa ukaa' - don't know. Knows there is a carbon credit as heard people talking about it, but don't know what it is.		1	1
Don't know. Hewa ukaa = wind		1	1
Don't know. Son: carbon = the air / gas that people inhale; hewa ukaa = being produced by trees.		1	1
Hewa ukaa = air produced by trees, when air is measured, there are some people buying it. Carbon = gas/air.	1		1
Hewa ukaa = don't know exactly what hewa ukaa is, normally asks himself this. Carbon = dirty air/gas. Trees produce oxygen to regulate the carbon dioxide; factories produce CO2 (dirt or smoke); trees absorb CO2 (which destruct the ozone layer) produced by the factories/industries	1		1
Hewa ukaa = don't know. Carbon = air or dirty air.	1		1
Hewa ukaa = don't know. Carbon = dirty gas/air	1		1
Hewa ukaa = there is air that we exhale that is 'inhaled' by the trees - there is another air that trees exhale that we inhhale / need - this is hewa ukaa. Carbon = there is carbon and oxygen - we inhale oxygen. Carbon is that which we exhale.	1		1
Hewa ukaa = tree from 4 years old is capable to absorb carbon / hewa ukaa and able to produce oxygen - which cleans the air. The rich countries are wanting to pay for the trees to absorb carbon and produce oxygen.	1		1
We live off oxygen and increase of carbon means less oxygen and so difficult to live		1	1

Woman = don’t know. Brother: carbon = dirty air which is in the atmosphere or in trees; hewa ukaa = kiswahili for carbon. Harvested from trees.		1	1
Grand Total	**35**	**35**	**70**