

Commodifying forest carbon:

How local power, politics and livelihood practices shape REDD+
in Lindi Region, Tanzania

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Andreas Scheba

School of Environment, Education and Development
Institute for Development Policy and Management

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Abstract

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International efforts to promote REDD+ (reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest-carbon stocks) have enjoyed widespread support in climate negotiations. While proponents of this ‘payments for ecosystem services’ approach proclaim win-win benefits, others critique this commodification of forest carbon for contributing to social and environmental injustices that will undermine conservation and development in the longer-term. In this dissertation I respond to these concerns by critically examining how REDD+ initiatives emerge in the context of Lindi Region, Tanzania. I specifically investigate how REDD+ initiatives interact with local livelihood practices, local forest governance and the drivers of land use in order to interrogate the mechanism’s contribution to local development. I conducted ethnographic fieldwork in two villages, both characterised by relatively large forest areas and ‘shifting cultivation’, where different REDD+ projects are underway. In total I stayed in Tanzania for 11 months and applied qualitative and quantitative methods that resulted in 116 recorded interviews, one focus group discussion, innumerable journal entries from ethnographic interviewing and participant observation, 118 household surveys and data from document analysis.

Drawing on debates within international development and neoliberalisation of nature I conceptualise REDD+ initiatives as processes promoting ‘inclusive’ neoliberal conservation. In doing so I point at the inherent contradictions of this mechanism that aims to combine a neoliberal conservation logic with inclusive development objectives. I empirically examine local livelihood practices to question popular notions of land use and argue that REDD+ initiatives must grapple with poverty, intra-village inequality and villagers’ dependence on land for crop production to contribute to inclusive economic development. I follow up on this argument by discussing the importance of material and discursive effects of REDD+ initiatives to the livelihoods of poor, middle-income and wealthy households and to forest conservation. I then link these effects to an examination of how power and politics shape the implementation of REDD+ initiatives on the ground, specifically discussing the technically complex and politically contested process of territorialisation and the local practices of community-based forest management. I illustrate how seemingly technical REDD+ initiatives are inherently political, which gives them the potential to contribute to local empowerment. At the same time I question naïve assumptions over community conservation and good governance reforms by showing in detail how community-based forest management institutions are practiced on the ground and how this affects benefit distribution within the villages. My last empirical chapter examines how Conservation Agriculture is introduced in the villages as the best way to reconcile agricultural development with forest protection. I specifically discuss the role of social relations in shaping the dissemination and adoption of this new technology in rural Tanzania.

Throughout this thesis I argue that local livelihood practices, power struggles and politics over land and people shape how REDD+ initiatives, as inherently contradictory processes of ‘inclusive’ neoliberal conservation, emerge on the ground and I empirically show what this means to different forest stakeholders.

Declaration

I, Andreas Scheba, declare that no portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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This thesis is dedicated to our beloved son, Samir.

List of Abbreviations

AEO	Agricultural extension officer
AVLFR	Angai village land forest reserve
CA	Conservation agriculture
CBFM	Community-based forest management
CCI	Clinton Climate Initiative
CCM	Chama Cha Mapinduzi
CDM	Clean Development Mechanism
COP	Conference of the Parties
CUF	Civic United Front
DANIDA	Danish International Development Agency
EUR	Euro
FAO	Food and Agricultural Organisation
JFM	Joint forest management
LIMAS	Lindi and Mtwara Agribusiness Support
MJUMITA	Community Forest Conservation Network of Tanzania
NGO	Non-governmental organisation
PES	Payments for ecosystem services
PFM	Participatory forest management
REDD+	Reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest-carbon stocks
RIPS	Rural Integrated Project Support
TFCG	Tanzania Forest Conservation Group
TShs	Tanzanian Shilling
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
URT	United Republic of Tanzania
USD	United States Dollar
VC	Village chairman
VEO	Village executive officer
VLFR	Village land forest reserve
VNRC	Village natural resource committee

Chapter 1: Introduction

1.1 Encountering people, forests and carbon in Lindi, Tanzania

It is August 2011 and I find myself in a 4x4 Land Rover driving into Mihumo/Darajani's part of the Angai village land forest reserve, which is one of Tanzania's largest community-owned and protected forests. The 139,420 ha large reserve is managed and owned by 24 villages¹ in Liwale, one of six districts of Lindi Region, in South-eastern Tanzania. Fortunately, I am not alone in this vast landscape. With me in the car are two scholars, one district official, two villagers and the driver. They all know each other fairly well. In fact, I am the only novice in the group. The atmosphere is relaxed and my companions are engaging in conversation, making jokes and excitedly look out of the window into the vast woody landscape.

I am marvelling at the driver who is skilfully navigating us across country. We are far away from ordinary roads. I see trees, bush and grassland everywhere. I can tell that this is not an easy drive. At times the car is moving slowly. The bumpy obscure surface causes the steering wheel to jerkily move left and right. This doesn't seem to bother the driver much though. He remains concentrated and alert; fully aware of the obstacles that will come our way: little streams, bush, trees and broken branches lying across this flat and seemingly abandoned landscape.

I continue looking from the car into the woods. Indeed, this place is full of life. It is as vivid as any other place on earth. You can see it, smell it, and feel it. I picture how wildlife hide in their dens. In the grassland, shrubs and bushes, or 10 metres high up in the trees or anywhere in between. The miombo trees are striking. In their various shapes and sizes they stand on the nutrient-poor sandy soils; so typical for this region (Mukama, 2010; WWF, 2014). One tree emerges after the other until it passes left or right of the car. The trees look uniform in structure but studies show that these woodlands are extremely rich in diversity (Mukama, 2010). In 2004 more than 133 tree species were identified within the Angai village land forest reserve alone (S. Dondeyne, 2004). Among this great variety one can spot globally known species, highly valued for

¹ Previously they were 13 villages but in the year 2008/9 eight of them split into two or three villages, creating a new total of 24 villages.

their outstanding timber quality, such as: *Brachystegia*, *Julbernardia globiflora*, *Dalbergia melanoxylon* and *Pterocarpus angolensis* (Mukama et al., 2011).

The place we are driving through belongs to the Eastern miombo woodlands. An ecoregion of grassland and 'savannah woodlands' found across Southern Tanzania and Northern Mozambique. Miombo woodlands are hugely important far beyond our place. Their reach goes beyond these two countries far into the African continent. As an extensive forest formation they cover about 2.7 million km² across central, eastern and southern Africa including Angola, Zimbabwe, Zambia, Malawi, Mozambique, Tanzania and Democratic Republic of Congo (Frost, 1996). It is a vast forest landscape that has been inhabited by and provided vital resources to millions of people for thousands of years (Campbell et al., 1996; Sunseri, 2009).

Among these people are the 3,000 plus residents of the village Mihumo/Darajani who do not hesitate to state how much they value the benefits they receive from this extensive forest landscape (Mukama et al., 2011; Mustalahti et al., 2012; Sundström, 2010; Taku Tassa, 2010). Living in one of the world's poorest regions, it is quite clear how much they depend on the forest resources in order to eat, build, heat and live. The forest provides them with poles and timber that are used for construction. Mushrooms, fruits, wild meat and honey are collected for consumption, and villagers gather firewood for daily cooking. And in addition the forest provides water catchments and places for non-extractive activities including celebrating the act of circumcision. In short, communities around the Angai forest have for long relied on the forest ecosystem to survive and to find meaning and fulfilment in an otherwise harsh environment.

No less important is the agricultural use of the forest landscape. Peasants have utilised this fertile forestland for the cultivation of agricultural crops for centuries (Seppälä and Koda, 1998; Sunseri, 2009). In the near absence of livestock keeping due to existence of the harmful tsetse fly, crop production has until today remained the major income source in this rural economy (URT, 2012a). In growing both seasonal and perennial crops including maize, millet, sorghum, peas, rice, cassava, groundnuts, cashew nuts and sesame, the fertile forestland has not only helped farmers to feed a continuously growing population but also to supply international markets with primary commodities. In return, they have received valuable cash income for the purchase of basic necessities.

“We have arrived at our destination”, I am told by one of the scholars. Then all of us eagerly leave the car to see for ourselves the state of Mihumo/Darajani’s 11,792 ha large forest reserve. It is not long before I realise that the scholars and Liwale District Natural Resource Officer are concerned. Some trees were cut down and late and intensive fires passed through some of the reserve, supposedly damaging regrowth and the quality of the secondary forest. I cannot help but notice the complaints to the two accompanying villagers about illegal timber harvesting and the use of fire for agricultural cultivation. A sense of disappointment takes over and the conversations suddenly become less benign.

In this moment I recalled the complaints I had heard from development actors at previous encounters. Among them were researchers, district officials and development professionals who expressed concerns over the unsustainable use of (forest-)land in the Angai villages. Referring to illegal timber harvesting and “shifting cultivation” as the major threat to protecting the precious forests, it was clear that farmers’ way of securing their livelihoods has once again come under criticism for their destruction of a greater ‘global’ environmental good (cf. Bernstein and Woodhouse, 2007).

Something, however, was different this time. When debating about who and what might cause forest destruction, the people around me did not just link their concerns to the extent of biodiversity or the amount of harvestable timber in the forest. Even the two accompanying villagers did not primarily talk about these issues. Instead, everybody seemed to worry about the changes in carbon stocks as a result of the unwanted activities. People around me viewed the forest landscape from the perspective of counting carbon contents in the trees and soil. This, I felt, was something extraordinary.

Although unrecognised, carbon stored in trees and soil has always been an integral part of villagers’ environment, but it started explicitly with participatory forest carbon assessments in 2009, in which all of the present people participated, that farmers began to view their forest landscape in terms of changing carbon stocks. Since then rural villagers in Mihumo/Darajani started to think and talk about their forests as a potential provider of carbon credits, the new global fictitious commodity created through international climate negotiations (Kosoy and Corbera, 2010; Newell and Paterson, 2010). By being told that from protecting forests villagers can cash in from saleable carbon credits, the rural dwellers experienced once again an attempt by foreign actors to

re-direct their landscapes toward international markets. When in the past villagers were told to produce timber, ivory, copal or wild rubber for global demand (Sunseri, 2009) it was now the promise of selling carbon to international buyers that would bring prosperity to Angai villages (CCI, 2011; Mukama et al., 2011; Mustalahti et al., 2012; Sundström, 2010).

Several months later and hundred kilometres to the East in a little village called Ruhoma, about 475 people find themselves in a similar situation. It is early March 2012 and the usually busy farming village population gathers in the village centre to witness the arrival of special visitors driven in their 4x4 cars. The honourable guests in the vehicle were no other than members of Tanzania's national REDD+ task force, people from the national capital Dar es Salaam, from the Vice President's Office, the Ministry of Land and the national media. All of them travelled a few hundred kilometres to converse with Ruhoma residents about their latest experiences with protecting the carbon in their coastal forests and miombo woodlands. I assume that my own presence as a white European researcher further contributed to making today's village assembly something unusual.

The important visit was of no surprise to the villagers. Well prepared, the village authorities welcomed the guests and seated them on humble wooden chairs behind tables, all of which were located under a big mango tree, which was the village's usual place for holding assemblies. Once seated in the appropriate place, the visitors could enjoy a group of residents performing a rehearsed song illustrating the importance of REDD+ to forests. The performance of the song was then followed by the secretary of the local village natural resource committee who reported the latest information about the achievements of carbon-driven forest protection.

Finally, he presented the mode of distribution of REDD+ trial payments among villagers and the benefits that the community derived from them. Individual villagers were asked to step forward to tell the visitors how the trial carbon money helped them in their daily lives. Many bought food, staples such as maize and millet, but also sugar, salt and cooking oil with it. Others, the better-off families, added clothes, radios and other consumer items to the purchase list. Overall, people seemed happy and appreciated the cash they received in return for their efforts – protecting the forest carbon on their village land. Here too, in this seemingly remote village, located on the

Noto plateau in Lindi rural district, the global idea of selling forest carbon has found its way among the local peasantry in Tanzania's rural landscape.

1.2 The REDD+ approach

1.2.1 The emerging global REDD+ regime

Our two encounters between people, forests and carbon in two poor forest adjacent villages in South-eastern Tanzania cannot be understood without considering the global context of climate change negotiations. In recent years forests, long valued for their timber and non-timber products, have attracted much international attention because of their important role as carbon sinks in global climate stabilisation (Buizer et al., 2014; Corbera and Schroeder, 2011; Karsenty, 2008; Pistorius, 2012). In a world seriously threatened by an ever-increasing amount of greenhouse gas emissions (IPCC, 2014), the ability of trees to sequester carbon from the atmosphere has generated much interest across political actors. This prominence has particularly gained political support with the popularisation of certain scientific studies, among them Stern (2006), IPCC (2007), van der Werf (2009) and Houghton (2003), which suggested that deforestation and forest degradation could cause between 12 to 20% of total annual greenhouse gas emissions. Based on the assumption that reversing this trend is a quicker and easier solution than large-scale changes to fossil fuel consumption in the global North (Eliasch, 2008; Stern, 2006), policy makers launched into the inclusion of forest protection into global climate mitigation efforts (Buizer et al., 2014; Corbera et al., 2010; Karsenty, 2008).

Global support for valuing trees for their carbon sequestration functions was for the first time expressed in the United Nations Kyoto Protocol, which was negotiated in 1997 and ratified in 2005 (Buizer et al., 2014). The protocol's Clean Development Mechanism, a market-based climate mitigation instrument that allows carbon trading between developed and developing nations, successfully commenced the linking of local forestry and development activities with international climate finance, albeit with restrictions. In the clean development mechanism the offsetting of forest carbon was limited to afforestation and reforestation projects, leaving emission reductions from averted deforestation, forest degradation and enhancing biomass carbon stocks in existing forests out for political and methodological reasons (Corbera et al., 2010; Kanninen et al., 2007). The limited range of forest carbon projects eligible in the clean development mechanism contributed to a marginal role of forestry projects, at least in terms of

number of projects, in the compliance carbon market (Buizer et al., 2014; Thomas et al., 2010). In early 2014 there were only 55 afforestation and reforestation projects out of 7478 registered CDM projects worldwide (UNFCCC, 2014a). The significance of forestry carbon changed with the emergence of various voluntary carbon standards, which allowed a wider range of land-use activities for the generation of tradable carbon credits. In 2012 forestry and land-use activities represented 32% of all over the counter transactions in the voluntary carbon market, ranked second only to renewable energy projects at 34% (Peters-Stanley and Yin, 2013).

Due to concerted efforts by Costa Rica, Papua New Guinea and the coalition of rainforest nations at conferences of parties (COP) to the United Nations Framework Convention on Climate Change in the first decade of 21st century, a rethinking has taken place at the global level, resulting in a much broader array of forest-related conservation activities to benefit from (future) carbon finance (Buizer et al., 2014). Under the umbrella term REDD+ (reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest-carbon stocks) the international community firmly expressed their willingness to take the protection of forests for their climate benefits to another level. In addition to earning carbon money for planting new trees (afforestation and reforestation), countries can tap into climate finance for emission reductions from the avoidance of deforestation and forest degradations as well as from the improvement of carbon stocks in existing forests (Buizer et al., 2014; Corbera and Schroeder, 2011; Pistorius, 2012).

Since then the world's nation states have worked hard to develop the REDD+ regime, which, starting from the initial plan to financially reward rainforest nations for emission reductions caused by deforestation (RED), extended to incorporating avoided emissions from degradation (REDD) and recently expanded to allowing a range of carbon-stock enhancement and conservation activities (REDD+) to be part of this global governance framework (ibid). Despite the expansion of the mechanism in scope, the core idea of REDD+ has remained the same: to offer financial incentives to developing countries for forest protection by valuing and trading the carbon stock stored in trees or not emitted into the atmosphere (Buizer et al., 2014; Corbera and Schroeder 2011).

REDD+ can be seen as the most popular example of new market-based conservation approaches, in which a financial value is created and exchanged for nature services

(Arsel and Büscher, 2012; Corbera, 2012). At its core REDD+ suggests that payments should be made between buyers and sellers of forest carbon credits, which are conditional on the provision of independently verified emissions reductions that must be ‘additional’ to what would have happened in the absence of the project. They must also be permanent in their nature, which means they must last for many years (often 20 years or more) (Clements, 2010; Wunder and Wertz-Kanounnikoff, 2009). The idea of REDD+ is thus quite straightforward in suggesting “that conservation of carbon stocks in forests will occur only when the money received for reducing deforestation and forest degradation exceeds the most attractive opportunity cost foregone, for instance income from forest clearance and conversion to agriculture.” (Buizer et al., 2014, p. 2). Arild Angelsen, agricultural economist and one of REDD+’s most prolific supporters, explains the simple logic (Angelsen, 2009, p. xii).

A core idea behind underlying REDD+ is to make performance-based payments, that is, to pay forest owners and users to reduce emissions and increase removals [of carbon from the atmosphere]. Such payments for environmental (or ecosystem) services (PES) has its merits: it provides strong incentives directly to forest owners and users to manage forests better and clear less forestland. PES will fully compensate carbon rights holders that find forest conservation more lucrative than the alternatives. They simply sell forest carbon credits and less cattle, coffee, cocoa or charcoal.

1.2.2 REDD+ readiness

Despite being a rather simple idea, i.e. paying forest owners for the protection and enhancement of carbon stocks, the design and implementation of REDD+ globally and on the ground, faces numerous challenges. A number of international stakeholders, among them governments, UN organisations, NGOs, private companies and universities have all been involved in attempting to resolve ongoing complex technical, methodological and political problems.

“REDD+ readiness programmes” and demonstration projects have been implemented by various agencies to prepare and assist developing countries in the design and implementation of REDD+ (CIFOR, 2012; Corbera and Schroeder, 2011). The United Nations established the REDD Programme which is implemented by its three organisations FAO, UNEP, UNDP. The World Bank launched its Forest Carbon Partnership Facility and Forest Investment Programme. Norway started its International

Climate and Forest Initiative and in addition contributed to the Amazon Fund and Congo Basin Fund. Together these programmes have supported more than 40 countries in analysing historical land-use emissions, designing baselines and drafting future carbon sequestration strategies (Corbera and Schroeder, 2011)

According to estimates by Streck and Parker (2012) around USD 14.5 billion were spent on REDD+ activities in 2010 by different international and national actors, expecting to reach USD 32.1 billion per year by 2020. Over the years more than 500 forestry and land-use carbon projects have been implemented by companies, international NGOs, governments and climate investors, covering an area of more than 26.5 million hectares of forests around the world. Market value of forestry and land-use projects decreased by 8% from 2011 to 2012 still reaching a respectable sum of USD 216 million. Over time a cumulative 134 MtCO_{2e} was transacted through forestry and land-use projects amounting to an estimated total value of USD 0.9 billion (Peters-Stanley et al., 2013).

Project developers have struggled with several issues foremost with problems of ensuring permanence and avoiding leakage of carbon emission reductions (CIFOR, 2012; Corbera et al., 2010; Karsenty, 2008). These challenges relate to the difficulties with measuring, reporting and verification (MRV) and setting the baseline of forestry and land-use related emissions (ibid). The credibility of REDD+ crucially depends on real, measurable and additional emission reductions or carbon stock enhancements. Proponents agree that what is needed is a functioning monitoring, reporting and verification system as well as agreed reference levels of past and projected emissions (CIFOR, 2009). While considerable advances in remote sensing of forest cover and carbon sequestration modelling have been made in the last decade (Melick, 2010; Seymour and Forwand, 2010), there are still doubts whether carbon emission reductions will be accurately measured and monitored. Capacity deficits in technical, human and financial resources of REDD+ countries that limit consistent and transparent data collection and analysis remain an important challenge. Experience has shown that there are considerable gaps in measuring and monitoring degradation that need to be resolved (Angelsen, 2009; Corbera et al., 2010).

How to finance REDD+ programmes is another significant matter that has not been resolved yet. Much more money to what has already being spent will be required to

flow from developed to developing countries to finance REDD+ in future. For this to materialise a variety of finance sources will be utilised including public funds and private markets (Angelsen, 2009). The common understanding is that funding will vary according to the different phases of implementation. Voluntary carbon markets and bi/multilateral public funds will provide the financial support for REDD+ activities in phase 1 and 2 (Angelsen, 2009). Once in phase 3, money from the international compliance carbon market, which stakeholders utilise to meet legally binding greenhouse gas reductions agreements, could most likely become the main source of finance (Clements, 2010; Corbera et al., 2010).

Although nation states agreed at the latest COP in Warsaw that REDD+ finance should be “adequate and predictable” (UNFCCC, 2014b) uncertainty still remains as to where the money will come from. The Warsaw REDD-plus framework (UNFCCC, 2014c) also recognised the importance of social safeguards and transparency in benefit sharing, and stipulates clear rules on monitoring, reporting and verification of emissions. The principle of free, prior and informed consent has been promoted as one of the most important social safeguards that project stakeholders should adhere to when implementing REDD+ on the ground. Project participants are referred to the ILO Convention 169 and UN Declaration on the Rights of Indigenous Peoples and the principle of benefit-sharing of the Convention on Biological Diversity (UNFCCC, 2013). A number of organisations have started to come up with specific provisions on safeguards that shall guide REDD+ project implementation. Examples are The UN-REDD Programme’s Social and Environmental Principles and Criteria, World Bank Safeguards and Strategic Environmental and Social Assessment, and the REDD+ Social and Environmental Standards.

1.2.3 REDD+ beyond carbon: social and biodiversity aspects

In addition to compensating forest owners for their valuable carbon sequestration services, it has been argued that REDD+ and carbon forestry projects can contribute to social and biodiversity objectives (Corbera and Schroeder, 2011; Ebeling and Yasue, 2008; Harvey et al., 2010; P. D. Hirsch et al., 2011; UN-REDD, 2009). Although REDD+ initiatives remain firmly focused on valuing and financially rewarding carbon stocks in forests (Buizer et al., 2014), the debates have broadened over the years and extended into examining the potentials and risks beyond carbon (Lawlor et al., 2013; Poudyal et al., 2013).

This expansion of the debate thus highlights the longstanding knowledge that forests are important to humans and nature for more than their carbon sequestration functions (MEA, 2005). It is well known that forests are critical for all life on earth as they provide us and other species with a range of “ecosystem services” (MEA, 2005). However, some of these benefits are in harmony and others in conflict with carbon sequestration.

For instance, although proponents of REDD+ have argued that it has the potential to deliver biodiversity co-benefits (Gardner et al., 2012; Harvey et al., 2010; Phelps et al., 2012; Pistorius, 2012), also the opposite has been suggested (Phelps et al., 2012; Potts et al., 2013). Trade-offs between carbon and biodiversity can emerge due to fundamental ecological differences between the two (ibid). Critics suggested that REDD+ projects are likely to target carbon rich forests leaving aside more biodiversity rich landscapes (Venter et al., 2010). As a potential solution to this problem the concept of decoupling, understood as the “optimally locating both carbon and biodiversity services on a landscape in a spatially explicit manner”, has been recently presented (Phelps et al., 2012; Potts et al., 2013, p. 3).

Similar debates exist with regard to the livelihood consequences and social benefits of REDD+. Many supporters of REDD+ suggested that the mechanism could contribute to climate mitigation and socio-economic development (Angelsen, 2008; Ebeling and Yasue, 2008; Kanowski et al., 2011; Lawlor et al., 2013). One argument goes that REDD+ can provide significant amounts of money desperately needed by developing countries to promote socially beneficial forest protection (Kanninen et al., 2007). The implementation of REDD+ projects can provide a range of development benefits including employment (Lawlor et al., 2013), additional or more diversified income (Lawlor et al., 2013; Mahanty et al., 2013b; Swallow and Goddard, 2013; Wunder and Albán, 2008), infrastructure development (Lawlor et al., 2014; Mahanty et al., 2013), better governance and democratisation (Joshi et al., 2013; Kanowski et al., 2011; Poudyal et al., 2013), improved knowledge, capacity and understanding of conservation values (Palmer Fry, 2011).

Engel et al. (2008) and Kinzig et al. (2011) warned against creating hopes of poverty alleviation and development benefits from REDD+ implementation as payments for

ecosystem schemes are primarily conservation strategies and should not be overburdened with social and economic objectives that they cannot fulfil. This perspective has been criticised by Corbera and Pascual (2012) who point out that one cannot ignore questions over distributional and procedural issues when designing and implementing PES in developing countries as this would risk delegitimizing the mechanism, which could be counterproductive for its conservation effectiveness.

REDD+ and forest carbon initiatives have received much criticism from the moment of their inception for their potential negative social results. Critics highlighted from the outset that restrictions of access and use to forests for the protection of carbon could cause significant livelihood losses and hardship to forest communities. REDD+ projects could cause unjust alienation of local people from forests to allow powerful conservation organisations, states and corporations to benefit from the new carbon-revenue stream (Griffiths, 2009; Lawlor et al., 2013; Lovera, 2009; No REDD, 2011; Phelps et al., 2010).

Empirical evidence has confirmed the legitimacy of these fears. A recent review by Lawlor et al. (2013) shows that some projects resulted in population resettlements and restricting use and access for sub-populations. In a paper volume produced by non-governmental organisations (all openly critical of REDD+) it was also stated that REDD+ preparations in Kenya resulted in the forced displacement of more than 1,650 Ogiek families since November 2009 (No REDD, 2011). Another widely reported story by Oxfam International concerned the eviction of over 22,000 people from the Mubende and Kiboga districts in Uganda to make way for a carbon project (Grainger and Geary, 2011).

Studies have also shown that with some projects the carbon benefits received do not cover the foregone opportunity costs of avoided land use activities (Evans et al., 2014; Mahanty et al., 2013b; Nelson and de Jong, 2003; Palmer and Silber, 2012). To avoid becoming “poverty reproducers” (Wollenberg and Springate-Baginski, 2009) some scholars have argued that REDD+ should provide additional income, alternative livelihoods, and security over land tenure and local resource rights to communities. In addition long-term pathways out of poverty must be created and communities must be assisted to reduce the pressure of deforestation (Evans et al., 2014).

In this situation of potential positive and negative effects, several scholars have thus suggested to think of REDD+ in terms of trade-offs (Bottazzi et al., 2014; Buizer et al., 2014; Evans et al., 2014; Hirsch et al., 2011; Visseren-Hamakers et al., 2012). Instead of win-win-win rhetoric scholars are encouraged to use critical trade-off analysis to determine the winners and losers of REDD+ and similar conservation interventions (ibid).

1.2.4 Governing people, forests and carbon

How REDD+ interventions distribute costs and benefits across different stakeholders crucially depends on governance decisions and practices on the ground. Therefore, a growing number of scholars have argued that more attention needs to be paid to governance issues when examining REDD+ (Agrawal et al., 2010; Chhatre et al., 2012; Corbera and Schroeder, 2011; Evans et al., 2014; Lederer, 2012; Ribot and Larson, 2012). ‘Governance’ in the context of REDD+ means ‘who gets to decide what about forests, and how’ (cf. Cotula and Mayers, 2009). Given that tropical forest loss and degradation is deeply rooted in social, political, economic and ecological processes that operate at local, national and global scales (Geist and Lambin, 2001; Seymour and Forward, 2010), governance and institutional factors become decisive in shaping forest management and use (Ostrom and Nagendra, 2006). Corbera and Schroeder (2011:90) state:

REDD+ is a governance process with multiple actors, interests and activities, involving several sources of formal and informal power and authority (UN bodies, multilateral organisations, governments, but also community and indigenous organisations), which all influence each other and may or may not coincide in their interests and vision regarding how such strategy of forest and climate governance should actually look like in the near future.

This is important to recognise because as a form of governance REDD+ shapes how the problem of tropical deforestation and degradation is framed as well as the possible solutions (Thompson et al., 2011). Thompson et al. (2011) describe how REDD+ derives its legitimacy to govern over a number of different actors and stakeholders and transform a number of objects including land cover, livelihoods activities, ecosystem services and governance capacities in a variety of different settings by linking itself to the broader concern for global wellbeing in the sense of mitigating global climate change.

Many scholars have emphasised that for the mechanism to obtain local legitimacy it must provide equitable and just outcomes, adhere to good governance practices, promote inclusive policies, institutional frameworks, transparency and address corruption (Corbera and Schroeder, 2011; Kanowski et al., 2011; Larson and Petkova, 2011). In fact ‘good governance’ has become one of the most highlighted issues around REDD+ since implementation activities started. In 2010 all member states of the UNFCCC agreed in their negotiations during the COP16 in Cancun, Mexico, that for REDD+ to succeed in conserving forests and providing its co-objectives, a participatory democratic inclusion of the many stakeholders associated with and affected by forest governance is absolutely crucial. In particular the agreement confirms the necessity to show “respect for the knowledge and rights of indigenous peoples and members of local communities” and “the full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities” (UNFCCC, 2011).

Governance includes a variety of issues but highly important to REDD+ are questions around tenure and local participation (Chhatre et al., 2012). Tropical forests tend to be in remote areas where rural people’s property rights over land and forests are often not clearly defined, recognised and enforced. Project implementers have thus been confronted with issues around unclear tenure over forests and forestland across the South when designing REDD+ interventions (Naughton-Treves and Wendland, 2014).

Secure land tenure is suggested to be a key factor in ensuring equitable and effective REDD+ outcomes (Chhatre et al., 2012; Larson et al., 2013; Naughton-Treves and Wendland, 2014). Sunderlin et al. (2014) state that a variety of efforts are underway to address tenure insecurity including participatory mapping, boundary demarcations, clarification of formal tenure rights, regularization, strengthening the legal basis for community-based forest management, and defending against external claims on land within project boundaries.

Local participation of forest communities in designing and implementing REDD+ is further regarded to be a necessary requirement to achieve equitable, efficient and effective conservation on the ground. Many scholars have expressed their support for decentralised and locally owned forest management regimes to avoid cases of social injustice (Agrawal and Angelsen, 2009; Chhatre et al., 2012; Ribot et al., 2010;

Sandbrook et al., 2010). For decades community-based forest management (CBFM) has been promoted as the best means of preventing alienation while delivering multiple socio-ecological outcomes. The premise underlying these reforms is that sustainable management is most likely to occur where local users are able to manage and extract benefits from natural resources (Chhatre and Agrawal, 2008; Ostrom and Nagendra, 2006; Ribot et al., 2010). Decentralized forest management is also understood as a way to promote a broader democratisation process in developing countries, with positive outcomes for the performance of local governance institutions (Wily and Dewees, 2001; Wily, 2001). Prominent scholars have argued that CBFM can help sequester carbon without adversely affecting the equity benefits for local communities (Agrawal and Angelsen, 2009; Chhatre and Agrawal, 2009; Larson and Petkova, 2011).

1.2.5 REDD+ in Tanzania

Forests are of great importance to Tanzania's 45 million citizens. According to a World Bank study, rural populations derive significant forest services most of which are unaccounted for in official statistics but estimated to be equivalent to 10 to 15 percent of the country's gross domestic product or between 35 USD and 50 USD per capita per year. When placed in relation to a gross national income per capita of about 350 USD, one can easily see the importance of forests as a livelihood source. It was also estimated that forests provide around 90% of the country's energy supplies, 75% of building supplies and 100% of traditional medicines (World Bank, 2008a).

The country has vast forest resources. In total, Tanzania mainland has about 33.4 million hectares of forests, covering just below 40% of its 88.6 million ha large landmass. Out of the 33.4 million ha forests, woodlands cover about 90%, the rest are mangrove forests, montane forests, small patches of coastal forests and plantations of softwood and hardwood (URT, 2013). Of the total forest area 16 million ha are reserved forests, 2 million ha are in national parks and the remaining 15.4 million ha are unprotected forests found in Village and General lands, which is generally open-access land (ibid).

According to official statistics the country is experiencing considerable rates of deforestation and forest degradation. The FAO data, to which governments generally refer to, use satellite imageries from different time periods, which suggest that the country loses an average of 403,000 ha of forests (>1% of remaining forest area) each

year (URT, 2013). The average amount masks of course regional differences: coastal forests and miombo woodland are seen to have declined by something closer to 7% and 13% respectively, compared to estimated forest decline in the Eastern Arc Mountains of around 1%. The degradation of forests plays an equally important role in Tanzania, but it is even less understood than deforestation (Burgess et al., 2010).

Deforestation and forest degradation are taking place both in reserved and unreserved areas, although the latter seems to be much more affected. Official accounts from the Government of Tanzania (URT, 2013) mention settlement and agricultural expansion, uncontrolled wild fires, timber extraction, intense livestock grazing, industrial development, firewood and charcoal production, refugees, illegal mining and most recently large scale agriculture of bio-fuel production as direct and indirect drivers of land-use change in the country. The most significant factors are suggested to be “shifting cultivation”, timber extraction, firewood/pole gathering, charcoal production and overgrazing. Other research (Ahrends et al., 2010) has documented that the impact of urban growth is a significant factor driving forest degradation.

The Tanzanian government together with several conservation NGOs have recognised the relevance of REDD+ to the country at an early stage, and have played an important role in initiating dialogue, building institutional capacity and implementing pilot-projects. A National Climate Change Steering Committee, a National Climate Change Technical Committee, and a National REDD+ Task Force were established (URT, 2013). The country has received significant funding from Western governments to facilitate the institution and capacity building process of REDD+. The Norwegian government has been especially active, committing 500 million Norwegian Kroner (around 80 million USD) directly or via the UN-REDD Programme to the country, while additional smaller contributions came from the governments of Finland and Germany, and the World Bank’s Forest Carbon Partnership Facility. In addition, several conservation NGOs, who have been active in the country before, have rearranged their budgets and programmes to include REDD+ in their stated activities (Burgess et al., 2010). In collaboration with the private sector, universities, local and central governments and international organisations, eight non-governmental organisations received official funding from the Government of Norway to implement REDD+ demonstration projects (Table 1.1 and Image 1.1). Tanzania has thus recorded the

greatest number of sub-national REDD+ demonstration projects in any African country (Lin et al., 2012).

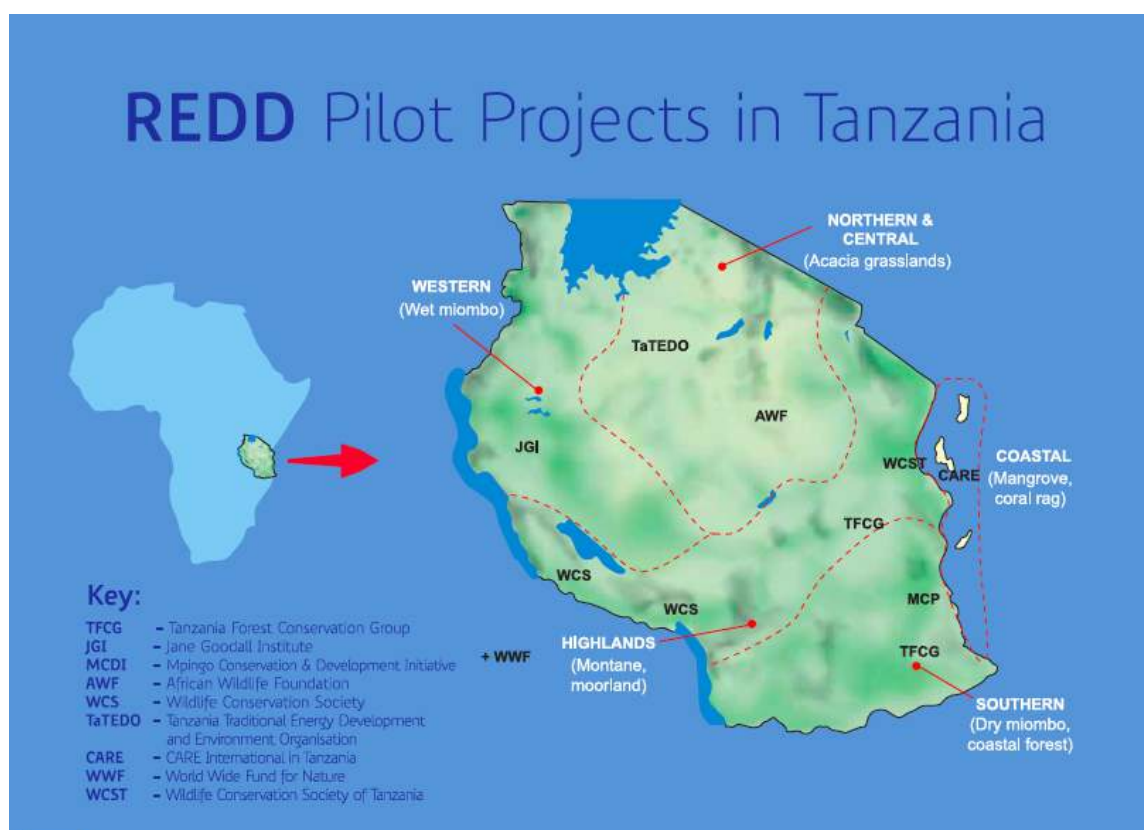
Table 1.1 Official REDD Pilot Projects in Tanzania

Facilitating NGO / Project Name	Timeline and budget	Scope	Actions
African Wildlife Foundation Advancing REDD in Kolo Hills Forests (ARKFor)	4 years, 2.56 m USD	21 villages and 71,632 ha of mixed land uses including 19,924 ha of forest	assessing carbon and other benefits; enhancing REDD+ understanding; improving land and forest management; developing benefit sharing mechanisms; supporting livelihoods alternatives, including better agricultural practices
Care Tanzania Hifadhi ya Mis-itu ya Asili (HI-MA) / Piloting REDD in Zanzibar through Community Forest Management	4 years 5.5 m USD	60,000 ha forest and 16,000 rural households across 29 sites	Promotes Community Forest Management (COFM) through: Addressing drivers; Improving governance, including equitable benefit sharing; Ensuring poor benefit and are not further disadvantaged; Controlling leakage, e.g. domestic woodlots and income generating alternatives; Mainstreaming gender
Jane Goodall Institute Building REDD Readiness in the Masito Ugalla Ecosystem Pilot Area in Support of Tanzania's National REDD Strategy	3 years 2.8 m USD	90,989 ha of forest under varied ownership between 15 villages	Facilitating establishment of: inter-village CBOs to manage forests, replicable and scalable remote sensing method, community and CBO capacity to monitor carbon stocks, and community mechanism for equitably sharing carbon revenues; Expected outputs include 90,989 ha conserved forest, sequestering 55,000 MTeCO ₂
Mpingo Conservation and Development Initiative (MCDI)	4 years 1.9 m USD	Southern Tanzania, with expected 50,000 ha of conserved forest	MCDI aims to use REDD+ revenue to overcome start-up costs for PFM and FSC certification (combining REDD+, PFM and FSC) Expected outcomes sequestering 50,000 MtCO ₂ e, and providing economic benefits to approximately 18,000 people
Tanzania Forest Conservation Group (TFCG) and Community Forest Conservation Network of Tanzania (MJUMITA) Making REDD Work for Communities and Forest Conservation in Tanzania	5 years 5.9 m USD	215,000 ha of forest and 51,000 beneficiaries across two biodiversity hotspots and 36 villages	Assisting communities to market emission reductions generated through interventions that aim to address the main deforestation drivers including PFM, improved agriculture, improved forest governance and land use planning; National and international advocacy on REDD+ policy
Tanzania Traditional Energy Development and Environment Organization (TaTEDO) Community-Based REDD Mechanisms for Sustainable Forest Management in Semi-Arid Areas	4 years 2.1 m USD	11 villages working with 250 forests (10-50ha each)	Aggregation of forest/ Ngitili owners to facilitate REDD+ implementation and access to carbon markets; build local community capacity on MRV and carbon market access; develop participatory benefit sharing mechanism; and address drivers, including energy efficient technologies and improved land use practices. Expected outcomes include 2,500 ha conserved forest, 108,285 MTeCO ₂ , with 6,000 local beneficiaries

<i>Table 1.1 (cont) Official REDD Pilot Projects in Tanzania</i>			
Wildlife Conservation Society (WCS) REDD Readiness in Southwest Tanzania	4 years 1.2 m USD	In and around protected areas (PAs) in four forests in Southern Highlands (52,680 hectares)	Baseline study, Provide methods for estimating degradation, deforestation, carbon sequestration, emissions, leakage; Provide carbon data; Demonstrate appropriate tools for implementing and monitoring REDD+; Estimate expected emission reductions levels; Provide economic incentives (and address drivers), reaching at least 50,000 people, including benefit sharing, environmental education, and alternative forest resource provision
Wildlife Conservation Society of Tanzania (WCST) Piloting REDD in the Pugu and Kazimzumbwi Forests	4 years 3.9 m USD	Pugu and Kazimzumbwi forest reserves (7,272 ha)	Improving forest management through complementing central government's management and engaging adjacent communities

Image 1.1 Official REDD Pilot Projects in Tanzania

Source (URT, nd)



National and international researchers have been busy measuring the amounts of carbon stored in Tanzania's forests and woodlands. Global data sets have been used to calculate carbon storage for a number of regions in the country. Efforts have been made by the Finnish funded National Forest Resources Monitoring and Assessment of Tanzania

(NAFORMA) Programme, which was supported by the UN-REDD Programme, to train national technicians in remote sensing, satellite image interpretation and forest mapping to enhance measuring, reporting and verification capacities in the country. In addition, NAFORMA has been undertaking a National Forest Inventory based on field samples, collecting information regarding biophysical, environmental and socio-economical parameters (FAO, 2013). Locally based monitoring systems are also envisaged as a cost-effective means to collect and interpret data on forest and carbon change as well as on social and governance aspects (Burgess et al., 2010; Mukama et al., 2011).

Across the REDD+ demonstration projects the NGOs are involved in addressing capacity issues related to forest carbon assessments, involving communities in participatory forest management and identifying alternative livelihood strategies. A key element of REDD+ initiatives in the country are attempts to speed up the process of decentralising forest management, which started in the early 1990s when progressive laws, policies and institutional frameworks were adopted (URT, 2013).

1.2.6 REDD+ in Lindi

In Lindi Region of Tanzania there are currently three REDD+ interventions carried out. Two of them are official REDD+ pilot projects that are financed by the Government of Norway under the REDD+ programme. They are “Mpingo Conservation and Development Initiative” in Kilwa district and “TFCG/Mjumita Making REDD work for communities and forest conservation in Tanzania” in Lindi rural district and Kilosa district (Morogoro Region). The third REDD+ initiative takes place in the Angai village land forest reserve (AVLFR) in Liwale. It was initiated by Finnish researcher, Dr. Mustalahti, and builds on a long history of Finnish development assistance in establishing community-based forest management in Liwale. The current development partnership programme between Finland and Tanzania in Lindi region is called LIMAS (Lindi Mtwara Agribusiness Support) and runs from 2010 to 2014.

The three above-mentioned REDD+ projects have all highlighted the role of “shifting cultivation”, logging and fire as the major drivers of deforestation and forest degradation in the project areas and wider region (Forrester-Kibuga and Samweli, 2010; Mpingo, 2013; Mukama et al., 2011). In order to increase local support of forest protection, the project stakeholders of these three REDD+ projects stated that the most important drivers of forest destruction must and will be addressed. While “Mpingo

Conservation and Development Initiative” decided to focus on fire management techniques to reduce the impact of uncontrolled fire on forested land (Mpingo, 2013), the project proponents of “TFCG/Mjumita Making REDD work for communities and forest conservation in Tanzania” began to introduce Conservation Agriculture in the villages to address “shifting cultivation” (TFCG, 2012). Conservation Agriculture is also a main aspect of the ongoing LIMAS programme in the Angai villages of Liwale (LIMAS Newsletter, 2013).

Conservation Agriculture represents the chosen technology to reconcile agricultural growth with forest protection. In promoting Conservation Agriculture techniques LIMAS and TFCG project staff hope to convince villagers to stop opening up new farms in order to decrease the pressure on forests. Simultaneously they promise that agricultural productivity still increases, allowing farmers to meet future food demands and pursue economic development opportunities (LIMAS, 2010; TFCG, 2012). In introducing Conservation Agriculture into the villages they join a powerful alliance of global development actors who have been actively promoting this technology as the most promising solution to Africa’s agricultural development challenge (Baudron et al., 2012; Giller et al., 2009; Kassam et al., 2009).

Because my dissertation is based on research in the Angai village land forest reserve in Liwale and in TFCG/Mjumita’s REDD+ project in Lindi rural district I will briefly describe these two interventions in the next section. In addition a brief overview of the two projects is provided in Table 1.2 below.

Table 1.2 Overview of the two studied REDD+ initiatives

	REDD+ initiative in the Angai village land forest reserve (AVLFR)	TFCG/Mjumita REDD+ Project
Key actors involved	<p>Dr. Irmeli Mustalahti</p> <p>National and international researchers</p> <p>Clinton Climate Initiative</p> <p>Ministry of Foreign Affairs of the Government of Finland</p> <p>Liwale District Council</p>	<p>Tanzania Forest Conservation Group (TFCG)</p> <p>Community Forest Conservation Network of Tanzania (MJUMITA)</p> <p>Ministry of Foreign Affairs of the Government of Norway</p> <p>Lindi Rural District Council</p>
Timeline	<p>Rural Integrated Project Support (RIPS) (1988 – 2005)</p> <p>PFM & REDD+ research by Dr. Mustalahti and national and international researchers (2005-)</p> <p>Clinton Climate Initiative (2009-10)</p> <p>Lindi Mtwara Agribusiness Support (LIMAS) (2010-14)</p>	<p>REDD+ project „Making REDD work for communities and forest conservation in Tanzania“ (2009-2014)</p>
Key strategies	<p>RIPS: CBFM in all 24 villages surrounding the Angai Forest</p> <p>Dr. Mustalahti research project in 3 villages: linking participatory forest management with REDD+ payments</p> <p>LIMAS: CBFM, Sustainable timber harvesting (FSC) coupled with REDD+ payments</p> <p>Conservation Agriculture</p>	<p>CBFM & REDD+ across two biodiversity hotspots with 215,000 ha of forest in 36 villages with approximately 51,000 beneficiaries</p> <p>REDD+ payments</p> <p>Conservation Agriculture</p>
Funding arrangements	<p>RIPS Phase III (1999-2005): 7.46 million EUR & LIMAS: 9 million EUR from the Ministry of Foreign Affairs of the Government of Finland</p> <p>PFM & REDD+ research: Academy of Finland (271,700 EUR)</p> <p>Additional funds from Clinton Climate Initiative, Danish and Tanzanian governments</p>	<p>5.9 million USD from the Ministry of Foreign Affairs of the Government of Norway</p>

1.2.6.1 REDD+ in Angai village land forest reserve

The contemporary efforts to implement REDD+ in Angai village land forest reserve build on previous interventions by Finnish development assistance directed at establishing community-based forest management in Liwale district. Finland and Tanzania have had a long development cooperation relationship particularly in the Lindi Region and Liwale district (Seppälä and Koda, 1998; Sundström, 2010). In 1993-94 the Liwale District Council proposed to the Finnish aid programme RIPS (Rural Integrated Project Support; a development cooperation programme for the period of 1988 to 2004) the establishment of a Local Government Forest Reserve in the Angai² forest. While RIPS programme staff liked the idea of institutionalising sustainable forest management, their focus on participatory development drove them to support community centred approaches to forest management instead (Johansson, 1996 in Mustalahti, 2007). However, between the years 1994 and 2000 efforts by RIPS staff to create consensus with the district over the establishment of a community forest reserve were largely unsuccessful, because of resistance from Liwale District Council to formal loss of power and considerable income from logging operations (Mustalahti and Lund, 2010; Mustalahti, 2007).

Only in the year 2000, with the help of a new and ambitious development worker (Irmeli Mustalahti) and in a context of favourable changes in national forestry policy and law, a consensus on the ownership and management of the Angai forest was reached. The District agreed to the establishment of an Angai Village Land Forest Reserve (AVLFR)³ that should be managed jointly by all villages under a joint village forest management committee (Mustalahti, 2007). After the 13 villages surrounding the Angai forest applied in the same year for the demarcation of the forest reserve and village boundaries, they finally obtained village land certificates and therefore legal tenure over their village land and forest reserves in 2005 (Mustalahti, 2007). The AVLFR covered a total area of 139,420 ha and is since then owned by 24 villages (most of the previous 13 villages split in recent years) surrounding the Angai forest. In the village of Mihumo/Darajani 11,792 hectares of forests were set aside under the village land forest reserve, which covers around 40% of the entire village land (29,555 ha).

² The name Angai, which means “poisonous roots”, (Mustalahti, 2007) summarizes a vast range of forests, each having its own ‘local’ name such as Mbobole, Majuni, etc. (M Interview 10)

³ Please see Appendix XI for information on village land forest reserves in Tanzania.

In support of the village's efforts in negotiating and managing the village land forest reserve with the district, RIPS decided to initiate an intervillage union called MUHIMA (*Muungano wa Hifadhi ya Msitu wa Angai*). Between 2007 and 2008, several institutions including the Tanzanian National Forest Programme, the Danish international development agency DANIDA and the Ministry of Foreign Affairs in Finland provided technical and financial support to the Liwale District Council and the villages to prepare workable forest management plans and bylaws (Mustalahti and Lund, 2010).

In 2009 Dr. Irmeli Mustalahti (then in her capacity as a post-doctoral researcher) started an international participatory action research project titled "The role of Participatory Forest Management in Mitigation of and Adaptation to Climate Change: Opportunities and Constrains"⁴. The research was specifically concerned with the idea of combining forest decentralisation with REDD+ efforts to promote sustainable and poverty alleviating forest management. Through the efforts by Dr. Mustalahti and her colleagues, the idea of accessing forest carbon to promote sustainable forest management in Liwale had gained further support by the National Forestry and Beekeeping Division, Liwale District Council, the Clinton Climate Initiative, the International Union for the Conservation of Nature and other research/University partners.

The Clinton Climate Initiative selected the Angai forest from a pool of 70 potential sites to support community-based forest management linked with REDD+ based carbon payments and FSC timber harvesting (CCI, 2011). However, Clinton Climate Initiative's proposal to include Liwale as an official site for REDD+ piloting was not supported by the Norwegian embassy. Because of the complicated and conflict-ridden history of the Angai forest and the many other actors already involved they found the proposal not suitable for testing the REDD+ approach (personal communication, 2011). This had negative consequences and significant amounts of finance became unavailable to project developers in Liwale. Despite this, project staff from CCI continued to participate in REDD+ efforts led by Dr. Mustalahti and her national and international research colleagues. Nevertheless, much uncertainty prevailed about the future of REDD+ in Angai, about possible funding sources and the potential to sell forest carbon.

⁴ For the project website see: <http://blogs.helsinki.fi/tzredd-actionresearch/>

To take REDD+ implementation forward Dr. Mustalahti and her colleague Dr. Zahabu approached the UN-REDD programme as well as the project staff of LIMAS, which is a new Finnish led development programme that started in Liwale in 2010. LIMAS (Lindi and Mtwara Agribusiness Support)⁵ is a five-year programme aimed at increasing agricultural productivity, business opportunities and forest management in selected districts in Lindi and Mtwara regions. Among the options to generate more income from forestry the LIMAS project mentions the sale of forest carbon credits (LIMAS, 2010). It was agreed that project developers would focus on establishing community-based forest management first and then examine the potential of linking REDD+ payments to sustainable forest management practices.

1.2.6.2 TFCG/Mjumita REDD+ project

On 6th November 2009 the Norwegian Embassy launched the “TFCG/Mjumita Making REDD work for communities and forest conservation in Tanzania”⁶ as the first REDD+ pilot project in Tanzania. The TFCG/Mjumita REDD+ project is a five-year partnership between the Tanzania Forest Conservation Group (TFCG) and Community Forest Conservation Network of Tanzania (Mjumita). The project aim is to “reduce greenhouse gas emissions from deforestation and forest degradation in Tanzania in ways that provide direct and equitable incentives to communities to conserve and manage forest sustainably”. It thus “aims to demonstrate at local, national and international levels, a pro-poor approach to reducing deforestation and forest degradation by generating equitable financial incentives from carbon finance sources for communities that are sustainably managing or conserving Tanzanian forests at community level”. Through a community carbon enterprise voluntary emissions reductions shall be aggregated and sold according to international standards (TFCG, 2009a).

The project staff used the first half of 2010 to identify appropriate project sites for REDD+ interventions. On the basis of various criteria Lindi rural and Kilosa districts were selected as the two areas, where activities began to demonstrate the potential of REDD+. By 2013 the project is implemented across 36 villages located in these two districts with a total area of 373,200 ha, and a total forest area of 215,000. In Lindi rural district the project includes 17 villages with a project area of 120,000 ha and a forest

⁵ For the project website see: <http://www.limas.or.tz/limas/>

⁶ For the project website see: <http://www.tfcg.org/makingReddWork.html>

area of 75,000 ha. In Ruhoma villagers set aside 2,488 hectares of forest under the newly established village land forest reserve, which covers around 65% of the entire village land (3,817 ha) and 88% of all forests in the village. While DANIDA had financed PFM activities in Lindi rural and Kilosa districts (UTUMI) from 2000 to 2003, many villages had not been part of this programme, thus no PFM related activities had taken place before the arrival of the TFCG/Mjumita project.

1.3 Research rationale

1.3.1 Research approach and objectives

Arguably REDD+ is more than just a mechanism that transfers money from the North to South for the protection of forest carbon. From the literature review above we learnt that REDD+ should be seen as a governance project (Thompson et al., 2011; Corbera and Schroeder, 2011) that has the potential to “induce transformational change that overcomes business-as-usual practices” (Korhonen-Kurki et al., 2014). It sets out to transform “discourse, attitudes, power relations, and deliberate policy and protest action that leads policy formulation and implementation away from business as usual policy approaches that directly or indirectly support deforestation and forest degradation” (Brockhaus and Angelsen, 2012, pp. 16–17). In doing so it affects the livelihoods of various forest stakeholders on the ground resulting in winners and losers of the changes in forest governance and management. As a value laden transformational process, which prioritises forest carbon protection and enhancement over forest conversion, it confronts resistance, conflicts and power struggles over land and natural resources from global to local scales (Corbera and Schroeder, 2011).

These counter processes have the potential considerably to transform REDD+ at the local level and making it, like we experienced with many other international policies too, look very different to its initial design (cf. McAfee and Shapiro, 2010). REDD+ projects will be reshaped at the village level depending on traditions, cultures, political-economic relations, socio-economic systems and ecological processes. Scholars therefore call for more studies that consider how the local context specific factors, discourses and processes shape REDD+ design and implementation on the ground (Evans et al., 2014; Corbera and Schroeder, 2011; Sandbrook et al., 2010; Hirsch et al., 2011). Working within the field of environmental governance they have suggested that it is essential to analyse 1) how power and political processes come to shape its design and actual implementation and 2) consequently how gains and losses are distributed and

allocated, with a focus on the influence of social identities, and emerging stakeholder conflicts in particular places.

From the literature review above it is apparent that there is an intense debate about the local livelihood consequences of REDD+ initiatives. While proponents like to emphasise the potential economic, environmental and social benefits of REDD+ projects, critics have warned against restrictions to forest resources that are critical to the livelihoods of poor forest dwellers. In this dissertation I respond to this concern by empirically examining the observed and potential effects of REDD+ initiatives on local livelihoods in Lindi, Tanzania. I do so by posing the following research question:

Research question 1: How do REDD+ initiatives interact with local livelihood strategies in Lindi, Tanzania?

It has also been outlined above that governance reform is a critical element of REDD+ initiatives around the world. Since REDD+ projects aim to change how forest stakeholders manage and use forestland and resources, they have to engage with existing institutions – both formal and informal – governing human-forest relations. Proponents specifically highlight the importance of reforming tenure regimes over forests, ideally giving local stakeholders more control over their resources. However, research from development theory and practice has shown that governance reforms do not easily change the actual practices of institutions as they are deeply embedded in social relations of power and politics (Hickey, 2013, 2012a). My dissertation aims to respond to these issues of governance, tenure and local participation in REDD+ projects by posing the following research question:

Research question 2: How do REDD+ initiatives interact with local forest governance in Lindi, Tanzania?

In order to reduce deforestation and forest degradation REDD+ initiatives set out to transform the primary drivers of land use change in the region. On the one hand this will be attempted by institutional reforms towards community-based forest management and by offering financial incentives for the protection and enhancement of forest carbon, which should cover the opportunity costs foregone from agriculture. On the other hand project proponents will aim to change local perceptions, opinions and discourses over

the value and benefits of forests to promote conservation friendly ways of land use. This also includes the introduction of new technology such as Conservation Agriculture that aims to change how farmers make use of agricultural land. While my study design and personal skills do not allow an examination of the ecological potentials and pitfalls of Conservation Agriculture, my research aims to provide important insights into the socio-economic processes and factors that may hinder or promote its adoption. Knowledge of Conservation Agriculture is critical to understanding the future potential and performance of community based forest management and REDD+ since agricultural expansion, which Conservation Agriculture aims to mitigate, is the single most important driver of land use change in the villages, region and Africa at large. In this dissertation I will carry out a critical examination of the efforts that aim to address the drivers of land use change by responding to the following research question:

Research question 3: How do REDD+ initiatives aim to address the drivers of land use change in Lindi, Tanzania?

From the above research questions it becomes apparent that the primary objective of my thesis is not narrowly to test the effectiveness of REDD+ in terms of reducing deforestation and forest carbon protection. Instead, through my research I aim to ask critical questions about the nature of REDD+ interventions, the socio-political and economic processes that come with it, and how local contexts and practices shape their outcomes. This, I hope, will also shed some light on the potential ‘success’ of REDD+ to protect forests and contribute to climate mitigation. More so, however, I hope to contribute to a better understanding of the development effects of REDD+ initiatives and what this could mean to broader debates on development theory and practice. I therefore pose a fourth, and last, research question that builds on the insights from the previous ones to ask:

Research question 4: What is the significance of my findings about REDD+ initiatives in Lindi, Tanzania to broader debates on development theory and practice?

1.3.2 Main and subordinated research questions

In order to further specify my main research questions I will add the following sub-questions.

Research question 1: How do REDD+ initiatives interact with local livelihood strategies in Lindi, Tanzania?

- What are the most important livelihood strategies in the villages?
- How are local livelihoods linked to land use (change)?
- What are the benefits and losses from REDD+ in the village?
- How are the livelihoods of different village groups affected by REDD+?

Research question 2: How do REDD+ initiatives interact with local forest governance in Lindi, Tanzania?

- How do REDD+ initiatives envisage rural villagers should govern their forests?
- How do local power⁷ struggles and politics⁸ shape the design and implementation of REDD+ and forest governance at the village level?
- How do REDD+ initiatives interact with local tenure regimes?
- How do local villagers participate in REDD+ initiatives?

Research question 3: How do REDD+ initiatives aim to address the drivers of land use change in Lindi, Tanzania?

- How do REDD+ initiatives change local villagers' perceptions of farming?
- What discourse is promoted in the course of introducing REDD+ in Lindi, Tanzania?
- What are the impacts of introducing Conservation Agriculture on farming behaviour in the villages?

Research question 4: What is the significance of my findings about REDD+ initiatives in Lindi, Tanzania to broader debates on development theory and practice?

⁷ I refer to Barnett and Duvall (2005, p. 42) who conceptualise 'power' as „the production, in and through social relations, of effects that shape the capacities of actors to determine their circumstances and fate“. They distinguish between four types of power: (1) Power as relations of interaction of direct control by one actor over another (compulsory power). (2) The control actors exercise indirectly over others through diffuse relations of interactions (institutional power). (3) The constitution of subjects' capacities in direct structural relation to one another (structural power). (4) The socially diffuse production of subjectivity in systems of meaning and signification (productive power).

⁸ I draw on insights from Hickey (2013, p. 4) who builds on Leftwich's (2004) definition of politics as „all the processes of conflict, co-operation and negotiation on taking decisions about how resources are to be owned, used, produced and distributed“ but also highlights the struggle over ideas as a fundamental element of politics.

- How do REDD+ initiatives intend to contribute to development?
- How do REDD+ initiatives actually contribute to development?
- What type of development do REDD+ initiatives result in?

1.3.3 Thesis structure

Following this introductory chapter I will proceed to present the theoretical framework that underlines my investigation. REDD+ aims to reduce deforestation and forest degradation by putting a financial exchange value on the carbon sequestration services of forests. REDD+ is therefore an example of so-called payments for ecosystem services schemes. I will begin my theoretical framework by discussing the theoretical and practical assumptions of payments for ecosystem services. I then place payments for ecosystem services and REDD+ within wider debates on the neoliberalisation of nature. To do this I will draw on two bodies of literature. I will first explain the concepts of neoliberalism and neoliberalisations within international development to learn about the common and variegated form of neoliberalisations. In this section I will also highlight neoliberalism's inclusive turn in recent years. Thereafter I draw on insights from the neoliberalisation of nature and more specifically neoliberal conservation to learn more about REDD+ for my study. In the last section I bring the two bodies of literature together and synthesise their arguments about the participatory approach to development/conservation under the name 'inclusive neoliberal conservation'.

The third chapter will present the methods used to answer the research questions set out in the introductory chapter. After discussing some ontological and epistemological considerations related to my research I present the ethnographic approach as my research strategy and describe the justification, selection and characteristics of my selected case study sites. This is followed by information on the schedule and challenges during my fieldwork, a detailed discussion of the qualitative and quantitative methods used to collect data and the logic, assumptions and methods used to analyse the data. I will end this chapter by discussing aspects of reflexivity and ethics of my field research.

The fourth chapter discusses the livelihoods of villagers in Ruhoma and Mihumo/Darajani, specifically with regard to their reliance on land for the production of

crops for food and income. I begin by comparing some data of the livelihoods in the two case study villages with regional and national averages to analyse relative performance regarding poverty and development. I then present information on the amount of cash income villagers generate and the relevance of farm and off-farm income sources to poor, middle-income and wealthy households. After this I concentrate on showing in detail how different wealth groups make use of village land for the production and sale of crops, which is the single most important livelihood activity in the villages. This chapter, and the following chapter five, therefore sets the stage for answering research question 1: How do REDD+ initiatives interact with local livelihood strategies in Lindi, Tanzania?

The fifth chapter builds on the previous chapter to analyse the linkages between livelihoods and REDD+ in the villages. I draw on quantitative survey results and interview data to illustrate the benefits and losses of forest protection. This is complemented by an examination of the REDD+ trial payments in Ruhoma and how they compare to the opportunity costs of crop production. Having presented some of the effects of REDD+ to livelihoods, the final section of this chapter analyses the discourse promoted by development actors to promote forest conservation over agricultural expansion. This chapter contributes to answering research question 1, but it also offers important findings to research question 3: “How do REDD+ initiatives aim to address the drivers of land use change in Lindi, Tanzania?”

The chapters six and seven primarily respond to the research question 2: how do REDD+ initiatives interact with local forest governance in Lindi, Tanzania? The sixth chapter examines the decentralisation of forest management in our two case study villages as a process of territorialisation that aims to shift power from the district and customary institutions to formal village authorities. I will show that territorialisation under neoliberalism is a complex technical and political process that highly depends on state and non-state actors with limited room for villagers to determine the process, despite donor claims of promoting ‘participatory’ development. In illustrating how territorialisation is embedded in local politics and power struggles over votes, land and natural resources I offer important insights to questions of how power and politics shape the emergence of REDD+. My findings clearly show how the commodification of forest carbon is embedded in a local political context that can either accelerate or hinder its implementation.

In chapter seven I analyse how villagers put community based forest management into practice. I first outline in detail the envisaged rules and regulations for the two village land forest reserves by analysing the draft forest management plans and bylaws. Thereafter, I will present findings from my ethnographic fieldwork to discuss the actual performance of the community based forest management institutions. On the basis of participant observation, interviewing and household surveys I will highlight the convergences and divergences between the formal institutions and their practices by villagers on the ground.

In chapter eight I will discuss efforts to promote Conservation Agriculture as the best way to address the drivers of deforestation in the villages. I will specifically focus on the performance of the farmer field school approach to spread knowledge about this new technology. My findings show how Conservation Agriculture is introduced in the villages to reduce deforestation and how this shapes local perceptions of its opportunities and barriers. In explaining how socio-economic and cultural factors constrain the dissemination and adoption of this new technology, I offer important findings to answer research question 3: “How do REDD+ initiatives aim to address the drivers of land use change in Lindi, Tanzania?”

The ninth and last chapter presents the conclusion of my dissertation. It will synthesise the arguments presented throughout my thesis and discuss their relevance to wider debates around REDD+, neoliberal conservation and development. In this way it will aim to answer research question 4: “What is the significance of my findings about REDD+ initiatives in Lindi, Tanzania to broader debates on development theory and practice?” The last section will offer potential avenues for future research.

Chapter 2: Theoretical framework

2.1 Introduction

In this chapter I will present the theoretical framework underpinning my study. I will first introduce the concept of payments for ecosystem services to theorise REDD+. I will discuss the debates around the theoretical assumptions of payments for ecosystem schemes and their applicability in practice. This is followed by an alternative conceptualisation of REDD+ as a process of neoliberalisation. I will analyse neoliberalism and neoliberalisation from two different perspectives. First, I will learn from the debates within international development to make the reader aware of the ‘inclusive’ turn of neoliberalism. Then I turn to literature on the neoliberalisation of nature and more specifically to neoliberal conservation for an analysis of REDD+ and payments for ecosystem services. I synthesise the two bodies of literature to derive at ‘inclusive’ neoliberal conservation as my theoretical framework underpinning the following chapters. At the end I engage with key insights of the literature on rural commons, decentralisation of natural resources and the uptake of agricultural innovation to advance my theoretical framework for the analysis of REDD+ initiatives in Tanzania.

2.2 Payments for ecosystem services (PES)

2.2.1 Conceptualisation of PES

As REDD+ places an exchange value on the carbon sequestration benefits provided by forests, it forms part of a larger conservation ideology called payments for ecosystem services (PES). Corbera (2012, p. 612) recently even described REDD+ “as the world’s largest PES experiment”. PES views ecosystem services, i.e. “the benefits people obtain from ecosystems” (MEA, 2005), as positive externalities, which are currently not paid for and thus not internalised in economic decision-making (Muradian et al., 2010). PES programs try to reverse this market failure by internalising the positive externalities into market or quasi-market exchanges (Muradian et al., 2013, 2010). The creation of new markets in ecosystem services is therefore proposed as the solution to environmental degradation, which is the result of market failure (Muradian et al., 2010). Based on this theoretical understanding proponents of PES argued that these mechanisms would seek out environmental service providers of higher value and lower cost, and are thus more flexible and cost-efficient than state or command-and-control conservation policy in

many situations (Bishop et al., 2008; Engel et al., 2008; Mayrand and Paquin, 2004). In addition PES schemes are thought to deliver the required financial funds that governments lack to promote the conservation of biodiversity, water, carbon, etc. As a new market-oriented instrument it shall create innovative public-private partnerships in order to reverse the trend of “running down natural capital assets” (Gómez-Baggethun et al., 2010). Bishop, chief economist at IUCN, in collaboration with members from Shell International, Forest Trends, Green Horizons and Earthmind.net strongly illustrates this adoration of market-led conservation of nature (Bishop et al., 2008, p. 299):

Conventional approaches to ecosystem management have sought to protect natural resources by taxing business and restraining the market. Such efforts often seem like a rear-guard action, defending nature while retreating in the face of growing economic pressure. There is another way [...] The power of market-based environmental policy is not in doubt; the real challenge is to persuade policy makers, business leaders, and the general public that a range of ecosystem services can be managed effectively, efficiently, and equitably using market-based instruments.

Because of the rapid emergence and adoption of policies promoting payments for ecosystem services across the world, Muradian proposes to think of this as “a paradigm shift in the field of environmental conservation” (Muradian, 2013, p. 1156). What makes PES schemes so different to previous conservation approaches is their performance-based character that relies on conditionality, i.e. “whether the service provider has met the conditions of the agreement”, and additionality, i.e. “the measure of outcomes in relation to what would have occurred in the absence of the intervention” (Sommerville et al., 2009, p. 34). These aspects of PES are vital as they result in the requirement of complex and methodologically challenging monitoring regimes (Corbera, 2012).

With the increasing application of payments for ecosystem services across the world, scholars have observed important deviations between the theoretical propositions and actual experiences on the ground. It has been argued that PES schemes are sometimes not voluntary or that they do not result in payments at the scale of the service provider. Some PES schemes have not established a clear-cut relationship between land use and the provision of ecosystem service and others have failed to meet the criteria of conditionality (Muradian et al., 2010; Sommerville et al., 2009a; Vatn, 2010). Often,

and especially in developing countries, the conditions of full information, clear property rights and competition assumed by the Coasean approach are not met in practice (Muradian et al., 2010). Scholars have therefore developed alternative conceptualisations of payments for ecosystem services to more accurately reflect realities on the ground. Among them are Muradian et al. (2010 p. 1204) who explicitly suggest that PES conceptualisations must pay more attention to “the structural conditions that lead to the lack of well-functioning markets, to trade-offs between equity and efficiency and to the importance of social embeddedness in the design and implementation of PES schemes”.

2.2.2 Poverty alleviation under PES

Payments for ecosystem services as a concept is not only promoted for its nature conservation potential but also as a means to contribute to rural poverty alleviation (Balderas Torres et al., 2013; Pagiola et al., 2005). The provision of additional income and potential co-benefits associated with the PES projects are thought to improve the livelihoods of poor land owners (ibid). Because payments are made to land users, the distribution and ownership patterns of land become decisive factors that shape the poverty impact of PES programmes (Pagiola et al., 2005). Besides direct effects on project participants, PES programmes may also contribute to poverty alleviation through indirect effects including changes in land tenure, labour demand, availability and access to other ecosystem services, strengthening local institutions, building capacity and transferring specific know-how and building infrastructure (Balderas Torres et al., 2013; Pagiola et al., 2005).

Other authors such as Engel et al. (2008) and Kinzig et al. (2011) argued that PES is not primarily thought as a mechanism to alleviate poverty and conservationists should refrain from overburden PES programmes with social and economic objectives they cannot fulfil. This perspective has been criticised by Muradian et al. (2010) who argue that equity and efficiency concerns are closely intertwined in PES schemes and practitioners are confronted with difficult ethical and distributional issues when implementing programmes on the ground. In a direct response to Kinzig et al. (2011) Corbera and Pascual (2012) point out that ignoring questions over distributional and procedural issues when designing and implementing PES in developing countries risks to delegitimize the mechanism and could be counterproductive for its conservation effectiveness. They claim that PES schemes must actively take fairness, participation,

ethical considerations and livelihood consequences into account to avoid contributing to social and environmental injustice.

2.3 Neoliberalism, neoliberalisation and development

2.3.1 Neoliberalism and neoliberalisations

The concept of payments for ecosystem services both in theory and practice has been criticised for signifying neoliberal ideas of environmental governance. To many, especially within the disciplines of development studies, human geography and anthropology, payments for ecosystem services and other market-based conservation policies resemble wider processes described as neoliberalisation of nature or neoliberal environmental governance (Arsel and Büscher, 2012; Brockington and Duffy, 2010a; Büscher et al., 2012; Corbera, 2012; McAfee and Shapiro, 2010; Roth and Dressler, 2012).

The concept of neoliberalism has been used to describe and generally critique contemporary forms of globalisation that restructure societies and environments, making them more unequal and more precarious for the poor (Ferguson, 2010; Harvey, 2005). Thought of it as a political project neoliberalism has been critiqued for its normative political ideologies and discourses that promote notions of free markets, individual freedoms and democracy at the expense of dismantling collective institutions and practices (Murray, 2009; Harvey, 2005). In theory neoliberal ideology is thought to imagine a process of capital accumulation that favours state-authorised market transformations (Peck and Theodore, 2012) of marketisation, commodification, privatisation, de- and reregulation, market proxies in the residual public sector and the construction of flanking mechanisms in civil society (Castree, 2008a). Neoliberalism is therefore a historically specific form of capitalism, which, as a mode of economic production and exchange, is subject to private property, money-mediated markets, commodification (of labour power) and the need of continuous growth for capital accumulation (Castree, 2008a; Harvey, 2011, 2005).

By now the term has been so widely applied in all kinds of contexts that its (mis-)uses over the many years have caused debate within academia whether it remains, or ever was, useful as an exploratory concept (Barnett, 2005; Castree, 2010; Ferguson, 2010; Hilgers, 2013; Peck, 2013). The many applications of the concept, often done in an all-encompassing and totalising way, explaining everything that is bad for the poor or the

world in general, has resulted in some analysts questioning whether we should stop using the word altogether (Ferguson, 2010; Barnett, 2005). However, voices that call for a continuation of the term as an explanatory concept to observed social phenomena remain pertinent (Peck, 2013b; Ferguson, 2010; Hilgers, 2013; Castree, 2010).

A key aspect that has been highlighted in contemporary debates about neoliberalism is to think of it as a process rather than a fixed, monolithic ‘thing’ that hangs over the world ready to conquer more and more places (Castree, 2008; Peck, 2013b). Instead, neoliberalism should be seen as a process comprised of multiple yet interconnected neoliberalisations in the plural that are organised at different spatial and temporal scales (Castree, 2008). Neoliberalisations, as processes of restructuring, therefore always exist among other processes that co-shape its design and outcomes. They never secure a monopoly but always confront resistance and contradictions shaped by context specific factors, actors and relations therefore resulting in “actually existing neoliberalism” (Brenner and Theodore, 2002).

From this we learn that neoliberalism necessarily evolves in a ‘zigzagging course’ producing “chronically uneven spatial development, institutional polymorphism, and a landscape littered with policy failures, oppositional pushbacks, and stuttering forms of malregulation“ (Peck, 2013b, p. 140). But these observed variegated natures of neoliberalism on the ground must not be thought of as incomplete or partial versions of one kind of full or ideal neoliberalism. Instead, they are all part of the whole, which can only be present in ‘conjuncturally hybrid forms’ (Brenner et al., 2010; Peck, 2013).

Neoliberalism is found, almost overwhelming empirical evidence now shows, in all manner of forms and formations, but it can *never* be found in a pristine state, implemented on a *tabula rasa* or social blank slate, in a fashion that is entirely unobstructed or unmediated. And there is no ideal type or institutional template against which hybrids can be singularly evaluated (Peck, 2013 p. 144, emphasis original)

The variegated path of neoliberalisations is therefore “not of manifest destiny but one shaped by opportunistic moments, workarounds and on-the-hoof recalibrations, which in practice often bear little resemblance to the lofty ideals expressed in neoliberal theory” (Peck and Theodore, 2012, p. 179). In summing up, we can say that processes of neoliberalisations remain forever incomplete, contradictory and unevenly realized in an empirically observable world of “actually existing neoliberalism”.

Given all these calls for embracing locality, complexity and variegated nature of neoliberalisations, one could easily forget about the cross-contextual patterns, strategies and disciplines of neoliberal ideologies (Peck, 2013b; Castree, 2008; Harvey, 2005). In observing neoliberalisations embedded in local relations we still need to remember the importance of the extra-local contexts, which make neoliberalisations “more than the sum of its local parts” (Peck and Theodore, 2012, p. 180). This resonates with Perreault and Martin (2005, p. 194) who assert that “Neoliberalism is a multiple and locally experienced process to be sure. It is also, crucially a broader phenomenon that connects as well as differentiates, that globalizes even as it localizes“. Neoliberalisations globalise within extra-local contexts that are shaped, here too not without their contradictions, by a neoliberal ideology that has remained its capacity to evoke and promote its utopian destination of specific socio-economic-cultural transformations (Peck, 2013b, p. 145; Castree, 2010; Harvey, 2005).

2.3.2 ‘Inclusive’ neoliberalism

In global development policy the neoliberal ideology was particularly prevalent in the Structural Adjustment Programmes of the Washington Consensus, which set out to radically transform state-society relations in developing countries from the 1980s onwards (Connell and Dados, 2014; Harvey, 2005; Murray, 2009; Simon, 2008). The radical down-sizing of the state in favour of free trade and export-driven development to serve global markets was presented as the best means to poverty eradication as economic growth was to ‘trickle-down’ to the poorest members of the society (ibid).

With the turn of the millennium, the ideology of neoliberalism underwent an important change within development policy and practice. In the millennium development goals, poverty reduction strategies and world development reports one could see a kind of realisation that unfettered market orthodoxy failed on its own terms, as widespread poverty continues to persist while global inequality has risen to an unprecedented high (Craig and Porter, 2006; Hickey, 2010; Klak et al., 2011; Murray, 2009). Scholars observed an emerging new thinking and practice of international development that some described as ‘inclusive’ neoliberalism (Craig and Porter, 2006), ‘advanced’ liberalism (Abrahamsen, 2004) or even postneoliberalism (Yates and Bakker, 2014).

This new form of neoliberal development policy still centred on promoting global

markets and free trade, as the best ways to increase overall welfare, but it also incorporated social and political reforms to include more parts of society in wealth accumulation (Abrahamsen, 2004; Ballard, 2013; Craig and Porter, 2006; Hickey, 2010). More specifically development policies and reforms were increasingly couched in a language of good governance, democracy, participation, ownership, accountability and so forth that signalled a promise of equitable and just distribution of growth (ibid). The definition provided by Craig and Porter below neatly illustrates the character of ‘inclusive’ neoliberalism as the new basis for development policy:

While retaining core conservative neoliberal macroeconomic and pro-market policy settings, ‘inclusive’ neoliberalism adds ‘positive liberal’ approaches emphasizing ‘empowerment’ to enable participation (and ensure ‘inclusion’) of countries and people in global and local markets. These include: institution building and an enabling state ensuring global market integration; building human capital via services (health, education); empowering and protecting the rights of the vulnerable through participatory voice and legal access; engendering moral obligations to community and work (Craig and Porter, 2006, p. 12).

One of the key strategies of ‘inclusive’ neoliberalism has been ‘to get the institutions right’ to bring equitable growth: codified legal frameworks, pro-poor policy, devolved governance, market mechanisms and participatory democracy were all highly emphasised as necessary institutions to achieve poverty reduction (Ballard, 2013; Craig and Porter, 2006; Golooba-Mutebi and Hickey, 2010). The most visible trends within ‘inclusive’ neoliberalism were the rise of non-governmental organisations and participatory development approaches across the South (Bebbington et al., 2007; Kamat, 2004). These trends clearly illustrated the idea of a more responsive state and citizens, who were expected to “more actively engage in shaping their own futures” (Hickey, 2010, p. 1141). In transforming themselves into rational and profit-driven entrepreneurial agents, who also contribute to collective community well-being, the poor were expected to participate in development initiatives through which they achieve self empowerment (Hickey, 2010; Kamat, 2004). This, in return, has been criticised by others to whom neoliberal participatory approaches caused more disempowerment and exclusion as opposed to emancipatory development⁹ (Cooke and Kothari, 2001; Kamat,

⁹ Emancipatory development involves „critical reflection on the structures and processes that bind and is directed to breaking free from them“ (Habermas, 1987 in Johnson et al., 2012:626).

2004). I will come back to the last point in more details shortly below, but before that I will turn to the sphere of the environment for my analysis.

2.4 Neoliberalisation of nature

Neoliberalism, as any other system of production and exchange, is necessarily an environmental project (Castree, 2008a; McCarthy and Prudham, 2004). In the early 2000s a growing number of scholars began to argue that over the last decades neoliberal ideas increasingly penetrated the ‘environment’, from carbon trading to fisheries, water, forests, ecosystem services and so on (Castree, 2010; Heynen et al., 2007; Liverman and Vilas, 2006; McCarthy and Prudham, 2004). In key publications such as McCarthy and Prudham (2004), Heynen and Robbins (2005), Heynen et al. (2007) and Castree (2008) scholars made use of case study analysis to illustrate how policies and politics transformed society-environment relations along the lines of neoliberal ideas. This and other research demonstrated how, in the pursuit of capitalist growth, markets and private companies became more and deeper involved in the management and governance of nature (Bakker, 2010). Drawing on Marxist philosophy, Castree elucidated that within a capitalist economy processes of neoliberalisations of natures offer firms, state bodies and other stakeholders ‘environmental fixes’ to the endemic problem of requiring sustained economic growth (Castree, 2008a, 2008b). In presenting the logics behind his four identified ‘environmental fixes’¹⁰ he also pointed at the important role states play in sanctioning and assisting ‘fractions of capital’ to “gain commercial advantage in and through the domain of the physical environment” (Castree, 2008a, p. 146).

Subsequent intellectual work that applies, refers, responds, critiques and constructively improves the analytical premises laid out by Castree on the neoliberalisation of nature

¹⁰ In brief, Castree’s environmental fixes are as follows (Castree, 2008a). Environmental fix one (1) describes the belief that the private sector can and should actively solve environmental problems. The assumption hereby goes that in bringing the objectives of resource conservation deeper into the logics of capital accumulation, allowing resources and ecosystems to be privatised and marketised, the inherent contradiction of capitalist environment-society relations shall be reduced or even overcome. His environmental fixes two and three denote actions by private capital to further capital accumulation through resource use/extraction either (2) via opening up the non-human world from hindering government regulation to market rationality or (3) via discursive and institutional actions that allow them actively to degrade hitherto protected or proscribed environments. The last and fourth environmental fix (4) describes state actions, either the restructuring of historical state-society relations to achieve the transfer of environmental responsibilities to the private sector or the pursuit of “market-mimicking ways” by state bodies to foster capital accumulation in the real of environmental conservation.

has been abundant since then (Arsel and Büscher, 2012; Bakker, 2010; Brockington et al., 2008; Bumpus and Liverman, 2008; Büscher et al., 2012; Corbera, 2012; Fletcher, 2010; Igoe and Brockington, 2007; Mansfield, 2007; Roth and Dressler, 2012). Consequently the debates and arguments around the neoliberalisation of nature and the nature of neoliberalisation have grown exponentially, making it practically impossible to discuss all aspects of them in this chapter. Instead, I will focus on the specific theoretical developments provided by scholars within this epistemic community that I consider pertinent to my study of REDD+ in rural Tanzania. Specifically, I will draw on recent work on ‘neoliberal conservation’ or ‘market-oriented conservation’ to further inform my own analysis.

