Governing Forests in a Carbon Challenged World: Learning from REDD+ in Tanzania.

By

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Dedication

For my late maternal grandmother, Agnes Kibua Sekisasa (1930-2000), aka Bibi Egi, you were my first participant to what I learned later is called *oral-historical interview*.

In 1999, Roots & Shoots, a worldwide youth environmental program of the Dr. Jane Goodall's Institute, announced an environmental essay competition for high school students in Tanzania. Based on a single detailed interview with an elderly family member (above 50 years), writers were asked to produce a 10,000 words essay describing people-environment relations as observed and experienced by the interviewee throughout their life in their immediate environments (village or district).

I was lucky that my maternal grandmother was visiting with us for several weeks. Our conversations (the interview) lasted several days going back and forth in time and space. We learned a lot from each other. We entitled our collaborative handwritten essay:

"Recollection of the past, Forecasting the Future: Environmental Changes in Amani, Tanga, 1930s-1990s".

Our essay won the top prize out of 317 entrants in August 2000, one month before Bibi Egi passed on.

Conducting oral historical interviews with elderly persons in Kilwa and Lindi Districts for this dissertation was reminiscent of my interviews with Bibi Egi. If she was around, we would have compared recent transformations in people-forest relations and forest institutions under neo-liberal and carbon challenged contexts, to those she experienced during the colonial and independent socialism eras.

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The journey to my doctorate degree would not have been possible without the genuine and generous support of many. I apologize in advance to those that I will forget to mention here, but I know you know that I truly appreciate your support before and during this journey. None of what I write below effectively summarizes abundant benefits I have amassed from our rich interactions. Words are not enough to express my sincere feeling of gratitude. Forgive me for reducing our nuanced interactions to a few sentences.

I feel highly and ever indebted to my committee chair, Dr. Rebecca Hardin, who constantly reminded me to pay attention to the bigger picture: broader theoretical and policy implications of my study beyond South-Eastern Tanzania. The book on parenting that you and Arun gave to my wife (Nurbibi) and I was the most invaluable resource as we learned how to take care of our new born son, Imran, away from our mothers and aunties who in normal circumstances would have assumed the responsibility. You always and uniquely understood the personal and professional circumstances I found myself in and always came up with most encouragement to keep going. I try to emulate your mentoring style whenever I mentor others.

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cultural nuances of coastal communities in my study sites and Arun pushing me to create frames that innovatively merges several topics arising from my work.

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Many thanks to several faculty at SNRE from whose classes I learned several important things that shaped this dissertation in very meaningful ways. Maria Lemos, I am sure you have heard this from other students, but I will repeat anyway: thank you for pushing me to think about what my dependent and independent variables are and from there formulate empirical questions and hypothesis on the relationships between my variables. Such a structured approach has helped immensely in simplifying this complex topic of forest governance in carbon challenged world. To Prof. Howard Stein, I truly appreciate your push to consider literature on development economics and its implications on my topic of interest. Hearty appreciations to Dr. Julia Paley for introducing me to ethnography of democracy which developed into a full chapter.

Many thanks to my wife, Nurbibi, my son, Imran: you two mean the world to me. We have been through thick and thin. Now it is my turn to focus all my attention on your wellbeing as you have taken care of me throughout this journey.

Many thanks to my sisters (Mwajuma and Nuria), my brothers (Himidy, Ismail and Idrisa) and the rest of my extended family: you have covered for me during very crucial moments such as illnesses and deaths of very important members to our family. I tried to avail myself but I know

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Abstract

The last forty years has seen both unprecedented loss of natural tropical forests and innovation in forest governance. Forest governance refers to the constellation of public and private actors, regulatory institutions mediating the interactions between actors and their actions and inactions that affect forests. The coexistence of innovative forest governance arrangements and continued deforestation and forest degradation implies that more work is needed to refine the theory and practice of forest governance in a rapidly changing world. To provide empirical analysis on the making and performance of the emerging forest governance landscape, this dissertation uses the Tanzanian case of the recently introduced international program to reduce emissions from deforestation and forest degradation (REDD+). REDD+ implementation through participatory forest management in over fifty tropical developing countries neatly captures several transformations in forest governance. It is informed by recent understanding that tropical forest loss is a result of multiple interacting factors operating from local to global levels. It has expanded forest management goals beyond biodiversity and timber values to include local livelihoods and climate change mitigation and adaptation goals. It brings different actors together in negotiating the best ways of avoiding tropical deforestation and forest degradation including local forest communities, district councils, national governments, national and international non-governmental organizations, private sector such as financiers of carbon credits and buyers of sustainably harvested forest products.

Drawing from extensive ethnographic field data (participant and non-participant observations, oral histories, key informant interviews, work histories, focus group discussions, documentary reviews and household surveys) conducted over several trips spanning five years (2009-2014), with actors in Kilwa and Lindi Districts in South-Eastern Tanzania, this dissertation makes several contributions organized into three substantive chapters.

The first substantive chapter, entitled *"Negotiating forests under the REDD+ context in South-Eastern Tanzania"* provides descriptions of (a) transformations in people-forest relations and the local to global forces causing these transformations, (b) transformations in forest institutions regulating the emerging and unsustainable people-forest relations and (c) how local forest residents creatively deploy the use of modern technologies of mobility (cellphones and motorcycles) and the discourses of decentralization, democracy and participation to continue performing otherwise banned cultural-ecological practices of shifting cultivation and wood extraction blamed for the reported forest disappearance.

The second substantive chapter, entitled *"Deliberative democracy and the making and unmaking of illegitimate forest institutions"* exposes and analyzes the paradoxical eruption of REDD+ resistance despite the adoption of participatory and democratic processes in making and implementing REDD+ interventions. Using the theory of deliberative democracy coined by Joseph M. Bassette (1980) and combining distinctive accounts of deliberative democracy by Jurgen Habermas, Rawl and Nancy Fraser and latest contributions in that field I argue that: (a) the adoption of deliberative democratic processes remain alien to local residents and hence has resulted in the production of legally legitimate but democratically illegitimate and unfair forest institutions; (b) local residents have opted for violent and non-violent resistance as alternative mechanisms for contesting the introduced forest institutions since the prescribed democratic spaces remain inaccessible to them; and (c) national and international REDD+ actors should view resistance as a crucial ingredient in making durable institutions for attaining sustainability in complex social-ecological systems.

The third substantive chapter, entitled *"Mismatched: why do REDD+ payments fail to avoid deforestation in human dominated miombo ecosystems?"* challenges and expands on the application of recently introduced carbon payment as an innovative financing scheme for encouraging adoption of sustainable forest management practices in the tropics. I provide empirical evidence to support obvious cautions made by other scholars that carbon payments will remain inadequate in making avoided deforestation a competitive land use against

traditional land uses such as crop farming, logging and ranching for a number of reasons detailed in this chapter. Using detailed ethnographic descriptions, I argue that when those inadequate payments are aligned to seasonality of cultural-ecological practices causing forest change and if injected at the appropriate spatial scale (individual and/or community) where decisions affecting forests are made, they have a greater chance of achieving intended impacts on transforming local people's cultural practices for attaining REDD+ goals.

Chapter One: Introduction

This doctoral dissertation is motivated by the simultaneous occurrence of unprecedented loss of tropical forests and unparalleled innovation in forest governance over the last three decades. I define forest governance as the constellation of public and private actors, regulatory institutions and their actions (and inactions) that affect forests. The last 25 years has seen net forest loss and increased forest degradation in poor tropical countries while richer temperate countries have recorded net forest gains (Forest Assessment Report FRA 2015; Sloan and Sayer, 2015). Although global annual rate of forest loss has declined from 7.3 M ha yr in 1990 to 3.3 M ha yr in 2015, the current annual rate of forest loss in the tropics at 5.5 M ha yr remains significantly higher than the Global rate (Keenan et al., 2015). The general condition of weak forest governance in the tropics combined with the effects of recent socio-economic, technological and environmental changes have resulted in a situation whereby clearing a forest is often more profitable than maintaining a standing forest (Bromley et al., 2010; Capistrano, 2010; Lambin et al., 2006; MA, 2005; Milledge, 2010; SOFO 2014). 2014).

Consequently, the last three decades has seen unparalleled innovation in forest governance (see Lemos and Agrawal, 2009). It is now widely recognized that sustained efforts are required to address the increasing problems of tropical deforestation and forest degradation which poses severe and potentially irreversible effects on the well-being of forest ecosystems and the millions of people living in and around forests in the tropics (Chhabra and Geist, 2006; MA, 2005; Mooney, et al., 2005; Moran and Ostrom, 2005; SOFO). Forest governance transformations have been characterized by both the expansion of state forest governance and introduction and expansion of various non-state forest management arrangements as scholars and practitioners are actively searching for innovative ways to avoid tropical deforestation (ibid; Hardin, 2011; Ostrom, 2007). Recognizing that forest management under the state, private or

community arrangements alone are not a renewable resource management panacea (e.g. Berkes, 2004; Mshale, 2008; Ostrom, 2007; Nelson and Agrawal, 2008; Nelson, 2010), forest governance scholars and practitioners have contributed to innovative design and experimentation with various forms of hybrid governance systems commonly referred to as "adaptive and collaborative resource governance systems" (see Lemos and Agrawal, 2006; Lemos and Agrawal, 2009; Armitage, Berkes and Doubleday, 2007). This coexistence of innovative forest governance arrangements and continued deforestation and forest degradation implies that more work is needed to refine the theory and practice of forest governance.

Although tropical forests have managed for multiple values from the colonial period to the present, during each moment there has been at least one major value for which forest governance is organized about. Forest management for timber values dominated the colonial period whereas most of the post-colonial period has been dominated for timber and conservation values in most tropical developing countries. The contemporary moment is dominated by the carbon narrative given the crucial roles played by tropical forests in climate change mitigation and adaptation. Using the case of the recently introduced international funding mechanism to reduce emissions from deforestation and forest degradation (REDD+), the dissertation empirically analyzes the motivations, implementation and outcomes of forest governance in a carbon challenged world – a world where the realization that tropical forests play a significant role in addressing the climate change problem globally as well as locally resulted in several transformations in forest governance.

REDD+ implementation in over fifty tropical developing countries sufficiently embodies these recent transformations in forest governance. REDD+ is informed by recent understanding that tropical forest loss is a result of multiple interacting factors operating from local to global levels (e.g. Lambin and Geist, 2002). It has expanded forest management goals beyond biodiversity and timber values to include local livelihoods and climate change mitigation and adaptation goals following realization that tropical deforestation and forest degradation accounts for up to

20% of global greenhouse gases emissions (IPCC 2007). REDD+ brings different actors together in negotiating the best ways of avoiding tropical deforestation and forest degradation including local forest communities, district councils, national governments, national and international non-governmental organizations, private sector such as financiers of carbon credits and buyers of sustainably harvested forest products.

The REDD+ program has also transformed the distribution of roles, powers and rights held by the different actors. National governments are now playing the facilitating and regulatory roles in forest management through creation of national level structures, organizations, rules and norms while previously most forests were owned and managed by the state in the tropics. Local governments are now sharing facilitating roles with national and international non-governmental organizations in linking local forest communities as suppliers of carbon credits on one hand and international entities such as bilateral partners and private partners as financiers of carbon credits on the other hand. International standards and benchmarks regulating carbon markets such as voluntary carbon standards and climate, community and biodiversity alliance (CCBA) standards are brought to bear on the practices of local forest residents and their local forests.

REDD+ has received unprecedented attention from both scholars and practitioners. REDD+ creatively combines recently decentralized community based forest management (CBFM) and innovative payment for environmental services (PES) under contexts of participatory and democratic processes for reconciling between the multiple and often competing forest values among diverse local to global forest actors. Initially tropical developing countries particularly the Indian and Brazilian delegations to the UNFCCC rejected the REDD+ program contending that avoiding tropical deforestation will have serious impacts to the national economies and livelihoods of millions of forest dependent communities in the tropics.

Following series of international negotiations, in 2007 in Bali, Indonesia during the 13th UNFCCC COP, stakeholders agreed to a pilot REDD+ program. Piloting the REDD+ program began in 2009

in nine tropical developing countries and by 2012 it had spread to about 29 tropical countries. Other REDD+-like interventions were developed and currently REDD+ and REDD+-like initiatives are being implemented in over 50 countries. A quick Google search on scholarly publications on REDD+ publications in 2012 revealed over 8000 hits and a similar search in 2015 provides over 30,000 hits. Literature on REDD+ as an emerging and complex forest governance landscape has shifted from speculative studies informed by theoretical and empirical studies on forest management to actual assessment of various aspects of REDD+ design and outcome. This dissertation is one a few comprehensive studies that applies multi-disciplinary methods and long-term field based research (2009-2014) to assess the motivations, design, implementation and outcomes of emerging and complex forest governance landscape using the case of REDD+ implementation in Tanzania.

Conceptual framework and research aims/questions

To analyze the emerging and complex forest governance landscape in the tropics using the case of REDD+, this dissertation is organized into three sequential components: motivations behind REDD+, implementation aspects and outcomes from REDD+. This design is informed by frameworks designed in studying complex social ecological systems (SES) also known as coupled human – nature systems (CHANs). Specifically, this dissertation builds on one such framework -- the Institutional Analysis and Development (IAD) framework -- whose development began in the 1980s by researchers associated with the Workshop in Political Theory and Policy Analysis at Indiana University (Kiser and Ostrom, 1982; Ostrom 1986; Ostrom, 1990; Oakerson, 1992; Ostrom et al., 1994; Gibson et al., 2000; Ostrom, 2005). The framework maintains that the formation of fair and acceptable institutions (rules, norms, structures and organizations) for effective and sustainable forest management should be informed by clear understanding of the characteristics of resource system itself, characteristics of the resource users and the emerging interactions between resource system and resource users (Ostrom, 1990; Ostrom, 1999; Ostrom, 2005). The framework identifies four key components including: characteristics of the resource system; characteristics of the resource users; institutional arrangements; and

outcomes. Importantly, the framework has evolved to show linkages and direction of causality and feedback between the different components (Ostrom, 2009).

Table 01 summarizes the three components of this dissertation according to the IAD Framework. Review of literature, data collection and analysis in this study is focused on the three areas of the framework: (1) REDD+ Motivations, (2) REDD+ Implementation and(3) REDD+ Outcomes.

Table 1: Conceptual framework and research questions

IAD Framework	Dissertation Components	REDD+ Steps	Research questions
Features of the resource system	*REDD+ Motivations* Analysis on underlying and proximate drivers of deforestation	Select project site Establish historical rate of forest change using appropriate methods Identify drivers of deforestation and forest degradation	Is the forest disappearing and becoming degraded?
Features of the resource users			How do people and their actions (and inactions) cause either deforestation and/or forest conservation?
Institutional arrangements	*REDD+ Implementation* Analysis on the processes and content of forest institutions	Develop rules and structures for addressing drivers of forest change	Does the adoption of democratic and participatory approaches result in the making of fair and acceptable forest institutions?
Outcomes and feedback	*REDD+ Outcomes* Analysis on the social and ecological outcomes.	Quantify and market emissions reductions (ER) credits achieved Deliver carbon payments and other benefits to participating communities	What are climate, community and conservation outcomes of REDD+ interventions?

Theoretical literature and framing on REDD+ motivations

This part of the dissertation empirically analyzes the motivations behind REDD+ by critically interrogating the factors and processes blamed for the reported disappearance of forests around the world. I contend that, clear identification of the factors, actors and processes responsible for forest loss will enable development and application of appropriate strategies for sustainable management of tropical forests. Broadly, the continued loss of forests in the tropics implies that we need better articulation of the actors, factors and processes behind forest losses. At the international level, REDD+ is motivated by the realization that avoiding tropical deforestation and forest degradation will result in the reduction of up to 10% of net greenhouse gases emissions that cause global warming and eventually climatic changes (IPCC 2013). REDD+ framework maintains that avoiding tropical deforestation and forest degradation offers cheaper climate change mitigation options while actors are pondering about feasible ways to achieve emissions reductions in costly sectors such as energy, industry and transportation that constitute the bulk of GHG emissions. REDD+ is based on the premise that delivering direct and indirect benefits through carbon financing schemes to people living in and around forests in the tropics will incentivize adoption of sustainable forest management practices and avoid deforestation and forest degradation.

REDD+ implementation begins with selection of a project site, establishing historical rate of deforestation and identifying drivers of deforestation and forest degradation (Namirembe 2007; MCDI 2012). Latest assessments indicate forests in poor tropical countries are rapidly disappearing. Between 1961 and 1998, forest cover in Tanzania reduced from 44 million ha to 33.5 million ha representing an annual loss of 0.73% (FBD, 2001). At this rate, forest cover in the country will reduce to 28.4 million ha or less by 2020. FAO (2005)'s estimate of 413,000 ha of forest loss per year suggests that forest cover in the country will reduce to 26 million ha by 2020.

The discussion and practice of forest governance is now shifting from providing evidence of forest loss to pay more attention on the causes of deforestation and forest degradation and the best ways of halting and reversing forest loss in the tropics. The UN REDD+ Framework (June

2008), identifies three factors accounting for 70% of forest change in Africa: clearing undisturbed forests to expand shifting cultivation, agriculture intensification in shifting cultivation areas and direct conversion of forest area to small-scale permanent agriculture. The UN REDD+ Program selected Tanzania as one of the initial nine countries to test REDD+ projects because of evidence of forest loss and laudable recent forest management reforms. Although there are no recent data on actual forest change at the sub-national level in Tanzania, various reports on deforestation and forest degradation identify shifting cultivation, forest fires, timber and charcoal production as the main drivers of forest change. For instance, the area under cultivation in Kilwa District, Tanzania increased by 40% from 63,000 ha in 2005/06 to 104,744 ha in 2010 (MCDI, 2012). Slashing and burning forests for expanding or opening new farm plots is the common practice in Kilwa district where over 90% of residents almost entirely depend on small-holder farming for their sustenance (ibid).

Consequently, REDD+ implementation has fueled resurgent focus in regulating local cultural ecological practices of shifting cultivation and wood extraction for attaining REDD+ goals. While debates on shifting cultivation and wood extraction by local residents are matured and settled (see Michael Dove 1983; Conklin; Carneiro; Fairhead and Leach; Boserup; etc), resurgent focus on regulating these practices under REDD+ contexts warrants their resurrection (see …).

Literature on people-forest relations has effectively blurred the nature-culture divide to demonstrate the interdependencies and co-productions between natures and cultures (e.g. Dove 2008 edited volume on this topic). For instance, McCann (2005) observes that "African landscapes are all anthropogenic, i.e. formed by interactions with humans." Local people observed that in the past shifting cultivation did not result in deforestation, but recent changes in the practice of shifting cultivation are resulting in undesirable forest changes. Similarly, Fairhead and Leach (1996) provided compelling evidence on how we have been misreading human-environment interactions and challenges popular narratives that blames local people's actions for reported undesirable forest changes in sub-Saharan Africa. However, deforestation and forest degradation remains real and has increased significantly over the last four decades.

To explain the ongoing imbalance in people-forest relations, Kikula (1998) notes that, sometimes, abrupt changes in social or ecological elements in a coupled human and natural system could affect the ability of the entire system to recover from perturbations and hence result in potentially irreversible adverse effects. Existing critical scholarship has enabled improvements in understanding forces behind reported forest losses. Others have articulated these interacting perturbations operating across multiple spatial and temporal scales that cause imbalanced people-forest relations at the local level (e.g. Lambin and Geist, 1996 and 2002; Hardin and Remis, 2009). Moreover, Kottak (1999)'s review demonstrates that human-environment interactions are dynamic departing from earlier scholarship that assumed human-environment interactions to be constant within defined spatial and temporal scales. Rapid recent changes in socio-economic, technological and environmental factors under conditions of weak forest governance in the tropics have resulted in a situation whereby clearing a forest is often more profitable than maintaining a standing forest (Capistrano, 2010; MA, 2005; Milledge, 2010).

Forestry literature is abundant but has paid little attention on people living in and around forests (SOFO, 2014). This lack of better understanding on the human dimensions of forest change and forest governance continues to affect design and implementation of effective forest management interventions. This dissertation, building on extensive ethnographic field work spanning five years (2009-2014) provides detailed articulation of forest change from the people's perspectives guided by two empirical questions: *How local cultural-ecological practices affecting forests (e.g. shifting cultivation and wood extraction) have changed over time? What factors influence transformations in those socially and ecologically important practices?* This analysis combines secondary data on forest cover changes at the regional, country and local level and ethnographic field data to provide detailed description of the factors behind the reported forest changes. Following Lambin and Geist (2006)'s categorization of drivers of forest change into proximate and underlying factors, I analyze several underlying forces and their interaction in causing alterations in the way a proximate driver (e.g. shifting cultivation) is

performed. This dissertation also explores whether there is a shared view among local people, NGOs and district councils regarding deforestation and forest degradation and their causes. Analyzing whether knowledge of deforestation and forest degradation is shared among diverse actors enables challenging powerful narratives of forest degradation held by technical foresters that have been used to propagate exclusion of people from forests.

Theoretical literature and framing on REDD+ implementation

REDD+ implementation concerns the interaction among and between diverse local and non-local actors in making and applying specific interventions and institutions to address the identified drivers of deforestation and forest degradation. Forest management institutions is a collective term defined as a set of rules, guidelines, policies and the structures and organizations, that guide human-forest interactions either prohibiting or allowing for certain actions (Ostrom, 2005). Recognizing that human dominated tropical forest ecosystems are characterized by existence of diverse actors with often competing interests over forested landscapes, REDD+ proponents have promoted the adoption of recently decentralized community based forest management (CBFM) in implementing REDD+ projects (UN REDD+ 2008). CBFM programs emerged in the mid-1980s based on the premise that giving forest management rights and powers to local communities while promoting equitable sharing of forest conservation benefits and costs, will heal historical enmity between people and forest conservation authorities and as a result, would achieve both conservation and livelihood goals more effectively, efficiently and sustainably (Agrawal and Ribot, 1999; Berkes, 2004; Hutton and Leader-Williams, 2003; Murphree, 1993; Ostrom, 1990; Western and Wright, 1994).

CBFM proponents have used empirical and game theoretic evidence of successful commons to argue for the introduction and expansion of various forms of community forestry (e.g. Wade 1988, Ostrom 1990, Baland and Platteau 1996 and Donald, 1998). The timing of their key advances in pushing for decentralized approaches coincided with a time of increasing hegemony of broader tenets of the neo-liberal orthodoxy such as democratic decentralization and market approaches (see Heynen et al., 2007). This situation combined with increasing

pressure by international conservation organizations and clear state failure to manage the commons post-independence, marked the beginning of what others have called a paradigm shift from centralized to decentralized renewable resource management systems (see Western and Wright, 1994; Songorwa 1999; Agrawal and Gibson, 1999; Adams and Hulme, 2001; Baldus, 2001; Murphree, 2002; Fabricius, 2004; Jones and Murphree, 2004; Brockington, 2005; Brosius et al., 2005; Nelson and Agrawal, 2008).