2.5 Neoliberal conservation

Alongside many other domains of environmental governance, neoliberalisation has also penetrated the field of conservation policy and practice (Igoe and Brockington, 2007; Brockington et al., 2008; Büscher et al., 2012; Arsel and Büscher, 2012; Roth and Dressler, 2012). Although conservation and capitalism have always been closely intertwined (Brockington et al., 2008), the advent of neoliberalism has led to an increase “in the intensity and variety of forms of capitalist conservation” (Brockington and Duffy, 2010, p. 470). This was brought to the fore by Igoe and Brockington (2007) who argued that new types of ‘neoliberal conservation’ have emerged across, particularly the poorer areas of, the world. Packed in rhetoric of win-win promises, neoliberal conservation was seen to restructure and reregulate relations with nature through processes of commodification and territorialisation and via new governance networks with public and private stakeholders (ibid).

Many of the common elements of neoliberal conservation early outlined by Igoe and Brockington (2007) and Brockington et al. (2008) help us to make sense of contemporary conservation policies including REDD+ or payments for ecosystem schemes. I will now present and discuss the most relevant of their arguments drawing on their original as well as on additional contributions by other scholars.

2.5.1 Win-win rhetoric

A major point of their argument is that neoliberal conservation comes with a package of win-win rhetoric. Conservation organisations and state entities, that design and

implement neoliberal conservation programmes and policies, promise a number of positive benefits to people, environment and economy. It promises to reconcile environmental conservation with livelihood security and questions of finance. Conservation is presented as an opportunity for economic growth and profits. For instance, when tourists pay for visiting nature reserves or land owners protect land for carbon sequestration services. The underlying premise is to offer stakeholders a simple solution to complex problems (Igoe and Brockington, 2007; Roth and Dressler, 2012).

Neoliberal conservation offers win-win outcomes while, at the same time deliberately excluding difficult political questions of systemic inequality and power imbalances. It promotes a view of society nature relations where consensus appears to reign over conflicts (Igoe and Brockington, 2007; Büscher et al., 2012). The inherent contradiction of capitalism that causes the socio-ecological crisis in the first place is blinded out. Technical and socio-managerial fixes are favoured over radical socio-ecological transformations, leaving critical questions about the connections between continuous growth and sustainable environments aside (Büscher et al., 2012).

Moreover, these win-win ideas of 'green growth' become value and commodities themselves that are widely spread for the purpose of attracting additional support and resources (Büscher, 2013a; Igoe, 2010). Proponents of neoliberal conservation, of whom many see in this some lucrative investment opportunities for profit generation, stimulate certain neoliberal discourses and actions, under the umbrella term sustainable development, to convince conservationists and the wider public about the merits of fuelling 'green' economic growth (Adams, 2008; Igoe et al., 2010). Within a 'sustainable development historic bloc' (Igoe et al., 2010) various means are being utilised to advance certain views, images and discourses of the relations between humans and the environment. These views, images and discourses have been criticised for being apolitical, managerial, technology-focused and deeply embedded in capitalist modes of productions that pushes forward an 'ephemeral value creation' of conservation through financialisation and the media (Büscher et al., 2012).

Igoe (2010) argues that we are experiencing a spectacularization of human-environmental relationships through images and media with potential negative consequences (alienation, exclusion, etc) to people and their environments. His insights build on Garland (2008 p. 62 cited in Igoe, 2010) who argued that neoliberal

conservation appropriates value from landscapes “through various mediations and ultimately transforms it into a capital of a more convertible and globally ramifying kind.” Moreover, Igoe (2010 p. 376) draws on writings of Debord to highlight that “images are not merely representations of late capitalist realities, they are an indispensable part of those realities. They are not different and separate from the conditions that they portray, they are produced by them and, in turn, define and reproduce them.” What Igoe points out is that neoliberal conservation uses images, videos and other media in the Debordian sense of spectacle to fetishize the mediations between people and their environments, influencing and limiting people’s conceptions of themselves and nature to certain consumerist and capitalist-dominated perspectives while excluding other alternatives.

All this creates a ‘discursive blur’ (Büscher and Dressler, 2012) of win-win conservation that, empirical evidence shows, is untenable in practice (Igoe and Brockington, 2007; Roth and Dressler, 2012). Trade-offs are the norm of neoliberal conservation, and indeed in conservation in general (Hirsch et al., 2011), resulting in winners and losers of enacted interventions. Counter to its rhetoric, neoliberal conservation cannot, therefore, proclaim automatically to benefit everyone. Instead, careful analysis is required to examine who benefits and why, likewise who loses and why, and what does this mean to stakeholders in conservation and development (ibid).

2.5.2 Reregulation and territorialisation

Another critical argument is the observation that neoliberal conservation encourages reregulation of state-society relations resulting in increased processes of territorialisation. Territorialisation under neoliberalisation is understood as a “new type of state making” that produces “new types of neoliberalised state forms”. Building on insights from Vandergeest and Peluso (1995), who defined territorialisation as “the demarcation of territories within states for the purposes of controlling people and resources”, Igoe and Brockington (2007) argue that neoliberal territorialisation projects promote decentralised forms of governance with the objective to privatise and commodify nature. This process is often driven by powerful conservation or international finance agencies, who, because of their financial resources, technology and expertise, are more likely to succeed in enabling these transformations of power to a more local level within a discourse of sustainable development or in today’s words of ‘green growth’ (Igoe and Brockington, 2007). Through their active participation in the

process of territorialisation non-state actors obtain the power to claim authority over the boundaries, restrictions and uses of natural resources (Corson, 2011; Peluso and Lund, 2011).

Peluso and Lund (2011, p. 673) point out that territorialisation as a process is part of both governance and disciplining of practice associated with Foucault's concept of governmentality; it "produces and maintains power relations among governed environmental subjects and between subjects and authorities". Inspired by Foucault's governmentality concept they argue that territorialisation is a governmentalisation of space, which enables individual or collective entities control over territory and land.

Territorialization is a claim; not always a state claim, but a collaborative claim. It is in some way a bundle of rights – as one says for other kinds of property – but it produces a 'collectivity' in some sense, even though it would not be incorrect to say that landed property held by an individual is also a territory. Because our use of the term territory has a collective aspect, it can be seen as an explicit move to 'governmentalize' space (Foucault 2007) – or as we are saying in this collection, 'to control' by claiming the power to govern territorially. In other words, governance or control of territory constitutes a form of land control (Peluso and Lund, 2011p. 673).

Because this form of territorialisation assists the commodification of natural resources and spaces, in order for external actors to capture them (Igoe and Brockington, 2007), Ferguson (2006) argued that we should think of these newly demarcated territories as 'transnational spaces'.

2.5.3 Commodification of nature

Territorialisation allows property right holders over land to, in McAfee's famous words (1999), 'sell nature to save it'. Neoliberal conservation intensifies market-based conservation policies and practices on the assumption that the environmental problems can be solved by bringing them deeper into the capital accumulation circuit of private entities. This intensified incorporation into capitalist accumulation is achieved through the ever-expanding commodification of acts of 'nature saving'. Through commodification conservation, in the past often understood as the frontier to capital expansion, has under neoliberalism become intensively about opening-up new spaces for surplus generation while positing the preservation of ecosystems (Büscher et al.

2012; Brockington et al., 2008; Igoe and Brockington, 2007).

Commodification is here understood as the process of making new things to be sold (Castree, 2003). In contrast to real commodities such as coffee, timber or tables, payments for ecosystem services schemes create fictitious commodities (Brockington, 2011). Other examples of these are land, money and labour. Fictitious commodities were not produced to be sold and they do not physically exchange hands when they are sold. Instead what people exchange, with respect to land for instance, are title deeds. Freeing ecosystem services from their social and ecological contexts in order to become commodities, that are ready for market exchange, requires complex social engineering including measuring, valuing and titling exercises. At the same time commodities always remain socially and ecologically embedded in their sites of production. The effects market exchange has on people and environments can therefore be substantial (ibid).

Kosoy and Corbera (2010) portray how Marx's concept of commodity fetishism may inform what payments for ecosystem services within the realm of capitalist conservation could mean to us. They illustrate how the commodification of ecosystem services involves three important stages: the framing of ecological functions as a commodity subject to trade (separating it from the whole ecosystem), the establishment and assigning of a standard unit of exchange for this commodity and linking providers and users of this commodity in a market or market-like exchange. Due to the immense complexity of ecosystems, the processes of commodification and itemisation are very problematic as they aim to simplify and split ecosystems into independent, bounded units. Resistance stems from the materiality of ecosystems that do not allow to be easily split up into independent units for trade. In addition local producers of ecosystem services face power imbalances at the extra-local level that could impact on their incomes and thus make their situation worse.

To commodify and value nature based on their 'ecosystem services' in purely monetary terms, brings forth a number of contradictions related to the representativeness of its natural materiality (Büscher, 2013b) and ignores the existence of multiple languages of valuation practised by different stakeholders located in multiple settings (Kosoy and Corbera, 2010). Moral, aesthetic and ethical dimensions of nature are sidelined, which could eventually undermine other logics of conservation, such as environmental

stewardship and collective obligations, and could end up being counterproductive in the long-term if, for instance, payments cease (Swart, 2003).

Vatn (Vatn, 2010, 2005) argues that the incorporation of market logics into conservation could modify behavioural patterns and motivations in a way that individualism and competitions is prioritised over community and reciprocity values. Aside from this, treating nature as a commodity entails the risk of transforming it purely according to profit-making motives, which could result for instance in the use of bioengineering to create more efficient ‘nature’ such as large-scale monoculture plantations of carbon-rich trees at the expense of biodiversity (Heynen et al., 2007).

2.5.4 Hybrid governance

The neoliberalisation of conservation is generally embedded in hybrid governance regimes that encourage the increased involvement of private for-profit and not-for-profit actors. This results in more and more conservation-business partnerships in which state officials become highly dependent on the financial resources outsiders bring (Igoe and Brockington, 2007). The resulting decentralised and fragmented sovereignty had earlier been described by Ferguson (2006) as the ‘privatisation of sovereignty’ and by Mbembe (2001) as ‘private indirect government’. Sovereignty then becomes a commodity used by state officials to enter alliances with private investors and donors, who get to finance forms of territorialisation over land and resources for the purpose of conservation (Peluso and Lund, 2011).

Networks of thoughts and actions are created across public and private actors from the local to the global level. There are no easy boundaries anymore to be drawn between ‘community’, ‘state’ or ‘NGO’. They are all heterogeneous entities with connections across spatial scales (Agrawal and Gibson, 1999). At the same time they remain highly exclusive when it comes to money flows – money spent usually stays within these networks (Igoe and Brockington, 2007). Governance reforms that resulted in decentralised and community-based approaches to conservation have been particularly favoured by private and international actors as ways to insert markets and facilitate commodification in conservation (Büscher and Dressler, 2012; Dressler et al., 2010).

It is important to remember that scholars critical of the neoliberalisation of nature commonly understand environmental governance “not as the ‘governance of nature’ but

as ‘governance through nature’ – that is, as the reflection and projection of economic and political power via decisions about the design, manipulation and control of socio-natural processes” (Bridge and Perreault, 2009, p. 492). This also involves transforming subjectivities.

2.5.5 Eco-subjectivities

Drawing on Goldman (2001), Igoe and Brockington (2007) argue that local participants in neoliberal conservation programmes are expected to turn into ‘eco-rational subjects’, whereby the ‘eco’ in this case refers to both economic and ecological character traits. This, they elaborate, hinges on a number of significant factors. Local participants must be given the legally guaranteed property rights to become ‘environmental stakeholders’ in conservation-oriented business ventures. Property rights give them the authority and incentive to protect resources as well as the capital and/or collateral to enter into market relations. Property rights, however, also make it possible for people to lose their resources since their defining feature is to make things alienable (Mansfield, 2007). To become eco-subjects participants must also be able to realise the present and projected market value of the conservation service they want to sell and to acquire the necessary technology, skills and ethics of accountability that are required in conservation business partnerships. Büscher et al. (2012, p. 15) add to the above in arguing that “Neoliberal conservation thus takes on the appearance of being a technical design process to incentivize “stakeholders” (seen as predictable utility-maximizers) to produce idealized outcomes”

2.5.6 Politics and place matter

Neoliberal conservation does not automatically result in negative outcomes only. Nor does it result in the opposite. Outcomes of neoliberal conservation are generally both positive and negative for people and their environments. A large body of literature has by now provided substantial empirical evidence to this statement (Igoe and Brockington, 2007; Arsel and Büscher, 2012; Roth and Dressler, 2012). Therefore, neoliberal, or market-oriented conservation as some call it, opens up new spaces of change that can be beneficial or detrimental to different groups in society. Among other factors, politics and place-based context become important in shaping neoliberal conservation design and outcomes. Like they are important when examining the outcomes of neoliberalisations in general (see section above).

Roth and Dressler (2012) recently pointed at the ‘particularities of place’ to highlight the need for scholars to examine in detail how locally embedded social relations and institutions shape processes of neoliberalisation or, in their own terms, market-oriented conservation. In doing so researchers are encouraged to look at the continuities as much as they look at change when studying market-oriented conservation practices. Often, they argue, neoliberal conservation programmes are transformed to such an extent on the ground that they are no longer recognisable as such. Local actors and relations transform neoliberal conservation programmes to make them fit to the local socio-economic context and politics.

Their arguments about the importance of local politics and context in market-oriented conservation is clearly supported by studies, published in their special issue, that provided empirical details of how and why PES and other neoliberal initiatives were transformed on the ground. Similarly, Milne and Adams (2012) examined PES schemes in Cambodia and argued that they are masqueraded as markets despite not being market per se.

2.6 Neoliberal conservation and the commodification of forest carbon

Neoliberal conservation has occurred in many spheres of conservation policy and practice including eco-tourism, certification schemes, payments for ecosystem services, biodiversity offsetting and so forth. One key arena of neoliberal conservation practices has been (forest) carbon trading. Since the birth of the carbon commodity much has been written about the ethics, politics, economics and social effects of the commodification of carbon (Böhm et al., 2012; Bumpus and Liverman, 2008; Lohmann, 2009; Newell and Paterson, 2010). What I will discuss in this section is the literature that applied the theoretical underpinnings of the neoliberalisation of nature framework to empirical findings about forest carbon conservation.

Research on the commodification of forest carbon has provided crucial insights into the benefit distribution of such projects. Corbera and Brown (2010) make use of Ribot and Peluso’s ‘theory of access’ (Ribot and Peluso, 2003) to analyse the social processes underlying and influencing the distribution of benefits from three forest-carbon offset projects. They argued that several factors – that go beyond the often mentioned aspect

of holding legal property rights over land and trees – influence who can access benefits from the commodification of forest-carbon and why. Besides land tenure project participants benefit through structural and relational mechanisms such as capital, labour, expertise and technology from the commodification of forest carbon. These enable certain project stakeholders such as project developers or carbon brokers to benefit from forest carbon offset schemes despite the fact that they do not hold any property rights over trees or land.

While several processes influence who benefits from forest carbon, current research on the commodification of forest carbon still puts much emphasis on examining issues of property rights over forests (Mahanty et al., 2013a). Looking at Cambodia, the Philippines and Papua New Guinea it was found that the commodification of forest carbon faces complications due to complex and ambiguous property rights over forested land. Because forest carbon represent new channels of money making several entities including states, intermediaries such as NGOs, customary owners and other local forest users exert power to claim their stakes. This further complicates property claims on the ground with the potential to alter the power relations among stakeholders, potentially resulting in forms of exclusion to other benefits from the forest. This, in return, creates forms of conflict that could threaten the effectiveness of the mechanism to protect forests (Mahanty et al., 2013).

One long neglected aspect of forest carbon – the politics of modelling and monitoring – was recently examined by Leach and Scoones (2013) in the context of Sierra Leone and Ghana. They illustrate how the commodification of forest carbon, almost by default, leads to certain path dependencies pushing projects in the direction of ‘fortress’ forms of conservation or uniform plantations under clear state or private control. They argue that the carbon accounting methodologies, protocols and requirements construct certain landscape pathways promoting stability and control and one-way deforestation narratives that threaten the livelihoods of poorer and already marginalised land and forest users.

As outlined earlier, the particularities of place (Roth and Dressler, 2012) matter a great deal when payments for ecosystem services schemes are implemented on the ground. Lansing (2013) illustrates this in the context of Costa Rica where a payment scheme targeted at incentivising reforestation results in an indirect state subsidy for large

agribusiness. This, however, did not come about because of neoliberal features (commodification and privatization) of the policy. Instead, long standing patterns of land use and agricultural production transformed the PES schemes to fit existing socio-economic hierarchies.

Similarly, Osborne (2011) studied a carbon forestry project in Chiapas, Mexico using an agrarian political ecology approach to highlight the historical continuities of neoliberalisations in place. She argues that carbon producers experience mixed results including loss of some short-term benefits of land because of the labour and land requirements of the project. In her case especially the labour requirements constrained the production of subsistence and annual cash crops. Despite this peasants continued their participation in order to strengthen their formal claims on land, which they saw under threat from neoliberal agrarian policies.

2.7 ‘Inclusive’ neoliberal conservation

Earlier I pointed out that scholars of international development have argued that neoliberalism has taken on an ‘inclusive’ turn in recent years, which has also meant a stronger focus on good governance and participatory forms of development (Ballard, 2013; Kamat, 2004; Hickey, 2010; Craig and Porter, 2006). Although the same trends have also been observed within conservation policy and practice of the last decades (Büscher and Dressler, 2012; Dressler et al., 2010; Brockington et al., 2008) it seems to me that these two epistemic communities have not sufficiently taken note of the similarities and differences of their accounts¹¹. In this section I will therefore try to synthesise their arguments under the label ‘inclusive’ neoliberal conservation.

As mentioned above, the most visible trends within ‘inclusive’ neoliberalism were the rise of non-governmental organisations and participatory development approaches across the South (Bebbington et al., 2007; Kamat, 2004). Participatory approaches to development particularly advanced the idea of a responsive state and citizens who actively shape their own future to achieve self-empowerment (Hickey, 2010, p. 1141; Kamat, 2004). This resonates with changes in conservation policy and management where exclusionary models of protected areas, labelled as ‘fortress conservation’

¹¹ Exceptions are McAfee (2012) and McAfee and Shapiro (2010), who mention the relevance of ‘inclusive’ neoliberalism to the neoliberalisation of nature debate. However, they do not expand on their insight.

approaches (Brockington, 2002), were increasingly critiqued for their social injustices and ecological ineffectiveness and more and more replaced with participatory approaches to biodiversity conservation (Dressler et al., 2010; Lele et al., 2010). During the latter period of 1990s a 'new conservation era' (Hulme and Murphree, 1999) emerged in which people were no longer seen as conservation adversaries or threats but as allies and winners in this endeavour. By including local communities in a democratic and participatory manner into the project design, implementation and benefit distribution, proponents promised to meet the dual objective of social and ecological sustainability (Cernea and Schmidt-Soltau, 2006).

This new 'inclusive' understanding of conservation has had an immense outlet in so-called community-based conservation schemes, which called for participatory engagement, indigenous knowledge and community needs in achieving equitable forms of conservation (Adams, 2008; Brockington et al., 2008; Dressler et al., 2010). In the course of community conservation approaches local stakeholders have increasingly been connected to global markets for conservation (Hulme and Murphree, 1999; McAfee, 1999) and thus incorporated into transnational networks of international NGOs, finance institutions and donors, where external actors have played a significant role in shaping conservation outcomes, or at least how outcomes have been presented (Brockington et al., 2008). Some have therefore argued that community conservation has been succumbing, at least partly, to the neoliberal ideology of development in general (Büscher and Dressler, 2012; Dressler et al., 2010; McCarthy, 2005). From another perspective one could say that devolved and community centred approaches to conservation and natural resource management seem to have played an important role in enabling the expansion of neoliberalisations into more and more predominantly rural areas to further capital accumulation (Büscher and Dressler, 2012). In a way this evokes Castree's (2008) insights that neoliberalism is necessarily an environmental project.

To many the objective of community-based natural resource management turned to promoting markets, commodification and privatisation of resources under neoliberalism (Dressler et al., 2010; Igoe and Brockington, 2007; Büscher and Dressler, 2012). As a consequence principles of social justice and equity have rarely been attained. Scholars have argued that in some cases this neoliberal approach to participatory conservation has led to a disempowerment of the very communities they were meant to support (Dressler et al. 2010; Brockington et al., 2008).

These critiques of participatory conservation approaches resemble wider critiques of participatory development under neoliberalism. Scholars from both epistemic communities have argued that under neoliberalism participatory approaches have hardly ever achieved the suggested win-win outcomes in practice (Cooke and Kothari, 2001; Dressler et al., 2010; Kamat, 2004; Mitlin et al., 2007). Participatory and community-based approaches have come under criticism as empirical research revealed the deeply entrenched conflicts and power imbalances within ‘communities’ and between them. In several cases this resulted in inequitable benefit sharing across local stakeholders of decentralised management regimes (Agrawal and Gibson, 1999; Brockington et al., 2008).

With the rise of non-governmental organisations in development and conservation, scholars found fault with their lack of accountability in participatory approaches (Bebbington et al., 2008). Some argued that non-governmental organisations primarily served donor requirements when pursuing participation rather than trying to build up genuine partnerships with local stakeholders (Kamat, 2004). Questions of power and politics were often sideline in favour of concrete and measurable intervention outcomes (Kamat, 2004). As a consequence they reinforced clientelistic and exclusive relations through participatory initiatives (Cooke and Kothari, 2001; O’Reilly, 2010).

More recently, however, this perspective has been challenged in international development research for being too pessimistic and for ignoring potential spaces of change, progressive politics and existing forms of participatory citizenship (Hickey, 2010; Lazar, 2012). Responding to wide spread and generalised critiques of participatory approaches to development, Hickey and Mohan (2005) pointed out that some participatory approaches did result in genuine transformations of societal relations. They proposed thinking of participation in terms of an expanded and radicalised understanding of citizenship as a social practice that transforms the political process of inclusion and exclusion. People, who are part of a particular political community, should express agency as citizens to claim their status and rights in influencing the allocation and distribution of resources that go beyond the immediate project intervention. They should therefore actively engage in political debate and decision-making processes and become involved in ‘transformative forms of politics’ (Hickey and Mohan, 2005; cf Lazar, 2012). Citizenship is hereby understood from a

civic republican angle as a set of practices that is centred on participating in politics.

Even if participatory citizenship occurs in less radical projects or if participatory approaches are being conducted in predominantly technical forms, the inclusion of local stakeholders in project interventions can have long-term benefits to citizen formation (Hickey, 2010; O'Reilly, 2010). "On the positive side even the most problematic interventions have made some identifiable material improvements in terms of challenging problems of poverty and under-development", claims Hickey (2010 p. 1147). At the same time citizenship alone is hardly ever enough to challenge the underlying power relations responsible for uneven development and poverty (Hickey, 2010). Indeed, analysts and practitioners working in the field of international development have increasingly argued that research into the politics of development has become one of the most important aspects of contemporary development studies (Hickey, 2013; Li, 2007; Nelson, 2010). Similarly, the importance of politics has also been highlighted in recent accounts of neoliberal conservation (Roth and Dressler, 2012; Milne and Adams, 2012).

From research in international development we learn that alongside researching the processes and effects of 'good governance' reforms in developing countries, contemporary analysis of politics should aim to understand the actual politics driving development and under-development. This particularly comes as a response to voiced critiques about the failure of exporting Western style institutions through good governance reforms that proved to be inappropriate in developing country contexts (Evans, 2004; Hickey, 2012b). Contemporary research on development therefore focuses on how power and politics shape the functioning of institutions (Hickey, 2013 p. 4). Specific analytical focus is laid on state capacity and the commitment of elites to inclusive development (Bukonya and Yanguas, 2013). Hereby it is again emphasised that state capacity is centrally a political process rather than a technical problem and depends on society's ability to reach political settlement (ibid).

2.8 Re-crafting the rural commons

2.8.1 Collective action and common property

Scholars researching local forest management and conservation in rural areas across the world often refer to and link their analysis to the study of common pool resources,

which they understand as “natural and human constructed resources in which (i) exclusion of beneficiaries through physical and institutional means is especially costly, and (ii) exploitation by one user reduces resource availability for others“ (Ostrom et al., 1999, p. 278). By studying when and how communities successfully manage natural resources held in common, the common property theory has achieved to refute Hardin’s (1968) “tragedy of the commons” and its simplistic notions of individual rent-maximising behaviour that is incapable of collective self-restraint for environmental sustainability (Wade, 1988; Ostrom, 1990; Baland and Platteau, 1996; Agrawal, 2007; Ostrom, 2005).

Nobel prize laureate Elinor Ostrom and scholars from the International Forestry Resources and Institutions Program have carried out the most substantial work on common property theory, particularly in relation to forests, which has also provided a strong academic support to local involvement in conservation strategies. Indeed, their global and manifold body of research has shown that community based management can be as, if not more, successful than centralized state-managed regimes in achieving sustainable forest use (Agrawal, 2007; Ostrom and Nagendra, 2006). In the light of REDD+ this insight has gained particular traction in recent years. A recent study by Chhatre and Agrawal (2009, p. 17667) for instance analysed carbon storage and livelihoods benefits of forests governance regimes across 80 countries in Africa, Asia and Latin America and concluded that “transfer of ownership over larger forest commons patches to local communities, coupled with payments for improved carbon storage can contribute to climate change mitigation without adversely affecting local livelihoods”.

Over the years scholars of common property theory have considerably advanced our understanding of the factors that facilitate or enable successful management of common pool resources such as forests (Agrawal, 2007). Agrawal (2001) identified more than 30 different variables, which he grouped into four clusters, to explain the successful governance of common pool resources. His four clusters are the characteristics of the resource system, the user group, the institutional arrangements and the external environment.

Research has found that the characteristics of the resource system (e.g. forest, lake, pasture) influences how easily commons are governed (Ostrom, 2005; Agrawal, 2001).

The most influential factors are the size of the resource system, its boundaries, whether the resource is mobile, the extent to which resource units can be stored, rate and predictability of flow of benefits from the resource system, and easy of monitoring resource conditions (Agrawal, 2007).

In contrast to romantic notions of harmonious rural communities, reality has shown that rural groups can be diverse and strongly divided along different dimensions such as ethnicity, race, and religion (Agrawal and Gibson, 1999). Common property research has therefore tried to locate the most relevant user group characteristics for effective commons governance and found that the size of the group, whether the boundaries of the group are clearly defined, heterogeneity, inequality and interdependence among group members, dependence on the resource, and the availability of sufficient resources to initiate and carry the costs of collective action are most influential (Anderson and Agrawal, 2011; Agrawal, 2007; Poteete and Ostrom, 2004; Agrawal and Gibson, 1999; Ostrom, 1990).

The third cluster, the institutional arrangements, has been the object of most common property research and is perhaps best understood (Agrawal, 2007). Here the focus is on how different institutional set-ups, including formal and informal arrangements, shape forest outcomes. Generally, scholars of common property theory understand the role of institutions to “provide information and assurance about behaviour of others, to offer incentives to behave in the collective good, and to monitor and sanction opportunistic behaviour” (Cleaver, 2002, p. 8). In the course of assessing different institutional realities on the ground and how they impact on the quality of common resources, common property scholars have established that rules that are easily understood, enforced and locally devised, which take into account differences in terms of the types of violations, provide assistance in resolving conflicts and hold user and officials accountable are best suitable to promote sustainable forest management (Wade, 1988; Ostrom, 1990; Baland and Platteau, 1996; Agrawal, 2007; Ostrom and Nagendra, 2006).

Less studied in the common property literature is the role of the external environment (Agrawal, 2007). Nevertheless, several factors have been identified that constitute the context and therefore shape the governance of forest commons: demographic changes, cultural norms, technological innovations, market pressure, and the nature and level of

involvement of state and non-state agencies (Agrawal, 2007).

Because of the constantly changing internal and external environment, the sustainability of effective forest commons strongly relates to the ability to devise and revise institutions, or in other words, to practice adaptive governance (Dietz et al., 2003). For adaptive governance system to develop successfully stakeholders should aim to uphold the provision of good and trustworthy information, ways to deal with conflicts, foster rule compliance, provision of infrastructure (technical, physical and institutional) and ability to change (ibid). On this note it is vital to understand that the relationship between institutions and the state of common pool resources is mutually constitutive. Institutions do not only affect the state of common pool resources, but they are also affected by them, thus creating a kind of feedback loop, where one influences the other (Ostrom, 2007, 2009).

2.8.2 Decentralisation of natural resources

Secure property rights in combination with local decision-making and management powers are important factors for the successful governance of forest commons (Larson et al., 2010; Ostrom et al., 1999; Dietz et al., 2003; Agrawal, 2007). Many governments in the South have officially adopted strategies of decentralisation, which is the “transfer of powers from central government to lower levels in a political-administrative and territorial hierarchy” (Larson, 2005, p. 33). If powers are transferred to local actors that are representative and downwardly accountable, such as elected local governments, with autonomous and discretionary decision-making powers, then we speak of democratic decentralisation (Larson, 2005). According to theory the representation of the popular and the accountability of leaders are key democratic elements that shall make decentralisation effective at the local level (Ribot et al., 2010; Ribot, 2004; Agrawal and Ribot, 1999).

Over the past three decades, decentralisation reforms have come about due to social, economic and political pressure to governments (Larson et al., 2010; Ribot et al., 2010). In some countries they emerged as a response to local and international demands that pointed at previous wrongdoings and the exclusion of local people, which led to displacement and social hardship (Nelson and Agrawal, 2008; Agrawal and Redford, 2009). In other countries they were primarily initiated to reduce government costs of

forest protection (Colfer, 2005 in Larson, 2005) or to increase forest revenues (Larson, 2005). Overall, democratic decentralisation has been promoted as a way to increase efficiency, equity, and democracy effects of natural resource governance. The institutionalisation of local participation via democratic decentralisation is thought to facilitate sustainable forest commons (Agrawal and Ribot, 1999; Agrawal and Ostrom, 2001; Crook and Manor, 1998; Wily and Dewees, 2001).

Unfortunately, the experience with decentralisation reforms tells us that often only minimal actual changes in powers have occurred (Ribot, 2004; Larson and Ribot, 2007; Ribot et al., 2010; Poteete and Ribot, 2011; Larson, 2005). Many governments only officially support the transfer of powers onto the local level in order to please donors, appease voters and attract international funding (Larson, 2005). But because of central government resistance to the loss of power countries end up with contradictory legal systems that makes it difficult for local constituencies to claim their legal rights. Sometimes this situation even ends up in centralisation of forest governance and more state control of local natural resources as opposed to more local control (Larson, 2005; Larson and Ribot, 2007; Ribot et al., 2006).

Often not enough powers that would lead to autonomous and discretionary decision-making are devolved to local communities or there is no security provided, which leads to people privileging short-term over long-term gains and prevents them from making long-term investments (Larson, 2005). In other cases powers were transferred to undemocratic institutions like user groups, stakeholder committees or traditional leaders as opposed to representative and downwardly local governments (Larson, 2005). In this case they were not accountable to and representative of local populations, which can more easily lead to unequal benefit distribution and increased rural poverty. Participation in this form has not achieved the enfranchisement promised by decentralisation theory (Ribot et al., 2010; Brockington, 2007; Ellis and Mdoe, 2003; Ellis and Freeman, 2004). Ellis and Freeman (2004, p. 24) argue that the transfer of powers to local levels is sometimes based on “an idealist projection of democratic processes in communities”, which, when failed to materialise, “can become part of the problem of rural poverty, not part of the solution”.

If decentralisation occurs then it is often the result of considerable donor pressure (Larson, 2005). It is more likely for local governments to be given powers if they make

their demands heard and insist on reforms while at the same time being accountable to local citizens (Ribot, 2003). There needs to be sufficient financial, technical and political capacity at the local level for decentralisation to work (Larson and Ribot, 2009). Central government is an important partner of local governments since it can provide technical expertise, finance, market access etc. Effective decentralisation requires the central government to be accountable to local government and it should strengthen both levels of governments. Local decision-making powers should be maximised while maintaining a level of minimum standards across the nation (Larson and Ribot, 2009). At the same time incentives structures must be changed to make decentralisation beneficial to the local population (ibid).

Scholars of decentralisation reforms have increasingly emphasised the role of power and politics in the design, practice and outcome of this governance approach (Larson and Ribot, 2007; Nelson and Agrawal, 2008; Lund and Saito-Jensen 2013). This shall explain the given paradox that despite increasing local participation and recognition of communities' rights, including property rights to forests, community empowerment and greater benefits have been unattained in decentralisation, as the power dynamics underlying complementary access mechanisms remain unaltered (Larson and Ribot, 2007; Ribot et al., 2010; Dressler et al., 2010). According to Larson and Ribot (2007, p. 189) the rural poor continue to compete on an "uneven playing field of ethnic and other social inequities and economic hurdles". Thus even if communities hold secure rights to forests they are unable to access benefits because of, among other reasons, technical, financial, bureaucratic and political hurdles (Larson and Ribot, 2007; Ribot and Peluso, 2003).

In recent years several scholars highlighted the role of techno-bureaucratic values and practices (Backstrand, 2004; Ojha, 2006; Ojha et al., 2009; Giri and Ojha, 2011) and the authority given to expert knowledge (Li, 2007; Nightingale, 2005; cf. Kothari, 2005) in impeding the successful implementation of decentralised forest management. Ojha (2006) argues that the processes of scientisation and bureaucratisation create a 'techno-bureaucratic doxa' that makes the democratic control of natural resources by citizens increasingly difficult.

2.8.3 Technology and agricultural innovations

Studies demonstrate that there are enormous potentials for African small-holder agriculture to increase productivity with positive effects on household's wealth and welfare (WDR, 2008). In addition to that concerns over environmental degradation and climate change result in calls for African farmers to adapt their farming practices towards 'sustainable intensification' (Meijer et al., 2014). Independent of the many views over the suggested ideal way of rural development in Africa (WDR, 2008; Woodhouse, 2009), there is a general consensus that agricultural innovation and the uptake of new technologies and practices play an important role in African agricultural development (Larsen et al., 2009; Rijn et al., 2012).

Despite the fact that African agriculture has never been static, as African farmers constantly adapt to a changing environment and climate (Kristjanson et al, 2009), the uptake of agricultural innovations and new technology has so far been slow and insufficient in generating the potential outcomes (Suri, 2011; Ndjeunga and Bantilan 2005). While innovations and adaptations in cultivating the land in response to changing circumstances constantly happen in Africa and elsewhere (Kristjanson et al., 2009), the continuation of enormous efforts by donor agencies, governments, multilateral and non-governmental organisations in promoting 'modern' farming methods and technology in Africa make it important to examine when, how and why new agricultural innovations spread across and become accepted by large members within groups of African farmers. Moreover, farmers often experiment with different aspects of a new innovation and sometimes only adopt parts of it while they neglect other elements. In general changes in farming practices appear to be incremental rather than radical and wholly transformative (Kristjanson et al., 2009).

Nevertheless, the uptake of a new technology or practice is a complex and complicated process, which different theories have tried to explain (Meijer et al., 2014; Leeuwis and Aarts, 2011). A still popular view is that technologies can be transferred in a linear process, whereas agricultural specialists and development experts create the technology and distribute it via extension workers to the farmer, who then adopts it. This simplistic notion of innovation has been increasingly refuted by scholars who emphasise the importance of systems thinking, context and social learning in innovation (Meijer et al., 2014; Knickel et al., 2009; Klerkx et al., 2012; Leeuwis and Aarts, 2011). In their view

innovations emerge within “a larger, more complex system of diverse actors, their actions and interactions, and the formal and informal rules, organisational cultures and practices, and social and economic institutions that influence their practices and behaviours” (Knickel et al., 2009; Meijer et al., 2014). The uptake of new technologies or farming practices therefore depends on multiple factors and a range of processes such as knowing, learning, experimenting, adapting, etc which altogether are both extrinsic and intrinsic to the subject and unfold in a circular rather than linear mode of progress (Meijer et al., 2014). Klerkx et al. (2012, p. 458) define agricultural innovation as “a co-evolutionary process, i.e. combined technological, social, economic and institutional change.”

The main achievement of systems thinking in examining agricultural innovation is to put the individual farmer into a larger network of human-human and human-environment relations where information is exchanged and collaborative learning happens (Knickel et al., 2009). Innovation is therefore an interactive and collaborative learning process that results through changing social practices and relations between people, tools and natural resources (Knickel et al., 2009; Klerkx et al., 2012; Leeuwis and Aarts, 2011).

Departing from systems thinking in agricultural innovation leads us to appreciate the role of both extrinsic and intrinsic factors in promoting technology uptake. Meijer et al. (2014) recently combined different theories of innovation to derive an analytical framework that includes extrinsic and intrinsic factors in influencing technology uptake and particularly stresses the importance of knowledge, perceptions and attitudes in the decision-making process of adoption. Based on the knowledge farmers obtain of a new technology, they develop certain perceptions of it, which together form attitudes towards it. Knowledge, perceptions and attitudes are shaped by extrinsic variables that can be grouped into characteristics of the farmer (gender, age, marital status, income, assets, education, personal traits, position in social networks, status, etc), characteristics of the external environment (geography, biophysical, infrastructure, societal culture, political conditions, etc) and characteristics of the innovation (costs, benefits).

Among the most relevant aspects in the decision-making process is the perception of risk and uncertainty that farmers have towards a new technology (Pattanayak et al., 2003; Jerneck and Olsson, 2014). For many, especially food insecure farmers, spending

time and labour on something with uncertain benefits represents a real challenge (Jerneck and Olsen, 2014). In this context resource endowments play a considerable role too. Farmers who are better-off may find it easier to venture into new agricultural innovations if they feel that they offer prospects of economic returns (Meijer et al., 2014; Kristjanson et al., 2012). However, this relationship between food security and agricultural innovation taking appears to flow in both ways. More food secure farmers tend to be more able to innovate, and farmers who more likely innovate tend to be more food secure (Kristjanson et al., 2012). Resource endowments and agricultural innovation are also linked to each other in terms of farmers' ability to access credit to finance technology uptake (Daniel et al., 2012; Bullock et al., 2013). Farmers, the poorer ones more than their wealthier counterparts, face multiple constraints to accessing credits (quantity rationing, collateral, transaction costs, etc), which subsequently influence their ability to invest in productivity enhancing technology (Daniel et al., 2012).

Meijer et al. (2014) stress that exactly how external factors influence farmers' decision of adoption depends on their knowledge, perceptions and attitudes about them. These intrinsic factors differ between farmers as they are shaped by access to information, exchange, training, learning opportunities, extension services, etc. For innovations to happen people must be able to learn, to gather information, to communicate, exchange and use information in a creative way that exploits market opportunities or other social needs (Lundvall, 1999). In their study of credit rationing and agricultural innovation Daniel et al. (2012) claim that „access to information, both in general (education, listening to the radio) and specific to agriculture (membership of farm cooperative)“ is a major factor influencing credit access, and thus the ability to invest in productivity enhancing technology.

Against this background some scholars have highlighted the role of social capital in promoting information exchange and thus innovation. Social capital defies an easy definition, but entails trust and norms that enable collective action as well as informal and formal networks between groups of people (Rijn et al., 2012). Social capital, especially which results in agents' participation in networks beyond the local village, is thought to enhance information flows, reduce transactions costs and therefore facilitate innovation (Rijn et al., 2012). But social capital can also have negative effects on innovation as some forms of it can foster inward-looking behaviour or take away time

and resources from agricultural innovation (ibid).

Extension services offered by governments, private companies or non-governmental organisations aim to promote agricultural innovations through changing the knowledge, perceptions and attitudes of farmers (Meijer et al., 2014). Very popular are community-based or farmer-to-farmer extension approaches, which are seen to be more effective and cheaper than traditional approaches (Wellard et al., 2013). They appear to work well under “community selection of CB extensionists to ensure wide ownership; working through groups which the poor can access; and a dual focus on technologies and community development, to sustain development initiatives and articulate local demand for technologies and services“ (Wellard et al., 2013, p. 34). To sustain community based extension approaches it is important for local communities to support their extension workers, for extension workers to develop marketable skills, for communities and extension workers to establish associations and CBOs, and to increase the linkages between the extension worker, research and organisations (Wellard et al., 2013).

As with other extension approaches too also farmer-to-farmer and community based extension require forms of communication, which include on the one hand professional deliberate communication and on the other hand everyday communicative exchanges. Both are critical in exchanging meanings and, as social practices, restructuring social relationships that create spaces for change that enable innovation (Leeuwis and Aarts, 2011). Based on this understanding Leeuwis and Aarts (2011, p. 32) propose that in order to facilitate innovation communication professionals should apply a range of “process facilitation strategies” that include network building (reconfiguration of relationships between and within networks, formation of new networks, demise of existing ones), supporting social learning (promotion of dialectical debate and joint learning) and dealing with dynamics of power and conflict (mobilisation of power resources to overcome resistance).

2.9 Conclusion

In this chapter I presented the theoretical framework that underlies my study. I first outlined the concept of payments for ecosystem services, which is the most common conceptualisation of conservation mechanisms like REDD+. I presented the logic and inherent assumptions of the payments for ecosystem services approach and highlighted some of the debates surrounding its applicability in practice.

I then placed REDD+ and payments for ecosystem services within wider debates of neoliberalism and neoliberalisation of nature. I started off by discussing neoliberalism and neoliberalisations within international development to make the reader aware of the common and variegated forms of neoliberalisations. In this section I also highlighted the recent ‘inclusive’ turn of neoliberalism, which I found is largely missing within the debates of neoliberalisation of nature.

The core of my theoretical framework hinges on the neoliberalisation of nature or more specifically on neoliberal conservation. I draw on theories of neoliberal conservation to make sense of the neoliberal processes inherent in implementing payments for ecosystem services. Findings from this literature are relevant to my study as some of the most common elements of neoliberal conservation will likely be present also in the design and implementation of REDD+ projects in Tanzania. These elements include the use of win-win rhetoric, reregulation and territorialisation processes, the commodification of nature, hybrid governance regimes and the creation of eco-subjectivities.

After briefly discussing some of the findings from research that has applied the neoliberalisation of nature framework to explain the commodification of forest carbon, I continued with a section on ‘inclusive’ neoliberal conservation. In this section I synthesised findings from both bodies of literature on neoliberalism to critically examine participatory approaches to conservation and development under ‘inclusive’ neoliberalism. The last section engages with the literature on the rural commons, decentralisation of natural resources and the uptake of agricultural innovation in order to further inform my analysis of REDD+ initiatives in Lindi, Tanzania.

Chapter 3: Methods

3.1 Introduction

In this chapter I describe the methods I employed to collect and analyse the data for this study. The next section presents the overall research approach of my dissertation. It discusses some ontological and epistemological considerations, my ethnographic research strategy and the justification, selection and characteristics of my case study sites. In the third section I present the schedule of my fieldwork in Tanzania and I briefly discuss challenges with local language during field research and how I went about them. After that I explain in detail the qualitative and quantitative methods used to collect data. The fourth section explains the logic, assumptions and methods used to analyse the data. The fifth and final section discusses the aspects of reflexivity and ethics of my field research.

3.2 Research approach

3.2.1 Ontological and epistemological assumptions

The essence of research is to understand and make sense of the world (Williams, 2003). This quest is deeply interlinked with philosophical debates about what is reality (ontology) and what can we know about it (epistemology). In this section I want to briefly outline my personal position to these fundamental knowledge questions.

I am influenced by the ideology of critical realism for my understanding of the philosophy of science. As a critical realist I believe that there is a real, material world out there, independent of the researcher, containing power and structures. As Bhaskar (2008[1978]) suggested, this world can be defined as the ‘real’. The ‘real’ is not directly observable. Yet once the powers and structures that it contains are activated they become ‘the actual’, which is then observed in ‘the empirical’ (Bhaskar, 2008[1978]; Sayer, 2000). Therefore, despite the existence of one real and actual world, people know this world differently (Sayer, 2000). “Multiple constructed realities” (Denzin and Lincoln, 1998, pp. 24–28) are produced because of people’s different experiences, conditions and relationships with social and material structures. For the researcher it becomes important to study these different interpretations of one material world, aiming to understand which historical and contemporary factors have shaped them (Sayer, 2000). Critical realism does not, in contrast to social constructivist approaches, view all

interpretations as equally true representations of ‘the real’ or ‘the actual’. Indeed, one statement can be more ‘true’ than another. The researcher’s quest is thus to critically examine representations and interpretations of reality and investigate the factors such as power, structure and social networks, shaping them (Sayer, 2000).

Critical realists assert that objects such as people have causal powers, but because of structural mechanisms and social contexts these powers are realised differently (Sayer, 2000). When scientific knowledge is produced, researchers must be seen as social actors and co-producers of this knowledge, which is derived from the interaction between the researcher, the researched and the material world. Critical realism thus recognises that knowledge is always fallible, embedded and incomplete (Sayer, 2000). These assumptions distinguish critical realism from positivist philosophy to science that proclaims researcher’s detached position to one objective truth that needs to be identified in generalisable laws designating relationships between different variables (Creswell, 2008; Sayer, 2000; Williams, 2003). Because the researcher can’t be seen as detached from the material world he/she co-creates through researching, it becomes essential to reflect on one’s positionality in knowledge production (will be discussed in section five of this chapter).

3.2.2 Ethnographic approach

Using critical realism as the common ontological and epistemological position in this study supports my decision to use an ethnographic approach, employing a combination of qualitative and quantitative methods for data collection, as my overarching research strategy (McEvoy and Richards, 2006). Ethnography does not have a strict definition, but it belongs to open-ended ways of approaching the world and producing predominantly qualitative data (Brockington and Sullivan, 2003; Creswell, 2008; Hammersley and Atkinson, 2007; Spradley, 1980).

Ethnography usually involves the researcher participating, overtly or covertly, in people’s daily lives for an extended period of time, watching what happens, listening to what is said, and/or asking questions through informal and formal interviews, collecting documents and artefacts – in fact, gathering whatever data are available to throw light on the issues that are the emerging focus of inquiry. Generally speaking ethnographers draw on a range of sources of data, though they may sometimes rely primarily on one” (Atkinson and Hammersley, 2007 p. 3).

As a research strategy, ethnography is usually exploratory in nature. Ethnographers enter a 'natural field' in order to study, in Malinowski's words, 'foreshadowed problems' of people in their every day life (Atkinson and Hammersley, 2007). The strength of this approach lies in the researcher's extended immersion in the field to collect close observations full of depth and details of people's accounts and actions. Usually only one or a few cases are examined and during the fieldwork the researcher learns from the interpretations used by actors to analyse their connections to local and wider social structures (Brockington and Sullivan, 2003; Atkinson and Hammersley, 2007).

An ethnographic approach was deemed ideal to study the emergence and potential effects of forest carbon commodification in Lindi, Tanzania. Ethnographic methods were employed to research in detail how economic and socio-political processes including power and politics shape the conservation actions and discourses of different actors at the village level. Ethnography, as my point of departure, allowed me to enter the two case study villages with an open mind and the objective to really listen to people to obtain their stories and opinions of conservation and development. It encouraged me to go beyond listening and to participate in daily activities for an extended period of time and thus experience first-hand and in-depth what poverty, exclusion and governance means in rural Tanzania. Living in the villages and participating in public life also meant that I could be present to observe events whenever they emerged. Ethnography also taught me to remain flexible and open to unforeseen findings during the fieldwork, which led to continuously revisiting my research strategy, questions and findings and ultimately to writing a whole chapter on Conservation Agriculture for this dissertation.

Ethnography as a research approach is not without controversy. It has been criticised by others for being unscientific, unreliable, wholly subjective and dependent on the orientation of the ethnographer. Because of the small number of cases investigated the data collected are thought to lack generalizable propositions. A key critique relates to the 'anecdotal' representations provided in ethnographies and how they are influenced by the actions of ethnographers in the field (Herbert, 2000; Milne, 2009). Rengert (1997, p. 469) brings the critical stance towards ethnographic research to a point:

Ethnographic research is the least scientific of the research approaches since, by definition, it involves a small sample size, is difficult to replicate, and contains a great deal of subjectivity and interpretation on the part of the researcher. Ethnographic research needs to be supplemented with carefully designed research projects in which the ideas developed are subjected to scientific rigor.

In the light of these heavy critiques it is important to defend the reliability and validity of my ethnographic findings. In order to address the above-mentioned criticism, and to generate robust data, I carefully considered the processes of data management and analysis including documenting transparently the procedures of collecting and analysing findings, and treating all the data comprehensively (not selectively) during the analysis (Milne, 2009). This means that before making generalisations I considered all the components of my data and not only selective pieces. In addition I made use of triangulation to overcome weaknesses inherent in every method. Throughout this dissertation but especially in this chapter I openly communicate the research process of my study, from data collection to interpretation, to ensure transparency and traceability (Altheide and Johnson, 1998; Milne, 2009). In the ethics section of this chapter I discuss questions about my own position in the field and how this affected the knowledge I produced.

Within this broader ethnographic research strategy I mainly used qualitative methods such as participant observations, ethnographic interviewing, semi-structured interviews, focus group discussion and document analysis. For these methods I purposefully selected research participants. In addition to that I conducted a small-scale household survey at the end of my fieldwork in both villages to complement and triangulate some of my qualitative findings with quantitative data. For the survey I used random sampling to select participants. I decided to embed this mixed-method approach into my larger qualitative research framework to counteract some of the critique posed to ethnography and to harness the strength of each method to derive at more reliable, complete and robust data (Bryman, 2004; Creswell, 2008).

3.2.3 Case Study

3.2.3.1 Justification

Because ethnographic enquiries aim to produce rich and in-depth data they usually focus on one or a few cases as the “unit of analysis”. Specificity, complexity and

context are recognised and appreciated as researchers investigate the particulars of certain phenomena (Denscombe, 2007; Mabry, 2009; Yin, 2003). At the same time ethnographers should produce knowledge that is important to populations beyond the geographical boundaries of the selected cases. Generalisations generated by case studies are different to quantitative studies, where statistical sampling procedures are followed. In qualitative studies cases are purposefully selected to enable the researcher to gain insights of wider significance (Denscombe, 2007; Yin, 2003). By gaining a detailed insight into the particular, the case-study approach reveals important knowledge on the complex set of relations, processes and features that help us to better understand the general phenomenon (ibid).

For this dissertation I decided to conduct ethnographic methods in two case study villages in Lindi, Tanzania. I limited myself to two villages to be able to spend as much time as possible in each village to achieve a rich ethnographic enquiry. At the same time I chose not to stay in one village only in order to obtain comparative data and more diverse findings to my research questions.

3.2.3.2 Selection of and gaining access to case studies

Figure 3.1 Globe showing Tanzania in Africa



I chose Tanzania (Figure 3.1) as the country of my fieldwork because of the relevance and significant progress that REDD+ had made there. Tanzania has vast forest resources that are significant to its largely poor population in the rural areas. The country experiences rapid socio-economic changes such as economic growth and urbanisation, and considerable rates of deforestation and

forest degradation have been observed in the past few decades (URT, 2013). From the beginning REDD+ has enjoyed much support from government sectors (Burgess et al., 2010) and several NGOs in the country, which have started to implement pilot projects (United Republic of Tanzania, 2010). The international community, the United Nations REDD+ Programme, the Government of Norway and others have provided much support for the design and implementation of REDD+ in Tanzania (Burgess et al.,

2010). At a time when REDD+ was still very new and in its infant phase, Tanzania presented itself as an inviting case for in-depth research.

Alongside the significance of Tanzania for my research subject, I regarded this country as a good choice because of my personal experience in East Africa. I stayed in Kenya from July 2005 to September 2006 as a volunteer in a Don Bosco street children project where I was able to meet many different people from East Africa and to visit some places in this region. During this time I also travelled to Tanzania for a short period of time. I was familiar with the very basics of the national language Swahili and had an idea of what to expect from East African cultures and lifestyles.

Within Tanzania I selected two villages – Mihumo/Darajani and Ruhoma – in the Lindi Region in the South-eastern part of the country as my case study sites. That I ended up in these two villages for my ethnographic fieldwork was a combination of purpose, coincidence and luck. Despite my experience in Eastern Africa I did not have any contacts to people engaged in REDD+ projects, conservation organisations, scholars or other institutions in Tanzania that could have helped me to enter potential case study sites. I, with the assistance of my supervisors, had to search for potential case study sites, using the Internet as my point of departure.

Through the Internet I got to know Dr. Irmeli Mustalahti, then postdoctoral researcher at the University of Helsinki in Finland, and her research project called “The role of Participatory Forest Management in Mitigation of and Adaptation to Climate Change: Opportunities and Constraints”, which aimed to “*analyse how the communities could benefit from improved forest management through international funding for reduced emissions from deforestation and forest degradation (REDD+)*” (Mustalahti, 2009). I arranged to meet Dr. Mustalahti at a workshop organised by herself in May 2011 at the University of Helsinki where we discussed my research project. We agreed that I would accompany her on a field trip to Tanzania in August 2011 to look for research opportunities in ongoing REDD+ projects.

Together with Dr. Zahabu, a well-respected Tanzanian scholar in the field of carbon monitoring and forestry, we travelled to Kilwa, Lindi Region and Liwale to meet people from various non-governmental organisations (TFCG, Mjumita, Mpingo), from the official Finnish development aid programme LIMAS (Lindi and Mtwara Agribusiness

Support), from local district councils and last but not least village residents who were involved in REDD+ projects. During this trip we also travelled to Liwale district, where Dr. Mustalahti and Dr. Zahabu had carried out participatory forest-carbon assessments in three villages, Mihumo/Darajani, Ngunja and Ngongowe. In these three villages I observed how they presented their findings from the carbon assessments to the village council and members of the village natural resource committee.

After some observations and contemplation I decided to select Mihumo/Darajani as one of my case study sites. Mihumo/Darajani was bigger than the other two villages, in size, in population and in forest resources. From all three villages it was Mihumo/Darajani that expected the greatest benefits from selling forest carbon. The village was also much closer located to Liwale town (16 km away), which was important to me for practical and safety reasons. In the field I primarily used a simple bicycle to commute between places. Sometimes I made use of the local motorcycle taxis, but because of the high risks involved, I tried to avoid them. Being situated closely to Liwale town I knew that I could ride with my bike to town every two or three weeks for a day or two to communicate with my family, check emails, save data on my laptop, do internet research and have better food. If I had selected one of the other two villages I would have spent considerably more time travelling from the village to town. The proximity of Mihumo/Darajani to Liwale town's hospital and road infrastructure was also comforting with regard to health issues, as I could get treatment for any kind of sickness more easily.

The other case study village, Ruhoma, was selected later during fieldwork, after Dr. Mustalahti had left the country and I travelled on my own to Lindi town in November 2011. At that time I had obtained my research permit, which allowed me to conduct research and hold interviews with district officials and project staff from Mjumita/TFCG project. Upon consultation with local field coordinators I decided to conduct research in Ruhoma village, because of the significant progress that REDD+ had made there. While most other villages were still in the very first phase of project implementation, Ruhoma was about to receive REDD+ trial payments. I selected Ruhoma to have as much exposure as possible to the process and challenges of implementing REDD+ on the ground.

In summary I can thus say that in a context shaped by personal relationships I followed

purposive or theoretical sampling procedures to select the two case study villages. As explained above within pre-determined choices I selected these two specific villages because they had certain characteristics that I wanted to examine (Denscombe, 2007; Yin, 2003). In the following section I will briefly present my two case study villages. I will also discuss some of the characteristics that make these two villages relevant to my research project.

3.2.3.3 Characteristics of case study villages

The two villages – Mihumo/Darajani and Ruhoma – are both located in Lindi Region, in the South-eastern part of Tanzania (see Figure 3.2 below). Lindi Region is the fourth largest of Tanzania's 30 regions. It covers around 67,000 km² and borders the Pwani Region to the north, the Morogoro Region to the west, the Indian Ocean to the east and the Mtwara and Ruvuma regions to the south. The region is divided into 6 districts: Kilwa, Lindi rural, Lindi urban, Ruangwa, Nachingwea and Liwale. Across the region Islam is the most widely practiced religion. In both case study villages almost everybody was a Muslim.

The climate of Lindi is influenced by the Southern-eastern trade winds in mid-year and Northern-eastern trade winds during the turn of the year. These winds influence onset and the amount of precipitation in the study areas. The temperature ranges between 20 and 30 degrees Celsius averaging to 25 degrees Celsius (Mukama, 2010; TFCG, 2012). Although the rainfall pattern is unimodel, with the rainfall season lasting from December to April (TFCG, 2012), this area has also been described as bi-model because of a dry spell experienced in February (Mukama, 2010). Often village residents talk of two rainfall periods. The short rains last from late November to January whereas the long rains last from March to May. The average rainfall amounts to between 600 and 1000 mm (Mukama, 2010).

Figure 3.2 Map of regional boundaries in Tanzania

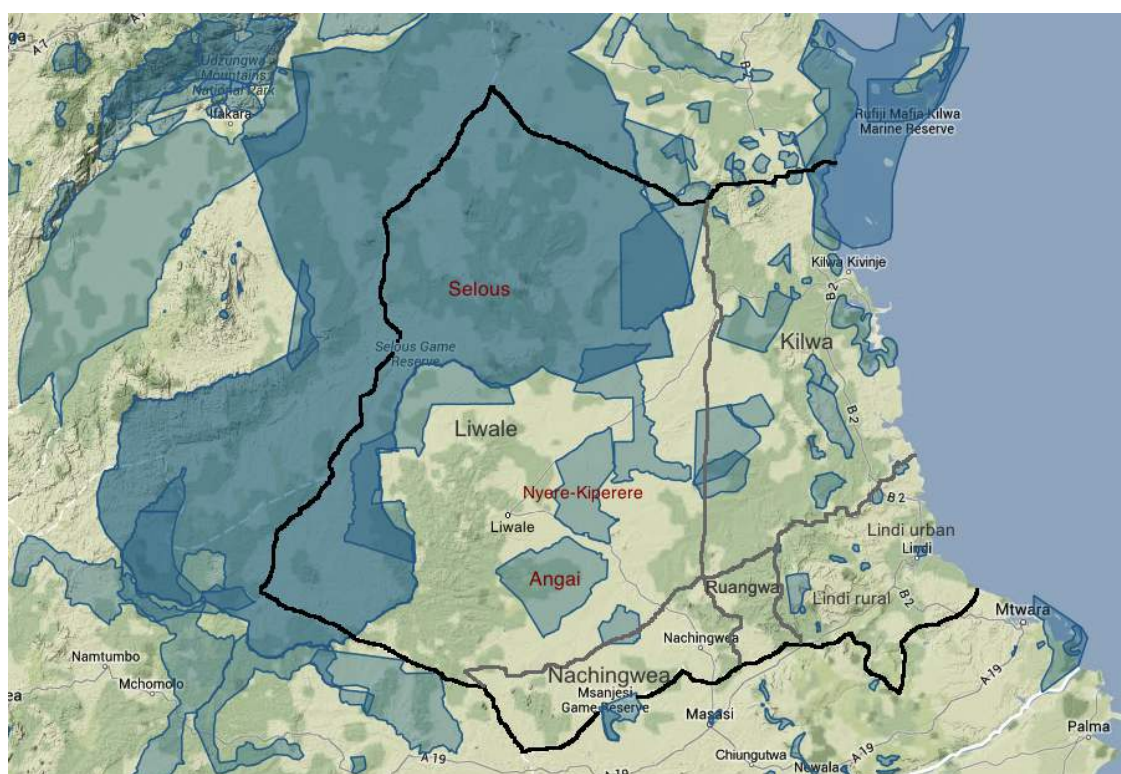
Source: NBS (2013c)



The villages of Mihumo/Darajani and Ruhoma are located in Liwale and Lindi rural districts respectively (Figure 3.3 and 3.4 below). The village of Mihumo/Darajani is located 16 km South of Liwale town in Mihumo ward, division of Mihumo, in Liwale district. The second case study village – Ruhoma – is located around 63 km west of Lindi town, in Rutamba ward, division of Milola, in Lindi rural district.

Figure: 3.3 Lindi Region with district boundaries and forest reserves

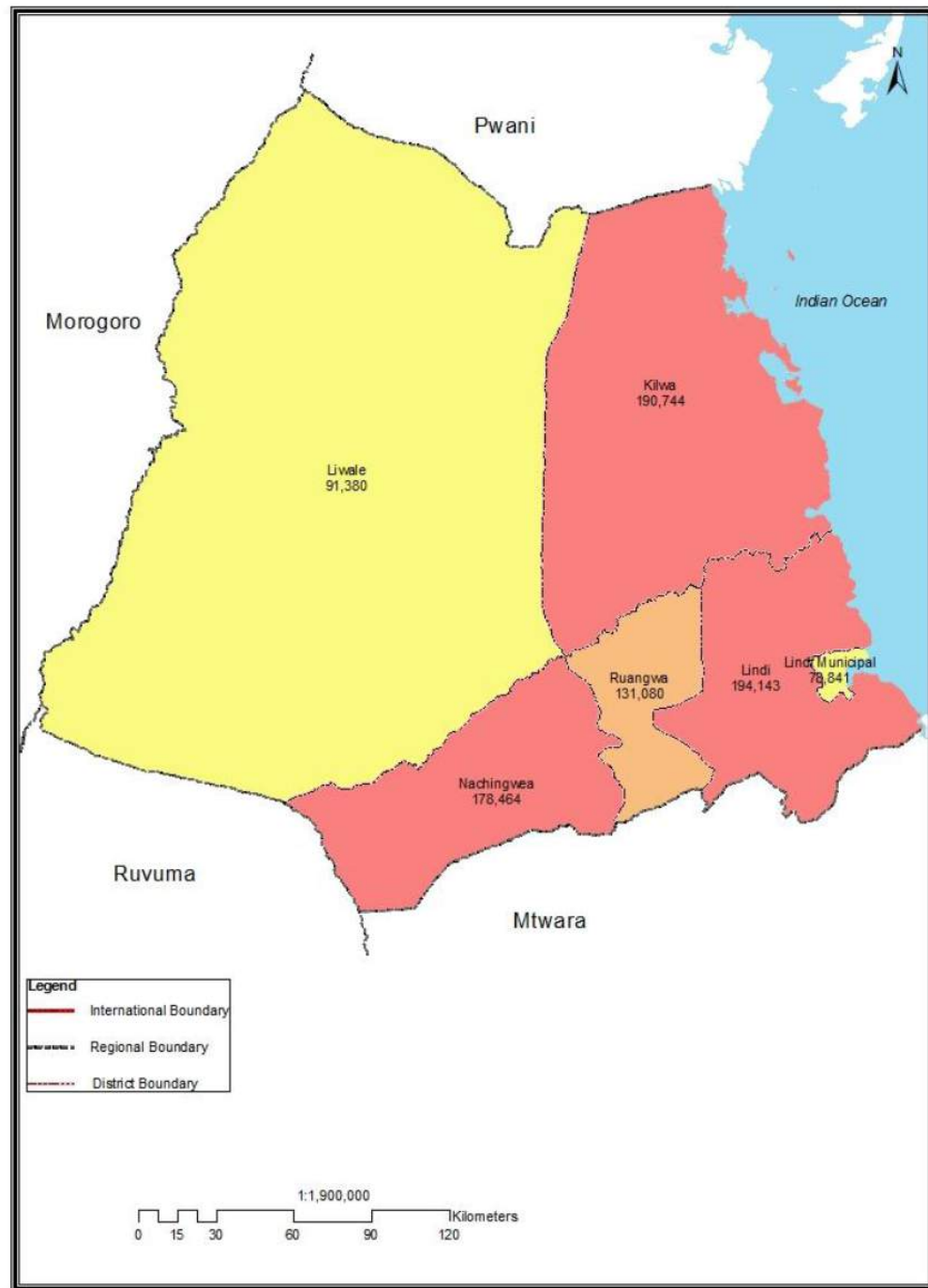
adapted from: Wdpa (2014)¹²



¹² Blue areas are nature, wildlife and forest reserves. I redrew the regional boundaries and drew up the district boundaries as best as I could by hand. A more accurate representation of the district boundaries can be found in map 3.4 below.

Figure 3.4 Map of Lindi showing districts and population size

Source: NBS (2013c)



Among the six districts in Lindi Region Liwale is the largest one covering an area of 3,838,000 hectares. In 2012 the district had a total population of 91,380. With an average population density of 2 people per sq km, Liwale is among the most sparsely populated districts in the country (Sundström, 2010). The predominant ethnic group are Ngindo people. Other local ethnic groups include Mwera, Yao, Ndonde, Makonde and Ngoni (Johansson, 2008). The protected Selous Game Reserve occupies an area of 2,558,600 hectares, which is two thirds of the entire district (Mukama, 2010).

Liwale has a mostly flat landscape that is covered by sandy soils, which are deep and poor in nutrient contents (Mukama, 2010). The district is part of the Eastern African Miombo Woodlands ecoregion and it is estimated that it contains 1,736,100 ha of forests (Taku Tassa, 2010). The village of Mihumo/Darajani has more than 3,000 inhabitants and spans across an area of 29,555 hectares that include large patches of dry miombo, closed dense forests, riverine and wet miombo forests with some high valuable timber species including *Brachystegia* sp., *Julbernardia globiflora*, *Dalbergia melanoxylon* and *Pterocarpus angolensis* (Taku-tassa, 2010). In 2004 more than 133 tree species were identified in this area (S. Dondeyne, 2004).

Liwale district has two forest reserves, which are Kiperere and Angai village land forest reserve (AVLFR) (Figure 3.5). Kiperere is a registered forest reserve under the central government covering an area of 87,000 ha. The AVLFR (see Figure 3.6) covers a total area of 139,420 ha and is managed and owned by 24 villages (previously 13 villages) surrounding the Angai forest. The village of Mihumo/Darajani set aside 11,792 ha as forest reserve and thus it contains about 8.45% of the total AVLFR.

Figure 3.5 Vegetation cover and forest reserves in Liwale

Source: Johansson, 2008

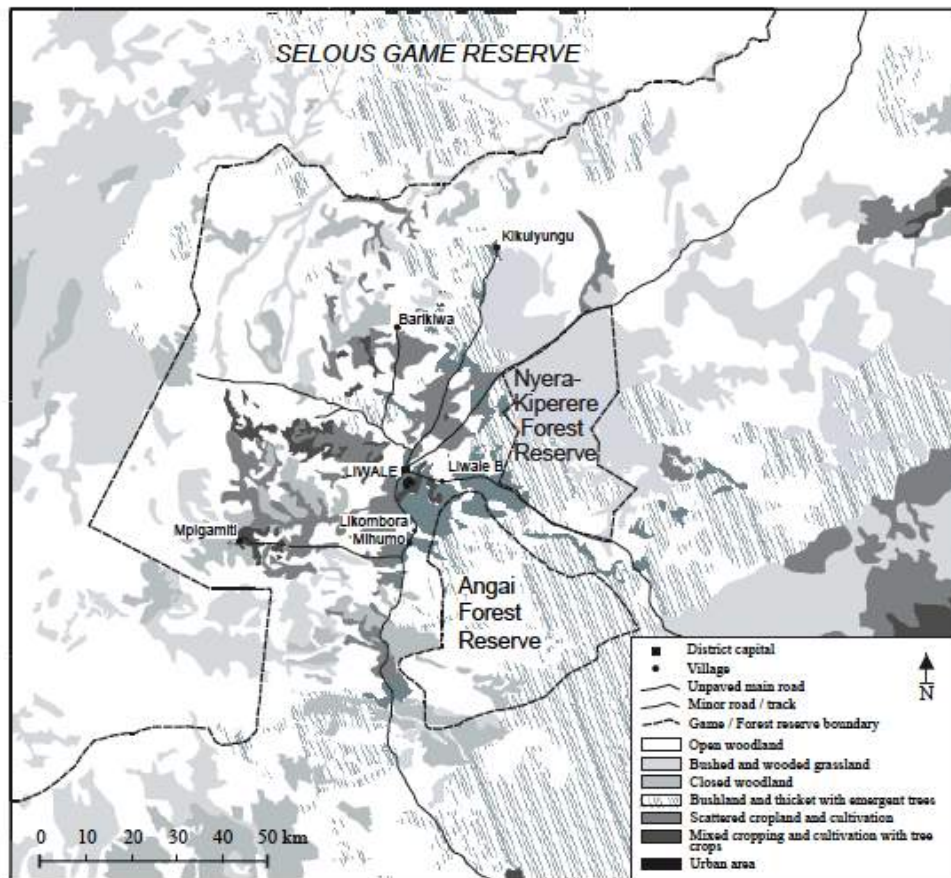
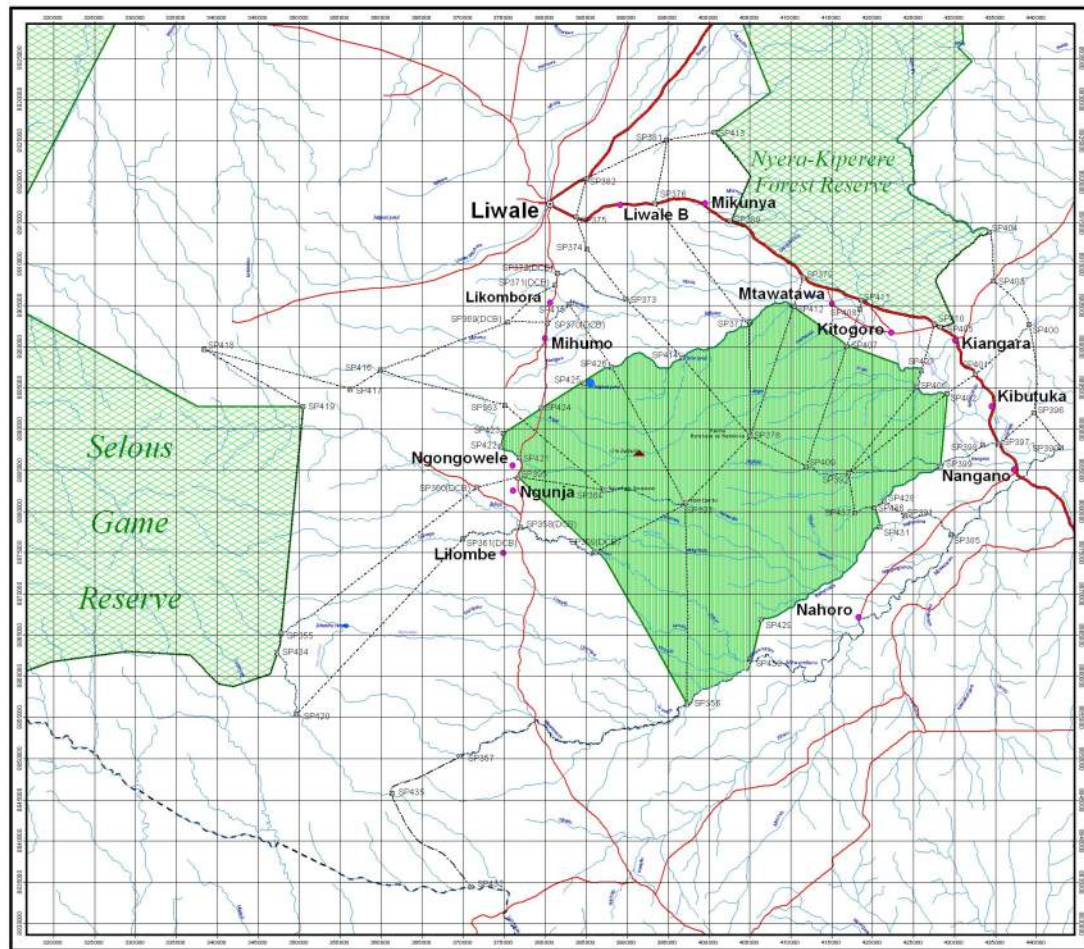


Figure 3.6 Map of Angai village land forest reserve in 2009

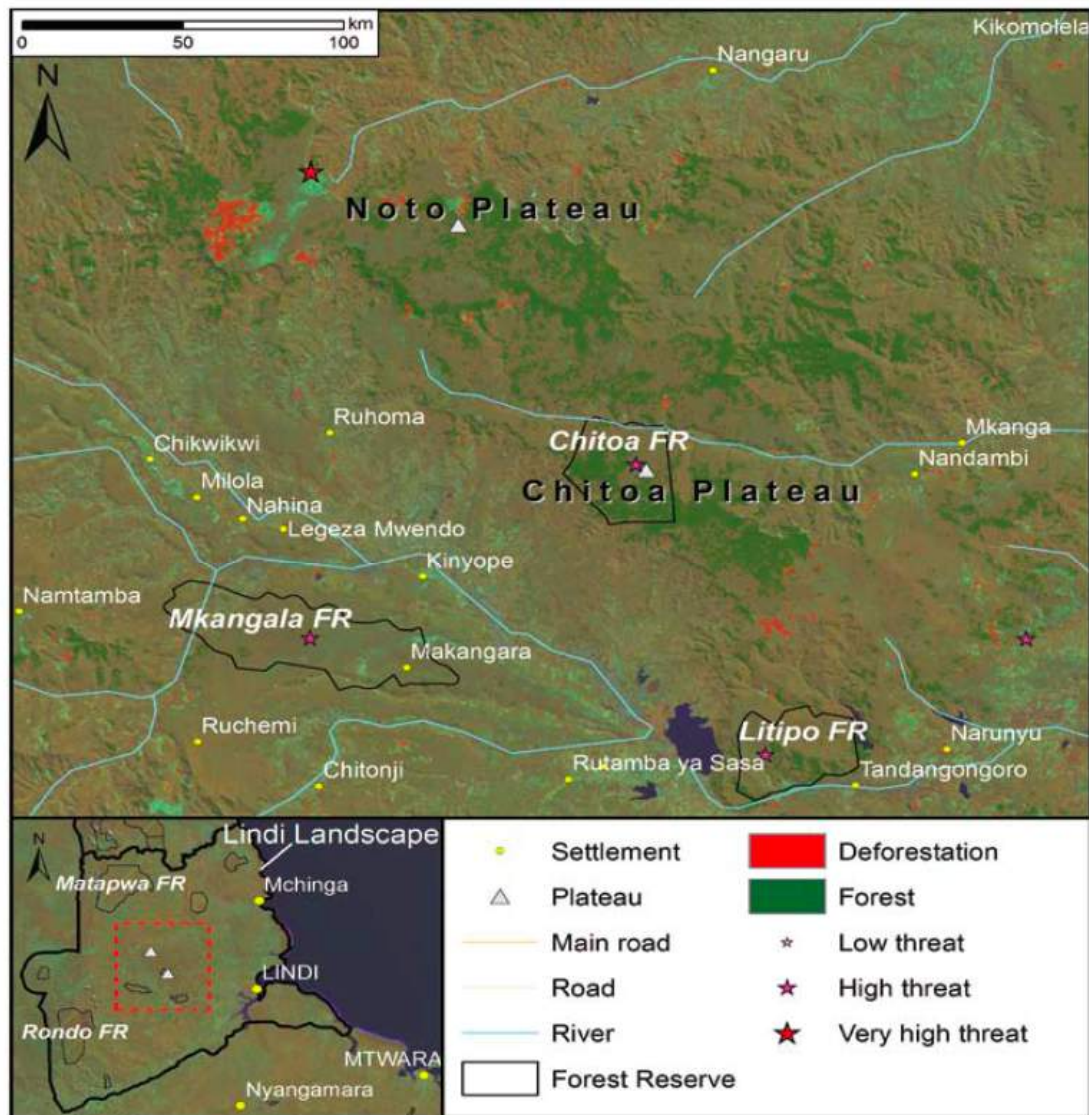
Source: CCI, 2009



The village of Ruhoma is situated in the Lindi Plateaux and Valleys landscape that covers most of the 753,800 hectares in Lindi rural district. The predominant soil types in the district are sands, loamy sands and sandy loams whereas valleys are characterised with clay soils while sandy-loamy soils are found in the upland areas (TFCG, 2012). Ruhoma is located on the Noto plateau (Figure 3.7), which is predominantly covered by dry evergreen forests that include the canopy species *Pteleopsis myrtifolia*, *Azelia quanzensis*, *Zanthoxylum deremense* and *Grewia conocarpa* (TFCG, 2009b). According to recent surveys elephants, buffalos and several near endemic and threatened vertebrate species were found in the Noto plateau forests (ibid). Before the REDD+ intervention there were three forest reserves in the district: Litipo forest reserve, Chitoa forest reserve and Mkangala forest reserve.

Figure 3.7: Map of Noto and Chitoo Plateau

Source: TFCG (2009b)



In 2012 the total population in the district was 194,143. Some of the most prevalent ethnic groups are Mwera, Makonde and Maraba. The village of Ruhoma is considerably smaller than Mihumo/Darajani both in size and population. The 475 residents living in 169 households live across a village area of 3,817 hectares. Despite its smaller size, forests play a significant role in Ruhoma too since they cover a total area of 2,830 hectares in the village. About 88% of this area, which is equivalent to 2,488 hectares, was set aside as forest reserve in the course of TFCG/Mjumita's REDD+ intervention.

3.3 Data collection

3.3.1 Research schedule and language

My research strategy involved mainly ethnographic fieldwork in the two case study

villages. In total I lived more than 11 months in Tanzania, from August 2011 to July 2012. However the first three months were spent organising my field research including learning Swahili and obtaining the necessary research permits from Tanzania and the University of Manchester. Of the remaining 8 months I spent about 7 months in the villages in three fieldwork phases. The other month was used up travelling between the villages or in urban areas such as Dar es Salaam, Liwale town and Lindi town for the purpose of preparing the different fieldwork phases (meeting district authorities or project staff, printing of documents, organising journeys, etc), or recovering from sickness and regaining energy. A detailed fieldwork schedule can be found as Appendix I.

Before presenting the specific methods used to gather the information and findings of this dissertation, I will discuss language challenges during the fieldwork. As outlined above, one of the reasons for selecting Tanzania as my case study site was related to my experience in Kenya, where I had learnt some of the basics in Swahili. Yet when I arrived in Tanzania I realised that my basic Swahili skills had largely disappeared. It was therefore a necessary decision to attend a basic and medium Swahili language course offered by KIU, a private education centre based in Dar es Salaam. Because of the importance of the language to my fieldwork I decided to study at least two extra hours every day after a four-hour class with KIU.

After a 5 weeks course I was able to engage in simple conversations about day-to-day activities. This was just enough to navigate through the introductory phase of my fieldwork. I was able to introduce myself at relevant regional, district and village authorities and to project staff members, to present my research objectives and methods to them, and to have simple conversations about Europe, Austria and Manchester among others. However, when I started my fieldwork in November 2011 I struggled to engage in satisfactory conversations with villagers about forest management, agriculture and development. This was certainly one of the most frustrating and challenging experiences I had in the field. After discussing this problem with my supervisors I was advised to keep on trying, learning, improving and persevering. When Prof. Brockington visited me in the field he encouraged me to keep talking and listening to Swahili every day. At the same time he advised me to use a digital tape recorder when interviewing villagers. The recorded conversations did not only serve as data for my thesis but they allowed me to listen to the conversation again and again to improve my

language skills.

I put a great deal of effort into learning Swahili as this was the only way to get to know what villagers think about the research issues. With time my language skills improved. I learnt phrases, sentences and words that were relevant to my topic by heart. I listened to the recorded interviews and looked up almost every word I did not understand to write it down in a vocabulary list. I spent hours and hours in public places in the village to talk about anything with whoever was around in order to keep practicing. At the end of the day this strategy paid off and the longer I spent in the field the better I could converse in Swahili. Especially in the last few months of my fieldwork I was able to engage in most discussion I wanted albeit not without minor and not so minor grammatical mistakes. Nevertheless, I was able to ask more critical questions and engage in long and meaningful discussions around village politics, development and social dynamics between people. The quality of my interviews thus increased a lot in the latter phases once my language skills were more developed. The same applies to data gathered through participant observation. In the beginning of my fieldwork I mainly observed others and tried to have very simple conversations, but after a few months I was able to meaningfully engage in people's daily activities.

3.3.2 Participant observation

Participant observation is the primary research method for ethnography and denotes watching, listening, interacting with and recording actions and discourses of people as they carry out day-to-day activities (Drury et al., 2011; Hammersley and Atkinson, 2007; Spradley, 1980). Often a distinction is made between participant observer and observing participant depending on the degree of participation. Throughout my fieldwork I took on the role of a participant observer. As a PhD researcher I spent my time in the field observing what other people did as opposed to actively trying to participate in development activities. I disclosed my research aim and objectives from the beginning, which meant that I overtly conducted participant observation among villagers unless they were not comfortable with it.