Over three decades have passed and despite the general situation of low performance in achieving conservation and livelihood outcomes (see Adams and Hulme, 2001; Berkes, 2004; Bromley et al, 2010; Capistrano, 2010; German et al., 2010; Hardin and Remis, 2006; Kellert et al., 2000; Nelson and Agrawal, 2008; Roe et al., 2009; Turner, 2004), CBFM programs have rapidly expanded in over 60 tropical developing countries (Blomley et al., 2010; FAO, 2010; Molnar et al., 2011). REDD+ implementation through participatory forest management arrangements further promoted the expansion of CBFM projects in several countries. However, despite being such a galvanizing program, REDD+ implementation has faced resistance at the local level in many countries (see anti-REDD+ campaign). Emergence of REDD+ resistance suggests a paradoxical effect produced by that program despite adoption of democratic and participatory approaches in developing and applying specific REDD+ interventions and institutions.

Motivated by reported and observed resistance against REDD+, this component of the dissertation investigates on two intertwined questions: *(a) Why are local people resisting forest institutions and interventions that they (local residents) made through democratic and participatory processes? (b) Why are local people not using the same democratic processes such as village assembly meetings to contest the introduced forest institutions and instead they have opted for resistance outside the prescribed democratic spaces?* I use the concept of deliberative democracy as coined by Joseph M. Bassette (1980) and latest developments in that field to assess how processes of democratic deliberation produce paradoxical reactions contrary to expectation. Brohman (1998) broadly defines deliberative democracy as "any one of a family of

views according to which *the public deliberation of free and equal citizens is the core of legitimate political decision making and self government".* Although REDD+ and community based forest management (CBFM) projects do not use the term deliberative democracy explicitly, I find their use of democratic participation in decision-making and emphasis on consensus building neatly fitting the meaning of deliberative democracy as described above. For instance, one of the objectives of the Tanzanian Forest Act (2002) aims to "*encourage and facilitate active citizen involvement* in the sustainable planning, management, use and conservation of forest resources through the development of individual and community rights."

Since Bassette's formulation, proponents and skeptics of deliberative democracy have engaged in theoretically and empirically informed debates that have influenced the evolution of the current deliberative democracy field. Ercan and Dryzek (2015) summarize three areas of major debates on to include: appropriate sites of deliberation, the composition of suitable actors involved in deliberation and the choice of legitimate communication styles during deliberation. Drawing from several empirical case studies published in a special edition, they (Ercan and Dryzek, 2015) summarize the evolution of the field of deliberative democracy on these three areas. Initial conceptualization recognized two distinct sites of deliberation in deliberative democracy. These are Rawlsian and Habermasian accounts of deliberative democracy (Ercan 2014). Rawlsian approach is narrow and contends that, "deliberation should occur only in the state and its institutions such as courts or legislatures (ibid). Rawls view deliberation as a communicative interaction using rational reasoning among elected representatives making decisions on behalf of the broader society. Harbemasian approach is broader and maintains that, "deliberation must be open to all who are affected by the outcome" (ibid). Habermas views deliberative democracy as a broader communication process happening through a large public sphere with no constraints and limitations on participants. Critics have contributed in expanding the sites of deliberation beyond Rawlsian and Harbemasian approaches. One notable contributor is Nancy Fraser who argued that Harbemas' single large public sphere is idealistic and instead she argues that deliberative democracy should include what she calls

multiple publics and even subaltern counter-publics by those oppressed by the decisions resulting from the single large public sphere.

Expansion in deliberation sites has been accompanied by expansion in suitable actors involved in deliberation. Suitable actors have expanded from earlier conception of elected representatives in state institutions such as citizens jurors to recent realization that even self appointed representatives particularly in subaltern counter publics are suitable actors (Ercan and Dryzek, 2015). The expansion of sites and actors has necessitated expansion of communication styles to enable meaningful participation of different actors with different communication abilities and styles. Communication styles have expanded to include story telling and rhetoric, moving from the earlier strict use of rational argument as the only valid communication styles in deliberation (ibid).

However, existing literature on deliberative democracy have not empirically investigated what happens when these diverse deliberation sites, actors and communication styles are forced to coexist and dialogue. REDD+ implementation through CBFM in South-Eastern Tanzania embodies these expansions. There are multiple actors deploying different communication styles in deliberating at different sites. This multiplicity of sites, actors and communication styles in REDD+ implementation allows engaging with the theory of deliberative democracy at its crucial moment for its refinement. Rawlsian approach (smaller forums of elected representatives) is embodied in the various committees of elected representatives created for making certain decisions on forest management. Habermasian approach (broader conception of public deliberation through the single large public sphere) is embodied in the village assembly which is open to all adult residents (at least 18 years old) where decisions made from the smaller Rawlsian like forums would be presented for deliberation and approval. In the REDD+ context, Nancy Fraser's multiple publics and subaltern counter publics do exist as well. These include women's discussion at the water source, men's discussions at village market centers, discussions during ceremonial gatherings such as weddings and funerals, among others. These multiple publics are usually about any topics that concern residents and the

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resurgent forest protection under REDD+ context has fueled conversations about forests in most gatherings.

Resistance is a reaction to the effects of the introduced interventions triggered by perceptions of fairness or unfairness of the introduced forest institutions. If local residents perceive or actually experience the resulting institutions to be fair, then they will recognize and accept those institutions, and vice versa. The notion of fairness, recognition and acceptance of institutions leads to another important aspect of deliberative democracy, that is, legitimacy of the formed forest institutions. Legitimacy is a broad/vague term and has been defined and categorized differently by different theorists of democracy. In this dissertation, I adopt Ercan's categorization of legitimacy into procedural legitimacy and substantive legitimacy (Ercan 2014). Procedural theorists contend that legitimacy arises from *fairness of the deliberation process* while substantive theorists contend that legitimacy arises from *fairness of outcomes* (ibid). This means under procedural legitimacy, the forest institutions formed for REDD+ implementation are legitimate as long as they followed a legal process in their formulation. Similarly, under substantive legitimacy, the forest institutions formed for REDD+ implementation are legitimate as long as they are fair to the targeted citizens regardless of whether they were formulated through a legitimate process. In this chapter I analyze both procedural legitimacy (recognition, acceptance and fairness of *rule making processes*) and substantive legitimacy (recognition, acceptance and fairness of *rules made*).

Theoretical literature and framing on REDD+ outcomes
The aim of this element is to empirically test the REDD+ theory that transferring forest management rights and powers to local communities while promoting equitable sharing of carbon payments is usually associated with high climate, community and biodiversity benefits (see e.g. Bond, 2009; Chhatre and Agrawal, 2009; Ostrom 2009; Richards, 2008). Although the primary objective of the REDD+ program was to achieve climate change mitigation goals at the international level, negotiations by developing countries resulted into inclusion of community and conservation benefits under the REDD+ program. As a result, all REDD+ programs are

expected to achieve climate, community and conservation objectives at the minimum. Climate benefits under REDD+ are defined as emissions reductions achieved and are measured in tons of carbon. Community benefits refer to improvements in socio-economic well-being of participating communities at the household, sub-village and village levels. Biodiversity benefits are defined as net positive impacts on forest conservation values. While common property resource writers used empirical and game theoretic evidence to develop this theory since mid-1980s (see Murphree 1993; and Ostrom, 1990) recent changes in socio-economic, political, and environmental factors and emergence of PES schemes necessitate revisiting the theory (Capistrano, 2010; German et al., 2010; Ostrom, 2009; Remis and Hardin, 2009). Although the theory and practice of CBFM received burgeoning attention by scholars from different disciplines over the last three decades, simultaneous assessment of conservation and livelihood outcomes have remained largely unanalyzed (Agrawal and Benson, 2011; Agrawal and Chhatre, 2011; Ostrom, 2009). This study contends that current CBFM expansion is occurring without sufficient understanding of whether and how to enhance simultaneous achievement of multiple outcomes (see Agrawal and Redford, 2006; Mahantys et al., 2006; Molnar, 2011).

This part of my study is prompted by gaps in the existing literature on simultaneous assessment of conservation and livelihood goals and inadequate attention paid on generating detailed explanations of causal mechanisms between REDD+ institutions and multiple conservation and livelihood outcomes (see Agrawal and Chhatre, 2011; Ostrom, 2009).

1. *What are the specific REDD+ features that affect livelihood and conservation outcomes?* The objective of this question is to identify and explain the specific REDD+ interventions that affect carbon, livelihood and conservation outcomes. Ethnographic narratives are used to describe the rules and actions designed and applied since 2009. These REDD+ interventions are categorized into three groups: interventions that mainly affect livelihood outcomes, interventions that mainly affect conservation outcomes and interventions that jointly affect livelihood and conservation outcomes. Respondents were asked to rate their

satisfaction/dissatisfaction with these interventions in improving livelihoods and forest conditions with a Likert-type scale (Bernard, 2000).

2. *How does REDD+ influence livelihood and conservation outcomes, simultaneously?* The objective of this question is to assess and compare livelihood and conservation outcomes between treatment and control villages before and after introduction of REDD+ institutions. Multiple regression analysis using dummy variables of forest management institutions (presence 1, absence 0) will be used to evaluate relationships between institutions and conservation and livelihood outcomes.

3. *What are the relationships between conservation and livelihood outcomes?* The objective of this question was to explain REDD+ institutional features that maximize synergies and minimize trade-offs between conservation and livelihood outcomes. Spearman ranked order correlations will be used to test correlations between the three dependent variables of carbon, livelihood and forest conservation outcomes.

This dissertation make timely contribution on the simultaneous assessment of multiple social and ecological outcomes paying attention to two broad recommendations made by NSF reviewers and other scholars. First regards the need to have a clear overarching hypothesis with clear independent and dependent variables: thus, this study combines comparative statistical analysis of carbon, conservation and livelihood data with qualitative narratives of forest management institutions to empirically investigate an overarching hypothesis that *local autonomy for forest management (i.e. CBFM) combined with equitable sharing of conservation benefits (i.e. PES) is always associated with high carbon, conservation and livelihood outcomes* (see Chhatre and Agrawal, 2008; Persha et al., 2011). Second, regards need for clear articulation of how findings are generalizable beyond Tanzania: thus, this study ensures generalization of findings by selecting cases basing on the independent variable of local forest institutions instead of basing on the dependent variables of conservation and livelihood outcomes to prevent selection bias (see Agrawal 2002; Chhatre and Agrawal, 2009; Poteete et al., 2011).

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Further, it adopted a stratified random sampling design in selecting households and forest plots for analysis on the dependent variables (see Bernard, 2000; Russel and Harshbarger, 2003).

The Setting

This dissertation uses the case of REDD+ implementation in Tanzania to analyze the motivation, implementation and outcomes of emerging complex forest governance arrangements in managing human dominated tropical forest ecosystems. REDD+ implementation involves interaction of various state and non-state actors in making decisions at the local, national and international levels. This dissertation provides detailed articulation of REDD+ processes and outcomes at the sub-national level. From review of literature and my observation and interaction with REDD+ actors at the international, national and local levels, I realized that REDD+ negotiations at the local level particularly from the people's perspectives have not received sufficient attention. Understanding what happens at the local level is especially important in evaluating whether local forest residents will be able to continue undertaking actions to avoid deforestation post donor and NGO supported phase under the REDD+ context.

REDD+ implementation in Tanzania follows the community based forest management (CBFM) program. Under this arrangement, NGOs are collaborating with District Councils in facilitating REDD+ pilot projects at the village level. The pilot phase in Tanzania involves national level and sub-national REDD+ readiness activities. National level processes are supported by the UN REDD+ Program and the Norwegian Government and involves development of national level structures, organizations, policies, guidelines, strategies and policies on REDD+. Sub-national processes are supported financially by the Royal Norwegian Government and involved establishing CBFM structures, rules and plans at the village level. NGOs and District Councils are providing technical support to villages to enable them meet national and international standards required for sale of carbon credits internationally. At the end of the donor/NGO supported phase, villagers are expected to have acquired necessary skills and experience to

continue implementing REDD+ interventions with minimal technical support from District Councils.

REDD+ implementation involves several steps. From review of the Tanzania National REDD Framework (2009) and TFCG and MCDI's REDD+ project designs in Kilwa and Lindi Districts, I summarize the main actions related to REDD+ implementation at the village level in box 1 below. Completing most of the activities for establishing REDD+ projects at the village requires technical and financial resources. NGOs and District Councils provide the needed technical and financial support to villagers. Implementation takes participatory approaches whereby Village Councils and Village Natural Resources Committees with guidance from NGOs and District Councils draft the plans and decisions for submission to village assemblies for discussion and approval by all villagers.

Box 1: REDD+ implementation process at the village level in Tanzania.

REDD+ Implementation steps at the village level
1. Establish a community based forest management (CBFM) project in the village. Involves survey of village boundaries, developing a village land use plan and assessment of forest resources in the village, among others
2. Demarcate the Village Land Forest Reserve (VLFR)
3. Form the Village Natural Resource Committee (VNRC)
4. Develop Village Forest Bylaws that provides regulations on what is allowed and disallowed inside the VLFR
5. Establish the historical rate of deforestation
6. Identify drivers of deforestation and forest degradation
7. Develop and implement actions to address the identified drivers of deforestation and forest degradation
8. Assess emissions reductions credits achieved from the implemented activities
9. Market the verified emissions reductions credits
10. Apply the revenues to continue undertaking activities that will further reduce deforestation and forest degradation in the future

Tanzania and the two selected districts (Kilwa and Lindi) in particular, provides an ideal site for this study for a number of reasons: (a) there is evidence of deforestation and forest degradation driven by several interacting underlying and proximate causes; (b) because of its recent forest institutional reforms and performance, Tanzania's participatory forest

management program is considered the model program in eastern and southern African region (Bromley et al., 2010; Wily and Dewees, 2001), (c) Implementation of the UN REDD+ program in Tanzania under CBFM arrangements that involves multiple actors provides an opportunity to understand multi-actor collaboration (or lack of), (d) I am also a native of Tanzania and speak the native language hence better equipped for this kind of research.
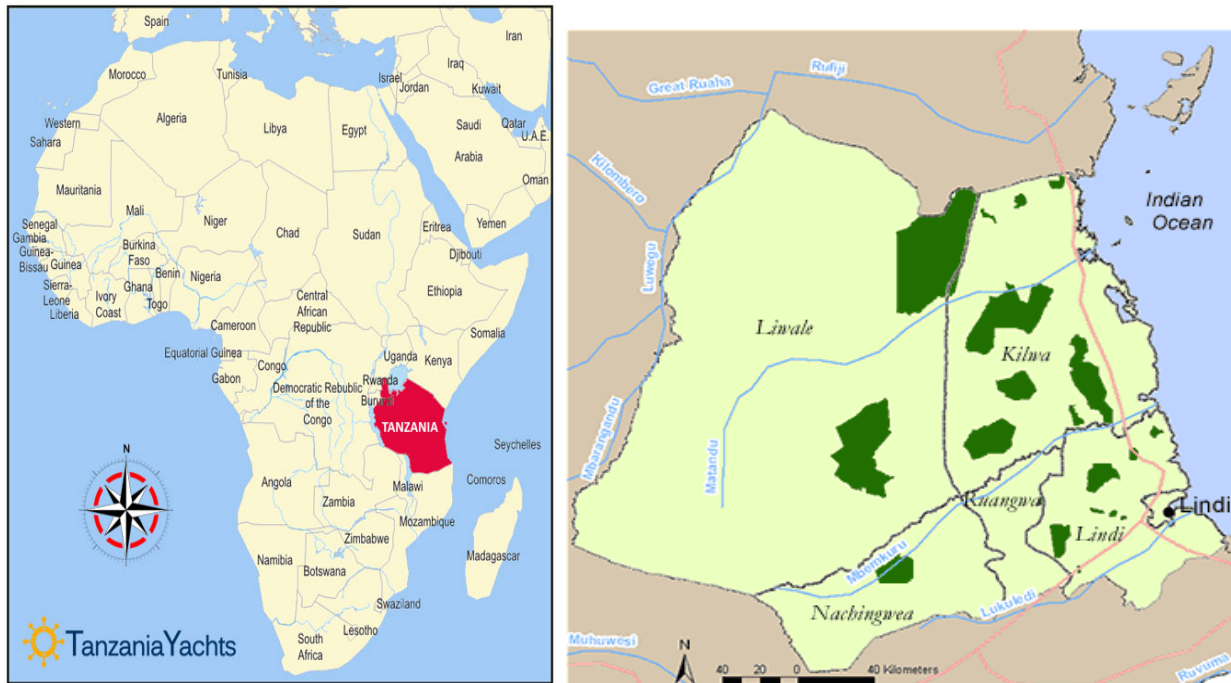
Figure 01: Location of Kilwa and Lindi Districts, Tanzania. (source: http://coastalforests.tfcg.org/tz-lindi-ns.html)

In Kilwa District the Mpingo Conservation and Development Initiative (MCDI) is implementing a four-year (2010-2014) REDD project to cover 10 villages whose approach provides indirect benefits at the village level. In Lindi District, the Tanzania Forest Conservation Group (TFCG) is implementing a five year (2009-2014) REDD project to cover 14 villages whose approach provides direct financial and non-financial benefits at the household and community level. Several factors influenced my choice of the two districts, including: (a) the history of implementation of participatory forest management (PFM) in the two districts contending that

those that have been involved for a longer time are likely to have gained some experience crucial for success; (b) their respective proximity to Dar es salaam and recent road and bridges construction which makes them more accessible to the Dar es salaam markets for forest products; (c) the similarities and differences in forest types which influences forest values and uses and; (d) similarities and differences in specific REDD+ interventions as summarized in table 02 below.

Table 2: Comparison on REDD+ implementation in Kilwa and Lindi Districts, Tanzania.

Comparison dimension	TFCG in Lindi District	MCDI in Kilwa District
REDD+ revenue sources	Mainly sale of carbon credits	Combination of carbon credits and certified logging on the same forests
Benefits types and delivery approach	Combined equal individual payments to all residents in the participating communities and group and community level socio-economic development projects	Village level payments and community socio-economic development projects
Main approach to avoiding deforestation and forest degradation	Implementation of a REDD+ agricultural development strategy that aims at promoting increased agricultural yield through adoption of no-till conservation agriculture and other agricultural support to reduce effects of shifting cultivation on forests	Implementation of a comprehensive fire management plan that aims at promoting controlled early burning to reduce effects of fire on forest carbon stocks
Proximity to Dar es salaam (markets)	Farther from Dar es salaam, about hours	Closer to Dar es salaam, about 4 hours
History of CBFM	All villages enrolled into CBFM during 2010 for REDD+ implementation	Four villages started between 2004-06 before REDD+ and four villages enrolled during 2010/11 following REDD+ introduction in the district

The two districts are mainly comprised of miombo ecosystems and face the same drivers of deforestation and forest degradation including small-holder shifting cultivation and wood extraction for timber, charcoal and poles. Similarity in the drivers of deforestation and forest degradation in the two districts makes it more relevant to compare how REDD incentives will

result to changes in the frequency, extent and intensity of the same main drivers of forest change between the two sites.

Methods for data gathering and analysis

This dissertation draws from review of grey literature, household survey, semi-structured interview, oral historical interview, work histories, focus group discussion and participant and non-participant observation data. These methods were conducted over multiple visits in Kilwa and Lindi and districts in the 14 villages covered in this study between 2009 and 2014.

Table 3: Timeline of major dissertation research activities

Time	Research activities
August 2009 – March 2010	Meeting and discussions with REDD+ actors at the national level in Tanzania. Reviewing information about the nine REDD+ readiness project sites in Tanzania. Discussions with four NGOs implementing four of the nine REDD+ projects in Tanzania Selecting Kilwa and Lindi Districts as study sites for my dissertation Attending several national level REDD+ events including TFCG's national launch of their REDD+ project
April – May 2010	Preliminary fieldwork in Lindi District to understand planned REDD+ activities and assessing deforestation and forest degradation in four villages Meetings and discussions with District Councils to understand the history of forest loss and forest management in the district and the introduction of REDD+
June – July 2010	Preliminary fieldwork in Kilwa District to understand planned REDD+ activities and assessing deforestation and forest degradation in four villages Meetings and discussions with District Councils to understand the history of forest loss and forest management in the district and the introduction of REDD+
June – August 2011	Fieldwork in six villages in Kilwa district including semi-structured interviews, focus group discussions, household surveys and forest plots assessments
August – November 2011	Fieldwork in six villages in Lindi district including semi-structured interviews, focus group discussions, household surveys and forest plots assessments
December 2011	Fieldwork in Lindi District to observe trial carbon payments delivery in Mkanga Moja and Likwaya villages, meetings and discussions with villagers, NGO staff and district council staff
February – March 2012	Fieldwork in Kilwa district to follow up on REDD+ implementation progress and challenges
May – August	Organizing fieldwork targeted at understanding villagers' participation in

2012	REDD+ activities, their satisfaction and presenting preliminary field research in all 13 villages
June – August 2013	Fieldwork to assess REDD+ outcomes: assessing livelihood changes at the household and community level through focus group discussions, key informant interviews, observations and household surveys.
September – October, 2013	Fieldwork to assess REDD+ outcomes: Forest inventories in all the 13 villages
June – August 2014	Final community feedback meetings to present final findings and recommendations in all the 13 villages in the two districts

Village selection ensured selection of accessible and less accessible villages to comparatively analyse drivers of forest change in relation to proximity to markets and roads; REDD+ and non-REDD+ villages to comparative analyze changes in forest conditions, carbon stocks and livelihood conditions before and after introduction of REDD+. Table xx below presents the villages sampled in this study in the two districts.

Table 4: Study sites

Category	Kilwa District		Lindi District	
	Accessible	Less accessible	Accessible	Less accessible
REDD+ villages (experimental cases)	Mchakama	Likawage, Liwiti	Ruhoma,	Mkanga Moja,
CBFM but no REDD+	Kisangi	Kikole,	Mnolela, Hingawali,	Chiwerere
Non-REDD+ villages (control cases)	Mavuji	Migeregere,	Kilangala A,	Mputwa

Data collection and analysis on REDD+ motivation

This component of the dissertation aimed at assessing forest change in the two districts and identify the main interacting underlying and proximate drivers of deforestation and forest degradation. This assessment combined secondary data on forest change from the two NGOs facilitating REDD+ projects in the districts and empirical assessment of forest change and drivers of forest change. Empirical methods applied ethnographic field data (focus group

discussions, work histories, semi-structured interviews, participant observations), household surveys and forest assessments.

At the community level, I conducted preliminary fieldwork in the selected districts and villages between April and August, 2010. Then, I organized several subsequent planned fieldwork in June-December, 2011, February-March, May-September, 2012 and June-August, 2013. Finally, I conducted my final community feedback meetings to share my final findings during June-July, 2014. Upon arrival in each village, I always started with a short discussion with village leaders to understand some latest developments relevant to REDD+ activities in the village and then request for an open public meeting of all interested villagers. In such public meetings, I introduced (or reintroduced) myself and my research team, shared research progress, received feedback and updates and explained in detail upcoming research and engagement plans.

Each village visit lasted a minimum of one week and included observations, focus group discussions, in-depth interviews (work histories and oral historical interviews), forest assessments and review of documents. The evidence used in this component is a subset of a broader database focusing on how shifting cultivation and wood extraction practices have changed over time and factors influencing the changes in those practices; the differences (if any) in local forest institutions before and after introduction of CBFM/REDD+ projects; and people's understanding of and interaction with emerging institutions as they continue to perform their socially and ecologically important cultural ecological practices.

I conducted at least three separate focus group discussions in each village: one with all 25 members of politically elected village councils; another with the 12-16 members of the village natural resource committees (VNRC); and the third group discussion with 25 randomly selected villagers ensuring balanced representation of men and women, young and elderly and from all sub-villages (hamlets) in each village. I separated these groups to provide space for free discussion of sometimes sensitive topics such as forest clearances in protected forests.