From the beginning of my stay in the villages, I conducted participant observation in different settings to obtain a better understanding of the life of villagers. I participated in village meetings, discussions among people in open spaces, development events with district or other authorities, in the market place, at farms, at the soccer field or at

somebody's home if I got invited. Due to my research interest I also spent much time accompanying cultivators to their farms. While assisting them in farming activities I tried to have conversations with them about agriculture, forests, village politics and development. Researching villagers in their 'natural environment' was vital for me to get a sense of the challenges and opportunities REDD+ offers. But it also allowed me to spend much time with one person, which led to many different conversations ranging from particular subjects to life in general.

In many instances I could take note of my observations openly using my pen and a small notepad. I usually wrote down my observations in German, because this was the quickest option to me. Sometimes I found myself in sensitive situations where note taking would have been inappropriate. Whenever this happened I would make mental notes during observations and wrote them down in the evening from my memory. In addition to these notes I also took 'theoretical notes' or 'analytic memos' (Bryman and Burgess, 1994) to make sense of the observations I made in the field.

3.3.3 Ethnographic and semi-structured interviews

During participant observation I conducted ethnographic interviewing with people around me. Ethnographic interviewing is different to typical semi-structured interviews, where the participant is removed from his daily activities to a constructed setting (Bryman, 2004). Ethnographic interviewing is done in the natural context of the participant, during daily activities, at home, on the farm, in the market place and so forth. This type of interviewing is thus characterised by a higher degree of informality achieved by maintaining context (Schensul and LeCompte, 1999). Ethnographic interviews often move between unstructured, structured, semi-structured and narrative interview experience.

I conducted ethnographic interviewing throughout my fieldwork in the case study villages. Usually when I found myself around other people I aimed to ethnographically interview them about their livelihoods, village politics, forest management, climate change mitigation, forest-carbon and so forth. Other times I asked them broader questions about life in general from which a rich conversation would emerge where we would all interview each other. Ethnographic interviews could last for hours or a few minutes depending on the relationship between me and the researched, the availability of the interviewee, the context and other factors.

This method provided me with rich and deeper insights into the social relations in the village and personal opinions, feelings and experiences of individual villagers. Ethnographic interviewing allowed me to ask questions to groups of people, who would then engage in lively discussions. At other times I could interview individual farmers, villagers, committee members or other persons in a private, comfortable setting, which allowed me to obtain otherwise maybe censored data. Ethnographic interviewing enabled the interviewee to take agency and co-structure the interview, determine its direction, stop short at certain questions or start talking about completely different topics.

Alongside ethnographic interviewing I conducted semi-structured interviews with villagers, district officials, development agents and researchers (Table 3.1). These interviews differ from ethnographic interviews in the sense that I arranged a time and place to meet before interviewing the person (Bryman, 2004). The second big difference is that I recorded these interviews using a digital tape recorder after obtaining consent. The interviews usually took place in the village at the person's home in the late afternoon or evening after the working day was over. The interviews were also more structured compared to the ethnographic interviews.

For different groups of interviewees such as committee members, sub-village chairman, conservation agriculture group members, ordinary villagers or district officials I created different guiding questions that I asked during the interview. However, I always remained flexible during the interview and adapted to the individual's special knowledge on certain topics, his/her willingness to talk about certain things and not others, and contextual factors while making sure the conversation was overall useful to my research. In total I conducted and recorded 116 semi-structured interviews in both villages. Of these 116 interviews I conducted 66 with stakeholders of Mihumo/Darajani village and 50 interviews with stakeholders of Ruhoma village. For a detailed list of all recorded interviews see Appendix II.

Table 3.1 Recorded interviews

Interviewee type	Amount of interviews		Main content
	Mihumo/Darajani	Ruhoma	
Conservation Agriculture farmers	18 (7 M, 11 F)	7 (3 M, 4 F)	Conservation agriculture technology; farmer field schools
District and ward officials	3 (3 M)	6 (6 M)	Development initiatives (REDD, farming) & village politics
Village elders	6 (5 M, 1 F)	2 (2 M)	Village politics, livelihoods
Sub-village chairman	7 (7 M)	0	Local governance; village development
Village committees	14 (7 M, 7 F)	14 (6 M, 8 F)	CBFM institutions and practices
Village council	4 (4 M)	0	Local governance, development
Community development (teacher, health, Vicoba, village leader)	4 (4 M)	4 (4 M)	Village development initiatives, village politics
Ordinary villagers	8 (6 M, 2 F)	14 (9 M, 5 F)	Livelihoods, agriculture, forest, village politics
Researcher & project staff	2 (1 M, 1 F)	3 (3 M)	REDD & CBFM

It was my aim to interview more district officials in both villages, but in order to organise interviews with them I would have had to spend considerably more time in Liwale and Lindi towns, which would have reduced my time in the villages. Similarly, I wanted to interview people in Dar es Salaam from national ministries, international organisations and project organisations. However, this was not possible in the time available and to achieve it would have meant a significant restructuring of my fieldwork phases and research schedules. I would have spent much more time trying to gain access to these stakeholders and organise meetings with them. Instead I decided to focus on interviewing actors in the two villages to create good village ethnographies. Complementary information about the projects was sourced from official documents in order to close potential information gaps.

3.3.4 Focus group discussion

A focus group discussion allows interviewing a small group of people on a specific topic in a short period of time. It allows participants to engage in discussions and the researcher to learn from the various views and opinions on a certain theme (Bryman,

2004; Liamputtong, 2011).

I conducted one focus group discussion with ten members in Ruhoma, because I spent relatively little time in that village. I decided to arrange for a focus group discussion with members from the village council, village natural resource committee, village land use planning committee, REDD+ committee and ordinary villagers. I invited a key villager of the Mihumo/Darajani village to Ruhoma to take part and facilitate with me the focus group discussion. This villager was the former secretary of the village natural resource committee and then a member of the participatory forest carbon assessment group. From the beginning he participated in many forestry related activities in Mihumo/Darajani and had substantial knowledge of REDD+ and community based forest management. I invited him to Ruhoma to organise and facilitate with me the focus group discussion, which focused on villagers' experience of REDD+ and Conservation Agriculture activities. Because conducting large focus groups is a challenging exercise, as it requires engaging all participants as best as possible in a dialogue/debate that results in meaningful findings, his insights, participation and organisational skills were of great help to me. I obtained rich information about community-based forest conservation, participatory forest carbon assessments and rural development in both villages.

However, his trip to Ruhoma was not only beneficial to me. He expressed his appreciation and gratitude a number of times saying that he had learned a lot from this journey and stay in Ruhoma. It was our agreement, from the beginning, that he will communicate his experiences to other villagers in Mihumo/Darajani. Besides him also villagers in Ruhoma benefited greatly from his visit. During and after the focus group discussion I could witness vivid exchanges between him and the villagers on topics that were of great importance to all of them. Without him I would have certainly struggled to facilitate a focus group discussion. My Swahili skills were good but not sufficient to understand, lead and direct a group of participants in stimulating discussions.

3.3.5 Document analysis

Formal and informal documents provided important data for my dissertation (Bryman, 2004; Denscombe, 2007). I collected documents throughout my studies prior, during and after the fieldwork. I collected information concerning the study site, project documentation and progress reports, institutional frameworks, agricultural land use and

interventions, land use planning, forest-carbon assessments, project brochures and info material, newspaper articles, etc. From these documents I learnt much about project goals, challenges and opportunities with regard to forest conservation and agriculture.

Most of these documents were sourced from the Internet. Others were given to me by Dr. Mustalahti and TFCG/Mjumita project staff. Among the most valuable written sources were draft land use plans, forest management plans, by-laws and other ‘village-centred’ documents. From these documents I could source important data about the specificity of intended institutional frameworks, management systems and distribution of costs and benefits in the project sites. Most of the documents sourced were written in English, but some of them were written in Swahili. I gathered documents written in Swahili more towards the end of and after my fieldwork when my language skills had improved substantially. I was able to read and understand them, although I regularly used English-Swahili dictionaries in book format and from online sources.

3.3.6 Household survey

The main objective of my household survey was to numerically describe differences in the two villages with regard to household’s land use, specifically crop cultivation, and perceptions of Conservation Agriculture and forest governance. In addition I wanted to compare wealth groups within and across the two villages on the same dimensions to obtain a picture of the extent of local inequality. I designed the questionnaire prior to and during my fieldwork in Tanzania (questionnaire in Swahili and English attached as Appendix III). Before commencing my fieldwork I created a preliminary questionnaire based on discussions with former PhD colleagues, especially Sumana Datta and Ashish Aggarwal, and my supervisors. At that time I already knew that I wanted to finalise the survey design only closer to the end of my fieldwork after getting to know the context of my study sites. This helped me to specify and formulate my questions in a way to ensure validity and reliability of responses (Drury et al., 2011; Creswell, 2009). Therefore, I only arrived at the exact sections and questions of the survey in May/June 2012. These were influenced by my observations in the field and a quick online literature review conducted while staying in Lindi town.

After creating a first English version of the survey I obtained feedback from my supervisors and local staff of TFCG/Mjumita project, who pointed at some necessary clarifications. I translated the survey questionnaire from English to Swahili with the

assistance of a TFCG/Mjumita staff member from the office in Kinyope. She also helped me in piloting the survey with four residents of the neighbouring Kinyope village, which resulted in reducing the length of the survey and reformulating certain questions. The final questionnaire had 6 different sections: a background section about the interview, a section about the household structure, two sections about the economic assets and income and expenditures of the household, a section on agricultural activity and Conservation Agriculture, and a final section on forest governance and REDD+.

Unfortunately, in the time of preparing my household survey I fell sick twice, once suffering from a foot injury and another time I got malaria. I spent around two weeks in Lindi town to recover. It was at that point that I decided to limit the scope of my survey because of the time constraints. I reduced the sample size and aimed for at least 30 participants in Ruhoma. In Mihumo/Darajani I aimed for at least 60 respondents. I recognised that because of a lower sample size the ability to generalise to the wider population is compromised. Nevertheless, I used a random sampling procedure to derive at my sample. For the sampling procedure I obtained an up-dated list of all permanent residents in the villages. See Appendix IV for a detailed description of the sampling procedure.

I used the same questionnaire in Ruhoma and Mihumo/Darajani. The last question, which was related to the usage of trial carbon payments, was not posed to respondents in Mihumo/Darajani as they had not received any payments. In total I interviewed 39 households in Ruhoma and 79 in Mihumo/Darajani. The time of interviewing varied depending on the participant's level of understanding, education and subject knowledge. The average time was 47 minutes. I tried to interview household heads but this was not always possible. In Ruhoma I interviewed 33 household heads (11 female and 22 males) and 6 wives. In Mihumo/Darajani I interviewed 57 household heads (6 females and 51 males) and 22 wives. In both villages around 65% of the interviewees finished primary school (Standard 7), around 5 percent had continued schooling after Standard 7 and around 30% had never gone to school or left school before Standard 7.

When implementing the survey I used two assistants in each village. In Ruhoma I requested the invited guest villager from Mihumo/Darajani to assist me in conducting the survey. In addition I asked a young, male villager from Ruhoma, to whom I had built a good relationship, for help. In Mihumo/Darajani I requested the assistance from a

young male friend and from a middle-aged man, who was referred to me by the local nurse due to his competencies. The assistants were of great help to me, as without them some participants would have struggled to clearly understand my questions. Occasionally we interviewed elder people to whom my research assistants translated some of the questions into the local language Kimwera or Kingindo.

The main challenges faced when implementing the survey were related to the questions about the farm size, amount of crop harvested and income and expenditures. No farm had ever been professionally measured in any of the two villages. Therefore, villagers did not have precise data on the sizes of their farm. However, the interviewees were aware of the measurement – acre – and could estimate the size of their farms. Because villagers employ casual labour on their farms, who are paid according to how much land they work, it is common for farm owners to know the sizes of their farms in acres. If the interviewee did not know how big one acre is we took the local demonstration plot, which was one acre big, as a reference.

With regard to the questions related to the harvest we encountered similar problems. With the exception of the crops sold, villagers did not have exact measurements of the harvest. However, because of the importance of crop to the livelihoods, everybody could tell us how many sacks (*gunia*), buckets (*debe*) or baskets (*tenga*) he/she obtained from each crop. These are common measurements used also in other areas of Tanzania (Sachedina, 2008).

Another challenge related to obtaining incomes and expenditures of the households. It was difficult for interviewees to remember the amount of money obtained in the different categories. I tried to make it easier for respondents in reducing the recall times to months or weeks and request average amounts for this period. This helped to derive at meaningful estimates but still care needs to be taken when interpreting this data. In some instances I could also feel hesitation by the interviewee to reveal sensitive data such as income and expenditures. I aimed to reassure to the respondent the anonymity and confidentiality of the data and highlighted the purpose of my research. In cases of doubtful responses the research assistants and I tried to confirm the correctness of the information during or after the interview.

3.4 Data analysis

3.4.1 Qualitative data

Qualitative data from interviews and focus group discussions were translated and transcribed from Swahili to English in MS Word or MS Excel. I used online and offline dictionaries for the translations/transcriptions, which took me several months. To confirm the correctness of the process underlying my transcriptions my supervisor crosschecked the quality of a few randomly selected documents. Following this I coded the data inside the documents. By this I mean that I divided the raw text into segments (using a table structure in Word or Excel) upon which I applied keywords that best captured the content of the segment (Bloor and Wood, 2006). In doing so I began to conceptualise and make sense of my data as I grouped categories into larger themes. In the course of re-reading my coded material I constantly refined the codes and themes, thus creating a hierarchy of codes. I then created worksheets in Excel for every theme, into which I copied and arranged the material based on the assigned codes. In these worksheets I also linked relevant participant observations that I recorded in my journal to codes. For an illustration of my coding approach I attached an exemplar table (providing only one or two segments for selected codes of the theme “carbon payments in Ruhoma”) as Appendix V. Documents, newspapers and other written sources were analysed and coded without any software programme but using the same coding categories and themes described above.

3.4.2 Quantitative data

The quantitative data were analysed in MS Excel and SPSS 20 for Mac. Data cleaning was performed manually in MS Excel. As mentioned earlier I performed the household survey with 79 respondents in Mihumo/Darajani. However, I decided to remove three respondents D25, D33 and M15 from the analysis, as I did not trust in the validity of their responses. My analysis of Mihumo/Darajani is thus based on 76 respondents. In the following text I first describe the procedures used to group households into different wealth classes. This is followed by briefly discussing the assumptions and calculations used in my analysis.

3.4.3 Wealth ranking

Poverty and wealth are complex, multidimensional and fuzzy concepts that defy easy measurements (Bevan and Joireman, 1997; Campenhout, 2007; Williams, 1999). They

differ in specific contexts. Thus, alongside quantitative indicators, qualitative approaches and insider assessments have become popular to distinguish and define relative wealth within a social setting (Campenhout, 2007).

In this study I grouped households into wealth groups after I returned from the field. I derived at my indicators of wealth after a brief analysis of the survey data. The selection of wealth indicators was also informed by my personal observations and informal conversations with villagers about wealth during my field research. This means there is a personal bias involved in the ranking procedures, as the selection of criteria influences how individual households are perceived. However, some of the indicators that I used have featured also in other studies because of their usefulness (Campenhout, 2007).

In both villages I decided to conceptualise wealth as a combination of annual cash income and the extent of assets that households possess. However, in the two villages I used different combinations of variables to measure these criteria as I found them more appropriate in each context. For both villages I ran a two-step cluster analysis in SPSS to obtain a preliminary grouping, which I then improved manually. See Appendix VI for detailed information on the wealth ranking procedure.

In Ruhoma I used housing structure, assets value, amount of bicycles and total cultivated land to measure the assets of the households. I used total annual income as my variable for generated cash income. Besides income, housing structure emerged as the most significant wealth variable for classifying households, but I used the amount of bicycles to move some poorer households into the middle group.

In Mihumo/Darajani I used housing structure, amount of bicycles and mobiles, total cultivated land and number of chickens to measure the assets of the households. Bicycles and mobile phones have become important assets in this village, because they are readily available, require less time to acquire and can be used for productive income-generating activities. I used total annual income and cashew nut yields as indicators for generated income. In this village besides income the amount of bicycles and the total cultivated land emerged as the most significant wealth variables for classifying households, but I used housing structure to move poorer households into middle group. I used cashew nut yields to complement information on annual income as cashew nuts are the major cash crop in Mihumo/Darajani and wealthier farmers

generally possess larger cashew nut fields and generate higher outputs for sale.

3.4.4 Reference adult equivalent

To make households with different amounts of members comparable to each other, I calculated a reference adult equivalent for each household using the information about age and sex from the household survey. I used calculations outlined by (Brockington, 1998) who refers to Grandin (1998) and Little (1980) to arrive at following estimates: adult male = 1 RAE; adult female = 0.86 RAE; children 0 – 5 = 0.52; children 6 – 10 = 0.85 RAE and teenagers 11 – 15 = 0.96 RAE.

3.4.5 Agricultural harvests and incomes

To convert the agricultural harvests from local measurements to kilograms I used the following assumptions. Generally harvests were measured in sacks (*gunia*). One sack weighs 120 kg and is equivalent to six buckets (*debe*) (20 kg each). Also, one basket (*tenga*) is equivalent to half a bucket (10 kg). There are two exceptions. One sack of cashew nuts generally weighs 80 kg and contains 4 buckets of 20 kg. One sack of sesame weighs 100 kg and contains six buckets of 17 kg each. In terms of crop prices I consulted shop owners and farmers in the villages to obtain average prices in the time of conducting the survey. The prices per kg were as follows: maize 500 TShs, millet/sorghum 350 TShs, pigeon peas 500 TShs, cowpeas 500 TShs, cassava 150 TShs, groundnut 500 TShs, vegetables 1000 TShs, cashew nut 1200 TShs, sesame 1500 Tshs and rice 500 TShs.

3.4.6 Opportunity costs calculations in Ruhoma

To derive at the opportunity costs of forest carbon conservation in Ruhoma I used the following calculations. For each household I calculated the total value of annual crops produced, which I used to derive at mean crops value per hectare temporary farm for each wealth class. I performed a net present value calculation for a period of 25 years using a discount rate of 10% (based on current interest rates) and assuming that mean crops value remain the same over the entire period. It was assumed that one hectare land is used for the production of annual crops for 3 years, followed by 10 years of fallow, followed by another 2 years of cultivation, followed by 10 years of fallow. My NPV calculation does not include other forest uses such as charcoal production or timber extraction. However it includes the net present value of forest protection of USD 75 per

hectare as suggested by Merger et al. (2012). Information about carbon stocks, deforestation rates, were taken from Merger et al. (2012) who calculated that the mean natural forest carbon stock in the Lindi project site of TFCG/Mjumita amounts to 158.8 tCO₂ per hectare and the deforestation of one hectare of forest results in emissions of 105 tCO₂.

3.5 Reflexivity and ethical considerations

3.5.1 Reflexivity

As researchers we influence our surroundings and therefore the data we produce. It is impossible to remain neutral or uninvolved (Bryman, 2004; Denzin and Lincoln, 1998). Furthermore, we come with our personal cultural lens to the field, which influences how our experiences, perspectives and position in the social structure are shaped (Hammersley and Atkinson, 2007). It thus becomes important to reflect on our role and identity as researchers and how this affects the knowledge we disseminate.

During the field research I saw myself as a young Austrian who is conducting fieldwork in rural Tanzania for his PhD studies at the University of Manchester. This, however, was not always how villagers perceived me. At times I was perceived as a member of foreign development organisations or the Finnish LIMAS programme. At other times I was thought to be member of REDD+ project who is promoting forest protection among the villagers. Often I was seen simply as a student, a very old student for that matter, who lives in the villages to learn about rural Tanzania. In some rare instances I was mistaken for being a Christian missionary who is looking for the right places to build churches and promote conversion. Problematic perceptions of my role and identity in the field certainly influenced what information participants were willing to share with me.

To rectify wrong perceptions, and for that matter to obtain better information, was a continuous process that required thought and deliberate actions. Especially because of the existing relationships between the development actors and myself, it was not always easy to position myself as a student. However, during my extended stay in the villages I could clarify my positionality by explaining it to people and by doing what I claimed: to conduct research for my PhD. I did not facilitate any development activities or forest protection activities and I did not engage in church building or anything similar that would have sent conflicting messages. I did not unnecessarily hang around with district

officials, development partners or priests in the region. I paid for my own accommodation, transport, food and always remained the master of my daily activities. In doing so I succeeded to build trust among the community. By talking, answering questions, living respectfully and making clear the purpose of my stay I could change problematic perceptions. As a consequence villagers increasingly believed in my honesty and the sincerity of my claims. They got to see me as a PhD student doing research in their communities on the emergence of REDD+. This contributed to villagers' willingness to share more interesting and confidential information with me.

Unfortunately, some villagers remained sceptical until the very end of my stay. Their scepticism meant that it was not easy, and sometimes impossible, to obtain their opinions and knowledge to my subject questions. My identity as a Christian certainly created a barrier to some religious believers, who did not feel very comfortable in having me around and participating in information exchange. It seems that they remained doubtful of my real intentions. Living in the villages for an extended period of time automatically meant that I created better friendships with some and not others. Some of my friends were involved in local party politics and openly showed their affiliation to certain political parties. A few villagers therefore linked my identity to certain political ideologies. I tried to counter this by not supporting specific parties during political discussions and by deliberately talking and creating relationships with people from all parties and backgrounds during my fieldwork period.

Unfortunately, my positionality contributed to a gender imbalance regarding the participants and informants of my research. Because of the cultural and religious context of my fieldwork setting, I, as a young European Christian, sometimes experienced difficulties in accessing and obtaining information from female participants. At times I felt that it would have been inappropriate and offensive for me to approach women alone at their homes to conduct interviews. In such cases I talked to them when they were in groups or with their husbands or kids. This contributed to a gender imbalance of my data, which can be seen as a limitation of my dissertation. However, in the course of collecting data I could counter the imbalance to some extent. For instance, a good amount of survey respondents in both villages were women (either household heads or wives). In Ruhoma and Mihumo/Darajani females made up 17 out of 39 and 28 out of 79 respondents respectively. Similarly, among all semi-structured interviews we find 22 women in Mihumo/Darajani (out of 66) and 17 in Ruhoma (out

of 50). In these cases I requested a formal interview based on the woman's membership in a certain social group such as conservation agriculture, village natural resource committee, etc. With regard to fieldwork notes from participant observation, I interacted and collected more information from male residents. Nevertheless, I did manage to talk to several women in private when I was allowed to accompany them to their farms or when we met and talked in public spaces such as streets or markets.

3.5.2 Ethical issues

Ethical considerations are vital to any research as the rights and interests of research participants must be respected and protected throughout the research period (Creswell, 2009; Bryman, 2004). In my research the main ethical concerns related to participants providing informed consent, offering a guarantee of confidentiality and anonymity, right to opt out at any time, transparency of the research objectives and being aware of power relations between myself and the participants.

Prior to commencing my field research in the villages I obtained all legal requirements and permits from my host institution the University of Manchester and the Tanzanian government to conduct research for my PhD studies. I obtained letters of introduction from the Regional Administrative Office in Lindi and from Lindi rural and Liwale districts for my two case study villages. I introduced myself at the districts and in the villages officially and openly presented my research purpose, aim and objectives. I explained my research methods and the anticipated use of the data collected. I then requested and obtained official permission from the village council to carry out research in the villages.

Throughout my research period I ensured confidentiality and anonymity to all research participants. I explained to them that no formal relationship with any government or other organisation exists and that all information collected will be used for my PhD studies. However, I also explained that the results of my studies will be published and disseminated in the form of a dissertation, journal articles, conferences and perhaps of a book in order to create more awareness among the public about the challenges villagers face with forest carbon conservation. Whenever I interviewed people or conducted participant observation I explained to villagers that they have the right to withdraw, skip questions or not participate at all. I made sure not to introduce private spaces of individuals and if in certain cases the majority of people did not want my presence I

changed location. When recording interviews using my digital tape recorder I paid particular attention to obtaining informed consent from the participant. I ensured full anonymity and confidentiality and explained to him/her the reason for recording our conversation, which was related to language challenges as explained in section 2.3.

Living for extended periods in my research sites enabled me to build rapport and relationships based on trust and mutual respect with research participants. For sure, in both villages there were people I had better relations with than others. In rare instances I felt hostility towards my presence. At all times I tried my best to remain professional and respectful to anybody around me.

3.6 Conclusion

In this chapter I presented ethnography as my overall research approach after outlining briefly critical realism as my perspective to ontological and epistemological debates within science. This dissertation is based on an ethnographic enquiry into the emergence and potential effects of the commodification of forest carbon in two case study villages in South-eastern Tanzania. I immersed myself into the local context of Lindi Region in Tanzania to collect close observations of people's own accounts, actions and social relations shaping the emergence of neoliberal conservation, forest carbon commodification and REDD+. Making use of qualitative (participant observation, ethnographic and semi-structured interviews, focus group discussion and document analysis) and quantitative methods (household survey) I could gather and triangulate robust, reliable and holistic findings. In researching the emergence of REDD+ and its processes of neoliberalisation and commodification in an ethnographic fashion, I remained flexible and open to all kinds of data from the field while maintaining a theoretical focus. The following chapters will now present the findings of my study.

Chapter 4: Livelihoods in rural Lindi

4.1 Introduction

In this chapter I discuss the livelihoods in my two case study sites. This is important in order to assess the emergence and potential effects of REDD+, which will be carried out in the next chapter (Chapter 5). The data presented here are largely drawn from my quantitative survey, whose conceptualisation and implementation I described in the methods chapter (Chapter 3). It is important to recall that because of the low sample size and the resulting high standard error around my survey results I do not claim statistical representativeness of my findings to the wider village population. Nevertheless, the collected quantitative data form part of wider ethnographic findings, which in their entirety confirm the usefulness of the survey results in contributing to a better understanding of the qualitatively observed economic activities in the villages and their intricate relationship with land. More specifically, the quantitative data enables us to examine and express numerically the differences and similarities between a sample of poor, middle and wealthy¹³ households in the villages. Throughout the chapter I incorporate insights from my qualitative methods to substantiate and illustrate the quantitative survey results.

The main purpose of this chapter is to discuss the livelihoods of villagers in Ruhoma and Mihumo/Darajani, specifically with regard to their reliance on land for the production of crops for food and income. This chapter therefore contributes to answering research question 1 “How do REDD+ initiatives interact with local livelihood strategies in Lindi, Tanzania?” Moreover, it responds to the sub-questions concerning the economics of livelihoods in the villages, how they are linked to land use and what this means to the emergence of REDD+ in this particular context.

4.2 A brief introduction of the region and case study villages

4.2.1 A brief history of poverty and development in Lindi, Tanzania

Humans have occupied parts of the Lindi region for thousands of years (Sunseri, 2009). For all this time natural resources have been key to people’s livelihoods, particularly

¹³ Households are grouped into poor, middle-income and wealthy categories in the two villages on the basis of a conceptualisation of wealth as a combination of income and assets. I explain the process underlying the wealth ranking in my methods chapter in more details.

forests, wildlife and land for agriculture. These resources have enabled rural populations to survive on a daily basis. But they were more than mere economic resources for production: they had important cultural roles too. Forests, for instance, provided meaning to the population, as people performed initiation rituals and trees were thought of having spiritual meanings that offer special connections to honoured ancestors (Sunseri, 2009; Zahabu et al., 2009; Johansson, 2008).

The use and governance of the natural resources in Lindi Region have been shaped by the many interactions between local people inhabiting the region and outsiders. These encounters were often characterised by power struggles over land and people with winners and losers at all spatial levels (Sunseri, 2009; Neumann, 2001; Iliffe, 1979). Prior to colonialism local chiefs, lineage elders and international traders benefited most of the natural wealth in the region, which was firmly linked to the world market via the Indian Ocean trade network. This got disrupted by colonial forces – first German and then British – that came with new claims of state authority over natural wealth, which, especially due to scientific forestry and ‘closer settlements’, negatively affected people’s access and use of forests. State efforts to displace local people and later reconnect them as labourers to their natural wealth continued under post-colonialism, particularly visible in the Ujamaa villagization programme of the 1970s that displaced more than 70% of the rural population from their settlements within three years. Throughout the years, however, local people practiced resistance to the powerful outside forces. At times they succeeded in preventing subjugation and could transform the interactions to their own benefits (Sunseri, 2009; Neumann, 2001; Iliffe, 1979).

People’s encounters with state forces were shaped by an ideology of ‘fortress’ conservation, which caused socio-economic hardship to rural residents in Lindi and many other parts of the world (Agrawal and Redford, 2009). This finally ought to change when a decade later community based and participatory approaches gained international support as they promised to integrate the development of local livelihoods in national conservation objectives (Dressler et al., 2010; Wily and Dewees, 2001).¹⁴

¹⁴ Please see Appendix XI for further details on the history of forest governance in Lindi and the emergence of community-based forest management (CBFM) and joint forest management (JFM) approaches as the promised alternative.

In Tanzania participatory forest management strategies emerged¹⁵ via pilot projects in the 1990s that were based on three clear objectives: improving forest quality, improving rural livelihoods and improving local governance (Lund and Treue, 2008). These three objectives are interlinked as better protected forests should offer livelihood benefits to rural villagers, who in return engage in better governance (Wily, 2001). These livelihood benefits can be considerable, especially in Lindi region of Tanzania where large tracts of miombo woodlands exist (Nelson and Blomley, 2010). Some studies suggest, for instance, that villages around the Angai forest could on average earn 60,300 USD per year from sustainable forest management (Nelson and Blomley, 2010).

Community-based forest management (CBFM) and joint forest management (JFM) promised to provide meaningful livelihood benefits to rural Tanzanians, but few studies have been conducted to assess them (Blomley and Iddi, 2009). Nelson and Blomley (2010) and Blomley and Iddi (2009) argue that although communities obtain subsistence benefits from protected forests they have received minimal cash benefits so far from CBFM forests due to the fact that much of CBFM has been established on previously degraded land with little merchantable timber left. Often communities have also suffered from increased crop raids from wildlife as a result of forest protection. At the same time they point at the vast valuable forest resources that are left in the country, especially in the south-eastern parts including Lindi, and which could be brought into CBFM to benefit communities from sustainable harvesting.

A study by Persha and Blomley (2009) found that the sustainable management of a CBFM forest is threatened by the absence of tangible benefits from the forest resource. According to Vyamana (2009, p. 250) income from CBFM and JFM forests were very low for communities and neither of the two provided equitable distribution of the costs and benefits of forest protection. Instead some village groups, generally the wealthy, obtained more benefits than others. She thus highlighted the problem of elite capture because “current administrative arrangements appear to exclude the poor from realising the full suite of benefits”.

¹⁵ According to a national survey of 2008 over 4 million hectares were under either forest management regime, with more than 2,300 villages participating. This community-driven forest protection is still growing as international donors continue to finance decentralization in Tanzania. Over the years the governments of Germany, Denmark, Finland and UK – together with the World Bank, UNDP-GEF and other smaller actors – have invested more than US\$ 20 to 30 million in PFM activities (Treue et al., 2014). In Lindi region the Finnish government has been especially active in providing ‘development’ cooperation, which has increasingly turned towards participatory approaches to natural resource management (Seppälä and Koda, 1998).

Similarly, Ngaga et al. (2013) argued that both CBFM and JFM can contribute to livelihood improvements across households of all wealth classes although richer households tend to benefit more than poorer households. Pilly (2012) conducted a study of CBFM in Kilwa district of Lindi region, which found that village members had received valuable benefits including improved environmental services, forest products for sale and subsistence needs, secured forest ownership, improved village infrastructure and social services. He also highlights that women, elderly and the poorest receive less benefits than other village members.

His findings correspond with the insights from Seppälä and Koda (1998), who argue that gender and generational aspects underlie conflicts over natural resources and its manifestation in social order in the region. This includes conflicts between matrilineal pattern of kinship identification and patrilineal property rights. It also includes the phenomenon of young girls having many children, which often leads to very low education levels among female villagers with negative consequences for their possibilities to generate wealth. Young couples and female-headed households often belong to poor members of the village, because the unfavourable household composition contributes to increased vulnerability to economic hazards due to unforeseen health problems or crop failures for instance (Seppälä, 1998).

4.2.2 Poverty and development in Lindi today

Villagers in Ruhoma and Mihumo/Darajani still live in one of the poorest regions in the country and the world (Sundström, 2010). In Tanzania, and indeed the rest of the world, wealth is geographically unequally distributed and concentrated in urban areas. Rural residents across the country are generally worse off than urban citizens (Covarrubias, et al., 2012; NBS, 2013a). According to the Household Budget Survey 2011/12¹⁶ less than two percent of poor population live in Dar es Salaam, 14.4 percent live in other urban areas and about 85 percent of the poor population live in rural areas. Moreover, rural households are deeper in poverty as they experience larger poverty gaps, i.e. the average shortfall of per capita consumption in the population relative to the poverty line (NBS, 2013a, p. 5). While the overall poverty gap index for Mainland Tanzania is 6.7 percent,

¹⁶ The Household Budget Survey uses the basic needs approach to measure absolute poverty in Mainland Tanzania. This means that a definition of the absolute minimum resources necessary for long-term physical well-being in terms of consumption of goods is attempted. The basic needs poverty line was estimated to be 36,482 TShs per adult equivalent per month (NBS, 2013a, p. 3).

the gap for people living in Dar es Salaam is 0.8 percent and 7.9 percent for people in rural areas (NBS, 2013a). Probably one of the most serious characteristics of being poor is a lack of sufficient food. Residents of Lindi Region are part of a geographical band of food insecurity in the country that ranges from Mtwara and Lindi Regions through the central regions up to Arusha and Manyara. According to the World Food Programme about 23% of all households in rural mainland Tanzania experienced food insecurity¹⁷ between November 2009 and January 2010 (Research and Analysis Working Group, 2011).

An important factor contributing to poverty in the region is a lack of investments in infrastructure. Infrastructure development in Lindi Region faces challenges with regard to both quality and quantity (NBS, 2013b). Despite efforts being made to improve the situation, road networks are still underdeveloped and grid connectivity is basically non-existent in rural parts of Lindi Region. Even nationwide only 4% of all households living in rural areas are connected to the national power grid. Therefore, Tanzanians' rural residents still have to use firewood and kerosene/paraffin as their main energy sources for cooking and lightning. No running water is available to households, thus villagers use protected and unprotected water sources such as wells, rivers and streams to obtain water for cooking and washing (Covarrubias, et al., 2012; NBS, 2013b).

In our two case study sites houses were commonly built of wooden poles, grass, or thatch but more modern material such as iron sheets, metals, stones, cement bricks or sundried and baked bricks have become more widespread. This trend has been noticed across the country as housing conditions improved between 2007 and 2011/12 (NBS, 2013b). However, as Table 4.1 shows, residents of Ruhoma and Mihumo/Darajani are far behind the national average where nearly 66% of all households had modern roofs and 73% had modern walls in 2011/12 (NBS, 2013b).

Table 4.1 Housing structure 1

	Grass/wooden walls	Bricks
Mihumo/Darajani (76)	67	9
Percentages	88%	12%
Ruhoma (39)	29	10
Percentages	74%	26%

¹⁷ Food insecurity was understood as having *poor* (mainly cereal-based diet with almost no animal diet and very little of any other food item consumed (vegetables just 3 days per week and pulses 2 days)) or *borderline* (marginally better diet, eating pulses, vegetables, and fruits approximately one day more per week than poor consumption households) *food consumption*.

Similarly, the large majority of interview respondents in the two villages used grass/thatch as roofing material. Among the interviewees only around a quarter in Ruhoma and about a third in Mihumo/Darajani used modern material such as corrugated iron sheets (Table 4.2).

Table 4.2 Housing structure 2

	Grass/thatch	Iron sheets
Mihumo/Darajani (76)	52	24
Percentages	68%	32%
Ruhoma (39)	29	10
Percentages	74%	26%

Another feature of poverty in the region is the low education level among villagers (URT, 2012a). As Table 4.3 illustrates, primary education generally represented the educational ceiling for people in the villages and a considerable amount of residents dropped out even before that. None of the households had members with university or other tertiary education.

Table 4.3 Education level

	No or below STD 7	Primary School (STD 7)	Secondary School
Mihumo/Darajani (76)	24	47	5
Percentages	32%	62%	6%
Ruhoma (39)	14	24	1
Percentages	35%	62%	3%

Poverty and development also expresses itself in the possessions of consumer items. In the Household Budget Survey of 2011/12 it was found that transport assets (bicycles) and communication assets (mobiles) were the most prevalent possession among the Tanzanian population. Around half of the rural population now owns at least one mobile phone (NBS, 2013b). Similar results were observed in the two case study villages. In Mihumo/Darajani 56% of the interviewed households had one bicycle, 61% had one radio and 29% had one mobile. In Ruhoma much less interviewed households had one bicycle (38%), the same percentage (62%) had one radio and almost half of the households had one mobile. As mentioned in the methods chapter I used the amount of bicycles and mobiles among other factors for the categorisation of farmers into wealth groups.

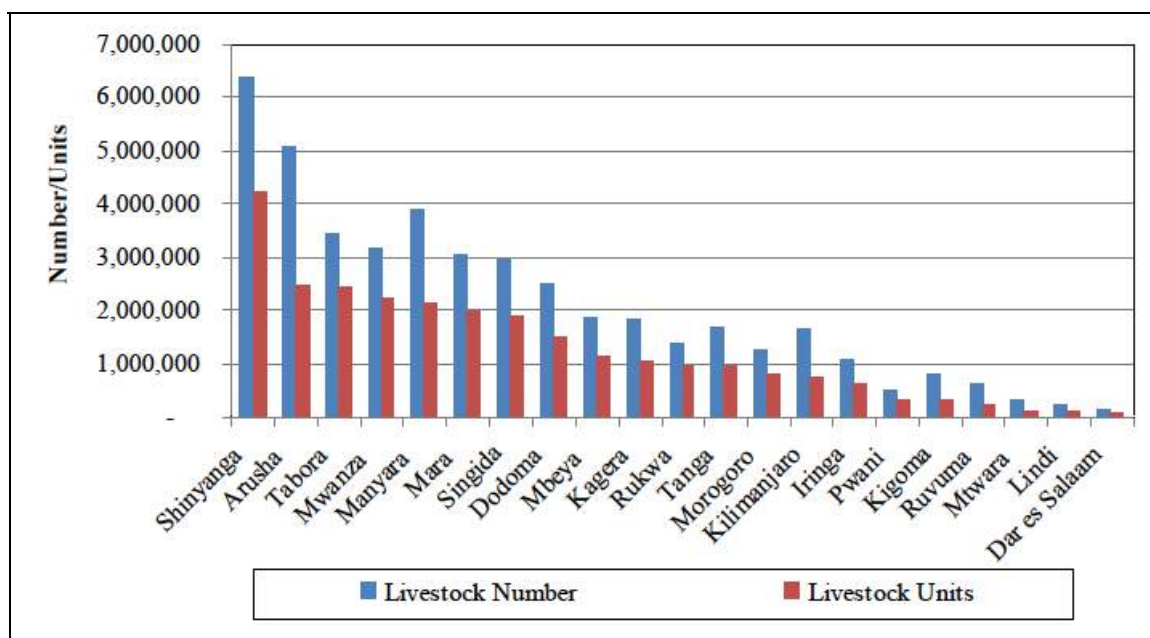
4.2.2 The role of agriculture

The agricultural sector, which includes crops, livestock, hunting and gathering, fisheries and forest, is the largest sector in the economy of rural Tanzania. It employs about 75 percent of the entire workforce in the country, making the large majority of the population dependent on land and natural resources. At the same time this sector only contributes about 25% to the national gross domestic product (GDP). While the annual GDP growth rate recorded for the entire economy was quite high at 7% over the period 2000 to 2010, the agricultural sector grew by 4.3% only, which is significantly lower than the MKUKUTA¹⁸ target of 10% by 2010 (Research and Analysis Working Group, 2011).

While livestock grazing and pastoralism is extensively practiced in other areas of Tanzania, especially in Northern and Western regions, residents in Lindi Region mainly practice crop production as their major agricultural activity (Covarrubias, et al., 2012; URT, 2012a, 2012b). As we can see from the Graph 4.1 below, Lindi Region ranks second last in terms of livestock numbers and units.

Graph 4.1 Livestock numbers and units per regions in Tanzania Mainland

Source: URT, 2012



The main factor for the low livestock numbers relates to the existence of tsetse fly (genus *Glossina*) and consequently sleeping sickness (*Animal trypanosomiasis*) in the

¹⁸ MKUKUTA (Mpango wa Kukuza Uchumi na Kupunguza Umaskini Tanzania) is a Kiswahili acronym for the National Strategy for Growth and Reduction of Poverty, which was the national development framework for 2005-2010 in the country.

environment of Lindi Region, which has made cattle herding practically unviable (Sunseri, 2009; URT, 2012a, 2012b). Farmers in Lindi Region therefore focus on crop production on a total usable land of 351,498 ha (URT, 2012a). On this land farmers mainly plant annual crops during the long rain season¹⁹. Cereals such as maize, sorghum, and paddy are the main crops followed by oil seeds and oil nuts. Fruit and vegetables, root and tuber crops (cassava) and pulses were planted on less than 1% of the planted area (URT, 2012a).

Farmers in Lindi Region cultivate fields with low levels of mechanization, low utilisation of fertilisers or improved seeds, no irrigation opportunities, poor extension services, infrastructure and marketing opportunities (Covarrubias, et al., 2012; Mashindano and Maro, 2011). Throughout the region farmers depend on the hand hoe and machete as the major tools for operation. A tiny fraction of the population (less than 3%) uses tractors for ploughing or harrowing (URT, 2012a). Although many farmers still lack modern input factors that could enhance the productivity of their farms, certain technologies have become more commonly applied across the region. Improved seeds, for instance, were used on about half of the total planted area. Insecticides and pesticides were applied on 45% of the planted area and herbicides were used on 17% of the total planted area. One of the most pressing problems that farmers in Lindi Region face is the dependence on rain. Statistics show that the area planted under irrigation still amounts to less than 1% of the total planted area (URT, 2012a).

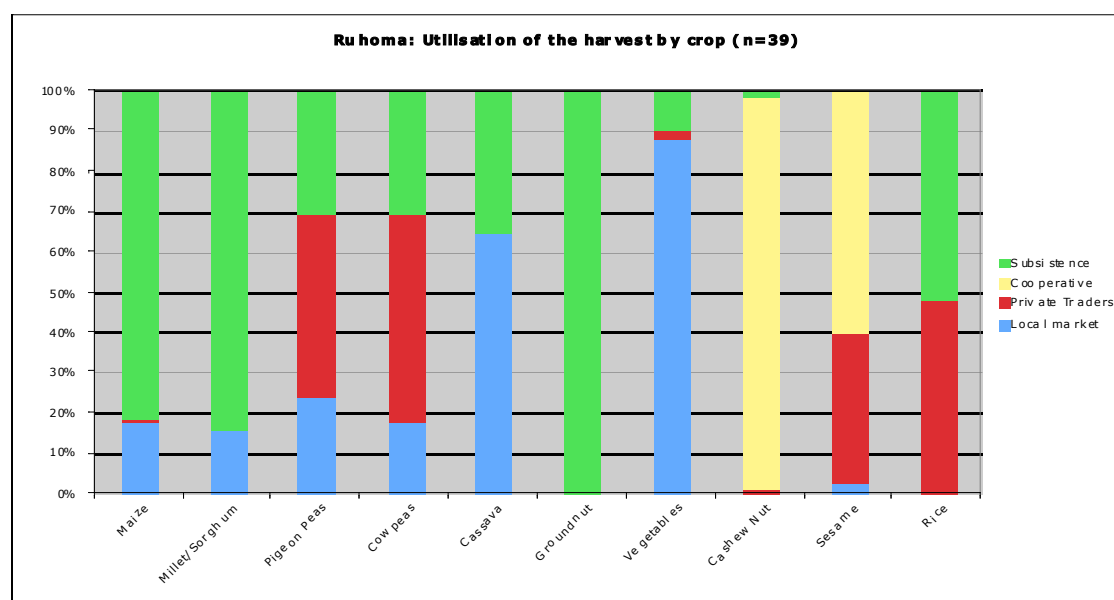
Farming in the Lindi province is often described as ‘shifting cultivation’ (Bolin, 2010; Forrester-Kibuga and Samweli, 2010; Johansson, 2008; LIMAS, 2010; Mukama, 2010; Mustalahti and Tassa, 2012; TFCG, 2012), which suggests that farmers cultivate one piece of land for a few years and then abandon it for the purpose of regeneration. It is suggested that farmers move to other areas to look for more fertile lands after experiencing declining soil fertility and increased weed infestation on their farms. New farms are preferably opened up in the fertile lands of primary or secondary forests (ibid). Although it is remarked that shifting cultivation does not necessarily lead to long-term deforestation and forest degradation (Dove and Carpenter, 2008), recent changes in population growth, market access and commercialisation of agricultural crops have been highlighted as the main reasons for making this form of agriculture unsustainable and detrimental to the environment (TFCG, 2012). In popular discourse population growth

¹⁹ The long rainy season lasts from March to May and the short one from late November to January.

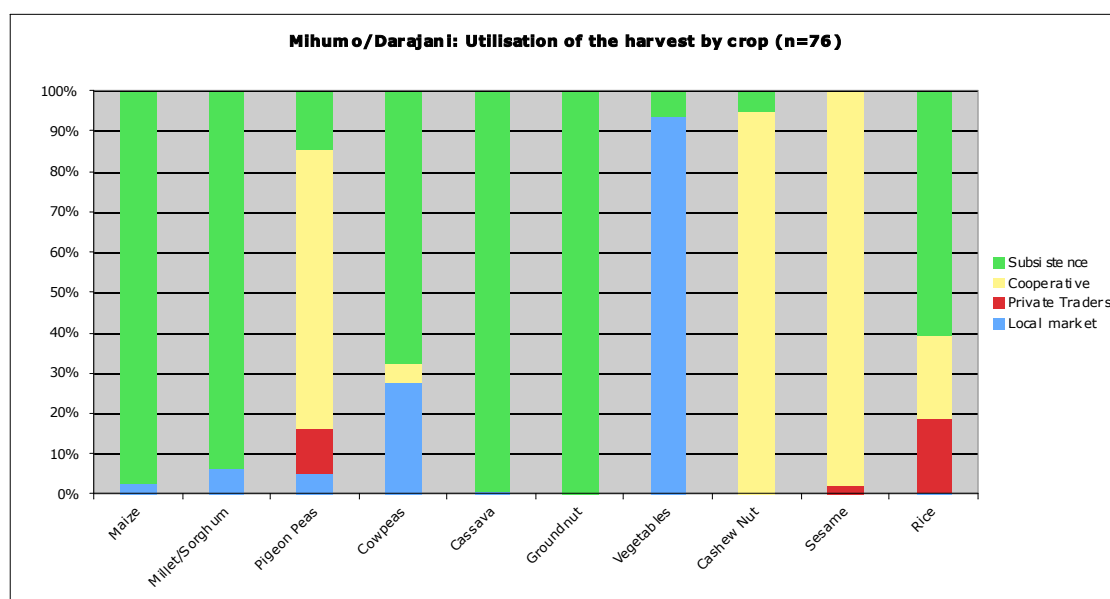
and local slash-and-burn practices are often mentioned as the driving factors behind deforestation and forest degradation (Adams, 2008; Holmgren, 2013; Leach, 1996). It is therefore interesting to note that, according to the latest population and household census, the average annual growth rate in Lindi Region decreased from 1.4% between 1988-2002 to 0.9% from 2002-2012. Lindi Region recorded the second lowest rate in the whole country. The observed reduction in the annual growth rate corresponds with the national trend where annual population growth declined from 3.3% in 1967 to 2.7% in 2012 (NBS, 2013c).

The majority of households in Lindi Region produce crops for subsistence needs and markets. In Liwale district 73% of all households sold crops, which was the highest rate recorded in the region (URT, 2012a). Major cash crops in Lindi Region are cashew nuts, sesame, groundnut, cowpeas and pigeon peas. Crops are consumed or sold to the local market, private traders and local cooperative. As we can see from the graphs 4.2 and 4.3 below, private traders play a bigger role in Ruhoma than in Mihumo/Darajani, where the local cooperative is the most important buyer.

Graph 4.2 Utilisation of harvest by crop in Ruhoma

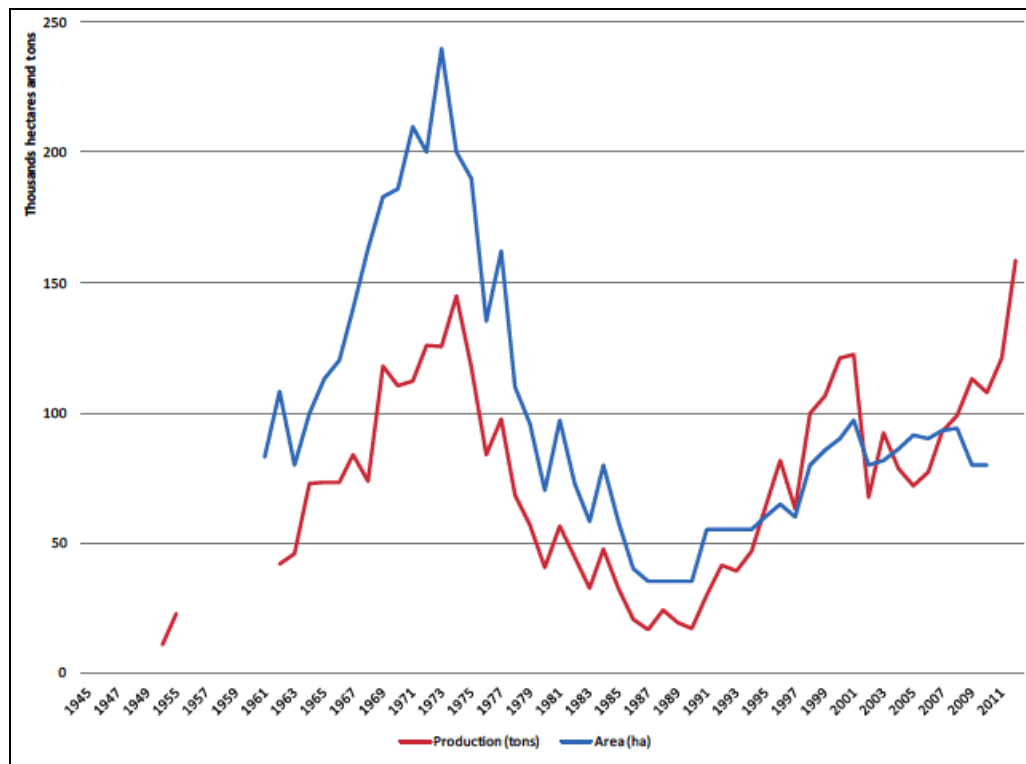


Graph 4.3 Utilisation of harvest by crop in Mihumo/Darajani



In Lindi Region more than 90% of the area planted with oil seed and oil nut crops was under sesame cultivation, which also represents the main cash crop in Ruhoma. Cashew nut, the major cash crop in Mihumo/Darajani, was planted on 66% of the area planted with perennial crops in the region (URT, 2012a). Cashew nuts are sold to the local cooperative and from there purchased and transported by international buyers for processing in India. As we can see from Graph 4.4 below, the production of cashew nuts in Tanzania peaked in 1973/74 at 145 million tonnes and then collapsed falling to 16 million tonnes in 1989/90. Since then it has experienced growth reaching 122 million tonnes in 2000. After several years of lower volumes the production has crossed the 120 million tonnes mark again in 2011. Higher volumes in recent years were due to better prices in the world market according to traders (Graph 4.5 and 4.6) (UNIDO, 2011).

Graph 4.4 Production of raw cashew nuts in Tanzania Source (Nkonya and Barreiro-Hurle, 2013)
(1945 – 2012)



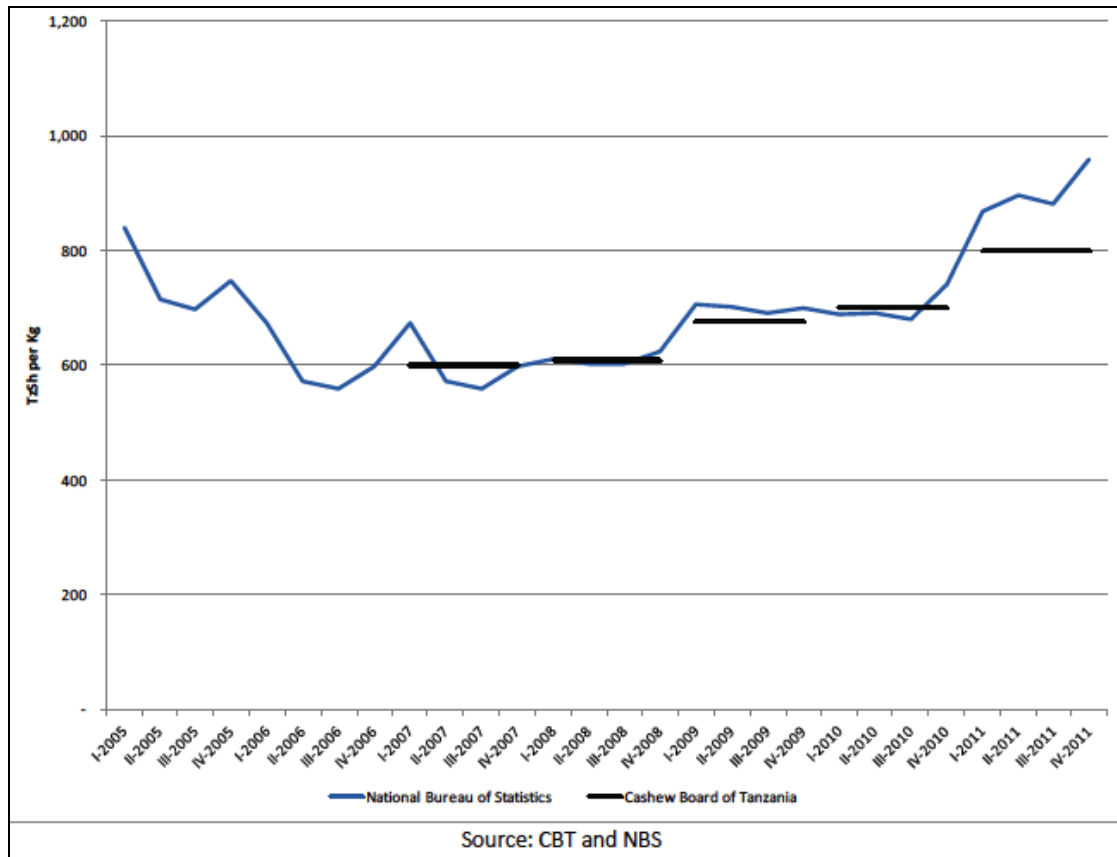
Graph 4.5 Export volume in TShs. Billion of major export crops

Source (NBS, 2013b)

FOREIGN TRADE							
Major Exports: (TShs. Billion)							
Commodity	2006	2007	2008	2009	2010	2011	2012
Coffee	92.8	143.3	124.1	150.0	162.3	225.7	292.8
Cotton	56.8	49.8	95.6	146.8	133.1	103.9	-
Sisal	9.3	7.4	18.5	-	11.1	-	-
Cashew nuts	62.7	33.8	82.0	94.4	173.2	189.6	222.0
Cloves	10.0	10.6	16.0	18.5	11.3	48.4	58.3
Diamonds	28.0	23.4	23.8	24.2	14.2	17.0	41.0
Gold	968.0	672.1	807.9	1,058.2	1,336.7	3,463.8	3,410.7
Tobacco	129.1	116.9	210.2	327.5	178.7	437.9	348.1
Tea	41.7	48.3	50.3	88.1	68.1	73.5	87.4
Total	1,398.4	1,105.6	1,428.4	1,907.7	2,088.7	4,559.8	4,460.3

Graph 4.6 Farm gate prices for cashew nuts in Tanzania (2005-2011)

Source: Nkonya & Barreiro-Hurle, 2013



In Liwale the sale of cashew nuts is the major income source for most farmers. Yet households face problems with uncertainty about payments and prices in the open market, government regulations, ineffective and costly cooperatives, weak partnerships among stakeholders, poor market access, high transportation, transaction costs and access to formal credit (Kilama, 2013; Nkonya and Barreiro-Hurle, 2013; UNIDO, 2011). Villagers have become increasingly frustrated with the uncertainty regarding the payments they receive from the sale of their crops. In Liwale riots and protests broke out in April 2013 when farmers were offered lower payments to what was agreed in the previous year. Police had to be employed, firing tear gas in the local market place, to stop angry farmers who directed their frustrations at local politicians of the ruling CCM party (BBC, 2013a).

Sesame is another important cash crops in Lindi and Mtwara regions, which together account for 35% of the total export of the crop in the country. Analysts see great potential in the country's sesame industry, but more public and private investment is required to improve production and marketing. Problematic policies, legislations and

institutional framework are considered major factors that prevent about 80,000 producers in the two regions to benefit more from its cultivation (Mashindano and Kihenzile, 2013).

4.2.3 The role of off-farm activities

Scholars have highlighted in the past that off-farm activities are crucial to the livelihoods of rural residents in Tanzania and Sub-Sahara Africa at large. The non-farm sector is an important contributor to poverty alleviation and income generation. Agriculture and non-agricultural activities often interlink with incomes flowing from one sector to the other and from rural to urban spaces. Incomes from off-farm activities are essential to finance investments into crop production, livestock grazing or other agricultural activities (Covarrubias, et al., 2012; Ellis and Mdoe, 2003; Woodhouse, 2009).

Despite their importance off-farm income sources are still inadequately available for most of the rural population in Tanzania. The data collected by the agricultural census survey of 2007/08 shows, that households with off-farm income sources decreased from 26.6% in 2002/03 to 15.4% in 2007/08 (Research and Analysis Working Group, 2011). However, Covarrubias et al (2012) report a somewhat different picture in stating that 34% of rural households engage in non-agricultural self-employment activities. Both studies confirm that for those households, which are able to engage in off-farm income activities, the money earned is significant. On average money earned from off-farm sources makes up 30 to 50% of the total income of rural households (Covarrubias et al., 2012; Research and Analysis Working Group, 2011).

Off-farm income sources include wage labour, petty trade, craftsmanship and many more activities, of which the vast majority is conducted informally. Formal employment opportunities are almost non-existent. Data of the latest employment and earnings survey show that Lindi Region contributes only 1.3% of the total amount of employees in the country. This is the second lowest rate after Rukwa (NBS, 2013d).

4.3 The economics of livelihoods in Ruhoma and Mihumo/Darajani

4.3.1 Income levels

Lindi Region belongs to the poorest regions in the world. Consequently, the income levels of its households are generally very low. In Ruhoma the 39 interviewed households generated an estimated total income (income is here understood as cash income minus loans) of 26,001,880 TShs (16,460 USD²⁰) over a period of 12 months. This means that households generated on average around 420 USD cash income per year. If converted to adult equivalents this results in cash income of mere 503 TShs (0.3 USD) per day. This is similar to Mihumo/Darajani where the mean cash income per household and adult equivalent is 626,112 TShs (396 USD) and 395 TShs (0.25 USD) respectively (Table 4.4).

Table 4.4 Mean household and adult equivalent cash income

	Total	Total HH Cash Income	Mean HH Cash Income	Mean Cash Income per AE	Mean Cash Income per AE per day
Ruhoma	39	26,001,880 TShs (16,457 USD)	666,715 TShs (422 USD)	183,501 TShs (116 USD)	503 TShs (0.3 USD)
Standard Deviation			756,711 TShs (479 USD)	208,271 TShs (132 USD)	571 TShs (0.4 USD)
Mihumo/Darajani	76	47,584,490 TShs (30,117 USD)	626,112 TShs (396 USD)	144,279 TShs (91 USD)	395 TShs (0.25 USD)
Standard Deviation			548,632 TShs (347 USD)	126,425 TShs (80 USD)	346 TShs (0.22 USD)

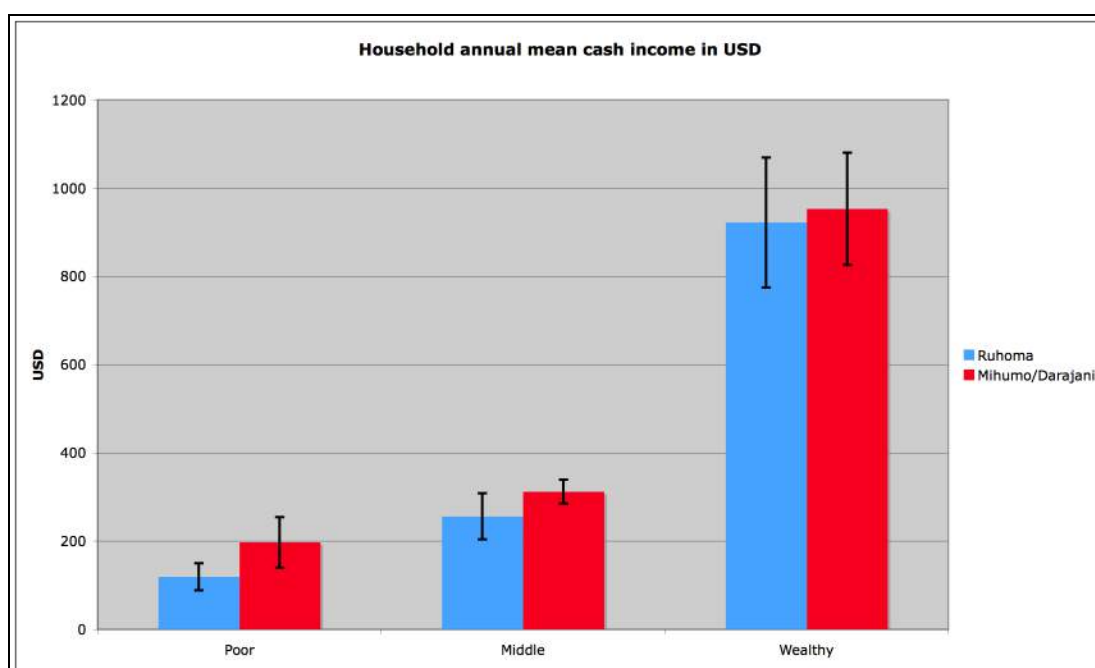
It is clear from these data that households in both villages are very poor when it comes to generating cash income. On average an adult equivalent lives from 100 USD cash income for a period of a whole year. The mean cash income per day is around 0.3 USD. In both villages we see significant variations between the wealth classes though (Table 4.5 and Graph 4.7). In Ruhoma wealthy adults generate cash incomes that are eight and four times higher than that of adults coming from poor and middle-income households respectively. In Mihumo/Darajani wealthy adults obtain cash incomes that are four and two times higher than that of poor and middle-income households.

²⁰ To increase readability I rounded large (over 1,000) dollar figures to the nearest ten throughout the document.

Table 4.5 Mean cash income per household and per adult equivalent

	Wealth class	Mean Household Income	Standard Deviation	RAE	Mean Income per RAE per day
Ruhoma	Poor (n=12)	188,240 TShs (119 USD)	167,918 TShs (106 USD)	3.5392	146 TShs (0.1 USD)
	Middle (n=14)	404,428 TShs (256 USD)	309,385 TShs (196 USD)	3.9950	277 TShs (0.17 USD)
	Wealthy (n=13)	1,457,308 TShs (922 USD)	838,318 TShs (531 USD)	3.3308	1,198 TShs (0.76 USD)
Mihumo/Darajani	Poor (n=11)	311,005 TShs (197 USD)	302,021 TShs (191 USD)	4.5055	189 TShs (0.12 USD)
	Middle (n=53)	492,331 TShs (312 USD)	310,279 TShs (196 USD)	4.0974	329 TShs (0.21 USD)
	Wealthy (n=12)	1,505,825 TShs (953 USD)	696,024 TShs (441 USD)	5.2575	785 TShs (0.5 USD)

Graph 4.7 Household annual mean cash income in USD



All wealth classes record mean incomes per adult equivalent per day of less than 1 USD. Poor adults live on an estimated mean cash income of 0.1 USD per day, which is much lower compared to 0.76 USD and 0.5 USD for wealthy adults in Ruhoma and Mihumo/Darajani respectively.

4.3.2 Relevance of sectors

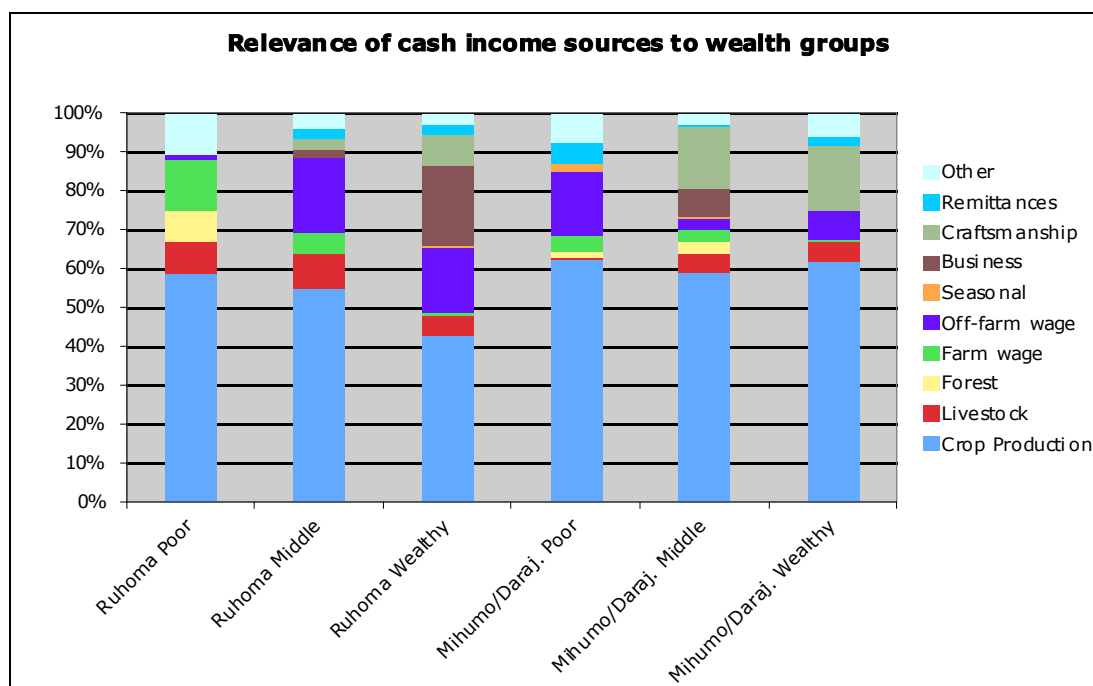
Although households obtain cash incomes from various sources, the sale of crops represents the single most important income source to all wealth classes in both villages (Table 4.6). With the exception of the wealthy in Ruhoma the sale of crops generated between 55% and 62% of the total cash income of all other wealth groups. In Ruhoma poor and middle-income households depend more on crop production²¹ for cash income compared to wealthy households, who managed to generate already more than 50% of their cash income from off-farm sources. Despite the high importance of crop sales to all groups, every wealth group generates considerable amounts of cash in other ways.

Table 4.6 Relevance of sectors to total income

		Crop Prod.	Livest.	Forest	Farm wage	Off- farm wage	Season	Business	Craftsm.	Remitt.	Other
Ruhoma	Poor (12)	59%	8%	8%	13%	1%	0%	0%	0%	0%	11%
	Middle (14)	55%	9%	0%	5%	20%	0%	2%	2%	3%	4%
	Wealthy (13)	43%	5%	0%	0%	17%	1%	20%	8%	3%	3%
Mihumo/D	Poor (11)	62%	1%	1%	4%	16%	2%	0%	0%	5%	7%
	Middle (53)	59%	5%	3%	3%	2%	1%	7%	16%	0%	3%
	Wealthy (12)	62%	5%	0%	0%	8%	0%	0%	17%	2%	6%

²¹ In this section only crops that are sold and converted to cash are considered as income. I will discuss the total value of crop production in the last section of this document.

Graph 4.8 Relevance of cash income sources to wealth groups



Poor households in Ruhoma largely depend on cash income from agriculture, which includes crop production (59%), livestock (8%) and forest (8%) incomes. In addition they generate almost 13% of their cash by working as casual wage labourers on village farms and about 11% comes from other sources. In Mihumo/Darajani the poor too depend much on agriculture but mostly on crop production, which brings more than 62% of their income. Other important sources are farm wage labour (4%), remittances (5%) and 'other' sources (7%). Also off-farm labour records a high share of about 17%, but this is solely the result of household D27, who distorts the average in this case.

Middle-income households in Ruhoma generate much income from livestock (9%), off-farm wage labour (20%) and farm wage labour (5%) in addition to crop production (55%). As we can see they managed to tap into the off-farm wage labour source that usually brings good amounts of money. In Mihumo/Darajani the middle-income households generate much from craftsmanship (16%), which includes carpentry and logging, and business (7%) besides the obvious agriculture-related sources that together amount to 67%. Here too, they managed to diversify their income sources to include off-farm activities.

The wealthy in Ruhoma obtain much from their income from business (20%), off-farm labour (17%) and craftsmanship (8%). They managed best to diversify their income sources and already generate more than 50% of their cash income from off-farm activities. In contrast, wealthy in Mihumo/Darajani still generate more than 60% from crop production, but here too off-farm wage labour (8%) and craftsmanship (17%) play important roles in their income portfolio.

According to my findings crop sales remain the most significant source of income for all households but in Ruhoma the wealthy and middle-income households managed better to diversify their livelihoods and generated about half and a quarter respectively of their income from off-farm activities. In contrast, poor households still largely depend on agriculture or farm-wage labour for their livelihoods. In Mihumo/Darajani middle and wealthy households generate large amounts of cash from craftsmanship besides crop production. I will now explain the various income sources in more details in the next section.

4.3.3 Income from crop sales

In contrast to common understandings that villagers in Mihumo/Darajani and Ruhoma practice 'shifting cultivation' my research shows that they combine temporary with permanent farms and to a lesser extent vegetable farms. On temporary farms villagers cultivate annual crops such as maize, sorghum, groundnuts, sesame, pigeon peas and cowpeas. On permanent farms villagers grow perennial crops such as cashew nuts, bananas or coconuts. Sometimes temporary farms, where annual crops are grown first, become permanent farms in the long-term. Farmers mix annual and perennial crops during the first or second year of cultivation and once the perennial trees are three or four years old they replace the annual crops. As planting trees is culturally accepted as a form of claiming ownership over land, the permanent farms move from the communal property to the property of individual households.

It is possible for someone to farm for three years, when the cashew nut tree starts to bear fruit, he moves and farms somewhere else. So you find a lot of areas with cashewnut trees and people have moved (M Interview 14)

You farm and you get food for the first year, in the second year, in the third year. In the fourth year, the cashew nut trees have grown. And there you don't use any fertilizers. And the soil is depleted.

After 5 or 6 years, you make another plan. (M Interview 10)

I will elaborate on the uses of land in later sections. In this section I will discuss the income generated from these land uses. In Ruhoma almost every households obtained income from crop sales. Wealthy households derived considerably more than middle-income and poor households from the sale of crops. They achieved around 3.7 and 2.8 times the amount compared to poor and middle-income households respectively. However, this results from the performance of some wealthy households, who generated very large amounts exceeding 1,000,000 TShs (633 USD), while others obtained very little in this category. In Mihumo/Darajani as well the wealthy have a much higher mean income from crop sales than poor and middle-income households. Their average income is 6.7 and 3.2 times higher than that of the poor and middle-income households respectively (Table 4.7).

Table 4.7 Income from crop sales

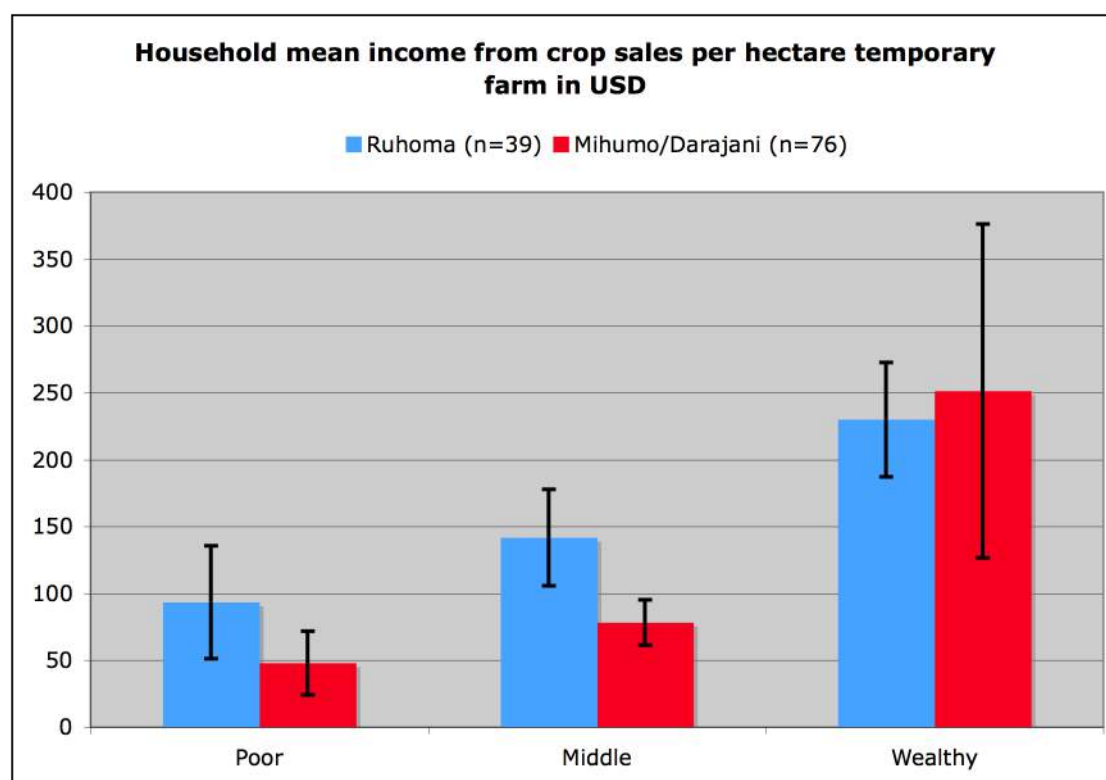
		Sum	Mean	StdDev
Ruhoma	Poor	1,330,880 TShs (842 USD)	168,040 TShs (106 USD)	120,495 TShs (76 USD)
	Middle	3,111,000 TShs (1,969 USD)	222,214 TShs (141 USD)	210,160 TShs (133 USD)
	Wealthy	8,162,000 TShs (5,166 USD)	627,846 TShs (397 USD)	426,535 TShs (270 USD)
Mihumo/Darajani	Poor	1,517,050 TShs (960 USD)	137,914 TShs (87 USD)	127,801 TShs (81 USD)
	Middle	15,509,540 TShs (9,816 USD)	292,633 TShs (185 USD)	245,617 TShs (155 USD)
	Wealthy	11,154,900 TShs (7,060 USD)	929,575 TShs (588 USD)	447,653 TShs (283 USD)

In Ruhoma the wealthy obtain 2.5 and 1.6 times more net income from crops sales per hectare on temporary farms than poor and middle-income households respectively. In Mihumo/Darajani wealthy households earn 5.2 and 3.2 times more net income from the sale of annual crops per hectare temporary farm compared to poor and middle-income households respectively (Table 4.8 and Graph 4.9).

Table 4.8 Mean household net income from crop sales per ha temporary farm²²

		Total	Mean net income per ha from annual crops sales on temporary farms	StdDeviation
Ruhoma	Poor	12	147,572 TShs (93 USD)	230,845 TShs (146 USD)
	Middle	14	223,896 TShs (142 USD)	213,830 TShs (135 USD)
	Wealthy	13	363,349 TShs (230 USD)	243,450 TShs (154 USD)
Mihumo/Darajani	Poor	11	75,786 TShs (48 USD)	124,322 TShs (79 USD)
	Middle	53	123,794 TShs (78 USD)	194,503 TShs (123 USD)
	Wealthy	12	397,072 TShs (251 USD)	682,903 TShs (432 USD)

Graph 4.9 Household mean income from crop sales



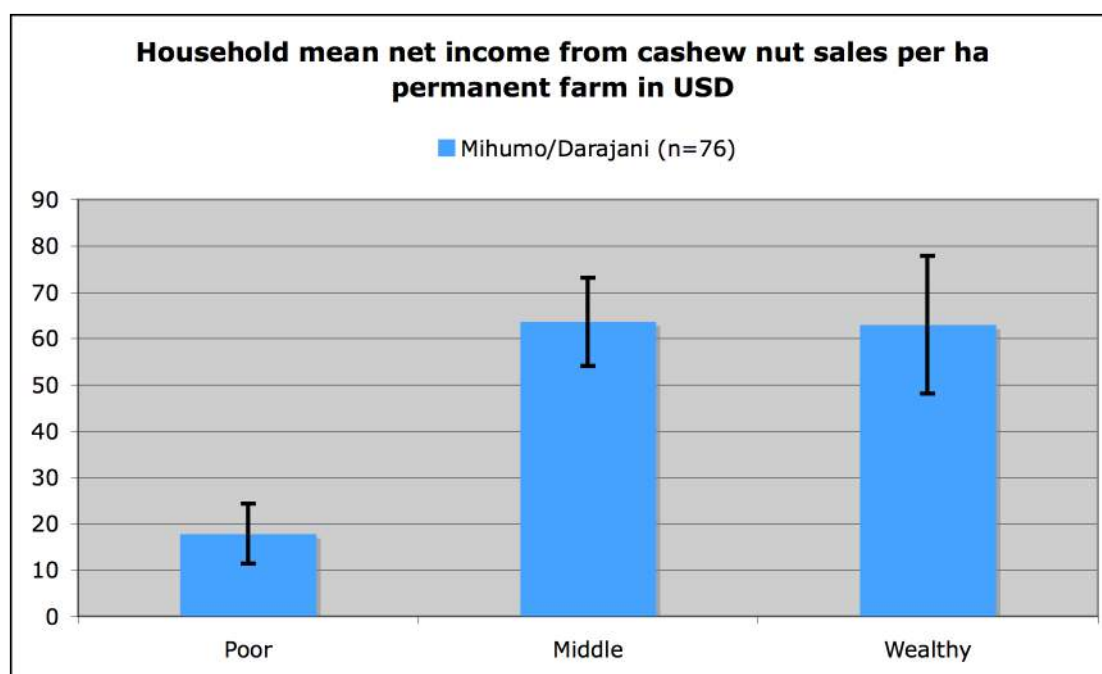
²² I calculated this by multiplying the amount of crops sold with mean kilogram prices (see methods chapter) and then deducted expenses on crop production to derive at net income from sales for each household. I then calculated the mean for each wealth group.

In Mihumo/Darajani I also calculated the mean net income from the sale of cashew nuts per hectare on permanent farms (Table 4.9 and Graph 4.10). On permanent farms wealthy households earn 3.5 times more than poor households per hectare. According to my data there was no difference between the performance of middle-income and wealthy households with regard to the net income from cashew nut sales per hectare on permanent farms.

Table 4.9 Mean net income from cashew nut sales in M/D

	Total	Net mean income/ha on permanent farms	StdDeviation
Poor	11	28,148 TShs (18 USD)	33,920 TShs (21 USD)
Middle	53	100,481 TShs (64 USD)	109,960 TShs (70 USD)
Wealthy	12	99,501 TShs (63 USD)	81,189 TShs (51 USD)

Graph 4.10 Household mean net income from cashew sales



4.3.4 Livestock grazing

As is typical for this region villagers in Mihumo/Darajani and Ruhoma are not big herders. They keep very small amounts of livestock, mostly limited to chickens and goats (cf. Sundstrom, 2010). There was not a single cattle herder in either village. A look at the number of livestock possessed by survey respondents illustrates the subordinated role that herding continues to play compared to crop production (Table 4.10).

Table 4.10 Livestock holdings in Ruhoma and Mihumo/Darajani

		N	Chicken	Goats	Sheep	Pigeons	Ducks
Ruhoma	Poor	12	32	25	2	0	0
	Middle	14	47	21	0	0	0
	Wealthy	13	74	29	0	0	0
	Total	39	153	75	2	0	0
Mihumo/ Darajani	Poor	11	11	0	0	12	0
	Middle	53	432	11	25	133	22
	Wealthy	12	254	3	0	5	19
	Total	76	697	14	25	150	41

As we can see from the above table (4.10) chickens were the most prevalent livestock among the interviewed households in both villages. Chickens are easy to keep and affordable to most of the population. In Ruhoma wealthy households keep on average more chicken than the middle-income households and poorer households. In Mihumo/Darajani middle-income and wealthy households keep much larger numbers of chickens than households in Ruhoma (Table 4.11). The high standard deviations point at the considerable differences even within the wealth classes. Because Mihumo/Darajani is around 16 km away from Liwale town and thus in relative close proximity to a growing urban market, some wealthy and middle-income villagers keep chickens for sale to urban restaurants, guesthouses or residents. Goats were commonly held in Ruhoma but not in Mihumo/Darajani. Around one-quarter of the survey respondents in Ruhoma claimed to keep goats. Some of them kept larger numbers starting from six goats and more.