Oral historical interviews, work histories and semi-structured aimed at gathering data for historical analysis on shifting cultivation and wood extractions and changes in institutions applied to regulate people's use of forests. I conducted work histories with several farmers, charcoal producers, loggers and current and former members of village natural resources committees. Work histories with farmers aimed to establish the current annual farming calendar and compare it to that in the 1970s and 80s and explain reasons for changes (if any) in crop types, farm sizes, timing of activities and distribution of farm activities among household members. Work histories with wood extractors (loggers and charcoal producers) aimed to compare the performance of these activities between now and before introduction of CBFM in the village covering the changes experienced in forest institutions and their reactions/responses to the changes. Work and oral historical interviews with current and former members of village natural resources committees aimed to understand the challenges and performance (success as well as failure) in implementing contemporary locally developed forest rules and previously externally imposed forest rules.

Following these qualitative data gathering techniques, I developed and administered a household survey to about 50 randomly selected households in each village for gathering quantitative data on various aspects. In this component, I include quantitative data on proportion of villagers engaged in sesame cultivation, farm sizes and changes over time in farm sizes.

Throughout my visits and stays in the villages and at the district headquarters, I conducted planned and opportunistic field observations and review of documents. Planned field observations included forest walks, participating on forest management activities with village natural resource committee members, attending various meetings and social events such as funerals and other ceremonies at the village level, and conducted farm visits during farm preparation, weeding, harvesting and observing interactions between farmers and sesame buyers at the village centers.

Data collection and analysis on REDD+ implementation

This part of my dissertation aimed at understanding the paradoxical eruption of REDD+ resistance despite adoption of democratic processes in the making and implementation of REDD+ institutions and interventions. Therefore my methods focused on the identifying the institutions (rules, structures, organizations) that are being made, participation levels in the processes for making those institutions and data on resistance (when they occurred, who was involved and reasons for the resistance).

Following initial visits in August – November, 2009 and having established contacts with villagers, NGO officials and district government officials I collected more information about the conflicts even when I was not in the places where such conflicts occurred through phone and email. In subsequent visits during 2010 and summers of 2012, 2013 and 2014 I conducted focus group discussions, in-depth interviews and field observations related to events of resistance to REDD+ interventions in the communities. I organized separate focus group discussions with members of the village natural resources committees, village councils and ordinary villagers. I conducted in-depth interviews with officials from the district government, the NGOs and a few individual villagers. I also conducted open village assembly meetings where we would discuss about the events of REDD+ resistance in the village among other things. I combined these observations, interviews and group discussions with review of relevant documents on REDD+ such as meeting reports, activity reports, by-laws, forest management plans and quarterly and annual project reports. These data gathering methods on conflicts aimed to gather the following information:

These methods focused on three broad topics: the making of REDD+ institutions, the effects of the REDD+ institutions and interventions and the unmaking of REDD+ institutions

The making of REDD+ institutions and interventions covered several questions: What is REDD+ and its intentions? What deliberation processes were adopted for decision making on REDD+: what are the spaces for democratic and collective decision-making? Who participates in these spaces? What decisions are made in each space? What accounts for the low and high levels of

participation recorded? How does participation in REDD+ spaces/activities compare to participation in other spaces/events in the village unrelated to REDD+?

Focusing on desirable and undesirable effects of REDD+ institutions on local residents enabled an assessment of the different reasons why some local forest residents continued to oppose REDD+. Here I gathered information on what were the REDD+ promises made to the communities? Which promises have been delivered and which have not? What other effects (good and bad) have local people experienced that they think are a result of REDD+ introduction in their community? From focus group discussions and review of documents, I conducted follow up interviews with specific individuals who have benefited or adversely affected by REDD+ interventions.

Finally data on "unmaking forest institutions" focused on collecting and analyzing data on the performance of resistance. Although I present this as the last element in this framing, but these varieties of resistances are what triggered this investigation. After visiting several villages, I realized that these varieties of resistances are triggered by several factors but in this article I am focusing on the role of forest institutions made through deliberative democracy in causing resistances/conflicts, which is very paradoxical. I collected information on the events of resistances including when it occurred, how many people were involved, why the event occurred, what were the claims being made, what are the prescribed ways of making the same claims, why they did not follow the prescribed mechanisms for making claims? Different versions of the same events from multiple sources enabled identification of visible and not-so-visible forms of resistances and their causes.

Data collection and analysis on REDD+ outcomes
This component investigates an overarching REDD+ hypothesis that *giving forest management rights and powers to local communities (i.e. adopting CBFM) while promoting equitable sharing of conservation benefits (i.e. applying PES schemes) is usually associated with improved forest and livelihood conditions (see Chhatre and Agrawal, 2009).* The study tests several sub-

hypotheses as presented in tables 05 and 06 below, and then perform multivariate regression analysis to determine correlations between the three major variables: forest institutions and conservation and livelihood outcomes. Selection of context relevant variables (see Liu, 2007; Ostrom, 2009) is informed by preliminary fieldwork and review of literature.

Research hypothesis 1: Forests in REDD+ villages have higher carbon and conservation values than those in control villages. Since specific forest institutions affect differently different aspects of forest conditions, this study uses several indicators as summarized in table 05 below. This improves on previous studies by Chhatre and Agrawal, 2009 that used carbon stocks only; Ostrom, 2009 that used Shannon index of diversity only; Persha et al., 2011 that used species richness only. Use of single variable in assessing forest condition is inappropriate for multi-use forests such as REDD+ forests which aim at maximizing carbon stocks (biomass variables), conserve biodiversity (diversity indices) and improve livelihoods (forest regeneration for continued supply of forest products). None of these variables is a good representative of the others.

Table 5: Variables and sub-hypotheses for assessing forest conservation outcomes

	Indicator of forest condition	Research hypothesis
1	Shannon Index of diversity	No statistical difference in H values between treatment and control plots.
2	Tree carbon stocks for all species and timber volumes for the 10 most important species.	Significantly higher stocks/volumes in treatment plots than in control plots.
3	Forest productivity using regeneration curves (cumulative tree count against DBH sizes)	Good forest regeneration in treatment plots and poor forest regeneration in control plots.
4	Human forest disturbances: fire, logging, pole cutting, hunting, farming, charcoal burning.	Significantly lower frequencies of anthropogenic forest disturbances in treatment than in control plots.

Research Hypothesis 2: While there are no significant differences in socio-economic conditions between villages, there are significant differences in socio-economic conditions between sub-populations within villages. These sub-populations includes female vs. male headed

households, near vs. far households and poor vs. non-poor households (from focus group discussions conducted in Kilwa in 2011). Gendered differences in access to and utilization of forest resources are expected to cause differential impacts of REDD+ institutions between males and females. Far households (beyond 30 minutes' walk from village centers) are expected to report negative effects compared to near households since proximity to the village center is inversely related to forest dependence. Categorization of households into poor vs. non-poor using local indicators of wealth status (house type and farm size) will reveal equity aspects of conservation costs/benefits distribution.

Table 6: Variables and sub-hypotheses for assessing livelihood outcomes.

	Indicator of livelihood impacts	Research Hypotheses
1.	Changes in household access to and utilization of forest resources: poles, fuel-wood, and thatch	Decreased access in REDD+ villages than in control villages because forest rules enforcement prohibits uncontrolled use of forest resources.
2.	Changes in access and quality of important social services: water, education, and health.	Improved access and quality of social services in treatment villages than in control villages because usually REDD+ projects promise provision of these services.
3.	Changes in access to land for farming	Decreased in experimental villages than in control villages because setting aside forest lands for conservation is expected to reduce amount of land available for other uses.

Research Design

This study uses a comparative case study approach (Bernard, 2000) to assess the effect of REDD+ institutions on livelihoods and forests between four cases: two treatment villages (Kikole and Kisangi) and two control villages (Migeregere and Ruhatwe), all in Kilwa District ($8^0$15`-$10^0$00`S, $38^0$40`-$39^0$40'E) in South-Eastern Tanzania (figure 02 and figure 03, attached). REDD+ implementation in Kilwa started in 2009 and undertaking this study in 2013 allows sufficient time to evaluate conservation and livelihood outcomes.

Case selection: To attribute conservation and livelihood outcomes to the main independent variable of local forest management institutions, this study controls for other

factors through selection of cases with insignificant variations in the other factors (Bernard, 2000; Persha et al., 2011) (table 03 below). These other factors include: bio-geophysical conditions, user group features, institutional characteristics, market forces and demographic factors (see Agrawal and Benson, 2011; Geist and Lambin, 2002; Lambin et al., 2006; Ostrom 2007). The four villages had comparable forests, livelihoods and forest institutional regimes before 2009 (DANIDA, 2004; MCDI, 2009; TFCG, 2008) hence changes in forest and livelihood conditions are mainly attributable to introduced REDD+ institutions since 2009.

Table 7: Similarities and differences between selected villages

Variable	Migeregere	Ruhatwe	Kikole	Kisangi
CBFM/REDD+ institutions	Absent	Absent	Present	Present
Population (households)	~1500 (360)	~1100 (250)	~1200 (300)	~1000 (225)
Socio-economic activities	Farming (100%)	Farming (100%)	Farming (100%)	Farming (100%)
Forest size	1600 ha	1000 ha	1650 ha	1600 ha
Distance to the main roads	15km	18km	22km	15km

Bio-geophysical conditions: Given their proximity to each other, the four villages selected exhibit insignificant variation in bio-geophysical conditions: elevation, soils, precipitation and forest types (MCDI, 2009; TFCG, 2008).

User group and demographic features: Prior to CBFM/REDD+ introduction in 2004, the four villages selected exhibited insignificant variations in poverty status, forest dependence, local population size, patterns of migration and emigration, and livelihood strategies (DANIDA 2004). Over time the villages still exhibit insignificant variations in population sizes and patterns of migration and emigration (TFCG, 2008; MCDI, 2009). Therefore changes in poverty status and forest dependence (if any) could be attributable to presence/absence of REDD+ interventions.

Market and technology related forces: Proximity to the main road connecting Kilwa town to commercial cities of Dar es Salaam and Mtwara and Northern Mozambique is taken as a proxy indicator of market forces in this study (see Milledge et al., 2007; Milledge, 2010). To control for effects of market forces, this study selected villages within insignificantly different

distances from the main roads dropping three villages covered in the broader research study that are either too far or too close to the main roads.

Data Collection and Analysis: Livelihood Outcomes

Due to unavailability of time series data on household socio-economic conditions, this research administered 240 semi-structured household socio-economic surveys (60 per village) to elicit changes in the selected variables of livelihood conditions. A semi-structured questionnaire includes closed-ended and open-ended questions for mixed quantitative-qualitative data analysis (Bernard, 2000; Russel and Harshrbarger, 2003). The questionnaire was tested to a sample of 50 households during summer 2011. Stratified random sampling (Bernard, 2000) was applied to ensure proportional representation of: (a) *both female headed and male headed households* (to determine gendered differences in livelihood impacts of REDD+ institutions); (b) *near and far households with reference to the village center* (far households are those beyond 30 minutes' walk from village center; far households tend to be more dependent on forest resources than near households and hence may report more dissatisfaction with REDD+ institutions); (c) *households under different poverty/wealth status* (poor and non-poor to determine differences in livelihood impacts between poor and non-poor households).

Analysis on livelihood outcomes: Responses were ranked using a 5-point Likert scale (5=increased a lot, 4=increased, 3=no change, 2=decreased, 1=decreased a lot). Each closed ended question was followed by an open ended question to identify factors causing changes in livelihood conditions. Respondents in treatment villages were asked an additional set of questions for each livelihood variable to elicit their satisfaction with REDD+ effectiveness with a 5-point Likert-type scale. Different descriptive and inferential statistics were applied in analyzing and comparing results between households in treatment and control villages. Spearman ranked order correlation will compare responses between treatment and control households. Regression analysis will test strength of correlation between presence/absence of REDD+ institutions and livelihood outcomes.

Table 8: Variables for assessing livelihood outcomes

Livelihood variable	Question/s
Access to social services: water, education and health.	How has your household's access to water changed between 2009 and 2013? (repeated for each social service)
Access to important forest resources: poles, fuel-wood, charcoal, and timber.	How has your household's access to fuel-wood changed between 2009 and 2013? (repeated for each resource)
Access to land for farming and/or settlement.	How has your household's access to land for farming/settlement changed between 2009 and 2013?

Data Collection and Analysis: Forest Conservation Outcomes

Sampling design and effort: From extensive review of literature on methods and variables for assessing *miombo* woodlands (see e.g. Backeus et al., 2006; Banda et al., 2006; Chamshama et al., 2004; Mugasha and Chamshama, 2002; Munishi et al., 2010; Shirima et al., 2011) combined with individual conversations with some of these authors while in Tanzania during 2011-2012 (Chamshama, Shirima, Zahabu, Ndangalasi and Munishi) and field trials in two villages (Kikole and Mavuji) this study adopted the use of rectangular vegetation sampling plots with dimensions of 20m by 50m. About 10-15 forest plots were systematically placed in each village forest accounting for any observable spatial heterogeneity in forest cover or forest type making a total of 51 vegetation sampling plots in the 4 villages. In each plot all trees with a DBH (diameter at breast height) of at least 3.1cm were recorded, measured (DBH and height) and identified using botanical names (van Wyk and van Wyk, 1997). Vegetation sampling plots were geo-referenced for subsequent spatial analysis. I applied my background training forest ecologist and worked with one research assistant who is a trained botanist (Selemani Haji) with over 20 years field experience for effective and efficient identification of all trees hence reduce the number of unidentified specimens taken to the botany laboratory at the University of Dar es salaam. One soil sample using a 10cm deep soil corer was collected from the center of each forest plot for analysis of soil characteristics to control for edaphic factors in comparing forest conditions between plots.

Table 9: Variables and analysis for assessing carbon and conservation outcomes

Variable	Description and Analysis
Shannon Index of Diversity:	Captures both species richness and abundance and is a good predictor of forest conditions to determine if forest institutions have reduced the effects of fire, selective logging, and multi-species harvesting for charcoal and poles. Statistical "t" tests will be used to test statistical differences between treatment and control plots.
Carbon stocks	An indicator for assessing effects of institutions in reducing emissions from fire, selective logging, charcoal production and pole cutting. Will be computed using allometric equations by Mugasha and Chamshama (2002). Statistical "t" tests will be used to test statistical differences between treatment and control plots.
Timber volume estimates for the ten commercially most important timber species	An indicator for assessing effects of institutions in reducing the problem of uncontrolled selective logging. Preliminary fieldwork identified ten commercially most important timber species exported to the middle-east and China. Volume estimates will be computed in "R": $((DBH)^2 * 3.14 * height)$. Statistical "t" tests will be used to test statistical differences between treatment and control plots.
Forest productivity:	Forest productivity will be analyzed using regeneration curves –plotting cumulative numbers of individual trees as DBH class sizes increases. Reverse J curves will indicate good regeneration. Comparison between treatment and control units will reveal whether REDD+ institutions correlate with enhanced forest regeneration.
Frequency of anthropogenic forest disturbances	Comparing frequencies of anthropogenic forest disturbances (fire, pole cutting, charcoal making, selective logging, and hunting) between treatment and control plots will reveal the effectiveness of REDD+ institutions in controlling them.

General data analysis: Following descriptive and statistical analysis on the various variables as summarized in table 05 above, multiple regression analysis will test hypothetical relationships between presence/absence of CBFM institutions and forest conservation outcomes. Through collaboration with the organization implementing REDD+ in Kilwa, the Mpingo Conservation and Development Initiative (MCDI), this study will have access to analyzed remotely sensed images for further analysis and comparison of forest conditions between villages over the last 10 years. An agreement was reached between MCDI and the co-PI that the co-PI will develop a village forest governance educational tool for tracking REDD+ impacts by villagers and in return MCDI will supply analyzed images for use in the dissertation.

Chapter Two: Negotiating Forests Under the REDD+ Context

Abstract:

Actors involved in piloting the program to reduce emissions from deforestation and forest degradation (REDD+) in south-eastern Tanzania have identified uncontrolled forest fires and slash-and-burn shifting crop farming practices as main drivers of undesirable forest change. Beginning 2009 they embarked on developing and implementing specific interventions to reduce the effects of forest fires and shifting cultivation on forests. This resurgent focus on regulating local cultural-ecological practices triggers memories of harsh state interventions for forest conservation goals during colonial and post-colonial moments. Using empirical evidence from extensive ethnographic field research spanning five years (2010-2014) in Kilwa and Lindi districts in south-eastern Tanzania, this article presents detailed aspects of changing people-forest relations, transformations in forest governance actors, roles and ideals and how local forest residents are articulating and navigating through this emerging complex forest governance landscape. Findings allow making three broad interlinked arguments. First, abrupt changes in the performance of local cultural ecological practices as influenced by multiple interacting factors at the global and local levels are resulting in undesirable forest changes, and that this view is shared by local to global actors. Second, the adoption of arguably less coercive forms of governmentality under decentralized community based forest management arrangements are producing similar state-like effects to those produced by colonial and post-colonial socialism governments in regulating people-forest interactions. Third, local people are creatively appropriating the emerging discourses of democracy, decentralization and participation in designing narratives and counter narratives for asserting claims and challenging prescribed forest policies that are being introduced. Although people's innovation (sometimes called resistance) and continued subversive performance of 'banned' cultural-ecological practices is viewed as counter-productive to projects of controlling tropical forested landscapes, this article argues that people's innovative agency is crucial in shaping the theory

and practice of forest governance under regimes of changing and uncertain social and ecological contexts.

INTRODUCTION

It is a pleasant Friday afternoon on August 4th, 2012 in Kikole village, Kilwa district in south-eastern Tanzania. Over 100 men and women and a few dozen children have gathered at the village market center ready for the meeting. It is an open public meeting for sharing my research findings from prior visits I conducted in the village in 2010 and 2011. As dictated by guidelines for running village meetings introduced during the socialism period, I am seated at the high table sandwiched between the village chairman and village executive officer. Behind us are two rows of benches on which respected elders (mostly men) and my two research collaborators are seated. Being a majority Muslim community like most coastal communities in East Africa, women are seated on one side separate from men. After I finished my presentation and responding to a few questions, Bwana Bakari raised up his hand seeking permission to speak. Hajji, the village chairman called on him to talk. I remembered Bakari, a 50+ native resident and one of the four shop owners in the village always asking very detailed questions. I had my notebook and pen ready. He adjusted his glasses that had very thick lenses, cleared his voice and started by commending me for keeping my promise of returning to their village.

"Bwana Mtafiti (Mr. Researcher) I have said this before to you in person and I will repeat it here in public…" cautioned Bakari now facing directly towards where I was seated and speaking with the authority/tone of a father talking to his son "…perhaps, we need to get you a wife here in the village so that when you come back you are coming home…" The gathering cheered loudly in agreement to his proposal. I blushed but said nothing knowing that we would easily deviate into discussing matters of sex, sexuality and marriage: topics that always permeate in most discussions among coastal communities in Tanzania. "Please continue", Haji the village chairman instructed Bakari.

"I am confused and so are majority of us… maybe you as a "msomi" [educated elite] can help us understand these issues". The confusion was about the contradicting messages they receive

from the District Council, Non-Governmental Organizations and private investors regarding the best ways of using and benefiting from their forests. First, the District Council brought a non-governmental organization called the Mpingo Conservation and Development Initiative (MCDI) in 2004 to establish participatory community based forest management (CBFM) project in the village. Kikole residents were suspicious but reluctantly agreed and established a CBFM project. They became the first village in eastern and southern Africa to sell sustainably harvested timber using Forest Stewardship Council (FSC)'s group certification scheme. Then in 2007/08 they learned from neighboring villages that the District Council had brought a private investor named Bioshape International Company limited that was seeking land to cultivate jatropha for biofuel production. That investment would involve forest clearance for plantation purposes. They feared that if forests in neighboring villages were cleared, those villagers would encroach into Kikole forests. The company promised to provide employment opportunities to residents, community development projects, and large sums of money as compensation for the village land. In 2010, MCDI came back to introduce yet another scheme related to forests called REDD+: referring to the recently introduced international funding mechanism to reduce emissions from deforestation and forest degradation in tropical developing countries. MCDI explained that, to benefit from the combination of FSC timber certification scheme and REDD+ payments, the village need to commit more forest into forest protection and abandon several local practices that destroy their forests. Bakari said that they did not understand how the two would work together on the same forests: the certification scheme which they already knew and liked since they had seen its tangible benefits is based on revenues from sustainably harvested timber whereas the new REDD+ scheme is based on generating revenues/payments from avoiding deforestation. He wondered whether REDD+ was just a way to stop sustainable selective logging. Moreover, REDD+ required additional consent forms to be signed by the village; this made residents suspicious of its intentions. Bakari further recalled another investor who approached them in 2011 also seeking land to cultivate rice but never came back to the village. He also mentioned about numerous researchers from Tanzania, the UK, Norway, the USA, Netherlands and elsewhere always flocking their village for research purposes. "What is it that you all see in our forests that we don't and makes you so interested with our forests?" He

wondered. Bakari then finished on a light note almost pleading with me that if I married in their village, I will have more reasons to apply my knowledge, resources and networks in helping them decipher these contradicting and competing demands on their forests.

What is happening in Kikole village with regard to competing forest demands is not unique to that village only. Forested landscapes in south-eastern Tanzania have attracted different local and non-local actors for wide ranging purposes from forest conservation, short and long term field based research activities, protection of wildlife habitats for game viewing and hunting, to expanding small-holder farms and various large-scale land-based investments. These increased demands and competitions for forested tropical landscapes have been extensively covered in the existing literature.

What is novel in this essay, are local residents' creative abilities in articulating and appropriating the emerging social-political and economic context and changing technologies of mobility in negotiating and reclaiming their culturally and ecologically meaningful landscapes. Using ethnographic field data gathered from several field visits and stays spanning over five years (2010-2014) in four villages in Kilwa district, I provide detailed contextualized descriptions on how actors navigate and appropriate this emerging and complex forest governance landscape. Forest governance landscape refers to the constellation of local and non-local actors and interactions between them, the regulatory institutions in place and the actions and inactions of state and non-state actors that affect forests.

To weave this tapestry of changing forest governance landscape and local residents' innovative navigation of the emerging landscape, I make three interlinked claims/arguments.

First, how have local cultural ecological practices changed over time and factors influencing transformations in those socially and ecologically important practices? Exploration on these questions provides rationale behind the resurrection of otherwise old debates on shifting cultivation and wood extractions by the residents in this article. While literature on these

cultural-ecological practices is matured and settled (see Michael Dove 1983; Conklin; Carneiro; Fairhead and Leach; Boserup; etc), resurgent focus on regulating these practices under REDD+ contexts warrants their resurrection. I describe how contemporary slash-and-burn shifting cultivation and various wood extractions are performed compared to how they were performed prior to 1990s. Concurrently, I discuss factors that have caused transformation in these practices. Following Lambin and Geist (2006)'s categorization of drivers of forest change into proximate and underlying factors, I analyze several underlying forces and their interaction in causing alterations in the way a proximate driver (e.g. shifting cultivation) is performed. Analyzing whether and how transformed shifting-cultivation and wood extractions result in undesirable forest changes provides an opportunity for critical engagement and expansions on debates on human-environment interactions (see Fairhead and Leach, 1996). Importantly, this detailed ethnographic analysis provides a contextualized understanding of conditions under which these practices result in undesirable forest change (or not).

Second, whether and how contemporary forest governance institutions are different from those applied before 1990s?

Harsh exclusionary conservation approaches by the state during colonial and post-colonial socialism eras actively alienated people from forest and land resources that sustained their livelihoods (insert a few references). Contemporary decentralized and participatory approaches are argued to deploy less coercive interventions in regulating people's access to and utilization of forest resources. In theory, contemporary institutions differ from conventional ones since they are based on the discourses of democracy, decentralization, and participation. Recently decentralized community based forest management (CBFM) is based on premise that, giving local forest residents the rights and powers to manage their forests while promoting equitable sharing of forest conservation benefits and costs would heal historical enmity, create fair and acceptable forest rules and as a result attain both conservation and livelihood goals. However, REDD+ implementation through CBFM arrangements around the world has faced varieties of resistances and boycotts from local forest residents (insert ref). To explain the paradoxical emergence of resistance against contemporary forest governance institutions, I borrow from

Ferguson and Gupta's concept of Spatialization the State and Kottak (1999)'s New Ecological Anthropology to articulate contemporary state representation at the local level and analyze the state-like effects produced by contemporary non-state forest management interventions such as CBFM/REDD+.

Third, how do local residents articulate and navigate through the emerging forest governance landscape as they continue to perform their socially and ecologically important practices? Local residents have always been creative in finding ways to resist and challenge powerful introduced interventions. Evidence is plenty of violent and non-violent resistances from slavery era to peasants' struggles applying weapons of the weak in performing everyday resistances. The application of democratic participation in making and applying rules in managing now locally owned forest resources was expected to create local environment subjects who will continue to apply those participatory and democratic principles in sustainably managing their forests. What is novel in this essay and this section in particular is a detailed ethnographic description of the creative appropriation of the discourses of democracy, participation and decentralization by local forest residents in designing their narratives and counter narratives for negotiating their claims over forested landscapes. Moreover this detailed ethnographic description uncovers local people's innovative use of new technologies of mobility such as motorcycles and cellphones in performing their otherwise banned cultural-ecological practices in the forests.

THE SETTING
Negotiating forests under the REDD+ context is an ethnographically informed analysis of how local and non-local actors articulate the expansion of forest values, forest actors and changing local forest institutions in already and continuously contested forest landscapes. The use of REDD+ provides an opportunity to expand on our understanding of the configuration and politics of emerging and complex forest governance landscapes. The addition of REDD+ to community based forest management imposes several transformations. REDD+ adds climate change mitigation goals on CBFM projects that were previously introduced for their forest

conservation and livelihood improvement goals. REDD+ brings international actors such as financiers of carbon credits with their new technologies and expectations to bear at the local level. REDD+ reconfigures roles and powers among pre-existing forest actors whereby the government at the national and district levels saw their powers diminishing while NGO's roles and powers expanded (at least temporarily) as facilitated by their possession of huge financial resources and new internationally accepted knowledge about the climate change mitigation value of tropical forests.

The narrative behind REDD+ framework is simple in explanation but not in practice. It begins with application of acceptable methods to analyze the historical rate of deforestation and forest degradation in a defined project zone. This is followed by the development and application of specific interventions that would incentivize sustainable forest management practices to avoid deforestation and forest degradation. Thereafter, the forest managers/owners and/or users would be paid/rewarded for their efforts or actually reduced emissions from their actions. Consequently, it is expected that local residents would continue to apply the revenues in adopting alternative livelihood strategies away from the forest or engaging in forest friendly livelihood options.

In many tropical developing countries, REDD+ is being implemented through participatory forest management (PFM) arrangements for the aims of making REDD+ socially equitable. PFM precedes REDD+ in Tanzania. In the early 1990s, the Tanzanian government in collaboration with several national and international partners introduced various transformations in forest management. One of the notable transformations was the adoption of the Forestry Policy in 1998, which for the first time recognized local people living inside or adjacent to forests as partners in sustainable forest management. The new Land Act (1998) and Village Land Act (1999) provided legal recognition to "village land" as one of the land tenure regimes and vested the authority of managing such lands to village councils. In 2001, Tanzania adopted PFM guidelines that provided a detailed step-by-step implementation plan for establishing CBFM projects on village land. In 2002, the new Forest Act was adopted to provide legal backup to the

policy and guidelines. The goals of the Tanzanian PFM program were threefold: to improve local forest governance capacity, to improve livelihoods of forest communities and to improve forest conservation on village land.

The Danish International Development Agency (DANIDA) provided financial and technical support to the Tanzanian government in developing policies and guidelines and also testing the new approach on the ground. However, in 2004 DANIDA reprioritized (reallocated) their funds to other areas of cooperation with the Tanzanian government following slow progress with PFM implementation on the ground (interview notes with Evarist Nashanda in Dar es salaam, 2010 and Mahimbo in Lindi District, 2010).

In Kilwa District, a non-governmental organization called the Mpingo Conservation and Development Initiative (MCDI) took over and revitalized CBFM projects in four villages beginning 2004 (interview with MCDI national and international directors, Jasper Makala and Steve Ball, Feb 2010 and June 2010). In 2009, MCDI applied for and was awarded funds by the Norwegian Government to pilot REDD+. With this funding, MCDI was able to enroll more villages into the CBFM activities and finalize CBFM requirements as per the PFM guidelines in the villages already involved.

METHODS

The evidence base for the arguments I am making in this article comes from extensive ethnographic field research conducted over multiple visits and stays in Dar es salaam, Kilwa district headquarters and in five villages: Kikole, Mavuji, Kisangi, and Liwiti (insert a map here). Insert a line or two on what motivated the selection of Tanzania and Kilwa in particular for this study

I started research activities in Dar es Salaam through desk survey of relevant literature and discussions with several national level REDD+ actors from the government, development partners (donor community), academic/research institutions and NGOs involved in REDD+ from

October 2009 to March 2010. During the five years (2009-2014), I attended several national and international conferences/workshops on REDD+ and related topics in Tanzania, the UK, USA, China and Mauritius. In these events, I met more REDD+ actors, exchanged information and collected more data relevant in this article through observations and interviews.

At the community level, I conducted preliminary fieldwork in the selected districts and villages between April and August, 2010. Then, I organized several subsequent planned fieldwork in June-December, 2011, February-March, May-September, 2012 and June-August, 2013. Finally, I conducted my final community feedback meetings to share my final findings during June-July, 2014. Upon arrival in each village, I always started with a short discussion with village leaders to understand some latest developments relevant to REDD+ activities in the village and then request for an open public meeting of all interested villagers. In such public meetings, I introduced (or reintroduced) myself and my research team, shared research progress, received feedback and updates and explained in detail upcoming research and engagement plans.

Each village visit lasted a minimum of one week and included observations, focus group discussions, in-depth interviews (work histories and oral historical interviews), forest assessments and review of documents. While these methods covered broad topics and questions, in this article I draw on data that tells about whether and how shifting cultivation and wood extraction practices have changed over time and factors influencing the changes in those practices; the differences (if any) in local forest institutions before and after introduction of CBFM/REDD+ projects; and people's understanding of and interaction with engaging institutions as they continue to perform their socially and ecologically important cultural ecological practices.

I conducted at least three separate focus group discussions in each village: one with all 25 members of politically elected village councils; another with the 12-16 members of the village natural resource committees (VNRC); and the third group discussion with 25 randomly selected villagers ensuring balanced representation of men and women, young and elderly and from all

sub-villages (hamlets) in each village. I separated these groups to provide space for free discussion of sometimes sensitive topics such as forest clearances in protected forests.

Oral historical interviews, work histories and semi-structured aimed at gathering data for historical analysis on shifting cultivation and wood extractions and changes in institutions applied to regulate people's use of forests. I conducted work histories with several farmers, charcoal producers, loggers and current and former members of village natural resources committees. Work histories with farmers aimed to establish the current annual farming calendar and compare it to that in the 1970s and 80s and explain reasons for changes (if any) in crop types, farm sizes, timing of activities and distribution of farm activities among household members. Work histories with wood extractors (loggers and charcoal producers) aimed to compare the performance of these activities between now and before introduction of CBFM in the village covering the changes experienced in forest institutions and their reactions/responses to the changes. Work and oral historical interviews with current and former members of village natural resources committees aimed to understand the challenges and performance (success as well as failure) in implementing contemporary locally developed forest rules and previously externally imposed forest rules.

Following these qualitative data gathering techniques, I developed and administered a household survey to about 50 randomly selected households in each village for gathering quantitative data on various aspects (insert a table with total population, total number of households and total number of sampled households in each village). In this article, I include quantitative data on proportion of villagers engaged in sesame cultivation, farm sizes and changes over time in farm sizes.

Throughout my visits and stays in the villages and at the district headquarters, I conducted planned and opportunistic field observations and review of documents. Planned field observations included forest walks, participating on forest management activities with village natural resource committee members, attending various meetings and social events such as

funerals and other ceremonies at the village level, and conducted farm visits during farm preparation, weeding, harvesting and observing interactions between farmers and sesame buyers at the village centers.

ARGUMENT

My findings about how the REDD+ impositions on the ground affect contemporary forest governance allow me to make three broad and interrelated arguments.

First, there is a shared knowledge among local residents, non-governmental organization actors and government agents that recent transformations in people-forest relations as mediated by changing socio-political, economic, technological, institutional and environmental forces are resulting in undesirable forest changes. This understanding provides rationale behind the continued efforts to regulate people-forest relations.

Second, while on paper, contemporary forest governance institutions claim to be different from their predecessors through their adoption of discourses of decentralization, democracy and participation, in practice the two approaches produce similar state-like effects on local people who continue to perform otherwise banned cultural-ecological practices. This claim suggests that in order to better understand contemporary versus conventional forest governance institutions, we need to look at the effects they produce on people and forests.

Third, local people are creatively appropriating the emerging discourses of democracy, decentralization and participation in designing narratives and counter narratives for asserting claims and challenging prescribed forest policies that are being introduced. Although people's innovation (sometimes called resistance) and continued performance of 'banned' cultural-ecological practices is viewed as counter-productive to contemporary projects of controlling tropical forested landscapes, this article argues that people's innovative agency is crucial in

shaping the theory and practice of forest governance under regimes of changing and uncertain social and ecological contexts.

To provide evidence for the above claims, this section is organized into three subsections corresponding to the three arguments. I begin by describing transformations in people-forest relations and the factors influencing such transformations. Then I describe transformations in forest governance institutions and how local people interact with the introduced institutions. Finally, I describe interactions between local people and NGO actors in developing and applying emerging forest institutions to unveil the careful articulation and creative appropriation of the emerging discourses of democracy, participation and decentralization in developing narratives and counter narratives towards the introduced institutions.

Transformations in people-forest relations: production of bad shifting cultivation.
In this section I provide rationale behind resurrection of this matured and settled debates on the environmental effects of shifting cultivation. I argue that contemporary shifting cultivation is remarkably different from conventional shifting cultivation and the current practice is resulting in deforestation and forest degradation.

Slash and burn shifting cultivation has been a common practice among societies residing in *miombo* woodlands in eastern and southern Africa for centuries since the emergence of crop farming.[i] Local people observed that this kind of shifting cultivation as practiced for centuries in the past did not result in deforestation, but recent changes in the way shifting cultivation is performed is resulting in undesirable forest changes. Field observations, in-depth interviews and focus group discussions identified several factors that determine the effects of current shifting cultivation on forests. These include crop type, duration taken before spatially relocating farmlands, methods of farm preparation, farm size, and number of people engaged in the activity, among others. In turn these factors are influenced by increased prices for agricultural and forest products, eroding and weak institutions aimed at regulating effects of

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shifting cultivation on forests, and increased accessibility to markets following recent roads and bridges construction.

In Kilwa district, shifting cultivation for sesame farming is the main driver of deforestation and forest degradation in the region. Other crops such as maize, sorghum, cassava, and pigeon peas, have little effects on forests because usually they take longer (8-15 years) to relocate farm plots and even when relocating farms for cultivating these crops, residents do not go after dense forests. Sesame is the main problem. Hereafter, I describe how shifting cultivation for sesame farming causes deforestation and forest degradation.

While sesame is a not a new crop in the region, its cultivation for commercial purposes only started during the last 15 years. The collapse of Famers primary cooperative societies in the late 1980s at the end of the socialism regime and the transition towards a free market economy saw increased number of private traders going to Kilwa and other southern towns to buy sesame and other agricultural and forest products. The recent construction of roads and bridges over the Rufiji river delta has greatly improved accessibility to Kilwa. Nowadays it takes 3-5 hours to reach most of the villages in Kilwa from Dar es Salaam while before 2011 and especially during the rain season it would take several days reach there. Growing market demand for sesame in oil factories in nearby towns of Dar es Salaam and Morogoro further fueled sesame production in that region. At the same time, the last 10 years have seen rapid increase in sesame prices from TSh xx per kilo in 2005, to TSh in 2009, TSh in 2011 and TSh in 2013. As a result, the number of villagers cultivating that crop has increased and individual farm plots for sesame have expanded. Household survey data from four villages (n=176) reveal that average household farm size has increased from one acre in 1996 to three acres per household in 2011. The aggregate effect of sesame farming on forests is much more because only 53% (n=176) reported cultivating that crop in 1996 while almost all households (97%) reported cultivating that crop in 2011.

Mzee Waziri, a 69 year old resident of Kisangi village (Oral historical interview, June 2010) makes interesting suggestions in his comparison of farm sizes during the socialism period in the 1970s and current farm sizes. The Government introduced minimum acreage rules for every household all over the country to ensure that there was enough food production for household consumption and surplus for sale at farmers' primary cooperative societies to supplement food shortages in other parts of the country. He explained that in addition to individual farms, every household had to provide labor force to work in the communal farm as part of living in Ujamaa village. He further observed that:

"Many people failed to meet the minimum acreage requirement which was at least 0.5 acre of the main cash crop and another 0.5 acres of the main food crop. Those who failed to meet the requirement were punished variously such as working at the communal farm or confiscating some property from their houses. We did not cultivate as much because we had small families and also relied on a variety of forest products as well…I think nowadays we need to set a maximum acreage rule instead of a minimum acreage (he said with a laughter) because farm sizes have increased beyond…these young women and men (continued as shifting his sitting posture on a piece of log under a cashew tree), motivated by the prospects of generating income from that crop (sesame) have no mercy over forests…"

In several villages, memories of people who were arrested, fined, jailed for a day or two or whose property such as furniture and chickens were confiscated for failure to meet minimum acreage requirements are very common. Bi Mwanahawa's comments added to this story (oral historical interviews, Kikole village, July 2010).

"…mwanangu (my son)!, the main threat to forests in this village is not logging or pole cutting, the problem is sesame farming. In the past (1940s and 50s) we had small gardens of sesame next to our houses. We used ground sesame seeds as an ingredient in cooking leafy vegetables. Actually I remember we preferred groundnuts and coconut milk to sesame. This was a women's crop. But these days, men have taken over and

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there is no villager who is not cultivating that crop. It generates a lot of money. If I was still young and strong enough, I would have done the same…who doesn't like money? " Asked Mwanahawa rhetorically giggling.

To respond to growing demands for sesame, farmers have also adopted new ways of farm preparation to save time and increase production. In the past, farm preparation involved the husband cutting all trees in a forested area, collecting tree branches and women and children burning all plant materials followed by sowing sesame seeds. Nowadays, farmers have devised innovative ways of saving time and energy in farm preparation. They remove a ring of bark around a tree that eventually kills the tree - a practice known as 'girdling' in forest ecology. Once trees have dried up, farmers burn these places before the beginning of the rain season. This technique enables farmers to clear a larger area of forest within a short time. However this technique reduces the space per hectare for sowing sesame seeds which would affect total per hectare yield compared to previous ways of farm preparation. This loss is compensated through increased area of forest cleared.

Farmers are also applying new technologies of mobility to facilitate increased production of sesame in order to maximize revenues. The use of cellphones to communicate with traders in Dar es Salaam and negotiate prices is one aspect. Faster means of transportation such as the use of motorcycles has had the most impact on forests. In my first visit in Mavuji village in the summer of 2008 I remember there were only 3 motorcycles in the entire village with over 300 households. In my next visit in 2010 I noticed several motorcycles. By 2013, there were countless motorcycles in that village. Ngazulu, a very entrepreneurial villager and member of the village natural resource committee in Mavuji village narrated his own experience:

> '…initially I saw the increased prices and demand for sesame as an opportunity to generate income and use it as capital to start up alternative income generating activities such as shops, restaurants or buying motorcycles for transporting people and their agricultural products from village to village. When I bought my first motorcycle in 2010 I reduced my farm size during the 2011 season. Sesame cultivation especially the process

of preparing a new farm is not a joke. Then I realized I could hire labor to work on my sesame fields while I work on my motorcycle business. Now I have two motorcycles and I am hiring casual laborers to work on my sesame fields every year…"

The practice of slash-and-burn shifting cultivation has changed especially for the cultivation of sesame and causing deforestation and forest degradation. Responding to increased prices and demand for sesame facilitated by improved market accessibility following recent roads and bridges construction connecting Kilwa and Dar es salaam, shifting cultivation for sesame has changed in several ways that affect forests. More forest area is cleared to expand and open new sesame fields. New and faster ways of clearing forests have emerged accelerating forest loss. Income from other income generating activities is applied to expand sesame farms. Almost all adult residents are now involved in sesame farming which is a big change compared to mid 1990s where only about half of residents engaged in sesame farming and farms were smaller. As a result, the new practice is resulting in deforestation and forest degradation.

Transformations in forest institutions: are contemporary local forest institutions different from conventional ones?

Multiple and interacting local to global forces as described in the previous section make it more profitable to clear forests than maintaining standing forests. So far REDD+ and CBFM projects in Kilwa district, have failed to make forest conservation a competitive land use against traditional land uses such as crop farming and wood extractions. As a result, local forest enforcement units at the village and district offices have to use sticks instead of carrots. I explain how recently introduced forest rules for attaining forest conservation goals under CBFM/REDD+ contexts are experienced and dealt with by local forest residents and forest enforcement units at the village and district level.

Juma's story is about whether decentralized forest institutions produce effects that are similar or different to those produced during state control of forests in the past. My first encounter with Juma and his colleagues was one morning in July 2010, when I was driving into the forest to conduct forest assessment plots in Mavuji village. Juma a 46 years old native resident of that village was working with his colleagues at their temporary sawing platform in one part of the village forest reserve. They had collected and were processing "viringi" for making and selling sawn wood at a nearby town of Nangurukuru. Viringi is a local term for left over tree branches following il/legal logging in the village forest reserve. Deeply involved in their activity and probably due to the noise of sawing, they did not notice the approaching car. As I slowed down a few meters from them, they quickly ran into the bushes leaving a motorcycle, a bicycle and a few tools at the scene. We took pictures of the scene and drove off.

In the evening, on our way back to the village we were surprised to find Juma and his colleagues still working at the same scene. This time they did not run away. We stopped, greeted them and I asked why they ran away in the morning. Juma who appeared to be the leader to his two younger colleagues, explained that in the morning they thought we were forest management officials from the district, but then later they learned that we were researchers and posed no harm to them. I asked him how did they learn about us. In response, he smiled, took out his cellphone and excitedly said "uchawi wa mzungu huu kaka" [translating to "my brother, this is white man's witchcraft"]. I realized that using their cellphones, they got information about us from fellow villagers.

I was surprised by Juma's statement that we were researchers and therefore we meant no "harm" to them. As I watched them arrange the sawn wood pieces on two bicycles and the motorcycle, I explained why I was puzzled by his statement: that I expected after a decade of implementing community based forest management (CBFM) which applies democratic participation in making and implementing forest rules, there would be no "harm" done to the local people or the forest or forest conservation authorities. He wanted to interrupt but I continued by reminding them that the full CBFM guidelines in Kiswahili Language available at

their village office and a summarized version posted on the village notice board clearly CBFM gives forest management rights and powers to local communities while promoting equitable sharing of forest conservation benefits. In turn CBFM would heal historical enmity between local people and forest conservation authorities, improve local livelihoods and provide incentives for sustainable forest management. Sele, one of Juma's colleagues who was at that moment gathering their tools and equipment ready to go back to the village center, became impatient and interrupted me to narrate some of those harms and harassment that he and other Mavuji residents have experienced recently including arrests, unfair cash fines, confiscation of equipment and forest products and at times brutal beatings from forest law enforcement units at the village and district offices.

Amina's story sheds light on transformations in state representation at the local level and emerging forms of interactions between residents who violate forest rules and forest agents. Conversations I had with three members of the village natural resources committee in Liwiti village while conducting unplanned forest patrol in October, 2011 provides an articulation of the less coercive forms of making local environmental subjects such as VNRC members. Having walked in the forest for about two hours, thirsty and getting tired I asked what is it that motivates them to do such a difficult job. Amina, the only female VNRC member among the three that day said:

> "…most people want serve as VNRC members because of the occasional payments when conducting forest patrols, undertaking various forest management activities such as fire control, attending seminars or escort tourists and researchers like you into our forests…"

After reading the village forest management plans and forest bylaws in the four villages I visited, I verified that these payments are listed in those documents. Saidi, another VNRC member, added:

> "…however, I think that over time, you start to like the job and it pains you when see people destroy forests. I have served for seven years now and I am ready to continue despite the challenges we face…"

Because Amina, Saidi and other VNRC members all residents in their respective villages, their knowledge of the village, the forests and the people somehow makes their forest patrols more effective. For instance, they would know at which times of the year and on which parts of the forest local residents are likely to conduct logging, charcoal production or cutting building poles. For a village like Liwiti with one village center where all 47 households are located in close proximity, Amina's work becomes even easier. They boasted that they would easily know who is likely to go into the forest for logging, charcoal production or hunting.

The state representation for forest control at the village level is no longer in the form of game scouts from elsewhere, or outsider forest officers with university education who pretend not able to speak Kiswahili without mixing with English who arrive at the village in a government vehicle. Instead, the government representation at the village level is now mainly in the form of local agents who use the local language, tools, buildings and knowledge in persuading others to sustainably manage forests. Although the external and higher level state forest officers still patrol the villages, most of the work is done by local environmental subjects. Less coercive power and technologies of governance are employed in producing decentered subjects capable of self-governance for sustainable forest management. Those who continue to perform the banned cultural ecological practices are now facing less coercive interventions from governmentalized local agents who could be their neighbors, siblings, wives, husbands, fathers, mothers, medicinal men/women, carpenters, teachers, mid-wives, etc. The pre-existing social-cultural relations between local agents and targets have moral bearings and determine how current interventions are performed and their environmental outcomes. This suggests that CBFM is another form of dominant hegemonic cultural practices co-opting local cultures to further propagate state hegemonic views of forest conservation as influenced by dominant narratives of degradation.

Interview with Mtitu (a senior officer forest officer in Kilwa District) provides evidence of the application of technologies of mobility such as cellphones and motorcycles by local people in

performing their banned practices such as logging and charcoal production. These improved mobilities enable rule violators to effectively avoid the closer monitoring by the local forest enforcement units. In July 2013 while at the district headquarters in Kilwa I noticed that the piles of confiscated logs, sawn wood, bags of charcoal and various tools and equipment confiscated from rule violators were larger than in my previous visits. As I was seated in Mtitu's office waiting for him to finish copying my brief reports to be shared in the villages the following weeks, I commented that they must have become very effective in apprehending rule breakers. He did not seem amused by that. In response he said:

> "…I do not feel proud or effective seeing these things piling up here…It means the trees from which these [forest products] were obtained have already been lost in an unplanned way and possibly unsustainable too…"

He continued to describe that with increased use of cellphones and motorcycles, what I saw outside is probably a small fraction of forest products being illegally harvested.