Table 4.11 Mean holdings of chicken and goats per wealth class

Wealth Class	Ruhoma				Mihumo/Darajani	
	Mean Chicken	StdDev	Mean Goats	StdDev	Mean Chicken	StdDev
Poor	2.7	3.9	2.1	4.0	1	1
Middle	3.4	4.5	1.5	4.1	8.2	9.2
Wealthy	5.7	7.8	2.2	4.4	21.2	16.2

Livestock sales represent an important income category to some households in both villages. The 39 interviewed households in Ruhoma sold on average 42,282 TShs (27 USD) per household. In Mihumo/Darajani the 76 interviewed households sold livestock at an average of 29,000 TShs (18 USD) per household. The average is lower compared to Ruhoma because of the lower number of goats possessed by the villagers.

Between the wealth classes we can notice some differences. Despite the fact that livestock sales are an important contributor to poor and middle-income household's annual cash incomes in Ruhoma, the poor obtained only about half of the cash income from livestock sales than the middle-income households and wealthy households generated double the amount of middle-income households. In Mihumo/Darajani the wealthy obtained more than 3 times the amount of cash from livestock sales compared to middle-income groups (Table 4.12).

Table 4.12 Income from livestock sales

		Total	Sum	Mean	StdDev	Max
Ruhoma	Poor	12	190,000 TShs (120 USD)	15,833 TShs (10 USD)	32,039 TShs (20 USD)	110,000 TShs (70 USD)
	Middle	14	514,000 TShs (325 USD)	36,714 TShs (23 USD)	67,456 TShs (43 USD)	240,000 TShs (152 USD)
	Wealthy	13	945,000 TShs (598 USD)	72,692 TShs (46 USD)	129,044 TShs (82 USD)	400,000 TShs (253 USD)
Mihumo/ D.	Poor	11	18,000 TShs (11 USD)	1,636 TShs (1 USD)	5,427 TShs (3 USD)	18,000 TShs (11 USD)
	Middle	53	1,239,000 TShs (784 USD)	23,377 TShs (15 USD)	37,329 TShs (24 USD)	180,000 TShs (114 USD)
	Wealthy	12	947,000 TShs (599 USD)	78,916 TShs (50 USD)	143,544 TShs (91 USD)	480,000 TShs (304 USD)

4.3.5 Forest resources

Residents of the two villages use timber and non-timber forest products from their village land mostly for subsistence purposes. Small amounts of non-timber forest products such as mushrooms, honey, fruits, berries and medical plants are collected in forests located in the open area. Because in Mihumo/Darajani the forest reserve is 10 kilometers away from the settlement area villagers rarely find their way into the reserve

for these products. The most common fruits collected were *hangadi*²³ and *ming'oko*. Usually women collect these fruits, which they then sell in small amounts in the local market. In Ruhoma non-timber forest products are collected in small amounts in forests that are located in and outside the protected area for subsistence needs. Beekeeping activities take place in both villages, but some residents also collect wild honey from the forests. Since it takes special knowledge to collect honey only a handful of villagers pursue this activity. The most important non-timber forest product is firewood, which is used for daily cooking. In both villages residents collect firewood from areas nearby their farms on village land outside the forest reserve.

Hunting and fishing activities are common in Mihumo/Darajani but less so in Ruhoma. Villagers in the Liwale district are known for their traditionally good hunting skills and their use of game as an important source of protein (Johansson, 2008). However, because these activities are deemed illegal they are not overtly conducted or reported to the general public. Nevertheless, during my fieldwork period I was offered small amount of wild meat on a number of occasions. One of the persons who hunted and sold wild meat to local villagers was a member of the village natural resource committee.

The harvesting of timber and poles is not a major cause of deforestation or degradation in both villages as it predominantly serves to meet local construction needs for the creation of houses, beds, tables, chair and so on. In both villages I could not observe large-scale timber harvesting for commercial purposes. In Mihumo/Darajani, where timber harvesting in the forest reserve is prohibited, villagers obtain the timber from the large area outside the reserve, which is called “open area”. However, as Taku-Tassa (2010 p. 59) also noticed, according to some residents harvesting of high value tree species takes also place inside the forest reserve (Journal 17.8.2011).

In Ruhoma only 4 out of 39 interviewed households claimed to have obtained income from the sale of forest products. Three of the four belonged to the poor households and one to the wealthy category. The three poor households claimed to have obtained 130,000 TShs (82 USD), 52,000 TShs (33 USD) and 1,000 TShs (0.6 USD) over a

²³ *Hangadi, hangai, ruangai and ming'oko* are the local names for root tubers of the *Dioscorea* species (CSC and FAO, 1993; Neuwinger, 1996). They are poisonous roots that are found in the forest. The Angai forest takes its name from the *hangai* root tuber, which is collected, washed, dried and pounded into flour during times of food shortages (Akatama, 2013).

period of one year. The one wealthy household stated an income from 10,000 TShs (6 USD) from the sale of forest products.

In Mihumo/Darajani we see similar results. Only a handful of villagers, namely nine out of 76 interviewed households, claimed to derive income from the sale of forest products. The amount differs considerably ranging from 6,000 TShs (4 USD) to 260,000 TShs (165 USD).

4.3.6 Wage work

In both villages people pursued wage work to earn income. Different categories of wage work exist in the two villages. They can be broadly defined as on-farm wage work, off-farm wage work and seasonal work.

On-farm casual wage work is an important source of cash income for some villagers. Farmers work on the farms of other farmers to earn money to pay for the most basic needs such as food, inputs and schooling equipment. The mean on-farm wage labour income of the poor and middle-income households was very similar and higher than that of wealthy households, although the high standard deviations show the differences within the wealth classes (Table 4.13). Households earn very different amounts of money from wage labour on the farm starting from 3,500 TShs (2 USD) and ending with 200,000 TShs (127 USD) per year. In Mihumo/Darajani we see similar results. In this village too the middle-income households recorded the highest mean at 15,018 TShs (10 USD) compared to 11,909 TShs (8 USD) of the poor and 5,000 TShs (3 USD) of the wealthy.

Table 4.13 Income from on farm casual wage labour

		Sum	Mean	StdDev	Max
Ruhoma	Poor	290,000 TShs (184 USD)	24,167 TShs (15 USD)	41,113 TShs (26 USD)	120,000 TShs (76 USD)
	Middle	309,000 TShs (196 USD)	22,071 TShs (14 USD)	53,574 TShs (34 USD)	200,000 TShs (127 USD)
	Wealthy	124,000 TShs (74 USD)	9,538 TShs (6 USD)	50,000 TShs (32 USD)	15,831 TShs (10 USD)
Mihumo/Darajani	Poor	131,000 TShs (83 USD)	11,909 TShs (8 USD)	14,700 TShs (9 USD)	40,000 TShs (25 USD)
	Middle	796,000 TShs (504 USD)	15,018 TShs (10 USD)	28,086 TShs (18 USD)	150,000 TShs (95 USD)
	Wealthy	60,000 TShs (38 USD)	5,000 TShs (3 USD)	11,678 TShs (7 USD)	30,000 TShs (19 USD)

From these findings we learn that it is most commonly the poorer and middle-income households who engage in these activities to earn cash. This is because on-farm wage labour can be characterised as insecure, low-paid and hard manual work.

In stark contrast to this is off-farm wage labour (Table 4.14). Off-farm wage labour includes daily wage labour that is not related to farming such as carrying stones, construction work or herding. But it also includes higher-level jobs in education, health, government offices or for the local cooperative. With regard to the latter there are only a couple of residents who are in a fortunate position to earn a fixed salary each month, which is exclusively provided by the Tanzanian state in the two villages. As we can see from the table below, wealthy households obtain much more cash from off-farm sources than middle-income and poorer households.

Table 4.14 Income from off-farm wage labour

		Sum	Mean	StdDev	Max
Ruhoma	Poor	20,000 TShs (13 USD)	1,667 TShs (1 USD)	4,438 TShs (3 USD)	15,000 TShs (9 USD)
	Middle	1,106,000 TShs (700 USD)	79,000 TShs (50 USD)	253,924 TShs (161 USD)	960,000 TShs (608 USD)
	Wealthy	3,180,000 TShs (2,012 USD)	244,615 TShs (155 USD)	796,164 TShs (504 USD)	2,880,000 TShs (1,823 USD)
Mihumo/Darajani	Poor	395,000 TShs (250 USD)	35,905 TShs (23 USD)	108,000 TShs (68 USD)	360,000 TShs (228 USD)
	Middle	684,000 TShs (433 USD)	12,905 TShs (8 USD)	54,545 TShs (35 USD)	360,000 TShs (228 USD)
	Wealthy	1,400,000 TShs (886 USD)	116,667 TShs (74 USD)	345,972 TShs (219 USD)	1,200,000 TShs (759 USD)

Occasionally young adults leave the village in search for income. Among the few opportunities is to practice artisanal mining. Tanzania is rich in precious minerals, which are mined for the export market. During my fieldwork I was told that people sometimes go to neighbouring areas where mining takes place to try their luck. It is a very dangerous and taxing work that often remains unrewarded. Therefore only a few villagers pursue this as an income opportunity. Yet once in a while villagers who do go away for the search of season work return with considerable amounts of cash in their pockets.

In Ruhoma only two wealthy households reported income from seasonal work. One claimed to have obtained 100,000 TShs (63 USD), the other one stated to have earned 30,000 TShs (19 USD) over the past one year. In Mihumo/Darajani only three out of 76 interviewed households reported this source of income. Among them are one poor household, earning 50,000 TShs (32 USD), and two middle-income households, earning 10,000 TShs (6 USD) and 200,000 TShs (127 USD) respectively.

4.3.7 Business and services

There are a few villagers who offer business services such as petty trade, milling cereals, maintenance and repair, transportation, etc to earn additional income. In Ruhoma only five out of 39 interviewed households claimed to derive income from business (Table 4.15). Four of the five belong to the wealthy category with the

remaining one being middle-income. In Mihumo/Darajani eight households derived business-related income. Two of them belong to poor and six to the middle-income categories. Craftsmanship such as carpentry, construction, bricklaying, etc also provided income to several households among the survey respondents. In Ruhoma two middle-income and three wealthy households derived money from this category. In Mihumo/Darajani one poor, 11 middle-income and six wealthy households obtained income from craftsmanship.

Table 4.15 Income from business and services

		Sum	Mean	StdDev	Max
Ruhoma	Poor	0 TShs (0 USD)	0 TShs (0 USD)	0 TShs (0 USD)	0 TShs (0 USD)
	Middle	252,000 TShs (159 USD)	18,000 TShs (11 USD)	37,874 TShs (24 USD)	120,000 TShs (76 USD)
	Wealthy	5,374,000 TShs (3,401 USD)	413,385 TShs (262 USD)	523,860 TShs (332 USD)	1,380,000 TShs (873 USD)
Mihumo/Darajani	Poor	963,000 TShs (609 USD)	87,545 TShs (55 USD)	289,361 TShs (183 USD)	960,000 TShs (608 USD)
	Middle	6,014,000 TShs (3,806 USD)	113,472 TShs (72 USD)	204,563 TShs (129 USD)	780,000 TShs (494 USD)
	Wealthy	3,040,000 TShs (1,924 USD)	253,333 TShs (160 USD)	349,788 TShs (221 USD)	1,080,000 TShs (684 USD)

Business in Ruhoma can be seen as an important contributor to income of wealthy households while in Mihumo/Darajani it is important to middle-income households. Craftsmanship, which includes carpentry and timber harvesting, is an important income source for middle-income and wealthy households in Ruhoma and Mihumo/Darajani. Especially in the latter village middle and wealthy households generate substantial amounts from it during the year.

4.3.8 Remittances, loans and other income sources

Remittances include money that households receive from family members or friends who live outside the village. In Ruhoma seven households obtained income from remittances. Among them are three middle and four wealthy households. The amounts received differ but the wealthy households obtained larger amounts ranging from 30,000 TShs (19 USD) to 200,000 TShs (127 USD).

Also in Mihumo/Darajani some households received remittances. In total ten households stated this income source. Among them are two poor, six middle-income and two wealthy households. The amounts received differ widely ranging from 5,000 TShs (3 USD) to 300,000 TShs (190 USD). Remittances are important to all wealth classes as they provide meaningful support to households particularly when they find themselves in difficult times.

Loans are generally hard to get. Especially from official institutions like banks, which are reluctant to hand out credit due to the high risks involved. Rural residents generally fail to obtain loans as they do not possess enough value assets that could serve as securities for the banks. This, however, does not imply that loans do not exist in rural Tanzania. Villagers succeed in obtaining loans from family, friends or local saving groups such as Vicoba. In Ruhoma two middle and four wealthy households received loans. One wealthy household received a large loan to the amount of 400,000 TShs (253 USD). None of the poor households interviewed stated to have been provided with a loan. In Mihumo/Darajani only one wealthy household received a loan. The wealthy household stated to have received an extraordinary large sum of 10,000,000 TShs (6,329 USD) as a loan from the local bank. Of this large amount he claimed that 5,000,000 TShs (3,164 USD) were still outstanding.

Several households in Ruhoma and Mihumo/Darajani stated to have obtained money from “other income sources”. In Ruhoma all wealth classes derived this kind of income. The amounts range from 10,000 TShs (6 USD) to 400,000 TShs (253 USD). As mentioned above it is likely that some of the interviewees did not want to reveal all of their income sources. Therefore, we can assume that some of the money stated under ‘other’ income sources comes from illegal activities. In Mihumo/Darajani too all wealth classes derived money from other income sources. Here the amounts range from 8,000 TShs (5 USD) to 700,000 TShs (443 USD).

4.4 Linking wealth and land use

As illustrated earlier, the production and sale of crops is the most important livelihood activity in the villages. The production of crops provides households with food and cash income both necessary for economic and human development. At the same time, agriculture is the most significant driver of land use change in the villages and the

region at large. In this context it is pivotal to discuss in more detail the performances of different village groups concerning the use of village land for the production and sale of crops.

As discussed in section 2.2, the form of agriculture practised in the two villages is often described as ‘shifting cultivation’. Labelling agriculture in rural Lindi as ‘shifting cultivation’ conveys a certain image of farmers. The risk exists that one thinks of them as farmers who constantly move from one place to another in the pursuit of fertile land. In this section of this chapter my aim is to illustrate that farmers in both villages practice a more complex form of agriculture, as they make use of a system of fallow rotation together with longer-term perennial crops and intensive cultivation of lower-lying wetland areas. This is important to recognise as it influences the way farmers may respond to REDD+ interventions.

4.4.1 Using land for crop production

4.4.1.1 Temporary and permanent farms

Villagers cultivate crops for subsistence and commercial purposes. Among the survey respondents (n=115) all claimed to farm and with the exception of six households (4 in Ruhoma and 2 in Mihumo/Darajani) all obtained cash income from the sale of crops. Villagers in Mihumo/Darajani and Ruhoma cultivate temporary, permanent and to a lesser extent vegetable farms. Due to a lack of capital and labour constraints households cultivate small areas of temporary farms.

In Mihumo/Darajani poor and middle-income households cultivate on average 2.2 (StdDev: 1.4) and 2.5 (StdDev: 1.7) acres respectively. In contrast the mean size of temporary farms of wealthy households is 5.6 acres (StdDev: 5). However, two wealthy households claimed to have extraordinarily large farms, amounting to 15 and 16 acres, which considerably increases the average, as the high standard deviation shows. If we remove these two households from the calculation the mean size reduces to 3.7 acres, which is more accurate based on my observations during the fieldwork. Similar results to Mihumo/Darajani can be found among the survey respondents in Ruhoma. The mean size of temporary farms amounts to around 2 acres but it increases with the wealth class (Table 4.16).

Table 4.16 Household mean size of temporary farms per wealth group

	Poor	Middle	Wealthy
Ruhoma	2.2	2.5	3.1
Standard Deviation	1.6	1.2	1.9
Mihumo/Darajani	2.2	2.5	5.6
Standard Deviation	1.4	1.7	5

Although permanent farms can be found also in Ruhoma, they were much more important to villagers in Mihumo/Darajani. In Ruhoma one may find isolated plots of coconut or cashew nut trees in the village area. In contrast, households in Mihumo/Darajani cultivated large areas of cashew nut trees all around their farms. In the past cashew nut trees were very relevant to the livelihoods in Ruhoma too, but unfavourable prices and problems with pests and diseases resulted in a steep decline of their numbers. Instead other crops such as sesame and cowpeas replaced the cashew nut as the most dominant source of agricultural cash income in this region (see also TFCG/Mjumita, 2012).

This divergence between the villages with regard to the importance of perennial crops becomes visible when we look at the extent of the area under permanent farms. In Ruhoma 28 of 39 interviewed households do not have any permanent farm, and the remaining 12 farmers cultivate less than 5 acres. In Mihumo/Darajani only 5 out of 76 households did not have permanent farms. The remaining 71 villagers owned permanent farms of different sizes. We find remarkable differences within the village between the wealth groups with regard to the size of permanent farms. While poorer and middle-income households own permanent farms of around 4 acres, the wealthy households own more than double this area (Table 4.17).

Table 4.17 Mean size of permanent farms per wealth group in M/D

	Poor	Middle	Wealthy
Mihumo/Darajani	4.2	3.8	10.9
Standard Deviation	2.1	2.8	4.1

4.4.1.2 Fallow land and vegetable gardens

Besides permanent and temporary farms, households designated land for vegetable farming and as fallow land. Farmers of both villages kept land under fallow for different

periods for the purpose of regeneration. In Mihumo/Darajani 36 of 76 interviewees claimed to have fallow land at the time of interviewing. In Ruhoma the same applied to 25 of 39 interviewed households.

Vegetable farming is not much practiced in Mihumo/Darajani. The main factor for this is the lack of irrigation opportunities (Table 4.18). Nevertheless there were some households who cultivated vegetables on designated fields along the local rivers. Among the survey respondents 11 of 76 interviewed households had a vegetable garden. While none of 11 interviewed poor households cultivated vegetables, around 15% of middle-income and three of twelve wealthy households cultivated between 0.5 and 2 acres of vegetables for sale in the village. The cultivation of vegetables requires a lot of labour, as daily watering is needed. Therefore, only some middle-income and wealthier households can afford to grow vegetables.

Table 4.18 Distribution of vegetable farms in Mihumo/Darajani

		Wealth Group			Total
		Poor	Middle	Wealthy	
Size	0 acre	11	45	9	65
	.25 acre	0	4	0	4
	.50 acre	0	3	1	4
	1.00 acre	0	0	2	2
	2.00 acres	0	1	0	1
Total		11	53	12	76

In Ruhoma a greater number – 14 of 39 interviewed households – had vegetable gardens (Table 4.19). Ten of the 14 plots amounted to 0.25 acre in size. Ruhoma's village land included some parts of the wetland located mainly in the neighbouring village Kinyope. This made it easier for villagers of middle-income and wealthy classes to do some vegetable farming at affordable costs. Only two poorer households cultivated 0.25 acres maximum, but several middle and wealthier households managed large areas of up to 1 acre.

Table 4.19 Distribution of vegetable farms in Ruhoma

		Wealth Group			Total
		Poor	Middle	Wealthy	
Size	0 acre	10	8	7	25
	.25 acre	2	5	3	10
	.50 acre	0	0	2	2
	1.00 acre	0	1	1	2
Total		12	14	13	39

4.4.1.3 Overview of land use for crop production²⁴

In sum we see some similarities but also distinct differences between the survey respondents of the two villages with regard to the use of land for crop production. In both villages temporary and permanent farms are the most important land uses. Temporary farms are very important to both villages as they are utilised for the production of annual crops for subsistence and commercial purposes. Consequently, they make up 31% and 45% of the total land of the interviewees in Mihumo/Darajani and Ruhoma respectively. In both villages we could observe that wealthy households own larger areas of temporary farms than poor and middle-income households. This is also true when we compare temporary farm sizes per adult equivalent for each wealth group. However, the difference is more prevalent in Mihumo/Darajani than in Ruhoma (Table 4.20).

Table 4.20 Mean temporary farm size (acre) per adult equivalent

	Poor	Middle	Wealthy
Ruhoma	0.7	0.7	0.9
Standard Deviation	0.7	0.5	0.5
Mihumo/Darajani	0.5	0.7	1.3
Standard Deviation	0.4	0.5	1.8

A clear distinction exists between the two villages with regard to permanent farms, as they are much more significant in Mihumo/Darajani compared to Ruhoma. In the former they make up 53% of the total land of the respondents while in the latter this amounts to only 10%. In Ruhoma sesame and cow peas, both annual crops cultivated on temporary farms, widely replaced cashew nuts as the primary cash crop. This caused villagers to focus on temporary farms rather than perennial farms. In addition, it

²⁴ See also Appendix VII for more detailed information

impacted on the extent of land under fallow in the two villages. In Ruhoma 42% of the land of the respondents was under fallow. In contrast, only 14% of the land was fallow in Mihumo/Darajani. Interviewees in Ruhoma kept relatively large amounts of land fallow while residents in Mihumo/Darajani tend to convert their temporary farms into permanent farms instead. The survey data also shows that wealthy households own much larger permanent farms (on average more than 10 acres) than poorer and middle-income households. This can also be illustrated in terms of permanent farm sizes per adult equivalent (Table 4.21).

Table 4.21 Mean permanent farm size per adult equivalent

	Poor	Middle	Wealthy
Mihumo/Darajani	1	1	2.5
Standard Deviation	0.5	0.8	1.5

Table 4.22 Overview of land uses for crop production

		Mihumo/Darajani		Ruhoma	
Type	Temporary farm	223	31 %	100	45 %
	Permanent farm	377	53 %	23	10 %
	Fallow land	103	15 %	94	42 %
	Vegetable garden	7	1 %	6	3 %
Total		710	100 %	223	100 %

Across the three wealth groups temporary farms made up around 30% of the total land in Mihumo/Darajani (Table 4.22). However, wealthier households held more permanent farms than middle-income and poorer households. The opposite is true for fallow land. Fallow makes up 22% of the total land of poor households, 16% of the total land of middle-income households and only 9% of the total land of wealthy households. This suggests that wealthy households are in a better position to use their land to cultivate crops. Poorer households fail to mobilise enough resources, which results in having almost a quarter of the land lying fallow. Also in Ruhoma wealthy households hold more land under temporary and permanent farms compared to poorer and middle-income households, who have more of their land under fallow. This again seems to suggest that wealthier households managed to put more of their land under productive use than poorer and middle households.

4.4.2 Productivity and production volumes

In earlier sections I described how much land the interviewed villagers in Ruhoma and Mihumo/Darajani cultivate for the production of annual and perennial crops. Now I will present their estimations of the amount of crops produced. Analysing the production volumes will give us a better understanding of the productivity of smallholder farming in the two villages.

Table 4.23 Overview of production volumes of survey respondents

	Mihumo/Darajani	Ruhoma
Total cultivated land	607 acres	129 acres
Total amount of crops produced	83,117 kg	34,881 kg
Crops produced/acre/hectare	137 kg / 339 kg	271 kg / 670 kg
Annual crops on temporary farms	68,565 kg on 223 acres	32,520 kg on 100 acres
Annual crops/acre/hectare	307 kg / 759 kg	325 kg / 801 kg

In Ruhoma and Mihumo/Darajani the interviewees produced on average 801 kg and 759 kg of annual crops per hectare respectively (Table 4.23). These results support other studies, which find that the productivity of smallholder agriculture in Sub-Sahara Africa is close to one tonne per hectare. The data collected for the latest agricultural census in Lindi region in 2007/08 by the National Bureau of Statistics (2012:178-181) confirms this statement. Their census recorded average hectare yields in Liwale and Lindi rural of 0.8 t for maize, 0.9 - 1 t for paddy, 0.7 t for sorghum, 0.8 – 0.9 t for finger millet, and 0.4 – 0.6 t for cowpeas.

If we examine the production volumes and productivity levels per wealth class we can identify some interesting differences between and within villages. In Ruhoma (Table 4.24) the survey data suggests that the outputs of annual crops achieved per hectare temporary land increases with the wealth status. Per hectare temporary land wealthy households harvest on average 1.4 times the amount of annual crops than poor households.

Table 4.24 Output and productivity per wealth class in Ruhoma

Annual crops					
Wealth Group	Total output	Mean output per household	Max	Mean output/acre	Mean output/hectare
Poor	6,700	558	2,360	258	637
Middle	11,058	790	2,343	325	804
Wealthy	14,762	1,136	3,032	369	912

In Mihumo/Darajani we see a different picture (Table 4.25). Poor and middle-income households achieve mean outputs of annual crops of around 850 kg per hectare. In comparison, wealthy households produce on average 566 kg of annual crops per hectare. As we will see shortly, wealthier households in Mihumo/Darajani cultivate relatively more pigeon peas, rice and sesame than maize or millet on annual farms. Poor households put much emphasis on maize and millet in contrast. Because maize and millet weigh more than the other crops, this could be the reason for the lower outputs achieved by wealthier households compared to poorer ones. However, more important to consider is the total generated value from crop production, which will be done below.

Table 4.25 Outputs (kg) and productivity per wealth class in Mihumo/Darajani

Annual crops					
Wealth Group	Total output	Mean output per household	Max	Mean output/acre	Mean output/hectare
Poor	8,863	806	1,660	355	876
Middle	44,116	832	2,820	337	832
Wealthy	15,585	1,299	2,180	229	566
Perennial crops					
Wealth Group	Total output	Mean output per household	Max	Mean output/acre	Mean output/hectare
Poor	691	62	240	15	36
Middle	7,770	146	440	39	96
Wealthy	4,991	416	960	38	94

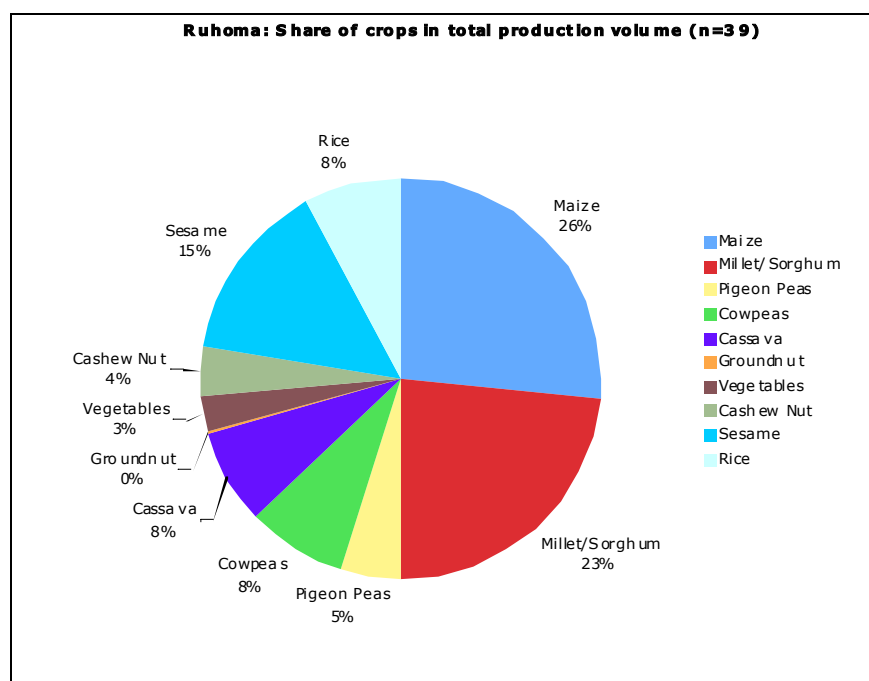
With regard to cashew nuts middle-income and wealthy households produce around three times more per hectare than poorer households. The higher returns for the valuable cash crop is linked to the usage of pesticides without which the harvest is seriously constrained. As the poor lack the means to apply sufficient pesticides, they fail to harvest decent amounts of cashew nuts from their permanent fields. As anywhere else in the world higher returns on fields can result from various factors of which one is related to how much money is spent on preparation, cultivation and to combat diseases and weeds. As the following table (Table 4.26) illustrates wealthy households spend on average much more money on agriculture than poorer and middle-income households. Wealthy households buy labour power and chemical inputs to enhance their farm productivity.

Table 4.26 Mean household spending on agriculture per wealth group

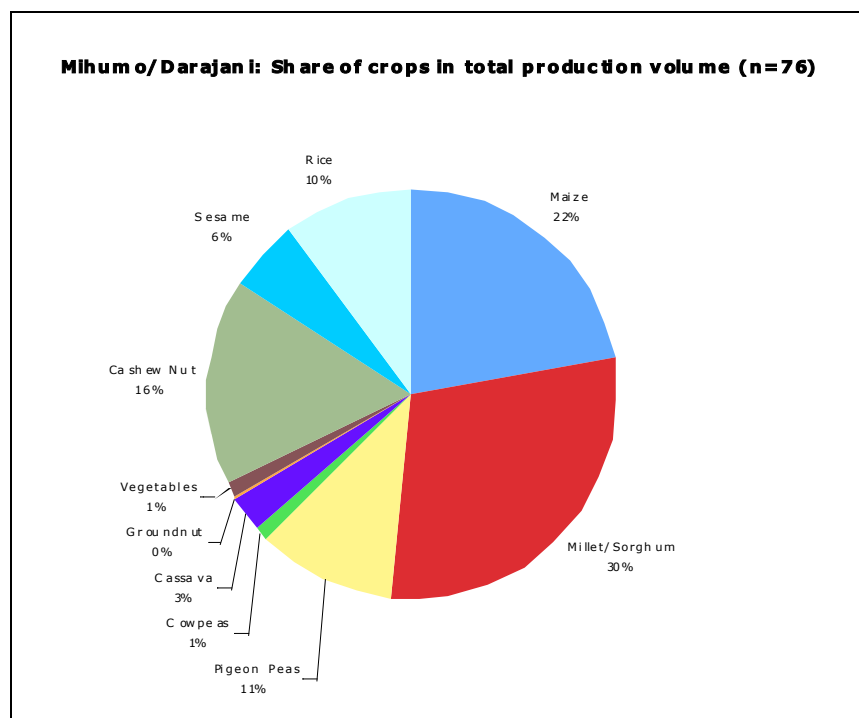
	Poor	Middle	Wealthy
Mihumo/Darajani	22,455 TShs (14 USD)	59,505 TShs (38 USD)	274,667 TShs (174 USD)
Standard Deviation	40,116 TShs (25 USD)	61,662 TShs (39 USD)	272, 832 TShs (173 USD)
Ruhoma	8,791 TShs (6 USD)	30,300 TShs (19 USD)	150,077 TShs (95 USD)
Standard Deviation	18,632 TShs (12 USD)	53,591 TShs (34 USD)	206,115 TShs (130 USD)

In order to understand potential gains and losses from REDD+ interventions it is important to analyse the value of crops produced per hectare agricultural land. As mentioned above, farmers in Ruhoma and Mihumo/Darajani cultivate various crops of different monetary values on their fields. In general maize, millet/sorghum, peas and rice are the most important crops in both villages as together they make up more than two thirds of all the crops produced (Graph 4.11 and 4.12).

Graph 4.11 Share of individual crops in total production in Ruhoma



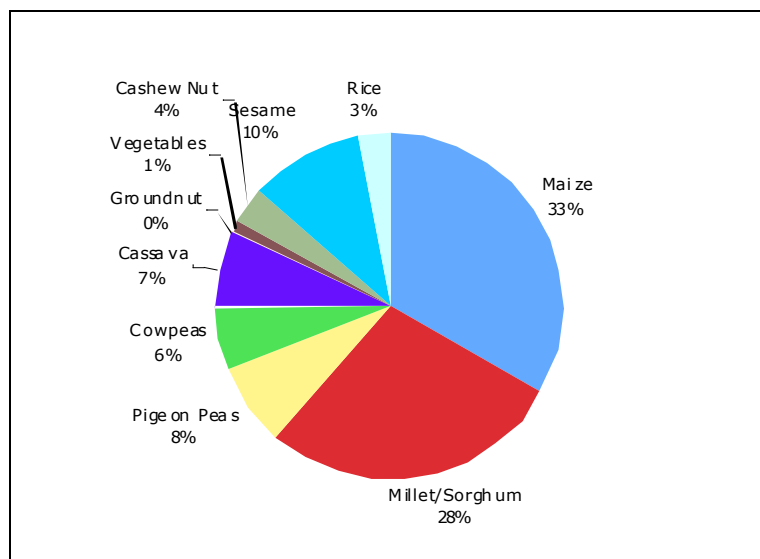
Graph 4.12 Share of individual crops in total production in Mihumo/Darajani



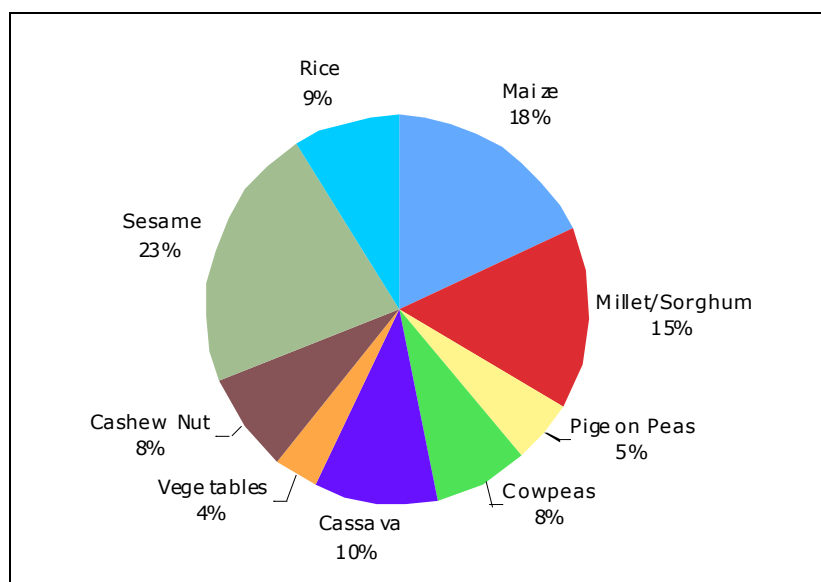
The most important difference between the villages relates to the primary cash crop. In Mihumo/Darajani cashew nuts make up 16% of the production volume, but sesame accounts for only 6%. This is different to Ruhoma where sesame makes up 15% of the volume, while cashew nuts account for 4% only.

In both villages there are important differences between the wealth classes in terms of what crops they produce, which influences the total value produced per hectare. Wealthier households produce larger amounts of higher value (cash) crops such as cashew nuts, sesame, rice or pigeon peas. In contrast, poor households focus much more on maize and millet/sorghum as food crops. In Ruhoma maize and millet/sorghum, which is used for staple food, together make up around 60% of the entire harvest among the poor and middle-income households, but only a third among the wealthy households (Graph 4.13). Also in Mihumo/Darajani we see stark differences between the wealth groups. For the poor households millet/sorghum and maize make up 71% of the total production volume, but for the wealthy the same crops account for 29% only (Graph 4.14). Detailed information about amounts of crops produced per wealth group can be found in Appendix VII.

Graph 4.13 Share of crops in total production for poor and wealthy in Ruhoma

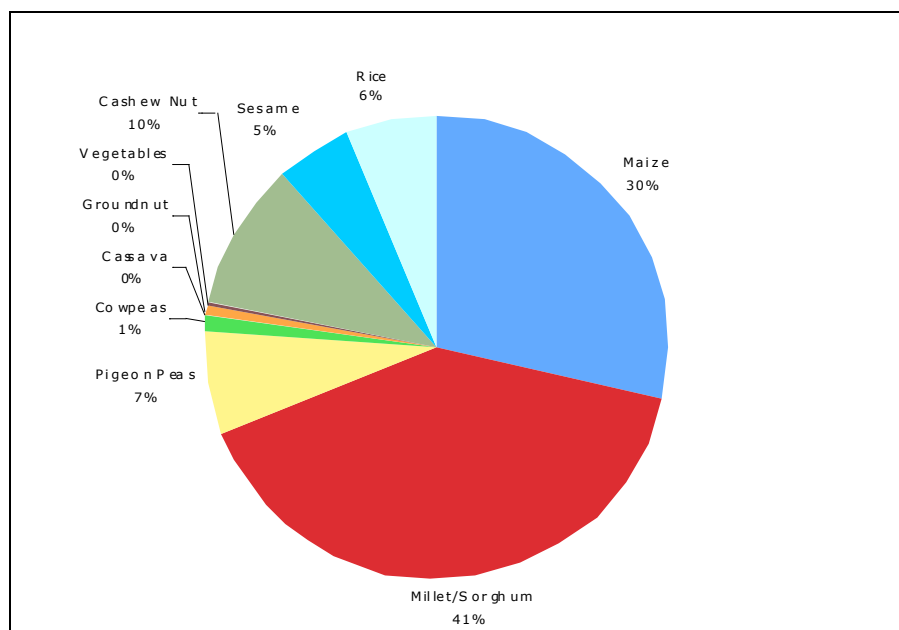


Share of crops in total production among poor (n=12)

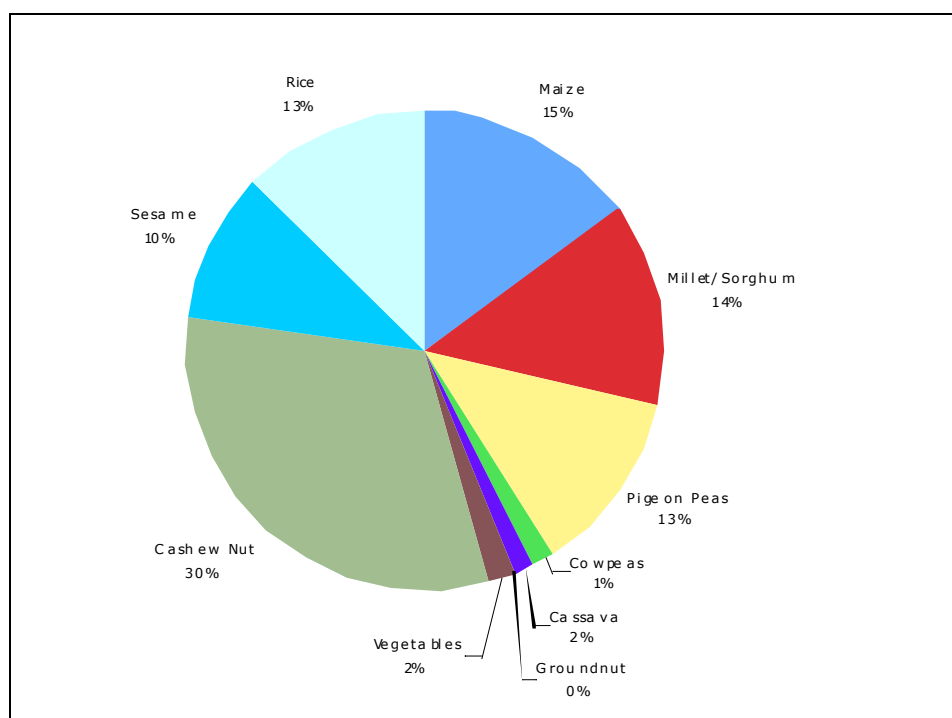


Share of crops in total production among wealthy (n=13)

Graph 4.14 Share of crops in total production for poor and wealthy in M/D



Share of crops in total production among poor (n=11)



Share of crops in total production among wealthy (n=12)

As we can see from Table 4.27 below, there are considerable differences between the wealthy and poorer groups in Ruhoma with regard to the total value of annual crops produced per hectare temporary farm. Wealthy households produce on average twice the value of annual crops than poorer households on temporary farms. In comparison with middle-income households they produce 1.2 times the value of crops. In

Mihumo/Darajani poorer and middle-income households produce the same value of annual crops, which is considerably less than what wealthy households produce.

Table 4.27 Household mean value of crop production per ha on temporary farm²⁵

		Total	Mean value of crops produced per ha on temporary farms	StdDeviation
Ruhoma	Poor	12	338,684 TShs (214 USD)	369,383 TShs (234 USD)
	Middle	14	511,713 TShs (324 USD)	321,493 TShs (203 USD)
	Wealthy	13	628,790 TShs (398 USD)	344,474 TShs (218 USD)
Mihumo/Darajani	Poor	11	401,003 TShs (254 USD)	204,075 TShs (129 USD)
	Middle	53	404,812 TShs (256 USD)	427,749 TShs (271 USD)
	Wealthy	12	628,838 TShs (398 USD)	687,135 TShs (435 USD)

If we analyse the value of cashew nuts produced per hectare land on permanent farms, we record again differences between the wealth classes (Table 4.28). However, middle-income households seem to achieve higher values of cashew nuts per hectare than wealthy households. Poor households generate much lower values compared to other wealth groups.

Table 4.28 Household mean cashew value in Mihumo/Darajani

	Total	Mean value of cashews produced per ha on permanent farms	StdDeviation
Poor	11	37,855 (24 USD)	37,453 TShs (24 USD)
Middle	53	135,754 TShs (86 USD)	107,950 TShs (68 USD)
Wealthy	12	121,289 TShs (77 USD)	103,364 TShs (65 USD)

²⁵ I calculated this by multiplying the amount of crops produced with mean kilogram prices (see methods chapter). To derive at per hectare values I divided the total value of crops produced by the size of temporary farm in hectare for each household.

4.5 Conclusion and discussion

In this chapter I set out to discuss the livelihoods of villagers in my two case-study sites. In doing so I aim to answer in part research question 1 “How do REDD+ initiatives interact with local livelihood strategies in Lindi, Tanzania?” The information in this chapter provides, so to say, the foundation to subsequent chapters, especially chapter 5, which aims to assess impacts of REDD+ on livelihoods.

From this chapter it became apparent that villagers in Lindi Region belong to the poorest people in the world. There is widespread poverty in the region, which expresses itself in poor infrastructure (water, electricity, houses), low consumption rates, food insecurity, lack of assets, low education levels, low income levels and low levels of mechanization in agriculture. From my household survey we learnt that cash income levels in both villages are very low, suggesting that the mean cash income per adult equivalent per day amounts to mere 0.3 USD. Against this background of rural poverty combined with villagers’ high dependence on land for crop production, I argue that REDD+ initiatives must grapple with the urgent need for inclusive economic development if they want to gain popular support among the rural population. Otherwise the risk of them contributing to social and environmental injustices and human impoverishment are real and potent.

As part of the need to promote inclusive economic development, it will be important for REDD+ interventions to address local inequality in the villages. According to a recent study by Andersson and Agrawal (2011) economic inequalities within and between groups negatively affect forest conditions. My data show that inequalities exist between different wealth groups in both villages. One reason is that wealthy households managed to diversify their livelihoods into more profitable activities such as business, services and off-farm wage labour, which provide them with significant cash to supplement crop sales. Hence, in order to address local inequality it may not be enough to focus on strong collective forest governance institutions as suggested by Andersson and Agrawal (2011). Instead, both farm and off-farm livelihood strategies should be considered by REDD+ interventions to make wealth distribution more equal, and forest conservation more likely, in the villages.

Although livelihood diversification is an important strategy noticeable among all wealth groups, my findings illustrate that poor households still rely much on agriculture (crop production, livestock, forests and farm wage labour) for cash income. At the same time crop sales remain by far the single most important cash source to all wealth groups in both villages. The production and sale of crops, as the most important economic activity for villagers in Lindi Region, manifests the continuous dependence on land for human and economic development. This dependence cannot be, as popular discourse does, described as 'shifting cultivation'. Instead, I argue farmers practice a more complex form of agriculture that makes use of fallow rotation, and intensive cultivation of temporary and permanent farms.

In illustrating that land use is influenced by the type of integration of villagers into the global economy, expressed in what cash crops are produced for local, national and potentially international markets, I also emphasise the need to look beyond the local context to understand and address land use drivers. The main purpose of all this is to highlight that in competition over fertile village land, REDD+ interventions must carefully consider how global and local processes effect agricultural land use strategies of villagers, as they influence the willingness of farmers to set aside land for protection. More specifically, I argue that REDD+ must consider how different wealth groups within the village use village land for their livelihoods, if a broad consensus over forest protection is to be established.

In this light I analysed in detail the usage of village land for the production and sale of crops by different wealth groups. I showed that in both villages wealthy groups cultivate larger temporary and permanent farms than their fellow residents, they keep less land fallow compared to poorer and middle-income households, and they generate higher values per hectare farmland. This has important consequences with regard to the opportunity costs of REDD+, which will be discussed in the next chapter.

Chapter 5: Material and discursive effects of REDD+

5.1 Introduction

We learnt from the previous chapter that villagers in Ruhoma and Mihumo/Darajani depend on land for crop production as their main livelihood and income activity. As poor, resource constrained farmers they cultivate annual and perennial crops on temporary and permanent fields for subsistence and commercial purposes. Their practices also entail the clearing of primary and secondary forests in order to open up agricultural plots for cultivation. It is this land use that is in direct conflict with the objective of protecting forests for biodiversity and carbon sequestration purposes. Nevertheless, in both villages considerable amounts of forests have been put under protection. In Ruhoma villagers set aside 2,488 hectares of forest under the village land forest reserve, which covers around 65% of the entire village land (3,817 ha) and 88% of all forests in the village. In Mihumo/Darajani 11,792 hectares of forests were set aside under the village land forest reserve, which covers around 40% of the entire village land (29,555 ha).

Building on the insights from chapter four, this chapter will continue to answer research question 1 “How do REDD+ initiatives interact with local livelihood strategies in Lindi, Tanzania?” It will specifically aim to assess observed and potential impacts of REDD+ to local livelihoods of different village groups. In addition I will offer insights into the discursive effects of REDD+ to address research question 3 “How do REDD+ initiatives aim to address the drivers of land use change in Lindi, Tanzania?” in the latter part of the chapter.

The chapter begins by discussing the perceived losses and benefits from the decision to protect forests on village lands. Drawing on survey and interview data I provide insights from villager’s own accounts about the positives and negative consequences of setting land aside for protection. I will then analyse the potential of carbon payments, specifically referring to REDD+ trial payments in Ruhoma and contrast them to foregone benefits from crop production. This is followed with a discussion of villagers’ fears over potential losses from forest protection including decreased agricultural outputs, wildlife damage and displacement.

In the second part of the chapter I will show how forest conservation was introduced in the two villages as a path to green development, promising villagers to economically benefit from forest resources in a sustainable way. A certain discourse was promoted that highlighted the economic and environmental benefits from forest carbon commodification while simultaneously downplaying its costs to some stakeholders. This was enhanced by the development actors' efforts to create a certain crisis narrative of the currently practiced forms of agriculture ultimately aiming to change villager's perceptions of themselves and the landscapes they inhabit.

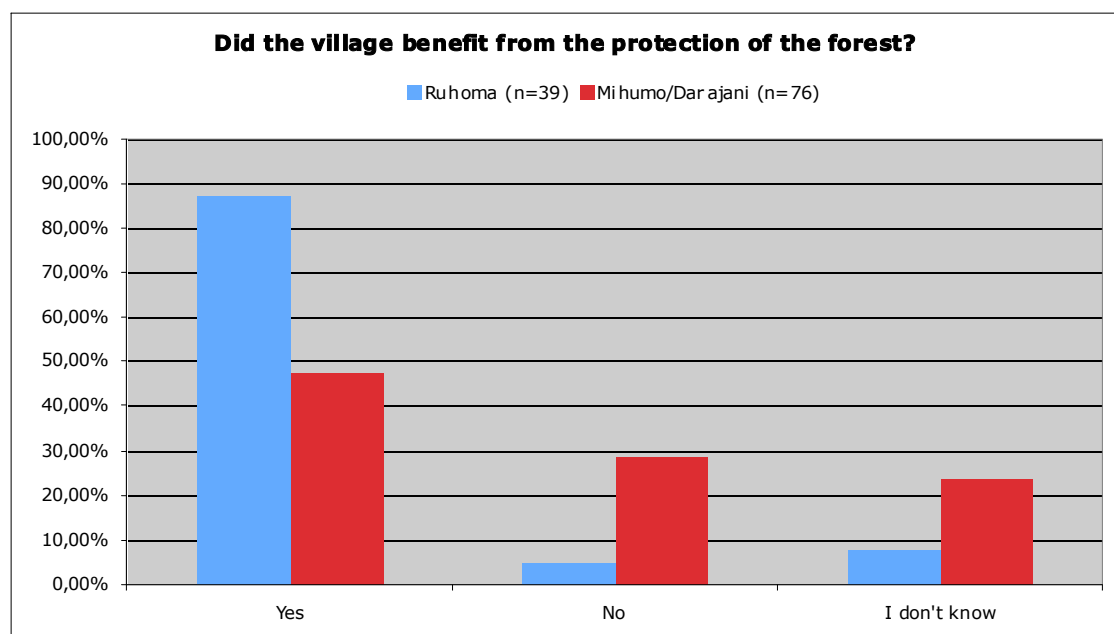
5.2 Perceived benefits and losses from forest protection

5.2.1 General perceptions

Whether we continue to protect the forest or not will depend on the benefits we get from it. If we don't benefit from it we will farm again there in the forest to get a lot of food (R Interview 17).

As part of my household survey I asked respondents two questions about the collective and individual benefits of forest protection. I obtained very different results in the two villages (Graph 5.1).

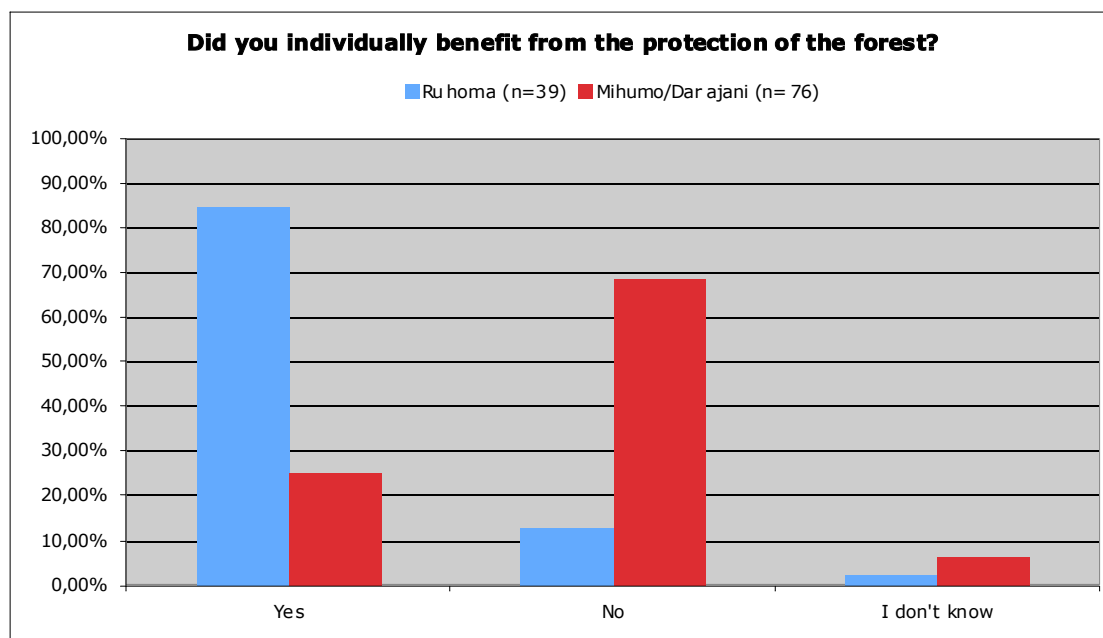
Graph 5.1 Perceptions of collective benefits from forest protection



The vast majority of respondents in Ruhoma believed that the village benefited from the protection of the forest. Only about 10% of the interviewees responded with “no” or “I

don't know" to the question. This is different to Mihumo/Darajani where less than 50% stated that the village benefited from forest protection. These opposing views over the benefits of forest protection become even more striking when we look at the individual level (Graph 5.2).

Graph 5.2 Perceptions of individual benefits from forest protection



In Ruhoma more than 80% of the respondents claimed that they individually benefited from forest protection. Yet in Mihumo/Darajani less than 30% of all interviewees felt this way. There is at least one easy answer to it.

In Mihumo/Darajani there was a general feeling of deep disappointment with the way development activities regarding forests have been carried out. From the early 90s onwards residents have been advised to protect the forest in order to reap significant monetary and non-monetary benefits. However, so far the general consensus among the rural population in this village expresses a sense of betrayal by the district and development actors. Many times the experts come, people from Europe, from the national capital or the local district office, to visit the villages, to talk about the importance of forest protection, and to raise expectations of future incomes. However, so far very little has materialised of what was promised. Frustrations, anger and disappointment about the lack of benefits have become dominant feelings in the village. Villagers in Mihumo/Darajani have not been allowed to harvest timber from the reserve,

which they could sell to raise income. At the same time no REDD+ trial payments have been dispersed among the population. The only income that the village receives from the forest reserve are fees from foreign researchers to obtain the permit to enter the reserve.

There is nobody here in the village who has got benefits from the forest. People enter the forest, they leave, and we don't know anything about what he did, and what he harvested. We ordinary villagers don't benefit from the forest. (M Interview 21)

Since we started to protect the forest the community hasn't benefited at all. It is the situation of destitute that drives them to enter. And they don't understand how they will benefit. (M Interview 54)

Yeah, we haven't got any answers yet from the Europeans. But they can come, and they say, people we want that you protect the forest, don't cut the forest. We are being told this. Don't cut the forest. We must not practice shifting cultivation. But that they come to bring some kind of support, we don't see it. He can come overnight, he inspects and then he leaves. We don't understand. They come to take what? We don't understand. If they come to dig our trees, they dig and leave with them. But we haven't got any amount of money. Maybe tax, it can be that they pay tax 10,000. That's it. (M Interview 16)

In Ruhoma the opposite was the case. During my stay in this village I could witness a general sense of satisfaction with the decision to protect the forest. Villagers expressed happiness about the monetary and non-monetary benefits they have received so far from the REDD+ project. These include trial carbon payments for every villagers as well as training provided in the form of workshops, progress in decentralisation reform (legal tenure over forest resources) and knowledge about improved agricultural techniques. In the course of the project the village was also assisted in building a new office. Especially because of the REDD+ trial payments villagers in Ruhoma felt that they benefited individually from the decision to protect the forest. In total an amount of 21,081,960 TShs (12,730 USD) was provided by the REDD+ project to the village. A sum of 2,973,560 TShs (1,900 USD) was kept and spent on community development projects and the remaining 18,108,400 TShs (11,570 USD) were distributed transparently and with the help of TFCG/Mjumita project staff to all ordinary

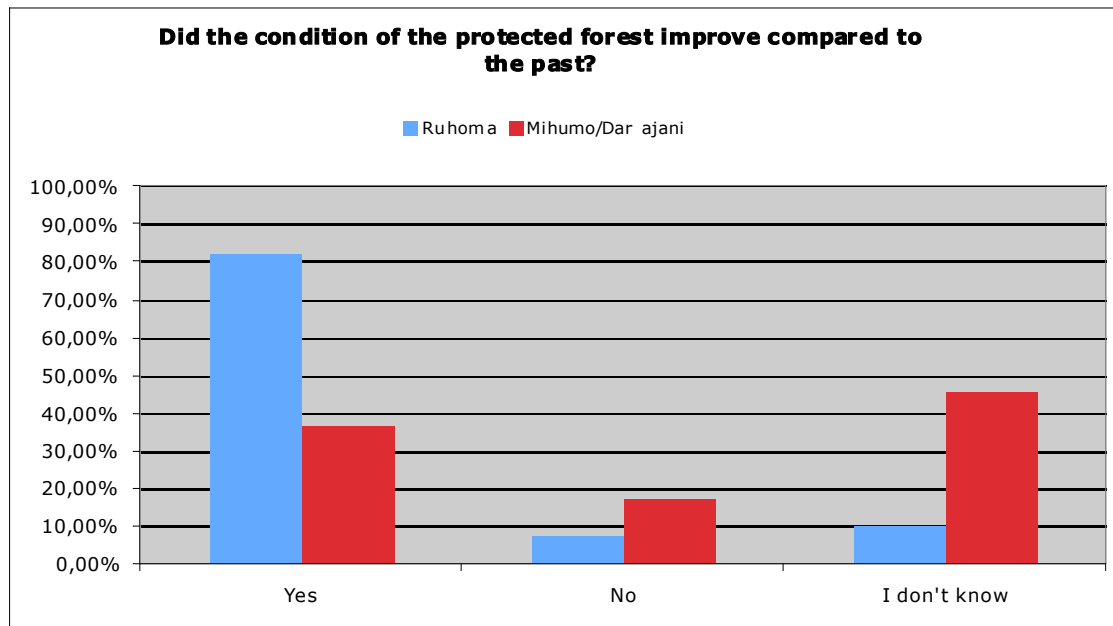
residents²⁶ of the village. Each registered adult in the village received an amount of 39,000 TShs (25 USD). For every registered minor (up to 14 years) an amount of 20,600 TShs (13 USD) was paid.

We get benefits from carbon, we villagers. Like they brought us money. Every person got money. Children got money. And with the money, every person used it the best way according to his knowledge. Some bought food to help him/her together with his/her family. Others used it for farming, so that he could have more afterwards for his family (R Interview 26)

These differences in the perceptions of the benefits from forest protection also contributed to contrasting views over the condition of protected forests (Graph 5.3). In my livelihood survey I asked interviewees whether they thought that the condition of the forest has improved compared to the past. In Ruhoma a clear majority of the respondents claimed that it has, while in Mihumo/Darajani less than 40% thought so. Because of the benefits that Ruhoma and its residents received from forest protection, villagers claimed that no illegal destruction is taking place anymore within the forest. Therefore, more than 80% of the interviewees believed that the quality of the forest is increasing. In Mihumo/Darajani people were generally uncertain and sceptical about the condition of the forest due to the lack of benefits received. Around 40% of the respondents either believed that no effective protection is in place or they did not know what the condition of the forest currently looks like.

²⁶ Residents were defined as people who were born and live in the village or who migrated into the village to reside there permanently (Source: Ruhoma bylaws)

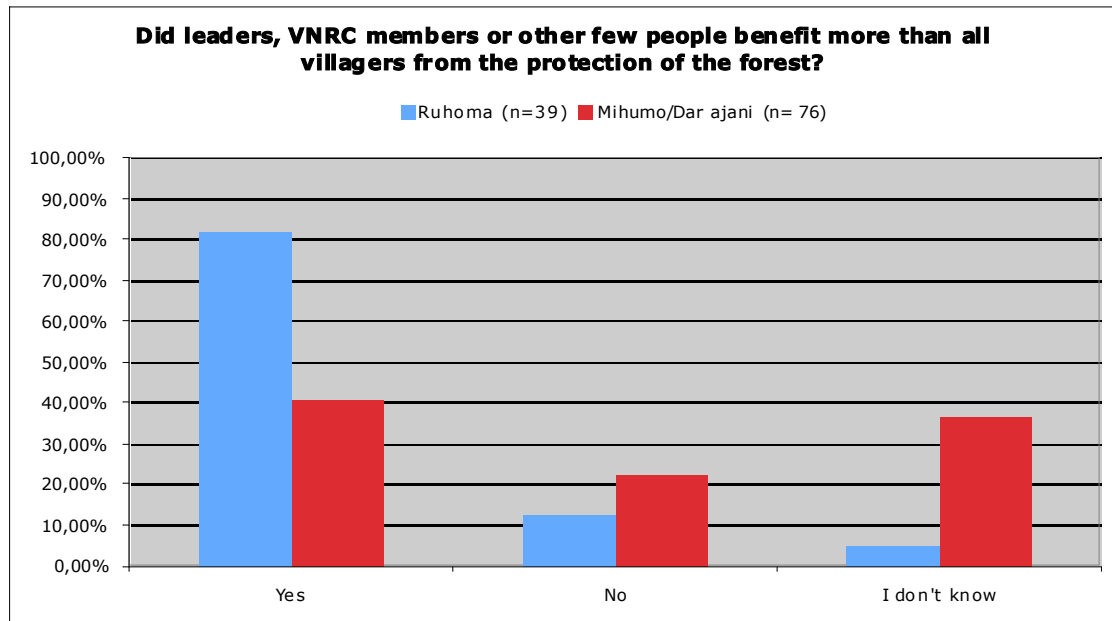
Graph 5.3 Perception of the condition of forest reserve



5.2.2 Distribution of benefits

It is a well-known challenge for any development project to ensure the equitable distribution of benefits among project participants. As mentioned in the previous chapter local inequality often negatively affects forest conditions (Andersson and Agrawal, 2011), therefore equitable benefit distribution should be an important objective of any REDD+ initiative. In our case study sites I asked interviewees whether they believed that certain groups in the village (leaders, members of the village natural resource committee or others) benefited more than the rest of the village from the protection of the forest (Graph 5.4). In Ruhoma a large percentage of the interviewees (80%) believed that some groups benefited more than others. In Mihumo/Darajani about 40% of the interviewees answered with 'yes' while another 40% claimed to not know. Especially in Ruhoma many residents felt that benefits were unequally distributed as village leaders and committee members received additional benefits in the form of training, allowances, permits and income from forest carbon assessment exercises. While the trial payments were equally distributed among all villagers, certain groups benefited from the many activities that were conducted in the villages by development actors.

Graph 5.4 Perceptions of elite capture of benefits



This sentiment about the unequal distribution of benefits is also mirrored in some semi-structured interviews that I conducted in Mihumo/Darajani. Ordinary residents complained about the lack of transparency and that elites in the village obtain money by taking researchers into the forest, from permits, tax or other forest related activities.

This part, I don't understand. The ones who arrive there as tourists, they don't have money or they arrive to do sightseeing (*kutalii*) by which system? Because often they arrive there to do sightseeing (*kutalii*). Many times. I haven't got the answer yet about what share the village receives from that. Not yet. And if anything is available, then it is small. And it is not to build productivity (*tija*) for here. The leaders just eat it. The ones who take them there and bring them back. They go there, they bring them back. These are the ones who get allowances to get some food (M Interview 16)

5.2.3 Prospect of carbon payments in Mihumo/Darajani

In both villages participatory forest carbon assessments were carried out in order to establish potential amounts that villagers could receive in future from the sale of forest carbon. In Mihumo/Darajani participatory rural appraisal methods were employed by district officials and researchers, where members of the village natural resource committee, village council, elders and farmers were invited to select villagers, who should take part in the forest carbon assessment exercises (Mukama, 2010; Mukama et al., 2011; Sundström, 2010). It was found that the village land forest reserve in Mihumo/Darajani has similar carbon stocks to other forests in the region, which are usually low with the exception of closed forests, which make up a small area of the

entire forest reserve. However, because of the large area of the reserve the total amount of carbon stored is still significant. It was established that the carbon stocks in dry miombo, wet miombo and closed forests amount to 17.24 tC, 16.75 tC and 84.89 tC per hectare respectively (Figure 5.1) (Mukama et al., 2011).

Figure 5.1 Total carbon stock in Mihumo/Darajani VLFR

Source: Mukama, 2010

FOREST NAME	STRATUM	AREA (ha)	CARBON STOCK (tC/ha)	Total carbon stock (Mega tonnes of Carbon)	
				Upper limit	Lower limit
Ngunja	Lowland dry miombo	2379	18.37 ± 2.25	43.7	38.35
	Upland dry miombo	4247	18.02 ± 2.9	76.53	64.21
Total				120.23	102.56
Ngongowe	Dry miombo	8021	19.36 ± 2.51	155.28	135.15
	Closed forest	181	41.73 ± 22.17	7.55	3.54
	Encroached river basin	83	7.2 ± 2.32	0.59	0.4
Total				163.42	139.01
Mihumo	Dry miombo	8169	17.24 ± 2.55	140.83	120
	Wet miombo	1695	16.75 ± 7.71	28.40	15.32
	Closed forest	1927	84.89 ± 16.85	163.58	131.11
Total				332.81	266.43

After a second round of participatory forest carbon assessments in the Angai forest, it was established that in the Mihumo/Darajani village land forest reserve the dry miombo²⁷ (dominated by *Brachystegia* spp) and wet miombo forests (miombo forest located in wetland) experienced an annual increase of 3.8 tCO₂ and 0.5 tCO₂ per hectare. In contrast the carbon stock of closed forests (dominated by *Brachystegia microphylla*) decreased by 0.3 tCO₂ per hectare (Table 5.1). Scholars pointed at the community-based forest management initiatives and the large distance of the reserve to the settlement area as contributing factors to the annual increase in carbon stocks. With regard to the decrease in carbon stocks in closed forests they highlight the role of elephants as the main driver (Personal communication, 2013).

²⁷ Stratification of the forest into dry miombo, wet miombo and closed forests was performed by the village forest assessment team prior and during participatory forest carbon assessment activities. Stratification was based on vegetation type, disturbances, stocking and topography (Mukama, 2010). Miombo woodlands are often rather arbitrarily divided into dry and wet types depending on rainfall, canopy and species content (Chidumayo et al., 2010).

Table 5.1 Carbon stock changes in Mihumo/Darajani VLFR

		Volume changes (m ³ /ha) 2009-2012	Annual Change (m ³ /ha/year)	Annual Change (tC/ha/year)	Annual Change (tCO ₂ /ha/year)
Mihumo	Dry miombo	12.7	4.2	2.1	3.8
	Wet miombo	1.5	0.5	0.25	0.5
	Closed forest	-1.0	-0.3	0.15	-0.3

However, the annual changes in the carbon stocks of different forests in the village land forest reserve do not allow us to calculate potential incomes from the sale of forest carbon. The increases in carbon stocks achieved in the village land forest reserve could be cancelled out by decreases observed in the open village land. Although nobody in Mihumo/Darajani had concrete information on the deforestation/degradation rates in the village and consequently the potential of future carbon payments, villagers developed hopes, created expectations and began to discuss strategies for the distribution of future carbon payments.

5.2.4 Prospects of carbon payments in Ruhoma

In February in 2012 households in Ruhoma were among the first in the project to receive REDD+ trial payments. The TFCG/Mjumita project used funding financed by the Government of Norway to distribute money among villagers. The payments were not based on actual conservation performance but on estimations about potential future incomes from the protection and sale of forest carbon. The amounts distributed were calculated on the basis of local annual deforestation rates in the village, average carbon stocks in village forests, total area of village forest with age above 10 years and area of forest with age above 10 years put into village forest reserve²⁸ (Deloitte, 2012).

On the basis of satellite images TFCG/Mjumita estimated that the annual deforestation rate in Ruhoma amounts to 33 hectares. Because of the village assembly decision to protect 88% of the total forest area, it was calculated by project staff that an area of 26 hectares, which would lead to 2,693 tCO₂ per year if deforested, would be protected every year if REDD+ efforts succeed. With an estimated, and rather optimistic, net carbon income of 5 USD (=7,826.011 TShs in Feb 2012) per avoided tCO₂, a total sum

²⁸ Over 50% cover of forest regeneration of any height was classified as forest, as were natural and planted woodlands and forests with greater than 30% canopy

of 21,081,960 TShs (12,730 USD) was made available by the project proponents for distribution²⁹.

A committee was established, consisting of twelve male and female members from the village council, the village land use committee, the village natural resource committee and the different sub-villages, and instructed to prepare a strategy for the distribution of the trial payments (Table 5.2). With the approval of the village assembly it was decided that not all the money should be distributed to the residents directly. A sum of 2,973,560 TShs (1,900 USD) should be kept and spent on community development projects. The remaining 18,108,400 TShs (11,570 USD) were distributed to all ordinary residents of the village. As mentioned above each registered adult received an amount of 39,000 TShs (25 USD). For every registered minor (up to 14 years) an amount of 20,600 TShs was paid (13 USD).

Table 5.2 Distribution of REDD+ trial payments

Community development projects	
Patrolling	700,000 TShs (447 USD)
Bricks for new village office	530,000 TShs (337 USD)
Benches for local school	630,000 TShs (403 USD)
Loan repayment power tiller	450,000 TShs (288 USD)
Allowances for REDD+ activities (carbon assessments, etc)	280,000 TShs (179 USD)
Stationary	33,560 TShs (21 USD)
Net to catch/keep out wild animals	350,000 TShs (224 USD)
Money distributed to residents	
346 Adults x 39,000 TShs	13,494,000 TShs (8,640 USD)
224 Minors x 21,600 TShs	4,614,400 TShs (2,950 USD)

Because of the large amount of money that was given to individual villagers directly (86% of the total amount provided by the project), the trial payments played an important role as cash income particularly to poor and middle-income households. They contributed 53%, 31% and 9% of the total annual cash income of poor, middle-income and wealthy households respectively (Graph 5.5). Their contribution gains even more in importance if we consider mean annual cash incomes per adult equivalents. The

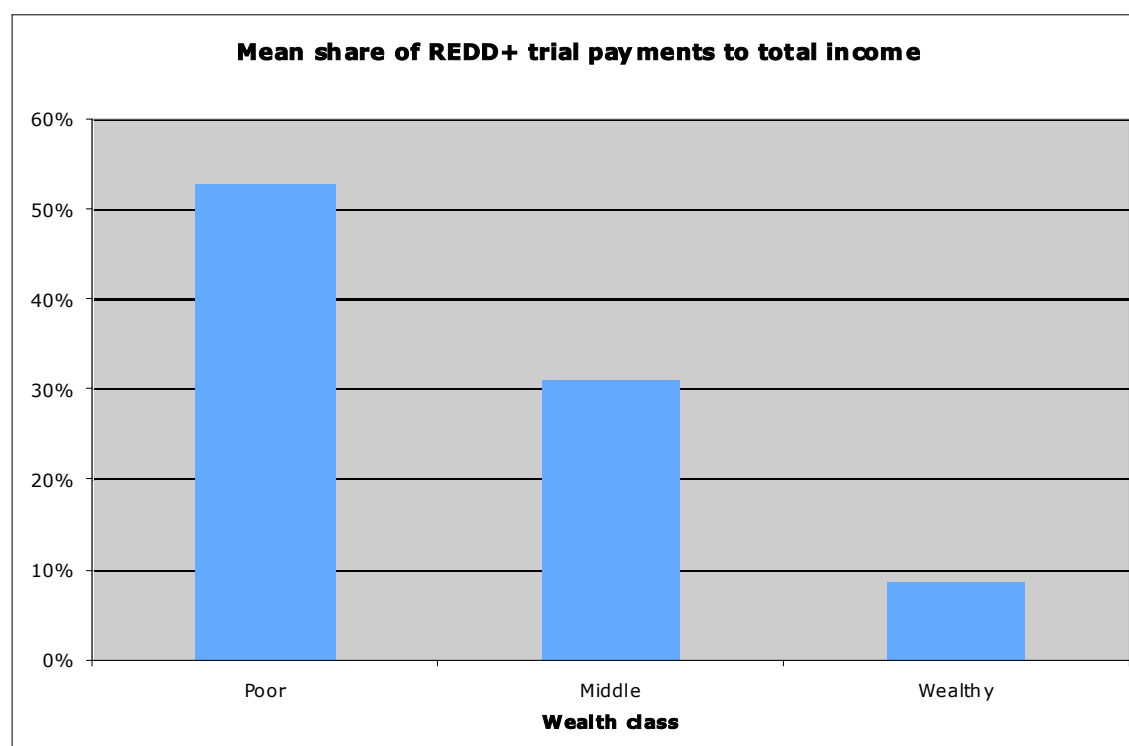
²⁹ See Appendix X for further details on the rather optimistic calculations

provided amount of 39,000 TShs (25 USD) contributes 74%, 39% and 9% to poor, middle-income and wealthy adults' mean annual cash income respectively (Table 5.3).

Table 5.3 Share of REDD+ payments to cash income in Ruhoma

Wealth Group	REDD+ payments to mean annual cash income per AE	REDD+ payments to total income	Standard Deviation
Poor	74%	53 %	31%
Middle	30%	31 %	16%
Wealthy	9%	9%	6%

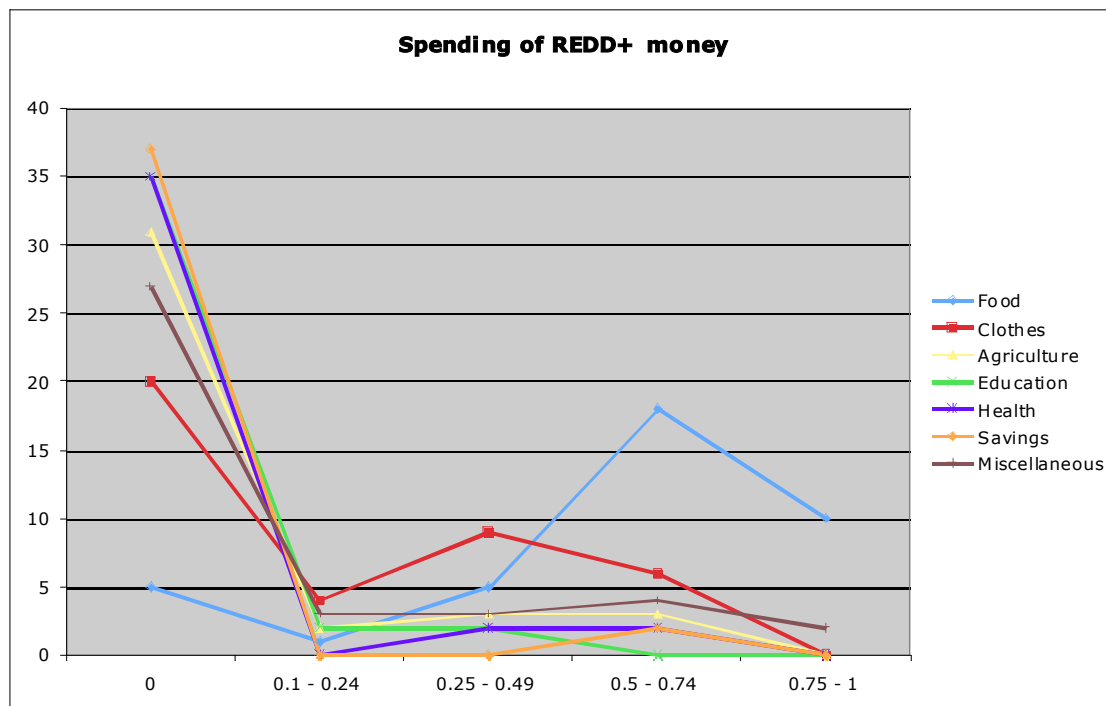
Graph 5.5 Mean share of REDD+ trial payments to total income



The REDD+ trial money was put to use by villagers in different ways. Most of them spent the money on food, cloths and miscellaneous such as consumer goods. The graph 5.6 below shows the number of respondents in relation to the share of REDD+ money they spent on food, clothes, agriculture, education, health, savings or miscellaneous. As we can see 18 of 39 interviewed respondents spent 50 % to 74% of their REDD+ money on food. In addition to this, ten respondents spent even more, namely between 75 % and 100%, of their payments on food. Food was the most popular option for villagers in Ruhoma. The trial payments were dispersed in February, which is usually a month

characterised by food insecurity. Another important category is spending on clothes. Nine respondents claimed to spend 25 % to 49% of their money on clothes while six respondents claimed to spend 50 % to 74% on clothes.

Graph 5.6 Spending of REDD+ trial money



5.2.5 Potential losses

Villagers also expressed concern over potential losses from forest protection. In Mihumo/Darajani large areas of village land were kept outside of the reserve to provide villagers with ample land for agricultural and forestry activities. In contrast, most of the fertile forestland in Ruhoma was put under protection. Several farmers were therefore afraid of the potential negative consequences this could have on the production of crops for food and income. In the forest farmers could clear land and harvest large amounts of crops due to the high fertility of the soil combined with no or little weed infestation. Since everybody is now required to farm in the designated agricultural fields that are located outside of the reserve, villagers claimed that more resources are required to achieve similar returns or alternatively they end up with lower agricultural outputs. This could lead to increased food insecurity especially among poorer households.

I think that it is possible that we will get worse off (*tutashuka chini*) because of REDD. Because these days we depend on good harvests, and we went to forest and farmed sesame. But now we

are not allowed to go there anymore. So now it is possible that the economy worsens a bit (R Interview 33)

They entered the forest because they ran away from the weeds. Now we fight the weeds, because we decided to protect the forest. We are told to improve our farming. Maybe they will bring us inputs, pesticides to fight weeds. But they told us there is no guarantee that we get these things (R Interview 21)

But this year hunger will come. This year people are forced to farm in the village land. Small farms, small farms. You see. In September we will have food shortage. From that time onwards people will start to fight. You agreed to protect the forest. This will be a big challenge. (R Interview 6)

Related to the fear of facing lower agricultural outputs due to less fertile lands is the threat of increased crop damage from wildlife. In both case study sites forests are inhabited by wild animals such as elephants, buffalos, monkeys and wild pigs, who cause damage on fields (cf Johansson, 2008). Some residents worried that due to the protection of the forest the population of wildlife will increase, which could lead to more damage of crops on their farms.

The wild pigs are the real nuisance these days. I don't know if it is the case because we decided to protect the forest. But three years ago there weren't much problems with wild pigs. People used dogs to chase away monkeys and wild pigs (R Interview 6)

Another key concern related to the fear of becoming economically and physically displaced from the forest. In the beginning, when the idea of forest conservation was introduced in the villages, many residents were sceptical, as they feared of becoming displaced from village forests. They worried of having to accept the loss of access and use rights of forest resources (economic displacement) or the physical removal from forestland (physical displacement) as a result of the protection of forests (Agrawal and Redford, 2009). These fears appeared to be one of the main reasons for locating the village land forest reserve far into the forest in Mihumo/Darajani, leaving much land outside the reserve unprotected. However, due to the lack of benefits that villagers received from the protected forests, some started to argue that they have practically been displaced from the reserve. Especially, among those residents who were not part of any committee or the village council, many believed that the Angai forest was sold to Europeans. They believe that they are not allowed to enter the forest anymore, because outsiders protect it. They conclude that the forest was sold by corrupt village leaders or

by the district council to outsiders, who want it to be protected.

Europeans bought it, together with the chairmen of the village. And the village government reflected and then asked the villagers about the forest to be sold to the Europeans. Then they agreed. Let's sell the forest. Afterwards the Europeans left. The villagers were informed that the forest has been sold. The forest has been sold. They went via the chairmen and the village government. There wasn't any meeting. The chairman and his village government discussed the issues. Afterwards the people were just informed that this forest is not yours anymore. It was sold many years ago. Maybe 6 years ago. (M Interview 8)

But because of the delays in the problems it is hard and villagers believe that the forest has been sold because what they have been told and implemented has not benefited them. (M Interview 63)

In Ruhoma fears over economic and physical displacement prevailed too in the beginning. Villagers first decided to put smaller areas of the forest under protection, but because of efforts by TFCG/Mjumita project staff they then brought most of their forest into the reserve. In doing so they transformed a previously open-access forest into common property, which had negative impacts to some stakeholders. According to interviews conducted in Ruhoma, conflicts emerged after the initiation of the reserve with farmers from other villages, who had been farming in Ruhoma's forests for years on a customary basis. Because of the restrictions imposed by the newly created forest management plans and bylaws, these farmers were no longer tolerated anymore and faced threats of physical displacement. In addition, one interviewed farmer in Ruhoma complained about the inclusion of his coconut farms into the forest reserve, which restricted his user and access rights to an important income source to him. As he was no longer allowed to make use of fire to clear the undergrowth on his permanent farm, he claimed to face economic displacement from his coconut farm due to the establishment of the forest reserve.

5.2.6.3 Foregone benefits from agriculture in Ruhoma

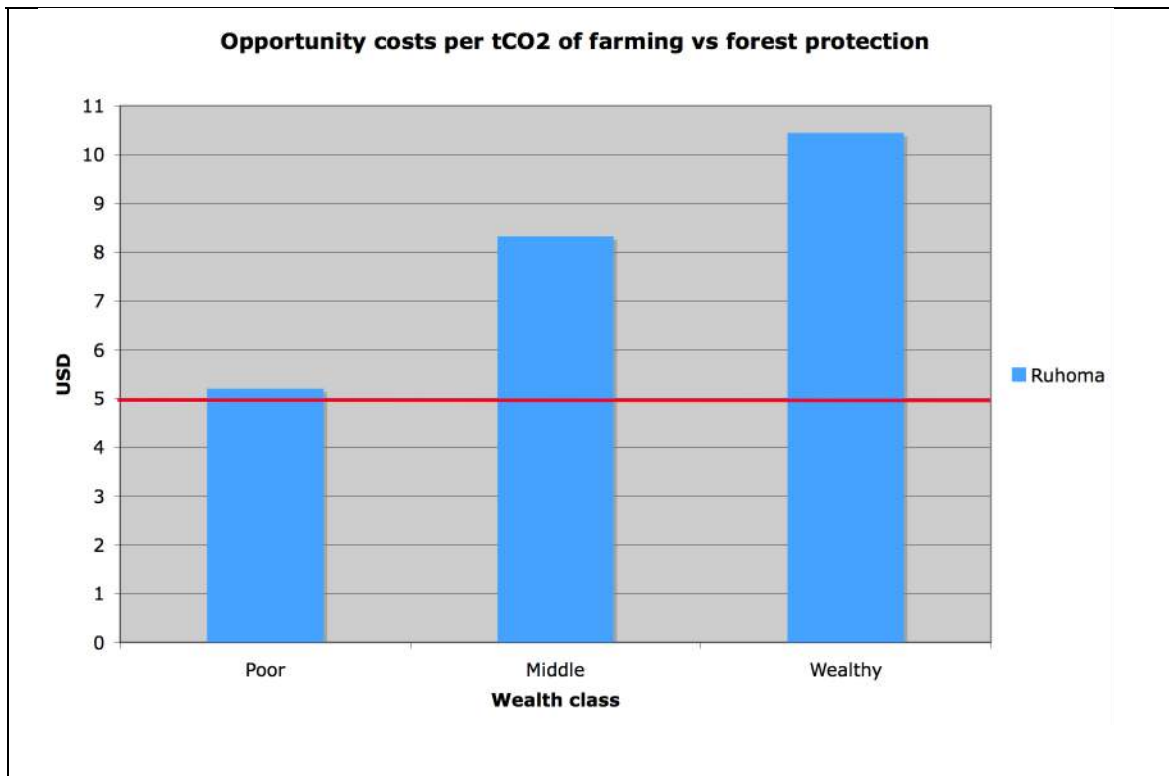
It is often remarked that payments for ecosystem services schemes must cover opportunity costs of alternative land uses to incentivise resource owners to change towards more conservation friendly practices. In this section I will attempt a simple opportunity cost analysis to estimate the foregone benefits that villagers in Ruhoma

incur as a result of protecting fertile forestland³⁰. Merger et al. (2012) estimated the net present value of agricultural land use in the TFCG/Mjumita REDD+ project site in Lindi at 1,023 USD per hectare. They assumed that the land is used for two years for the production of sesame followed by ten years of fallow. On this basis they argue that large mitigation potentials exist from avoiding the expansion of shifting cultivation into the forests and unsustainable charcoal production. They calculate that avoiding the expansion of shifting cultivation incurs opportunity costs of USD 8.9 per tCO₂. Given an income of 5 USD per tCO₂, project participants forego benefits of USD 3.9 per tCO₂ if they continue protecting the forest as opposed to using it for agricultural expansion.

For my own calculations of the incurred opportunity costs for crop production among the survey respondents in Ruhoma, I refer back to the mean crop values produced by different wealth groups on temporary farms, as outlined in chapter four. It was established that poor, middle and wealthy households obtain mean crop values per hectare temporary farm of 214 USD, 324 USD and 398 USD respectively. On the basis of these findings, poor, middle-income and wealthy households forego benefits to the value of USD 0.2, USD 3.3 and USD 5.4 per tCO₂ respectively (Graph 5.7), given an estimated carbon income of USD 5 per tCO₂. Or, in other words, poor, middle and wealthy households forego benefits of USD 21, USD 350 and USD 572 respectively per hectare protected forestland. This calculation concerns the opportunity costs for using one hectare of forestland for the production of annual crops for 3 years, followed by 10 years of fallow, followed by another 2 years of cultivation, followed by 10 years of fallow. It does not include other forest uses such as charcoal production or timber extraction. However it includes the net present value of forest protection of USD 75 per hectare as suggested by Merger et al. (2012).

³⁰ Please see Appendix X for further details on the opportunity cost analysis.

Graph 5.7 Opportunity costs of agricultural land use and REDD+ in Ruhoma



Hence my data suggest that from a financial point of view, the commodification of forest carbon is unlikely to cover the opportunity costs incurred for giving up annual crop production, especially of middle-income and wealthy households. Wealthy households forego considerably higher amounts of value from protecting forestland compared to other wealth groups. However, my data also suggest that carbon payments could cover the opportunity costs incurred by poorer households.

Villagers in Ruhoma did not perceive foregone benefits as losses as such. Trial payments were dispersed in February 2012, at a time when farmers were waiting for their harvests and households generally lack cash. Cash was therefore very valuable at this time. The amount of 39,000 TShs was worth more in February than it would have been after the harvest later in the year. Anyway, no calculations were made about the opportunity costs of various land uses. Villagers were also promised that they can evaluate and reconsider their decision of protecting the forest after five years, that enough land would remain outside of the reserve to continue farming and that improved agricultural techniques will be introduced in the village to increase productivity. Most villagers were thus happy about the money and did not think about future losses. There were a few villagers though who criticised that the amount was too small. In their view

the small amount does little to compensate them for their incurred losses from not opening up farms in the forest.

The amount doesn't suffice to convince people not to enter the forest for farming etc; for now it was accepted but it's not enough. For 39,000 TShs to tell a person to not go into the forest, this is too little (R Interview 11)

To lift our lives they brought 40,000 for every person. Really, does this lift your life? And we don't understand if it is every year. 40,000 is of no purpose. Better we farm our forest and we get maize. There you get maize hey. There is no weed there. For 40,000 I buy two portions of small fish (*dagaa*) and the money is gone. (R Interview 22)

The money from REDD is not enough for me to continue farming in the agricultural area. Because even if you add them up, it doesn't compensate for one acre farming. ... If the money is not enough, the villagers will enter into the forest because of the hard life. If you don't have 10 shilings in your pocket, and the farm needs to be cultivated, you think you get sufficient food from here? (R Interview 23)

5.3 Promoting REDD+ as green development

In the light of the above findings, which questioned whether REDD+ payments will cover the opportunity costs of crop production as the alternative land use, it is pertinent to ask “Why do villagers, who significantly depend on agricultural land for food and the generation of income, speak of forest conservation and voluntarily set aside a considerable amount of productive village land as forest reserves?” This is a crucial question, indeed, which I will address in this section.

For my analysis I use a broad definition of discourse as “*shared and expressed ways of understanding a phenomenon*” (Benjaminsen and Overå, 2011). Similarly, environmentalism is here defined as “*a broad field of discursive constructions of nature and human agency*” (Brosius, 1999, p. 278). I draw on insights from Castree (2013), who explains that nature can be understood and communicated in different ways depending on the objectives of the beholder. He claims that different actors conceptualise and communicate nature differently but because of power imbalances certain realities of nature become more dominant than others.

In the following sections I will show that in our two villages development and conservation actors promoted a view of forest landscapes as spaces of biodiversity and carbon sequestration. At the same time the perception of forests as future agricultural land has been denounced and reformulated in a crisis narrative (Roe, 1991) that highlights the detrimental environmental effects of this particular land use. In this way efforts to protect the forest and to commodify forest carbon have been hailed as the rational path to green development, which shall bring economic and environmental benefits to the entire community (cf. Lansing, 2011; Li, 2007). In doing so development actors convinced villagers to set aside productive forestland for protection.

5.3.1 The promise of environmental benefits

5.3.1.1 Climate change mitigation

When introducing forest protection and forest carbon commodification to villagers, development actors highlighted the role of forests to global environmental change. They depicted farmers and forests in rural Lindi as stakeholders in a global world that is threatened by dangerous climate change. In creating a form of global crisis environmentalism, development actors communicated to the villagers a certain responsibility in stabilising global greenhouse gas emissions. For that reason I could observe villagers talking about carbon dioxide, greenhouse gas emissions and climate change mitigation when embarking on my fieldwork in these two remote areas of Tanzania. Farmers had been told that their agricultural practices are tied to people in other corners of the world. They directly impact either positively or negatively to the state of the global climate.

She [Dr. Irmeli] drew a map of the world and she said that the world is one. There are not two worlds. The world is one. This means that the loss/problems that result from Tanzania, they can, it is possible that also they reach Europe. And the losses/problems from Europe, it is possible that they also come here Tanzania. And there you find many problems due to the many industries. The many industries release a lot of smoke. The smoke takes the air up. It can enable a change in the weather. The rain does not come in time. And also other things can be different. There the industries, they agreed to reduce but they disagreed. And here, the laying of fire in the bush needs to be reduced so that the reason for carbon (*hewa ukaa*) does not result. So she talked about that and drew a map of the world. It is necessary that we communicate in order to reduce carbon. To reduce the losses that we get from the change in weather. She tried to educate us until we understood. (M Interview 10)

This year we planted trees. Trees for timber. We planted around 50. Afterwards they will help us to improve the weather situation. You know the issue of the weather. The pollution of the climate because of the many industries. The pollution of the climate as a consequence of people cutting trees arbitrarily. There is no rain. So when we plant trees, we care for rain and better climate. Here we can produce good air. If you want to cut a tree, you need to plant another one. (R Interview 35)

5.3.1.2 Promising local sustainability

In addition to the contribution of forests to global climate regulation, villagers spoke about local environmental conditions. It was a particularly common experience for me to hear people talking about the forest's ability to influence the local weather. Specifically the notion that trees could 'drag or pull in' clouds and therefore attract rain was widespread among the rural population (cf. Brockington, 2006; cf. Conte, 1999). The argument that rain and good weather depends on a healthy forest was certainly one of the most convincing reasons for villagers to protect their forests. For this to recognise, one interviewee said, they don't need the government. In addition to the rain, forest conservation was also regarded to reduce heat levels, improve local air conditions, particularly during dry seasons, and to help conserving local water sources.

But the main benefit from the forest is the rain. For this benefit we don't need support from the government. We can agree ourselves, if we protect the forest then we receive rain. If you protect the forest then you get a lot of clouds/mist and then you get a lot of rain. In the summer, it is very hot. But if you have a forest, then you also get good air. For this you don't need the government. (M Interview 4)

If you do something you must ask for what purpose. Now we protect the forest and ask for what purpose. Mostly for development. So for the rain for example that it will continue to come. Like the scientists say. If we protect the forest, the climate will change, rain will be a lot. A lot of rain means good harvest, which means development. This is how I see it. (R Interview 31)

At times, when it did rain, some villagers would even point out that because of their hard efforts to protect the forest the rain comes now more regularly than it did in the past. This raised their confidence in their decision to protect the forest. It also raised their expectations of better future harvests. However, among the villagers many were careful to not draw premature conclusions. While they would know of this tree-local

weather connection, which was seen to be a scientific claim, their strong belief in a God given weather would not be easily shaken.

The way I see it. Often we depend on science to they tell us. When the scientists tell us that the weather situation has changed globally etc., others, who have studied, can continue to say, ah this is the plan of God. But also others say we have a forest, which brings us the rain. So every day we get used to the idea that having the forest brings the rain. So if we damage the forest than this is the challenge... But we don't understand if the increase causes more rain or what. But often we say that God has its own plans. Because we only started last year to protect the forest and this year we have continued, but just because we started to protect the forest the rain comes. Is this possible? (R Interview 31)

5.3.2 Promising economic benefits

5.3.2.1 Forest carbon payments

Potential payments from the sale of forest carbon credits were certainly the most important benefit promised by development actors to the villagers. It was indeed fascinating to experience how villagers in remote rural Tanzania, who are in many other respects excluded from the circulation of global commodities, learn of the carbon commodity as a new way of making money. Due to workshops and meetings held by researchers and district staff, villagers have begun to talk about carbon trade and related markets as a new business opportunity resulting from the conservation of forests. They were aware that there is a business to be made from 'dirty air' with rich countries. By cleaning the air for the people with the dirty industries, villagers receive money that they could use to finance infrastructure, schools, hospitals etc.

We were told that if we protect the forest, if you protect the carbon, to a big amount, then we will get money, because it will be analysed how many tonnes of air were protected. So the countries with the industries, they will pay us for taking care of the air. We protect the air and they produce dirty air and we protect. So we are going to be paid. If it goes like this, then it is a good plan. Because when we protect the forest, it is necessary that we don't cut...(M Interview 14)

Our aim is to improve the forest. To protect the forest. If you protect the forest, you get carbon. If you take the carbon to the market, money will be available. From the money, a percentage we get. Another part we must use to improve the forest. In the village we will plan of how to use the money. The money must be divided to improve the forest, and another part to give to the villagers. Another part to build things for the forest. (R Interview 21)

The commodification of forest carbon as a means to protect forests has really taken roots in the discourse of village leaders. Village leaders told me many times that without money it is almost impossible to ‘force’ people not to clear forestland. But through payments the farmers would see the benefits of forest protection and therefore change their behaviour towards conservation friendly ways. It is a clear expression of what Fletcher (2010) called ‘neoliberal environmentalism’, which relates to forest conservation in terms of cost-benefit considerations, as opposed to strong moral values for the conservation of nature.

If the money (from forest carbon) comes here, the villagers would get a big challenge and they would see how the forest provides benefits. And also at the last meeting we told them that this is a fundamental issue. If the money from forest carbon comes, the money will help the villagers a lot and they will see how this area is now not to play around with. And also the security (*ulinzi*)... if you see somebody laying fire, it will be easier to report because people will now see the benefits of the forest. Because villagers like it a lot to see the results of what they do. And if you look, issues around the forest started a long time ago. We started 2002. People want to see, what are the benefits. Because we started 2002 and now we are in 2012, so it is ten years by now. We have been in the process of Angai forest. So it will be good if people see the benefits. (M Interview 11)

Because of the complexity of the matter, the low educational level and limited sources of information available in the village, many villagers had a number of unanswered questions and uncertainties about the nature of carbon trading. It was definitely hard for everyone to fully comprehend the opportunities and costs involved in this new business venture.

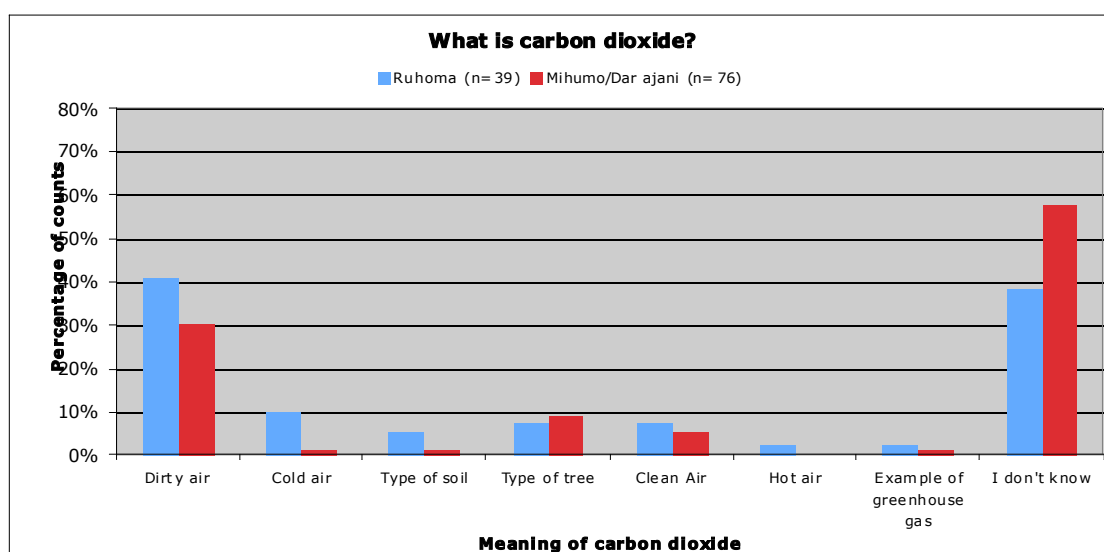
Forest carbon? Hmm... I have heard it but haven't understood it. Its meaning I haven't understood well yet. (M Interview 13)

This is true. People don't know the meaning of carbon... Many of us, carbon we don't know. We haven't fully understood what carbon is. (R Interview 34)

From the graph 5.8 below we obtain mixed results with regard to the understanding of villagers of carbon. It shows that the two most common answers to the question “What is carbon dioxide” were either “I don’t know” or “dirty air”. The latter was the common signifier used by development actors to explain the concept behind carbon trade. It was

therefore chosen by 40% and 30% by interviewees in Ruhoma and Mihumo/Darajani respectively. Quite a high percentage, namely about 40% and 55% in Ruhoma and Mihumo/Darajani respectively, claimed to not know the correct answer. However, many residents in both villages had a clear idea about the REDD+ projects. To them the projects meant that they get paid for protecting the forest. They understood that forests are important to Europeans because of climate change, and this is the reason why villagers were offered money to protect them.

Graph 5.8 Perceptions on carbon dioxide



5.3.2.2 Legal ownership over forest resources

In both villages the commodification of forest carbon was tied to community based forest management approaches. Therefore, many villagers highlighted the benefit of becoming the legal owners of the forest. They explained to me that until now outsiders and the district have benefited most from the forest resources. With the launch of community ownership over the forest³¹, for the first time they will be legal owners of the timber and non-timber products including medicine, mushrooms, vegetables, honey, timber, poles, bush meat and firewood (R Interview 20, M Interview 11).

5.3.2.3 Improved agriculture and alternative incomes

Understandably, lots of villagers had fears about the negative consequences of forest protection to their livelihoods. Development actors assured villagers that they will be

³¹ See Appendix XI for details on the legal provisions of community-based forest management in Tanzania.

allowed to extract forest resources to meet subsistence needs and they will be assisted in improving their agricultural techniques in order to increase productivity and outputs on their existing land. In addition alternative income generating projects will be launched to cover the losses incurred by the protection of the forest. This assurance was a significant contribution towards achieving consensus among the rural population in Ruhoma to protect considerable areas of forestland.

We agreed to this project because they told us they will bring better agriculture. We can farm in this area, and we will get good harvests. (R Interview 33)

They tried hard to mobilise us.... We explained to them that for farming we depend on farming there (in the forest). So they told us to protect it. And they told us we will get better farming. Modern farming (R Interview 38)

5.3.3 Promoting crisis narrative

In both case study villages development actors (district officials, project staff and researchers) criticised the conversion of forests to agricultural land. They aimed to influence how farmers view their long-standing agricultural practices, especially the pursuit of slash-and-burn shifting cultivation, and the role of forests to livelihoods. In a report (Forrester-Kibuga and Samweli, 2010, p. 15) of the TFCG/Mjumita project in Lindi the perceived problem is clearly stated: *“One of the most important contributions to deforestation is people’s attitudes towards their forests [...] There is a sort of collective blindness about the state of the forests.”* Consequently, as one of the mitigation efforts, the authors of the report proposed (ibid, 2010:26) to *“carry out awareness raising about the negative impact of shifting cultivation on forests, building on the current slight understanding that forests have a crucial role to play in water supplies.”* Similarly a project document prepared for the LIMAS project (LIMAS, 2010, p. 42) lists *“educate and communicate on the effects of shifting cultivation and use of fire for fields preparation, including implementation of rules and regulations to deter setting forest fires”* among the proposed activities related to the forestry management plan.

Some proponents of REDD+ in the study sites including agricultural extension officers, project staff and district officials thought that farmers pursue shifting cultivation because of a lack of knowledge or education. Project staff in Ruhoma, for instance, mentioned a couple of times during my fieldwork that villagers need to be ‘educated’ on

improved farming techniques and the importance of forests. The project staff hoped that with education the attitudes of farmers about agriculture and forests could be changed. They tried to educate villagers on the many benefits they receive from forests in order to promote protection. The clearing of trees for agricultural expansion was sometimes called ‘arbitrary’ (*holela*), thus giving the impression that it was an illogical or irrational action.

During my fieldwork I could observe that several village leaders co-opted a crisis narrative that condemns agricultural expansion into the forests. They highlighted, as the development actors too, the use of fire as particularly problematic. Cutting trees and setting fire was equated with the destruction of the environment, leading to less rainfall, droughts, less wild meat and global climate change. It was denounced by some as creating wasteland, called ‘*jangwa*’ (cf Brockington, 2006; cf. Conte, 1999), which only creates useless land with negative effects on local environmental conditions. The following quotations, which illustrate negative opinions over shifting cultivation, were taken from interviews with villagers who were well respected in the villages. One could say they were informal leaders among the village population.

With shifting cultivation and setting fire you farm for a few years and then the fertility is gone. Then people need to move again to another place and if you do this you damage the environment. You clear the land, forest and set fire. When you set fire it means you have damaged the environment. (M Interview 26)

Shifting cultivation doesn't have much productivity/benefits. It just continues to destroy the forest. So the farmers must be showed another phase of farming. Maybe with tractors, or projects. (R Interview 13)

5.3.4 Promoting green development discourse

Development actors made use of various strategies to promote a green development discourse of forest protection and the sale of forest carbon in the villages. In the following section I will briefly illustrate the means utilised to convince villagers over the benefits of protecting village forests.

5.3.4.1 Village assemblies and sub-village meetings

Official meetings with the village council, village committees and village assemblies

were the primary forms sought by development actors to spread certain ideas among the rural population. In official meetings matters are discussed formally, following a certain procedure, which gives decisions legal legitimacy. In such meetings it was common for district officials to accompany project staff to add another level of authority and legitimacy to the claims made. In Liwale many meetings, specifically with the village council, the village natural resource committee and the REDD+ committee had been conducted since the idea of community based forest management was first introduced in the early 1990s. However, during the time of my fieldwork very few meetings were held because of political and religious conflicts in the village.

In Ruhoma, meetings were conducted in each sub-village in the first phase of the project preparation in order to reach as many villagers as possible. The project staff paid particular attention to sub-village and general meetings during project preparation. They were guided by the free, prior and informed consent approach, which shall guarantee that project participants fully decide voluntarily whether to accept or reject external interventions (Forrester-Kibuga et al., 2011). As the quote below demonstrates, the idea of establishing a village land forest reserve was at first foreign to the majority of the villagers. However, through continuous meetings and the support of district officials people started to listen and internalise what they were told by project proponents.

The first time Ray³² came to explain to us at a general meeting. To many of us this came as a surprise. People started thinking about it. Another meeting other people came from Lindi district. They also make us believe more, they knew about the issue. They increased our confidence that this forest is our wealth. So we said our capacity is small, we need some sort of help to pull us. They talked about carbon measurements and selling it. But we still don't know about how to sell it. We will get used to it more and more. (R Interview 31)

When the project came, they first met with the village government. They were told and then they told the villagers. At first we refused, we said we don't want it. But after we got knowledge, we were told that we could try it. In future if we don't understand, it is possible to leave it. Now we agreed and the project continues. (R Interview 33)

After that more village assemblies were held particularly when new information needed to be spread, important decisions were to be made or when special guests arrived. The

³² Ray was the local field coordinator in Lindi rural for the TFCG/Mjumita REDD+ project

arrival of guests from other parts of Tanzania, or in some cases even from far abroad, too served the project proponents to support and legitimise their actions.

5.3.4.2 'Expert' knowledge

During my time in the villages I continued to ask villagers why they protect their forests. Often they replied by linking their decision to the arrival of experts '*watalamu*' in the village, who advised them to do so. According to their understanding the experts specifically came to hold assemblies to "educate" them on the benefits of improved forest management. Until today villagers have not stopped to recognize the authority of expert knowledge and they continue to recount certain narratives highlighting their major role in shaping the local discourse.

We used to refuse. We refused a lot. But we were taught by people who studied. So something that you don't know, disturbs you. If you know about it, then you will agree to it yourself. You learn from other people and then believe. We study by doing not with a pen. We learn by looking (R Interview 15)

Especially the authority given by villagers to people who have studied enables development actors, who were generally educated, to get their messages across successfully.

So this document was given and the purpose was to give the forest a name. We are the ones who look at the experts only. Because as you know, the ones who studied are at the top and the ones who did not study are at the bottom. (M Interview 10)

We don't have education but if you explain it to us we understand its benefits. But the problem is that we don't have education. We have the knowledge from birth only. We know how to make things without education, we just have knowledge from birth. We haven't been taught in school. (M Interview 16)

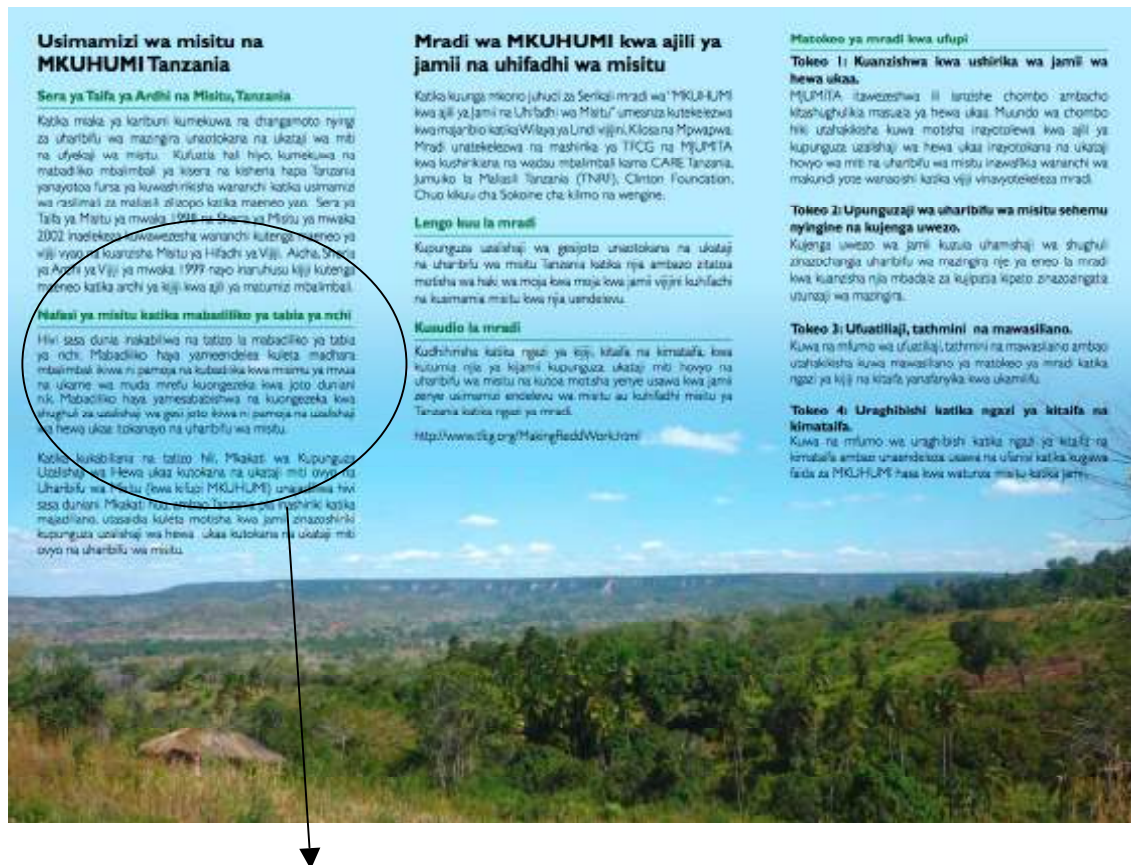
Often villagers regard experts as people who have *more* knowledge than them. They know *more* than them and therefore it is necessary to listen and learn *from* them. Discussions are therefore not necessarily about different ideas and strategies. Instead, it is about who knows more, who has understood and who has not yet understood. Therefore, people who disagree are the ones who have not yet understood and they need to be further educated about the right way of doing things.

Disagreements occurred but because we really educate one another they became less powerful as they came from people who did not understand what REDD+ is about. In future, day after day, they will understand more and more (R Interview 11).

5.3.4.3 The use of print media

The use of print media was another tool to attempt the internalisation of certain norms and values in favour of forest protection by villagers. Although there exist a number of information brochures, specifically for the TFCG/Mjumita project, many of them were written in English and therefore not found in the villages, since residents would simply not understand them. But the project facilitators produced materials written in Swahili to be disseminated in the villages. Because the majority of the villagers struggled to read well, by which I mean to fully and quickly comprehend the content of an entire text, brochures were deliberately written in an easier language and supported with pictures and drawings. Much effort was put into the brochures to present often highly complex matters in a way deemed appropriate for villagers. The Swahili leaflet shown below (Figure 5.1) was created in July 2011 by the TFCG/Mjumita REDD+ project. It uses compelling texts and pictures of livelihoods and forests to highlight how local actions of forest clearance are linked to both local threats of drought and the global concern of climate change. Rural residents are connected to environmental degradation, whereby a sense of responsibility and urgency is created to act in favour of forest protection.

Figure 5.1 Project leaflet TFCG/Mjumita REDD+

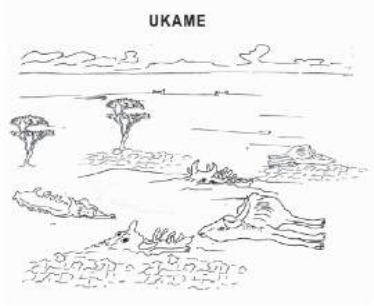




The role of forests in climate change:

Right now the world is faced with the problem of climate change. These changes have continued to bring various effects including changing patterns of rainfall and prolonged periods of drought from global warming etc. These changes were caused by an increase in emissions of greenhouse gases including carbon dioxide emissions that result from the destruction of forests (TFCG/Mjumita 2011; own translation)

In training material (Figure 5.2) produced by the TFCG/Mjumita REDD project for the use during workshops and seminars with village representatives to introduce participatory forest management and REDD the warnings of the dramatic negative effects of irresponsible forest clearance (drought and agricultural losses through shifting cultivation and the use of fire in the forest) were highlighted with the support of compelling drawings that can be easily understood by rural populations.

Figure 5.2 Images from training material used by TFCG/Mjumita REDD+

	
Drought	Shifting cultivation
	
Fire in the forest	

In cooperation with other non-governmental organisations in Tanzania pamphlets have been produced, which tell a story of a young man who, after learning of REDD and the dangers of unsustainable forest use, sets out to inform village leaders and other fellows in his home village of the opportunities REDD offers. Especially from this pamphlet (Figure 5.3) we can clearly see how strategies to promote forest conservation were highly adapted to the local cultural setting of rural Tanzania. By reading and looking at these kinds of materials villagers were to be sensitised to changes in their behaviour and lifestyles.

[illegible]

5.3.4.4 Extension services

Extension services were among the most emphasised techniques to exercise power. Especially the agricultural extension officers, both from the district and project organisations, were instructed to mobilise people to change their farming behaviour. I will talk more about the extension officer's strategies to promote conservation agriculture in chapter eight.

5.3.4.5 Multi-media events

Sometimes development actors used video and audio media to illustrate the harmful effects of traditional ways of living. They were effective tools in the pursuit of changing people's own perceptions of their lifestyles. A quote from a sub-village chairman in Mihumo/Darajani reveals how his perceptions of farming were changed after seeing pictures of environmental degradation on a video film.

In the beginning, the question about the forest was seen to be very difficult. As the Europeans came and when they brought the video camera to show how and which losses people get from destroying the forest. You get jangwa, and drought, the livestock dies and for people to get water they go 5 kilometer. So that we get touched and that if we don't take care of our forests we will end up like this. And they told us about the benefits of forests. If you protect the forest you get these benefits, timber, firewood, medicine, etc. honey,... They helped us a lot to give the villagers knowledge to know, if we do this then it will be bad, if we do that then it will be good.... So about the forests, people have understood it well. the forest is not a place to just use it.. to play around...to set fire.... (M Interview 11)

One day in Ruhoma I was lucky to attend a spectacular open-air cinema screening organised by members from the TFCG organisation (Figure 5.4). In an environment where people live a very humble lifestyle without access to power or running water the utilisation of movie screening and sound can have a long-lasting effect on people's memories. In two cars the TFCG staff came along with the screening equipment that excited almost everyone among the impatient crowd. After the installation of the equipment was completed, a wildlife DVD, which presented the natural wonders of the Serengeti, was shown. People were shown illustrative images of lions, buffalos, elephants etc. That the language spoken in the movie was English did not matter to anyone as the images spoke for themselves: protect wildlife. This entertainment

continued with the next two movies, particularly the last one. After showing scenes of ruthless forest destruction in the Pwani Region of Tanzania, villagers got to know the final video, which was about REDD+ in Tanzania as the solution to deforestation and forest degradation. When villagers noticed that some of the actors shown in the movie were sitting right in front of the screen (villagers of Ruhoma were interviewed and featured in the movie) the enjoyment was taken to another level. People started laughing and talking loudly about the video scenes. The ones shown in the video were clearly happy. It is likely that the video created a sense of happiness about their participation and achievements among the viewers this evening.

Figure 5.4 Photos of multi media evening in Ruhoma; Source: A. Scheba



5.4 Conclusion and discussion

This chapter set out to answer research question 1 “How do REDD+ initiatives interact with local livelihood strategies in Lindi, Tanzania?” and partly research question 3 “How do REDD+ initiatives aim to address the drivers of land use change in Lindi, Tanzania?” Building on the insights from chapter four about the role of widespread poverty, inequality and villagers’ dependence on land for crop production as the most important livelihood activity, this chapter attempted to assess the material and discursive effects of REDD+ initiatives in the two villages.

Concrete and equitable material benefits to villagers are vital if REDD+ initiatives want to gain popular support among the rural population (Corbera et al., 2007). Common property theory suggests that whether resource users organize for collection action considerably depends on the perceived costs and benefits that result from resource protection (Ostrom et al., 1999; Dietz et al., 2003; Ostrom, 1990). To overcome individual short-term benefit maximisation local stakeholders must establish institutions

that restrict access to the commons resource (i.e. creating costs) and provide meaningful incentives (i.e. creating benefits) to invest in it as opposed to exploiting it (ibid).

This chapter directly relates to the above insights. Its findings show that there exist stark differences over the perceived benefits and costs from forest protection in the two villages. Villagers in Ruhoma felt that they collectively and individually benefited from protecting the forest, as they accessed monetary and non-monetary benefits that contribute to inclusive development in the village. The exact opposite was observed in Mihumo/Darajani, where forest protection has not generated meaningful benefits to the local community and much uncertainty prevails about the potential of future carbon payments. This contrasting experience about REDD+ benefits contributed to villagers' oppositional perceptions over the effectiveness of conservation and the condition of the forest in the villages. While the benefits received in Ruhoma contributed to positive attitudes towards conservation, the population in Mihumo/Darajani expressed general dissatisfaction, frustration and disappointment about the forest reserve. Knowing that expected benefits from the protection of the commons must be substantial as initiating and implementing collective action is costly (devising new rules, monitoring and sanctioning them are big challenges that require considerable resources) (Dietz et al., 2003; Ostrom, et al., 1999) there is justified concern that the REDD+ initiative in its current form will not produce the envisaged conservation outcome in this village.

The many complaints from villagers encountered in Mihumo/Darajani are also directed towards the local district council and European donor agents. They are clear signs of mistrust and feelings of betrayal. This is worth mentioning as the nature of interaction between external actors and villagers also shapes collective action (Agrawal, 2007) and trust and reciprocity among stakeholders (Ostrom, 2010). The existence of trust facilitates collective action as individual users refrain from individual benefit maximisation in the belief that others will do so too. If there is only minimal trust between resource users, as in the case between development actors and villagers in Mihumo/Darajani, voluntary cooperation or the compliance with official rules becomes harder to achieve (Ostrom, 2010).

In both villages the residents had to consider the costs of forest protection in their decision over the management of the forest. Especially the villagers in Ruhoma expressed fears over lower agricultural outputs, more wildlife damage and increased

risk of food insecurity in future as a consequence of establishing the forest reserve. Fears over economic and physical displacement were prevalent in both villages and forms of displacement occurred on an individual basis in Ruhoma. This shows that trade-offs are inherent features of forest carbon protection (Hirsch et al., 2011). Nevertheless, according to villagers' perceptions the benefits outweigh the individual and collective costs of forest protection in Ruhoma. Among the various benefits received the villagers appreciated the monetary payments the most, which points at the important role of monetary incentives in changing behaviour in a poor rural setting like Lindi (cf. Ferraro and Kiss, 2002). Moreover, villagers perceived the distribution of the payments to be fair, transparent and locally managed, which is another critical factor influencing conservation behaviour (Dietz et al., 2003; Corbera et al., 2007). At the same time some villagers complained about the problem of elite capture of other developmental benefits. The distribution of benefits is an important matter for further consideration, because collective action is more likely if users perceive the rules governing benefit distribution to be fair and locally devised (Ostrom, 1990; Ostrom et al., 1999; Dietz et al., 2003).

External and internal processes can alter cost-benefit distribution, which contributes to local actor's changing resource use. By aiming to reward forest users with monetary payments for the protection and enhancement of carbon, REDD+ initiatives represent a deliberate external intervention that aims to facilitate collective action (Corbera, 2012). Carbon payments are the primary means of REDD+ to balance incurred livelihood losses from forest protection (Angelsen, 2009). In both villages no carbon credits have been produced, let alone sold, from which villagers could obtain income. In Ruhoma project proponents provided REDD+ trial payments, which contributed much to the positive perceptions of villagers about the benefits of protecting village forests. According to my data the trial payments were substantial as they contributed significantly to cash incomes of poor and middle-income adults as they made up 74% and 39% respectively of their mean annual cash income. Furthermore, cash payments were worth a lot when dispersed in February as during this time households lack money and food insecurity is most prevalent. As poor people depend much on casual farm labour for supplementary income (see chapter 4), the significant contribution of trial payments to their incomes may assist them in applying their labour power on their own farm as opposed to selling it to other farmers. This could have positive effects towards addressing local inequality with potentially positive outcomes to forest protection

(Agrawal, 2007; Anderson and Agrawal, 2011).

Despite the fact that trial payments were calculated on the basis of optimistic assumptions about potential future carbon payments (conservation success and carbon price), some villagers criticised them for their low amounts and for the uncertainty that remains over their future existence. Their sentiments were confirmed by my basic opportunity cost calculations, which illustrated that poor, middle and wealthy households forgo benefits of USD 21, USD 350 and USD 572 respectively per hectare protected forestland. Hence, future carbon payments are unlikely to cover the opportunity costs particularly of medium and wealthy village groups. This could lead to increasing pressure from these groups to abandon conservation. Studies have namely shown that income-inequalities could negatively or positively affect collective action depending on the institutional and situational context (Anderson and Agrawal, 2011). How local users structure rules to address income inequalities relates to the expected benefits. If they are substantial then local users may invest more resources to devise more complex rules and monitoring systems to overcome potential negative effects of inequality (Varughese and Ostrom, 2001).

My findings show that payments disproportionately benefit the poorest, as they almost cover their opportunity costs. However, this only applies as long as they remain poor. The moment they become richer their opportunity costs increase and carbon payments will become less beneficial. While at the moment most villagers did not perceive losses from foregone benefits as such, as they were happy about the additional cash they received, their attitudes towards conservation could change in the longer term as a result of new knowledge, perceptions and understanding of the benefits and costs of forest protection (cf. Adams et al., 2003).

Given the heavy dependence on land for village livelihoods and the likely possibility that REDD+ will not cover the opportunity costs incurred of forest protection I argue it is pertinent to ask why villagers still decide to protect fertile forestland from agricultural expansion. I then showed that state and non-state actors used a combination of crisis narrative and green development discourse in the villages to present the commodification of forest carbon as the optimal way of generating economic and environmental benefits to rural residents. The clearing of forests for agricultural purposes was presented as environmentally destructive although in Mihumo/Darajani,

for instance, no good and concrete data on land use change was available in the village (cf. Bolin, 2010; CCI, 2011). As development actors used discourse to persuade villagers to protect considerable areas of village forestland, we can conclude that, at least in the short run, discursive effects of REDD+ can be as decisive as material effects to influence villagers' livelihood decisions and land use of common pool resources (cf. Castree, 2013; Adams et al., 2003). This argument is informed by scientific debates about the role of ideas and discourse in institutional change (Schmidt, 2010; Lynggard, 2007). According to the discursive institutional approach or 'discursive institutionalism' institutional change occurs in two processes: when ideas are turned into discourse and when discourse is turned into institutions (Schmidt, 2010). My chapter demonstrated how ideas about forest protection, land use and governance held by development actors were articulated into a hegemonic discourse through various forms of locally adapted media. In the next chapters I will examine how this newly created 'green development' discourse was turned into new institutions. I now turn to chapter six, which examines the political processes behind the establishment of the village land forest reserves in the two villages.

Chapter 6: The politics of territorialising village land forest reserves

6.1 Introduction

In Tanzania all REDD+ pilot projects build on community-based forest management (CBFM) institutions as the chosen forest governance framework. The same applies to our case-study villages, where development actors aim to integrate the commodification of forest carbon with community-based forest management. Community-based forest management in Tanzania is a form of democratic decentralisation. If implemented successfully, it decentralises power and authority over the management of forests to local village institutions, who, it is expected, will manage forest resources sustainably (Blomley and Iddi, 2009)³³. In this process it establishes new boundaries around forests and new regulations over their access, control and use. This makes it also a process of state territorialisation (Vandergeest and Peluso, 1995), which is the “creation and maintenance of spatialized zones within which certain practices are permitted based on the explicit or implicit allocation of rights, controls and authority” (Peluso, 2005, p. 2).

State territorialisation under neoliberalism can be considerably shaped by non-state actors (Corson, 2011). In implementing territorialisation, state and non-state actors change the relations between people and their environments and between people themselves. How these changes come to look really depends on the social relations among actors, including non-human, which can include forms of cooperation, contestation and resistance (Peluso and Lund, 2011; Poteete and Ribot, 2011).

In the following text I examine the decentralisation of forest management as a territorial process that aims to shift power over forestland from the district and customary institutions to village authorities. I will show that territorialisation under decentralisation is a complex technical and political endeavour that highly depends on state and non-state actors with limited room for villagers’ agency, despite donor claims of ‘participatory’ development. Thus the outcomes of forest decentralisation largely depend on the capacities and benevolence of powerful actors outside the village, who often lack accountability for their actions (Ribot, 2006, 2004; Sundström, 2010).

³³ See Appendix XI for a brief description of the legal steps required to establish community-based forest management.

I will show how territorialisation is embedded in local politics and power struggles over people, land and natural resources. It is politics that considerably shapes how territorialisation unfolds on the ground. All this is particularly important as it illustrates how the commodification of forest carbon is embedded in a local political context that can either accelerate or hinder its implementation.

6.2 The long way to CBFM & REDD+ in Mihumo/Darajani

6.2.1 Initiating territorialisation of Angai forest

As outlined in the introductory chapter, in 1993-94 the Liwale District Council aimed to territorialise the Angai forest, for it to become a local authority forest reserve to be managed and owned by the district council. The intention was to demarcate boundaries inside the forestland to separate the forest reserve from the village land and to transfer authority and control over the access and use of the reserve to the district level (Mustalahti, 2007).

However, the wish of the Finnish donor agents was to decentralise forest management to the community level and to create a village land forest reserve. Because the Liwale District Council knew of the valuable timber resources within the Angai forest, it resisted from the beginning the plan of transferring all powers over control and access of the resources to the villages (Mustalahti and Lund, 2010; Mustalahti, 2007). What therefore followed is a long period of continuous negotiations between RIPS staff and the district, which finally ended in 2000 when the district council agreed to the establishment of a joint village land forest reserve across 13 Angai villages (ibid).

In September 2000 the 13 villages surrounding the Angai forest applied for the demarcation of the forest reserve and for the issuing of village land certificates to obtain legal ownership over their village land. Territorialisation of village and forestland is a necessary requirement in Tanzania to establish community-based forest management. Before the village can legally own and manage village land forest reserves, clear village and forest boundaries must be demarcated followed by the creation and approval of formal forest management plans and by-laws (Blomley and Iddi, 2009). The district council approved their joint-application in December the same year. In 2001 the territorialisation process in the Angai forest began and until the year 2004 remained the focus of the RIPS development programme (Mustalahti, 2007).

Given the size and dangerous nature (wildlife) of the Angai forest, demarcating village and forest boundaries was not an easy procedure. Due to a lack of resources and the significant difficulties of working in the vast forest area the team consisting of villagers, district officials and external experts struggled to complete this task. It took more time and additional help from the Ministry of Land, Ministry of Natural Resources and Tourism and the National Forest Programme's Coordination Unit Support Project to carry out the survey and mapping, which were finally completed in the year 2004 (Mustalahi, 2007).

The survey and mapping exercises resulted in a reorganisation of forestland and strengthened a certain understanding of the relations between people and forests. Through the demarcation of boundaries between and within villages, spatial areas were formally assigned to different villages, which strengthened a sense of ownership and control.

They take some people and go with them into the forest, in order to know the boundaries. To show them the boundaries of the different areas. This is ours, yours is here, here and here. If you cross over here, this is not yours. Then they return. And they go to Lilombe, and there they explain the villagers the same. The end is here, here and here. This is not yours. And they go with the chairman of the village and his Europeans and draw the boundaries (M Interview 8).

At the same time the demarcation of forestland also caused conflict between villages. While the boundaries of the farming areas were clear to the villagers, the boundaries in the forests were a matter of contestation (Mustalahti, 2007 p. 176). Between the villages of Mihumo, Likombora and Kipule conflict over traditional boundaries emerged during the demarcation process³⁴. Villagers from Likombora and Kipule complained that Mihumo's village land and their forest share are too big. Discussions among village elders, village council, VNRC and community members were held to settle the dispute. After rounds of negotiations an agreement was reached, then beacons were placed and trees were coloured to mark the village borders.

While the task of demarcating boundaries was conflict-laden and depended on local

³⁴ M Interview 53; M Interview 49; M Interview 54; M Interview 10; M Interview 56

participation and knowledge of traditional boundaries, district officials and foreign donor agencies with their 'expert' knowledge played an important role in the entire territorialisation process.

These leaders, the experts, these Europeans. They did it [put the boundaries]. Because this work was done since 2002. They cooperated with villagers themselves. And the villagers agreed (M Interview 10).

The white men [Europeans] who come to study in the forest and to put stones there for demarcation. They put them starting from Majuni, if you go, then again another beacon. There is open area, where villagers can farm and the area of the forest. From here to there it is 10 miles. There they started to put stones. And also they put another stone in between the borders of villages. Village of Ngongowele and village of Ngunja and village of Mihumo. They put stones. And they put stones between Likombora and Mihumo. People from the government in cooperation with the experts (M Interview 10)

At the end of the demarcation exercise a total land area of 479,131 ha was secured for 13 villages, and 139,420 h were set aside as the Angai village land forest reserve. In Mihumo 11,792 h out of 29,555 h total village land were set aside as a forest reserve (Mukama, 2010). Mihumo villagers decided to put the forest reserve 10 miles away from the village centre in order to keep enough land for agricultural expansion and for the collection of forest products. Villagers were clearly concerned about their livelihood needs; therefore they left a large area outside the forest reserve. Nevertheless, the area under protection still remained very big as it spans across more than 11,000 h of land.

The area of the forest is very big. Very big. Between the forest area and the area for farming, the protected area is very big. The area is very big compared to there... But also the area that we set aside is big. The area will help, if people have children, move, give birth to more children and move and even there, the government can take the chance and increase the farming area and decrease [the forest area] a little (M Interview 13).

After demarcating the forest boundaries, the village natural resource committee of Mihumo increased the reserve by putting up a fence around 1 km in front of the forest boundary as a kind of buffer zone. The committee members communicated to the villagers that the crossing of the fence was an illegal activity, which would be prosecuted by the village council. The fence signalled the end of the 'open area' and the

beginning of the reserve, where no ‘intruders’ would be permitted. Despite a lack of approved forest management plans and bylaws the village natural resource committee took on the role of the protector of the forest reserve and threatened villagers with arrest if they enter the protected area.

The process of territorialisation was legalised in 2005 when each of the 13 villages was finally given a village land certificate describing the village and the forest boundaries. This resulted in the loss of the district and central government to income from levies on forest products (Mustalahti 2007; Mukama, 2010). The issuing of village land certificates to the chairmen of the 13 villages was celebrated in the form of a ceremony, witnessed by the Ambassador of Finland who was invited to participate in handing over bicycles to all VNRCs to facilitate patrolling activities (Mustalahti, 2007 in Sundström, 2010).

6.2.3 Territory without authority

Territorialisation involves the allocation of rights, controls and authority over spatialized zones (Peluso, 2005). After having received the village land certificates, which made the villages the legal owner of the protected forests, all villages were required to conduct forest resource assessments in order to create a management plan and bylaws to obtain authority and control over the use and management of the forests. This would then enable them to declare the forest reserve and eventually start timber or other trade with the right to retain all revenues from the sale of forest products (Blomley and Iddi 2009).

Since writing forest management plans and bylaws is a difficult task that requires financial and human resources (Mustalahti and Lund, 2010), it is practically impossible for villagers to establish management plans and bylaws on their own. This made them once again dependent on external actors for assistance. However, the Liwale District Council made it clear from the beginning that no adequate resources exist to carry out forest assessments and inventories. While negotiations on this subject continued, the central and district government banned all logging activities in the Angai forest reserve. Villagers were promised that once management plans and bylaws were approved, they would be permitted to run sustainable timber harvesting (Mustalahi 2007; Mustalahti and Lund, 2010).

Between 2007 and 2008, several institutions including the Tanzanian National Forest Programme, the Danish development programme DANIDA and the Ministry of Foreign Affairs in Finland provided technical and financial support to the Liwale District Council and the 13 villages to prepare workable forest management plans and bylaws (Mustalahti and Lund, 2010). A facilitator from the Sokoine University of Agriculture was hired to conduct participatory forest assessments with the help of selected villagers and two district forest officers. Together they managed to create draft forest management plans and bylaws for all 13 villages (MNRT, 2008). Villagers were promised that they would obtain the finalised management plans and bylaws by July 2009 (Sundström, 2010).

However, in August 2009, Dr. Mustalahti and other researchers from the University of Sokoine wrote a letter to the Forestry and Beekeeping Division (FBD) requesting advice and input from the national FBD as they felt the management plans, created by the facilitator from the Sokoine University of Agriculture, were incomplete. Among the many concerns held, they stated that the forest inventory was not sufficient and estimated harvesting amounts and short rotation cycles could lead to over harvesting. In their view the management plans did not consider biodiversity and water management values (Personal communication, 2011). In short, more work, more negotiations and more resources were needed to finalise and approve them. In 2009 and 2010 the forest management plans and bylaws were regularly discussed among development actors with the position that they represent the major stumbling block to formally start the timber trade, and that concerted efforts were needed to finalise and approve them (Bolin, 2010; Camco, 2009; Kaale, 2010; Mukama, 2010; Mustalahti and Lund, 2010; Sundström, 2010).

Ten years after the territorialisation processes started in the Angai villages, and almost twenty years after negotiations over decentralisation began, villagers still waited for the transfer of authority over the forest reserve and its resources. From my ethnographic experience I can say that many villagers blamed the Liwale District Council for the delay of forest decentralisation. In their view the unfinished forest management plans and bylaws became the most important 'repertoire of domination' (Poteete and Ribot 2010) for the district council to prevent the local community from valuable timber benefits (M Interview 20). Because the management plans and bylaws were never finalised and approved, the formal ban on timber logging remained intact despite

villagers having obtained formal ownership over their village and forestland. Hence, in this case legal ownership over the forest did not improve the economic situation of the villagers at all.

We got the certificate. We were told that the harvest we will start after the verification. After putting these beacons. And we have already gone along the boundaries. This place we do this, that place we do that. This place is for this. But with regard to harvest, we are being told not yet. Yes the government restrains us (*inatubana*) because if we could harvest there and we got people, like Mr. Andrea, he wants trees, let him harvest there we would get money to buy paper for the office. But today we do not even have paper in the office. But the ones who hurt us are from the district. The national government empowers them. If they did not delay, also the ordinary villager would benefit today. (M Interview 20)

6.2.4 The District's agenda: dividing villages, creating new territories

In 2008 something pivotal happened in the Angai villages. District officials approached village council members of all the 13 villages around the Angai forest to advise them to divide their villages in order to make service provision from the government to the local communities easier. Alongside this argument, district officials told villagers about a national law and policy that suggested the division of villages larger than 250 households. The ward councillor confirms the emphasis on the 250 household mark in deciding upon new village boundaries. He presents the issue as a clear case of a necessary intervention to improve the lives of the rural population.

According to order/procedure a village should have 250 households. If it has more, then the service for the village becomes harder. It must be divided so that it becomes easier to offer services to the villagers [...] It is not possible that more than 3,000 people use one school. If there is an increase again in future it will be divided again. So also in Darajani we plan to have a primary school. (M Interview 62)

The Village Chairman of Mihumo recalled the District's decision to carry out a division of the Mihumo village. However, in his view the idea came from district officials with the aim to construct 'certain political environments'. One older man in Mihumo framed the division of the villages in a similar politicised way. The division of the village also had to do with shifting administrative and electoral boundaries in order to increase votes for the CCM party.

The division of the village, really, was basically initiated by politics. Because ... the wish from the villagers to decide to divide did not exist. But what was constructed was a way/technique from government leaders within the district council to produce certain political environments, to construct certain areas with many people etc. So they advised the community members about this and villagers agreed. They agreed and entered the phase of separation (M Interview 63).

The village was divided because they saw that there are many parties. If they start to divide the village, they will get votes easier. Our party will get more votes. When there was only one party, it was only Mihumo. There was only one party. Only CCM. But today Chadema... The CCM lost a lot of strength. Many are for CUF here. (M Interview 49)

In 2009, when village leaders in cooperation with district officials began to divide the village land they decided to put the new boundary behind the Southern goal post, so between the football pitch and the market place. This was voted for as the best place for the new village (Darajani) to begin, going southwards³⁵. In a later interview the VC of Mihumo revealed to me that the newly established borderline between the two villages was accepted by many as the area to the North would remain a stronghold of CCM (Chama Cha Mapinduzi) while the area to the South of the boundary would be controlled by CUF (Civic United Front) voters. Through this division, CCM voters would again have a chance to govern Mihumo village, while the many CUF voters were to be constrained to Darajani as their new village.

But with this border, already politics was brought in. To start there going North and to start there going South, with the political system, CCM it will be that many people who they want them to govern will be in Mihumo compared to obtaining the chance in the part of Darajani. These political issues were hidden a lot. They were not openly communicated at the time when we conducted these activities of dividing the village. (M Interview 63)

When creating the new village boundaries they solely considered the settlement and farming area, but not the forestland, which is the largest part of their entire village land. Villagers thought that the division would only concern the settlement and farming area but that the protected and unprotected forests would continue to be owned and managed

³⁵ In placing the boundary between the Southern end of the football pitch and the market place, villagers did not hear the complaints by the former head teacher who warned that the land of the school got accidentally divided. Some of the with cashew nut trees cultivated land was cut through by the new boundary. A part of Mihumo's school property was transferred into the area of the Darajani village. Since then debates have emerged over the rightful ownership of this patch of land.

jointly. The VC of Mihumo explained to me in an interview that their understanding of dividing the villages was about creating competition over better service provision but not to divide the natural resources so that somebody owns more than somebody else. All the resources were considered to be the resources of all of them (M Interview 63). The same opinion was voiced to me by the village executive officer and several sub-village chairmen (Journal 25.11.11; 1.1.12).

After all the years of struggle to demarcate the previous forest boundaries and to obtain the village land certificate, village leaders were understandably hesitant to repeat this exercise. Fear existed among village leaders and ordinary villagers that dividing the forest would take many years again, which would mean a continuation of restricted access and no revenues from the valuable resources.

Because we said, if we start this issue of boundaries, it will be big activities. Because even to get the land certificate, for every village it will take maybe 5 years to get it. So we said we leave this, on the map it belongs to Mihumo but when it comes to any money from the forest we share all together. Because to divide would be a big task. And if you look at the area, one village would suffer. If you look at Mihumo, its area is very small. A big area has been taken by Darajani. So we said lets do it together. Let's not create problems So this is how it goes. (M Interview 11)

There is one border for the forest area and the wealth in the forest. We leave it this way. The income will be split half and half. To talk about (the borders) is easy, but the implementation is work. It can happen that even after 5 years the implementation hasn't been done. You can't do it in one day (M Interview 21).

6.2.5 Participatory land use planning under REDD+

In 2009 villagers of Mihumo/Darajani were introduced to the possibility of selling forest carbon for their efforts to protect the forest. In the course of Dr. Mustalahti's research project participatory village land use planning was conducted to confirm forest and other land use boundaries and to assess different options for livelihood diversification. Through the facilitation of participatory land use mapping, which was carried out in 2009, and of participatory forest carbon assessments in 2009 and 2012 the prospect of forest-carbon money in addition to timber revenues got a lot of attention by villagers (Sundström, 2010; Mukama, 2010; Mukama et al., 2011).

Further support for demonstrating REDD+ in Angai was acquired from the National Forestry and Beekeeping Division, Liwale District Council, the Clinton Climate Initiative, the International Union for the Conservation of Nature and other research/University partners. Among the most involved partners was The Clinton Climate Initiative, which selected the Angai forest from a pool of 70 potential sites to support community-based forest management linked with REDD+ based carbon payments and FSC timber harvesting (CCI, 2011). A feasibility study was commissioned to assess the potential of the Angai area to become a community REDD+ project site. The company who conducted the assessment, Camco Advisory Services (T) Ltd, concluded in their draft report to CCI:

Given the above findings on the carbon stocks and existing institution set-up including template benefit sharing schemes in the area, the AVLFR provides a unique opportunity for the government as a site that can easily and cost effectively be developed and show cased as a REDD-Plus demonstration project Therefore it is recommended that a pilot project be established at Angai with funding sourced through REDD Readiness funds, the Government of Norway, the UN-REDD process and the World Bank Forest Carbon Partnership Facility. In addition, the Villages will need to be assisted to develop village land use management plans in order to enhance sustainable management of land and forest (Camco, 2009, p. 6).

In 2010 the Clinton Climate Initiative commissioned the NGO Mpingo Conservation & Development Initiative to support the CBFM and REDD+ process in Liwale. They were contracted to offer their expertise and resources regarding the redrafting and finalisation of the previously created forest management plans and bylaws. With their help new forest management plans and bylaws were drafted for 13 villages by the end of 2010.

Although villagers were informed in 2008 to divide their village land, this significant rupture did not feature in some researchers' accounts of the opportunities and challenges of REDD+ activities in Mihumo/Darajani (Mukama, 2010; Sundström, 2010; Bolin 2010). Only Taku-Tassa (2010) mentioned in a footnote that "Mihumo in this study refers to Mihumo village and the newly established Darajani village. Villages have the 'legal' rights to split up when the number of households reaches or exceed 250. Some observers attribute the splitting up of villages to political manipulation by some political elites." By 'manipulation by some political elites' he probably refers to the above-described objective of increasing votes for the CCM party through changing

village boundaries.

Also in the feasibility assessment conducted by Camco Advisory Services there was no mentioning of the village division and new village boundaries (Camco, 2009). In the forest management plans created by Mpingo the village division was mentioned but the NGO stated that both villages are still based on the village land certificate of Mihumo and that in future the management plan and bylaws will be utilised for both villages. All in all it appears as if there was confusion and a clear miscommunication between development actors, researchers, district officials and villagers over the origins and consequences of the village divisions.

6.2.6 A new wave of territorialisation under LIMAS

Because the management plans and bylaws created by Mpingo did not consider the division of the villages as instructed by the District, they were criticised and practically ignored by the district council and LIMAS (Lindi and Mtwara Agribusiness Support; the new development programme financed by Government of Tanzania and Government of Finland from 2010 to 2014). The plans were further criticised for being too simple and without clear scientific calculations based on forest inventory or land use data (Mustalahti et al, forthcoming).

While the District Council informed the villages in 2008 about the need to divide villages, only three to four years later did district officials communicate to village council members of Mihumo/Darajani the need to resurvey village lands to obtain new land certificates. The district did not organise the meetings to inform village leaders independently but they were facilitated by the LIMAS programme.

All these plans were unknown to the vast majority of the villagers in Mihumo/Darajani. It was only in a workshop in the village on 15 December 2011 that council members were informed about the need to resurvey the village lands and to demarcate the new boundaries. Many ordinary villagers remained uninformed about this new development long into the year 2012. Some continued to hold onto the idea of jointly owning the forest area, some thought the best is to put new boundaries but cooperate in managing the forest and others proposed to hold a village assembly to obtain the opinions of the villagers before doing anything. This uncertainty lingered in the village until the 31 March 2012, the day when the DNRO, the district land use officer and a staff member

of a GIS company arrived to hold a village council meeting. In this council meeting, some villagers tried again to question the whole idea of dividing the forest but the DNRO made it clear, once and for all, that each village requires its own boundaries, including the ones that go through the forest, and each village will have its own village government, committees and assembly.

6.3 Establishing CBFM/REDD+ in Ruhoma

6.3.1 Territorialising Ruhoma village land

In Lindi rural district formal boundary demarcations of all villages was carried out in the year 2007. However, at that time REDD+ ideas had not yet been introduced and there were no serious conflicts about the exact size and shape of village land. Even the boundary demarcation was not done in an inclusive and very participatory way. It was at times carried out sluggishly or without the consultation of all affected parties (R Interview 39; R Interview 40). District officials told me at that time villagers did not know the value of land, therefore they did not care much about formal boundaries. Still the staff from the district in cooperation with the National Ministry of Land recorded all village land boundaries and issued village land certificates for all the villages.

So what they did. After they attended the seminar on how to lay the beacons, every village decided to lay the beacon without consulting the neighbouring village. This was a programme for the ministry. People from Dar es Salaam came to do this exercise. When you go to lay the beacon, you must agree with your neighbouring village (R Interview 40)

... sometimes they were agreeing to make the exercise go through. As I told you, you find that from the village centre up to where the beacon should be like, it is very far. So when the person facilitating the exercise, tell the people so carry the beacon we are going to look for the point to lay this beacon, they will walk maybe for three hours. Then they are tired. So they just tell him, because he doesn't know, the point is here. So that man lays the beacons, takes the coordinates then he is gone to use them (R Interview 39).

But with the advent of forest decentralisation and the prospects of forest carbon money, boundaries became the subject of serious contestation. Territorial claims moved to the centre of inter-community conflict. Villages started to fight over parts of forests, each striving to increase their size and thus potential carbon income. When prior the REDD+ intervention farmers from different villages could move unhindered across areas, this

was no longer possible. With the advent of REDD+ villagers' livelihood activities, particularly farming, got tied to their residency. And their residency was tied to their place of settlement. Therefore, moving across areas to open up new farms became more problematic.

Before REDD there wasn't any conflict about land. But with REDD and every village to become its land titling, conflicts started (R Interview 3).

Actually that is what is bringing all this problems. You know every village is trying to make sure is conserving a very big forest. Even if the people in the village know actually our village size is very small. So they even encroach up to other parts of other villages. If you tell them that this is not part of your village, this is where the quarrel begins. Because they want to conserve an area as big as possible to get more money. But if you tell them, look here your boundary ends here. They say no, up to there is our boundary (R Interview 39).

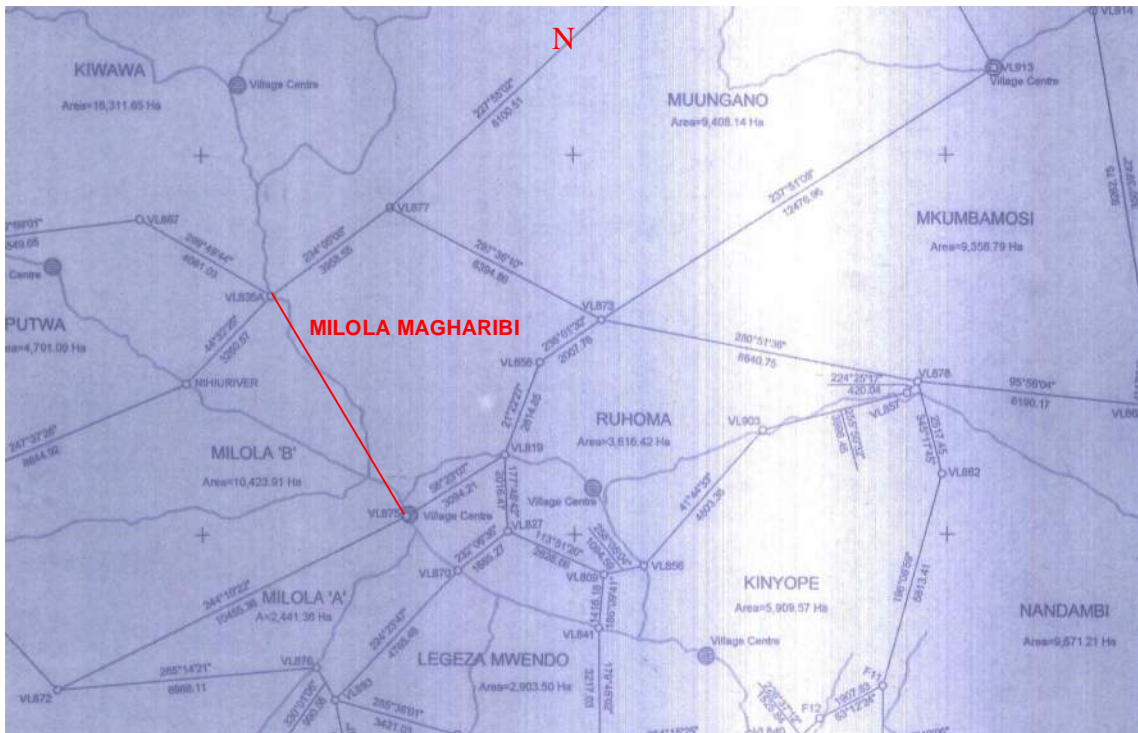
Yes many boundaries have changed due to REDD. Because people did not understand the value of land. Also the forest was just there but they did not know how to benefit from the forest. People did not know where their village ended. They just farmed. He didn't know whether he farmed in his village or in another village. So then we educated on the importance and value of land. As a consequence they started to defend their land and resources. They want to defend their claims to forestland not just for carbon but for other forest products too. So it is true that REDD brought this challenge (R Interview 48).

In Ruhoma one specific area has been the subject of fierce confrontation among villagers. Kikumbi is a sub-village of Milola Magharibi, a village, which officially split from Milola B in 2009 (LUP Milola Magharibi 2012). This new village Milola Magharibi borders Ruhoma to the West as illustrated in the map³⁶ below (Figure 6.1).

³⁶ Unfortunately I do not know the scale of the map. The North point and the new borderline (red) are my own personal additions based on information from the Land Use Plans of Milola Magharibi.

Figure 6.1 Map of Ruhoma and surrounding villages

Source: Lindi rural district office



Residents of Milola Magharibi's sub-village Kikumbi live in the Northeastern part of the village, as shown on the map in Appendix VIII, on their farms near or close to the Noto forest, which spans across several villages including Ruhoma. Before REDD+ was launched, Kikumbi farmers crossed the border into the areas of Ruhoma, Mkumbamosi and Muungano often without knowing it, to clear forestland for agricultural production. Ruhoma citizens knew about the farmers but they did not mind and thus abstained from voicing any concerns.

Since REDD+ was introduced and with it the agreement to protect the Noto forest on village lands, the situation has changed dramatically. Ruhoma villagers (foremost the elders and some village council members) in collaboration with district officials and NGO staff have met several times with community representatives from the neighbouring villages to resolve border conflicts. During the land use planning exercises the village boundaries were discussed and confirmed with all the neighbouring villages but conflicts over the boundaries with Milola Magharibi and Nangaro remained. There have been several subsequent meetings between village leaders and project staff where village boundaries were debated. Officially an agreement has been reached, whereby some Ruhoma villagers claim that their negotiators were not strong

enough so that their village has lost some of its area to Milola Magharibi and Nangaro.

But Ruhoma and Milola there are still conflicts in the place of Kikumbi. But the goal of REDD is that all the REDD villages should not have any boundary disputes. We got the opportunity to take the elders from the different villages. We go to every beacon and explain to them, from this beacon to the next one, what do you say. Once they agreed we give them a form about I agree to this boundary. And they fill it and we go to another beacon to do the same. They filled the forms and we have their signatures. But still disputes emerge. Because of a lack of understanding (R Interview 42).

And the ones that went have been 'swallowed'/beaten by the people from the neighbouring village. Here it was seen that they lost some strength and the others won. But the law from the past was different. They were given some land but this wasn't the law from the past (R Interview 10)

Despite the official agreement, which was confirmed in a letter signed by parties from all villages, some residents of Milola Magharibi resisted the decision, which they see as invalid. Especially the farmers in Kikumbi argue that the place where they farm rightfully belongs to them. Their argument goes as follows.

When villagization was carried out in the 1970s, they were forcefully removed from their homesteads that were located there, an area now shared by Milola Magharibi and Ruhoma village. At the time of the eviction, they relocated to Milola village where they lived and farmed for three decades. In recent years, the increasing scarcity of available land in this village encouraged them to look for new places and so they decided to return to their original home in the forest. Residents of Ruhoma village tolerated their presence and their practice of agriculture during all the years until REDD+ began.

Because of the prospect of money from forest carbon, residents of Ruhoma have started to emphasise the agreed-upon boundaries to argue for the removal of the 'illegal squatters'. To make their voices heard, they have started to explore different options to move them and with them their farms. Members of the VNRC together with villagers tried to chase the farmers away from their fields, but they were confronted with resistance and threats of violence. Consequently, some Ruhoma villagers see themselves unable to resolve the conflicts and therefore they call for assistance from the district or police in their attempts to displace the Kikumbi farmers.

They met there from the different villages. Elders from Ruhoma and Milola, Namila and others. But there is a sub-village that ends in our area. There are some problems. They farm but still experts say we must use the law. The WEO was informed and explained to them not to return there (R Interview 3).

We don't have the power. If you want to chase them away, you need to use the force of police. It is needed that the police comes to displace them. First they damage the forest, because this year they farm here. Next year there. Then there. They damage our forest. But we can't displace them. Maybe the district commissioner, or the land officer (R Interview 13).

Hence, it emerges that the territorialisation process under REDD+ has resulted in conflicts between villages and villagers over the rightful owners of forestland. While in the past most forests were considered to be open access and villagers could move unhindered between villages, this is no longer the case. Aside from Ruhoma many more villages were affected. Between the villages Muungano and Milola Magharibi serious conflicts over a parcel of about 50 ha land broke out after REDD was introduced. Their story even made it into the newspaper as Yankami (2013) reported in *The Guardian* (Tanzania) that villagers of Muungano and Milola Magharibi threatened to fight each other over the benefits of REDD+ money from disputed forestland.

6.3.2 Territorialising forestland

In order to establish community-based forest management in Ruhoma, the boundaries of the protected forest had to be demarcated and village land use plans established. Despite the fact that village land had been surveyed and legally recognised in 2007, no land use plan was in place in Ruhoma prior to the REDD+ intervention. After the village assembly had officially accepted and launched the REDD+ project, village level meetings and participatory land use planning were carried out in February/March 2011 with NGO staff, district officials and the village land use committee comprising of 'community representatives', who were all residents elected from every sub-village and two village council members. Over a six-day period a workshop was held in March 2011 in the village where a village land use plan was drafted and visualised in a provisional land use map (Appendix IX). This land use map was then taken to a village assembly for approval.

During the process of establishing the forest reserve, villagers first set aside a smaller size of their forests to prevent losing valuable land for agricultural cultivation or for the use of forestry products. They were afraid of ‘selling off’ a large part of the forest to the NGO and ‘their’ European financiers (R Interview 48; R Interview 19). Despite the monetary incentives for forest protection and trust building exercises by project staff, villagers remained clearly sceptical in the beginning. Many of them feared that their forest could be taken over by the state or foreign donors.

They set aside a small area, because still they were afraid. They doubted whether the protected forest area is theirs. Some people did not trust/believe if the forest was theirs. So they thought that in order to not lose out on agricultural land, they set aside a small forest area [...] Because many of the villagers are farmers, and their farming is shifting cultivation, they were afraid of protecting the whole forest area. They thought better to keep much forest outside, so that they can come and open up new farms there. Better to leave much forest outside of the reserve, so that we can continue to shift every day (R Interview 48).

The ones who refused in the beginning were afraid, that later we would be chased away from the forest. You must go, you sold the forest. You must go to the neighbouring village. This is the problem. The only problem. Later we will be displaced (R Interview 19).

Large areas of the forests were thus left outside the reserve, much to the discontent of the project staff, who, after a few months, embarked on a further education and awareness raising campaign to convince the villagers to increase the protected forest area. Their message was clear: The more you protect, the more carbon money you will receive. With so little forest under protection, the project might not have gone ahead.

After drawing the map, we saw that a lot of the forest is outside the reserve. The time when you go to the forest, then you can't know how much is outside. But once you draw the map, then you see. There is a lot of forest outside. So we need to return. It seems that they haven't got enough knowledge yet, still they leave much outside. We need to go back and educate them further, to make them understand the loss of leaving much area outside the reserve. When we returned we explained that if you leave much forest outside, then you will clear the forest on that land, and you will struggle to reduce emissions. And you will lose out of income from REDD. Because the REDD project wants you to reduce the amount of cleared land (R Interview 48).

Villagers' fears around deprivation of high agricultural incomes and forest products were mitigated by ensuring continued access for subsistence needs and initiatives to change their practices away from shifting cultivation to more productive permanent farming, particularly in the form of conservation agriculture. Villagers were also told that this agreement is only for the next five years. After this period they can either continue protecting the forest or cease to do so. With regard to the size of the agricultural area many villagers understood that its size could be enlarged in future if the need arises.

They told us to give them reasons why we want to leave it out. So we gave them some reasons (go there to take things). If these are the reasons, they said, then you can protect it because you can continue doing this in the protected forest (R Interview 31).

So we said that they should not be afraid, because they will be trained on farming. The farmer can stay on one plot and can increase his output. He can get more compared to shifting cultivation. They will be trained on farming, will increase their output, the forest will be protected and they receive money from REDD (R Interview 48).

Yes, when they came the first time. They said let us protect the forest. We agreed. They put the marks. When they came the second time they said this part has been already protected. But now, if you harvest a lot you farm a big area. If it is possible, then increase the size of the forest to get more money. If the forest is big, the protected area big, then also we get a bigger share. More money. So people agreed. They move the marks on the trees (R Interview 15).

In contrast to the situation in Mihumo/Darajani, the villagers in Ruhoma faced a very difficult decision with regard to the size of the village land forest reserve. They had to strike the best balance between various land uses when demarcating the forest reserve. On the one hand enough area for future agricultural expansion had to be secured, while on the other hand the forest reserve had to be large enough to bring in a considerable amount of carbon money. Villagers and development actors tried to resolve this conflict through participatory land use planning and democratic decision-making in order to foster on the ground 'legitimacy'. In village assemblies the size and location of the forest reserve were debated for many hours until a majority could be reached in favour of an extension. Villagers agreed on the expansion of the forest reserve, which then encompassed 88% of the total forest area. However, a majority does not include everyone. There were some villagers who continued to feel unhappy about this decision.

They argued that the extension of the reserve into the secondary forests, or what they called *jangwa* referring to regrown woodlands and bush on formerly used agricultural land, was unnecessary and against what they had agreed when accepting the project.

Even here, it was a *jangwa*, but they also took it. Meetings are being held and we complain but they don't hear us. They listen to themselves. But they don't like our voices. All of Noto [refers to closed forest] we gave them. The others we wanted to do our thing. But they don't understand us, and they don't hear us (R Interview 28).

Most residents of Ruhoma supported the decision to extend the forest reserve also long after the village assembly took place. The general opinion was that there still exists a lot of forestland, which will be enough for their livelihood needs also for the next 20 years or more.

Lot of agricultural land available for people in Ruhoma. For the next 10 to 20 years there won't be any problems with farming also when we continue to have more and more children. Agricultural area is very big (R Interview 3).

We are not many people but we have a lot of land. But we don't use it wholly. We farm here, we leave, we farm there. And despite protecting the forest much land remains available (R Interview 6).

6.3.3 Decentralisation continues

During the 6 days workshop in March 2011 participants did not only draft a village land use plan but also bylaws for the management of the forest. One month later, on 25 April 2011, a draft forest management plan for Ruhoma village was ready. These bylaws and the forest management plan were revised according to decisions and agreements made in subsequent village and council meetings. Nevertheless, because of the ongoing conflicts over the village and forest boundaries, project staff could not submit them to the district for approval.

The by-laws haven't been passed because of the border conflicts. The boundaries that are on the map of the village. the village was surveyed in 2007. If the forest area followed the boundary of the village land that was surveyed in 2007, it would be easy to pass the land use plan. But because the border changed, it is required to draw another map to show the new boundaries on which the villages agreed upon. They must be passed by the land officer and then the by-laws can be approved. Because the by-laws regulate

the protected forest in a village area. But if the village area has conflicts that are yet unresolved, then the by-laws can't work (R Interview 48)

Despite the agreements between village leaders from Ruhoma and Milola Magharibi over the location of the village boundaries, the district land officer holds onto the boundaries surveyed in 2007 as they represent the legal boundaries as stated in the village land certificates. He insists that new boundaries cannot just be agreed upon in words but they need to be resurveyed by government officials. Then new village land certificates can be applied for and reissued by the Ministry of Land. In holding onto the importance of the legal process in changing boundaries, it seems he also wants to give villagers a lesson about the seriousness of legal activities – such as boundary demarcation – and the consequences of their actions.

... once a boundary is surveyed whether you don't agree with it or you agree with it that becomes the legal boundary until it is changed legally. And the change should involve the nullification of the existing boundaries and resurveying this one. So we don't change boundaries by words. We change by the legal process. So I use to tell them so. Because it is not me who made the mistakes. It is you villagers who did not see the importance of that exercise and you messed it up so you must bear its consequences. So when the next comes when you are involved in some society matters you become serious. Because the land is not yours it is still in Tanzania. If it goes to the next village it is still Tanzania. And by the way there is no boundary of the use of land. I am living in Ruhoma but I have been cultivating in Milola. This is not a big deal. This is what I have been telling you.

In addition, for efficiency considerations the project staff decided to collect as many forest management plans and bylaws as possible from several villages first in order to submit all of them at once. This was seen as better than submitting them one by one. As a result during my entire fieldwork period the plans and laws had been kept at the TFCG/Mjumita office and the district council without having been approved. Shortly before I left Ruhoma at the end of June 2012, the district's natural resource officer, who is also the main local REDD+ person, explained to me that the forest management plans and bylaws ...

... are almost finished. What I was lacking here was some attachment which I am told is with the district lawyer. But the district lawyer has been transferred to Dar es Salaam recently and he did not hand over most of the documents. So what I am

planning in the next few days is to collect the attachment... So I just told those people in the project that we need to meet on Saturday so that we summarize all the documents. Then the coming meeting we sent them... Or even the management plans have to follow the same channel to be approved by the councillors. They are good. These management plans, the channels somehow different. After being approved by the councillors they are going to be implemented directly. But with regard to land use, they have to be approved by the ministry. The by-laws, if they have been approved by the district, then they can be approved by the district. But the by-laws of land use and even the land use plan itself have to be sent to the ministry (R Interview 42)

6.4. Conclusion and discussion

In this chapter I analysed the politics underlying territorialisation processes in both villages, which are necessary to establish community based forest management as the decentralised governance framework for REDD+ initiatives. The findings of this chapter primarily serve to answer research question 2 “How do REDD+ initiatives interact with local forest governance in Lindi, Tanzania?” In tracing the history of decentralising forest management and territorialising village land forest reserves in the two villages, I could provide important insights into the technically complex and politically contested nature of formalising ownership and authority over village land and forests.

This chapter adds to a body of knowledge about the politics of decentralisation. Because decentralisation envisages the transfer of powers from central to local representative and accountable democratic institutions, it is often accompanied by conflicts, struggles and resistance (Ribot, 2006; Larson, 2005; Poteete and Ribot, 2011). Scholars have argued that because REDD+ initiatives increase the value of forestland to incentivise its protection, central governments or other powerful actors, could aim to resist local empowerment and strengthen their access to carbon benefits (Sandbrook et al., 2010).

My chapter illustrated how the design and outcome of decentralisation and territorialisation in Lindi, Tanzania, were shaped by struggles between villages or between the village and local district council over land, natural resources *and* people. This demonstrates that the commodification of forest carbon is embedded in local politics and power struggles that go beyond the domain of natural resource benefits. Especially the experience in Mihumo/Darajani highlights that contestations over land,

and for that matter forests, are as much about politics and power struggles over natural resources as they are about the governance of social relations (represented by struggles over votes in our case) (cf. Hickey, 2008; Leach et al., 1999; Hall et al., 2014).

Another contribution of this chapter was to discuss how the materiality of the forest, including its size and structure, influence the technical and political process of decentralisation. Because of the large and dangerous nature of the Angai forest, the practical implementation of decentralisation became very difficult and highly time consuming. This was visible in the activities of boundary demarcations, which required more resources and time than anticipated, and of course with regard to creating forest management plans and by-laws. To conduct professional forest inventories in an area like the Angai forest requires substantially more human and technical resources compared to much smaller forests. This finding therefore related to arguments stated by common property theorists about the role of resource characteristics in facilitating or hindering successful collective action (Agrawal, 2001).

Nevertheless, the materiality of the forest does not automatically determine institutional outcomes. From our experience in Mihumo/Darajani the state capacity and political will of the Liwale District Council to empower local villagers to benefit from forest resources must be thoroughly questioned (cf. Sundström, 2010). The limitations of local participation and citizenship became particularly apparent in Mihumo/Darajani (cf. Hickey and Mohan, 2005). Despite their continuous inclusion in development activities, villagers' possibilities to shape the decentralisation process have been minimal. Because of the highly technical nature of the process, they have always been dependent on the knowledge and capacity of external actors – state, companies, researchers, NGOs and donor agencies – to take the reform forward (Scheba and Mustalahti, forthcoming). Yet, this has repeatedly not happened in Mihumo/Darajani (cf. Sundström, 2010). In contrast, due to the instruction of the district to divide village lands, the villagers were, rather involuntarily, taken back to the beginning of the decentralisation process. Miscommunication, confusion and hidden politics accompanied the district's decision to divide village lands in all Angai villages.