> "…you see, we repeatedly urged our colleagues at the ministry headquarters in Dar es Salaam to convince private cellular phone companies to provide coverage in this area since early 2000s. I have worked here since 1981 and one of the main challenges has always been poor and delayed communications in undertaking our job. We argued that the use of cellphones will improve communications with headquarters and with VNRC members whenever they needed assistance such as when there are reported cases of forest rules violations. We got the cellphone coverage and initially we were very effective in apprehending rule violators. Sadly, the rule breakers are now applying these technologies more than we do. Combined with increased number of motorcycles, they can easily inform each other of the whereabouts of forest enforcement units and use motorcycles to escape. We hardly manage to arrest most people behind the piling forest products you see outside because they ran before our enforcement units arrived at the scene. I think it is about time we start confiscating cellphones alongside chain saws, bicycles and other tools because the cellphone has become a deforestation equipment too…'

Mtitu even suspected that cellphone technology especially the use of mobile-money transfer is used to facilitate bribing and hence trucks transporting il/legal agricultural and forest products pass uninspected at police check-points along the main road connecting Kilwa and Dar es salaam. "How else can one explain the tonnes of illegal timber reaching Dar es salaam while there are at least three check-points specifically for inspecting natural resources products along the way. My friend, I am retiring in two years, once I retire let us chat some more I will tell you a lot more. Right now I still need to protect my job" He finished with a smile as Pandu, his office mate who works on fisheries resources entered the office.

Negotiating forests

Changes in people-forest interactions as influenced by multiple interacting factors indicate that forested landscapes are becoming more socially and ecologically important to the residents for their survival. Transformations in forest governance institutions particularly the deployment of local environmental subjects has implied closer monitoring of local residents' access and use of forested landscapes. As a result, people have to constantly find ways of accessing and utilizing forests without being apprehended. To negotiate their claims and belonging to culturally and symbolically important forests, local residents have adopted variety of violent and non-violent strategies. I cover violent resistances in another article. In this article I focus on local residents' innovative appropriation of the discourse of democracy, participation and decentralization in negotiating claims over forested landscapes

In the introduction section of this article I narrate Bwana Bakari's questions. From Bakari's submissions, I realized several things related to people's appropriation of democracy, decentralization and participation in negotiating their forests. First, Bakari repeatedly used "our forest/s" which indicated that Kikole residents now feel that the forests are theirs and they are not being tricked by the central government in creating forest reserves as previously perceived.

On my first visit to Kikole in 2009, Sudi, the village executive officer explained to me why they had set aside only 450 hectares out of 15000 hectares of forest in the village for CBFM projects.

> "we thought MCDI was tricking us to allocate our forests for forest protection where we will not be allowed access and use of that protected area. Because they informed us the minimum size to enroll was 450 hectares, we decided not completely reject their proposal. Instead, we set aside that small area and furthest from settlements such that if eventually they take it, we will not be affected negatively"

Second, Kikole residents effectively exercised their rights and powers to question introduced interventions and investments to safeguard their interests. As a result, in most cases, they would not directly reject the proposed interventions or investments, but their endless questioning and negotiations would eventually discourage the investor. "I am very proud of my people", boasted Haji the Kikole village chairman when we were talking about their initial rejection and later acceptance of REDD+ in their village.

> "…my people know their rights and they do not want to be bull dozed by district officers or MCDI people. We know they (MCDI and district officials) have good intentions, but they have taught us we have rights to interrogate any introduced scheme…"

Local resident's appropriation of democracy and participation in delaying REDD+ implementation as a strategy to keep off suspicious interventions is frustrating NGO officials and District Councils. An unexpected exchange between two MCDI officials at their offices in June 2011 summarizes these frustrations. On that day I was at the MCDI offices' main lounge accessing internet to reply to emails. Charles, REDD+ community development officer and Grace, REDD+ project manager were also working on their computers and we all had occasional chats. I started a conversation about the difficulties of working with coastal communities who tend to act very receptive to outsiders but usually give strategic responses: responses based on their perception of who you are and what effects you might cause to them (good or bad). Charles contributed by saying that, it is because of such strategic and talkative tendencies that they have not managed to get Kikole's consent to join REDD+.

Charles: "Sometimes I wish we were still in the era of centralized forest control whereby the government would just declare certain forests as forest reserves without consultation or seeking consent from the locals".

Grace: "I share your frustration Charles, but I still think when people agree to enroll in REDD+ through a democratic and participatory process we can then hold them accountable in the future if they do not fulfill their part of the agreements…"

Charles: "…remember, we are implementing a time-bound project and most activities at the village level cannot proceed if people have not consented to join the project. And we claimed to the donors that we can implement this project within the specified time. Don't you think failure to get people's consent soon enough will indicate that we did not have the experience of working with these communities in the first place?"

Grace: "…relax, we will get their consent. If not we will drop Kikole. After all, Mchakama, Kisangi, Liwiti, Nambonde and Likawage have already consented. It is no big deal dropping one village."

Eventually, MCDI excluded Kikole village from its new REDD+ project between 2010 and 2013 and enrolled the village in 2014 after residents were satisfied with the explanations.

The negotiations between local people and MCDI officials in developing and implementing comprehensive fire management plans in each village is another evidence of local people's creative abilities in appropriating introduced democratic spaces and institutions to negotiate their claims over forests. MCDI's REDD+ scheme combines selective logging and sale of emissions reductions on the same forests. While there is a clear trade off between logging and avoided deforestation, MCDI argues that significant emissions could be prevented from practicing controlled burning which has less effects on forests compared to uncontrolled forest

fires. However, these fire management plans can only be implemented after MCDI obtains informed consent by villagers obtained through village level assembly attended by at least 50% of adult village members and consensus reached by simple majority.

Local people deploy what I call narratives of *"self-disciplined citizens in need of no imposed restrictions on fire use"* to argue against adoption of the comprehensive fire management plan. They argue that, they have mastered well the use of fire over time; they prevent fire from escaping to the forest or others' farms. They further note that occasionally and only accidentally fire does escape and cause damage to the forest and on other people's farms and when such incidents occur, they would organize themselves to extinguish the fire. What is central in their argument is that fire escaping beyond one's farm is accidental and no one would burn someone else's field or the forest intentionally. Therefore they contend that there is no need for imposing restrictions on fire use. Moreover, they argue that even when one's field is burnt, this is usually a result of actions by someone close to them. Therefore, they claim that the social-cultural ties between them are more important than compensations paid when one's farm is burnt.

However, there is another side of the story that they do not publicly reveal when engaging in the debate over adoption of the comprehensive fire plan. This regards the use of fire to attract wildlife into village and subsequently hunting them. Most communities in Kilwa district are adjacent to the Selous Game Reserve – the largest and "wildest" game sanctuary in Africa and the world established in 1896 during the German Colonial regime. Wildlife roams freely across the landscape as they do not recognize political boundaries in the absence of physical barriers/fences. To attract wildlife into village land, they practice early burning at the end of the rain season and beginning of the dry season during July and August. During this time, grass has grown tall, start to dry, become coarse and hence not very nutritious. Early burning would burn the coarse top grass and due to windy situations, the fire is usually not very intense. Grass would re-sprout using soil moisture. Wildlife will be attracted to the fresh, soft and nutritious grass outside the reserve. Local hunters would then hunt the animals. This period coincides

with the harvest season when people have money from sale of sesame. Hunters then have an assured market for the wild meat. This practice has been used by local people for ages. Inside the reserve, ecologists are always late in carrying "early burning" and become agitated every time they are "outsmarted" by local people.

NGO representatives are now complaining that democracy becomes a barrier forgetting that under undemocratic situations of the past, NGOs were not part of this process. In the past harsh government interventions were imposed on the local people in such situations, now, harsh interventions are not an option anymore.

DISCUSSION AND CONCLUSION

Transformed people-forest relations
The REDD+ program was motivated by the realization that uncontrolled forest clearance in the tropics causes up to 20% of global greenhouse gases emissions that eventually cause climatic changes. As its name suggests, REDD+ aimed to avoid deforestation and forest degradation. To supporters of protectionist approaches, reduced emissions from avoided deforestation provided more justification for interventions aimed at regulating people's access and use of forests. In the miombo ecosystems of Eastern and Southern Africa, this resurgent focus on controlling slash-and-burn shifting cultivation resurrected otherwise matured and settled debates.

Literature on people-forest relations has effectively blurred the nature-culture divide to demonstrate the interdependencies and co-productions between natures and cultures (see e.g. Dove 2008; Fairhead and Leach, 2008; Shetler, 2007). For instance, McCann (2005) observes that "African landscapes are all anthropogenic, i.e. formed by interactions with humans." Similarly, Fairhead and Leach (1996) provided compelling evidence on how we have been misreading human-environment interactions and challenges popular narratives that blames

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local people's actions for reported undesirable forest changes in sub-Saharan Africa. Others have adequately situated human-environment interactions within the real contexts and spatial-temporal scales in which they exist while acknowledging cross-scale interactions (Hughes, …). Recent literature has also demonstrated that human-environment interactions are dynamic departing from earlier scholarship that assumed human-environment interactions to be constant within defined spatial and temporal scales (ref.). Moreover, we know that human-environment interactions as observed at the local level are a result of multiple interacting factors across multiple scales (Lambin and Geist, 1996; Hardin and Remis on transvaluation).

However, sometimes, abrupt changes in social or ecological sub-systems in a coupled human and natural system could affect the ability of the entire system to recover from perturbations and hence result in potentially irreversible adverse effects. Unprecedented deforestation and forest degradation in the tropics over the last three/four decades suggests that people-forest interactions are not at a balance. Rapid recent changes in socio-economic, technological and environmental factors under conditions of weak forest governance in the tropics have resulted in a situation whereby clearing a forest is often more profitable than maintaining a standing forest (Capistrano, 2010; MA, 2005; Milledge, 2010).

In this article, I have provided detailed descriptions on how people-forest interactions in Kilwa District have changed and the forces behind those changes. Farm sizes have expanded using faster techniques of forest clearance concurrent with increase in number of people cultivating crops such as sesame that require constant spatial relocation of farm plots and targeting matured forests resulting in rapid forest clearance. These changes in are influenced by increased market accessibility following roads and bridges construction over the Rufiji river delta, growing demands for sesame in oil factories in nearby big cities and rapid increase in agricultural and forest products. Local people's use of emerging technologies of mobility such as motorcycles speed up transportation of people and forest and agricultural products while the use of cellphones readily connects local residents to markets and market information.

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As a result, there is a shared understanding among local residents, non-governmental organizations, district level authorities, national and international actors that the combination of several factors operating from local to global scales have resulted in transformed local cultural-ecological practices such that the emerging practices are destructive to forests. This detailed ethnographic description of how shifting cultivation and wood extractions result in deforestation and forest degradation strengthens causal relations between proximate and underlying drivers of forest change and provides explanations of forest loss as analyzed by others through forest assessments and analysis of remotely sensed images (see e.g. MCDI's forest assessment reports).

Transformed forest institutions

It is now widely recognized that sustained efforts are required to address the increasing problems of tropical deforestation and forest degradation which poses severe and potentially irreversible effects on the well-being of forest ecosystems and humans from local to global scales (Chhabra and Geist, 2006; Lambin et al., 2006; MA, 2005; Mooney, et al., 2005; Moran and Ostrom, 2005). The last three decades has seen both unprecedented disappearance of tropical forests and unparalleled innovation in forest governance and institutions (see e.g. Lemos and Agrawal, 2009). Forest institutions are especially important in situations where human-nature interactions are resulting in unsustainability of the coupled natural and human system under consideration (Ostrom, 2005 and 2009). Ecological anthropologists have carefully argued that the development of ecologically appropriate and culturally sensitive institutions to regulate human-environment interactions should be informed by contextualized understanding of dynamic human-environment interactions (Kottak, 1999).

Forest governance literature has provided theoretical and empirical evidence on the performance (rather failure) of conventional forest management by the state and used such evidence to argue for the introduction and proliferation of various novel forest institutions. In the tropics, forest governance transformations have been characterized mainly by the expansion from centralized forest management to decentralized and participatory approaches

involving local people residing within or adjacent to forests (Brockington, 2005; Nelson and Agrawal, 2008; Ribot, etc). Heynen et al (2007) argue that increasing hegemony of neo-liberal tenets of democratic decentralization and participation provided initial motivation for involvement of non-state actors in managing renewable resources such as forest commons. Brockington (2005) observes that neoliberal transformations provided space for national and international conservation and development organizations to argue that they are better resourced to address conservation and development problems compared to resources limited poor newly independent African states. Recent push for rights-based approaches have also provided additional justification for continued expansion of community based approaches (Rights and Resources Initiative RRI, …).

Implementation of REDD+ through recently decentralized community based forest management arrangements claimed to differ from conventional forest management by the state in that carbon payments to local resident after proof of avoided deforestation and forest degradation would serve as incentives for adoption of sustainable forest management practices. Moreover, delivery of community development projects and providing technical and financial resources to local residents in adopting alternative livelihood strategies away from forests would result in continued forest protection. However, this approach has been faced by variety of violent and non-violent resistances. In this article I have argued that the adoption of arguably less coercive forms of governmentality under decentralized community based forest management arrangements are producing similar state-like effects to those produced by colonial and post-colonial socialism governments in regulating people-forest interactions. The focus on the effects produced by the contemporary decentralized and participatory approaches to forest management enables a more meaningful comparison to their predecessors and provides explanation behind the variety of resistances reported against emerging non-state forest management institutions.

Negotiating forests: creative appropriation of discourses of democracy, participation and decentralization

Interaction between local people and contemporary forest institutions is influenced by both current and historical effects of forest institutions on people's access to and utilization of forested landscapes. Questions of people-state contestations over land and resources are not new. Environmental historians have documented how local forest residents articulated and contested harsh state interventions that aimed to control local people's access to and utilization of forest resources (Thadeus Sunseri, 2009; Neuman… etc). It is known that the aim of institutions is to create local environmental subjects whose conducts are aligned with environmental conservation goals of the state (Agrawal 2005). The colonial government introduced harsh exclusionary conservation approaches in establishing various protected areas. Independent African states adopted and expanded the colonial top-down conservation approaches until the 1980s when decentralized non-state conservation approaches emerged. Local people deployed varieties of resistances to negotiate and contest state conservation initiatives during colonial and post-colonial eras. In this article I have focused on non-violent forms of negotiations between local people and NGO and District Councils.

Focusing on non-violent interactions have enabled an articulation of how local forest residents are creatively appropriating the emerging discourses of democracy, decentralization and participation in designing narratives and counter narratives for asserting claims and challenging prescribed forest policies that are being introduced. Although people's innovation (sometimes called resistance) and continued performance of 'banned' cultural-ecological practices is viewed as counter-productive to contemporary projects of controlling tropical forested landscapes, this article argues that people's innovative agency is crucial in shaping the theory and practice of forest governance under regimes of changing and uncertain social and ecological contexts. Articulating and narrating these innovative approaches departs from popular narratives that have told similar stories describing local residents as victims rather than active, smart and powerful agents in negotiating their forests.

Chapter Three: The Paradox of Deliberative Democracy

Deliberative democracy and the making and unmaking of illegitimate forest institutions

INTRODUCTION

The implementation of REDD+ (an international program to reduce emissions from
deforestation and forest degradation) in the tropics was surprisingly met with heavy resistance
in many countries. REDD+ was motivated by the realization that avoiding tropical deforestation
and forest degradation will reduce up to 20% of global greenhouse gases emissions and
concurrently contributing to improving local livelihoods and attaining biodiversity conservation
goals. Through a combination of market based and fund based approaches at the international
level, and facilitation by national governments and non-governmental organizations, carbon
revenues would be generated and channeled to forest owners owners and managers in the
tropics to encourage adoption of sustainable forest management practices (UN REDD+
Program, 2008). Through adoption of participatory and democratic deliberation in decision
making for REDD+, local forest residents would negotiate and reconcile between the multiple
and often, competing forest land uses and hence produce socially and economically equitable
outcomes (ibid). This unique combination of forest rights devolution, equitable sharing of
carbon payments and adoption of democratic processes was expected to heal historical people-
state enmity and transform local forest residents into good forest stewards. The urgency and
promises of that program charmed development partners, governments and non-governmental
organizations into action to test it on the ground. The program started in 2009 in nine tropical
developing countries with funding from the Norwegian Government and with additional
funding from other sources, it rapidly expanded in over 50 tropical developing countries within
a span of three years. However, the initial zeal was short lived. By 2012, there were reports of

varieties of resistance against REDD+ from arguments made against the program to violent and non-violent actions at the local, national and international levels (see e.g. anti REDD+ coalition website). Given the initial excitement about that program and its use of enticing narratives, eruption of resistance towards REDD+ seemed premature and paradoxical.

The objective of this article is to analyze the paradoxical relationship between democratic participation and emergence of resistance in managing human dominated tropical forests under the REDD+ approach. Existing literature on participatory forest management has extensively covered aspects of forest rights and powers devolution (ref), analysis of livelihood and conservation outcomes from community forestry (ref), and factors for success or failure in community based forest management arrangements (ref). Recognizing that human dominated tropical forest ecosystems are characterized by existence of diverse local actors with often competing interests over forested landscapes, scholars and practitioners of community forestry have promoted the adoption of democratic processes in making and applying specific forest rules for the aims of creating fair and acceptable forest institutions (e.g. Ostrom, 2005). However, the feasibility of deliberative democracy in producing fair and acceptable forest institutions for sustainable forest management has not been analyzed in the existing literature. I investigate on two inter-related questions: (a) Why are local people resisting forest institutions and interventions that they (local residents) made through democratic and participatory processes? (b) Why are local people not using the same democratic processes such as village assembly meetings to contest the introduced forest institutions and instead they have opted for resistance outside the prescribed democratic spaces?

I use the concept of deliberative democracy as coined by Joseph M. Bassette (1980) and latest developments in that field to assess how processes of democratic deliberation produce paradoxical reactions contrary to expectation. Brohman (1998) broadly defines deliberative democracy as "any one of a family of views according to which *the public deliberation of free and equal citizens is the core of legitimate political decision making and self government"*. Although REDD+ and community based forest management (CBFM) projects do not use the

term deliberative democracy explicitly, I find their use of democratic participation in decision-making and emphasis on consensus building neatly fitting the meaning of deliberative democracy as described above. For instance, one of the objectives of the Tanzanian Forest Act (2002) aims to "*encourage and facilitate active citizen involvement* in the sustainable planning, management, use and conservation of forest resources through the development of individual and community rights." A conversation with one TFCG field officer facilitating in REDD+ projects in Lindi district during May 2010 further demonstrates the practical application of the concept of deliberative democracy in REDD+ implementation. Nuru explained that:

> "…We constantly mobilize local people to attend meetings where rules about forest use and conservation are made and implementation plans are developed and approved. We do not make these decisions for them. It has to be a participatory process as stipulated in national laws and international standards. They have to make these decisions on their own. Our role is to provide the needed technical and financial support that will enable them comply with national and international guidelines. We even remind them that they are the ones who will be affected positively if they make good decisions and negatively if they make bad decisions…"

Since Bassette's formulation, proponents and skeptics of deliberative democracy have engaged in theoretically and empirically informed debates that have influenced the evolution of the current deliberative democracy field. Ercan and Dryzek (2015) summarize three areas of major debates on to include: appropriate sites of deliberation, the composition of suitable actors involved in deliberation and the choice of legitimate communication styles during deliberation. Drawing from several empirical case studies published in a special edition, they (Ercan and Dryzek, 2015) summarize the evolution of the field of deliberative democracy on these three areas. Initial conceptualization recognized two distinct sites of deliberation in deliberative democracy. These are Rawlsian and Habermasian accounts of deliberative democracy (Ercan 2014). Rawlsian approach is narrow and contends that, "deliberation should occur only in the state and its institutions such as courts or legislatures (ibid). Rawls view deliberation as a communicative interaction using rational reasoning among elected representatives making

decisions on behalf of the broader society. Harbemasian approach is broader and maintains that, "deliberation must be open to all who are affected by the outcome" (ibid). Habermas views deliberative democracy as a broader communication process happening through a large public sphere with no constraints and limitations on participants. Critics have contributed in expanding the sites of deliberation beyond Rawlsian and Harbemasian approaches. One notable contributor is Nancy Fraser who argued that Harbemas' single large public sphere is idealistic and instead she argues that deliberative democracy should include what she calls multiple publics and even subaltern counter-publics by those oppressed by the decisions resulting from the single large public sphere.

Expansion in deliberation sites has been accompanied by expansion in suitable actors involved in deliberation. Suitable actors have expanded from earlier conception of elected representatives in state institutions such as citizens jurors to recent realization that even self appointed representatives particularly in subaltern counter publics are suitable actors (Ercan and Dryzek, 2015). The expansion of sites and actors has necessitated expansion of communication styles to enable meaningful participation of different actors with different communication abilities and styles. Communication styles have expanded to include story telling and rhetoric, moving from the earlier strict use of rational argument as the only valid communication styles in deliberation (ibid).

However, existing literature on deliberative democracy have not empirically investigated what happens when these diverse deliberation sites, actors and communication styles are forced to coexist and dialogue. REDD+ implementation through CBFM in South-Eastern Tanzania embodies these expansions. There are multiple actors deploying different communication styles in deliberating at different sites. This multiplicity of sites, actors and communication styles in REDD+ implementation allows engaging with the theory of deliberative democracy at its crucial moment for its refinement. Rawlsian approach (smaller forums of elected representatives) is embodied in the various committees of elected representatives created for making certain decisions on forest management. These include Village Councils (VC) comprised

of 25 elected representatives and village natural resource committees (VNRCs) comprised of 12-16 elected representatives. Habermasian approach (broader conception of public deliberation through the single large public sphere) is embodied in the village assembly which is open to all adult residents (at least 18 years old) where decisions made from the smaller Rawlsian like forums (VCs and VNRCs) would be presented for deliberation and approval. In the REDD+ context, Nancy Fraser's multiple publics and subaltern counter publics do exist as well. These include women's discussion at the water source, men's discussions at village market centers, discussions during ceremonial gatherings such as weddings and funerals, among others. These multiple publics are usually about any topics that concern residents and the resurgent forest protection under REDD+ context has fueled conversations about forests in most gatherings.

Actors use different communication styles in these sites of deliberation. VC and VNRC use more strict rules of participation in their respective committees and the decisions they make have to be informed by latest scientific knowledge on REDD+ issues as brought by NGOs and district councils to ensure decisions made adhere to national and international standards and benchmarks regulating forest carbon projects. Village Assembly use particular rules of attendance and deliberation such as speaking through permission of the chair, following a strict meeting agenda, observing acceptable dress code, and making decisions through quorums, among others. In the multiple publics and subaltern counter publics organized informally by residents such as men's discussions at the village market or women's discussion at the water source, actors use their own acceptable communication styles. Different actors also become valid actors in the different sites. VNRC and VC membership is limited to literate and orally eloquent individuals who can work with their fellow residents and represent their ideas in negotiations with external actors such as NGOs and District councils (Tanzanian PFM Guidelines, 2001). Attendance and participation at village assembly is open to all adult residents in the village. In Kilwa and Lindi Districts, subaltern counter-publics (active resistance) have involved even those below 18 years old.