The failure of decentralisation in Mihumo/Darajani link to Larson and Ribot's (2009) argument that there needs to be sufficient financial, technical and political capacity at the local level for decentralisation to work. Lack of capacity at the local district level is

a common problem in rural Tanzania, which makes the implementation of decentralisation dependent on external actors including donors and non-governmental organisations (Mustalahti and Lund, 2010). This, in turn, gives them considerable powers to influence the process according to their interests. In Ruhoma, for instance, TFCG/Mjumita was the driving force behind the decentralisation process, which they wanted to implement in as many villages as possible. They put pressure on the village community to increase the forest reserve, as they wanted to include also secondary forests into the reserve, which other villagers criticised. Nevertheless, the engagement of non-governmental organisations, researchers and development professionals working on REDD+ contributed to changing long standing power structures. This demonstrates that REDD+ does not automatically result in further marginalization or exclusion of local citizens. Instead, it highlights that if actors are committed to local empowerment they can achieve significant positive effects to villagers by assisting them in claiming their rights over the ownership and management of community forests.

However the case in Mihumo/Darajani demonstrates that despite local participation and recognition of communities' rights, including property rights to forests, the objectives of empowerment remain unattained as long as underlying power dynamics that shape access mechanisms to resource benefits remain unjust. In Larson and Ribot's (2007) words the rural poor are left on an "uneven playing field of ethnic and other social inequities and economic hurdles" (Larson and Ribot, 2007, p. 189). These hurdles to more empowerment include the increasing professionalization of community forest governance and the privileged role it gives to 'expertise' knowledge as opposed to 'local' knowledge (Ohja et al., 2006; Nightingdale, 2005).

My two cases illustrated that the entire process of decentralisation is very technical and complex, which creates a dependency between villagers and 'experts' that comes with considerable investments in resources and time. In recent years scholars have begun to question the usefulness of the technical complexity and bureaucratic nature inherent in community forest governance (Ohja et al., 2006; Nightingale, 2005). The importance and exclusive effects of professional knowledge and 'expertise' in community forest governance is particularly visible in the legal requirements related to demarcating boundaries and creating forest management plans and by-laws. These activities do not only subordinate local forms of knowledge over forest management but they also result in vast amounts of resources that are spent. As we could see in this chapter, all the

resources invested in experts, consultants and development professionals had only limited material effects to villagers in Mihumo/Darajani. Despite comprehensive evidence demonstrating that communities can collectively protect forests based on locally devised rules and institutions (Agrawal, 2007, 2001), there is a strong and hegemonic belief among policy makers and practitioners that forests can not be devolved without rigorous inventories and professional forest management plans. Given that REDD+ initiatives bring another layer of expertise knowledge – the measuring, verification and sale of forest carbon – to community forest governance, the exclusionary nature of ‘expertise’ and professionalization represents a real challenge for local empowerment under REDD+.

REDD+ initiatives, which introduced the promise of carbon payments to villages, added another layer to disputes over forests. In transforming open-access forests to common property, a new understanding of boundaries, community and property is being created, which changes the relations between people and forests, as well as between people themselves. The seemingly technical activities, concerning the formalisation of village and forest boundaries and participatory land use planning, are in fact inherently political – they shape who gets to access what (cf. Berry, 2009). This was clearly visible in the conflicts between Mihumo/Darajani and the local district council. But it was also evident in Ruhoma where I could observe increasing conflicts over boundaries between villages. I further saw villagers, who began to contest and threaten formerly tolerated forest users by suddenly questioning their customary rights of access to forestland.

These findings contribute better to understanding the process of establishing common property for the management of common pool resources. The literature on common property theory has been critiqued for lacking a proper historical and political analysis of the factors and processes driving institutional change (Johnson, 2004). Common property regimes can be understood as systems of rules, rights and duties that govern how user groups relate to each other in accessing and managing common pool resources (Ostrom, 1990). This chapter provided valuable insights into the making of new institutions, particularly with regard to transforming open access to common property through territorialisation. This is important as it places common property regimes into a specific historical context of Lindi region in Tanzania that is shaped by social relations that are both inclusive and exclusive. While transforming open access to common property regimes enhances the likelihood of resource protection (Agrawal, 2001, 2007;

Dietz et al., 2003; Ostrom, 1990), it also brings about negative consequences and losses to some user groups, which can aggravate social conflicts (Brockington et al., 2008).

At the same time the technical activities of REDD+ in the villages contributed to positive change including much attention and international efforts to take the decentralisation process forward and to change the balance of power over natural resource governance. They have assisted both villages to express their claims over the authority of village and forestland. In the case of Mihumo/Darajani they did so in opposition to local district interests, which were intent to prevent formal loss of power and control. In supporting participatory land use planning exercises they helped to address boundary conflicts and to organise village land according to different land uses. Although much more efforts and political will are required to meet villagers' development needs, the focus of REDD+ on community based forest management has undoubtedly the potential to contribute positively to the empowerment of local communities. In the next chapter I will examine how villagers practiced community-based forest management institutions and what this could mean to the development of the village and their forests.

Chapter 7: Practicing community-based forest management

7.1 Introduction

This chapter examines how villagers put community based forest management institutions into actual practice. It therefore contributes to answering research question 2: How do REDD+ initiatives interact with local forest governance in Lindi, Tanzania?" It is structured as follows.

I first outline in detail the envisaged rules and regulations for the two village land forest reserves by analysing the draft forest management plans and bylaws. I will discuss how these institutions envisage the forest reserve to be governed: who holds which responsibilities?; what is allowed in the reserve?; what is not allowed?; how is non compliance punished? These are the questions I address in the first section.

Thereafter, I will present findings from my ethnographic fieldwork in the two villages to discuss the actual performance of the community based forest management institutions. On the basis of participant observation, interviewing and household surveys I will highlight the convergences and divergences between the formal institutions and their practices by villagers on the ground. In comparing the different performances of very similar institutions in two village settings, I aim to highlight the challenges villagers face in implementing community based forest management and the role of REDD+ in mitigating these challenges.

7.2 Community-based forest management institutions

7.2.1 Forest management plans and bylaws

The drafted forest management plans and bylaws for Mihumo/Darajani³⁷ and Ruhoma served to describe the proposed governance framework of the village land forest reserves in the two villages. In both cases the documents present community based forest management as the institutional framework that should achieve the dual objective of sustainable forest management and community development. The documents contain

³⁷ In Mihumo/Darajani the forest management plans and bylaws that were drafted by Mpingo Conservation and Development Initiative will be replaced with new documents under the LIMAS programme. However, in the past and during my time of research they remained the latest written artefact of many consultations between development actors and villagers about the way the forest should be managed. Thus they remained the basis to which actual practices can be compared with.

in detail the rules and regulations for managing the village land forest reserves, thereby illustrating the donor's objective of empowering local communities with the management of their own resources. It is envisaged that in following these forest management plans and bylaws villagers should succeed in protecting their forests, which, in turn, would enable them to access forest carbon payments. In analysing the information provided in the draft forest management plans and bylaws, despite the fact that at the time of my research they were yet to be officially approved, we are in a good situation to understand the envisaged institutions at the community level and how they ought to function.

In both villages the management plans and bylaws distinguish between allowed and prohibited uses of the forests, and uses for subsistence needs and for income generating purposes. They also define 'the community' as all residents of the village, making people from other areas outsiders. This is already a significant change as forests in Mihumo/Darajani and Ruhoma were long considered to be open access. Farmers from different villages could establish farms in forests based on customary rules of governance. Yet this consequently becomes problematic as they are now considered outsiders with fewer rights than residents.

7.2.2 Permitted uses of the forest

We learn from the management plans and bylaws that residents of the villages may freely conduct all activities that do not harm the forest. However, this does not mean that they can just go and do these activities. Foreseen in the new institutional framework of community based forest management is the formalisation of (almost) every activity in the forest reserve. This is achieved through the issuing of permits. In Ruhoma, for instance, residents need a permit for every activity that they want to conduct in the forest reserve. In Mihumo/Darajani residents need a permit for everything except holding a ritual, fetching water for subsistence use and walking on given paths to reach other areas in the reserve. Non-residents need to pay fees for most of the activities in addition to obtaining a permit. Therefore, the formalisation results in a clear distinction and cost-benefit distribution between residents and non-residents, whereby the latter faces financial barriers to forest access.

Permits are issued either for free or with payment. The forest management plans explain that permits are issued with the objective of controlling resource extraction from the

forest. So even though villagers were not required to pay for every permit, the forest management plans required villagers to request permits for almost every activity in order for the village natural resource committee to control and monitor extraction rates of forest resources. This should contribute to the sustainable use of forest products. Among the activities that are free is the collection of non-timber forest products such as traditional medicine, firewood, wild fruits and vegetables, mushrooms, honey, roots, stones, grass, etc. In both villages residents are allowed to collect non-timber forest products for subsistence and commercial use, whereby tax may apply for the latter. Development actors hope that through this formalisation long-term sustainable harvesting rates will be achieved.

Permits should also be issued for timber forest products such as logs and construction poles. However, these resources cannot be harvested freely, neither by residents nor by non-residents. Villagers from both areas need to pay to obtain a permit from the village natural resource committee. In Ruhoma regulated amounts of timber forest products may only be harvested for subsistence use or community development projects such as construction of schools, hospitals, market place, etc. Residents of Ruhoma are required to pay 20,000 TShs (13 USD) to obtain a permit for 2 months that allows them to harvest up to 50 planks and 70 beams for subsistence use. In addition to the 20,000 TShs (13 USD) they must pay 200 TShs (0.13 USD) tax for every plank. No one in the village is allowed to harvest timber products and sell them.

This is different to Mihumo/Darajani, where villagers may harvest timber also for commercial use. Before any harvesting can take place, however, there must be a participatory forest resource assessment to determine the permitted harvesting rates. The rates and type of trees should be decided upon on the basis of guidelines from the forestry and beekeeping division of the Tanzanian government. Unfortunately, from the latest draft forest management plans and village bylaws I could not find any concrete procedures or criteria for determining the harvesting rates in this village.

Differences between the two villages also exist with regard to the hunting of wildlife and utilising the forest for educational/knowledge purposes. In Ruhoma no hunting is allowed in the village forest reserve. In Mihumo/Darajani residents may hunt certain animals after having obtained a permit from the village natural resource committee. Yet the technique is also of importance. Using snares to trap animals, for instance, is

prohibited in both villages. With regard to utilising the forest for educational and knowledge purposes, activities such as tourism, research and study tours require permits in both villages. The amount non-residents need to pay differs substantially between the two villages. In Ruhoma Tanzanian citizens and foreign citizens pay 5,000 TShs (3 USD) and 7,500 TShs (5 USD) per day respectively if they want to conduct research. In Mihumo/Darajani the same activity would cost between 45,000 TShs (28 USD) and 100,000 TShs (63 USD) for Tanzanians and foreign citizens respectively. In both villages the forest management plans and bylaws exclude people who contributed to drafting the institutions from taxes or fees. This saves development actors from having to pay fees or taxes when entering the village land forest reserves.

7.2.3 Prohibited uses of the forest

The formalisation of use and access rights through the issuing of permits aims to prevent unwanted activities in the reserve. A number of activities are prohibited, these include farming in the forest, collecting fresh cut firewood, harvesting wild beehives, trapping wildlife, digging minerals, soil and stones for business, harvesting in the area set aside for rituals, herding livestock, settlement, harvesting trees that are not cleared for harvesting, starting fires, and charcoal production. In Ruhoma it is strictly prohibited to harvest timber for commercial purposes. In Mihumo/Darajani residents may not harvest any timber at the moment since no harvesting plans have been prepared and approved by the Liwale District Council.

People who misuse their powers by acting outside their rights and responsibilities are to be treated as criminals who face legal prosecution. In the first instance the power of prosecution lies with the village natural resource committee, which should try to settle the offence in the village. In the case of any challenges, assistance from the village council, ward or district level may be requested. In the last instance disputes can be taken to court. In Ruhoma a detailed list exists, stating the fines for criminal offence, including the following; being found in the protected forest without any permit, carries a fine 2,000 TShs (1.3 USD); setting fire inside the forest will be penalised with 50,000 TShs (32 USD) or 6 months imprisonment; furthermore to farm, log timber, harvest forest products without permit, or produce charcoal would cost any offender 50,000 TShs (32 USD). In Mihumo/Darajani prohibited activities are generally penalised with a fine of 50,000 TShs (32 USD). If people enter the forest to conduct legal activities without having obtained a permit first they will be fined with 10,000 TShs (6 USD).

7.2.4 Rights and responsibilities of stakeholders

We learnt from the previous section that the new envisaged community based forest management institutions aim to formalise the use and access of resources within the village land forest reserve. As we know, institutions fundamentally depict the relations among social actors; subsequently the process of institutionalisation changes the power of different village groups. This new distribution of power is described in the forest management plans and bylaws. The documents clearly outline the rights and responsibilities of different village groups. In the following text I will discuss how it is envisaged various village groups would be affected by the implementation of community based forest management in the villages.

The village council would gain a significant degree of power, as it becomes the main manager of the village land forest reserve. Its role should be to prepare forest management plans and bylaws to determine how the forest reserve should be used and managed. The council should control and debate the income and expenses of the forest before they are reported to the villagers for further discussions. At the village assemblies any damage, conflicts or changes in the forest should also be communicated and discussed with the citizens. The council must work closely with the village natural resource committee and approve all permits issued by them. In case criminal offences occur they must be prosecuted. If conflicts arise that cannot be solved the village council must collaborate with the district council to obtain assistance.

The village natural resource committee is the other central village institution that gains power as the committee is responsible for coordinating all forest activities related to protection, harvesting, improvement, assessments, education, record keeping and reporting. Its role is to conduct forest resource assessments and to draft management plans, harvesting plans and bylaws with the village council. It should meet each month to discuss requests for permits and issues them on the basis of the management plan and bylaws. Subsequently it needs to make sure permit holders adhere to the rules and conditions. The village natural resource committee must ensure the protection of the forest reserve by organising patrols, educating villagers on the importance of forest protection and carrying out management activities such as preventing fire from entering the reserve and maintaining forest boundary demarcations. It needs to prepare annual

forest activity plans and report monthly to the village council about the state of the forest as well as income and expenses.

While the village natural resource committee of Mihumo/Darajani has the responsibility of organising and conducting patrols to ensure the protection of the forest, a specific patrol team was established in this village consisting of one patrol leader and six patrol team members from the village natural resource committee. Every two weeks a patrol should be carried out and there has to be at least one member of the village natural resource committee and one ordinary citizen. It is envisaged that this would facilitate accountability and better control of patrolling activities.

With the introduction of the potential sale of forest-carbon credits in the two villages, a committee of people was established whose members participated in forest inventories, specifically forest-carbon assessments, to determine the resource base in the forest reserves. For the communities to access international forest-carbon markets they must apply approved ways for measuring, reporting and verification of forest-related emissions. Alongside technologically sophisticated systems at the national level, development actors promote participatory forest carbon assessments to obtain local forest inventories including forest-carbon stocks and changes. Based on the collected inventories forest managements and harvesting plans should be developed.

Parallel to this group, a special REDD+ payments distribution committee was founded in Ruhoma. A group of 12 people, half male and half female, were selected by sub-village chairmen and other village leaders to manage the distribution of forest-carbon payments among the villagers. Among the members are representatives from the village council, village natural resource committee, land use planning committee and the wider village community.

Community based forest management centres on the empowerment of local actors, subsequently ordinary villagers are required to participate in the protection of the forest. They are obliged to prevent and report any harmful activity to the village natural resource committee and/or village council. In this way they would assist the patrol team and the village natural resource committee to detect criminal offences to make sure all villagers adhere to the law. Furthermore, citizens have an important role in controlling the powers of village institutions through participating in village assemblies,

legitimizing village leaders through democratic elections and holding them accountable for their actions.

The district council loses power over forest governance but it maintains the right to receive regular reports about the state and management of the forest. It is also entitled to inspect the income and expenses of the reserve. In case the reserve is not managed according to the management plan and bylaws the district may intervene and take over the management, thereby releasing the village from this responsibility. The district council is further required to assist the village in the protection of the reserve in providing knowledge and education, in finding markets for forest products and in contributing to solving conflicts.

From the management plans and bylaws we also learn about the responsibilities of the NGOs that assist villages in the protection of the forest. They are required to assist them in finding markets for forest products, educating community members about good governance and forest protection, facilitating assessments and providing assistance with the management strategies.

7.3 Community based forest management in practice

After outlining in detail the envisaged institutions that should govern the village land forest reserves in the two villages, I will now proceed to discuss how villagers themselves understood and performed community based forest management in practice. I will begin by presenting the opinions and knowledge villagers have of the rules and regulations that were drafted between ‘village representatives’ and development actors. This is then followed by a discussion of the actual practices observed during my fieldwork period³⁸.

7.3.1 Knowing and owning institutions

7.3.1.1 Forest management plans and bylaws

The forest management plans and bylaws were drafted in a participatory manner with village representatives and members of the village natural resource committee, with the view that this would lead to better outcomes and effectiveness, since villagers are more

³⁸ Although forest management plans and by-laws had not been approved at the time of my fieldwork, villagers were told by the NGO and researchers that they can and should practice community-based forest management already.

likely to adhere to new rules and regulations if they themselves created them (Ostrom, 1990). In this section I present findings that question how aware residents in both villages were of the institutions. This will give us a better understanding of the everyday practices of villagers that I will discuss in the next section.

During my fieldwork experience I observed that the ordinary villager has never studied the forest management plan or bylaws to make him/ herself conversant with the new community based forest management institutions. In fact, most of the people in the villages have never seen these documents, and with them the whole breadth of rules and regulations. Because of low literacy rates villagers heavily depend on oral communication. Thus the new institutions geared to shape power relations in the village were primarily communicated through village meetings, workshops and informal conversations with development actors and each other. Unsurprisingly, in this process the information is transformed and villagers create a new understanding of how the forest should be managed.

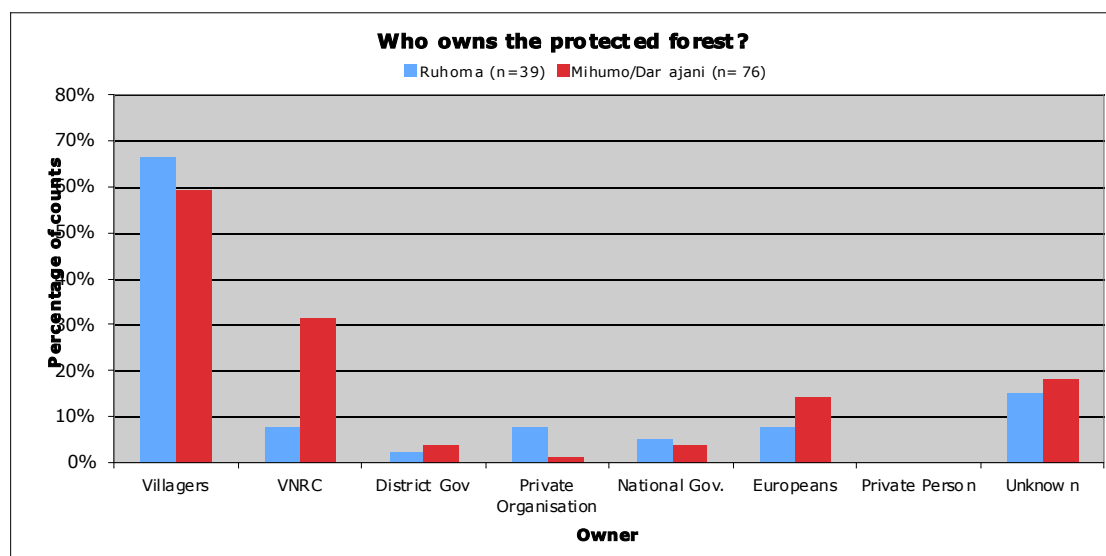
In Mihumo/Darajani even members of the village natural resource committee were not familiar with forest management plans and bylaws. For instance, the chairman of the committee saw the details of community based forest management for the very first time when I met with him to discuss them. Other members told me that they had either never heard of bylaws or that the previous committees had prepared them and taken them to the committee secretary and district council. Therefore they never got a chance to fully understand them. Some were unsure of whether they had been written down at all or if only verbal agreements existed.

In Ruhoma the situation looked more positive. A copy of the draft forest management plan and bylaws were available in the office and the village natural resource committee chairman and secretary could provide me with the relevant information. Yet also in Ruhoma the ordinary villager did not know where and what to find in these documents. Similar to people in Mihumo/Darajani they depended on the information provided in village meetings and many (in)formal conversations between villagers and development actors to learn about the nature and impact of community based forest management institutions.

In order to find out how villagers in Mihumo/Darajani and Ruhoma understood their role with regard to the village land forest reserves I asked them the questions “Who is responsible for taking care of the protected forest” and “Who owns the protected forest?” The results provided by the respondents are shown below.

7.3.1.2 Ownership and authority

Graph 7.1 Villagers’ perceptions of ownership of forest reserve

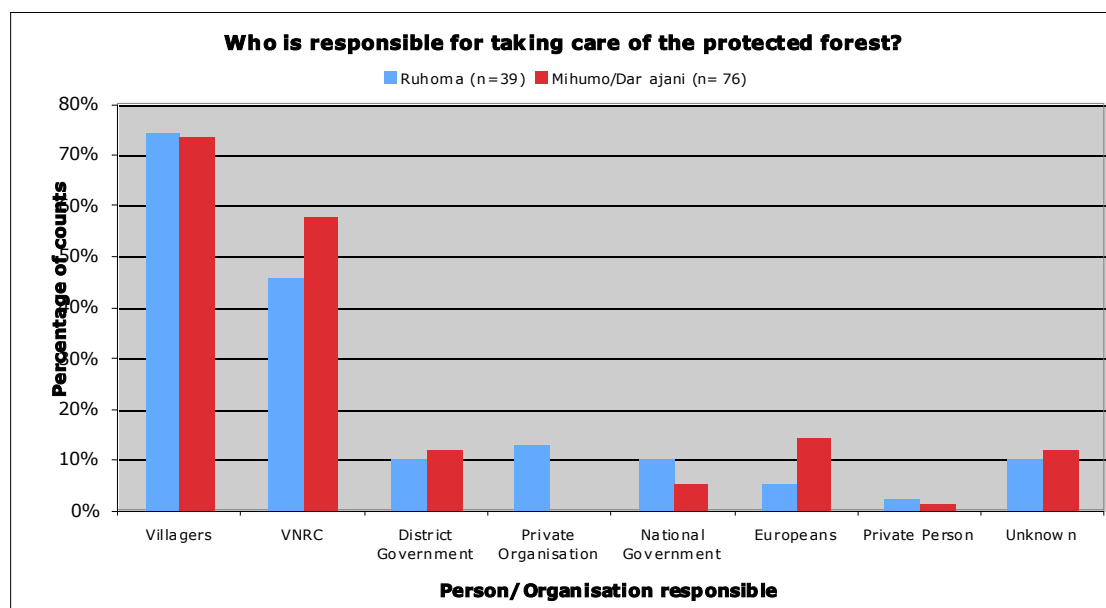


In both villages the majority of villagers regard themselves as the owners of the protected forest (Graph 7.1). In Mihumo/Darajani and Ruhoma 67% and 59% of all respondents, respectively, held this view. This clearly suggests that villagers see themselves at least as de jure owners of the village land forest reserves. However, considerable parts of the respondents claimed that the ownership of the protected forest lies in somebody else’s hands. This is especially visible in the case of Mihumo/Darajani where 30% and 15% of the respondents assigned ownership to the village natural resource committee or Europeans respectively. I cannot say whether these respondents believe that the village natural resource committee or Europeans have de jure or de facto rights, but this data connects to findings from participant observation suggesting that due to the important roles these two groups of people played in the last few years, some ordinary villagers believe that they are the legal owners of the reserve.

In Ruhoma it is especially interesting to look at the much higher percentage of people, compared to Mihumo/Darajani, who believe that the ownership lies with a private organisation such as with TFCG/Mjumita. In both villages 15% or more do not know

the rightful owner of the protected forest. Similar to this are the villager's opinions on who is responsible for managing the protected forest (Graph 7.2).

Graph 7.2 Perceptions of management responsibilities of forest reserve

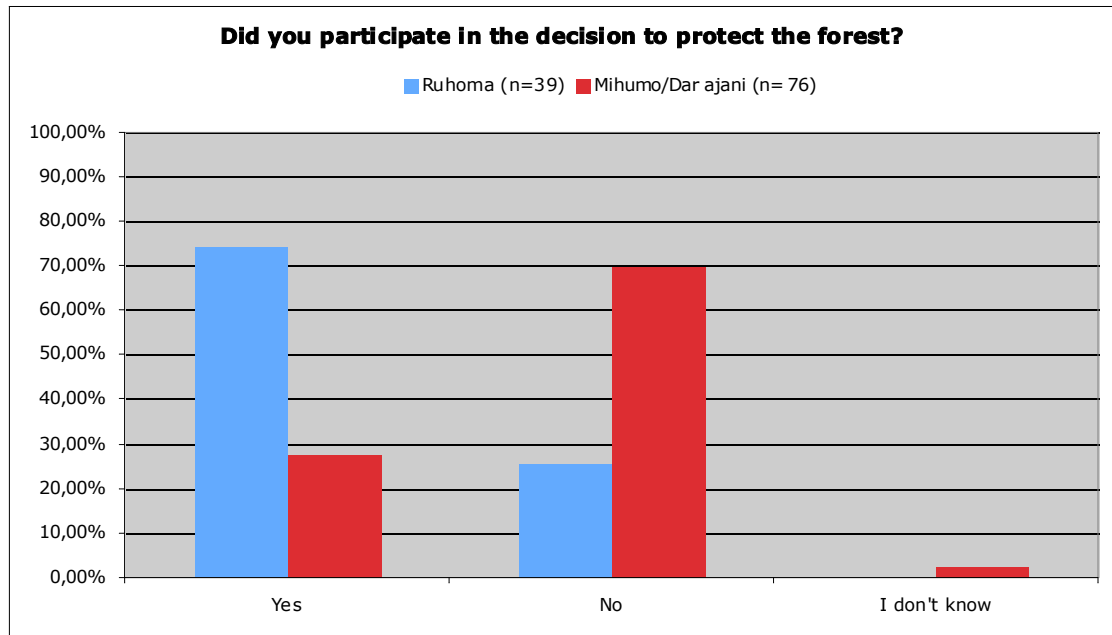


The large majority see the responsibility in the hands of the villagers and the village natural resource committee, whereby the latter has a bigger role to play in Mihumo/Darajani compared to Ruhoma. The fact that so many regard the villagers as the rightful managers of the reserve is encouraging. It links to a quote from Ruhoma, which neatly symbolises villagers' feelings that they are capable of taking ownership over the protection of their community resources.

There is the forest. If somebody cuts trees there in the forest, I know who was it. I will tell him, no, the forest is protected by us. We know the benefits we derive from the forest. Benefits for the whole community. Because the community things like office and school are very important for the community. It will help us all. If you see somebody cutting trees, you tell him, no, don't cut them. We are protecting this forest (R Interview 26).

Around 10% of the survey respondents believe that the district or non-governmental agents – the private organisation in Ruhoma and the Europeans in Mihumo/Darajani – are the managers of the forest. In addition, the same amount of people claimed that they did not know the answer to the question of who is responsible. When we look at the degree of participation of villagers in the decision to protect the forest, we get a very different picture in the two villages (Graph 7.3).

Graph 7.3 Perceptions of villagers over participation in decision making



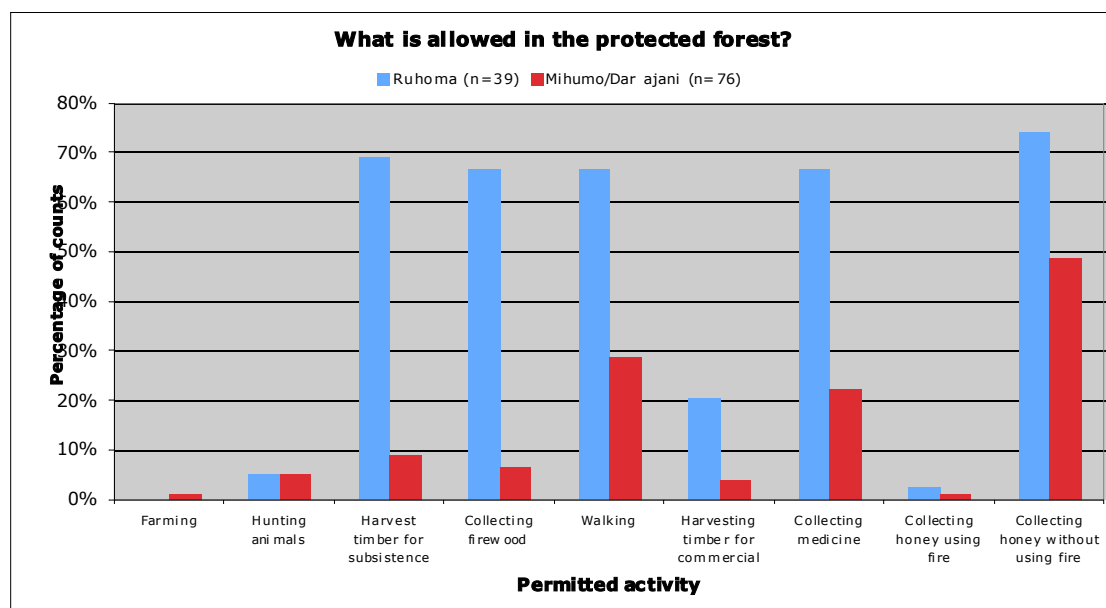
While in Ruhoma around 75% of the respondents said that they participated in the decision, almost the same percentage of people in Mihumo/Darajani claimed that they did not partake. This is puzzling as the decision to protect the forest was made in general village assemblies in both villages. One reason for this stark difference could be related to the point of time when the decision to protect the forest was made. In Ruhoma this was done fairly recently in 2011, only one year prior to my survey. In contrast, villagers in Mihumo/Darajani decided more than ten years ago to establish a village land forest reserve. Some of the respondents might have been absent from the village assembly at that time or perhaps they felt that the decision was made without them.

7.3.1.3 Forest uses

In order for community based forest management to succeed villagers must have knowledge of the different uses that are allowed and not allowed in the forest reserve. These rules and regulations are comprehensively described in the management plans and bylaws. Despite the many similarities in the prohibited and permitted forest uses in the two villages, people had very different understandings of what can be done and what cannot be done under community based forest management. In short, villagers in Ruhoma seemed to be much more aware of the meaning of community based forest management in practice compared to the rural population of Mihumo/Darajani. This

fact is neatly illustrated in Graph 7.4 below, which shows the responses I received from villagers when I asked them ‘What is allowed in the protected forest?’

Graph 7.4 Perceptions of villagers of forest uses



From the graph we learn that respondents of Mihumo/Darajani generally viewed the reserve as a closed-off area, where they had no rights to conduct any activity. With the exception of collecting honey without using fire, collecting medicine and walking, all other activities were deemed prohibited by more than 90% of the respondents. These include crucial livelihood activities such as hunting animals, collecting firewood and harvesting timber for subsistence use. Despite the fact that the village had formally obtained legal ownership of the village land and village land forest reserve, most residents felt that they had no rights to enter the reserve. Instead, so their logic goes, they must go to the ‘open area’, which is the uncultivated village land outside of the reserve. There they are allowed to request a permit from the village natural resource committee to harvest timber to meet subsistence needs.

This understanding of the forest reserve and the open area was primarily cultivated by some members of the village natural resource committee and village council. Despite the fact that no forest management plans and bylaws had been approved, some members of the village natural resource committee took on the role of guarding the forest reserve and issuing permits to residents for the harvesting of timber in the open area. Sometimes members of the village council participated in issuing permits and they

received parts of the taxes paid. Two quotes from villagers in Mihumo/Darajani illustrate the practices of arresting and issuing permits for the open area.

We don't enter there. If you enter the forest then you are being arrested. You can't enter the protected area. Also we as beekeepers we can't go there and cut. We would be arrested (M Interview 31)

Yes, there is an area, which is called open area. The village council can give you the permit, for example if you need it for construction. You will be given the permit there. And then you go and lumber. This is in the case of construction. (M Interview 9)

In Ruhoma many more respondents seemed to be aware of their rights regarding the access and use of the village land forest reserve. The permitted uses – harvesting timber for subsistence use, collecting firewood, walking, collecting medicine and collecting honey without fire – were all identified by 65% or more of the respondents. Yet this also shows that roughly a third of the respondents did not consider these activities as legal under community based forest management. This could mean that some villagers will wrongly refrain from conducting them, therefore leaving the benefits to others. Indeed, the process of formalising community based forest management seems to be much more fruitful with regard to communicating the activities which villagers are not allowed to conduct anymore. Setting fire, cutting trees arbitrarily and farming were not only the three main responses I received whenever I asked villagers to explain to me the prohibited activities in the forest reserve. The graph above also illustrates how farming, setting fire and commercial harvesting were deemed illegal by the vast majority of citizens in both villages.

Villagers can take medicine, firewood and *min'goko* [tuber root]. But to farm or to set fire is not allowed. They can use timber for construction but not for sale. For our subsistence use it is allowed. You get a permit and you go to the forest to take timber. (R Interview 10)

However, also here we discover incompleteness; from the graph we learn that around 20% of the respondents in Ruhoma thought that it was possible to do commercial timber harvesting in the reserve. Yet this activity is strictly prohibited in the management plan and the bylaws. Perhaps the response represents much more of a wish, which several villagers also expressed to me during discussions about the potential benefits of the forest reserve to the rural poor.

First, this is their forest and they will see its benefits later. Like trees. For now there is no harvesting there. But trees will be there. And after certain years, the trees will be ready to harvest and the benefits will be theirs. (R Interview 35)

If they allow us then people from the village could do so. Commercial harvesting is good business but for that we would need permission to do so. (R Interview 8)

In short, from my findings it appears as if villagers know much more about the activities that are not allowed under community based forest management compared to the ones that continue to be possible. Especially in Mihumo/Darajani the understanding of villagers of community based forest management is in stark contrast to the envisaged institutional framework outlined in the forest management plans and bylaws.

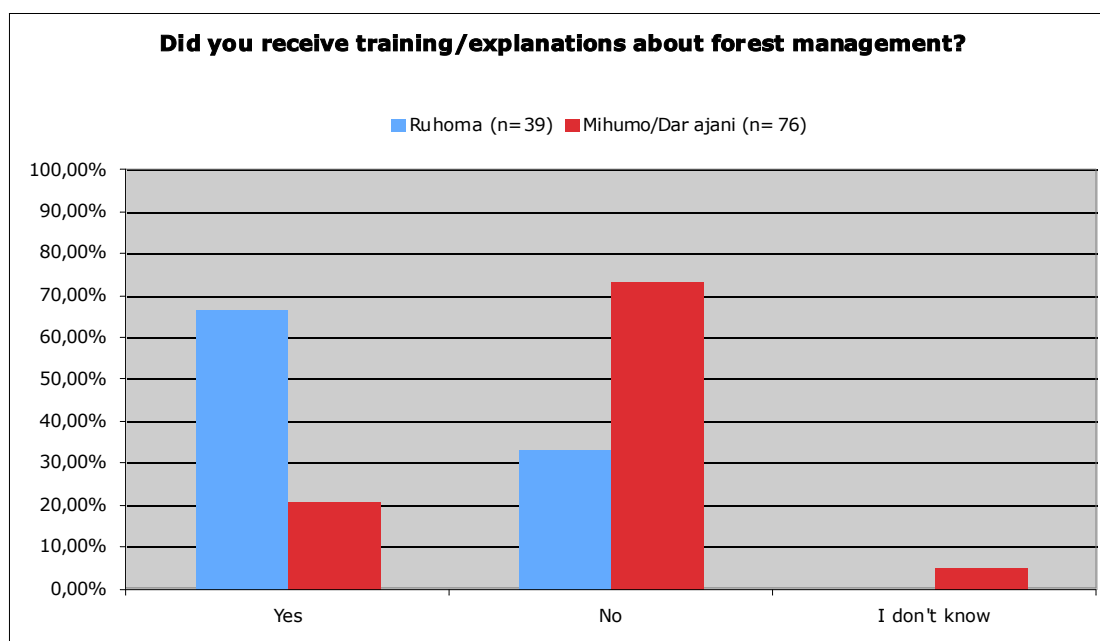
7.3.1.4 Training in forest management

Training, communication and dialogue about the community based forest management institutions, the rights and responsibilities of the various village groups and the rules over forest access and use become essential for the success of community based forest management. They are important factors that shape the performance of institutions on the ground. In Mihumo/Darajani village natural resource committee members complained about the lack of training they received about forest governance. According to their view they were insufficiently introduced to the management responsibilities and tasks related to forest governance. None of the current committee members have ever received any documentation outlining the tasks that need to be carried out. Therefore, their knowledge on the formal rules and governance framework, as summed up in the forest management plans and bylaws, has always been limited. Moreover, their capacity to educate fellow citizens also remains limited. It is true that village natural resource committee members learnt about their rights and responsibilities in short workshops or meetings with district officials, but during these meetings most of the participants did not bring the tools to make notes of important issues that were discussed by district officials or donor agencies.

We did not go to any seminar. After we joined we just continued the work. We did a seminar once. It was here in Mihumo. I can't remember who taught us. You need to write things down if you want to remember and we didn't write anything down. (M Interview 51)

Training and education of the community based forest management institutions also needs to be provided to the ordinary village population. From Graph 7.5 we learn that among the ordinary citizens there exists a stark difference between Ruhoma and Mihumo/Darajani. Much more people in Ruhoma compared to Mihumo/Darajani feel that they received training and explanation about forest governance. It is striking that a majority of more than 73% in Mihumo/Darajani said that they did not receive any training. This difference is not surprising. Because REDD+ and community based forest management were only recently introduced to Ruhoma, villagers benefited from the training provided by TFCG/Mjumita in workshops or village assemblies. In Mihumo/Darajani workshops and village assemblies were conducted more regularly when decentralisation started, but in the recent past/ current period selected participants and members of the committees receive training only on rare occasions when foreign donor agencies or researchers enter the village to conduct participatory activities.

Graph 7.5 Perceptions of villagers of training in forest management



7.3.2 Forest management activities

7.3.2.1 Patrolling

In terms of forest protection the village natural resource committee is the most important institution within community based forest management. According to the forest management plans the committee is responsible for forest management activities including organising patrols and forest inventories, issuing permits, educating fellow citizens, carrying out improvement and assessment activities and reporting to the village

and district council. But in practice the committees in both villages abstained from many of these management tasks. Instead, they focussed mostly on two activities – conducting patrols and issuing permits.

It appeared as if the village natural resource committee focussed on these two tasks because they would get money from conducting them. Issuing permits brought money because residents had to pay for them. The practice of patrolling brought money because people doing prohibited activities without permits were fined. This motivated members of the village natural resource committee to walk around in the open area or protected forest in search of people, who harvest timber without possessing a permit. If a person was found while logging or transporting trees without a valid permit, the member(s) of the village natural resource committee who caught him/her would take him to the village council to negotiate a fine. It also happened that the member(s) of the village natural resource committee aimed to settle the penalty immediately by requesting some form of compensation for letting the ‘illegal’ forest user go.

Village natural resource committee members highlighted the need to conduct regular patrols. According to the management plan of Mihumo/Darajani, for instance, the patrol team should go every two weeks to check the forest reserve. Yet in reality patrols were not carried out as planned. Committee members told me that organised patrols into the forest reserve have become rare. Apparently the last time they went was in February 2011. When they did go on patrols then only in the open area and usually after they had heard about villagers who felled trees without having obtained a permit.

The people of the forest committee used to go every week. But these days they don't go. They have quit going. When they went in the past, they started there, walked and slept over. Then they made a mark that they passed here. If you catch somebody then it is necessary to pay a fine. (M Interview 5)

We started the system of going into the forest. We went twice this year. Last year the secretary quit and another one joined. Since then we haven't gone to do a survey in the forest. We do patrols in the open area. When we hear that they fell trees then we go. We hear people entered, then we go (M Interview 49).

The fact that committee members of Mihumo/Darajani conducted patrols in the open area is a clear sign of a divergence between the formal rules and villagers adaptation of them. Formally, no rights exist for the village natural resource committee to carry out

patrols outside of the forest reserve. Yet in this village the forests in the open area are huge and they are the ones mostly used for the harvesting of timber and non-timber forest products. For the committee to leave out this area would have meant considerable loss of income and power over the use of forest resources within the village. It also needs to be highlighted that committee members especially went on patrols after they had heard about ‘illegal’ intruders. This too points to the assumption that patrols were primarily conducted for functional reasons, namely to catch and fine people for the committee’s and/or individual committee members’ benefit. Unfortunately it is not possible for me to show where exactly the funds ended up, but a lack of transparency and inconsistencies with regard to the budget and funds of the village natural resource committee make it possible for individual members to misuse or misallocate them. I will return to this point shortly below in the section on record keeping.

The reasons given by village committee members of Mihumo/Darajani regarding the lack of regular patrolling into the forest reserve were related to insufficient resources to cover the high operation costs. Members complained that with no proper uniforms, no training, no equipment, no tent, no bush knives and insufficient money for food, transport and allowances they are unable to perform this important but very challenging management task. Because of the size and nature of the Angai forest, without adequate funds it is not possible to do proper patrolling for several days that includes walking in dangerous terrain full of wildlife. Requests by the village natural resource committee to the village council to finance patrolling activities were not listened to. Their argument is that the lack of commercial activities in the forest leads to insufficient tax revenues that could be used to finance the patrolling task. Because members of a patrol generally demand an allowance of a minimum of 1,000 (0.6 USD) or 2,000 TShs (1.3 USD) per day, the missing financial support resulted in many of them being frustrated and unwilling to perform the tasks at their own expenses.

We haven’t gone there again because in our cash register there is no money. Because it is far. You need to carry food and medicine. We struggle because we don’t have money (M Interview 50).

But we are asking: Who will facilitate us? There is no money. If they had given us money, we would stay the whole time there. But you stay to your own loss (M Interview 29)

In Ruhoma the situation looked different. In conversations with ordinary villagers and village natural resource committee members I was told that regular patrols have been

conducted. In the beginning it was done voluntarily but once the REDD+ trial money arrived the amount of 700,000 TShs (450 USD) was set aside to finance patrolling four times a month for a period of one year. Every week six members of the village natural resource committee go into the forest reserve to assess the situation and check for any criminal offences. Because of the small size of the forest reserve the patrolling only takes three to four hours and there are no particular challenges. Nevertheless, sometimes they don't go all the way to the end of the reserve. At the end of the day each member receives an allowance of 2,000 TShs (1.3 USD). The REDD+ trial payment had noticeably positive effects on the capacity of the village natural resource committee to carry out regular patrols. The money set aside for this task was maybe a small amount for each member after every patrol, but it was high enough to cover the costs of the food for the family at home during this day.

Nonetheless, the formal power granted to the village committees to conduct patrols and penalise illegal activities does not automatically result in their actual power to perform these tasks. Even if villagers go regularly on patrols to catch criminal offenders, they may find themselves in a situation of weakness, when, for example, patrol members carrying bush knives come upon better-armed counterparts. In this situation they must let the offenders go without further prosecution.

We people from the village natural resource committee, if we decide to go into the forest, the ones that we can arrest, we arrest, and others where we struggle we don't arrest. If you go there, you meet people with weapons. We don't have weapons. We don't have uniforms. Whenever we go, we go with the clothes from home. And we wear sandals. We are weak. So also the people who meet us there, he can shoot at us. If we meet other weak person, we arrest him. If we see another person, eh, we run; because we don't have guns. No weapons. We just carry an axe or a knife (M Interview 16).

Once we went to the protected area because we got the information that there are people who are destructing. We went there and found them. We failed because we did not have any weapon or uniform. We were not seen as guardians. We look the same. They think all of us are thieves. The one with more strength wins. We failed and we reported to the district that because of lack of equipment to go on patrols in the protected area is difficult. We don't have uniforms or weapons. We are not seen as guardians (M Interview 54).

7.3.2.2 Issuing of permits

Through the institutionalisation of community based forest management in the villages, the collection of forest products, both timber and non-timber, should be formalised. This is done through the issuing of permits. In both villages I could observe the collection of non-timber forest products such as wild fruits, vegetables, honey and firewood by villagers. Villagers generally collected non-timber forest products for subsistence use, but some people also sold small amounts at the market place. Firewood was the most important non-timber forest product, because all villagers used it for cooking at home. In Mihumo/Darajani the *ming'oko* root was also among the most prevalent products collected and sold by women.

In Mihumo/Darajani non-timber forest products were collected around the farmland or in forests outside the village land forest reserve. Due to the great distance between the village and the forest reserve – around 10 miles – villagers found everything they need in areas much closer to the village. Everybody could go whenever he/she wanted to enter the so-called 'open area' to collect leaves, fruits and berries for subsistence use or small commercial activities. There were no permits issued and no tax was levied. While there might have been cases where people went as far as the village land forest reserve to collect such products, they were neither reprimanded nor penalised for this behaviour by anyone. It was generally accepted as a legitimate livelihood activity that does not need any further regulation. The same standards applied to hunting wildlife. People could go anywhere without having to obtain any permit or paying taxes. Similarly, in Ruhoma residents collected NTFP, especially firewood, for their subsistence needs. They too sourced these products in areas close to their farms outside of the reserve. To my knowledge no permits were ever requested for the harvesting of these kinds of forest products.

Usually firewood is collected close to village not as far as the forest. When the forest was destroyed then to open up farms, not to collect firewood. Firewood we collect from close areas here. (R Interview 1)

From these findings it can therefore be said that villagers resisted the formalisation of the collection of non-timber forest products. The formalisation of the collection of timber forest products was much more present in the villages. Important to note first though is that in both villages no large commercial timber harvesting was carried out at

the time of my fieldwork. Considerable timber harvesting for commercial purposes only took place in the past where businessmen came and contracted local villagers as labourers. In more recent times no influential businessmen entered the two villages to initiate the felling of trees to transport them out of the village. Instead, trees were felled for petty-trade, local construction or community development purposes.

Here it is only villagers. People from Dar es Salaam are not here. Because of the big costs to be allowed to harvest. You start at the regional office, then district and the district then decides in which village you must go to log. Or they start at the national level. They plan for you, which region are you allowed to go to log for timber [...] They came many years ago, but not these days (M Interview 10)

The money is not enough for other uses. There is nobody who goes to the forest and harvests 200 or 300 planks. It doesn't happen. It is people from here. They harvest 10 or 20 planks. So you get 2500 or 5000 shillings. You share it with the government and then you get how much? Very little. You stay and then you arrest somebody (M Interview 55)

In the view of the ordinary resident in both villages, timber harvesting was subject to having a valid permit, no matter where it takes place. The general understanding among the population was that anyone who wanted to fell trees is required to request permission from the village natural resource committee and village council first before he/she can begin operations. Villagers claimed that the requests were first received by the village natural resource committee and subsequently discussed among village council members. Through the issuing of permits, the village natural resource committee and the village council, or at least certain members thereof, had gained power among the population and played an important formal role in granting access to the communal resources of the village.

For example, if somebody wants to harvest timber he needs to go to the committee first. He sees the committee and then gets a licence. He is given somebody who takes him to the forest. This is the work of the committee. And if outsiders come who want to see the village natural resource committee then we assemble and we discuss how things go along. (M Interview 56)

People must not just go into the forest and cut trees [...] They must go to the office and ask for a permit. He needs to be asked what do you want to do with the timber? If he wants them for construction, 30 or 40, then he can get them. For business, he can't get the permit (R Interview 11).

In Mihumo/Darajani the village natural resource committee and village council issued permits for residents and people from neighbouring areas who wanted to harvest timber in the open area. They claimed that they did not issue permits for the village land forest reserve. This, again, is in stark contrast to the formal community based forest management institutions, which do not allow the village natural resource committee to issue permits for areas outside of the reserve. The task of the village natural resource committee is to protect the village land forest reserve and not the uncultivated area – whether forested or not – on communal village land. Because of the existing demand to harvest timber products in the open area, the village natural resource committee and the village council asserted their power of this territory to obtain financial income.

Because the committee often dealt with small-scale requests they issued permits to almost every person that applied. There was one significant difference however. From interviews with village natural resource committee members, I was surprised to hear different opinions of the amounts of tax people had to pay per plank. One village natural resource committee member, for instance, told me that for construction purposes no taxes apply. Only if the timber is sold, then you have to pay a tax of 2,500 TShs (1.6 USD) per plank. Most of the other village natural resource committee members explained to me that even for construction purposes tax applies, but to the amount of 250 TShs (0.16 USD) only. At the same time non-residents are required to pay 500 TShs (0.3 USD) a plank. Again others believed that independently whether you are a resident or not you will be charged 500 TShs (0.3 USD) each. From the interviews I conducted with village natural resource committee members it appears that there was considerable confusion about the amount of tax. The tax on sawed planks seemed to be negotiated on an individual basis where village natural resource committee members often tried to levy 500 TShs (0.3 USD) tax on each plank in order to increase their own share of benefits.

So what happens is that the price is 250. But we from the village natural resource committee we don't have any salary. Maybe if there is somebody from there who comes here to get 10 planks for doors. If I meet him then I tell him 500 shillings. From the 500 shillings I take 250 shillings for soaps for the work I do and 250 I take to village (M Interview 54).

In Ruhoma permits for timber harvesting were issued for subsistence purposes only. Also in this village some village natural resource committee members had a different

understanding of the amount of money required to obtain a permit. One member explained to me that for 10,000 TShs (6.4 USD) you obtain a permit, which allows you to harvest 50 planks and 40 beams, where you pay 200 TShs (0.1 USD) tax on each plank. Another member spoke of 500 TShs tax per plank, and a third one told me that 20,000 TShs (10 USD) are required to obtain a permit for 100 planks and 300 TShs (0.2 USD) tax are levied on each plank. From the records I received from the village natural resource committee secretary I learnt that people were usually charged with 200 TShs (0.1 USD) tax per plank, but I also viewed a case where 300 TShs (0.2 USD) were charged. What I could not ascertain from the records was whether any income was received from the fees of 10,000 TShs (6.4 USD) or 20,000 Tshs (10 USD) required for issuing the permits.

One issue that emerged from my conversations with villagers about the harvesting of timber related to follow-ups of permits. I was told that craftsmen could easily log more trees than they were permitted in order to produce more planks. Village natural resource committee members seem to not rigorously follow-up on the amount of planks sawn. Craftsmen were therefore easily tempted to apply for small amounts of timber and then log much more than permitted.

7.3.2.3 Prosecution of illegal activities

If institutions ought to work, violation of their rules must be penalised (Ostrom, 1990). In the forest management plans and especially in the bylaws the fines and penalties for various offences are declared. They are also known among the village natural resource committee members although with a degree of confusion. Among the village natural resource committee members in Mihumo/Darajani various opinions existed about the scale of punishment for illegal timber harvesting, reaching from 50,000 (32 USD) to 300,000 TShs (192 USD) plus the confiscation of harvested timber. Nevertheless, in practice, as a consequence of the lack of regular patrols, apparently very little money was obtained from the prosecution of illegal activities in Mihumo/Darajani. The village natural resource committee did not have records of anyone being arrested or taken to court. Yet according to the views of some villagers illegal harvesting of timber products takes place unreported and without prosecution.

Some people who fell trees in the open area don't pay tax. They log timber and sell, but they claim to fell trees for construction. In

the morning we see people who buy timber and go with it. If you ask him he says ah this is just to pay my debts with him. I rent from him and now he is taking my timber (M Interview 49).

For some people who live on their farms it is easy to enter the forest, fell trees and we don't know about it (M Interview 50).

In interviews I was told that few offenders were arrested during the past year and charged with a penalty of 50,000 TShs (32 USD). Also their equipment was confiscated. Yet all of them requested their fine to be removed, or at least reduced, because of the difficult situation they find themselves in. After some time of negotiation and consideration their fine was reduced and the confiscated tools returned to their owners. Village natural resource committee and village council members claimed to practice 'brotherhood' with their fellow villagers. They are sympathetic and show understanding for the apparently dire situation of the criminal offenders.

Around three people got fined. But because they are our brothers, you know. If they arrive they say people we don't have 50,000. We did so because of poverty. So the 50,000 can be cancelled. He can pay 20,000 or 20 something. And others arrive there and say yes you caught me and my tools but I don't have anything. He can complain and maybe pays 15,000. We just put the 50,000 as a law. If somebody gets caught he pays 50,000. But nobody has ever paid 50,000. (M Interview 50).

According to the law the fine is 50,000. But we practice brotherhood. It is not possible 50,000 if they are people from here. It is possible but then we are seen as bad people. So we explained to them that their amount is a quarter. But according to the law somebody who is arrested with his tools pays 50,000 then he can be given back his tools and he can continue to cut trees (M Interview 56)

The first journey we went we found saws and pots. It was two years ago. Recently we went again and we found saws, pots, cutlery, flour. After that we didn't go again. They took the equipment to the office. We gave them to the head of the patrol. Then they came on their own. They said these are their tools. So the committee met. We decided to forgive them but they must pay 15,000 shillings. (M Interview 57).

I was also told that often the village natural resource committee fails to arrest criminals, because they know from other sources when patrols are being conducted. Thus, whenever the village natural resource committee is busy carrying out patrols, the criminals had already been warned and left the scene prior to their arrival. Nevertheless,

sometimes the tools of the offenders are left and village natural resource committee members collect and confiscate them.

They investigate people, ask them, the forest committee when do they enter the forest? When they enter they already left. They logged timber maybe 50, 100. They take a bicycle and leave. There are people who do it this way. They enter without permit, but they do it considering time. But to do this it needs to be somebody from here. Because strangers don't know when the forest committee enters the forest (M Interview 5).

When we go on patrol, people know that today the committee is doing the patrol. So when we go then we don't meet them but only their tools. So we take the saws to the office. Afterwards, when he comes to collect the tools, we fine him (M Interview 50).

Also in Ruhoma I came across cases where timber was harvested without the permission of the village natural resource committee. It is small-scale logging for construction purposes carried out by villagers. Obtaining a permit for a few planks to produce stools, chairs or similar things seem to be an unnecessary obligation. This view appears to be shared by villagers in general and the responsible authorities, as non-compliance to the rules does not result in penalisation.

... I for myself I haven't been ready to get permits. If I get the timber illegally [*michocholo*] then the days continue as if nothing happened (*siku zinakwenda*). And if you go for permit, you are being robbed a lot.

Towards the end of my fieldwork period an incidence happened that had considerable consequences for the village natural resource committee's own understanding of the prosecution of illegal activities. After a man was arrested by the district police, because he had felled trees in the open area, the village natural resource committee intervened to inform the district that they had given the man a permit to log timber. The district office, however, replied that the activity of the village natural resource committee was unlawful due to their lack of authority over the open area, resulted in a feeling of a complete loss of the sense of ownership over the governance of village land.

But anyway, we understand that we don't have any freedoms. Because the first time we got the knowledge that in the open area people get can timber for subsistence. But now we got the proposition that in the open area nobody must be allowed to harvest neither to build or anything [...] We from the village

natural resource committee followed up on that and apparently we don't have any authority to allow people to harvest. They have the authority. I as the vice-secretary I followed up on that a lot, I asked them, so what is the importance of the village natural resource committee and of the open area. Because they said the importance of the open area is to benefit the community. For construction, to farm, for charcoal. Today you announce that villagers may also not harvest there for construction. What is the importance of the village natural resource committee and the open area? [...] At the district they just said you have no authority to give out permits. Permits come from the district. So I asked him, it is possible that somebody has built his house and he needs three planks for his door. Must he come to the district to ask for a permit for three planks. They told us even if he wants one plank he must ask the district for the permit (M Interview 54).

7.3.2.4 Reporting and recordkeeping

The decentralisation of forest management to the community level enables the village to retain 100% of all forest-related income. Important responsibilities for village natural resource committee leaders are then the correct recordkeeping and reporting of all forest related income and expenses to the village council. When income and expenses of the forest are rightfully reported, the village council and subsequently the village assembly, consisting of all adults in the village, can decide upon the allocation of the funds to different development projects. To make this possible the VEO is required to obtain the income and expenses from the village natural resource committee and discuss them with the village finance committee and village council. After every three months reports must be provided to the village assembly to debate the financial situation of the village and decide upon future strategies.

In practice a great deal of confusion prevailed in Mihumo/Darajani in relation to the annual total income and expenses of the forest committee. Throughout my fieldwork period I heard complaints from villagers about the lack of knowledge and communication of any village income and expenses. Because of political³⁹ and religious⁴⁰ conflicts in the village, no village assemblies were held for many months,

³⁹ Political conflicts existed between the local CCM and CUF parties, especially between the village executive officer (CCM) on the one side and the village council and the village chairmen from Mihumo and Darajani (CUF) on the other side. They would rarely talk to each other and were involved in legal cases against each other.

⁴⁰ Religious conflicts existed between more 'conservative' Muslims on the one side and more 'progressive' Muslims on the other side. Or, put differently, between Muslims, who had different understandings of how to practice Islam. One could also argue that these religious conflicts were, at least

which made it impossible for the public to know the financial situation of the village. When I started to interview village natural resource committee members to find out more about the income and expenses of this specific committee, most of them told me that very little or no money is in their cash register. A few people went beyond that and put a figure between 15,000 (9.6 USD) and 39,000 TShs (25 USD) to it. When I tried to find out the reasons for that I was told that most of the income obtained from the taxes and fines gets used for patrolling and allowances. Other money was apparently provided to the village council to solve some immediate problems.

All the money is used for the patrol. But if they have, if there is a problem here in the village, they come and ask for it and they are being given. At times we haven't gone on patrol and money exists, but it is used for the village. They come to ask, and they are given (M Interview 56).

Whenever I asked for financial records I was directed to the secretary, chairman and treasurer of the committee. Unfortunately, all of them were unable to provide me with assistance. The same applied to my requests to the VEO, who too could not assist me with any details. In fact all of my attempts to obtain relevant records failed and no concrete information about the financial situation of the village could be provided. It appeared to me that the committee leaders kept no or only minimal records of forest management activities. This lack of proper recordkeeping was also criticised among other village natural resource committee members and ordinary citizens.

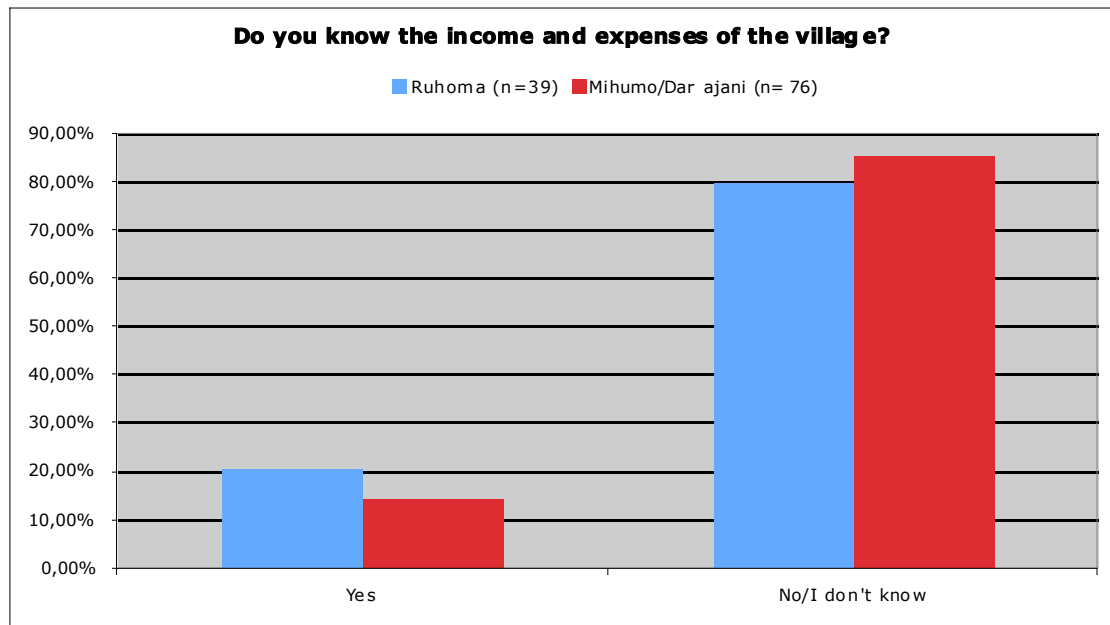
The VEO hasn't got a report from the committee for a long time. The chairman was called and asked by him: Where are your reports? Then the chairman called a meeting with the committee members to discuss this. We did not know that our chairman did not take the reports to the VEO. After the VEO complained we got the news that he doesn't take the report to the VEO (M Interview 57).

At the general assembly they are told about the income and expenses. These days they can't know how the profit of the forest is being used. The people at home can't know how the money is used (M Interview 55).

From the graph below (Graph 7.5) the degree of this problem becomes clearer as we learn that more than 85% of the people in Mihumo/Darajani admit that they do not know the income and expenses of the village.

in part, also political as many 'conservative' Muslims, who were affiliated to the local CUF party, used their religious beliefs to express resistance to the politics of the ruling CCM party (cf. Becker, 2006).

Graph 7.5 Perceptions of villagers of village income and expenses



The situation in Ruhoma looks very similar, as around 80% of the villagers did not know the income and expenses of the village (Graph 7.5). The reasons in Ruhoma appear to be quite different though as they have less to do with a lack of communication by village leaders but more with the non-attendance of most ordinary villagers in regular village assemblies. Apparently ordinary village assemblies tend to be badly attended. In contrast to Mihumo/Darajani, financial records of income and expenses of the village namely existed and were given to me upon request. Records were kept of patrolling activities, the issuing of permits and the income and expenses of the forest committee. This information was obtained by the VEO to include it in the analysis of the financial situation of the village at large. However, in interviews I was told that the ordinary villager does not easily understand the village income and expenses even though they are reported at village assemblies. Apparently, the way they are communicated to the ordinary villagers is problematic as some find it confusing and non-transparent.

7.3.2.5 Accountability

In Mihumo/Darajani the cooperation between the village natural resource committee, VEO and the village council was minimal. Almost no communication, no transparency and a complete lack of accountability caused a situation where nobody knew what the

other one was doing. Ordinary citizens then feel that there is enough opportunity for corruption, which leaders are only too happy to make use of.

There are meetings with the council. We get informed, that's it. Professionals come and inform leaders, but they don't take the message to the villagers. The people from the forest committee we only saw once together, at the day of election. Since then, they go separated ways. The day of election they were selected, then afterwards they left each other (M Interview 21)

These days trees are there but people log them arbitrarily. They enter like thieves. The leaders themselves are thieves, they follow them and log. Without any reports. The timber passes through during the day and people see them (M Interview 41).

For example me, I know that there is the protected area. I know that there are trees, I go and log them. I call the car and fill it up with logs (*magogo*) or poles (*boriti*) or planks (*mbao*). And I get money. Because from the government, we don't get anything when they harvest from there. You hear, we will go and log. We have gone and logged and put them here. Then they sell them and eat it themselves ... There are people from other areas who come. To steal, like from Lilombe (M Interview 18)

Often village natural resource committee members explained to me that their weak performance results from the lack of resources, most importantly the lack of money. Money is missing and therefore very little is possible. At the same time already given equipment was sometimes not handed over from one committee to the next one, but was kept privately by past committee members. This happened, for instance, with shoes and uniforms that were provided by development actors to every committee member. A lack of accountability characterises the relations between the committee, the village council and ordinary villagers. Money and resources are consumed without a clear commitment to accountability and transparency, which leaves the ordinary citizen unaware of potential misuse and wastage.

But village leaders were also able to do this differently, for instance in Ruhoma the income and expenses from the REDD+ trial payments were clear to all ordinary villagers. The majority of the rural population in the village knew exactly how much money was provided and how the amount was distributed. This is due to the work of the REDD+ payments distribution committee, which met and decided upon suggestions for the distribution of the trial payments. They practiced excellent leadership by adhering to good governance principles. Their suggestions were openly presented, debated and

subsequently accepted in a well-attended village assembly. Consequently, no accusations of corruption or bad governance were mentioned after the distribution of the REDD+ money.

7.4. Conclusion and discussion

In this chapter the design and actual practices of community-based forest management institutions were analysed, therefore contributing to answering research question 2: “How do REDD+ initiatives interact with local forest governance in Lindi, Tanzania?” The findings of the chapter provide important insights into how rural villagers in Lindi, Tanzania, interpret and implement community conservation, which is the preferred governance framework among many REDD+ supporters across the globe. This is crucial better to understand the actual workings of rural societies in Tanzania and how this links to social justice of conservation objectives.

Community based forest management is an institutional framework for the governance of forests that has been introduced in both villages as the best way to achieve environmental sustainability and community development. In both cases similar institutions were drafted to replace customary governance arrangements. The assumption that sustainable resource management can be attained by drafting and introducing common property institutions into rural societies has been widely critiqued within academia (Hall et al., 2014; Johnson, 2004) but, as my findings illustrate, still prevail in development practice. Efforts to introduce desirable institutional set-ups into rural Lindi appear to be informed by so-called ‘design principles’ of the Institutional Analysis and Development (IAD) framework that have shown to facilitate successful common property management in other locations (Ostrom, 1990).

In introducing ideas of ‘good governance’ via these new community forest institutions, rights, powers and responsibilities over forest access and use were redistributed and transferred to formal village institutions, assuming that the separation of powers under democratic governance would lead to more equitable, efficient and effective conservation and development outcomes (Larson and Ribot, 2007; Ribot, 2004; Agrawal and Ribot, 1999). In doing so development actors displayed a rather static and homogenous notion of a ‘community’ that collectively shares the objective of resource protection (Hall et al., 2014; Agrawal and Gibson, 1999). However, as much research has shown, communities are heterogeneous entities where diverse interests exist

(Agrawal, 2007; Agrawal and Gibson, 1999). Social groups and individuals within ‘communities’ can have different objectives that are in opposition to the collective good of forest protection (ibid). Nevertheless, as with inclusive neoliberalism in general, the introduction of ‘good governance’ reforms is thought to fix societal conflicts and environmental problems (cf. Hickey, 2012a, 2012b).

In introducing new institutions via forest management plans and by-laws in the two villages, development actors aimed to transform open-access forests to common property regimes; new notions of community insiders and outsiders, legal and illegal forest users and uses were created and formalised through a sophisticated ‘permits’ system. Non-residents suddenly found themselves outside of the ‘community’, eligible only to limited forest uses and this often in return of payments. Village residents confronted new complex rules and regulations that meticulously defined and rationalised every prohibited and permitted activity in the forest reserve.

These efforts by development actors to democratise and modernise collective action through drafting common property institutions resembles idealised notions of democratic resource governance (Ellis and Freeman, 2004; Hall et al., 2014; Mosse, 2005). By introducing common property institutions into rural settings development actors also communicate certain normative values and assumptions about natural resource use, which they, as outsiders, want to promote (Leach et al., 1996). These include idealised views of neoliberal development based on market-based conservation, bureaucratisation, formalisation, technocratic governance and deliberative democracy (Li, 2007; Sunseri, 2009; Ohja et al., 2006; Nightingdale, 2005).

In analysing the forest management plans and by-laws we could see how common property regimes clearly define who can access the resource, at what time, where and under which conditions. This means that they inevitably result in the exclusion of some users and uses (Ostrom et al., 1999; Brockington et al., 2008). The forest management plans and by-laws in the villages entailed clear rules about who can partake in decision-making over the resource and who will be excluded from it. They therefore have negative effects to some while they result in positive outcomes to others. While protecting common resources they produce long lasting socio-economic and distributional consequences that can hit different groups substantially (Ostrom et al., 1999; Johnson, 2004; Brockington et al., 2008). If the created rules are enforced and

infringements are punished, the villages of Mihumo/Darajani and Ruhoma can become unpleasant places to be in where social conflicts are merely mitigated and not removed (Brockington et al., 2008). Mechanisms for dealing with and resolving conflicts between different resource users therefore become essential in facilitating long-term sustainability of the commons (Dietz et al., 2003).

From the drafted institutions, analysed in this chapter, we could also identify efforts to make the use of the commons dependent on fees, taxes and permits to restrict who gets to use what type of resource. This links the common property regime to a process of commercialisation that defines access to a resource by the ability to pay. This could mean that poorer members of the group will find it increasingly difficult to access common resources, which could lead to increased inequality within the community (Beck and Nesmith, 2001).

The development actors' belief, or perhaps hope, that the drafted community-based forest management institutions will be adopted by local villagers proved problematic. This was the case much more so in Mihumo/Darajani than in Ruhoma. Surely, if new institutions are to be adopted, villagers must know them. When I examined villagers' knowledge of the rules and regulations set out in the forest management plans and bylaws I found out that most villagers did not know the breadth and depth of the many institutions. This lack of knowledge illustrates the problem of effective information dissemination in a rural setting of Tanzania, where oral communication and limited information channels are the norm (cf. Taku Tassa, 2010). On the one hand the lack of effective communication resulted from insufficient capacities at the local level. Conducting trainings, workshops, village meetings and disseminate information incurs costs and requires human and financial resources, which are not readily available in our rural settings. On the other hand, it resulted from local power struggles. As we know, knowledge is power. Village leaders who obtained knowledge from outsiders sometimes did not share it with others. Instead they treated it like an asset to accrue individual benefits (Taku Tassa, 2010). The problem of effective communication is therefore also a political problem related to power struggles between village groups.

Yet as research shows information exchange is important because only when rules are easily understood and locally devised then they are better suited to promote sustainable forest management (Ostrom, 1990; Agrawal, 2007). Similarly, when local user groups

obtain regular information about the state of the resource they better engage in collective action (Dietz et al., 2003). Both require effective information exchange and communication between people, preferably face-to-face, to facilitate cooperation in social dilemma situations. Effective communication can enhance reciprocity, individual reputations and trust between user groups (Balliet, 2009; Ostrom, 2006; Sally, 1995). Future efforts in the two villages should therefore enhance communication to improve the understanding of the situation, increase expectations of cooperation, enhance group identity and generate norms of cooperation (Kerr et al., 1999; Balliet, 2009).

In both villages most survey respondents assigned ownership and responsibility to protect the forest reserve to villagers, which means that the community has taken on the most foundational elements of community-based forest management. In Ruhoma villagers even knew the basic rules regarding forest use and access, which was mainly due to the recent introduction of the project and the many assemblies, trainings and workshops provided to disseminate knowledge of forest governance. Villagers in Mihumo/Darajani, who regarded the forest reserve as a close-off area where no livelihood activities can be conducted, confirmed that continuous training, workshops and education are required when new institutions are to be adopted.

However, the perception of the forest reserve as a closed-off area had other, probably more important, roots. Interviews in Mihumo/Darajani attested that entering the reserve would lead to arrest by the village natural resource committee. The committee therefore took on the role of protecting the forest and communicating, together with the district, that nobody is allowed to enter the reserve. At the same time they issued permits for and conducted patrols in the forested land outside the reserve. In this way the committee in Mihumo/Darajani reinterpreted the drafted institutions and used their formal powers to accrue money for, at least partly, individual benefits. The confusion over the amount of fines, stories about the handling of illegal forest users and secrecy over the income and expenses of the committee provide much evidence to this assumption. This illustrates the problem of corruption that has been acknowledged in studies of Mihumo/Darajani before (Taku Tassa, 2010). When village leaders are not held accountable by the popular we often experience a lack of responsiveness towards citizens' needs (Agrawal and Ribot, 1999). In Mihumo/Darajani the mechanisms to monitor and sanction local user groups, two activities that are central to effective forest governance (Gibson et al., 2005; Ostrom, 1990; Ostrom et al., 1999; Agrawal, 2007), were in the hand of the

village natural resource committee, which was not held accountable by the citizens. Infringements on collective rules were not sanctioned uniformly and were used to further personal enrichments instead of advancing the collective good. This only creates mistrust in the population, which is likely to negatively influence cooperation and compliance with collective rules (Ostrom et al., 1999).

In a context of severe lack of resources in Mihumo/Darajani, due to the restrictions imposed by the district council, the implementation of community-based forest management institutions was challenging from the beginning and ultimately led to personal enrichment. In Ruhoma, in contrast, recent REDD+ interventions resulted in regular patrolling and more transparent forest management practices. The good conservation practice performed in Ruhoma was influenced by good leadership and the availability of sufficient resources to initiate and carry the costs of monitoring and sanctioning forest use (Agrawal, 2001, 2007; Ostrom et al., 1999). From the REDD+ payments money was set aside for the activities of committee members. Due to this they felt less of a need to obtain money by fraud. For that matter the materiality of the forest plays an important role too. The smaller forest size and fewer dangerous animals in Ruhoma made forest management activities much easier and cheaper than in the vast landscape of Mihumo/Darajani.

The stark differences between the villages in terms of the decentralisation process, their relations with the district and development actors and the benefits accrued from forest protection (see chapter five and six) certainly played their part in shaping the observed practices outlined in this chapter. The politics and frustrations over failed decentralisation, and linked to this about failed inclusive economic development, may have also contributed to religious and political conflicts in Mihumo/Darajani, which resulted in no village assemblies taking place, where residents, as citizens, could have probed their leaders. The generated lack of accountability of village leaders made it impossible for the public to know the income and expenses of the village. This, in return, made it very difficult for them to engage in 'transformative forms of politics' and to practice 'participatory citizenship' to enable change (Hickey, 2010).

The findings of this chapter contribute to a growing literature that is concerned with the materialisation of community governance structures in specific contexts, in order to improve our understanding of the processes shaping or influencing institutional change

(Hall et al., 2014; Poteete, 2009; Benjamin, 2008; Johnson, 2004). Experience has shown that formal institutions that are drafted by outside actors are often not well adopted at the local level (Hall et al., 2014; Dill, 2010). Dill (2010, p. 33) explains this as a lack of fit between domestic norms, which inhibit or constrain popular participation, and the imported institutional superstructure, which should facilitate it. He further argues that by following a certain mode of institutionalisation community-based organisations are reified and separated “in an unrealistic way from the dynamics of change in the community of which it is both part and reflection”. This is problematic because if local resource users do not regard the institutional arrangements as legitimate or effective they generally resist compliance (Dietz et al., 2003; Agrawal, 2007).

Chapter 8: Conservation Agriculture and farmer field schools

8.1. Introduction

I insist that you all visit those CA plots so that you can thoroughly understand and implement the technology back home. For the districts, try to assist the farmers as much as possible in adopting the technology for the benefit of our farmers. We have a challenge on climate change, and by adopting CA we can contribute towards mitigating the challenge. (Minister, Hon. Mathia Chikawe in LIMAS Newsletter, 2013)

The honorary Minister of Justice and Constitutional Affairs Mathias Chikawe made this strong plea in his closing speech as the Guest of Honor at the Nanenane agricultural fair in Ngongo, Lindi, in August 2013. Along with district officials, agricultural extension officers, farmers and donor representatives he lobbied for the wide adoption of Conservation Agriculture among the resource poor, small-scale farmers in Southeastern Tanzania. He thereby joins a powerful alliance of development actors who have been actively promoting Conservation Agriculture as the most promising solution to Africa's agricultural development challenge.

Against the background of rural poverty, environmental degradation and rising local and global food demands, advocates argue that Conservation Agriculture should be adopted to meet the needs of farmers and the environment, i.e. to “improve the efficiency of inputs, increase farm income, improve or sustain crop yields, and protect and revitalise soil, biodiversity and the natural resource base” (FAO, 2009:i). In the midst of rising attention to sustainable agricultural development in Africa, this broad and powerful network of national and international actors increasingly call for Conservation Agriculture as the best option to the millions of small-scale African farmers (Baudron et al., 2012; Kassam et al., 2009).

Conservation Agriculture also represents the chosen technology of development actors to reconcile agricultural growth with forest protection. In promoting Conservation Agriculture techniques LIMAS and TFCG project staff hope to convince villagers to reduce opening up new farms in order to decrease the pressure on forests. Simultaneously they promise that agricultural productivity still increases, allowing

farmers to meet future food demands and pursue economic development opportunities (LIMAS, 2010; TFCG, 2012).

In this chapter I will argue that Conservation Agriculture is introduced to the villagers in the form of an agricultural modernisation package that includes productivity-enhancing practices, which are in fact unrelated to the concept of Conservation Agriculture. This creates a dichotomy between ‘backward’ and ‘modern’ farming with Conservation Agriculture representing the latter. Then I will discuss the approach development actors selected to promote Conservation Agriculture in the villages. I will examine the performance of farmer field schools in disseminating knowledge of this new technology. I will explain the factors contributing to the functioning and failure of these groups. This is followed by a discussion of the impacts these farmer field schools had on the participants in terms of their perceptions of different aspects of Conservation Agriculture. Barriers and possibilities of adopting Conservation Agriculture techniques will be looked at and analysed on the basis of the opinions and socio-economic conditions of the villagers.

8.2. Conservation Agriculture

8.2.1 Basic principles of Conservation Agriculture

[Conservation Agriculture] provides a truly sustainable production system, not only conserving but also enhancing the natural resources and increasing the variety of soil biota, fauna and flora (including wild life) in agricultural production systems without sacrificing yields on high production levels. As CA depends on biological processes to work, it enhances the biodiversity in an agricultural production system on a micro- as well as macro level (FAO, 2014).

Conservation Agriculture is not a single technology. It is a set of principles and practices that are based on three fundamental aspects: (1) no-tillage or minimum mechanical soil disturbance, (2) maintaining permanent soil cover with organic mulch and (3) practicing of crop rotations and/or associations (FAO, 2014, 2009). In trying to integrate the management of soil, water and biological resources, Conservation Agriculture is similar to other ‘green agricultural technologies’ including organic farming and agroforestry. In contrast to organic farming, however, Conservation Agriculture does not abstain from chemical inputs (herbicides, pesticides, fertilizers); it

only aims to minimize their usage to the most efficient level, i.e. understood as ways that do not interfere with, or disrupt, the biological processes (FAO, 2014).

Proponents of Conservation Agriculture (among them the FAO, World Agroforestry Centre, African Conservation Tillage Network, Africa Carbon Credit Exchange, CARE, WWF, etc) emphasise the importance of soil structure and soil organic matter to sustainable agriculture. Producing and maintaining a healthy soil ecosystem, consisting of combined living and non-living fractions, constitute the basis objective of this agricultural approach. This shall lead to the reversal of soil erosion and degradation on African lands, thus creating a productive and resilient environment for intensive crop production. In this way African farmers shall be empowered to adapt to future climatic changes that are expected to bring more temperature increase, rainfall variability, water stress, and extreme weather events (IPCC, 2007). Because the production and improvement of soil organic matter is also linked to increased carbon sequestration, Conservation Agriculture proponents point to the opportunities of climate mitigation. Moreover, the claimed reduced need for tractors and other machinery contribute to the reduction of greenhouse gases from agriculture (Kassam et al., 2009).

The most striking, and probably most debated aspect of Conservation Agriculture is its emphasis on minimum or zero tillage. Ploughing, an agricultural method practiced for thousand of years, is seen to damage the soil structure in the long-term, thus leading to declining soil fertility and organic matter levels, ultimately culminating in soil erosion. For this reason Conservation Agriculture proponents swear by the application of permanent soil cover in combination with cereal-legume crop rotations to maintain soil fertility and to combat weeds, pests and diseases. The organic mulch “protects the soil from the physical impact of rain and wind but it also stabilizes the soil moisture and temperature in the surface layers” (FAO, 2014). Through mulching the soil becomes a lively habitat of diverse organisms, who begin with a process termed ‘biological tillage’ that transforms organic matter into humus, thus contributing to the stabilisation of soil structure, which serves as a buffer for water and nutrients (FAO, 2014; Kassam et al., 2009).

When Conservation Agriculture is followed correctly, farmers are told to expect improved and sustained yields with less time required for weeding and less inputs required for crop production. Proponents thus argue that Conservation Agriculture

reduces the production costs, reduces the workload and increases the output for the farmer. All of this can be achieved while protecting or even enhancing the natural resource base of our environment.

For the farmer, conservation farming is mostly attractive because it allows a reduction of the production costs, reduction of time and labour, particularly at times of peak demand such as land preparation and planting and in mechanized systems it reduces the costs of investment and maintenance of machinery in the long term (FAO, 2012).

8.2.2 The challenges constraining adoption of CA in Africa

At present Conservation Agriculture has been adopted on a project-basis in Africa without any large-scale transformation of rural farming practices. In areas where it is practiced, non-governmental organisations and donor agencies have had a major influence in convincing farmers to adopt the techniques (Kassam et al., 2009). Often it has been found that farmers do not adopt all principles and practices. Instead, they pick the ones they find most suitable to their socio-economic and ecological conditions. Critics claim that farmers only practice Conservation Agriculture during promotion and donor programmes, but once support fades, they return to their 'traditional' way of land cultivation (Giller et al., 2009).

Given the supporter's claim of the many win-win benefits of Conservation Agriculture, the low uptake does come as a surprise. However, several factors have been identified that seem to hinder the dissemination of Conservation Agriculture related practices among rural farm dwellers in Africa. Lack of awareness of soil erosion and environmental degradation, lack of knowledge, limited access to inputs, credits and technical information, labour constraints, lack of clear tenure and competing uses for crop residues are among the most common. Critical scholars further highlight that some of its techniques can be detrimental for the productivity and income of the farmer, especially in the short-term, and that scientific evidence for its alleged benefits is incomplete. Moreover, the socio-economic condition of smallholder farmers in Africa often stands in clear conflict to Conservation Agriculture requirements. No-tillage, for instance, can result in lower yields during the first years of adoption, thus causing hardship for already income-stressed farmers. The increased need for herbicides and fertilizers during the first years further represents real material obstacles for adoption (Baudron et al., 2012; Giller et al., 2009; Knowler and Bradshaw, 2007).