Resistance is a reaction to the effects of the introduced interventions triggered by perceptions of fairness or unfairness of the introduced forest institutions. If local residents perceive or actually experience the resulting institutions to be fair, then they will recognize and accept those institutions, and vice versa. The notion of fairness, recognition and acceptance of institutions leads to another important aspect of deliberative democracy, that is, legitimacy of the formed forest institutions. Legitimacy is a broad/vague term and has been defined and categorized differently by different theorists of democracy. In this article, I adopt Ercan's categorization of legitimacy into procedural legitimacy and substantive legitimacy (Ercan 2014). Procedural theorists contend that legitimacy arises from *fairness of the deliberation process* while substantive theorists contend that legitimacy arises from *fairness of outcomes* (ibid). This means under procedural legitimacy, the forest institutions formed for REDD+ implementation are legitimate as long as they followed a legal process in their formulation. Similarly, under substantive legitimacy, the forest institutions formed for REDD+ implementation are legitimate as long as they are fair to the targeted citizens regardless of whether they were formulated through a legitimate process. In this article I analyze both procedural legitimacy (recognition, acceptance and fairness of *rule making processes*) and substantive legitimacy (recognition, acceptance and fairness of *rules made*).

My initial encounter with REDD+ resistance suggested that something was wrong somewhere: either the rules made or the processes for making the rules or both. Drawing on extensive ethnographic fieldwork (observations, focus group discussions, key informant interviews and review of documents) spanning four years (2010-2014) conducted with actors involved in implementing REDD+ projects in South-Eastern Tanzania, this article analyzes the puzzling relationship between the adoption of democratic participation in forest management and the emergence of resistance. Specific methods deployed included observations, literature review, semi-structured interviews and focus group discussions. Following initial visits in August – November, 2009 and having established contacts with villagers, NGO officials and district government officials I collected more information about the conflicts even when I was not in the places where such conflicts occurred through phone and email. In subsequent visits during

2010 and summers of 2012, 2013 and 2014 I conducted focus group discussions, in-depth interviews and filed observations related to events of resistance to REDD+ interventions in the communities. I organized separate focus group discussions with members of the village natural resources committees, village councils and ordinary villagers. I conducted in-depth interviews with officials from the district government, the NGOs and a few individual villagers. I also conducted open village assembly meetings where we would discuss about the events of REDD+ resistance in the village among other things. I combined these methods with review of relevant documents on REDD+ such as meeting reports, activity reports, by-laws, forest management plans and quarterly and annual project reports.

THE SETTING

Given the complexity of REDD+ implementation involving elaborate set of international standards and benchmarks, need for specific technical knowledge and requiring huge financial resources that local forest residents are lacking in, NGOs and District Councils have actively facilitated its implementation. Mpingo Conservation and Development Initiative (MCDI) is collaborating with the District Council to facilitate REDD+ projects in several villages in the Kilwa district. The Tanzania Forest Conservation Group (TFCG) is collaborating with District Council to facilitate REDD+ projects in 17 villages in Lindi District. Both NGOs received funding from the Royal Norwegian Government. The NGOs and District Councils approach respective village councils to propose establishment of community based forest management (CBFM) projects in the village. CBFM is the main mechanism for REDD+ implementation at the village level. Village Council then organizes a village assembly to approve the proposal and get signed prior-informed consent of the community to join the REDD+ program.

Once the consent has been obtained, then several steps follow. First is clear identification of the drivers of deforestation and forest degradation in a defined project zone. Second is development and application of ecologically appropriate and socially acceptable interventions

to address the identified drivers of deforestation. Third is generating revenues through market based or fund based approaches to pay for emissions reductions attained from the implemented interventions. Finally is application of revenues (carbon payments) as incentives to forest owners and users for continued implementation of sustainable forest management practices. All these processes have to use participatory approaches and get villagers approval through village assemblies.

To undertake the above activities requires formation of several structures and rules. The Village Council (VC) proposes a list of 12-16 villagers to compose the village natural resource committee (VNRC). This list will be presented one by one at a scheduled village assembly for deliberation and approval. CBFM guidelines provide criteria for villagers to consider in selecting VNRC members. These include literate individuals, residency status, capable of representing the community in negotiations with external actors and someone who have the best interests of village forests and the village at heart.

VNRC work in close collaboration with NGOs and District Councils in undertaking all activities for CBFM/REDD+ implementation on behalf of villagers. The most important institutional process is the development and enforcement of legally binding village forest bylaws that stipulate what is allowed and disallowed within different land use categories in the village. Other facilitating structures include designating a village land forest reserve (VLFR) as the REDD+ project site in the village, adopting a village land use plan (VLUP) designating different land parcels to different uses, and the development and implementation of annual village forest management plans. In tandem, ad hoc structures and guidelines have been developed including REDD+ Benefit Sharing Guidelines and Benefit Sharing Committees that were responsible for developing arrangements on how REDD+ revenues were going to be distributed among community members. All these rules and structures have to be presented and approved by villagers through village assembly meetings before they are approved by district councils.

According to the Tanzania Local Government Act – Village Act (1982), the Village Council is supposed to hold four quarterly village assembly meetings attended by all adult villagers who are 18 years old and above. The first three quarterly meetings (March, June and September) cover village reports during the preceding period only and plans for the next quarter. The December meeting serves as the annual meeting covering the entire year and presenting plans for the coming year for discussion and approval. Any intervention introduced by any external actor is supposed to reach the Village Council (VC) first and the VC will invite the actor to present the intervention during the next village assembly. However, if the matter is a time sensitive one, the VC will call an extraordinary village assembly specifically for that purpose.Village assembly meetings are thus the main "democratic space" where all major decisions about REDD+ are made. For instance, consent to join REDD+ initiatives should be agreed by at least two thirds of all adults attending a legal village assembly convened for that purpose.

PRODUCING ILLEGITIMATE FOREST INSTITUTIONS

Assessing the quality of deliberation in participatory processes is compounded by the existence of numerous models and criteria proposed by different scholars (e.g. …). Shrimer et al (2015) provide empirical evidence to support Ercan and Dryzek's (2015) assertion that deliberative democracy is a normative theory functioning as "a regulatory ideal to which democratic practice can aspire, but possibly never fully attain". Therefore, applying the expansive list of possibly unattainable normative criteria in assessing success/failure of democratic deliberation in particular settings becomes of little theoretical or practical use. One solution is to identify a set of few relevant criteria for assessing deliberative quality of particular case studies that is informed by understanding the context of that particular setting (e.g. Shrimer, Dare and Ercan, 2015). I use this approach in this article.

In his 1989 article "Deliberation and Democratic Legitimacy", Joshua Cohen argues that the aim of deliberative democracy is to form legitimate institutions. In the REDD+ context, institutions refer to the rules, norms, structures and organizations designed to regulate people-forest relations to prevent unsustainable forest uses and management practices (Ostrom, 2005). Although, there are many formal and informal sites of deliberation on REDD+ matters, the village assembly is the most important legitimation process. This is because none of the decisions made through deliberation or other mechanisms in village councils or village natural resource committees can become legally binding if not presented, discussed and approved by villagers through the village assembly.

Cohen uses the term democratic legitimacy defined as "the right, capacity and opportunity for those affected by collective decisions to participate in the making of those decisions" (Cohen, 1989 in Ercan, 2014). Building on Cohen's democratic legitimacy described, I assess the success/failure of REDD+ deliberation at the village assembly focusing on two broad aspects:

(a) *Access to deliberation:* are affected citizens able to attend the deliberation processes, i.e. the village assembly meetings? Access to deliberation is an aspect of deliberative democracy that has been taken for granted and hence has not received sufficient attention in the existing literature (Shrimer et al, 2015). I evaluate the logistical and other challenges that prevent rural residents from accessing deliberation sites such as village assembly meetings.

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(b) *Ability to deliberate freely:* once citizens have reached the deliberation sites, are they capable of participating in the deliberation? This aspect has been extensively covered in the existing literature. I have identified four inter-related challenges that affect quality deliberation in village assemblies. These include power related factors, communication rules and styles, openness and transparency and informational related factors.

While the Village Act (1981) requires that the village assembly allows all adult villagers (18 years and above) to take part in village assembly meetings, there are several logistical challenges

preventing villagers' access to deliberation sites. Attending to farm activities is the main reason for low attendance in village assemblies during the December, March and June meetings. December coincides with farm preparation activities. Usually the December meeting is postponed until January where there is a break in farm activities following sowing/planting season. March and June quarterly meetings coincide with the main rain season and villagers are busy working on their farms. Sometimes, the June meeting has been postponed to late July when farmers have finished harvesting their crops. Poor attendance in meeting is further affected by the fact that most households have two dwellings in the village: a permanent housing at the village center that was established in the 1970s during the socialism period and temporary farm-hut that they reside in during the farming season. Since all meetings are held at the village center, and given the large size of villages (over 15,0000 hectares), most villagers would not get information about the meeting in time or find it difficult to go long distances or crossing flooded rivers during the rain season to the village center to attend meetings. The September quarterly meeting gets most attendance as people are done with farm activities and they have not started farm preparation for the next season.

Although each village has a village center as a legacy of the Ujamaa Villages during the socialism period, there are usually several hamlets that reside far from the village center. Villagers from distant hamlets usually do not attend village meetings or they leave early fearing walking in the dark in an area known for man-eating lions and other dangerous wild animals such as buffalos. As such, decisions made usually do not favor those residing far from the village center. Two elderly women from Nanyumbu hamlet about one hour walk from Likawage village center left a meeting early in July 2012 contending that it is dangerous for them to walk back in the dark in a place full of dangerous wild animals such as lions and buffalos.

These practical challenges always result in low attendance at village assemblies. Kikole Village Executive Officer explained that:

> "In case the meeting attendance quorum is not reached (which is two thirds of all
> eligible attendees), the village assembly will be rescheduled in at least the next 14 days.

If at that second time the quorum is not reached again, the meeting will be called for a third time. At the third call, the meeting will be held regardless of the number of attendees and all decisions made will be regarded as legal and legitimate decisions made by the entire village."

Low attendance and postponing scheduled meetings is common in all villages visited in this study.

Table xx below summarizes attendance in key REDD+ moments and spaces.

Villagers attendance in key REDD+ events in Kilwa and Lindi Districts (source: review of village meeting reports, discussion with village leaders and NGO officials.)

Table 10: summarizes attendance in key REDD+ moments and spaces.

	Kilwa	Lindi
Initial meeting to introduce REDD+ projects	List of participants in most villages (Likawage, Liwiti, Kikole and Mchakama) attendance was about 100 residents with Likawage reporting 173 attendance (May 2011 meeting)	No participants list were necessary because almost all villagers attended including children. The NGO – TFCG – provided meals and soft drinks to attract residents to attend the events. Use of traditional dances and theatrical performance in REDD+ launch events further attracted bigger audiences.
Meeting to endorse nominated villagers in forming VNRC	With the exception of Mchakama Village, attendance was below 70 in the rest of the villages	Attendance was fairly high in most villages between 100-150. Again meals and soft drinks were used to lure people to the meetings.
Meeting to approve Village Land forest Reserve area size and location	In most villages attendance was between 40-60 participants and village leaders insisted that actual attendance could have been higher because not everyone who attended the meeting actually registered on the attendance list	Very poor attendance. Several meetings were held on the same issues in each village and attendance went down over time. Official records indicate that initially attendance was about 60-80 villagers but went down to 30 individuals. People decided to abscond the meetings especially those from hamlets that were going to be

		mostly affected. They thought that absconding meeting would prevent the passing of decisions.
Meeting to approve carbon payment distribution arrangement	Not applicable	Very high attendance. Almost all villagers attended including children in Likwaya and Mkanga Moja villages where I was present during the meetings. Review of documents reveal that attendance was very high in other villages as well.
Meeting to receive trial carbon payments delivered by TFCG to participating communities in Lindi district	Not applicable	Almost all villagers including children attended in the two villages I observed (Mkanga Moja and Likwaya: Review of documents reveal that attendance was exceptionally very high in most other villages.
Other meetings on various aspects of REDD+	Attendance is very high when there is an issue of concern to majority villagers and very low when things seem calm. For instance, over 75% of eligible adults attended a meeting in August 2011 in Kisangi village because they wanted clarification on how timber volume	Meetings to introduce the REDD+ agricultural development strategy recorded the lowest attendance. In some villages less than ten people attended and in others between 50-60 would show up but leave before the end of the meeting. This was because there were no

	was measured and how much revenues the village would make. But there was very low attendance (below 40 individuals) when they were discussing about the village forest boundary conflict with Kikole village around the same time.	allowances or meals and soft drinks to participants.
Committee meetings: such as VNRCs and land use management committees	Attendance is very high because participants are usually compensated through cash payments or meals and soft drinks for their attendance	Attendance is very high because participants are usually compensated through cash payments or meals and soft drinks for their attendance

Discussions and interviews with residents from far hamlets revealed that there are several ways of overcoming these practical challenges. These have included starting and finishing meetings early in the day, sending information about meetings several days in advance and at times spouses alternated in attending meetings to ensure that there is someone taking care of the farm while the other attends a village meeting. However the biggest barrier reported regards what happens at the meeting once one takes the trouble of attending. This regards whether they are happy about the process and outcomes of their participation in those meeting. This leads to the second aspect on whether citizens are capable of engaging in quality deliberation once they have reached the deliberation site.

Transparency and openness is crucial in public scrutiny of deliberative processes (Shrimer et al., 2015) and "offers an effective tool of legitimization" (Kesim and Ercan 2006). Lack of transparency causes skepticism among citizens and prevents meaningful deliberation of the proposed decisions. Residents in South-Eastern Tanzania repeatedly cited lack of openness and transparency among village leaders as a hindrance to their effective participation.

> "…we do not get the reports we are supposed to discuss in those meetings in time. Sometimes they present reports with a lot of figures that you cannot even understand. Yet, if you ask questions seeking clarification at times you will be publicly ridiculed and scorned by the leaders…Most village leaders take a defensive position and hence no constructive discussions take place…" observed Mzee Khamis from Mchakama village, Kilwa district.

Power related factors also limit quality deliberation. Various scholars have theorized that collective decision making by free and equal citizens and their representatives is an important precondition for successful deliberative democracy (e.g. Gutmann and Thompson, 2004). However, in reality citizens are not equal. They differ in terms of knowledge possessed about the subject of deliberation, socio-economic status, education, age, gender and many other aspects. These differences result in differences in powers held by different citizens in different

settings. In the REDD+ context, powers held and exercised by some village leaders have significantly affected the quality of deliberation.

In Mavuji and Migeregere villages, fear of repercussion from leaders involving the use of witchcraft and being excluded from future introduced projects that could benefit the individual or his/her family was mentioned in almost all focus group discussions and semi-structured interviews. Villagers possessing skills in witchcraft are also accorded powers in the deliberation sites. Many residents observed that one cannot dare make an argument that contradicts an argument made by a known witch in the village for fear of being bewitched. In one village, during a focus group discussion, several respondents explained that the village executive officer had embezzled village funds and they speculated that he used some of the funds to buy witchcraft targeting those who were adamant in questioning him. Interestingly, while in the villages during July – September 2011 I witnessed "wizards/witch hunters" who were going from house to house to expose and weaken witches' powers for at least one year. During subsequent meetings, I asked if such exercises reduced people's fear and the response was overwhelmingly YES. One woman in Migeregere village excitedly commented that

> "…if you were asking these questions say in May before these "witchcraft experts" came, we would not have been as free as we are now to tell you these stories of our leaders using witchcraft to threaten and silence us. Most of us would not even have dared come to your discussion groups…"

Communication styles and rules that are appropriate to the context such as use of appropriate language, dress code and speaking manners are crucial for effective deliberation (ref). In Kilwa and Lindi districts, some residents, particularly elderly community members do not attend village assembly meetings because they dislike the strict rules regarding particular ways of dressing and speaking in those meetings. One elderly man in Kikole village, July 2013 stated that:

> "…I do not go to the meetings anymore because I do not want to be embarrassed in public. If you want to speak, you have to raise up your hand as if we are back in primary

school. I am over 60 years, I am not going to raise my hand and wait for the permission of someone who is even younger than my last born to allow me to speak… they have what they call agenda of the meeting, which they post outside the village office and say that if anyone has any issue they would want to bring up during the meeting, they should check the agenda on the notice board and notify the village executive officer at least seven days before the meeting. I am not used to that system. I want to be able to make my suggestions as I think about them. It is not even clear what constitutes a new agenda or something covered in the existing agenda. You can easily be silenced by being told that your comment or question is not related to the agenda in question…"

When I asked respondents whether meetings were held in the 1990s, 1980s and even before, they stated, the formalized village assembly meetings started during the formation of Ujamaa villages in the 1970s. But the meetings were more meaningful then. Everybody attended and those who did not attend without apology were fined. We felt ownership of the meetings and everything was transparent. In the 1990s with the emergence of multi-party democracy, village meetings were no longer held. There were no clear issues to call the meetings for. A few meetings that were held were on specific issues such as when there was a disease outbreak, information about the annual Uhuru torch (Mwenge), local elections and the likes. But beginning early 2000s there has been a lot more need for these meetings especially extraordinary village assembly meetings related to various issues such investors seeking land for plantations and NGOs introducing forest conservation projects. In the four villages covered in this study from Kilwa for instance, a biofuel investment company called Bioshape organized at least four village assembly meetings in each village between 2006 and 2008 when seeking villagers' approval to allocate land for jatropha farming (review of village records). Similalry, Mpingo Conservation and Development Initiative (MCDI) have facilitated organization of village assembly meetings to speed up decision making processes related to introduction and implementation of community based forest management (CBFM) projects in the village since 2004. Review of village records and discussion with village leaders reveal that only two villages

have organized at least 2 annual meetings that were not related to MCDI or Bioshape in the four villages visited between 2008-2012.

For the reasons discussed above, the forest institutions developed and approved through the village assembly are legitimate from a legal perspective because they are formed through legally established processes but are democratically illegitimate because of low citizens participation in the deliberative processes.

THE UNMAKING OF ILLEGITIMATE FOREST INSTITUTIONS

In deliberative democracy, proponents of substantive legitimacy maintain that legitimacy derives from the fairness and acceptance of the outcomes regardless of whether the process for making those institutions was fair or not. Focusing on the impacts of outcomes of deliberative processes on citizens is further justified by the fact that achieving free and equal participation of all affected citizens is impractical for many reasons articulated in the previous section. Others have argued that the inclusiveness criterion of deliberative democracy should ensure discourses (interests) of affected citizens must be represented despite the physical absence of certain citizens (Dryzek, 2010: 30-35 and Shrimer et al., 2015). This suggests that if the REDD+ institutions developed and applied in Kilwa and Lindi districts were fair and acceptable to the citizens, resistance would not have occurred despite those institutions being democratically illegitimate, that is, formed by a few people since most could not attend or participate in the deliberation for the reasons elaborated in this article. Moreover, if the democratic places for deliberation were accessible to local forest residents, they would have used them to express their intentions to remake them. Therefore, local residents opted for various kinds of resistance through arguments and actions to contest those unfair and illegitimate institutions.

Following are examples of select cases of resistance from several villages. I include four REDD+ villages and one non-REDD+ village. All acts of resistance demonstrate two features. First there are real/actual or perceived threats of REDD+ institutions on people's access to and use of forest-lands and resources. Second, local residents do not have confidence in using the democratic processes such as village natural recourse committees and village assembly in contesting the unfair and illegitimate institutions introduced in their village.

Importantly, these acts of resistance indicate that, they are not spontaneous; rather they involve careful deliberation and planning among the concerned/affected citizens who plan and perform resistance. In other words, these are Nancy Fraser's subaltern counter publics. In most cases, acts of resistance remain invisible to external actors (NGOs and district councils) and their representatives at the village level (village councils and village natural resource committees) until when they are ripe for execution. This secretive and subversive planning for and execution of resistance imply that there are alternative deliberation sites that are becoming important in contesting forest institutions. Similarly, since most cases of resistance involved many forest residents, it suggests that are alternative ways of communication for circulating information (false as well as correct) that would encourage more residents to support the staged resistances. I describe the part of resistance that was visible to the public. Following IRB's guidelines on human subjects, I do not discuss the deliberation sites and the actual planning for resistance because some resistance involved unlawful conducts that would have legal implications on those involved. Moreover, I did not take part on organizing these resistances. Other scholars have provided detailed accounts of their involvement in the planning and execution of acts of resistance/advocacy (e.g. Julia Paley's book on "Marketing Democracy").

Case study	Description of resistance	Motivation for resistance
Kikole village,	Non-violent resistance creatively appropriating the	Resistance is triggered by powerful social memory of harsh and exclusionary state forest

Kilwa District	discourses of decentralization, democracy and participation	management practices of the colonial and post-colonial socialism eras that actively alienated people from their only means of survival – forested landscapes.
Nambondo village, Lindi District	Violent resistance creatively appropriating the introduced institutions and narratives to challenge the same institutions and narratives without violating any laws	Resistance is triggered by actual experiences of unfair effects of REDD+ institutions on people's access to and use of forested landscapes.
Rutamba village, Lindi District	Violent spontaneous resistance that violates national laws	Resistance is triggered by misunderstandings regarding the intentions of carbon payments delivered to the village, social memory of harst state interventions in the past and rumors of adverse effects of REDD+ interventions on people's access to and use of forest resources.

The case of Kikole village

This case demonstrates two things. First is the creative ability of peasants in understanding and appropriating introduced discourses of democracy and participation in questioning the intentions of introduced forest management initiatives. Second is the innovative ability of local residents in appropriating the emerging discourse of participation and free prior informed consent to reject the same introduced institutions. In most villages, REDD+ resistance targeted external REDD+ actors (NGOs and district councils) and their representatives at the village (village councils (VC) and village natural resource committees (VNRC)). In Kikole, VC and VNRC publicly acted neutral, that is, not siding with external or internal actors while in practice they sided with residents.

Kikole had been collaborating with an NGO named Mpingo Conservation and Development Initiative (MCDI) in implementing community forestry since 2004 and was the first village to sell FSC (Forest Stewardship Council) certified timber from community forestry in the entire Eastern and Southern African region in 2009. Although Kikole residents were hesitant to enroll in community based forest management (CBFM) projects since 2004, they did not reject such interventions outright. For instance, in 2004 following a series of meetings and negotiations with MCDI and Kilwa District Council they agreed to set aside 450 hectares of forest which was located furthest from human settlements in the village, an area close to forest reserve managed by the central government.

> "In most of the villages we work in Kilwa, we have to organize several awareness raising meetings and facilitate holding of village assembly meetings where villagers will make decisions on wther they want to enroll in the PFM program and agree on other aspects such as how much of their village forest is allocated for sustainable forest management purposes…we have learned that we have to repeat the same information over and over…" explained one MCDI officer, field notes, July 2010.

Kikole residents explained MCDI had told them that the minimum forest required to enroll in CBFM was 450 hectares. Therefore, while they doubted the intentions of MCDI and participatory forest management in general, they wanted to experiment the new forest management practice. Their fears were based on a long history of harsh and exclusionary centralized forest management approaches during the colonial and post-colonial socialism eras that resulted in creation of forest reserves where local residents where not allowed to enter and obtain any forest products. They suspected this initiative is the same old system given a different name.