8.2.3 Conservation Agriculture in Lindi, Tanzania

In both case-study sites Conservation Agriculture is being promoted to farmers as the best way to practice agriculture (LIMAS, 2011; TFCG, 2012). Especially under the Finnish-Tanzanian development partnership LIMAS, which operates also in Mihumo/Darajani, a lot of efforts and money have been directed towards the promotion of Conservation Agriculture in South-eastern Tanzania. In total around 130 demonstration plots were initiated in Newala and Liwale districts. Ward extension officers, their supervisors, Agriculture Training institute employees, primary school teachers and some farmers have been trained to become facilitators for farmer field schools (LIMAS Newsletter, 2011). In a flyer produced for the LIMAS programme the hopes placed in this technology become apparent:

Conservation Agriculture is promoted to assist farmers get better yields from their land. Conservation agriculture improves productivity, cuts down the workload in land preparation, and helps adaptation to climate change. The average yields increase as a result of improved soil fertility and favorable soil structure, which helps plants to effectively utilise water and nutrients. The need for fertiliser is minimised by systematic use of legumes in crop rotation. Conservation agriculture is implemented by millions of small and large scale farmers all over the world (LIMAS, 2011).

Project proponents of TFCG and Mjumita promote Conservation Agriculture in Ruhoma and other villages that take part in the REDD+ project. The agricultural extension officer of TFCG is particularly active in promoting this technology to farmers in the villages in order to assist them to reduce the pressure on forestland.

Conservation Agriculture is introduced in the two villages as an alternative to extensive agriculture based on slash-and-burn practices, which is regarded to be detrimental to the environment and forest protection. If we read the LIMAS project document their stated objective of the intervention is for farmers to adopt “a rational utilisation of the already well established fields” in order to “reduce the need to open new fields” (LIMAS, 2010). The District Agricultural Officer of Liwale resembles this view of Conservation Agriculture as the solution to slash-and-burn agriculture:

More important, the approach of Conservation Agriculture focuses on friendly environmental management, [on] friendly use of environment. The farmer will no longer need to shift from one

place to another. Because the cultivated land is treated with green manure, fertilizers, he doesn't have a reason to say let me go to another area to open up a new farm. He cultivates on the same piece of land continuously while producing maximum. At the end of the day he gets good income (M Interview 61).

In both villages Conservation Agriculture is communicated in the form of a package that includes non-Conservation Agriculture related techniques such as improved planting and weeding, usage of agrochemicals, recordkeeping, etc. In the villages all these agricultural techniques are summarized as Conservation Agriculture when being presented to the farmers. This creates a dichotomy between 'backward' and 'expert' farming with Conservation Agriculture representing the latter. Conservation Agriculture is thus viewed as the 'modern' or 'expert' way of farming, which puts it as the alternative to the 'traditional' slash-and-burn agriculture. It is not surprising then that villagers have high hopes in Conservation Agriculture, because they mistakenly link to it the benefits of general improved farming techniques, which are, at least partly, unrelated to this particular technology.

When we practice slash-and-burn agriculture (*kilimo sensa*⁴¹) and we use fire, the soil doesn't have any fertility. But with Conservation Agriculture we leave the residues, we don't use fire, we dig holes and put fertilizers. First lime then 'planting fertilizer' then we cover and then 'growing fertilizer'. We then compare slash-and-burn agriculture and Conservation Agriculture. Conservation Agriculture will produce more crops because we farm professionally (*kitalamu*) (M Interview 33)

Conservation Agriculture is seen to be superior to other forms of cultivation in the sense that farmers achieve better productivity per area, i.e. they use less input (labour and capital) for more output on the same piece of land. Villagers are also told that Conservation Agriculture can be followed without having to invest in capital-intensive machinery like tractors or animals for ploughing. The transition to this technology can be initiated even with minimal capacity building and with a hand-hoe as the only possession. Alongside the low capital requirements, the second big advantage to small-scale farmers refers to the reduced workload. Labour requirements, particularly in terms of weeding, are suggested to become less and better spread across the season. Project proponents argue that, when practiced correctly, Conservation Agriculture offers win-win benefits to the farmer and the environment (LIMAS, 2010; TFCG, 2012).

⁴¹ In Mihumo/Darajani villagers generally referred to slash-and-burn agriculture that involves cutting trees and/or removing crop residues from the field with the use of fire as *kilimo sensa*.

Project proponents in both villages regularly referred to successes made by Zambian farmers who practiced Conservation Agriculture. Zambia is presented as the prime example where Conservation Agriculture served to reverse degraded soils and helped to ‘develop’ poverty-stricken peasants. In Mihumo/Darajani videos about the Zambian success stories were shown to village council members and district leaders, encouraging participants to believe in the positive short- and long-term effects. Some project staff from both projects were taken to a study tour in Zambia to get a hands-on experience of the application of Conservation Agriculture.

8.3. Farmer field schools

8.3.1 Farmer field schools and Conservation Agriculture

Once development actors decide to promote a certain agricultural strategy to rural farmers, they need to think about how they can disseminate the new technology. A very popular approach is the farmer field school approach, which was used in both villages to train farmers in Conservation Agriculture. No less than 130 farmer field schools were initiated in Liwale and Newala districts as the main strategy of LIMAS. TFCG similarly aimed to establish farmer field schools in all of its REDD+ villages.

Farmer field schools consist of a group of farmers, who meet regularly (usually weekly) with a facilitator/trainer on a collectively managed field, where farming methods are practiced, analysed and debated according to its various socio-ecological benefits. In farmer field schools active participation and group dialogue shall enhance the learning process and knowledge dissemination, ultimately beyond the group members to all households in the villages of the participants (Davis et al., 2012; Friis-Hansen and Duveskog, 2012). The approach aims to facilitate participatory and experimental learning in groups that encourage the farmers actively to engage with each other in knowledge creation and exchange. The trainer becomes more of a facilitator rather than an authoritative instructor, who assists farmers in developing their technical, social and management skills for the use of self-empowerment (Davis et al., 2012; Friis-Hansen and Duveskog, 2012). Farmer field schools have been characterised as a “community-based, demand-driven, non-formal education program that appears to stimulate both empowerment and agricultural growth” (Friis-Hansen and Duveskog, 2012:415).

With these ideas in mind, LIMAS and TFCG/Mjumita established farmer field schools, hoping that this approach results in the wide adoption of Conservation Agriculture among villagers. They hoped that selected villagers would volunteer themselves to practice Conservation Agriculture techniques weekly with a facilitator on a collective field. Being given the knowledge and some limited inputs, the volunteers were expected to work on the demonstration plots to learn about Conservation Agriculture and ultimately become convinced of its benefits. Following this they will adopt the techniques on their private farms, which then become more demonstration plots that serve to convince fellow villagers. This was the intended plan, yet things turned out to be quite different in reality.

In Ruhoma the cultivation of maize on the demonstration farm failed and the group collapsed after a few months. Only four group members remained who decided to replace the failed maize with sesame cultivation without any further consultation with the facilitator. As a consequence of this disappointment, villagers generally claim that they did not obtain many benefits from this farmer field school. Moreover, as the quote below illustrates, some began to believe that Conservation Agriculture would put them in a worse position.

They put a demonstration farm and planted maize. They did not harvest. They did not harvest because this soil has lots of weeds. They failed to harvest based on their expertise (*utalamu*) to leave the weeds on the ground (*kutandaza nyasi*). [...] this is not the place for this agriculture that they brought [CA]. Conservation Agriculture and leaving grass on the ground. That's why we think they and their expertise will put us in a worse situation in future (*wanatuweka mabaya mbele*) (R Interview 33).

Similarly, the farmer field school in Darajani practically lost 11 of its 15 members within the first two months. The group was established at the end of November 2011 and in the middle of January most group members began to proclaim the breakdown of the exercise. Within a short time the group got reduced to merely four members, who continued to work alone on the farm with little consultation with the facilitator. One day when I visited the four members on the demonstration plot, the group leader told me that I am more interested in their activities than the facilitator, and that I come more often than him. He complained that the facilitator has given up on them, that he neglects them. Despite this they still managed to harvest maize, cowpeas, and pigeon peas but they failed with soya cultivation. Soya did not grow at all and they did not know exactly

why it has failed so terribly. They suspected expired soya seeds to be the reason. Other major challenges experienced on the plot were the lack of manure, pests that infested cowpeas and rats and hares that damaged the maize. At the end the remaining group members felt that they were left alone with the challenges. Given the objectives of the farmer field school to facilitate experimental and participatory learning these outcomes are clearly disappointing.

He [facilitator] is needed on the farm. But if you tell him then he says today is Friday. It is not the day of work. On the working days he is not available [...] He says he has been busy in other areas. He gives us reports on where he goes. The day after tomorrow I will come there, he says. He is not visible. We work long hours but he is not seen (M Interview 27)

In contrast the performance of the Mihumo group was better, especially with regard to the sustainability of the group. All group members remained active and ultimately achieved an average harvest from their one-acre plot. The group leader recorded the harvest, which amounted to 100 kg of maize; 92.5 kg cowpeas and 80 kg pigeon peas. In their field too soya did not prosper. In total they harvested 272.5 kg from their one-acre large field. In comparison, the mean harvest of annual crops by survey respondents amounted to 307kg/acre in Mihumo/Darajani. Major challenges were pest infestation on cowpeas and the theft of maize by local residents. Their farm was located next to the road just outside the village and therefore easily accessible; also for thieves apparently. To avoid this problem in future the group members bought another plot, which is further away from the village. There they want to continue practicing Conservation Agriculture.

Summing up, two of the three farmer field schools did not perform to the satisfaction of villagers, group members and development actors. The third one could record better results although group members hoped for more. However, from my research it becomes apparent that group dynamics and socio-economic context play important roles in influencing the performance of farmer field schools and Conservation Agriculture. The two farmer field schools that considerably struggled with the application of Conservation Agriculture had serious problems with intra-group conflicts, conflicts among group members and the facilitator, high drop-out quotes, low participation, lack of resources and low levels of empowerment.

Despite the many problems and challenges, the three farmer field schools also resulted in some positive outcomes for the group members. Participants who attended activities and/or seminars gained knowledge previously unknown to them. This included the advice regarding improved planting techniques, mulching, selection of seeds and crops, crop rotation and intercropping, the use of agrochemicals and natural fertilizers, improved harvesting techniques and proper recordkeeping.

In Ruhoma, for instance, ten of the 20 farmers, who were selected to form the agricultural group, were taken on a study tour to a few villages in Liwale district. In these villages they were shown rice, maize and peas farm, where they met with the farm owners to exchange experiences of crop cultivation. Unfortunately, many of the people who went on this trip did not feel completely satisfied with the knowledge they got. The majority felt that the farming presented to them wasn't really different to that they practice at home.

In Mihumo and Darajani both groups received 100 kg fertilizers (two types), 4 kg maize, 3kg cow peas, 3 kg pigeon peas, 2kg soya, books, a measuring rod, one big hoe and one record keeping book for the chairman for the start up. In contrast to farmers in Ruhoma, group members in Mihumo/Darajani were not taken to the classroom or on a study tour for lessons. Instead they were all given books to study for preparation. The real lessons started on the first day of practice on the demonstration plot. The facilitator explained to them how to dig planting basins, the spaces required in between the pits as well as the rows, the length, width and depth of the pits, and how to use the measuring rod correctly.

However, these positive effects should not let us forget that the performance of the farmer field schools fell short of everyone's expectations. We know from other studies that the problems experienced by groups in Darajani and Ruhoma are common features of farmer field schools and similar extension approaches (Islam et al., 2011). Islam et al. (2011) argue that issues related to the long-term sustainability of such groups apparently represent the major challenge. Often farmer field schools run as long as donor assistance continues but collapse as soon as external support is withdrawn. This phenomenon can have negative consequences such as creating a cycle of dependency among farmers, wastage of significant amounts of public or donor money and causing the decline of this approach due to its fiscal unsustainability (ibid).

According to Islam et al. (2011) five important aspects contribute to the sustainability of farmer-led extension groups, which farmer field schools are part of; group savings-credit performance, gender-based usefulness of FLE microcredit, group governance and leadership, social capital among group members and social capital between the members and the professional facilitators. I will now discuss the factors that have also been important to the performance of the farmer field schools in our case-studies below.

8.3.2 Factors influencing farmer field schools performance in Lindi, Tanzania

8.3.2.1 Group savings-credit performance/economic benefits

The weak performance of the farmer field schools in Ruhoma and Darajani can certainly be linked to unfilled expectations of many group members to obtain (immediate) economic benefits. While all of the three groups were told that group members are expected to volunteer, that no individual remuneration will be provided, and that the goal is that the collective harvest shall be distributed among all members, many participants in Ruhoma and Darajani quit the exercise due to the lack of material benefits. Development actors believed that group members would volunteer until they receive the benefits from the harvest, but as the examples in Ruhoma and Darajani show, this was not automatically the case. Many participants seemed to carry out a kind of cost-benefit analysis with regard to their participation in the collective group exercise. Many then concluded that participation was too much of a risk, as they contrasted the amount of benefits they will get from the exercise with the labour they are required to provide. Although the facilitator and project staff tried hard to convince farmers of the value of the knowledge/training they receive, for most this was just not enough to justify continuing participation.

People understood that the demonstration farm is about learning. But some people thought that if you return with some money for cooking oil, it would have been good. Now it was seen that they went once to Liwale, and then afterwards everyday they go there and they don't get anything. This broke their heart. This is why it has come to this situation. (R Interview 01)

And also if you farm, you won't be provided any help, money, to use for certain ways. It seems that we do this work like volunteers. There are no benefits at all. So the ones who started to farm, I haven't seen the benefits for them (M Interview 41)

In the situation of Ruhoma this became striking after group members accused the facilitator to delay the delivery of seeds. This caused many to give up on the project thinking that they will certainly end up with a bad harvest of maize. In their view to continue to provide free labour was counterproductive. In Darajani and Mihumo the Conservation Agriculture project was introduced in late November in 2011. For the group members of Darajani this delay meant that they would almost certainly get a bad harvest. This caused some to leave the group immediately and others not long after the first few meetings. While the delay affected both groups in Mihumo and Darajani, it was much more of a factor to the newly established Darajani group, because, in contrast to the group in Mihumo, they still had to find and prepare a plot for the demonstration farm before they could begin the exercises. The late start of the project caused severe labour constraints, as everybody was very busy working on his/her own fields, and disillusionment as the planting season had begun a long time ago. With time it became too risky for many to work on the collective farm with little prospects for success at the cost of losing time on their private fields. Once they realised that no money will be provided for their team efforts, most participants decided to leave.

We meet on the streets and ask: so did you go there today? I won't go today because of work at home. There is a lot of work on my farm, I can't do this work too. Better I quit. So every day some people quit and the number reduced in the group (M Interview 38)

Some people left before preparing the field. Some left when we were digging the holes. They started to leave. They thought that they would get money. (M Interview 27)

Alongside the requirement to provide labour for the group exercise, both groups were confronted with the challenge to purchase inputs for the demonstration plot. Although groups in Darajani and Mihumo were provided with some agricultural inputs they did not receive poison or pesticides to combat pests and diseases. This became a problem once the cowpeas on both plots got infested with pests and rats started to damage the maize. Group members requested assistance but the facilitator and LIMAS project staff argued that groups should cover these costs themselves. According to group members the acquisition of external inputs represented a challenge for the Darajani group as no group fund had been established and individual members hesitated to provide their own money. Moreover, no loans were provided to them, which could have helped them to acquire the inputs.

But now we always complain that we struggle with the rats. But they don't listen and we only started the group recently. Where do we get the money to buy poison? Or to spray the pesticide? We don't have the money. We just leave it. We don't have salt at home, do you take money to buy pesticide for the demonstration farm? (M Interview 40)

While these factors were also problematic to the Mihumo group, they were in a better position because they had the advantage of an already intact history of collective farming, functioning group management and working system, which enabled them to continue more easily with their collective exercise. Although group members also told me that they do not have the capacity to obtain the necessary inputs, they managed to get a loan from somebody to purchase and apply the pesticide on their farm.

8.3.2.2 Governance and leadership

Weak leadership and the lack of clear and agreed-upon rules definitely contributed to the high drop out rates in Darajani and Ruhoma. The chairman of the farmer field school group in Darajani did not follow up on the people who quit. He did not even bother to ask why they left the group. While he continued to run the activities required to keep the farm alive, he failed to sanction wrong behaviour and provide incentives for members to stay with him. At the same time participants too did not bother to excuse themselves for their absence. Every meeting less people than previously came to the demonstration plot, the others simply did not show up. At the end he was left with only three colleagues that stayed.

We did not follow up on those who left. But after we agreed that we would work on this day we visited all the people and said tomorrow is farming. Then tomorrow they did not come. We just left it. We planned another day. Every day we said: why do we follow up on them and they don't want? We knew that they don't want. We said if we go on certain days then it is only us who go. And there was nobody who came to ask how are you guys doing. People knew that they failed (M Interview 40)

[Andreas: Has the chairman come to you yet to ask you?] No. He just sees us as lazy people. He hasn't asked us yet. Maybe the others but not me. He hasn't called a meeting yet too (M Interview 38)

Good governance and leadership also includes effective communication channels where information can be disseminated to group members. Communication was a serious

problem. Information about group meetings, cancellations or changes, inputs and future plans was not always communicated to all group members. Sometimes group members obtained false information about the project, which in one case led to the dropout of one member in Darajani, because he thought that the group had collapsed already.

In the Mihumo group better governance and leadership contributed to the sustainability of the group. The leaders of the group were well respected and looked upon. Their instructions were generally followed without much questioning. The group drafted a constitution that penalises unexcused absence with 1,000 TShs (0.6 USD). While this penalty was generally not executed, the agreement seemed to contribute to the practice to excuse oneself if attendance is impossible. Some members told me that if people become too lazy they are requested to leave the group or they are excluded from any harvest.

8.3.2.3 Social capital among group members

The existing social capital among the members of the Mihumo group was a major factor contributing to the sustainability of their Conservation Agriculture project. The Mihumo group was established in 2005 in the context of an income-generating project related to crushing rocks. Since 2005, when they were more than 24 members, this group has also experienced many dropouts, corruption and governance problems. But when the Conservation Agriculture project arrived, this group had already gone through a selection process that resulted in the most committed members to remain. Among these members, who all are women except three men, a bond has been created. They enjoy a sense of togetherness and responsibility of the group's performance.

In this group we cooperate well. Many of them are women. We are only three men. The women have a sense of togetherness. Disputes are there. Everywhere with people you get conflicts. But not big ones. And they are very committed. We went there to clear the field and they all worked hard. They took axes and fell trees. But again we just clear the land. We don't have a donor. They work hard but we haven't got any financial assistance. (M Interview 35)

Among the group members in Darajani no strong social ties existed. One reason for that is related to the selection process of the group members. All members were selected at a village meeting that was organised by the agricultural extension officer, who served as the facilitator of the farmer field school. In this meeting the agricultural extension

officer presented the attendees with information about Conservation Agriculture as a new development intervention. He further requested volunteers to enlist themselves in farmer field schools to practice Conservation Agriculture. Apparently the village assembly was so badly attended that all present women had to join in order to maintain gender requirements in the group. Among them were women who had little babies to take care of. For them participation represented a challenge from the outset.

In Ruhoma the existing social capital among the group members may have had negative effects. In this village the members of the farmer field school were not asked to register at a public meeting. Instead, the facilitator, the TFCG agricultural extension officer, sent a letter to the village executive officer, requesting him to cooperate with the Mjumita Network leaders and the village council members to establish a farming group. Twenty farmers in total who live in different sub-villages were selected. Besides gender considerations no clear criteria was provided to the village leaders on the mode of the selection process. Under these circumstances, villagers argued that the group members were selected based on kinship and patronage networks. Villagers had expectations to gain benefits from this exercise, therefore they requested their ‘patrons’ to be included in the project. Farmers, who would have been more competent and motivated to join the group, were left behind and unable to participate.

People were chosen based on friendship etc. You take people close to you. To add them as group members. Because if take kind of people to a project of a group. You take him there because you think during the lessons he gets some small money. Maybe in future he will get some assistance (R Interview 06).

8.3.2.4 Social capital between the group members and the external facilitator

A crucial factor influencing the performance of the farmer field schools relates to the relationship between the group members and the external facilitator. The good performance of the Mihumo group was certainly also due to their long and healthy relationship with the agricultural extension officer (who served as the facilitator). Group members commented that he cares about them. They respected his agricultural knowledge and sense of responsibility. At the same time, the facilitator appreciated their commitment.

He facilitates us well. We follow him. Every Monday we are together. If he fails to come we know that he went to another farm. But we cooperate well and he comes and educates us. After he goes to a seminar he tells us about what he learnt. So we benefit from his knowledge. He teaches us on the farm. (M Interview 33)

AEO helped us well. The knowledge that I am talking about I got from the AEO. He came to the farm many times; until we planted all the crops (M Interview 32)

The same agricultural extension officer was portrayed very differently by the group members in Darajani. With time considerable problems emerged between him and the group. The dissatisfaction about the lack of economic benefits, the high drop out rate and little successes on the farm certainly contributed to the loss of motivation by the facilitator to lead and facilitate the group. Some group members expressed dissatisfaction with the entire mode of how this project was run and a sense of envy, because the facilitator was the one being taken to seminars and workshops. The ordinary group members were not taken to any study tours, and they felt the agricultural extension officer did not transfer the knowledge that he was provided with. Some did not accept the facilitator as their partner and immediate authority. In their view the donors should have come and cooperated with them directly. The fact that only limited inputs and no payments were provided caused anger and frustrations among some participants, who directed them towards the facilitator.

I think the AEOs have already gone to seminars three times. But we group members haven't gone. Only the chairman. But they haven't informed us about what did they learn. The AEO has returned but we did not get any training (M Interview 27)

The seminars should be given to the group members. Not to the AEO. Who does the work there? I see it as a great loss. I do the work and you get the salary. Is it possible? So the seminar must be given to the group members not to the AEO.
(M Interview 39)

At the same time the agricultural extension officer did not mobilise the group well enough. He failed to follow up on the high dropout, the challenges participants face and possible solutions. Participants generally mentioned the book as their source of knowledge rather than referring to the facilitator. Whenever the agricultural extension officer came to the demonstration farm his mode of learning resembled more of a one-way information exchange. From my participant observation there was not much

participatory learning, when group members of Darajani and the facilitator met on the plot. While he encouraged them to ask questions, group members often remained silent and followed what they were told. Some had the feeling that they were incapable to understand what the facilitator explained to them. They had difficulties in learning new knowledge. So they just copied the work of others without fully comprehending the purpose of the tasks.

In Ruhoma too there was conflict between the facilitator and the group members, which began with the issue of the delayed seeds. In the view of the facilitator, the failure of the maize was due to the lack of timely planting rather than availability of seeds. He refers to the lack of success as a consequence of 'silent protest', meaning that group members refuse to commit themselves to the group work due to personal responsibilities. Instead of officially leaving the group, they continue pretending to be interested and committed, but in reality they are not. Therefore, he talks of 'soft strike' or 'silent protest'.

They expected that when they attend training there must be payment again. So someone finds that already he is in the group. Going out abruptly is impossible. So what they are doing is just to have this so called soft strike 'ngomo baridi'. You know? It is a sort of strike but you cannot understand that one. They say, ja ja it is no problem we do this . If you come back you find that ah you know everybody was busy with his families. We are going to do this next week. Even sowing. Guys seeds are here. We plant this way and this way. Okay we are going to plant this very soon. If you go back, planting has not happened (R Interview 29)

Another issue with the facilitator caused more anger among some group members. One day the facilitator arrived at the demonstration farm in the evening to apply herbicide against a growing weed population. He had not informed any of the group members and was only accidentally seen by one of them. Group members felt he should have informed them in advance and taught them how to apply herbicides. His action frustrated them and left them wondering about the nature of cooperation. On the other hand, the facilitator told me that he was very busy at that time dealing with various issues in several villages. He decided to act quickly to prevent any further weed infestation without preparing and notifying the group in advance. He intended to discuss the application of pesticides with the group members on a later date.

8.3.3 Farmer field schools and perceptions of ‘Conservation Agriculture’⁴²

8.3.3.1 No- or minimum tillage

In the context of introducing Conservation Agriculture principles and practices the facilitators explained the negative effects of tilling the soil. Tillage causes the destruction of the soil ecosystem and should therefore be prevented, except in some areas (for rice cultivation for instance). Nevertheless, some farmer field school participants in Mihumo/Darajani and Ruhoma were of the opinion that ploughing the land would be useful and practiced more widely if they had the means (tractor, oxen) to do it. After removing the tree stumps from the fields, they would plough the land prior to the preparation of the planting pits. Despite the emphasis of the facilitators to promote zero or minimum tillage, these participants believed that ploughing should be done at least in some areas to combat weeds and to increase soil fertility. Especially to get rid of the nut grass weed (*Cyperus rotundus*), which is a very common problem in their areas, you need to till the soil. They also pointed at the fact that tilling the land is already being practiced in both villages but without tractor or animal draught. Farmers use a large hand hoe to turn the soil upside down and in Mihumo/Darajani some people got used to make ridges. So far only benefits have been observed from tilling the soil since fertility increases and weeds are removed. However, because this activity is very labour-intensive only wealthier families, who employ wage labourers, apply it to larger areas.

Some farmers wondered why they are being told to farm without the plough while in the rich countries this technology has been practiced for decades. They refer to the heavy machinery used in America, Europe and Australia that brings big profits to the farm owners. To them this advice of no or minimum tillage sounds a bit like a conspiracy theory to keep the African farmer poor.

8.3.3.2 Mulching

Generally all group members agreed to the advice that plant and crop residues should be left on the field to become mulch. Instead of burning them, as it has been done traditionally, farmers should practice mulching to increase soil fertility, to improve water retention, create humus and contribute to the protection of the forest. In fact the

⁴² I put Conservation Agriculture under quotation mark, because in the village this technology was introduced with other techniques and practices that are in fact unrelated to Conservation Agriculture. To increase readability I won't use the quotation marks in the text that follows.

mulching aspect was the most known and appreciated aspect of the Conservation Agriculture technology to the villagers. However, the development actors' perception that mulching was a new invention to the farmers should be questioned. Accounts of Ruhoma group members speak of lessons they learnt at school about maintaining permanent soil cover. They learnt about '*Mdandasio hifadhi*' or '*Mdandasio tambazi*' as the practice to leave crop residues on the ground and about '*Mdandasio mabaki*' as the practice to create compost in a separate place. Apparently at that time they only learnt about it in the classroom while now they see it being practiced on the (demonstration) farms.

Group members explained to me that traditionally it has been problematic to leave crop residues on the field, because people were seen to have 'dirty fields'. Farmers, who do not clean their field from the residues, have been regarded as lazy. To the ordinary farmer a clean seedbed represented the outcome of a good farm preparation. Therefore, to convince farmers to leave their residues on the field will have to address these cultural perceptions/attitudes. Another challenge is related to the fact that fire can easily cross from one field to the other. Even if one decides to do without fire, in an unfortunate situation his field could be burnt due to the practices of his neighbour. These instances have happened and are usually forgiven without further consideration.

Yes we used fire. We farm and we set fire. They said there are losses and benefits to using fire. We used fire because we thought the farm is dirty. We did not know that it was natural fertilizers.
(M Interview 33)

Another barrier to mulching in the past was related to wildlife. When crop residues are left on the field villagers fear the attraction of animals like rats, which then cause damage to their fields. They feed on crop residues and multiply in their numbers, which causes further distress in the next season, as they like to raid farms for the crop seeds during the time of planting.

In contrast to other areas in Tanzania mulching does not contribute to further conflicts between livestock keepers and farmers. In some areas the grazing of crop residues by livestock is a common practice. If farmers decided to exclude livestock keepers from accessing their fields this would cause serious disruptions to longstanding cultural practices and increase the challenges of obtaining livestock feed. In the Lindi region in

general there haven't been conflicts because of the vast lands available and the relatively few livestock keepers.

8.3.3.3 Crop rotation

Also the advice regarding crop rotation was theoretically welcomed by many of the group members. They agreed to its benefits with regard to soil fertility and combating pests and diseases. Among the ordinary villagers this practice was apparently not well known. Intercropping was practiced instead. Often when I questioned villagers on the value of crop rotation they explained to me that they do not have the capacity to manage several fields each having one or two crops only. To cultivate one acre of maize here, one acre of peas there and another acre of millet somewhere else would be impossible due to labour and capital constraints. When I replied that they could do crop rotation even on a one-acre big field, as they are practicing on the demonstration plot, they first seemed to be a bit surprised of this suggestion and then agreed to it.

And we learned that if you farm maize and it is harvested, don't go back there and plant maize again. You need to change. They told us about crop rotation. You put maize, you remove them, then you plant cow peas. If you continue many rotations you can plant tomatoes, and again maize, but don't just harvest maize and plant maize again (R Interview 17)

8.3.3.4 Output and costs

Many group members confirmed the development actors' view that Conservation Agriculture would lead to increased outputs. It would lead to extraordinary outcomes, nine times the current amount, according to some. At least theoretically, so they said, because so far the intervention has come too recently only with no clear benefits to show as of yet. It is clear that their positive judgement of Conservation Agriculture's improved productivity was influenced by an image of Conservation Agriculture as a package of modern agricultural techniques. This package includes productivity improving technology such as better planting and the usage of external inputs that is not directly related to the principles and practices of Conservation Agriculture. Yet to the group members Conservation Agriculture represented 'professional farming' at large, not a particular type of it. Given this situation it is unsurprising that group members spoke highly of its potential outputs.

If you are determined you get a big harvest. If people are determined they get a lot of food. For us CA is new. They say from one acre you can get 27 sacks of maize. You can't get this amount if you farm traditionally. You get 3 or 4 sacks. If you really follow the advice you can get (M Interview 36)

If you farm one acre you get lots of crops, because you farm professionally. This means for example using measurements, to dig holes using measurements, to put fertilizers, lime to reduce the acidity 'kali' of the soil. You put soil and fertilizers. After you cover it the crop will grow well. And the farm can be used for a long time. You put the residues aside and plant in the same holes. You put again fertilizers and continue to plant. You can use the farm for many years (M Interview 32)

Although villagers were generally optimistic about the productivity of 'conservation agriculture', they were also aware of the considerable costs that this strategy involved. In fact the costs for the external inputs were the single most discouraging factor to the ordinary villager to follow their colleagues on the demonstration plot. People complain that they do not have enough money; that they suffer from food shortage and struggle with daily life expenses. To expect that they now invest in expensive fertilizers and other inputs is unreasonable. On the other hand several group members told me that even the ordinary villager can invest in external inputs if he/she manages his/her budget well. If they start with a small area, something like $\frac{1}{4}$ of an acre, they should be capable of purchasing the inputs necessary to follow conservation agriculture.

CA is good and it results in a lot of crops. But here we are not able. The problem is: for CA you need to spend a lot. You need fertilizers. If you just plant you won't get anything. And here we use a lot of efforts to farm 4 or 5 acres but the harvests are little. With CA you can farm a small area if you use what is required then the income will be more compared to the big area. (M Interview 36)

The work is good. But one thing for us here is the availability of fertilizers. Because fertilizers are very expensive. So this farming will be difficult for farmers. If you comply to get fertilizers then this farming is very easy to outperform other farming (M Interview 44)

Besides of the affordability also the availability of external inputs constitutes a problem to some farmers, especially for those who live far away from the village centre. At certain times of the year, the planting season for instance, everything must be available on time within a short period. Given the inadequate communication and transportation

infrastructure farmers face big challenges in obtaining the inputs in due time. To this come the challenges of the right application of inputs on the field.

8.3.3.5 Workload

Unlike the development actors the group participants were a bit more cautious with the statement that Conservation Agriculture reduces the workload for the farmer. Because in both villages the technology was introduced in combination with the preparation of planting pits, most group members felt that the workload increases during the preparation of the field. To dig the holes based on exact measurements was something new and took much longer than their traditional practices. This impression was also widely spread among ordinary villagers, who had heard of the activities carried out in the demonstration plot. However, group members also remarked that with time this new labour task becomes easier and people will get used to the new mode of preparation. Because the holes can be used every year, the task of digging them doesn't have to be repeated after every harvest. The crucial aspect regarding labour requirements is the need to practice good time management, to prepare the field early and to plant and weed at the right times.

You know, they say it is a lot of work, because they haven't tried it yet. Also we, we said this is a lot of work. We dug the holes but we didn't know exactly. The importance is that you start early, then it is not so much work. But if you start when the rain has come already, then it is hard work. You need to start early. In June or July. You dig holes until October. (M Interview 26)

On the first day we thought to dig holes is hard work. But by now we think it is an easy work. Because we got used to it. And to weed is also easy. It is very easy. (M Interview 33)

Some group members claimed that weeding becomes less due to Conservation Agriculture. However, this was more the case because part of the Conservation Agriculture package related to planting in rows, which enabled the farmer to weed quicker between the crops. Because of the newness of the intervention in the village no profound experiences that could show a decrease in weeding requirements have been observed.

CA reduces the work for the farmer in terms of weeding if you cooperate well. With *kilimo sensa* you must weed three times. And

with CA you don't weed three times. And even if you do, the weeds won't be a lot (M Interview 35)

To weed is also easier because you follow the rows. The weeds stay in rows. And also to harvest is easier. You follow the rows. But our farming is very labour-intensive. (M Interview 36)

8.3.3.6 Conservation Agriculture protects the environment

Group members understood the contribution of Conservation Agriculture to forest protection. Given that under Conservation Agriculture farmers will be able to cultivate one piece of land continuously, they are no longer required to open up new fields in the forest. Although this assumption was widely spread and repeated regularly in meetings, farmer field school sessions and informal conversations, it does not hold in practice unless wider governance issues are addressed. This was also recognised by the TFCG who state in their agricultural development strategy for the Lindi region:

We recognise that in Lindi improving agricultural productivity will not necessarily lead to reduced deforestation. Interventions that aim to increase productivity by shifting to more cash crop production, mechanization and increased capital may result in an increase in deforestation. As such, this strategy should not be viewed in isolation but as part of the project's broader strategy to improve the sustainability of land and natural resources management within the project area. Other project initiatives, particularly village land use planning and community-based forest management, provide a critical 'policy context' within which this strategy will be implemented (TFCG, 2012 p. 6).

The notion that increased productivity may lead to agricultural expansion was observed during some of my interviews with group members. When asked about what they would do with the increased income from their harvests, some of them replied that they would invest in labour to expand their farms for crop cultivation. Farmers find themselves in a poverty-stricken situation where farming is their only source of income. It is easily understandable that substantial income increases would be invested in expanding agricultural production in order to meet future food and livelihood demands. The other suggested environmental benefits such as water and soil protection were all recognised by the group members. It made sense to them that mulching, crop rotation and minimum tillage contributes to a healthy soil ecosystem.

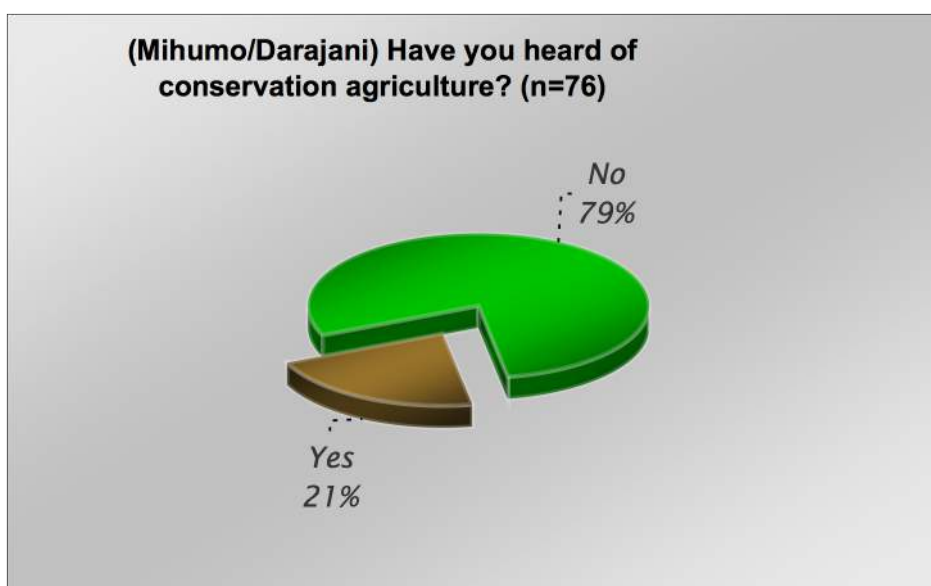
Proponents of Conservation Agriculture often highlight the reduced need for external inputs, which has positive effects on the environment. Less fertilizers, pesticides and herbicides means less energy and resources needed to produce these items. Contrary to these statements were the perceptions by the group members in Mihumo/Darajani who claimed that to practice Conservation Agriculture you rely a lot on external inputs. Fertilizers, lime, seeds, pesticides, organic manure need to be purchased to follow this agricultural strategy. It would indeed be interesting to compare the environmental destruction caused by contemporary forms of agriculture with the environmental costs produced when introducing Conservation Agriculture in the villages. Due to the fact that all external inputs are manufactured far away from the villages, some of them very far indeed, the environmental damage caused by the production and transportation could be substantial.

8.3.4 Spreading knowledge via farmer field schools to villagers

8.3.4.1 Awareness of Conservation Agriculture among villagers

The stated aim of the farmer field schools was to disseminate knowledge about Conservation Agriculture among all villagers. As a demonstration plot, the collective farm should serve as an example of the methods and benefits Conservation Agriculture apparently offers. Group members in both case-study sites were well aware of this expectation. They knew that the objective was to become teachers for their fellow villagers. Some had indeed high aspirations in their mission to educate their neighbours in ‘professional farming’. Despite this, no group succeeded in creating a wave of adoption of Conservation Agriculture principles and practices among all villagers. In fact the objective to spread information about this new technology was only met in Ruhoma but failed to materialise in Mihumo/Darajani. As Graph 8.1 below shows, the majority of the villagers (79%) in Mihumo/Darajani stated that they have not heard of conservation agriculture. This sounds surprising but I experienced it several times during my stay in the village that most ordinary farmers were unaware of Conservation Agriculture as a new technology to improve farming.

Graph 8.1 Awareness of Conservation Agriculture in Mihumo/Darajani



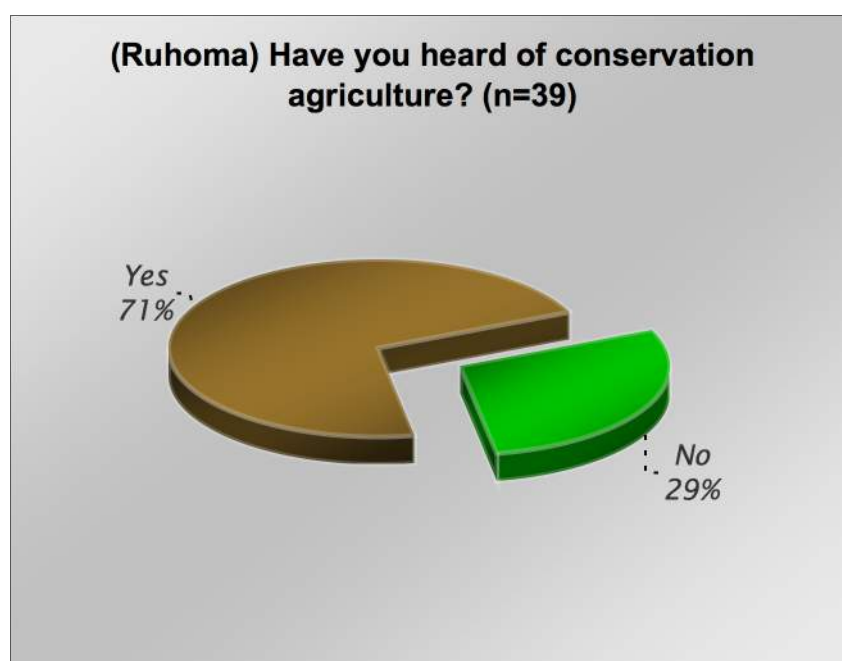
When I discussed this problem with members of the farmer field schools in Mihumo and Darajani their explanation was that people have not been mobilised as of yet. Especially for those residents who live outside of the village centre there have not been any well-planned strategies. While the group members did not have any concrete plans to mobilise their fellow villagers, the facilitator and LIMAS staff were in the process of preparing the farmer field day, which takes place every August. It was envisaged that on this day villagers would visit the demonstration plots in the wards to learn about their progress and challenges. In addition to the lack of mobilisation, people did not come by themselves to the demonstration plot to enquire about the intervention and its progress. Apparently, they did not see the value in doing so, at least not before the group had achieved any substantial benefits.

You can't force them. You can't force my husband. The lessons I get I need to teach him. We need to educate villagers. We need to take 10 to 15 people and teach them CA. But they don't agree. They think they waste time when they go there. If you have money then we come. If you don't have posho we don't have time to waste. Can you force him? (M Interview 31)

In Ruhoma most of the villagers (71%) knew about Conservation Agriculture (Graph 8.2). Ruhoma is a much smaller village compared to Mihumo/Darajani and therefore information spreads much more easily. In addition, much fewer people live on their farms and if so the distance from the farm to the village centre is short and regular visits

are common. At the same time, because of REDD+ and the trial payments, the residents were much more aware of all development interventions that were taking place. They were more involved in decision-making processes and project implementation. At the same time it seemed that especially in the beginning the TFCG put much efforts in initiating the project. Ten members of the group were taken to Liwale on a study tour before all of the twenty members received lessons during a three day long seminar in the village.

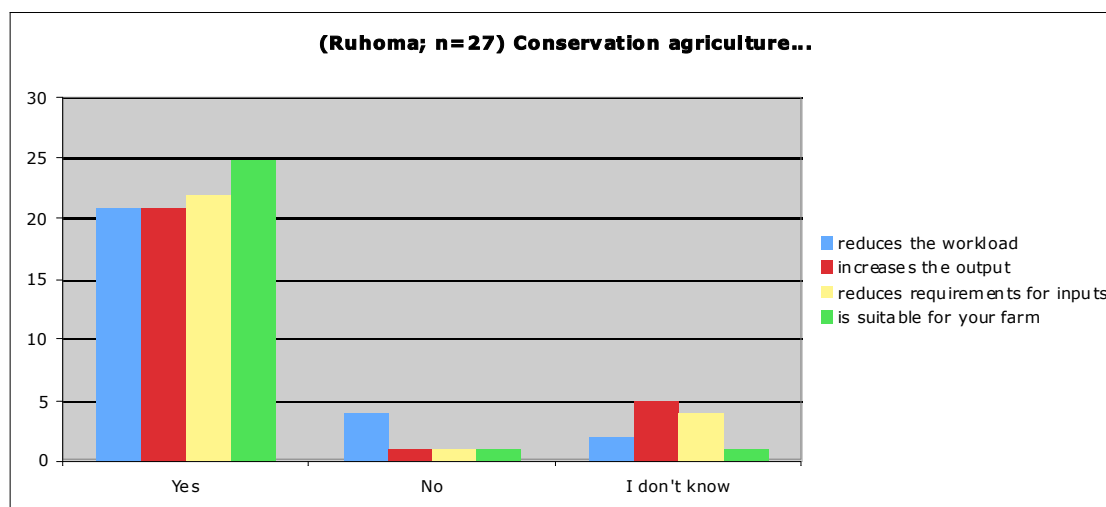
Graph 8.2 Awareness of Conservation Agriculture in Ruhoma



8.3.4.2 Perceptions of CA

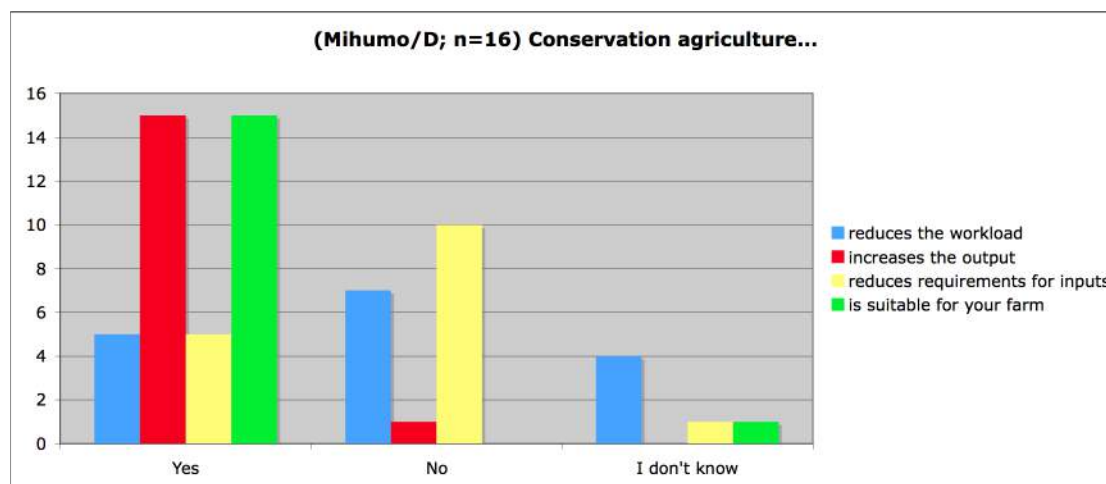
A follow up question was asked to those respondents, who stated that they have heard of Conservation Agriculture (Graph 8.3). They amounted to 16 and 27 people in Mihumo/Darajani and Ruhoma respectively. Among the respondents in Ruhoma a much more positive picture about Conservation Agriculture can be observed compared to respondents in Mihumo/Darajani. From the 27 respondents 21 and more believed that Conservation Agriculture reduces the workload, increases the output, reduces the requirements for inputs and is suitable for their farms.

Graph 8.3 Perceptions of Conservation Agriculture in Ruhoma



While the vast majority of the respondents in Mihumo/Darajani also believed that Conservation Agriculture increases the output and is suitable to their farm, 11 out of 16 were unsure or negated the assumption that it reduces the workload, and 11 out of 16 were unsure or negated the statement that it reduces the requirements for inputs (Graph 8.4). In their view Conservation Agriculture leads to better outputs but require more input of labour and capital to achieve that. The technology was associated with the purchase of modern inputs, predominantly seeds and fertilizers, because this happened at the demonstration plot. This was different to Ruhoma where group members were provided with modern seeds only. No fertilizers, no lime, no manure, etc. were provided. The herbicide, which the facilitator used, was purchased from his own money and was of little amount.

Graph 8.4 Perceptions of Conservation Agriculture in Mihumo/Darajani



8.4 Conclusion and discussion

In this chapter I examined development actors' objective of promoting 'Conservation Agriculture' in the study villages in order to reduce the pressure of agriculture on forestland. This chapter therefore primarily addresses research question 3: "How do REDD+ initiatives aim to address the drivers of land use change in Lindi, Tanzania?"

Indeed, it is logical for REDD+ projects to employ strategies that aim to address the primary drivers of land use change in order to protect forests. In Lindi, Tanzania, and across the whole of Sub-Saharan Africa, development actors have commonly promoted the view that in applying 'Conservation Agriculture' techniques, villagers can increase their agricultural outputs, thus pursuing economic development opportunities, without having to extend their fields further into forests. In this way, I argue, development actors introduce 'Conservation Agriculture' as a 'green technological' win-win solution to 'problems of environmental degradation'⁴³, rising global food demand and economic development. Their efforts mirror the activities of a broader coalition of international actors (donor agencies, governments, multilateral and non-governmental organisations) that actively promotes the 'sustainable intensification' of African agriculture based on modern farming methods and technological innovations (WDR, 2008; Meijer et al., 2014; Rijn et al., 2012). Our two REDD+ initiatives are a clear example of the promotion of technological innovation to solve social and environmental problems.

In analysing the various practices and techniques that development actors include under the name 'Conservation Agriculture' I argue that Conservation Agriculture is communicated to villagers in the form of an agricultural modernisation package that includes aspects that are *de facto* unrelated to this technology. This makes critical assessments over the costs and benefits of Conservation Agriculture to REDD+ initiatives difficult, if not impossible, leaving us with much uncertainty about the potential of this particular technology to address the drivers of land use change in Sub-Saharan Africa (cf. Giller et al., 2009)

I then examined the performance of farmer field schools, which were established in both villages to disseminate knowledge of Conservation Agriculture in a participatory

⁴³ I put this under quotation marks as it depends on the beholder whether certain land use changes are problematic and to be referred to as environmental degradation (see also chapter 5).

and community-driven way to villagers. Farmer field schools are a very popular extension approach to promote agricultural innovations in rural Africa. They are seen to be more effective and cheaper than traditional extension strategies of governments. The key strategies of farmer field schools are to change the behaviour of farmers through participatory group dialogue and collaborative learning on collective field sites (Islam et al., 2011; Meijer et al., 2014; Wellard et al., 2013).

The findings of this chapter illustrated the limited success of this extension approach and I particularly highlight the importance of socio-economic factors and group dynamics in shaping the knowledge, perceptions and attitudes by villagers towards Conservation Agriculture (Meijer et al., 2014). Drawing on insights from Islam et al. (2011) I specifically discussed how economic benefits, governance and leadership, social capital among group members and social capital between group members and the facilitator considerably influenced the performance and outcome of this extension approach in my case study sites.

Many group members of the Conservation Agriculture teams in both villages decided to quit the exercise because of insufficient economic benefits from participation. They found it problematic to provide voluntary labour to the group under a situation of great uncertainty and risk over the benefits of this technology. Because of operational problems (delay in preparation of the farm; delay of seeds, etc) they questioned the prospect of a reasonable harvest that would have covered the costs invested in the exercise. Furthermore, the lack of financial resources and access to credit facilitates made looking after the demonstration farms difficult. The importance given by villagers to economic benefits, risk and uncertainty in the adoption of new agricultural innovations is a common feature outlined by many studies that examine the uptake of a new technology (Pattanayak et al., 2003; Jerneck and Olsson, 2014). Especially for food insecure farmers it becomes a real challenge to spend time and labour on something with uncertain benefits (Jerneck and Olson, 2014). In this context resource endowments play a critical role. For better-off farmers it could be easier to venture into new agricultural innovations if they expect economic prospects in return (Meijer et al., 2014; Kristjanson et al., 2012).

A related key factor here is also the ability of accessing credit (Daniel et al., 2012; Bullock et al., 2013). As illustrated in my chapter, the lack of credit facilities

represented an important challenge to one of the Conservation Agriculture groups. Moreover, it represents a considerable obstacle to many of the rural villagers in Lindi, Tanzania. Especially poorer farmers struggle with obtaining credit, which would help them to invest in innovation to increase agricultural production (Daniel et al., 2012).

Another key factor impeding the success of the farmer field school approach to promote the uptake of Conservation Agriculture related to weak governance and leadership in two of the groups. Farmer field schools can be compared with the management of common property resources, where collective action leads to increased collective benefits (Dietz et al., 2003). From common property theory we learnt that locally devised rules, communication, monitoring, enforcement and sanctioning are critical factors in facilitating compliance (Ostrom, 1990; Ostrom et al., 1999; Gibson et al., 2005). The observations presented in this chapter point at similar findings. In one group where local rules were established, participation monitored, information exchanged and non-attendance sanctioned the performance was considerably better than in two other groups, where none of these mechanisms had been followed properly. Especially the lack of effective communication negatively impacted on group performance. Leeuwis and Aarts (2011, p. 32) argue that communication is critical in community-based extension approaches in order to create spaces for change that enable innovation. They distinguish between professional deliberate communication and everyday communicative exchanges that are both important to exchange meanings and restructure social relationships. According to their insights the facilitator of the farmer field schools in our villages should apply a range of “process facilitation strategies” to facilitate network building, supporting social learning and dealing with conflicts and power struggles.

This would build forms of social capital that would positively influence collective action (Rijn et al., 2012; Dietz et al., 2003; Gibson et al., 2005). In my analysis I illustrated the important role social capital within the groups and between groups and facilitators had on information exchange, collaboration and the performance of groups. Similar results have been reported by Wellard et al. (2013), who suggest that cooperation between the extension worker and the groups can be improved when the extension worker is selected by the community to ensure wide ownership, poorer members are included in the groups and development actors pursue a dual focus on technologies and community development. However, research and my chapter also

highlighted that social capital can have negative results too, when, for instance, farmer field groups limit benefits and information exchange within a closed networks of kinship and patronage (Rijn et al., 2012).

In the third and last section of this chapter villagers' knowledge and perceptions of Conservation Agriculture were discussed. The role of knowledge, perceptions and attitudes in the decision-making process of adopting new agricultural innovations has been recently emphasised by Meijer et al. (2014) as particularly important. Based on the knowledge farmers obtain of a new technology, they develop certain perceptions of it, which together form attitudes towards it. Villagers' knowledge, perceptions and attitudes in turn are shaped by access to information, exchange, training, learning opportunities and extension services as well as extrinsic variables such as the characteristics of the farmer, characteristics of the external environment and characteristics of the innovation (Meijer et al., 2014).

From my qualitative and quantitative data it becomes apparent that villagers do not automatically support or agree to the knowledge provided by the facilitator and development actors about Conservation Agriculture. For instance, minimum or zero-tilling the soil, which is a key aspect of Conservation Agriculture, remains widely questioned by villagers because of their own knowledge and perceptions of this particular practice. The aspect of mulching faces problems with long standing attitudes of villagers as they describe fields, where residues are left, as 'dirty fields and the work of lazy farmers'. The perceptions of villagers about the economic benefits were considerably shaped by the knowledge given by development actors and their examples from Zambia and not from their own experience of the technology in their individual settings.

All in all, this chapter illustrated how Conservation Agriculture and farmer field schools, which have been promoted as the win-win technical solution to support REDD+ and agricultural development, face significant socio-economic and political challenges on the ground (cf. Baudron et al., 2012). These findings are important as agricultural development, which is the primary driver of land use change in the villages, is tightly linked to villagers' possibilities to protect forestland. By looking at villagers' knowledge and perceptions of Conservation Agriculture in this chapter I emphasised the role of socio-economic and political processes that shape the uptake of this agricultural

innovation. As we know, the uptake of a new technology or practice is a complex, complicated and co-evolutionary process (Meijer et al., 2014; Leeuwis and Aarts, 2011; Klerkx et al., 2012) that depends on multiple factors and a range of processes such as knowing, learning, experimenting, adapting and so forth. My chapter confirms this and illustrated that villagers' uptake of Conservation Agriculture does not happen over night, but instead could happen in the form of incremental and incomplete adoption (Meijer et al., 2014).

Chapter 9: Conclusions

9.1 Introduction

UN-REDD provides an antidote to those who think that international climate negotiations are failing to bear fruit.⁴⁴

(Achim Steiner, Executive Director of the United Nations Environment Programme)

Amid cheers and applause negotiators announced the completion of the REDD+ program design. We now have a complete definition of what the program is, how it works and how participants will be paid. This program is a fabulous example [of] the U.N. climate process in action. Parties came together, worked through the tough spots and negotiated a program that will effectively address climate change. REDD+ will save forests, benefit communities and reduce emissions.⁴⁵

(Pipa Elias, REDD+ and agricultural expert for the Union of Concerned Scientists)

The above quotes echo the widespread praise for the alleged success achieved on REDD+ at the latest Conference of the Parties under the United Nations Framework Convention on Climate Change in Warsaw late 2013. At this summit a package of no fewer than seven decisions was produced, which has become known as the “Warsaw Framework on REDD-plus”. The efforts by the negotiators to finalise the rules for REDD+ programmes and projects across the developing world were celebrated as the “signature achievement” of the conference that drew to a close on 23 November 2013 (BBC, 2013b).

The achievements made on REDD+ apparently rescued an otherwise failed conference that was broadly criticised for its extraordinary lack of progress and ambitions (Economist, 2013). Only two days before the end of the negotiations more than 800 people from non-governmental organisations, social movements, trade unions, indigenous people associations and other groups walked out from the talks, withdrawing in protest from a conference that was delivering “virtually nothing” (Guardian, 2013). Hosted at a time when the Philippines were ravaged by the devastating Typhoon

⁴⁴ <http://allafrica.com/stories/201311250884.html>

⁴⁵ <http://www.rtcc.org/2013/11/22/warsaw-climate-talks-final-day-live-blog/>

Haiyan, illustrating just how much damage extreme weather events can have on developing countries, the conference's lack of agreement on how to tackle rising greenhouse gas emissions caused widespread anger and frustrations (ibid).

Amidst conflicts, blaming games and deadlocks over future commitments, the consensus and dedication that international negotiators from all over the world showed in taking REDD+ forward is therefore a clear sign of making the conservation, protection and sustainable use of forests a key pillar in future climate agreements. This ambition was further illustrated by the decisions of the governments of UK, US, Norway and Germany to transfer 280m USD to the World Bank's BioCarbon fund to promote the sustainable use of land in developing countries (Guardian, 2013).

The outcome of the latest COP takes us further into a situation where governments across the world push forward a certain approach to forest and land management in the developing South under the banner of climate change mitigation efforts. The governments are joined by a large network of global players, consisting of private companies, international finance institutions, non-governmental organisations and research institutions, who all show their willingness, capacity and financial readiness to protect forests as they function as the "world's lungs" in the fight of global climate change.

This dissertation sought to contribute to the debates regarding REDD+ by critically examining how this globally initiated and promoted approach of forest protection plays out at the most local level in rural Southeastern Tanzania. As with any other global policy or development intervention, the on-the-ground implementation of REDD+ initiatives confronts local realities and contexts that are shaped by specific and historically produced social relations over forests and people. In launching more and more REDD+ initiatives across the South, REDD+ proponents set out to change these socio-natural relations. This makes REDD+ a governance project rather than a simple mechanism of transferring money to the South for forest carbon protection and enhancement (Corbera and Schroeder, 2011).

In the pursuit of forest protection for global climate mitigation benefits, REDD+ initiatives aim to transform local forest governance and land use strategies away from business-as-usual towards conservation friendly practices. In doing so, however, they

confront counter processes that have the power significantly to shape REDD+ initiatives on the ground, making them almost incognizable from their initial design (cf. McAfee and Shapiro, 2010). The interactions between REDD+ initiatives and counter processes determine the design and outcome of the REDD+ governance project and consequently how costs and benefits to livelihoods are distributed among different stakeholders. Against this background my dissertation aimed specifically to research how REDD+ initiatives interact with local forest governance and land use strategies, and how this affects local livelihoods, by asking the following research questions in the context of Lindi, Tanzania.

Research question 1: How do REDD+ initiatives interact with local livelihood strategies in Lindi, Tanzania?

Research question 2: How do REDD+ initiatives interact with local forest governance in Lindi, Tanzania?

Research question 3: How do REDD+ initiatives aim to address the drivers of land use change in Lindi, Tanzania?

I also posed a fourth research question that builds on the findings from the previous three:

Research question 4: What is the significance of my findings about REDD+ initiatives in Lindi, Tanzania to broader debates on development theory and practice?

I will now present a summary of my thesis and its main findings in relation to my research questions outlined above.

9.2 Thesis summary and main findings

After an introductory chapter I outline the theoretical underpinnings of my research in chapter two. In my theoretical framework I first present and then critique the mainstream conceptualisation of REDD+ as a form of payments for ecosystem services with insights from more critical bodies of literature on neoliberalism and the neoliberalisation of nature. I draw on debates within international development and

neoliberalisation of nature to argue that REDD+ should be seen as processes promoting 'inclusive' neoliberal conservation. I decided to place REDD+ and payments for ecosystem services into a wider discussion of neoliberalism and its relationship to nature (conservation) to argue that it is but one of many prominent examples of how the protection and conservation of nature has undergone dramatic shifts in recent decades, which have been met with much scepticism by different scholars working in the field of conservation (Büscher et al., 2012; Brockington et al., 2008; Roth and Dressler, 2012; Fletcher, 2010; McAfee and Shapiro, 2010).

In discussing neoliberalisation of nature and conservation in depth, I offered important insights into the underlying processes of REDD+ initiatives, thereby addressing research questions two, three and four. In addition I emphasised that outcomes are generally mixed resulting in losers and winners, which provided us with answers to research question one and four. Research on neoliberal conservation has produced many insights into the most dominant processes that can be observed when programmes such as REDD+ meet local contexts. For instance, my theoretical chapter emphasises the need to think of REDD+ projects not as 'things' but as processes of neoliberalisations (thus my preference to talk of REDD+ initiatives) that never emerge on a *tabula rasa* or on a blank sheet, which means that they are inevitably incomplete, contradictory, unevenly realised and shaped by contextual factors and place-based processes (Peck and Theodore, 2012; Castree, 2008). This is important as it explains the great variety we see of REDD+ initiatives across the globe, and even across single villages, despite their common ideological point of departure. At the same time I pointed out that despite this variegated nature of REDD+ initiatives we can identify extra-local or almost universal elements among them, which, drawing on insights from neoliberal conservation, I argued are: win-win rhetoric, reregulation and territorialisations, commodification of nature, hybrid governance and eco-subjectivities (Igoe and Brockington, 2007).

Recognising some of the limitations within the debates of neoliberalisation of nature I decided to draw on international development literature to make the reader aware of the 'inclusive' turn of neoliberalism (Craig and Porter, 2006) and to highlight important findings from current research into participatory approaches and the politics of development. This was useful as it allowed me to view seemingly progressive elements of REDD+, such as local participation, tenure security, good governance, and democracy, as part and parcel of the 'inclusive' neoliberalisation process. These

welcome features do not refute the neoliberal character of REDD+ initiatives; instead they illustrate their 21st century character as observed also in other areas (Ballard, 2013; Hickey, 2010; Craig and Porter, 2006). Bringing these two bodies of literature together helped me to shed light on the opportunities and constraints of participatory approaches (Hickey and Mohan, 2005) under neoliberalism, and recognise the potential spaces of empowerment and the role of power struggles and politics (Hickey, 2008) entailed in 'inclusive' neoliberal conservation.

To strengthen my theoretical framework of 'inclusive' neoliberal conservation and to make it even more suitable to my case study context, I incorporated key insights from the literature on common property theory, the politics of decentralisation of natural resource management and the uptake of agricultural innovations. These bodies of thoughts helped me better to understand some of the key outcomes of my analysis of REDD+ in Lindi, Tanzania.

For data collection I decided to make use of ethnography as my overall research approach within a critical realist position to science. I considered an ethnographic approach to be ideal to study how REDD+ initiatives interact with livelihoods, governance and land use drivers in Lindi, Tanzania. Ethnography with its focus on close and detailed observations of people and actions in their 'natural settings' (Atkinson and Hammersley, 2007) allowed me to conduct an in-depth analysis of how livelihoods, power and politics in two villages in Lindi Region of Tanzania shape the emergence of REDD+, always taking into account people's own views and opinions. In concentrating on two case study sites only, I was able to employ a range of qualitative (participant observation, ethnographic and semi-structured interviews, focus group discussion and document analysis) and quantitative methods (household survey) over a period of 11 months, which resulted in rich and meaningful answers to my research questions.

Within this overall ethnographic strategy I employed a mixed-methods approach to triangulate findings and to harness the strength of each method, which contributed to more reliable, complete and robust findings (Creswell, 2008). In researching the emergence of REDD+ and its processes of neoliberalisation in an ethnographic fashion, I could maintain the theoretical focus outlined above while simultaneously remaining flexible and open to all kinds of data generated in the field. This openness resulted in many surprises during the fieldwork of which one led to a whole chapter on

Conservation Agriculture. However, ethnography is not without challenges and I discussed my personal experience of them and the coping strategies employed in that chapter. To strengthen the validity and reliability of my ethnographic findings I also openly discussed issues of reflexivity and ethics to ensure transparency throughout the research process.

I explicitly begin to answer my research questions in chapter four, which presents information on the livelihoods of villagers in the two case study sites, largely drawing on the results from my quantitative survey. This chapter therefore contributes to answering research question 1: “How do REDD+ initiatives interact with local livelihood strategies in Lindi, Tanzania?” From this chapter we learn that Lindi Region of Tanzania belongs to the poorest places in the world when we consider the cash incomes generated over a year. In general there is widespread poverty in the region, which expresses itself in poor infrastructure (water, electricity, houses), low consumption rates, food insecurity, lack of assets, low education levels, low income levels and low levels of mechanization in agriculture. At the same time my data illustrate the existence of inequalities in these seemingly homogenous villages in Southeastern Tanzania. In both villages wealthy households obtain several times the annual cash income of poorer households. When we take a closer look at the sources of annual cash incomes my data show that crop production remains the main income-generating activity across all wealth classes, but off-farm income sources such as business, services, craftsmanship and off-farm wage labour are of great importance to generating wealth. Livelihood diversification is an important trend in both villages, whereby wealthy households managed better to diversify their incomes, which makes them less dependent on the production of crops on land for obtaining cash. The poor, in contrast, derive much of their income from farm-related sources, which makes them heavily dependent on fertile land and agricultural labour markets for generating money.

Against this background of rural poverty and inequality I argue that REDD+ initiatives must grapple with the urgent need for inclusive economic development if they want to gain popular support among the rural population. In other words they must offer equitable and tangible material benefits to villagers, otherwise their risk of contributing to social and environmental injustices and human impoverishment are real and potent. As part of the need to promote inclusive economic development, it will be important for REDD+ interventions to address local inequality in the villages. In saying so I join

Andersson and Agrawal (2011) who demonstrated that economic inequalities within and between groups negatively affect forest conditions. Given my findings about the importance of off-farm livelihood activities to generating wealth in the village, it may not be enough for REDD+ to focus on strong collective forest governance institutions as suggested by Andersson and Agrawal (2011). Off-farm income sources have been crucial for wealthy households to generate wealth, whereas money is likely to flow back and forth between off- and on-farm activities. In this context, I argue that both farm and off-farm livelihood strategies must be considered by REDD+ interventions to make wealth distribution more equal, and forest conservation more equitable in the villages.

Despite the visible trend of livelihood diversification in both villages, crop sales remain by far the single most important cash source. The production and sale of crops, as the most important livelihood activity for villagers in Lindi Region, manifests the continuous dependence on land for human and economic development. This dependence cannot be simply described as ‘shifting cultivation’ as project proponents do in the case study sites. Instead, I argue farmers practice a more complex form of agriculture that makes use of fallow rotation, and intensive cultivation of temporary and permanent farms. Seeing livelihood practices for what they are is crucial to understand local responses to conservation and development interventions, including Conservation Agriculture as discussed in chapter eight.

In examining crop production in the villages I could also show that land use is influenced by the type of integration of villagers into the global economy, expressed in what cash crops they produce for international markets. Because villagers in Mihumo/Darajani concentrate on cashew nuts, which grow on perennial trees, as their main cash crops, they cultivate a much larger extent of permanent farms compared to farmers in Ruhoma, who focus on sesame production on temporary farms to generate cash income. This demonstrates that seemingly remote places such as villages in Lindi Tanzania are firmly integrated into a globalised world of commodity production and exchange, which influences the local livelihood choices of rural farmers. As REDD+ initiatives aim to introduce another commodity – the carbon credit – into this web of connections they further complicate land use options on the ground. In competition over fertile village land REDD+ initiatives are but one among many global and local processes targeting local land use strategies of African farmers.

The proposition that REDD+ must consider how global and local processes shape livelihood strategies is widely acknowledged (Corbera and Schroeder, 2011; Angelsen, 2009). On the basis of my analysis I add to it and argue that REDD+ initiatives must go even further and consider how different wealth groups within the village use land for their livelihoods, if a broad consensus is to be established. As wealth shapes how village land is used for the production of crops (in both villages wealthy groups cultivate larger temporary and permanent farms than their fellow residents, they keep less land fallow compared to poorer and middle-income households, and they generate higher values per hectare farmland), the opportunity costs of alternative land uses to forest protection differ between wealth groups in the village, which influences the costs and benefits of REDD+ to them.

Building on the insights from chapter four, I set out to examine the material and discursive effects of REDD+ in chapter five. The fifth chapter therefore contributes to answering research question 1 “How do REDD+ initiatives interact with local livelihood strategies in Lindi, Tanzania?” and partly research question 3 “How do REDD+ initiatives aim to address the drivers of land use change in Lindi, Tanzania?” The chapter showed that villagers from the two case study sites experienced forest protection very differently. While in Ruhoma villagers generally felt that they benefited both collectively and individually from the protection of the forest, the opposite is true in Mihumo/Darajani. I explained this divergence by drawing on interviews with villagers, who illustrate the lack of material benefits residents of Mihumo/Darajani obtained from the forest reserve. Although expectations of future carbon payments in combination with timber harvesting were created among residents in Mihumo/Darajani, participatory carbon assessment activities were still ongoing and therefore no clear information or plan existed about the amount, modalities or possible date of payments. In contrast, the disbursement of REDD+ trial payments in addition to other non-monetary benefits in Ruhoma resulted in a sense of happiness about the decision to protect the forest. The large sum distributed to individuals contributed considerably to the annual cash income of poor and middle-income households making up 74% and 39% of their mean cash income per adult equivalent respectively.

This contrasting experience contributed to villagers’ oppositional perceptions over the effectiveness of conservation and the condition of the forest in the villages. While the benefits received in Ruhoma contributed to positive attitudes towards conservation, the

population in Mihumo/Darajani expressed general dissatisfaction, frustration and disappointment about the forest reserve. These findings re-emphasise my argument that REDD+ must offer tangible and equitable material benefits to communities and to livelihoods of villagers directly if popular support and legitimacy for forest protection is to be achieved. They further show that carbon payments, if distributed equitably, could be very significant to poorer and middle-income groups of rural populations. The payments were largely spent on food, alongside clothes, because when they were disbursed in February many villagers found themselves in a situation of food shortage. As February is usually a month characterised by low or no cash savings of villagers, the disbursement of the payments made money worth a lot to villagers at that time. This illustrates how not only the amount but also the time of payment is important to villagers. As poor people depend much on casual farm labour for supplementary income (see chapter 4), the significant contribution of trial payments to their incomes may assist them in applying their labour power on their own farm as opposed to selling it to other farmers. This could have positive effects towards addressing local inequality and hence forest protection.

While project proponents and village leaders in Ruhoma ensured an equitable and transparent distribution of REDD+ trial payments, other benefits were unequally distributed according to survey respondents. It seems that wealthier village groups could benefit more from additional benefits and development opportunities from REDD+ through workshops, allowances, permits and participation in activities. More than 80% of survey respondents in Ruhoma felt that village leaders, committee members or other few people benefited more than the rest of the community from the protection of the forest. This result points at the considerable challenge of preventing elite capture within communities as some benefits will automatically benefit some residents while excluding others.

The fact that REDD+ trial payments were largely spent on food demonstrates the existence of food insecurity as a real problem to villagers. This also explains why villagers saw trade-offs of REDD+ primarily linked to food production. Some villagers argued that protecting the fertile forested land makes farming more difficult as they expect lower returns and more damage from wildlife. Fears over economic and physical displacement were prevalent in both villages and forms of displacement occurred on an individual basis in Ruhoma.

Although carbon payments are the primary means to balance trade-offs inherent in any REDD+ project, some villagers criticised them for their low amounts and for the uncertainty that remains over their future existence. Despite the fact that trial payments were calculated on the basis of optimistic assumptions about potential future carbon payments (conservation success and carbon price), my own calculations of the opportunity costs showed that poor, middle and wealthy households forgo benefits of USD 21, USD 350 and USD 572 respectively per hectare protected forestland. Hence, future carbon payments are unlikely to cover the opportunity costs particularly of medium and wealthy village groups. While they could cover the opportunity costs of poor households, they only do so as long as they remain poor. Once households become wealthier their opportunity costs increase and forest carbon payments become less beneficial.

Although one could argue that in monetary terms villagers lose more from the protection of forest land than they gain from REDD+ trial payments, many villagers did not perceive these losses as such with the exception of a few who complained about the smallness of the sum. While this could be the case because of the nature of payments, as forest carbon money represents kind of immediate free cash with the consequences only to be felt later, I argued that development actors' way of introducing and promoting REDD+ played a significant role too.

Especially given that both villages have not actually succeeded in producing and selling carbon credits to buyers, making the REDD+ initiatives and their material benefits dependent on state and donor funding from European governments, it is pertinent to ask why villagers have decided to set aside considerable village land under forest reserves. On the basis of qualitative interviews, document analysis and ethnographic data I argued that state and non-state actors used a combination of crisis narratives and green development discourse in the villages to present the commodification of forest carbon as the optimal way of generating economic and environmental benefits to rural residents. The clearing of forests for agricultural purposes was presented as environmentally destructive although in Mihumo/Darajani, for instance, no concrete data on land use change was available in the village. I therefore argue that REDD+ initiatives come with discursive strategies to persuade villagers to protect considerable areas of village forestland. Furthermore, I argue that, at least in the short run, discursive

effects of REDD+ can be as decisive as material effects to influence villagers' livelihood decisions and land use.

Closely linked to the received benefits and costs of REDD+ initiatives are the politics over the establishment of the village land forest reserves, which I examined in chapter six. This chapter contributed to answering research question 2: "How do REDD+ initiatives interact with local forest governance in Lindi, Tanzania?" I argued that the establishment of community-based forest management, specifically the demarcation of village and forested land, entail processes of territorialisation, which are technically complicated and deeply embedded in local politics and power struggles. I illustrated how specifically in Mihumo/Darajani the process of demarcating forest and village boundaries was technically demanding, politically contested and villagers continuously depended on external actors to take the process forward, who themselves were insufficiently resourced and coordinated. Ultimately, this resulted in a long period of incomplete territorialisation: although villagers received legal ownership over their forest territory, authority over the use and control was never formally transferred due to missing approved forest management plans and bylaws. Moreover, because of local power struggles and politics over votes the village was recently divided resulting in previously conducted territorialisation processes to become almost invalid.

In the second section I discuss the territorialisation process in Ruhoma that was characterised by much more success. Despite this it still faced challenges with inter-village conflicts over forest and village land boundaries. Because of the problematic way previous boundaries were drawn, the implementation of REDD+ was not a smooth process. As REDD+ interventions revalued forested land and villages were offered money for protecting their forests, conflicts emerged over the exact size and location of boundaries of village forests. In drawing on insights from Ruhoma I showed how the process of boundary demarcation changes the relations between people as previously tolerated customary rules of governance became contested.

The findings from chapter six highlight that REDD+ initiatives attempt to change local forest governance in the villages towards formalised community-based conservation. In doing so they introduce territorialisation processes, which are shaped by state and non-state actors. In implementing territorialisation social and historical factors play an important role. Territorialisation builds on existing notions of territories and boundaries

that have developed over time. In both villages the villagization programmes of the early 1970s played a big role in creating village lands, but since then population growth and new village establishments contributed to changing boundaries. This shows that forests are dynamic landscapes where people continue to move around. The territorialisation process under REDD+ transforms the landscape into something much more static, strengthening the idea of assigning villages and livelihoods to specific places with clear boundaries. While this may contribute to forest protection, it is also problematic as it reduces flexibility of movement and causes hardship to some, particularly less powerful, farmers.

In analysing the territorialisation processes in both villages my research illustrated that forest- and village land is valuable to local stakeholders not only for its economic benefits, but also as a political leverage in struggles over power. The struggles between villages and district over the landscape and the people it inhabits make the transfer of power contested on various grounds (beyond natural resource governance). This neatly illustrates how the commodification of forest carbon is embedded in local politics and power struggles that considerably shape its emergence and outcomes. The seemingly technical activities, concerning the formalisation of village and forest boundaries and participatory land use planning, are in fact inherently political – they shape who gets to access what (Berry, 2009).

At the same time I argue that some of the technical activities of REDD+ in the villages resulted in positive change including much attention and international efforts to take the decentralisation process forward. It has assisted both villages to express their claims over the authority of village and forestland, helped to address boundary conflicts, organised village land use planning exercises, financed forest inventories, etc. Although much more effort and political will are required to meet villagers' development needs, the focus of REDD+ on community based forest management has undoubtedly the potential to contribute positively to the empowerment of local communities.

In chapter seven I examined how villagers actually practiced community based forest management. It therefore contributes to answering research question 2: How do REDD+ initiatives interact with local forest governance in Lindi, Tanzania?" In both villages similar community-based forest management institutions were drafted by development actors, with the participation of village committees, to replace customary governance

arrangements. In introducing ideas of 'good governance' via these new institutions, rights, powers and responsibilities over forest access and use were redistributed and transferred to formal village institutions, assuming that the separation of powers under democratic governance would lead to more equitable, efficient and effective conservation and development outcomes. In the course of introducing these institutions open-access forests were transformed to common property; new notions of community insiders and outsiders, legal and illegal forest users and uses were created and formalised through a sophisticated 'permits' system. Non-residents suddenly found themselves outside of the 'community', eligible only to limited forest uses and this often in return of payments. Village residents confronted new complex rules and regulations that meticulously define and rationalise every prohibited and permitted activity in the forest reserve.

In analysing actual practices of forest governance in the two villages I illustrate how the drafted institutions were incompletely adopted by villagers. When examining villagers' knowledge of the institutions I found out that particularly in Mihumo/Darajani most villagers did not know the breadth and depth of the governance framework. This relates to the problem of effective information dissemination in a rural setting of Tanzania. Nevertheless, in both villages the majority of villagers regard themselves as the owners and managers of the protected forest, which means that the community has taken on the most foundational elements of community-based forest management.

Villagers in Mihumo/Darajani generally thought of the forest reserve as a closed-off area. Interviews attested that entering the reserve would lead to arrest by the village natural resource committee. The committee therefore took on the role of protecting the forest while at the same time issuing permits for forested land outside the forest. It appears that the committee in Mihumo/Darajani focussed on two tasks – issuing permits and conducting patrols – to accrue money for, at least partly, individual benefits. While forest management plans and bylaws prescribe rigorous recordkeeping to committee members, much confusion prevailed in Mihumo/Darajani over the income and expenses. The confusion over the amount of fines, stories about the handling of illegal forest users and secrecy over the income and expenses of the committee provide evidence to possible corruption.

In Ruhoma, in contrast, recent REDD+ interventions resulted in regular patrolling and more transparent forest management practices. The money from REDD+ certainly contributed to that as payments were set aside for the activities of committee members. It seems that they felt less of a need to obtain money by fraud. In a context of severe lack of resources in Mihumo/Darajani, due to the restrictions imposed by the district council, the implementation of community-based forest management institutions was challenging from the beginning and ultimately led to personal enrichment. For that matter the materiality of the forest plays an important role too. The smaller forest size and fewer dangerous animals in Ruhoma made forest management activities much easier than in the vast landscape of Mihumo/Darajani.

In chapter eight I examined efforts by development actors to promote ‘Conservation Agriculture’ in the study villages in order to reduce the pressure of agriculture to forestland. I illustrated the dominant view that in applying ‘Conservation Agriculture’ techniques, villagers shall increase their agricultural outputs, thus pursuing economic development opportunities, while protecting their environment. First I argued that ‘Conservation Agriculture’ is promoted in the study villages as a ‘green technological’ win-win solution to problems of environmental degradation, rising global food demand and economic development in the form of an agricultural modernisation package that includes aspects that are *de facto* unrelated to Conservation Agriculture. This is problematic as farmers may get confused or misguided about cause and effects of different agricultural practices and techniques.

I then examine the performance of farmer field schools to illustrate the importance of socio-economic factors and group dynamics of participatory extension approaches. Drawing on insights from another study I show how economic benefits, governance and leadership, social capital among group members and social capital between group members and the facilitator considerably influence the performance and outcome of this extension approach.

In the third and last section of this chapter the perceptions of group members and villagers of Conservation Agriculture are discussed. All in all this chapter highlighted how the socio-economic context of villagers considerably influences the perceptions and adoption of a new widely promoted technology that is regarded as the win-win solution to sustainable agricultural development and forest protection in rural Africa.

The chapter is indeed important as forest protection in rural Lindi is tightly linked to villager's agricultural practices and technology. While some form of technological change is absolutely necessary in order to increase agricultural outputs, my data suggest that the introduction of a new technology in the villages requires a sophisticated analysis of the socio-economic processes driving farmers's livelihood decisions and how they are compatible/in conflict with the technology.

9.3 Theoretical contributions

Given that empirical research on REDD+ is still in its early phase, I regard my ethnographic study of its emergence in Lindi, Tanzania, an important contribution to a better understanding of how local processes shape its implementation and what this could mean about its livelihood and developmental effects. While one can find several studies that examine the neoliberalisation of nature from an ethnographic angle (Buscher, 2013; Li, 2007; West, 2012, 2006), many of them concentrated on other subjects and not on REDD+ or forest carbon. My ethnographic enquiry into REDD+ therefore adds to the theoretically informed literature on neoliberal conservation by offering new empirical insights from forest carbon commodification, which is a rapidly evolving field on the ground. In addition I contributed to the literature on neoliberal conservation by incorporating theoretical insights from international development at the start of this thesis. In bringing two bodies of literature, each having separately discussed neoliberalism, neoliberalisations and nature, closer to each other, I could synthesise some of their findings, which helped me to conceptualise REDD+ initiatives as processes of 'inclusive' neoliberal conservation.