The Village Executive Officer noted that

> "..we were tired of endless meetings with MCDI. We did not want to say no because we were enticed by the benefits and promises MCDI made. Yet we did not want to say yes

and realize later that we have been fooled. So we decided to ask many questions and postpone meetings hoping MCDI officials would get tired and leave us alone with our forests. But they never gave up. So we had to use "their" own participatory forest management guidelines in making that decision. Since the forest we gave them is very small and currently no villagers really use it, we were comfortable if eventually they "took" it, we would not be seriously affected.

The village chairman stated that

"…since NGO and district council officers told that CBFM cannot be implemented in our village without villagers' permission (prior informed consent) to enroll in the program, we really had to be sure of the agreements we are entering into…"

Following the introduction of REDD+ program in Tanzania beginning 2008 and MCDI securing funds from the Royal Norwegian Government in 2009, MCDI went back to their CBFM villages including Kikole to introduce the new REDD+ project. MCDI explained to the villagers that REDD+ (sale of emissions reductions) will be combined with the existing CBFM (sale of sustainably harvested timber) on the same village forests. However, the area that Kikole had initially allocated for CBFM (450 ha) would not be ideal to maximize revenues from the additional sale of carbon credits. Since the village has over 7000 ha of forests, MCDI wanted to convince villagers to expand the forest size to at least 3000 ha from 450 ha. MCDI used the case of timber revenues already delivered to the community in 2009 to lure residents into expanding the village land forest reserve arguing that their forests will be better managed for present and future uses and combined revenues from sale of sustainably harvested timber and carbon credits will multiply several folds over.

However, in every negotiating meeting, villagers asked many questions and never reached conclusion. They did not clearly understand the concept of emissions reductions (carbon credits and their sale) and how that was going to be combined with sustainable logging. They just wanted to continue with the selective logging scheme whose revenues and other benefits they

had already seen since 2009. In addition REDD+ implementation required that MCDI signs contracts (MoU) with each participating village that would lock the agreed land uses for at least 30 years. Kikole residents reminded MCDI that under PFM guidelines they (villagers) have the powers to demand clarification and if not convinced, they have the right to reject the idea. MCDI attempted to clarify but Kikole residents refused the REDD+. In 2011, MCDI finally excluded Kikole village in the REDD+ scheme from and continued with the already agreed CBFM project for sustainable logging while introducing REDD+ in neighboring villages.

However, MCDI never gave up and using their experience from REDD+ implementation in villages neighboring Kikole, they managed to convince Kikole residents to enroll into REDD+ in 2014. It took from 2010 to 2014 and over repeated negotiation meetings to finally reach an agreement. Kikole residents felt jubilant about their experience and stated that they could not believe that they really had the powers to reject REDD+ because in the past, the Government would just declare an area as a forest reserve and remove people from the area without consultations.

In between the public consultations and negotiations performed through the village assembly, Kikole residents would organize their own informal discussions about what they called as MCDI's REDD+ project. These discussions happened at wedding and funeral ceremonies, at the village market center where men usually hang around playing board games especially after the harvest season, and at the water source where women usually converse about different issues and other arenas that brought several residents together. In these ways, Kikole residents shared information and collective thinking around issues of forest management. Interestingly, in these alternative deliberation sites, there are important power shifts from official village leaders to other members of the community depending on the issue at hand. I remember a heated debate that ensued at a funeral ceremony the night before the actual burial when residents debated about the importance of having cell-phones among rural residents in Tanzania such as Kilwa. In that discussion I realized that in such settings the village chairman and village executive officers had no powers to influence how the discussion ensued. Instead

other villagers who were viewed to have more knowledge on the topic such as the village medical officer and school head-teacher were given more authority on the subject by the residents given their education status and exposure outside the village.

The case of Nambondo village

Nambondo village reveals the use of force in resisting introduced institutions without breaking any laws. I was not in Nambondo when this incident happened but one NGO official informed me through phone. Later I visited the village to conduct interviews. Nambondo village had completed most of the processes for REDD+ implementation including setting aside a village land forest reserve and adopting forest bylaws that stipulates what is allowed and disallowed in different parts of the village.

One day in August 2012, MCDI officials arrived in the village and took four members of the village natural resource committee (VNRC) to go to the forest to conduct forest carbon assessments. This was a common practice and MCDI officials had conducted different activities inside the forest with few members of the VNRC. On this particular day, something different happened. After MCDI and VNRC members drove off into the forest, a group of villagers (men and women) quickly organized themselves and followed them into the forest. Upon finding them, they (villagers) asked MCDI and VNRC members to show their documentation that allowed them to be in the forest. They argued that it is MCDI and VNRC that informed villagers to be vigilante in protecting their forests even if it meant arresting their own people. MCDI and VNRC members did not have any papers and thought that it was a joke since they are known and have been working with the communities for several years. But the villagers were not joking. They arrested them, tied them up and sent the MCDI driver to fetch the papers. The driver returned several hours later and the villagers released MCDI and VNRC officials and allowed them to continue with what they were doing. "I could not believe what they had just done", commented the MCDI official who called me on the phone.

One of the rules adopted in the village was that anyone found inside the protected village forest should have documentation describing their business in the forest. Villagers argued that since it is allowed to collect non-timber forest products inside the protected forest such as mushrooms, fruits, tubers, vegetables and medicinal herbs, they found it unfair when a few villagers were arrested while they did not break any rules. Therefore, on that particular day, knowing the MCDI and VNRC members never carry any documentation with them, they wanted them "to test the bitterness of their own pill", said one villager laughing. Moreover, in Nambondo village, only about 40 residents attended the particular village assembly that approved the bylaws. Other villagers came to experience the effects of those institutions after the facts and did not know how best to make changes to the rules. They were told that they missed the opportunity since they did not attend the meetings.

Another villager who claimed that he did not take part in that incident argued that "…maybe this experience will make them rethink about remaking the rules and making sure the rules are fair to people." Eventually some amendments were made to the forest rules to make them less strict especially regarding forest access for obtaining various non-timber forest products.

This Nambondo case provides evidence of alternative deliberation sites that local residents use in making sense of the introduced institutions. Through their own sites of deliberation, they had discussed about the unfair rules, shared specific personal experiences of arrests and collectively thought of ways to challenge those rules. They cautioned each other about making sure that they do not violate any rules in challenging forest rules. "we have approached VNRC and VC on numerous occasions about the unfairness of these rules and they said these rules cannot be changed" Observed another villager who took part in the incident. What is interesting is that, their plans for this particular act of resistance remained unknown to VNRC and MCDI officials until the moment of its execution. Through this incident, I realized that resistance could be viewed as a moment and space when formal and informal deliberation sites, actors and communication styles are forced to dialogue for the production of fair and acceptable forest institutions.

The case of Rutamba village, Lindi District

Rutamba village presents a case of violent spontaneous resistance that is not even based on actual effects of REDD+ interventions. The village had accepted REDD+ from the start and had completed all steps up to receiving trial carbon payments from the Tanzania Forest Conservation Group (TFCG). Having formed a benefit sharing committee and agreed that each villager will receive equal payments from reduced emissions, TFCG organized a payment delivery ceremony and invited media people, government representatives and local politicians to witness the delivery of carbon payments to the village. On the big day, TFCG arrived with an entourage of about six vehicles including those from the district council and media people. The usual opening speeches were done and the floor was opened up incase there were any questions from villagers. One man stood up and stated that he does not understand why they are getting paid. He said:

> "…I understand that when you receive a payment for a commodity, you have to give that commodity to the buyer. But we are told that the land and the forests remain ours. I do not understand how carbon payments work. We expected there would be actual harvesting of carbon from our forests, but we were told that is not the case. I am not sure why are we being paid…"

To which the TFCG official responsible for explaining carbon payments stated that those issues were covered in previous meetings and to save time the meeting should proceed as planned and there will be opportunities for further clarification in days to come. At that point villagers started booing and shouting and their arguments could not be heard clearly. A group of young men and women picked up clubs and stones and shouted that everyone should leave. One person approached the Ward Councilor (the highest ranking politician available at the event) and wrestled him to the ground. TFCG officials, media people and government ran to their cars and left the village.

I went to the village two weeks to later investigate further why they disrupted the meeting where they were supposed to receive their payments after they had completed all REDD+ project steps. They gave several reasons. Some villagers explained that they heard that in

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villages where payments were delivered, stricter forest rules were introduced such as being allowed to enter the forest only once a week for collecting non timber forest products such as fuel-wood.

> "what if one the day I am allowed to enter the forest to collect firewood I have other engagements and prefer to collect firewood on a different day? Where will I get firewood for cooking while waiting for the particular day? This is not acceptable. It is absurd" Observed a lady during a group focus group discussion.

Others recounted a story of two villagers who were allegedly arrested in a neighboring village and the VNRC members who arrested those villagers beat them and skinned their feet. This story came up in several focus group discussions and semi-structured interviews. As the details of the story kept changing from person to person, I decided to ask for more details to establish its authenticity. Interestingly none of people telling this story could name the village where those people were arrested, when it occurred, what were they doing in the village forest, if they were taken to hospital or the police? Further investigation including discussions with TFCG officials, district councils and the police revealed that the story about two villagers being arrested and punished through skinning their feet and rules about entering the forest once a week were just rumors. However, these were very powerful rumors and widely circulated to the extent they seemed real to most participants in focus group discussions and semi-structured interviews.

In a focus group discussion of VNRC members, it was suprising to learn that even they (VNRC members) remain unclear and suspicious of REDD+ payment. One member observed that "…we cannot be cheated into entering Carl Peter's like contracts…" Carl Peters was a German explorer who tricked chiefs around Kilimanjaro area in northern Tanzania that facilitated consolidation of colonial powers during the 19th century.

When asked why not use appropriate procedures such as village meetings to channel their grievances and demand further clarification and changes to the rules, they commented that

"...those REDD+ officials are University educated people...do you think they will lack appealing responses to convince us into accepting interventions that will only benefit them?..." Eventually TFCG had to drop Rutamba village because of the hostilities that emerged out of unfounded fears.

This case further highlights that the democratic spaces created for deliberation and decision making were not working in that village. Official communications were not as effective as rumors and actual REDD+ payments and other benefits were not enough to offset powerful memories of harsh treatments by the state during colonial and post-colonial socialism eras. People have their own ways of communicating and because, for various reasons, they were not attending meetings, hence rumors and fears conveyed through informal channels became even more powerful.

CONCLUSION

Analyzing resistance against the recently introduced international program to reduce emissions from deforestation and forest degradation (REDD+) from a deliberative perspective provides two key insights for the theory and practice of participatory forest management, especially in situations that are characterized by the presence of multiple actors with often competing interests over forested landscapes.

First, my analysis suggests that it is difficult for a participatory process to satisfy all criteria for quality deliberation. Attendance in meetings is challenged by organization of meetings at times or seasons that make it difficult for residents to abandon their farm activities to attend meetings, and a history of unproductive meetings where nothing substantive is achieved in those meetings. Deliberation in meetings is affected by use of strict rules of deliberation, inadequate information/knowledge on the issues being discussed (the concept of REDD+ remains unclear to most residents), fear of retaliation from leaders incase one's participation is perceived as challenging the leaders, verbal threats, scorn and public ridicule. As a result the

democratic spaces created for making specific local REDD+ institutions remain alien to the residents. Low attendance in meeting and poor participation result in formation of legally legitimate but democratically illegitimate institutions.

Villagers then encounter the institutions made when they proceed with their daily lives. These include, being arrested for expanding farmlands into prohibited forest areas; obtaining forest products from prohibited forest areas among others. Villagers contend that they would not have complained if the forest institutions made had no negative effects on their everyday lives. Those attending village assembly meetings approved forest rules that would unfavorably affect others. For instance, since most residents from distant hamlets could attend meetings, then the forests closest to them were allocated for forest protection under REDD+. The forest institutions produced are therefore illegitimate both in their making (procedural legitimacy) and outcomes (substantive legitimacy).

Second, since villagers fail to use the created democratic spaces to challenge and reform the introduced reforms, they have opted for violent and non-violent resistance as alternative claim making mechanisms. These resistances range from creative appropriation of the introduced institutions to challenge the same institutions (Nambondo village), appropriation of discourses of democracy and participation in asserting their claims over forested landscapes (Kikole and Likawage villages) to use of violence (Rutamba village). Resistance is triggered by actually experienced effects of institutions (Nambondo village) and expected or imagined effects triggered by powerful social memories of past harsh state interventions (Likawage and Kikole) to fear of the unknown and widely circulate rumors (Rutamba village). My analysis further suggests that resistance is an important moment and space where formal and informal deliberation sites, actors and communication styles are forced to dialogue.

As the theory of deliberative democracy has expanded the sites of deliberation, suitable actors and communication styles, my analysis suggests that it is important for participatory forest management to embrace these developments for the aims of wider deliberation beyond formal

processes. However, further research is needed in establishing how different actors, communication styles and sites could all be combined instead of the spontaneous eruption of resistance as a way of bringing these together. This study also provides the needed empirical evidence on the feasibility of deliberative democracy particularly in locations and contexts not covered in the existing literature. Existing literature has analyzed deliberative democratic processes in urban settings and related to political-economic issues (with the exception of Shrimer et al, 2015). My study takes deliberative democracy to new locations (rural tropical developing countries) and new topics (making and applying forest institutions) and shows these nuances challenge the theory and practice deliberative democracy.

The uncritical adoption of deliberative democracy is failing to serve as an effective mechanism for negotiation and consensus building among diverse local actors with diverse interests. This is because deliberative democracy remains insensitive to pre-existing local systems of deliberation and decision-making. While these resistances are viewed as adversely affecting efficiency of current REDD+ institutions, they are very crucial in the making of durable institutions for attaining sustainability in complex social-ecological systems.

Chapter Four: Mismatched: Carbon Payment and Avoided Deforestation

Why REDD+ fail to avoid deforestation in miombo ecosystems and how to make it work?

INTRODUCTION

Proponents of the international program to reduce emissions from deforestation and forest degradation (REDD+) contend that the program promises affordable climate change mitigation options while conserving forest biodiversity and improving livelihoods of millions of forest residents in the tropics. The realization that halting and reversing deforestation and forest degradation in the tropics would reduce up to 20% of total global greenhouse gas emissions provided initial motivation behind REDD+. The basic assumption behind REDD+ is simple, carbon revenues from sale of verified emissions reduction credits would serve as adequate incentives to encourage adoption of sustainable forest management practices among forest owners, users and managers. Compared to emissions reduction options in the energy sector that require costly technological shifts, paying local forest residents in the tropics to avoid deforestation under REDD+ arrangements was deemed as an interim 'low-hanging fruit' while the world continues to ponder about feasibility of mitigation options in other sectors. Implementation of REDD+ through decentralized community based forest management (CBFM) gives local forest residents the rights and powers to make decisions about their forests and hence increase chances of achieving socially equitable outcomes. This article presents empirical analysis on whether REDD+ payments have promoted adoption of alternative practices that result in avoided deforestation.

Despite the potential positive outcomes, developing countries initially rejected avoided deforestation (AD later REDD+) as one of the climate change mitigation mechanisms under the

Kyoto Protocol for several reasons. Some argued that including AD under Kyoto Protocol mechanisms entails mandating developing countries to reduce emissions within their national boundaries; a move that contradicts Kyoto Protocol's principle of "common but differentiated responsibilities" which places the responsibility for reducing global greenhouse gas emissions with industrialized countries only. Others, particularly Brazilian and Indian delegations to the Conference of the Parties (COP) meetings of the UN Framework Convention on Climate Change, argued that avoiding tropical deforestation would have negative effects on the livelihoods and economies of concerned developing countries (Harvey et al., 2010; Phelps et al., 2010). Moreover, methodological disagreements in establishing baselines, proving additionality, preventing leakage and ensuring permanence of emissions reductions further complicated inclusion of AD during the first KP commitment period (Harvey et al., 2010). Instead the Bali Action Plan (Bali, 2007) provided a two year roadmap for developing a pilot international REDD+ program by 2009. The combination of several guidelines such as the Voluntary Carbon Standards (VCS) and the Climate, Community and Biodiversity Alliance (CCBA) standards were expected to improve the REDD+ design. Beginning 2009, REDD+ readiness projects started in nine tropical developing countries and within three years were expanded to over 30 countries becoming the largest global experimentation with payment for environmental services (PES). Pilot REDD+ funding has also fuelled rapid expansion of the community based forest management approach in many developing countries. As such, REDD+ has received unprecedented recognition as a triple-win strategy for reducing forest based emissions, conserving forest biodiversity and improving livelihoods of forest residents. Findings from ongoing readiness projects will inform future REDD+ designs and expansions.

REDD+ implementation in human dominated forest ecosystems uniquely combines emerging payment for environmental services (PES) and recently decentralized community based forest management (CBFM) arrangements. These two approaches have evolved concurrently but under different resource systems and in different geographical spaces. PES schemes have been extensively applied in managing water resources where clearly identifiable buyers and sellers are interacting for effective contractual agreements between the two parties. The context in

forest commons [existence of diverse local to global ecosystem services, service providers and service beneficiaries] has compounded the application of simple Coasean contracts. CBFM has emerged as one of the most ideal approaches in managing such complex social-ecological systems. REDD+ provides an opportunity of merging the two and in this article I discuss how this merge is unfolding.

In theory, PES and CBFM should fit into each other neatly. PES theory argues that where service providers receive adequate payments they would undertake actions that would ensure continued supply of the threatened ecosystem service under consideration (ref). CBFM theory argues that devolving forest management rights and powers to local people while promoting equitable sharing of conservation benefits would achieve intended conservation and livelihood outcomes efficiently, effectively and sustainably (ref). Theoretically combining the two is simple. If the primary approach is PES, then CBFM becomes a component of PES that provides the mechanism for organizing numerous local people in a defined social and geographical space for joint action to ensure continued supply of the service in question. And if the primary approach is CBFM, then PES becomes a component of CBFM that provides a mechanism for revenue generation that if equitably shared among diverse community members, then sustainable social and ecological outcomes will be attained. This paper focuses more on the PES side of REDD+, which is, analysing the types and amounts of revenues generated and their effects on creating local environmental subjects whose conducts are aligned to REDD+ ideals. REDD+ payments are expected to make avoided deforestation (maintaining standing forests) a more competitive land use compared to pre-existing land uses of shifting cultivation and wood extractions (Namirembe, 2007).

A burgeoning literature on REDD+ has emerged since 2009 and is slowly shifting from speculative analysis (see e.g. Redford and Adams, 2009) to more empirical analysis of REDD+ experiments around the world (see e.g. Mustalahti et al., 2012). This paper is one of a few that presents an empirical assessment of REDD+ using cases of REDD+ implementation in human dominated *miombo* ecosystems of eastern and southern Africa region. The article specifically

mentions *Miombo* ecosystems since particular features of a resource system and features of the resource users determine the emerging interactions between the two and influence the types of institutions formed and outcomes resulting from them (Kottak, 1999; Ostrom's 1990 IAD Framework). *Miombo* is a vernacular term adopted by ecologists to describe a peculiar type of ecosystem dominated by several plant species belonging to the genera *Brachystegia, Julbenardia* and *Isoberlinia* (Frost, 1996; TFCG, 2008). *Miombo* woodlands are characterized by wide-spaced slow growing tree species due to low soil fertility and very low annual precipitation amounts (ref). This type of ecosystem covers over two thirds of forested land in eastern and southern African region and is home to over 75 million people with an additional 25 million urban residents relying on them for wood and charcoal (Campbell, 2010). *Miombo* ecosystems provide habitat to largest wildlife populations and several hundred endemic plant and animal species. The co-existence of humans, farming, livestock, wildlife, hardwood timber species and other features accounts for *Miombo* ecosystems' high biological, ecological, economic and cultural values (FAO, 2004; Kanschik and Becker, 2001; Morris, 1970). In this article, I demonstrate that this complex ecosystem known by its dominant plant species, presents unique challenges in applying the REDD+ scheme.

In this article, I use empirical evidence from REDD+ implementation in six villages in Kilwa and Lindi Districts in south-eastern Tanzania to investigate the effect of carbon payments in transforming local people's cultural-ecological practices affecting forests. This paper is guided by three empirical questions. First, what are the different types and amounts of carbon payments that have been delivered to the participating communities and who has received these payments? Second, have carbon payments influenced behavioural transformations to align local people's practices to REDD+ goals? Third, under what conditions would carbon payments attain REDD+ imaginations in *miombo* woodland commons? The paper concludes by discussing the implications of these findings on the future of REDD+ in similar ecosystems in eastern and southern Africa region.

THEORETICAL FRAMING AND CASE DESCRIPTION

Payment for environmental or ecosystem services (PES) emerged as alternative financing mechanisms through contractual agreements between service providers and service buyers to ensure continued provisioning of important environmental services. Actions by one party result in loss of an important ecosystem service that is enjoyed by another party at a different geographical and/or social space. However, lack of incentives to encourage those whose actions threaten the environmental service prevent internalizing the environmental cost and instead creates an environmental externality on other users of the service in question. As such, ecosystem service payment arrangements are intended to incentivize service providers in undertaking actions that would ensure continued supply of the service in question without imposing an unfair burden on them. In the case of REDD+, actions by local forest residents in the tropics create a global environmental externality. To provide the theoretical framing and describe the study cases, I use several conditions of successful PES schemes as articulated by Wunder (2007) and Pagiola and Platais (2007) to cover five key requirements that I frame as questions: what is the ecosystem service to be paid for? Is the ecosystem service valuable and is its provision threatened? Are there willing buyers/financiers of the service? Who are the service providers and what actions do they take to supply the service? Who are the intermediaries facilitating exchanges between service providers and buyers?

What is the environmental service to be paid for?

PES arrangements require that the environmental service be valuable such that a payment mechanism would be feasible. The fact that deforestation and forest degradation in the tropics accounts for up to 20% of total global greenhouse gas emissions signifies the importance of avoiding deforestation for continued supply of this service. Reduction of forest emissions is crucial to dealing with the problem of increased atmospheric GHG concentrations to avoid already evident dangerous anthropogenic interference with the climate systems. Although REDD+ primarily concerns forest carbon, avoiding deforestation provides several secondary

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ecosystem services including carbon sequestration, forest biodiversity conservation, regulating micro-climates, providing wildlife habitats and water catchment function among others. Because REDD+ implementation in the two districts follows VCS and CCBA standards and benchmarks, such projects are expected to achieve net positive effects on the other ecosystem services. Failure to achieve net positive impacts on other environmental services would prevent project approval and hence emissions reductions attained will not be viable under existing carbon payments.

Is provision of the service threatened?

A second feature of PES is that, the continued provision of the ecosystem service should be threatened such that payments to service providers would make its provision feasible. Unchecked deforestation and forest degradation in the *miombo* ecosystems threaten continued supply of the emissions reductions service of forest ecosystems. Unprecedented deforestation has been observed over the last three decades fueled by the combination of several proximate processes and underlying forces. Proximate processes include slash-and-burn shifting crop farming systems, unsustainable legal and illegal selective logging, charcoal production, pole cutting, and forest clearances for other purposes. These proximate processes are influenced by several interacting underlying forces. Increased demand and prices for agricultural and forest products combined with improved transportation through roads and bridges construction have made it more profitable to clear forests than maintaining standing forests in Kilwa and Lindi, districts. Environmental factors such as extended drought periods and erratic rainfalls especially over the last ten years has resulted in increased dependence on forest resources for sustaining local livelihoods. At the same time, the transition from centralized to decentralized forest management saw weakening of forest institutions for regulating the various human actions affecting forests. Introduction of REDD+ and CBFM during 2009 articulated this context and argued that the projects would be feasible despite such a situation (MCDI and TFCG project documents). This paper empirically analyzes whether carbon payments are sufficient in encouraging avoided deforestation in such a context.