In this dissertation I illustrated how REDD+ initiatives, as processes of 'inclusive' neoliberal conservation, emerge in the form of a developmental strategy and as the 'rational' solution to a perceived problem of deforestation, against a background of rural poverty, inequality and dependence on land for crop production (cf. Lansing, 2011). This is crucial better to understand why natures, in our case forest carbon, become neoliberalised around the world (Castree, 2008). In the context of poor farmers in rural Southeastern Tanzania, 'inclusive' neoliberal conservation is being promoted as a path to green development that allegedly offers environmental and economic benefits. My findings thus speak to the win-win rhetoric of neoliberal conservation (Igoe and Brockington, 2007). My ethnographic account illustrates in detail how development actors promoted a crisis narrative and green development discourse through various

discursive means and participatory initiatives, in order for REDD+ initiatives to gain popular support and legitimacy among the rural population. This understanding provides us with important insights to why and how rural poor in Southeastern Tanzania revalue their local forest-landscape towards new forms of global integration. Influenced by development actors' discursive efforts they re-imagine their forests as spaces of carbon sequestration services that can be sold to international markets. Therefore, in contrast to the economic focus of the payments for ecosystem services concept, which postulates the significant role of monetary incentives (Muradian et al., 2010), I argue that discursive effects can be as important as material effects, at least in the short run, to influence people's livelihoods and local land use strategies (Schmidt, 2010).

This does not mean that material effects are insignificant. In contrast, my findings illustrate the importance of material benefits, specifically direct tangible benefits, to the livelihoods of rural villagers (cf. Corbera et al., 2007). Whether villagers receive tangible benefits from forest protection has important consequences for their conservation support (Dietz et al., 2003). In my dissertation I highlight, however, that the material-benefits-conservation-support linkages differ even within the villages. My study thus adds to the insight that neoliberal conservation produces mixed livelihood outcomes (Igoe and Brockington, 2007; Roth and Dressler, 2012) by highlighting the importance of wealth inequalities within communities and how they shape the effects of material benefits. First, I highlighted that besides the amount of the payments also the time and mode of distribution influence their effects. Second, I pointed out that the benefits of payments depend on the wealth class of a household/individual. My findings demonstrate that carbon payments are unlikely to cover the opportunity costs of middle and wealthy households, which means they forego considerable benefits from forest protection. At the same time, carbon payments could cover the opportunity costs of poorer households, but only as long as they remain poor. The moment they become richer, their opportunity costs increase, and the less beneficial become the carbon payments. This finding therefore questions the progressive character of direct and equitable forest carbon payments. While carbon payments played an important and positive role to create support for conservation, their benefits to progressive and emancipatory development must be critically questioned.

The fact that most survey respondents in Ruhoma spent the trial payments on food illustrates the persistence of deep poverty and the intricate relationship between forest

protection and food production. Land in Lindi Rural provides the livelihood basis for its residents from which farmers produce food and cash. If agricultural outputs decrease when fertile forestland is taken away from agricultural production, farmers become more dependent on agricultural markets for food. They can be volatile and higher prices can considerably impact on, especially poorer, households' access to food, which would mean more insecurity and livelihood losses. REDD+ payments would therefore have to incorporate these new trends in future and adapt accordingly to food availability and prices as influenced by the working of agricultural markets in rural villages that are characterised by stark wealth inequalities.

In discussing the importance of the perceived costs and benefits of REDD+ initiatives to different villagers' attitudes towards forest protection, I confirmed the key assumptions offered by common property theorists (Dietz et al., 2003). Moreover, I discussed their arguments further by pointing at the significant role of monetary incentives, the amount of payments and the time of disbursement to local support to conservation. My findings also confirm that benefits must be substantial and distributed equitably according to locally devised rules to promote collective action. An important contribution of my thesis to common property theory is to illustrate the relevance of discursive approaches to analyse institutional change (Schmidt, 2010). Based on my findings I cannot overemphasise the role of external actors – European donors, non-governmental organisations and local district councils – and their influence on local discourses to shape villagers' cost-benefit calculations. Not only do they contribute to villagers' decisions over collective action by creating a context of trust or distrust, collaboration or individualism in the villages. They actively aim to shape villagers' understanding, ideas, discourse and institutions of forest governance with considerable consequences for their actions. While my findings do not provide an answer to whether material or discursive effects are more important in changing human behaviour, they at least point at the high relevance of discursive approaches to institutional change to the studies of the commons (cf. Schmidt, 2010).

My dissertation demonstrates the incompleteness of the forest carbon commodification process and its embeddedness in a local socio-political context. In both villages no carbon credits have been produced, let alone sold. In chapter six I highlighted a major aspect of this fact, namely the challenges of territorializing village and forestland. Territorialisation, which forms part of a larger decentralisation process, is a key element

of all ongoing REDD+ initiatives in Tanzania and across the world. It has been highlighted before that neoliberal conservation encompasses process of territorialisation that are considerably influenced by state and non-state actors (Corson, 2011; Igoe and Brockington, 2007). The latter offering much needed money, expertise and technology to the former. My findings illustrate the dependence of villagers on these external actors to design and take the process of territorialisation forward, but it also shows their limitations. This relates to debates of participatory approaches to conservation and development (cf Mohan and Hickey, 2005). My study shows that participation of villagers has been much more instrumental than progressive in their character. Villagers constantly struggled to practice participatory citizenship and engage in ‘transformative politics’ (cf. Hickey, 2010). At the same time I argued that REDD+ initiatives resulted in spaces of positive change as they took on local power struggles over land and people, especially between the district and village, and introduced useful technical activities that assisted in better land use planning. These technical activities contributed to empowering villagers at the expense of the local district. They were therefore technical and political at the same time. The focus of REDD+ initiatives in Tanzania on community-based forest management certainly has the potential to empower local villages and to promote more equitable and inclusive forms of benefit sharing from forest resources.

The chapter six of my dissertation offers theoretical insights into the politics of forest decentralisation under REDD+ initiatives. While my findings confirm that REDD+ enhances intra and inter-village conflicts by increasing the value of forestland, they also highlight the considerable role of non-natural resource related conflicts to forest decentralisation. I therefore argue that a proper analysis of REDD+ must depart from an understanding that people and environments are co-produced (Smith, 2008; Bridge and Perreault, 2009) and should include an examination of politics that go beyond natural resource governance. This must by all means include a discussion of the materiality of the forest and how ‘external’ actors create or prevent opportunities for citizens to engage in change. Furthermore it should entail a discussion of the role of technical ‘expert’ knowledge and professionalization of community forestry in promoting local empowerment and transforming access relations to natural resources.

Whether community-based forest management, as the preferred governance framework for REDD+, will contribute to inclusive economic development will depend on how

villagers practice the institutions on the ground. Another contribution of my dissertation is therefore to question simple assumptions of 'good governance' reforms and to point at the discrepancy of envisaged community institutions and actual practices (cf. Hickey, 2013). The whole idea of REDD+ is deeply linked to the promise of community based forest management in Tanzania. In analysing the design of community forest institutions in the two villages I demonstrated how the supposedly equitable and democratic governance framework also results in the exclusion of some as non-residents and customary forest users face significant restrictions in the course of establishing a common property regime. Community forestry under REDD+ has therefore concrete negative consequences to some forest users. Secondly, from my research it became apparent that villagers understand and practice institutions differently to what was envisaged, although the foundational elements were adopted. A critical element is the dissemination of information and knowledge, which is an important factor facilitating collective action (Dietz et al., 2003; Ostrom et al., 1999). My findings demonstrated that communication and knowledge exchange relates to more than a lack of capacity. In fact it is shaped by power struggles in the villages. Better communication is therefore a political challenge as much as it is a technical one.

Another important contribution of my thesis is to analyse the different practices of community forestry in the villages. Here I discussed the important role of accountability, transparency, capacity, leadership and materiality of forests in establishing effective community institutions. I illustrated how REDD+ initiatives could positively affect forest protection in Ruhoma: by setting aside payments for monitoring and sanctioning forest use in the village and facilitating accountability and responsiveness of village leaders to the local population. At the same time I presented a very different picture of Mihumo/Darajani, where a lack of financial resources, low accountability, bad leadership and lack of citizenship resulted in potential forms of corruption, mismanagement and weak forest protection.

'Inclusive' neoliberal conservation entails the promotion of new technologies to overcome complex social and environmental problems. In our case Conservation Agriculture was promoted as the win-win technological package that is suggested to assist farmers in raising agricultural productivity while protecting their forestland. My dissertation brings to the fore the importance of the socio-economic context when new technology is being transferred or disseminated (Giller et al., 2009; Baudron et al.,

2012). I illustrate how socio-economic factors shape the knowledge, perceptions and attitudes by villagers towards Conservation Agriculture. This shows that the introduction of new technology is a complex process of socio-economic transformation and not just a simple case of giving it to the people. I discussed how intrinsic and extrinsic factors decisively shape the potential uptake of a technology, which occurs in an incremental way of continuous learning, experimenting and adapting to changing social and ecological relations (Meijer et al., 2014).

9.4 Future research

This dissertation only contributed a little to a better understanding of the emergence and impacts of commodifying forest carbon under REDD+ in Lindi, Tanzania. More research is required to broaden our understanding of the processes and outcomes of this and other 'inclusive' neoliberal conservation approaches. Here are some of my suggestions.

It will be important to study in more detail how REDD+ effects territorialisation processes on the ground, how it transforms property rights over forests and land and how they are shaped by political and power struggles in different contexts (Milne, 2012; Mahanty et al., 2013). It is well known that forests in the South are often under unclear tenure regimes (Naughton-Treves and Wendland, 2014). There is also an intensive debate whether REDD+ will lead to more decentralisation or centralisation of forest governance (Phelps et al., 2010; Sandbrook et al., 2010; Wunder, 2010; Agrawal et al., 2010). This research has shown that REDD+ interventions promoted decentralisation of forest governance, but they have encountered considerable political and technical challenges. More studies need to be conducted to examine whether REDD+ will bring more tenure security to local stakeholders or if it will grant other institutions ownership over valuable forestland. Furthermore, studies need critically to examine whether tenure security actually increases the possibilities of local stakeholders to benefit from their resources. As my data suggest, not only did one village receive legal ownership without the authority to control access and use, but also both villages participated in the decentralisation reform that was considerably shaped by non-state actors. This meant that non-state actors had an important role in designing the institutional framework of forest management once managed by communities.

There should be more studies on the livelihood impacts of forest carbon commodification with specific consideration of existing wealth inequalities in communities. It will be necessary to conduct longer-term studies to evaluate the distribution of costs and benefits but contemporary research can lay the groundwork and provide important insights into distributional issues. Future research could make use of value chain analysis to derive at the distribution of benefits among various actors located at different scales. Important will be enquiries into the labour aspect of conservation (cf. Sodikoff, 2012). Little is known to date about the labour input of forest carbon commodification. What type of labour is involved? Who are the labourers? How much do they benefit from doing conservation labour?

As important are studies into the procedural issues of REDD+ (Lawlor et al., 2013). More work is needed into the type of participation of various stakeholders in the design and implementation of REDD+, the role of discourse in shaping their participation and how power imbalances contribute to the outcome of (democratically legitimised) decisions. More studies need to look at the discursive tactics of development actors and how this transforms the local understandings and perceptions of forests and their benefits. As outlined in this study the neoliberalisation of conservation emerges as the developmental solution to perceived problems of environmental degradation. In the era of inclusive neoliberalism the participation of local stakeholders has become a common feature. It is therefore critical to study more in depth the type of participation and the role of community representatives in designing conservation agreements.

It will be critical better to link studies on REDD+ with research on agricultural development in rural Africa or elsewhere. Since forest protection is tightly linked to agricultural development, more studies are required that examine the potentials and pitfalls of different agricultural intensification schemes and their contribution to conservation. Farming practices need to be analysed and understood in more detail in order to arrive at alternatives that are socio-economically and technologically compatible. Conservation Agriculture as one possible technological alternative is being promoted across Africa. There is more critical research needed that investigates the claims of its proponents with the actual benefits and changes on the ground.

In arguing that REDD+ initiatives should be conceptualised as processes promoting 'inclusive' neoliberal conservation I also aimed to point at the contradictory nature of

these processes, in order to encourage further research in this field. REDD+ initiatives aim to offer triple wins (society, environment and economy) but in practice, as we have learnt from experience, trade-offs are the norm. Trade-offs occur because of the deep contradictions in place between neoliberal market-oriented conservation on the one side and inclusive development on the other side. Although REDD+ initiatives attempt to bring these two sides together, they will never fully succeed, as there will always be tensions between their different logics and objectives of governing forests and people. Exactly how these tensions and contradictions play out on the ground, as I illustrated in this dissertation, is a matter of power, politics and livelihood practices. I researched this in the context of Southeastern Tanzania, but more studies from other areas are required to further our knowledge of this important subject.

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Appendix I: Fieldwork schedule

Date/Duration	Location	Activities
Pre-fieldwork preparations		
August 2011	Kilwa, Newala, Lindi, Liwale	Exploratory trip with Dr. Mustalahti and Dr. Zahabu to three REDD+ projects in Lindi Region and to head office of LIMAS programme in Newala
September to October 2011	Dar es Salaam	Swahili language course (5 weeks) Preparations for fieldwork: research permits from University of Manchester and Tanzania Visit from family
First phase of fieldwork: November 2011 to January 2012		
1 st and 2 nd week of November 2011	Lindi & Liwale town	Meeting with officials at Regional Administrative Secretary and district councils to receive letters of introduction Meetings with project staff from TFCG/Mjumita Arrangements for stay in Mihumo/Darajani
20 th November to 25 th January	Mihumo/Darajani	Introduction to village authorities and village residents Open and informal conversations Practicing and improving my Swahili skills Visit of my supervisor Prof. Dan Brockington Participant observation Recording of 18 interviews with villagers
25 th January to 31st January	Liwale	Recovery from health problems (stomach pain, loss of body weight, tiredness)
Break from fieldwork: February		
February	Dar es Salaam	Visit from family for about three weeks One week spent for brief analysis of data gathered so far and preparing for the next phase of fieldwork
Second phase of fieldwork: March to April 2012		
March (1 st week)	Lindi town	Travel to Lindi town Meeting with district officials and project staff
March (2 nd week)	Ruhoma	Introducing myself to Ruhoma village Informal conversations with individual households Participant observation Official visit of national REDD+ task force Recording of 9 interviews with villagers
13 th March	Liwale	Travel to Liwale to reintroduce myself to district and village officials Arrangement for a new accommodation in the village
15 th March to 30 th April	Mihumo/Darajani	Recording of 37 interviews with villagers Participant observation of daily activities and of village council meeting with district natural resource officer Informal conversations with villagers
Third phase of fieldwork: May to June 2012		
May (1 st week)	Lindi town	Travel to Lindi and meeting with Saro, a Masters student co-supervised by Dr. Mustalahti, with similar research interests
May (2 nd and 3 rd week)	Ruhoma	Participant observation Document analysis

		Recording of 20 interviews
May (4 th week)	Lindi town	Discussion of findings with Saro Preparation of household survey
June (1 st and 2 nd week)	Ruhoma/Lindi town	Return to Ruhoma to conduct interviews and household survey but severe health issues (infected left foot and malaria falciparum) forced me to return to Lindi town for treatment
June (3 rd week) to July (1 st week)	Ruhoma	Finalisation, piloting and implementation of household survey with 39 respondents Focus Group Discussion Recording of interviews with villages and ward officials
Fourth phase of fieldwork: July 2012		
July (1 st to 3 rd week)	Mihumo/Darajani	Implementation of household survey with 79 households Recorded 9 interviews with village, district and ward officials
24 th July	Dar es Salaam	Return to Dar es Salaam to leave Tanzania via airplane on 26 th July

Appendix II: List of recorded interviews

Interviews recorded in Mihumo/Darajani

No.	Type of interviewee	Sex	Place	Date
M 1	Researcher	M	Liwale	17.08.2011
M 2	Researcher	F	Dar es Salaam	21.08.2011
M 3	Livestock owner	M	Darajani	19.12.2011
M 4	Village leader	M	Darajani	19.12.2011
M 5	Young villager	M	Darajani	19.12.2011
M 6	Sub-village Chairman	M	Darajani	24.12.2011
M 7	Elder	M	Darajani	26.12.2011
M 8	Elder	M	Darajani	29.12.2011
M 9	Sub-village Chairman	M	Darajani	30.12.2011
M 10	Sub-village Chairman	M	Darajani	30.12.2011
M 11	Sub-village Chairman	M	Darajani	31.12.2011
M 12	Vicoba	M	Mihumo	02.01.2012
M 13	Elder	M	Mihumo	02.01.2012
M 14	VNRC	M	Darajani	04.01.2012
M 15	Village outsider	M	Mihumo	12.01.2012
M 16	VNRC	M	Darajani	14.01.2012
M 17	CA ⁴⁶ Darajani	M	Darajani	19.01.2012
M 18	Young villager	M	Darajani	26.01.2012
M 19	Elder	F	Darajani	26.01.2012
M 20	Sub-village Chairman	M	Mihumo	27.01.2012
M 21	Young villagers		Mihumo	23.03.2012
M 22	Female farmer	F	Mihumo	23.03.2012
M 23	Male farmer	M	Mihumo	23.03.2012
M 24	Single mother	F	Mihumo	24.03.2012
M 25	CA Darajani	M	Darajani	24.03.2012
M 26	CA Mihumo	F	Mihumo	26.03.2012
M 27	CA Darajani	M	Mihumo	27.03.2012
M 28	CA Mihumo & REDD	F	Mihumo	27.03.2012
M 29	REDD	M	Mihumo	28.03.2012
M 30	Sub-village Chairman	M	Mihumo	28.03.2012
M 31	CA Mihumo	F	Mihumo	04.04.2012
M 32	CA Mihumo	F	Mihumo	04.04.2012
M 33	CA Mihumo	F	Mihumo	05.04.2012
M 34	CA Mihumo	F	Mihumo	07.04.2012
M 35	CA Mihumo	M	Mihumo	09.04.2012
M 36	CA Mihumo	F	Mihumo	09.04.2012
M 37	Elder	M	Mihumo	10.04.2012
M 38	CA Darajani	F	Darajani	10.04.2012
M 39	CA Darajani	M	Darajani	10.04.2012
M 40	CA Darajani	F	Darajani	11.04.2012
M 41	CA Darajani	M	Mihumo	12.04.2012
M 42	CA Darajani	F	Darajani	12.04.2012
M 43	CA Darajani	M	Darajani	13.04.2012
M 44	CA Darajani	F	Mihumo	13.04.2012
M 45	REDD	F	Darajani	21.04.2012
M 46	Village council	M	Mihumo	22.04.2012

⁴⁶ CA refers to Conservation Agriculture group

M 47	REDD	M	Darajani	22.04.2012
M 48	Elder	M	Mihumo	23.04.2012
M 49	VNRC	M	Mihumo	24.04.2012
M 50	VNRC	F	Mihumo	25.04.2012
M 51	VNRC	F	Mihumo	25.04.2012
M 52	Health/Dispensary	M	Mihumo	26.04.2012
M 53	VNRC	F	Darajani	26.04.2012
M 54	VNRC	M	Darajani	26.04.2012
M 55	VNRC	F	Darajani	26.04.2012
M 56	VNRC	F	Mihumo	27.04.2012
M 57	VNRC	F	Mihumo	27.04.2012
M 58	Teacher	M	Mihumo	11.07.2012
M 59	Sub-village Chairman	M	Mihumo	11.07.2012
M 60	District	M	Liwale	16.07.2012
M 61	District	M	Liwale	16.07.2012
M 62	Ward	M	Liwale	16.07.2012
M 63	Village council	M	Mihumo	20.07.2012
M 64	VNRC	M	Mihumo	20.07.2012
M 65	Village council	M	Darajani	20.07.2012
M 66	Village council	M	Mihumo	21.07.2012

Interviews recorded in Ruhoma

No.	Type of interviewee	Sex	Place	Date
R 1	VNRC	F	Ruhoma	09.03.2012
R 2	VNRC	M	Ruhoma	09.03.2012
R 3	VNRC	M	Ruhoma	09.03.2012
R 4	VNRC	F	Ruhoma	10.03.2012
R 5	CA	F	Ruhoma	10.03.2012
R 6	CA	M	Ruhoma	11.03.2012
R 7	Village outsider	M	Ruhoma	11.03.2012
R 8	REDD	F	Ruhoma	11.03.2012
R 9	Elder	M	Ruhoma	12.03.2012
R 10	LUP	M	Ruhoma	08.05.2012
R 11	LUP	M	Ruhoma	09.05.2012
R 12	LUP	F	Ruhoma	09.05.2012
R 13	Village leader	M	Ruhoma	10.05.2012
R 14	CA	F	Ruhoma	11.05.2012
R 15	Ordinary villagers	F	Ruhoma	11.05.2012
R 16	Village outsider	M	Ruhoma	12.05.2012
R 17	CA	M	Ruhoma	13.05.2012
R 18	LUP	F	Ruhoma	14.05.2012
R 19	LUP	F	Ruhoma	14.05.2012
R 20	Committees	F	Ruhoma	15.05.2012
R 21	Committees	M	Ruhoma	15.05.2012
R 22	Ordinary villagers	M	Ruhoma	16.05.2012
R 23	Ordinary villagers	M	Ruhoma	16.05.2012
R 24	CA	F	Ruhoma	16.05.2012
R 25	LUP	M	Ruhoma	17.05.2012
R 26	CA	F	Ruhoma	17.05.2012
R 27	Teacher	F	Ruhoma	20.05.2012
R 28	Village leader	M	Ruhoma	20.05.2012
R 29	Project staff	M	Ruhoma	21.05.2012
R 30	Ordinary villagers	M	Ruhoma	02.06.2012

R 31	CA	M	Ruhoma	02.06.2012
R 32	Ordinary villagers	M	Ruhoma	02.06.2012
R 33	Ordinary villagers	M	Ruhoma	03.06.2012
R 34	REDD	F	Ruhoma	04.06.2012
R 35	Teacher	M	Ruhoma	04.06.2012
R 36	Ordinary villagers		Ruhoma	06.06.2012
R 37	Ordinary villagers	M	Ruhoma	06.06.2012
R 38	Ordinary villagers	M	Ruhoma	06.06.2012
R 39	District	M	Lindi	13.06.2012
R 40	District	M	Lindi	13.06.2012
R 41	District	M	Lindi	14.06.2012
R 42	District	M	Lindi	14.06.2012
R 43	Project staff	M	Lindi	14.06.2012
R 44	Ordinary villagers	F	Ruhoma	20.06.2012
R 45	Ordinary villagers	F	Ruhoma	20.06.2012
R 46	Ordinary villagers	F	Ruhoma	20.06.2012
R 47	Elder	M	Ruhoma	21.06.2012
R 48	Project staff	M	Kinyope	22.06.2012
R 49	Ward	M	Rutamba	22.06.2012
R 50	Ward	M	Lindi	22.06.2012
R 51	Focus Group Discussion		Ruhoma	26.06.2012

Appendix III: Household questionnaire

Andreas Scheba

Reducing emissions from deforestation and forest degradation: A study of its emergence and impacts in Tanzania

HOUSEHOLD SURVEY QUESTIONNAIRE

A. BACKGROUND INFORMATION

(I) Interview details

1.	HH Code No.	
2.	Name of the Assistant (if any)	
3	Date	
4.	Start Time	
5.	End Time	

(II) General information about the Respondent

1.	Gender	<input type="checkbox"/> ME	<input type="checkbox"/> MK
2	Level of education (highest grade)		
3	Relation to the head of household		
4	Period living in household		

B. HOUSEHOLD STRUCTURE

(I) Size/Type of household

1.	Number of hh members		
2.	Adult members		
3.	Minors		
4.a)	Members in saving groups		4.b) Withdrawn
5.a)	Members in farming groups		5.b) Withdrawn
6.a)	Members in village committees		6.b) Withdrawn
7.	Village-Sub-village		
8.	Household located on farm?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(II) Family details

Code no	Family status	Educa tion	Marita l status	Plac e of birth	Place of living	Occupation

C. ECONOMIC ASSETS

(I) Status of landholding (acre)

	Type of farm	Size	Major crops	Place	Established (year)	Ownership
1	Permanent Farm					
2	Temporary Farm					
3	Fallow					
4	Vegetable Farm					
5	Total					

(II) Livestock holdings (number)

1.	Chicken	
2.	Goats	
3.	Sheep	
4.	Doves	
5	Duck	
6	Others	
7	Others	

(III) Type of house

1.	Materials used for walls	
2.	Materials used for roof	
3.	No of. rooms	

(IV) Ownership of assets

Sl no	Type of assets	Amount
1.	Bicycle	
2.	Radio	
3.	Motorbike	
4.	Phone	
5.	Others	

D. INCOME & EXPENDITURE

(I) Sources of income

Sl no	Source of income	Time period	Income
1.	Crop production	yearly	
2.	Livestock	yearly	
3.	Forest	weekly	
4.	Wage employment on-farm	yearly	
5	Wage employment off-farm	yearly	
6	Seasonal migration	yearly	
7	Business	monthly	
8	Craftsmanship	monthly	
9	Remittances	yearly	
10	REDD+	yearly	
11	Loan	yearly	
12	Others (monetary)		
13	Others (non-monetary; food, services, etc)		

(II) Expenditure pattern

Sl no	Pattern of expenditure	Time period	Expenditure
1.	Food	Weekly	
2.	Education of children	Yearly	
3.	Transport	monthly	
4.	Clothes	Yearly	
5	Water	weekly	
6	Health medication	monthly	
7	Agriculture: labour	yearly	
8	Agriculture: inputs	yearly	
9	Livestock	monthly	
10	Construction or repair of house	yearly	
11	Social occasion	yearly	
12	Acquiring new assets (including livestock)	yearly	
13	Others		

E. AGRICULTURAL HARVEST AND UTILISATION

(I) Usage of main agricultural produce (gunia, debe)

Sl no	Type of crop	Total harvest (last 12 months)	Sold local market	Sold Trader	Sold Cooperative
1.	Maize				
2.	Millet/Sorghum				
3.	Pigeon Peas				
4.	Cow Peas				
5	Cassava				
6	Groundnut				
7	Vegetables				
8	Cashew nut				
9	Sesame				
10	Rice				
11	Bananas				
12	Coconuts				

(II) Farming practice

Which of the following techniques should a good farmer practice on his maize farm? Which ones are you practicing?

Technique	Good	Bad	Practiced	Not pract.	Main reason
a) Intercropping with peas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b) Intercropping with millet or rice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Plant trees in the farm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) To make ridges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
e) Plant in rows and equal spaces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
f) To dig wholes when planting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
g) Usage of industrial seeds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
h) Usage of industrial fertilisers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
i) Usage of natural fertilisers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
j) Usage of herbicides	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
k) Usage of pesticides	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
l) Leave grass and residues on field	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
m) To till the soil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
n) Crop rotation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

(III) Conservation Agriculture

		Yes	No	I don't know
a)	Is it possible to practice slash and burn cultivation sustainably (without damaging the environment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b)	Have you heard of Conservation Agriculture?	<input type="checkbox"/>	<input type="checkbox"/>	
c)	Does Conservation Agriculture reduce the workload on the farm?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d)	Does Conservation Agriculture increase the harvest of crops?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e)	Does Conservation Agriculture reduce the requirements of inputs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f)	Is Conservation Agriculture suitable to your farm?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(IV) Farming knowledge

Where did you get your knowledge about farming from?

- ☐ Family ☐ Farms of villagers ☐ Demonstration farm ☐ Classes
☐ Village leaders ☐ Books ☐ Radio ☐ Other _____
☐ Government extension officer ☐ NGO extension officer

(V) Other

a) Does your household experience food shortage?

- ☐ No ☐ Yes, every year ☐ Yes, but not every year
☐ Yes, and it increased after protecting the forest

b)

b) Did you farm in the forest prior to REDD+?

- ☐ No ☐ Yes, every year ☐ Yes, but not every year

F. FOREST GOVERNANCE

(I) Who owns the protected forest?

- ☐ Villagers ☐ VNRC ☐ District Gov. ☐ Private Org.
☐ National Gov. ☐ Europeans ☐ Private Person ☐ Unknown

(II) Who is responsible for taking care of the protected forest?

- ☐ Villagers ☐ VNRC ☐ District Gov. ☐ Private Org.
☐ National Gov. ☐ Europeans ☐ Private Person ☐ Unknown

(III) What is allowed in the protected forest?

- ☐ Farming ☐ Hunting animals ☐ Harvest timber for subsistence
☐ Collecting firewood ☐ Walking ☐ Harvest timber for commercial
☐ Collecting medicine ☐ Collecting honey using fire ☐ Collecting honey without using fire

(IV) What is carbon dioxide?

- ☐ Dirty air ☐ Cold air ☐ Type of soil ☐ Type of tree
☐ Clean air ☐ Hot air ☐ Example of greenhouse gas ☐ I don't know

(V) Opinion about forest governance

		Yes	No	I don't know
a)	Do you agree that to protect the forest is better than to open up new farms in the forest?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b)	Did you participate in the decision to protect the forest?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c)	Did you receive training/explanation about forest management?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d)	Did you individually benefit from the protection of the forest?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e)	Did the village benefit from the protection of the forest?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f)	Did leaders, VNRC members or other few people benefit more than all other villagers from the protection of the forest?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g)	Do you know the income and expenses of the village?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h)	Did the condition of the protected forest improve compared to the past?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i)	Did the governance of the village improve compared to the past?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(VI) How often did you participate in village meetings in the last 12 months? _____

(VII) How did you use the REDD+ trial payments?

Usage	Percentage

University of Manchester
School of Environment and Development

Andreas Scheba

**Mpango wa Kupunguza Uzalishaji wa Hewa ya Ukaa kutokana na Ukataji miti ovyo na
Uharibifu wa Misitu (MKUHUMI):
Utafiti juu ya kuzuka kwa mpango huu na matokeo yake katika nchi ya Tanzania**

MASWALI YA WANAKAYA

A. UTAMBOLISHO WA MAHOJIANO

(I) Utambolisho wa mahojiano

1.	Namba ya kaya	
2.	Jina la msaidizi (kama yupo)	
3.	Tarehe	
4.	Muda wa kuanza	
5.	Muda wa kumaliza	

(II) Utambolisho wa mhojiwa

1.	Jinsia	<input type="checkbox"/> ME	<input type="checkbox"/> MK
2.	Kiwango cha elimu ulichomaliza		
3.	Je, una uhusiano gani na mkuu wa kaya		
4.	Je, umeishi muda gani ndani ya kaya hii		

B. UTAMBOLISHO WA KAYA

(I) Ukubwa/Aina ya kaya

1.	Idadi ya wanakaya		
2.	Idadi ya watu wazima		
3.	Idadi ya watu wasiojiweza		
4.a)	Idadi ya wanakaya waliojiunga kwenye VICOBA		4.b) Waliojitoa:
5.a)	Idadi ya wanakaya waliojiunga kwenye kikundi cha kilimo au mifugo		5.b) Waliojitoa:
6.a)	Idadi ya wanakaya waliojiunga kwenye kamati ya kijiji		6.b) Waliojitoa:
7.	Kijiji/kitongoji		
8.	Kaya hii ipo shambani?	<input type="checkbox"/> Ndiyo	<input type="checkbox"/> Hapana

(II) Wanakaya

[illegible]

C. RASILIMALI UCHUMI (HUDUMA NA MALI ZA KAYA)

(I) Umilikaji wa ardhi

	Aina ya shamba	Ukubwa (ekari)	Zao kuu	Mahali (kijiji)	Mwaka uliyoanza kulima/pumzisha	Umilikaji
1	Shamba la kudumu (minazi, korosho)					
2	Shamba lisilo la kudumu					
3	Shamba linalopumzika					
4	Bustani					
5	Jumla					

(II) Idadi ya mifugo inayomilikiwa na kaya hii

1.	Kuku	
2.	Mbuzi	
3.	Kondoo	
4.	Njiwa	
5.	Bata	
6.	Wengineo	
7.	Wengineo	

(III) Aina ya nyumba

1.	Aina ya kuta	
2.	Aina ya paa	
3.	Idadi ya vyumba	

(IV) Umilikaji wa mali

1.	Baiskeli	
2.	Redio	
3.	Pikipiki	
4.	Simu	
5.	Nyinginezo	

D. MAPATO & MATUMIZI

(I) Vyanzo vya mapato

Si no	Vyanzo vya mapato	Wakati	Kiasi
1.	Mapato ya kilimo	Mwaka	
2.	Uzalishaji wa mifugo	Mwaka	
3.	Manufaa ya msitu	Wiki	
4.	Malipo ya mshahara wa kazi za shambani (kibarua)	Mwaka	
5.	Malipo ya mshahara wa kazi isiofanika shambani	Mwaka	
6.	Kazi za msimu	Mwaka	
7.	Biashara	Mwezi	
8.	Ufundi	Mwezi	
9.	Fedha uliopokea kutoka kwa ndugu yeyote aliyeko nje ya hapa	Mwaka	
10.	MKUHUMI	Mwaka	
11.	Mkopo (VICOBA, benki)	Mwaka	
12.	Mengineyo (fedha)		
13.	Mengineyo (yasio ya kifedha: chakula, manufaa ya msitu,)		

(II) Matumizi

Si no	Matumizi	Wakati	Kiasi
1.	Vyakula	Wiki	
2.	Elimu kwa watoto (ada, daftari)	Mwaka	
3.	Usafiri	Mwezi	
4.	Nguo (mavaazi)	Mwaka	
5.	Maji	Wiki	
6.	Huduma ya afya	Mwezi	
7.	Kilimo: (vibarua)	Mwaka	
8.	Kilimo: (mbolea, dawa, ...)	Mwaka	
9.	Ufugaji	Mwezi	
10.	Matengenezo au ukarabati wa nyumba	Mwaka	
11.	Mila, unyago au ndoa	Mwaka	
12.	Kujipatia mali mpya (pamoja na ufugaji)	Mwaka	
13.	Mengineyo		

E. UZALISHAJI WA KILIMO NA UTUNZAJI WA CHAKULA

(I) Utumiaji wa mazao muhimu (gunia, debe, tenga, kg)

Sl no	Aina ya zao	Jumla la mavuna miezi 12 iliyopita	Masoko ya kienyeji	Mfanya biashara	Chama
1.	Mahindi				
2.	Mtama				
3.	Mbaazi				
4.	Kunde				
5.	Muhugo				
6.	Karanga				
7.	Mbogamboga				
8.	Korosho				
9.	Ufuta				
10.	Mpunga				
11.	Ndizi				
12.	Nazi				

(II) Vitendo vya kilimo

Katika shamba la Mahindi ni vitu gani vizuri vya kufuata? Kati ya hivi ni kipi unakitumia?

Vitendo	Kilimo bora	Sio Kilimo bora	Nafuata	Sifuati	Sababu kuu
a) Kuchanganya na kunde (mbaazi)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b) Kuchanganya na mtama au mpunga	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Upandaji ya miti ndani ya shamba	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Kupiga matuta	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
e) Upandaji kwa mistari na nafasi zinazofanana	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
f) Kuchimba mashimo wakati wa kupanda	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
g) Utumiaji wa mbegu za kiwandani	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
h) Matumizi ya mbolea za kiwandani	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
i) Matumizi ya mbolea za asili	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
j) Matumizi ya dawa ya magugu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
k) Matumizi ya dawa ya wadudu waharibifu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
l) Kutandaza nyasi shambani	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
m) Kutibua ardhi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
n) Mzunguko wa ubadilishaji wa mazao	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

(III) Kilimo Hifadhi

		Ndiyo	Hapana	Sijui
a)	Je, inawezekana kufuata kilimo cha kuhamahama kwa njia ya uendelevu (bila kuharibu mazingira)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b)	Je, umewahiona/sikia kanuni ya kilimo hifadhi?	<input type="checkbox"/>	<input type="checkbox"/>	
c)	Je, kilimo hifadhi kinapunguza muda wa kazi za shambani?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d)	Je, kilimo hifadhi kinaongeza mapato ya mazao?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e)	Je, kilimo hifadhi kinapunguza mahitaji ya pembejeo (dawa, mbolea)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f)	Je, kilimo hifadhi kinafaa kwa shamba lako?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(IV) Ufahamu kuhusu kilimo

Elimu yako kuhusu kilimo ulipataje?

- ☐ Familia ☐ Mashamba ya wanakijiji ☐ Shamba darasa ☐ Mafunzo
☐ Viongozi wa kijiji ☐ Vitabu ☐ Redio ☐ Mengineyo _____
☐ Bwana shamba kutoka serikalini ☐ Bwana shamba kutoka mashirika binafsi

(V) Mengineyo

a) Kaya yako ilikuwa na upungufu wa chakula?

- ☐ Hapana ☐ Ndiyo, kila mwaka ☐ Ndiyo, lakini sio kila mwaka
☐ Ndiyo, na umeongezeka kutokana na kuhifadhi msitu

b) Wakati wa kabla ya MKUHUMI ulikuwa umelima msituni?

- ☐ Hapana ☐ Ndiyo, kila mwaka ☐ Ndiyo, lakini sio kila mwaka

F. UTAWALA NA USIMAMIZI WA MISITU

(I) Nani ni mmiliki wa msitu uliohifadhiwa?

- ☐ Wanakijiji ☐ Kamati ya maliasili ☐ Serikali ya wilaya ☐ Mashirika binafsi
☐ Serikali kuu ☐ Wazungu ☐ Mtu binafsi ☐ Haijulikani

(II) Nani anawajibika kutunza msitu uliohifadhiwa?

- ☐ Wanakijiji ☐ Kamati ya maliasili ☐ Serikali ya wilaya ☐ Mashirika binafsi
☐ Serikali kuu ☐ Wazungu ☐ Mtu binafsi ☐ Haijulikani

(III) Kipi kati ya vifuatavyo vinaruhusiwa kufanya katika msitu uliohifadhiwa?

- ☐ Kulima ☐ Kuwinda wanyama ☐ Kupasua mbao za matumizi mengineyo
☐ Kukusanya kuni ☐ Kutembea ndani ya msitu ☐ Kupasua mbao za biashara
☐ Kukusanya dawa ☐ Kurina asali kutumia moto ☐ Kurina asali bila kutumia moto

(IV) Je, hewa ukaa ni nini?

- ☐ Hewa chafu ☐ Hewa baridi ☐ Aina ya udongo ☐ Aina ya miti
☐ Hewa safi ☐ Hewa moto ☐ Mfano wa gesijoto ☐ Sijui

(V) Maoni ya utawala wa msitu

		Ndiyo	Hapana	Sijui
a)	Je, unakubali kwamba kuhifadhi msitu ni bora kuliku kufungua mashamba mapya msituni?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b)	Je, umeshiriki kwenye uamuzi kuhifadhi misitu?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c)	Je, umepata mafunzo/maelekezo ya utunzaji wa misitu?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d)	Je, wewe binafsi umefaidika kutokana na utunzaji wa misitu?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e)	Je, kijiji kimefaidika kutokana na utunzaji wa misitu?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f)	Je, viongozi, wajumbe wa kamati wa kijiji au watu wachache wengine wamefaidika zaidi kuliku wanakijiji wote kutokana na utunzaji wa misitu?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g)	Je, unafahamu mapato na matumizi ya kijiji?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h)	Je, hali ya msitu uliohifadhiwa imeongezeka kuliko siku za nyuma?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i)	Je, utawala bora wa kijiji umeongezeka kuliko siku za nyuma?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(VI) Umeshiriki mara ngapi katika mkutano wa kijiji miezi 12 iliyopita? _____

(VII) Je, fedha zilizotoka MKUHUMI ulizitumiaje?

Matumizi	Asilimia

Appendix IV: Sampling procedure

In Ruhoma I was given a list of all registered households by the village executive officer, who had prepared it for the distribution of the REDD+ trial payments. We went through the list together and corrected a few changes. The total number of households was 169 in Ruhoma. In Mihumo/Darajani it was a bit more complicated. The village executive officer and the sub-village chairmen could not provide me with an updated list. Luckily, I was told that the local dispensary was carrying out a vaccination programme among all village residents. For this purpose they created an updated list of all resident village households. The total number of households was 690 according to this list. My sample population contained all permanent resident in the two villages. It did not include temporary visitors or farmers, who may have resided in the village for a short period of time during my fieldwork.

After numbering all the households on the list I wrote down all the numbers on small snippets, which I put into a plastic bag. In Ruhoma I asked two participants of the focus group discussion to randomly pick 50 numbers. In Mihumo/Darajani I requested the village chairman of Mihumo and village executive officer in Darajani to pick 50 numbers each. In both villages I asked the volunteers to pick 50 numbers in order to have back-up households in case some households won't be available for interviewing. In both villages I wrote down the picked numbers, cross-checked them with the household list and started the survey implementation.

Appendix V: Exemplar of coding sheet

SOURCE	SEGMENT	CODE
R Interview 47	<p>A: If you get 39,000 every year will it be enough to buy sufficient food?</p> <p>39,000 is too little. Too little. maybe from 100,000 onwards for every year. 39,000 doesn't suffice. Because I have children and grand children. I have 10 grand children, or 15. In future there will be problems. Many of them are young, only three farm themselves.</p>	Amount
R Interview 11	<p>(40:00) The amount doesn't suffice to convince people not to enter the forest for farming etc; for now it was accepted but it's not enough; For 39,000 to tell a person to not go into the forest, this is too little.</p> <p>We were told that in September money will come again;</p>	Amount
R Interview 8	<p>A: You established the REDD finance committee when?</p> <p>This year. REDD finance committee was selected in each sub-village; On papers there was written "I will be used" or 'I have failed" and if you grabbed the "I will be used" then you were selected; 12 people were selected, half male and half female members then they looked at number of total villagers (adults and young) and decided about payments; all who live here get the money, others who don't stay here they don't get the money;</p>	Committee
R Interview 34	<p>But others who had not stayed for three years here, they did not receive any money, or? Yes. They did not receive any money. There were no other criteria. Also if you married and left this village, then there is no reason for you to get this money. Because you have already left and moved to another village. So you are seen as not of resident from here.</p>	Conditions
R Interview 3	<p>Mkumumi claimed that it will help us villagers to improve our lives a bit.. and so far, after seminars and various activities, we believe that it can assist us in rising a bit. Because we received trial payments but once we agree completely to protect the forest then there will be more development and we will get a lot of money. The trial payment were received and got distributed and used.</p>	Development
R Interview 49	<p>How do you see the cooperation between you and the REDD people, also with regard to the distribution of the money etc</p> <p>The procedures that the REDD people follow, are very good. The fact that REDD people come directly to the villagers is very good. There is a lot of transparency and the follow up is easy on the money. Its benefits can be seen. Other times when money goes through the government it brings us disturbance. For example we have a project for vegetable farming but the money that was promised hasn't arrived yet. It has such a long way and there is another meeting etc. And it is only the amount of 3 millions, but until now it hasn't arrived. There is money put aside for the irrigation system in Kinyope. The money comes from the nation but it has to go via the district. Until it reaches here, the follow up is hard... People have their own interests in money, they lack heart. REDD is different. The money goes directly to the villagers, they make the decisions on how to use it. The projects are directly established between villagers and REDD.</p>	Distribution

R Interview 51	<p>(47:30) All activities started in the sub-village; Sub-village chairman made sure that he knows the amount of residents in his sub-village; how many people live here; then at a general assembly all the residents were read; people were asked about their children's names given; if they really exist etc we participated with the experts in this exercise it was a lot of work; then at the time of handing out the money: father takes his share; mama takes the money for herself and the children;</p> <p>Chairman of distribution committee: talks about that the remaining money of the first day was taken by the tfcg because they were afraid of theft;</p> <p>safe exists but we they saw this as the best way; tfcg people had guardians with them; also in future this is the best way; they become with guns and they were trained in safety;</p>	Distribution
R Interview 8	There were conflicts here whether they get the money or not and since they really got the money, they say yes now we have to protect it; at first they thought they will be cheated, will be told lies but now every man understands that REDD is good and important; It helps us because there won't be random majangwa; The forest will grow well	Effects
Journal 10.11.11	REDD as additional funds to finance strategies, which remain untouched otherwise.	Effects
R Interview 6	<p>A: People agreed because of the money. Money has been used. Were they very pleased?</p> <p>Viongozi are benefiting more (measure carbon, seminar, posho). Villagers also want to get some money, want to see how it works, contract for few years only (if we don't see the benefits we will leave it) and since last year they haven't farmed in the forest yet, they received money and will see at the end. The project shall reach the end. We agreed that until the end we look. People from Ruhoma can mobilise other people.</p>	Elite capture
R Interview 22	The money that came, arrived during a time of hunger. There was nothing in the house and people want to eat.	Time of payment
R Interview 34	Do you know if the money from REDD comes again this year and will it come next year? I am not sure whether it will come again this year or next year. But from my opinion, I think it is possible that we get again money this year from REDD. I don't know for sure.	Uncertainty
R Interview 24	So we decided to take some money and give it to the government for the amount that was claimed, so that it can help us. Then we talked about the VNRC. They do patrols. Let us put some money aside for them. When they return, they can buy soap to wash their clothes. We planned the expenses according to the amount of money we got. The money that we got individually, for our homes, helped us a lot really to overcome hunger. Nobody had to do wage labour. He bought food and put it inside. So people could focus on their own maize except going to his neighbours. We bought food and farmed on our own farms. So the next time when we get the money, if Gods wants, we will invest it in farming.	Usage
Journal 9.11.11	District does not expect many benefits from the REDD revenues	Usage

Appendix VI: Wealth ranking procedure

The purpose of doing the wealth ranking exercise was to end up with distinct groups of villagers, who differ from each other with regard to their wealth. In my study I grouped households into three clusters – poor, middle and wealthy – in order to compare them with each other. Although the groups are not representative of the entire village, they provide important information about how households differ between each other in terms of income, income sources, assets, agricultural activities and land use practices. In comparing them with each other we learn more about the extent of their differences. The aim was to establish a ‘poor’ cluster that contains households from the village that have very few means (income, land, assets) to make a living and compare them to middle and wealthy groups. While the middle households are somewhat in between, the wealthy group consists of households who are clearly well off and endowed with many resources (income, assets and land).

In order to arrive at these three categories I used different indicators in the two villages. I used the cluster-analysis in SPSS and set the number of clusters to three (poor, medium and wealthy). After the software grouped the households according to the indicators I moved some of the households manually (on the basis of one indicator) into another group to obtain a clearer distinction. After all I ended up with three groups that are clearly distinguishable in terms of their wealth, which is measured as a relationship between assets (land, housing, bicycles, mobiles) and income (total income, cashew nut output)




Ruhoma

I ran a two-step cluster analysis in SPSS. I specified three clusters in order to get poor, middle and wealthy categories. I selected the following variables: housing structure, total income, assets value and total cultivated land.

Clusters

Input (Predictor) Importance

■ 1,0 ■ 0,8 ■ 0,6 ■ 0,4 ■ 0,2 ■ 0,0

Cluster	1	3	2
Label			
Description			
Size	 43,6% (17)	 33,3% (13)	 23,1% (9)
Inputs	Housing Total 0 (100,0%)	Housing Total 2 (53,8%)	Housing Total 1 (100,0%)
	Total Income 296.363,53	Total Income 1.307.230,77	Total Income 274.777,78
	Assets value 75.000,00	Assets value 200.000,00	Assets value 127.777,78
	Total Cult Land 2,79	Total Cult Land 4,13	Total Cult Land 3,06

I obtained three clusters of which cluster 1 represented poor households, cluster 2 represented middle-income households and cluster 3 represented wealthy households. The software grouped many households in the poor category, because of their bad performance with regard to housing. However, among them were 5 households with bad housing but who possessed other valuable commodities such as radios, bicycles and mobiles. Because a bicycle is an expensive productive asset that can also be used to generate additional income, I decided to move the households who possess a bicycle into the middle category. Three of these five also had mobiles and four of them had radios. In this way I ended up with new groupings:

A category 'poor' that contains households with bad housing, low or no assets, a low income and smaller areas of cultivated farms. The second category I ended up with is

‘middle’ that contains households with medium housing or bad housing but with some assets, low to medium income and medium land holdings. The third category is ‘wealthy’ that contains households with good to very good housing, high income, high asset values and large land holdings.

Report						
Wealth Group		Housing Total	Total Cult Land	Bicycles	Mobiles	Total Income2
Poor	Mean	,00	2,60	,00	,08	179.448,33
	N	12	12	12	12	12
	Std. Deviation	,000	1,338	,000	,289	156.122,812
Middle	Mean	,64	3,13	,50	,79	382.700,00
	N	14	14	14	14	14
	Std. Deviation	,497	1,675	,519	,802	324.020,757
Wealthy	Mean	2,46	4,13	,77	,92	1.307.230,77
	N	13	13	13	13	13
	Std. Deviation	,519	2,824	,599	,641	782.759,376

	Household ID	Housing Total	Assets value	Total Cult Land	Total Income	Bicycles	Mobiles	Radio
POOR	R01	0	25.000	5	9.500	0	0	1
	R02	0	25.000	4	220.000	0	0	1
	R06	0	25.000	2	334.780	0	0	1
	R11	0	0	3	402.000	0	0	0
	R18	0	25.000	2	352.000	0	0	1
	R22	0	0	4	140.500	0	0	0
	R24	0	25.000	2	343.600	0	0	1
	R26	0	125.000	2	250.000	0	1	1
	R32	0	0	1	6.000	0	0	0
	R33	0	0	3	90.000	0	0	0
	R34	0	25.000	4	0	0	0	1
	R36	0	0	1	5.000	0	0	0
MIDDLE	12	12	12	12	12	12	12	12
	R05	1	200.000	1	210.000	1	1	0
	R10	1	225.000	4	417.200	1	1	1
	R12	1	100.000	5	10.500	0	1	0
	R13	1	0	5	207.300	0	0	0
	R14	1	350.000	4	625.000	0	3	2
	R15	1	125.000	3	298.000	0	1	1
	R17	0	250.000	3	1.256.000	1	1	2
	R20	0	150.000	2	161.000	1	0	1

WEALTHY	R23	0	225.000	7	772.300	1	1	1
	R27	1	25.000	1	55.000	0	0	1
	R31	1	25.000	2	280.000	0	0	1
	R35	0	275.000	2	433.000	1	1	1
	R38	0	100.000	3	262.500	1	0	0
	R39	1	100.000	3	370.000	0	1	0
	14	14	14	14	14	14	14	14
	R03	3	125.000	3	789.500	1	0	1
	R04	2	375.000	4	680.000	1	2	1
	R07	3	225.000	10	648.000	1	1	1
	R08	2	125.000	1	729.000	0	1	1
	R09	2	125.000	2	248.000	0	1	1
	R16	3	100.000	0	2.880.000	0	1	0
	R19	2	250.000	6	2.446.000	1	1	2
	R21	2	0	3	988.000	0	0	0
	R25	3	225.000	3	1.208.000	1	1	1
	R28	2	125.000	2	1.500.000	1	0	1
	R29	2	275.000	8	1.854.800	1	1	1
	R30	3	425.000	7	2.010.200	2	2	1
	R37	3	225.000	5	1.012.500	1	1	1
	13	13	13	13	13	13	13	13
	39	39	39	39	39	39	39	39

Wealth Groups Ruhoma						
Wealth Group		Housing Total	Assets value	Bicycles	Total Cult Land	Total Income
Poor	Mean	,00	22.916,67	,00	2,60	179.448,33
	N	12	12	12	12	12
	Std. Deviation	,000	34.473,859	,000	1,338	156.122,812
Middle	Mean	,64	153.571,43	,50	3,13	382.700,00
	N	14	14	14	14	14
	Std. Deviation	,497	104.171,245	,519	1,675	324.020,757
Wealthy	Mean	2,46	200.000,00	,77	4,13	1.307.230,77
	N	13	13	13	13	13
	Std. Deviation	,519	116.815,381	,599	2,824	782.759,376

Mihumo/Darajani


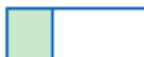

In Mihumo/Darajani I selected slightly different indicators to determine wealth in the village: Total income, total cultivated land, bicycles, mobiles, cashew nut yields and number of chickens. After running a two-step cluster analysis using these indicators in SPSS I obtained the following distribution of households: 24 households were grouped as poor, 40 were grouped as medium and 12 were grouped as wealthy. Then I made use of housing structure to move some poorer households into the middle category. I moved those 'poor' households with low assets (measured in bicycles and mobiles) but better housing structure into the middle group. I then ended up with three new clusters: 11 poor households, 53 middle-income households and 12 wealthy households.

The group of poor households has bad housing, no or low assets (bicycles and mobiles), low income, low to medium landholdings, small livestock and lower cashew nut outputs. The group of middle households has medium assets, medium stocks of chickens, and medium cashew nut outputs. The group of wealthy households has more assets, high total incomes, larger areas of cultivated land, larger numbers of livestock, and higher cashew nut outputs.

Clusters

Input (Predictor) Importance

1,0 0,8 0,6 0,4 0,2 0,0

Cluster	2	3	1
Label			
Description			
Size	 52,6% (40)	 31,6% (24)	 15,8% (12)
Inputs	Bicycles 1,10	Bicycles 0,00	Bicycles 0,83
	Total Cultivated Land 6,46	Total Cultivated Land 6,15	Total Cultivated Land 16,75
	Total Income2 (AgricNetIncome)- REDD&Loan 454.333,00	Total Income2 (AgricNetIncome)- REDD&Loan 330.855,00	Total Income2 (AgricNetIncome)- REDD&Loan 1.231.158,33
	Chicken 9,75	Chicken 2,21	Chicken 21,17
	CashewNutYield(kg) 145,25	CashewNutYield(kg) 110,46	CashewNutYield(kg) 415,92
	Mobiles 0,35	Mobiles 0,25	Mobiles 0,75

Report								
WealthGroup		Total Cultivate d Land	Housing Total	Bicycles	Mobiles	Total Income	Cashew nut (kg)	Chicken
Poor	Mean	6,45	,00	,00	,09	288.550,00	62,82	1,00
	N	11	11	11	11	11	11	11
	Std. Deviation	3,004	,000	,000	,302	298.995,681	67,597	1,000
Middle	Mean	6,32	,89	,83	,36	432.826,23	146,60	8,15
	N	53	53	53	53	53	53	53
	Std. Deviation	3,291	1,103	,580	,558	276.683,600	116,143	9,164
Wealthy	Mean	16,75	1,17	,83	,75	1.231.158,33	415,92	21,17
	N	12	12	12	12	12	12	12
	Std. Deviation	5,817	1,467	,577	,866	581.332,789	329,580	16,219

	Household ID	Housing Total	Total Cultivate d Land	Bicycles	Mobiles	Total Income	Cashew nut output(kg)	Chicken
POOR	D03	0	9	0	0	395.000	80	1
	D04	0	10	0	0	83.000	80	0
	D08	0	4	0	0	545.250	80	0
	D23	0	7	0	0	208.500	240	1
	D24	0	8	0	1	78.000	80	1
	D27	0	3	0	0	990.000	5	0
	D34	0	7	0	0	511.500	40	0
	D38	0	5	0	0	39.000	26	2
	M20	0	2	0	0	71.000	0	3
	M24	0	11	0	0	26.800	60	1
	M31	0	6	0	0	226.000	0	2
		11	11	11	11	11	11	11
MIDDLE	D02	0	7	2	0	583.000	240	0
	D05	0	5	1	1	525.000	400	15
	D06	0	4	2	0	1.059.000	240	9
	D07	0	8	1	0	114.000	5	0
	D10	1	6	1	1	1.117.650	400	7
	D11	2	5	0	0	417.000	280	10
	D12	2	14	1	0	128.000	100	6
	D13	1	6	1	1	605.000	235	9

	D14	2	6	0	0	549.470	160	0
	D15	0	6	1	1	610.400	220	10
	D16	1	4	1	1	182.000	20	30
	D19	1	4	1	0	507.200	120	4
	D20	0	3	1	0	140.400	60	9
	D21	0	3	1	0	212.000	120	2
	D22	3	9	1	0	531.000	280	11
	D26	2	3	1	2	273.000	0	2
	D29	2	8	1	1	562.800	60	2
	D30	0	7	1	0	382.000	240	30
	D31	3	11	0	1	690.000	400	0
	D32	2	4	0	0	355.500	120	2
	D36	0	9	2	0	823.000	100	3
	D37	0	6	2	2	122.000	100	10
	D39	3	5	0	1	131.000	80	7
	M01	0	5	1	1	276.000	80	10
	M02	3	7	0	0	367.500	60	2
	M03	2	4	0	0	165.000	40	0
	M04	2	1	0	1	320.000	0	0
	M05	2	8	0	0	453.000	440	0
	M06	2	8	0	1	80.000	60	0
	M07	2	9	1	0	204.000	100	2
	M08	0	3	1	0	813.000	400	0
	M09	0	7	1	1	265.500	80	10
	M10	2	8	1	0	241.070	80	16
	M12	0	3	1	0	338.400	120	3
	M13	0	6	1	0	259.400	120	30
	M14	0	6	2	0	1.084.000	160	15
	M17	0	9	1	0	299.500	240	12
	M19	0	4	1	0	252.500	0	0
	M21	0	2	1	0	92.400	0	2
	M22	0	12	1	0	685.600	150	15
	M23	0	9	1	0	457.000	160	10
	M26	0	12	1	0	472.000	80	1
	M27	0	14	1	0	560.000	40	17
	M28	0	13	1	0	684.000	320	4
	M29	0	8	1	0	323.000	240	12
	M30	0	6	1	1	775.000	120	0
	M32	2	4	0	0	36.000	80	1
	M33	0	6	0	0	86.500	80	37
	M35	0	4	1	0	425.000	160	0
	M36	2	13	0	0	332.000	160	8

WEALTHY	M37	0	1	1	0	897.000	60	5
	M38	0	5	1	1	205.000	80	30
	M39	3	1	0	1	870.000	80	12
	53	53	53	53	53	53	53	53
	D01	2	18	1	1	910.000	480	15
	D09	0	22	2	0	340.400	233	40
	D17	3	12	1	1	1.412.500	960	5
	D18	3	22	1	0	584.000	0	10
	D28	3	22	0	3	2.216.000	960	30
	D35	0	12	1	0	734.500	500	36
	M11	3	9	0	1	2.114.500	240	30
	M16	0	15	1	0	1.283.000	640	18
	M18	0	17	1	1	1.292.400	560	50
	M25	0	10	0	1	1.556.000	320	0
	M34	0	14	1	1	810.600	98	20
	M40	0	28	1	0	1.520.000	0	0
	12	12	12	12	12	12	12	12
	76	76	76	76	76	76	76	76

Wealth Groups Mihumo/Darajani								
WealthGroup		Housing	Bicycles	Mobiles	Total Cult Land	Chicken	Total Income	Cashew Yield(kg)
Poor	Mean	,00	,00	,09	6,45	1,00	288.550,00	62,82
	N	11	11	11	11	11	11	11
	Std. Deviation	,000	,000	,302	3,004	1,000	298.995,681	67,597
Middle	Mean	,89	,83	,36	6,32	8,15	432.826,23	146,60
	N	53	53	53	53	53	53	53
	Std. Deviation	1,103	,580	,558	3,291	9,164	276.683,600	116,143
Wealthy	Mean	1,17	,83	,75	16,75	21,17	1.231.158,33	415,92
	N	12	12	12	12	12	12	12
	Std. Deviation	1,467	,577	,866	5,817	16,219	581.332,789	329,580

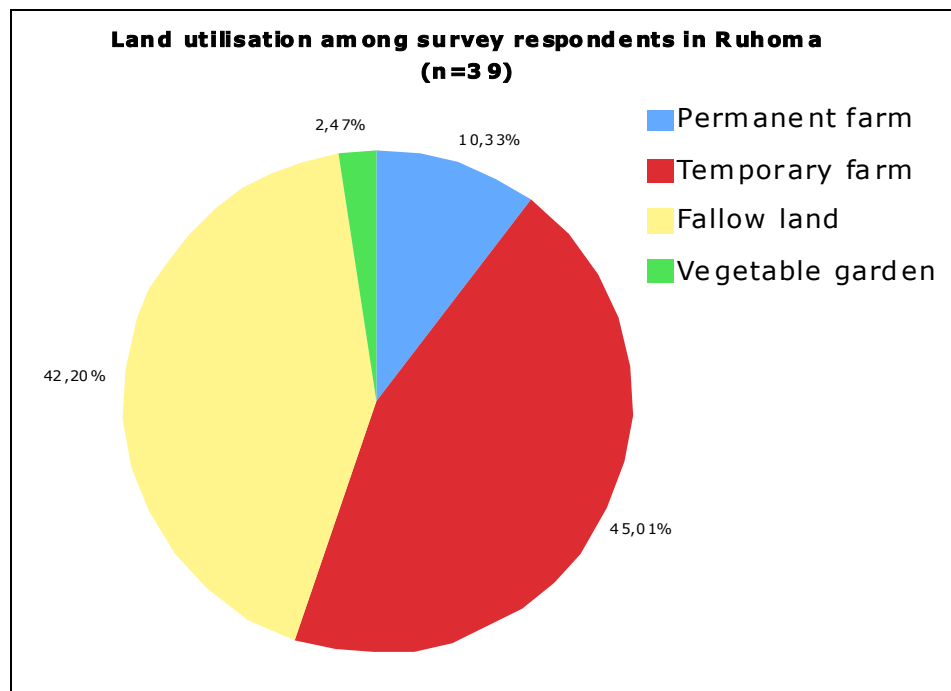
Appendix VII: Land utilisation and production of crops

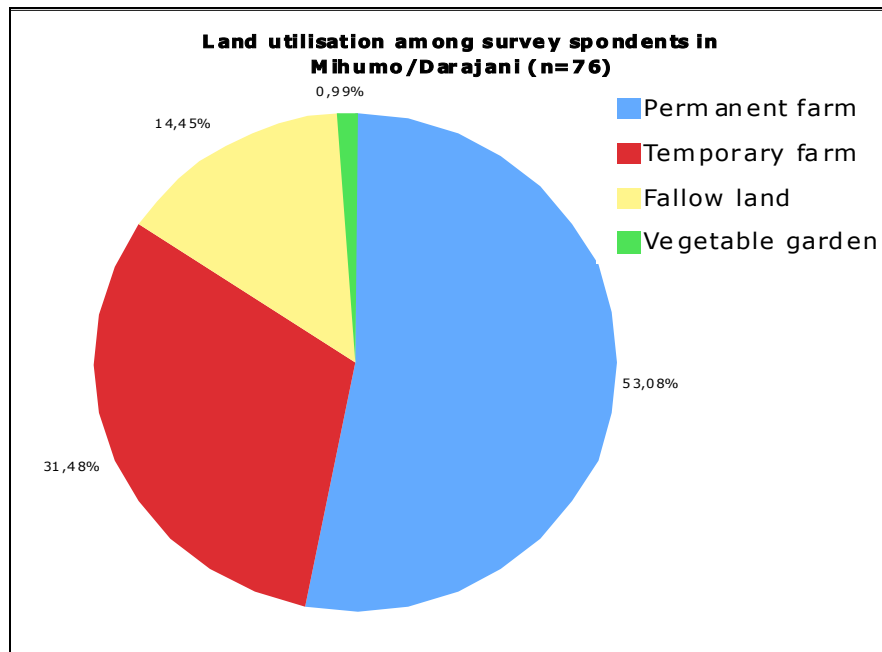
Distribution of temporary farms per size and wealth group in Mihumo/Darajani				
Size of temporary farm (rounded)	Wealth Group			Total
	Poor	Middle	Wealthy	
0 acres	1	6	0	7
1 acre	2	6	1	9
2 acres	3	16	3	22
3 acres	4	15	1	20
4 acres	0	4	1	5
5 acres	1	2	1	4
6 acres	0	3	3	6
8 acres	0	1	0	1
15 acres	0	0	1	1
16 acres	0	0	1	1
Total	11	53	12	76

Distribution of temporary farms per size and wealth group in Ruhoma				
Size of temporary farm (rounded)	Wealth Group			Total
	Poor	Middle	Wealthy	
0 acres	2	0	1	3
1 acre	2	3	1	6
2 acres	3	4	3	10
3 acres	1	5	3	9
4 acres	3	1	2	6
5 acres	1	1	1	3
6 acres	0	0	2	2
Total	12	14	13	39

Distribution of permanent farms per size and wealth group in Mihumo/Darajani						
		Wealth Group			Total	
		Poor	Middle	Wealthy		
	0 acres	1	4	0	5	
	1 acre	0	6	0	6	
	2 acres	0	5	0	5	
	3 acres	4	14	0	18	
	4 acres	1	11	1	13	
	5 acres	0	2	0	2	
	6 acres	4	4	1	9	
	7 acres	1	2	1	4	
	8 acres	0	2	1	3	
	10 acres	0	0	2	2	
	12 acres	0	3	2	5	
	14 - 17 acres	0	0	4	4	
	Total		11	53	12	76

Land utilisation among survey respondents





Land utilisation per wealth group										
		Total	Type of land use							
			Temporary	"%"	Permanent	"%"	Fallow	"%"	Vegetable	"%"
Mihumo/Darajani	Poor (n=11)	92	25	27%	47	51%	20	22%	0	0%
	Middle (n=53)	398	131	33%	199	50%	63	16%	5	1%
	Wealthy (n=12)	222	68	31%	131	59%	20	9%	3	1%
		Total	Temporary	"%"	Permanent	"%"	Fallow	"%"	Vegetable	"%"
Ruhoma	Poor (n=12)	57	26	46%	5	9%	25	44%	1	1%
	Middle (n=14)	83	34	41%	7	8%	40	48%	2	3%
	Wealthy (n=13)	84	40	48%	11	13%	30	36%	3	3%

Share of individual crops in total production volume

Share of individual crops in production volume per wealth class in Ruhoma											
Produce (kg)	Total	Maize	Millet/S	Pigeon Peas	Cowp.	Cass.	Ground	Veg.	Cashew	Sesame	Rice
Poor (n=12)	6,930	2,366	2,020	554	420	500	20	50	180	620	200
	100%	33%	28%	8%	6%	7%	0%	1%	4%	10%	3%
Middle (n=14)	11,384	3,710	3,460	305	870	325	0	290	186	1,318	920
	100%	33%	29%	3%	7%	3%	0%	2%	2%	13%	8%
Wealthy (n=13)	16,417	3,190	2,660	940	1,380	1,800	0	710	945	3,232	1,560
	100%	18%	15%	5%	8%	10%	0%	4%	8%	23%	9%

Share of individual crops in production volume per wealth class in Mihumo/Darajani											
Produce (kg)	Total	Maize	Millet/S	Pigeon Peas	Cowp.	Cass.	Ground	Veg.	Cashew	Sesame	Rice
Poor (n=11)	9,594	2,880	4,040	720	100	10	40	40	691	443	630
	100%	30%	41%	7%	1%	0%	0%	0%	10%	5%	6%
Middle (n=53)	52,106	11,900	17,086	5,193	555	2020	67	600	7,690	2,275	4,720
	100%	21%	31%	9%	1%	4%	1%	1%	20%	5%	8%
Wealthy (n=12)	21,036	3,620	3,240	3,000	280	360	20	460	4,991	1,985	3,080
	100%	15%	14%	13%	1%	2%	0%	2%	30%	10%	13%

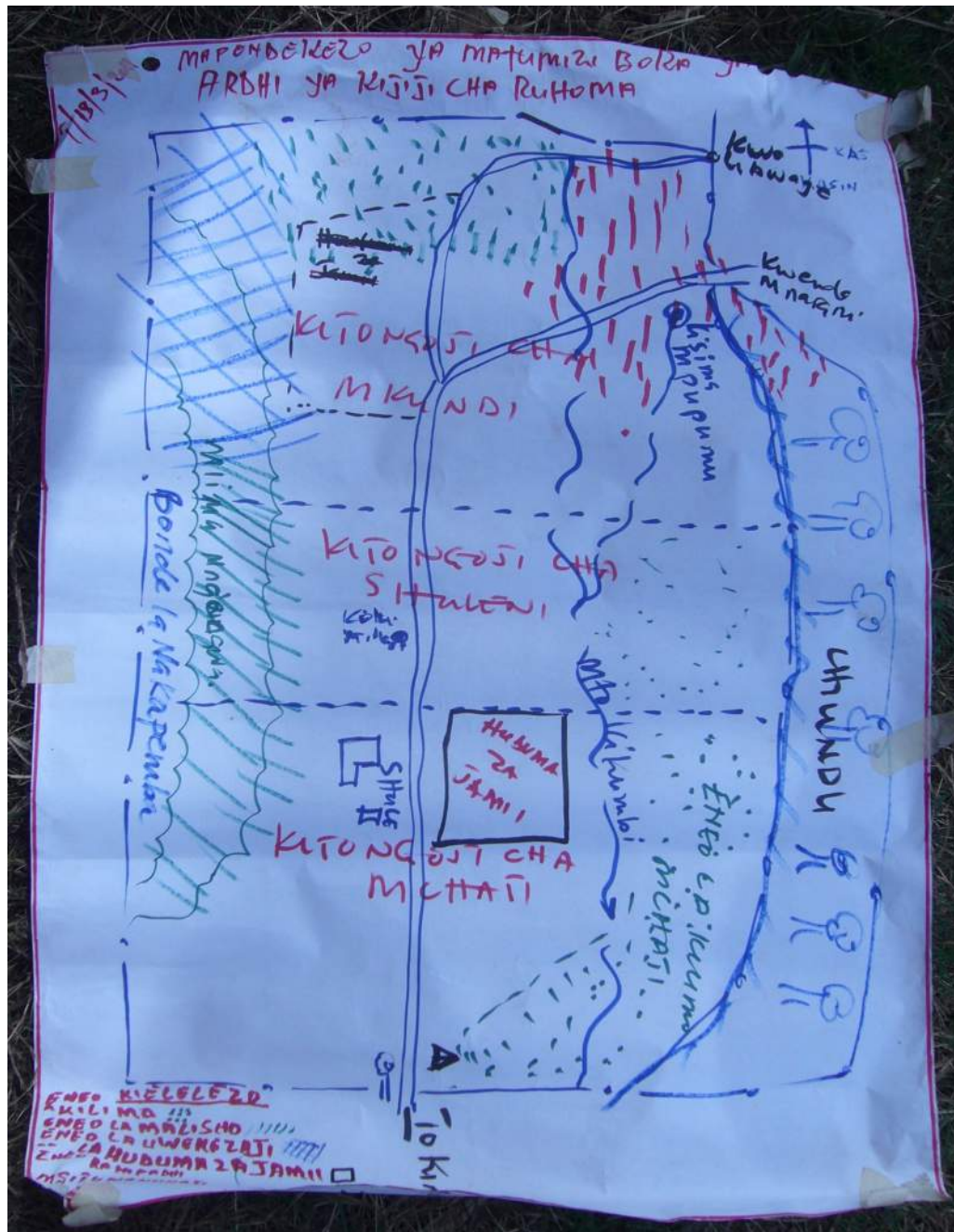
Appendix VIII: Map of Milola Magharibi

(Source: FMP Milola Magharibi 2012)



Appendix IX: Provisional land use map Ruhoma

Source (own photograph)



Appendix X: REDD+ trial payments calculations

According to Merger et al. (2012) the mean natural forest carbon stock in the Lindi project site of TFCG/Mjumita amounts to 158.8 tCO₂ per hectare. This means that a deforestation of one hectare of forest in Ruhoma results in emissions of 105 tCO₂. On the basis of satellite images TFCG/Mjumita estimated that the annual deforestation rate in Ruhoma amounts to 33.16 hectares. For the Lindi project site the average deforestation rate is estimated to be 1.55% per year (Merger et al., 2012).

After project proponents established that Ruhoma has a total area of 2,830.23 hectares of forest it was decided in village assemblies, which took place as part of the REDD+ project, that 2,487.70 hectares should be protected. This is 88% of the total forest area. Because of the decision to protect 88% of the total forest area, it was stated that 88% of the annual deforestation rate should be avoided. This would mean that 29.18 (88% of 33.16) hectares of forest should be left standing instead of being cut down every year. Of this amount 29.18 hectares, a share of 12% (100%-88%), can be cleared outside of the forest reserve. This leads to an area of 25.6792 hectares that remains protected every year due to REDD+ efforts.

Given a mitigation potential of 105 tCO₂ per hectare forest, the protection of 25.6792 hectares leads to avoided emissions of 2,693.8 tCO₂ per year. With an estimated carbon income of 5 USD (=7,826 TShs at the time) per tCO₂ a total sum of 21,081,960 TShs was made available by the project proponents for distribution among the 346 registered adults and 224 registered minors in the village. It is important to note here that a net income of 5 USD per tCO₂ presumes a minimum price of 9.8 USD per tCO₂. This is because the total costs of avoiding the release of one tCO₂ amounts to 4.8 USD over a period of 30 years in the project site. Total costs include implementation, transaction and institutional costs of the project (see Merger et al., 2012).

It is important to note here that a net income of 5 USD per tCO₂ presumes a minimum price of 9.8 USD per tCO₂. This is because the total costs of avoiding the release of one tCO₂ amounts to 4.8 USD over a period of 30 years in the project site. Total costs include implementation, transaction and institutional costs of the project (Merger et al., 2012).

Appendix XI: Governance of forests in Tanzania

Prior to colonialism populations in the Lindi region of Tanzania lived in ‘clans’ in nuclear settlements, or dispersed, moving across forested and open landscapes. Population density was low, resulting in extensive forms of agriculture where forests were left to recover after being cut down for agricultural cultivation. At that time power over the governance of land and forests was vested in local chiefs and lineage elders. They controlled and managed community-based activities including farming and wildlife hunting (Johansson, 2008; Sunseri, 2009). In fact, forests played an important role in making local authorities. Across eastern and central Africa, and particularly among the Zaramo people of the coastal hinterland in Lindi, the authority of ‘village chiefs’, or *wenye mabazi* (“wielders of the axe”) as they were known, stemmed from controlling and clearing the forests (Sunseri, 2009).

Although many commentators still regard the Lindi region to be remote and isolated from the outside world, in reality trade in humans and natural resources has for long connected the region to powerful outside actors. From early centuries onwards, coastal hinterland communities were linked to the world market via the Indian Ocean trade network. Swahili civilizations settled in the coastal hinterland from as early as the first century CE to trade mangroves with India, Middle East and the Mediterranean (Sunseri, 2009). In the 19th century Liwale and the Lindi region had become the economic hinterland of the Indian Ocean trade network through which important commodities such as ivory, rubber, gum, copal, beeswax, honey as well as slaves were transported to the coast, and from there via Zanzibar to Europe and the Middle East (Sunseri, 2009; Iliffe, 1979). Local chiefs and their followers could sustain their power by engaging in this trade that brought valuable commodities from Arab and Western nations in exchange (Sunseri, 2009).

Once colonial forces – first German and then British administration – claimed control over Tanganyika and the Lindi region, power structures over natural resources and people changed dramatically, especially among those rural societies that lived in or close to forests. German colonial rule introduced scientific forestry, which was continued under the British and even post-colonial administration⁴⁷. With the

⁴⁷ Scientific forestry originates in Germany of the 18th century and is a way of managing forests that is based on rational planning according to scientific principles, economization of forest management and technocratic governance.

introduction of scientific forestry, rural people encountered state authority and claims over forests, which negative effects on their livelihoods. State powers wanted to manage forests as state reserves for national economic development, where people were to be separated and restricted from using the forests (Sunseri, 2009; Neumann, 2001). Local livelihood practices including shifting cultivation were deemed irrational and destructive. Moreover, they were considerably disrupted when, under British rule for instance, many rural dwellers were forced to move from their homesteads to ‘closer settlements’; officially in order to combat sleeping-sickness and other diseases but effectively to contribute labour and taxes to the development of the colonial government. Under state rule forest and wildlife policies were powerful tools in engineering rural landscapes and people’s livelihoods (Sunseri, 2009; Neumann, 2001). However, state power wasn’t all encompassing and people in Lindi used their means to prevent subjugation either by practicing everyday resistance or large scale rebellion (Sunseri, 2009).

The most dramatic reorganisation of local livelihoods, however, happened in the first decades of national independence. The Ujamaa villagization programme of the 1970s displaced more than 70% of the rural population from their settlements within three years. Farmers once again had to witness the disruptive effects of state authority that aim to separate people from their livelihoods in order to reconnect them (as labourers) according to national development objectives (Sunseri, 2009).

In the 1980s a global shift in ideology and practice of natural resource management emerged that promoted community-based and participatory approaches (Dressler et al., 2010). In Tanzania, the idea of community driven forest management began with the initiation of several pilot projects in 1990s (Treue et al., 2014). These projects had a major influence on the design of the National Forestry Policy in 1998 (URT, 1998), the subsequent Forest Act No 14 in 2002 (URT, 2002) and in regulations and guidelines for Community Based Forest Management (CBFM) and Joint Forest Management (JFM) (Treue et al., 2014). The new ‘participatory forest management’ (PFM) framework, which set out to reform national forest governance for the first time after the colonial era, made a clear commitment to participatory approaches and provided a strong mandate toward the transfer of management responsibilities and/or rights over ownership onto the most local level (Blomley and Iddi, 2009). It strongly reflected a broader trend of forest decentralization in Africa and across the South (Ribot et al.,

2010). Under CBFM villages should become empowered to establish, own and manage Village Land Forest Reserves (VLFR) on village land. Under JFM village governments can co-manage National or Local Government Forest Reserves that are owned by the district or national government (Blomley and Iddi, 2009). In recent years many forest-adjacent village residents have experienced new forms of local forest governance as CBFM and JFM regimes expanded to a considerable extent in the country.

JFM is a joint agreement between concerned parties to manage national and local government forest reserves with adjacent communities. Under CBFM, a village land forest reserve (VLFR) or a community forest reserve (CFR) is established where village councils as corporate bodies obtain the rights to own the forests as legal property, create their own legally binding by-laws, subject to approval by the village assembly and district council, and to retain 100% of the revenue acquired from sales of forest products. Village bylaws are important instruments for the village to enforce their management regimes and penalise criminal offences. This includes for instance levying fines on illegal forest use. Village natural resource committees are accountable sub-committees to the village council and elected by the village assembly. Their role is to perform forest management activities in the village (Blomley and Iddi, 2009)

In order to establish a VLFR some minimum legal requirements must be fulfilled. First, villages must have legal tenure over their land, which means their land must be classified as “village land” and not “general land”. Second, a village natural resource committee (VNRC) must be elected by the village assembly whereby gender considerations must be taken into account. Third, the boundaries of the forest must be described. If a village shares forestland with neighbouring villages the boundaries within the forest owned by each village must be described too. Fourth, the village must develop a forest management plan and bylaws describing how their forest is managed, used and protected. The management plan and the bylaws must then be approved by the village assembly and the district council. Following all this, the VLFR is declared and managed in accordance with the forest management plan, bylaws and normal rules governing local governments. The Forest Act also allows for a number of villages to establish a joint village forest management committee and to own and manage a VLFR together. After three years of successful management villages may apply for the formal “gazettement” of the VLFR by the central government (Blomley and Iddi, 2009).

Research in Tanzania has generally confirmed the premise that community forest governance results in better forest quality (Blomley and Iddi, 2009; Blomley et al., 2008; Mbwambo et al., 2012; Persha and Blomley, 2009). According to a recent large-scale assessment of forest utilisation under CBFM, JFM and non-PFM forests within reasonable distance from Morogoro, Treue et al. (2014) found that PFM largely leads to better forest condition than forests that are under semi-open access or governed without community involvement (Treue et al., 2014). However, the authors also argue that villagers' capacity of successfully protecting forests on their land is strongly influenced by non-PFM related site-dependent factors, most importantly proximity to urban centres. In cases of small distances between the village forest and urban centres, especially the capital Dar es Salaam, the external pressure on forest resources seems to be so strong that no formal management regimes appear to be able to control it (ibid). Because villagers lack sufficient powers to enforce *de jure* rights over the management of the forests, the unauthorised activities (illegal timber trade, charcoal making, etc) from village external actors result in overharvesting with long term negative effects on local livelihoods (Treue et al., 2014). Another finding from past studies suggests that CBFM forests seem to increase forest exploitation outside of the reserve (Vyamana, 2009), which illustrates the problem of leakage that is often discussed in relation to REDD+ efforts (Balooni and Lund, 2014; Robinson et al., 2013).

Scholars have also examined the effects of both CBFM and JFM on local democratic governance. A study by Vyamana (2009), for instance, found that the introduction of participatory forest management promoted increased activities by the Village Environmental Committee or Village Natural Resources Committee. Frequent meetings on forest use and management were held, issues discussed and relevant decisions made. In contrast, the author argues, VNRC/VEC committees and their leadership in villages not engaged in PFM were rather inactive. Persha and Blomley (2009) linked better forest management practices and community institutions' effectiveness in their study to strong tenure security and decision-making autonomy of local village communities.

Other research has highlighted governance challenges and cases of corruption, mismanagement and violence at the village level towards marginalised groups of people (Brockington, 2007, 2008; Shahbaz et al., 2008; Lund and Treue, 2008; Persha and Blomley, 2009; Blomley and Nelson, 2010). Brockington (2007, 2008) emphasises the importance of the local level governance context – the workings of the village council,

village government, village committees and district council – in which CBFM and JFM are embedded. CBFM and JFM are part of local governance structures that are often characterised by weak performances of democracy, transparency and civil society. While decentralization reforms have the potential to strengthen local democratic institutions on which they depend, he argues that this will occur only over time and requires popular struggles and continuous learning. This is related to work by Blomley and Iddi (2009) and Nelson and Blomley (2010), who point at the considerable constraints of governments at the district level, which hampers quick implementation of decentralization laws and policies.