Who are the buyers of the named environmental service?

The third PES requirement is that, there should be willing buyers of the ecosystem service who will finance the actions of service providers for continued provision of the service. Once REDD+ becomes fully operational, industrialized countries and companies from those countries with emissions reductions mandates under Kyoto arrangements will serve as buyers of forest based emissions reductions credits. Ongoing REDD+ readiness projects were designed to trade their credits under voluntary carbon markets. However, most REDD+ projects around the world have not completed the process for trading emissions reductions credits in voluntary carbon markets. Six of nine REDD+ projects in Tanzania have delivered trial carbon payments through a simulated carbon market arrangement using funds from the Royal Norwegian Government. Recognizing the risks of relying on voluntary carbon markets in financing avoided deforestation in the future, REDD+ actors have actively been pushing for a fund-based approach instead of a market based approach. In a fund-based approach, willing financiers such as industrialized nations and firms are encouraged to contribute to a special international REDD+ fund and also through several bilateral and multilateral arrangements irrespective of the financier's historical, current or future GHG emissions. To ensure REDD+ acceptance at the local level, project implementers around the world have promised carbon payments to participating communities stressing that rich polluting industrialized countries are willing and ready to pay local forest residents for adopting sustainable forest management practices in the tropics.

Who are the service providers and what actions do they take to supply the service?

The fourth PES requirement is that, there should be clearly defined service providers undertaking actions that ensure continued supply of ecosystem service in question. Local forest residents in Kilwa and Lindi districts are serving as sellers of emissions reductions credits from avoided deforestation. They are expected to develop and apply specific forest governance institutions for attaining sustainable forest management goals. As community members are

diverse with often competing interests and abilities, the community based forest management (CBFM) arrangement provides a mechanism for organizing them for collective decision making regarding forest management and benefit sharing. In Tanzania REDD+ implementation through CBFM arrangements is guided by several pre-existing policies and legislations as well as new ones introduced since 2010. I summarize the important ones here. The Local Government Decentralization – Village Act (1982) provides legal recognition of a village as the lowest governance structure with clearly defined boundaries. This Act is important because it provides a working definition of what is a community in the sense of CBFM. The Village Land Act (No 5 of 1999) gives a village powers to manage land within its boundaries through a participatory village land use planning process. The Forest Policy (1998) and the Forest Act (2002) provide guidelines on the Participatory Forest Management program (PFM 2001) which guides CBFM implementation. The PFM program provides a step wise process for establishing CBFM projects on village lands. Blomley et al. (2010) in Wily (2000) argued that Tanzania's "unique blend of political history and bold legislative reforms has created one of the most advanced community forestry jurisdictions in Africa". In addition Tanzania has developed a National REDD+ Framework (2010) and National REDD+ Strategy (2012) which provide further guidance on REDD+ implementation in the country.

Specific actions by local forest residents who are organized in villages include formation of structures, institutions and plans for sustainable forest management. The most important structure is the village natural resource committee (VNRC) which is responsible for overall coordination of all REDD+/CBFM activities at the village level. The most important institutional process is the development and enforcement of legally binding village forest bylaws that stipulate what is allowed and disallowed within different land use categories in the village. Other facilitating structures include designating a village land forest reserve (VLFR) as the REDD+ project site in the village, adopting a village land use plan (VLUP) designating different land parcels to different uses, and the development and implementation of annual village forest management plans. In tandem, village natural resource committees (VNRCs) undertake other actions including promoting alternative livelihood strategies to reduce people's pressure

on forest resources, and raise local people's awareness on the various drivers of deforestation and forest degradation. This combination of incentives and penalties is expected to encourage adoption of sustainable forest management practices among villagers. While funding from the Norwegian Government covered the above establishment costs, future REDD+ revenues are expected to continue financing these actions. This article analyzes the feasibility of both current and expected future revenue streams to finance the above actions.

Who are the intermediaries who can assist in the payment exchanges between sellers and buyers?

The fifth PES requirement is that, there should be existence of capable and effective intermediaries and/or brokers who can assist in the payment exchanges between service providers and numerous buyers. This is especially important under REDD+ arrangements where the commodity being exchanged is intangible in the strict market sense and the market exchanges involve numerous service providers with limited financial and technical capacity on the one hand with buyers at a distant geographical location with limited knowledge of the service providers' actions, on the other hand. As such national and international non-governmental conservation and development organizations have served as intermediaries in the ongoing REDD+ readiness projects around the world. In the cases analyzed in this article, two national non-governmental conservation and development organizations have been working with local communities and district government authorities since 2010 to experiment REDD+ through CBFM arrangements. In Kilwa district, the organization is called the Mpingo Conservation and Development Initiative (MCDI) while in Lindi the organization is called the Tanzania Forest Conservation Group (TFCG). While the two REDD+ projects are located within similar *miombo* ecosystems with similar socio-economic conditions, the two organizations have adopted different payment mechanisms for their respective projects.

METHODOLOGY

The aim of this research was to empirically compare effects of REDD+ payments in encouraging avoided deforestation among local forest residents. I started this research in 2009 when REDD+ was just starting in Tanzania and around the world, I ensured selection of sites with the potential for delivering carbon payments within a few years to allow assessment of payment effects. Beginning 2009, the Royal Norwegian Government through its embassy in Dar es salaam, Tanzania and in collaboration with the Tanzanian government selected nine NGOs to coordinate implementation of nine different REDD+ readiness projects in the country under different forest types. Following document reviews, in-depth interviews, discussions and initial field visits I selected REDD+ projects in Lindi district in south-eastern Tanzania as study sites for this work. The Tanzania Forest Conservation Group (TFCG) coordinates REDD+ implementation that aims at maximizing revenues from sale of emissions reductions through spatial separation of land uses. That is, in designated project areas, no uses are allowed that would reduce forest carbon stocks, instead such uses as selective logging, crop farming and charcoal production are allowed elsewhere within the village outside the demarcated project zone. TFCG has introduced what I call direct payments whereby carbon revenues are shared equally among villagers irrespective of age, gender, socio-economic status, and dependence on forest resources. TFCG believes that since they have invested so much in raising awareness among locals on the importance of avoiding deforestation, the extra cash injected into the local economy will automatically be applied to pursue alternative livelihoods that have fewer effects on forests.

Since REDD+ involves actors with specific roles at the village to international level, I applied multiple methods in social and ecological sciences in gathering and analyzing data at different levels. In formulating specific questions at different levels, this work was guided by the three main empirical research questions explored in this paper. First, what are the different types and amounts of carbon payments that have been delivered to the participating communities and who has received these payments? Second, have carbon payments influenced behavioural transformations to align local people's practices to REDD+ goals? Third, under what conditions would carbon payments attain REDD+ imaginations in *miombo* woodland commons? Below I

summarize the questions and methods at each level. However, these methods were not applied sequentially, rather it involved several back and forth research activities at different levels over time. This allowed updating on earlier information and putting into dialogue observations emerging from multiple levels.

Research methods at the international level

At this level I wanted to understand progress in REDD+ negotiations especially with regard to fund-based versus market-based approaches in funding avoided deforestation projects and also review of REDD+ experiences in other countries. Main documents reviewed included outcomes from annual UNFCCC COP meetings, scientific publications and various grey literatures on REDD+ and voluntary carbon markets. I wanted to understand how ongoing REDD+ readiness projects are informing the thinking on the future of REDD+. In addition to extensive literature review, I conducted several interviews and discussions with international REDD+ actors met at international professional meetings where REDD+ issues were discussed. These interviews have informed the discussion and speculation of the future of REDD+ presented in this paper. These have included the climate change conference organized by the Western Indian Ocean Marine Science Association in Mauritius (March 2011), the Student Conference on Conservation Science (SCCS) at the University of Cambridge, UK, March 2013 and the US, International Society of Ecological Economists (USSEE) at the University of Vermont, Burlington, June 2013 and an invited presentation at the Center for International Forestry Research (CIFOR) in Bogor, Indonesia, August 2013.

Research methods at the national and project level

At this level I was particularly interested with the processes of developing several national level institutions for REDD+ implementation in Tanzania. These included the development of the National REDD+ framework which was finalized in 2010 and the National REDD+ Strategy which was finalized in 2012. In following these national level processes, I wanted to understand how REDD+ revenues will trickle down to the communities residing in project zones. I conducted

extensive document reviews, observation techniques and semi structured interviews with national level actors in the government, donor, academia and civil society sectors. Participant and non-participant observations included serving as a consultant and/or attending several national level meetings since December 2009. I have provided short-term consultancy services for the Norwegian Embassy in Dar es salaam (November 2009 – February 2010), TFCG (April 2010 – august 2010), TFCG (June 2011 – March 2012), TNRF (November 2011 – December 2012) and the national REDD+ Secretariat (April 2012 – August 2012). I have attended several national meetings on REDD+ including December 2009 REDD+ Launch workshop in Morogoro; April 2010 post Copenhagen Conference in Dar; February 2010 CCIAM in Dar; December 2010 CCIAM Launch Workshop; June 2010 TFCG MEC workshop; February 2012 CCIAM Scientific Conference in Dar; June 2012 REDD+ secretariat working retreat in Morogoro; and September 2012 REDD+ payments conference in Bagamoyo. These experiences enabled further access to REDD+ related documents and cemented relations necessary for conducting interviews and discussions. As a participant and/or non-participant observer, I listened to arguments made by different actors, observed exchanges between national actors and conducted opportunistic interviews or used such meetings to introduce myself and seek appointments for further interviews. I have conducted numerous interviews with the Tanzania Forest Conservation Group (TFCG), the Tanzanian National REDD+ Task Force members, National REDD+ secretariat team and the Royal Norwegian Embassy, among many others.

Research methods at the village level
At the village level, I specifically wanted to understand the types and amounts of carbon revenues reaching communities and whether those payments have attained their intended effects of transforming local cultural-ecological practices causing deforestation and forest degradation. To achieve this, I conducted extensive review of documents at the village level as cited in this paper, focus group discussions, semi-structured interviews and observation techniques. In each village, I conducted at least three focus group discussions. The first focus group discussion was conducted with all 25 members of politically elected village council. The second group comprised of the 12-16 members of the village natural resource committee

(VNRC). Discussion with VNRC members was also combined with members of other village level technical committees such as land use planning, benefiting sharing committees and carbon monitoring committees. The third group discussion was conducted with 25 randomly selected villagers ensuring balanced representation of men and women, young and elderly and from all sub-villages in each village. Each focus group discussion lasted 4-6 hours and a few were spread over two days. The aims of these group discussions were to make collective sense of various REDD+ implementation aspects in the village. I also conducted several oral historical and semi-structured interviews with different villagers. Interviews with charcoal producers and selective loggers aimed at estimating revenues from such activities, effects of REDD+ on those activities and effects of those activities on forests. Interviews and household surveys with farmers aimed at calculating revenues from crop farming at the household level, effects of REDD+ on farming activities and forests and other relevant information. In each village, 50 households were randomly sampled and checked to ensure proportional representation of male versus female headed households, poor versus non-poor households and near versus far households.

Carbon payments delivered to local communities
The methodology described in this section was developed and applied by the Tanzania Forest Conservation Group (TFCG). I summarize this methodology based on document reviews, field observations, interviews and discussions with the TFCG officer who developed this methodology – Theron Morgan-brown. This process was applied in each of the 17 villages in Lindi district in deriving the simulated amounts paid to each participating village. Key factors influencing the amount of carbon payments delivered to a village were forest size and historical deforestation rate for each village.

The first step in this methodology is calculating each village's individual baseline annual rate of deforestation over the past decade. This was accomplished mainly through analysis of remotely sensed images (LiDar) over a ten year period (2000-2010) following latest and appropriate Voluntary Carbon Standards (VCS) methodological guidelines. This annual rate of deforestation was then applied to the area that communities had elected to put into their village forest

reserve to calculate the potential future reductions in deforestation. The annual deforestation rate is conservative since they expect that land-use restrictions established with the land-use plan, labor intensive conservation agriculture interventions, and future expansions of village forest reserves (which some villages have proposed to do after realizing the implications for REDD) will reduce deforestation across the village and not just in the areas they initially decided to put in their forest reserves.

The second step is calculating the value of reduced deforestation rate in terms of carbon. To do this they multiplied the potential deforestation reductions (in hectares) by the average carbon stocks (per hectare) in above and below ground live biomass less the average post deforestation carbon stocks. They used standard forest inventories following Tanzania's National Forest Monitoring and Assessment (NAFORMA) guidelines in gathering forest data and used Mugasha and Chamshama (2002)'s methodology for estimating forest carbon in miombo ecosystems.

The third step was accounting for leakage, that is, ensuring that villagers are not paid for displaced deforestation within village boundaries. To help account for leakage and to reward communities that had put a greater percentage of their overall forest land into village forest reserves, they reduced each village's potential future reductions by the proportion of forest left outside of their village forest reserves.

The final step was the conversion of potential carbon savings to carbon dioxide CO_2 and then multiplied by $5 per ton to get the value of the trial payment. The price used was the prevailing price of carbon under the Chicago Climate Exchange (CCX) which is a voluntary carbon market.

However, overall community understanding of each of these steps was probably very low as evidenced by the fact that there were seldom any questions regarding the calculations (interview with Theron, December 2011). He further noted that, understanding will likely grow as the process is repeated. Communities did get the general gist though of the fact that putting

more forest under sustainable management meant greater potential future earnings and after the trial payments some villages proposed to expand their village forest reserves

Effects of carbon payments on people's practices

In assessing the effects of carbon payments in encouraging adoption of sustainable forest management practices among forest residents, I performed an opportunity cost analysis and evaluated the effects of various options that TFCG has undertaken to reduce the opportunity cost of avoided deforestation. I calculated and compared individual and household level revenues from four main land uses including carbon payments, crop farming, selective logging and charcoal production.

- Household revenues from carbon payments

I randomly sampled 50 households in Ruhoma village in Lindi district and gathered total household payments from REDD+ trial payments. As TFCG delivered individual payments, I added individual household members' payment to get total household payment and from that calculated average household payment for the village.

- Household revenues from farming activities

Since all households are farming households, I calculated average annual per hectare revenues from main crops in each district. While farmers cultivate several crops, I computed income from the main cash crop only as indicative of household income. As such, the income estimate is conservative because it does not account for all crops cultivated by the household. In Lindi the main cash crop is maize while in Kilwa is sesame. While cashewnut is another economically important cash crop especially in Lindi, I did not include this in my estimation because it does not result in deforestation and therefore REDD+ payments are not targeting cashew farmers.

- Revenues to individuals engaged in various wood extractions

TFCG, MCDI and community participants to the focus group discussions reported that selective logging and charcoal production were the leading wood extractions in causing undesirable

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forest changes. As such I estimated revenues generating by individuals engaging in these activities. Since most wood extractions in the area are unregulated, selection of interviewees took a snow-ball approach whereby each respondent would suggest names of other villagers involved in the activities for further interviews. In most times, I relied on being introduced to these villagers through villagers that I had already established trusting relations with. This enabled getting genuine responses instead of strategic responses. Whenever opportunity allowed, I combined my interviews with visits and observations as these practices were being performed. With the informants' permission, I took pictures of woods and charcoal bags and other signs of these practices in the villages. The aim of these interviews was to estimate monthly income generated from these activities. I recorded information on reported amounts of woods and charcoal produced, prevailing market prices, monthly/seasonal/annual revenues generated, costs incurred, and trends in these aspects. We also discussed about the implications of REDD+ on these practices.

RESULTS

To achieve the intended effect, REDD+ payments need to make avoided deforestation a competitive land use against traditional land uses of shifting cultivation and various wood extractions (charcoal, logging and pole-cutting). Therefore, in this section I present and compare revenue streams from the different land uses. This section calculates and compares revenues from carbon payment, crop farming, charcoal production and selective logging. While in both districts there are several food and cash crops cultivated by local farmers, I calculate and compare revenues from sesame in Kilwa and from maize farming in Lindi. This is because the two crops result in more deforestation than other crops taking into account proportion of farmers cultivating the crop, individual farm sizes, and duration taken before spatially relocating the farm. While for other crops such as sorghum and cow peas it takes up to fifteen years to relocate the farm, on average it takes only two years before a farmer decides to relocate a maize or sesame farm.

Are carbon payments/benefits sufficient to encourage avoided deforestation practices among local residents?

Comparison between carbon payments at the household and household income generated from maize and sesame farming reveal that the latter yields significantly more revenues to the household. In this section I explain and compare direct and indirect carbon/REDD+ benefits to the community against income from maize and sesame farming.

TFCG's REDD+ project supported by the Norwegian Government included a budget for testing out a simulated carbon market. In that arrangement, TFCG would assist participating communities in undertaking all project activities and then deliver carbon revenues simulating a real voluntary carbon market. Their aims were two folds. First they wanted to reward communities for having completed the process of establishing village's forest reserves, management plans, and forest bylaws. Second they also wanted to test out the mechanism for handling REDD revenue distribution arrangements that each village had established in their bylaws. Furthermore, as each community had very different population and deforestation dynamics, they wanted to make trial payments that would bear some resemblance (though conservative) to what the particular village could earn from real REDD, so as not to build unrealistic expectations and to more closely connect the payments with each village's opportunity costs (which were assumed to be directly related to historical deforestation rates).

I compare carbon revenues and revenues from maize farming at the household level. Maize is the main food and cash crop in Lindi district where 100% of households (n=47) reported cultivating this crop. While sesame and cashews are also important cash crops in the district, I do not include sesame because only 45% of respondents reported cultivating that crop. I also exclude cashew revenues because cashew is a perennial crop and it does not affect forests the same way as shifting cultivation for maize and sesame.

Under prevailing carbon prices of $5 per ton and average 123 tons of carbon per hectare in miombo ecosystems (TFCG, 2012), sale of emissions reductions credits yields $ 600 per hectare per year while maize farming yields $ 300 per hectare per year. While the total per hectare revenue from maize farming goes to the household involved in that activity, not all of the $600 goes to a household. Instead, the distribution of carbon payments is categorised into direct and indirect benefits. Direct benefits include individual payments for each member of the village. In some villages like Mkanga Moja village all villagers received equal payments regardless of age and gender. In other villages, like Ruhoma village, children under 18 years and elderly persons above 65 received reduced payments compared to those in the age bracket 19-64 years. This was decided through a village assembly where villagers argued that the productive labor force (19064 years olds) need more incentives as they are the one actively involved in forest management.

Most villagers like the equal carbon payments to all village members. Amina Said, a villager from Mkanga Moja village observed that,

> "we like this approach because we all get equal payments unlike other schemes where villager leaders and members of the village natural resources committee have received payments while the rest of the village did not receive any payments. This is the best approach." Observed Amina in Mkanga moja.

Accounting for village forest size, historical rate of deforestation and total village population, individual payments ranged from $5 per person in Mkanga Moja village to $25 per person in Muungano village. Since mean household size is about 4 persons in each village, therefore household revenues from sale of emissions reductions ranged from $20 in Mkanga Moja village to $100 in Muungano village. On the other hand, after accounting for the average household farm size of 1.5 hectares then average household income from maize becomes $ 450 per year. Clearly maize farming yields significantly higher income compared to carbon payments.

In Kilwa district, MCDI [the organization facilitating REDD+ implementation] combines revenues from sale of certified selectively logged timber and emissions reductions credits on the same forest. Their argument is that selective logging yields higher revenues than carbon payments and therefore in order to achieve sustainable forest management, it makes sense to strike a balance between the amount of carbon stocks stored in forests and the amount taken in terms of sustainable logging practices. In this arrangement, the participating village retains 100% of revenues from certified selective logging while MCDI uses all carbon revenues to establish a REDD+ project in neighbouring village. Since sesame is the main cash crop blamed for undesirable forest changes in Kilwa, I compare per hectare revenues from sesame farming and selective logging. The same comparison at the household level cannot be made because logging revenues are injected at the village level for community level social and development projects and not at the individual or household level as in Lindi district. However, average household income from sesame farming is $1000 per hectare per year. Most households cultivate between 2-4 hectares with a few individuals cultivating up to 8 hectares.

In each village a few villagers are also involved in charcoal production and logging (legal as well as illegal). Although charcoal production and selective logging is practices by a few villagers, these practices were ranked as second and third main drivers of deforestation and forest degradation by villagers, NGO representatives and government officials. In some villages in both districts up to 90% of adult male and female villagers engage in charcoal production and sale at the beginning of the farming season (February – March) when food reserves from previous harvest are depleted and the crops in the field are not ready for consumption. REDD+ interventions targeted charcoal producers in both district mainly through prohibiting their activities and providing forest conservation awareness knowledge. One charcoal producer from Mkanga Moja village argued that *"…we get about $5 /year [per individual] but you can make up to $50 a month from charcoal…" (December 2011 key informant interviews).* Similarly selective logging generates higher income to the loggers compared to direct and indirect carbon payments. Interviews with seven loggers from two villages revealed that on average they produce about 20 pieces of wood (2 by 10 feet) per month and make about $300 per month.

However, selective logging is also seasonal with most loggers engaging in this practice during the dry season after crop harvests. Also, all interviewed loggers concurrently engage in sesame and/or maize cultivation. Therefore, their income is the total of revenues from selective logging and farm income making even higher compared to the carbon payments.

It is clear that the direct carbon payments are inadequate in making avoided deforestation a competitive land use compared to revenues generated from traditional land uses. With this realization, TFCG and MCDI included a variety of indirect carbon benefits to the communities.

Using funding from the Norwegian Government, TFCG has delivered other incentives to encourage target local people to adopt alternative livelihood strategies that would reduce effects on forests. These have included training and support on group poultry keeping projects, beekeeping projects and no-till conservation agriculture. However all these projects have recorded minimal success.

The poultry project in Ruhoma village collapsed after all the chicks provided by TFCG to villagers died from a chicken flu disease. These were improved chick-breeds different from the local chicken that natives keep. As such they were less immune to the disease. At the same, not many villagers liked this project. During a repeat focus group discussion in Ruhoma Village (June 2013), one participant observed that:

> "…This project was a joke from the start. First the TFCG Agriculture officer made us construct these complicated chicken huts that I have never seen in my entire life. We felt it was a waste of time…

Another participant added

> …he brought the chicks and we asked whether we would be assisted in getting feeds and vaccines. He told us that group members have to make donations and buy chicken feeds and vaccinations. He also stressed that chicken huts had to be clean to prevent disease outbreak. It was a huge burden on us.

Yet another one retorted …

...We are not used to sweeping chicken huts/coops. Our traditional chicken huts are
built on stilts and chicken droppings go through the spaces between wooden floors and
fall on the ground outside the chicken hut. But these ones needed regular cleaning.

To which the first participant added

...In my group, other members stopped donating and cleaning the hut when it was their
turn. Because the hut was built in my compound, I assumed the responsibility and
reported to the TFCG agricultural officer. He told me to continue and later I would sell
all the chickens as mine alone. But the disease came and all the chicks died about a
month since we got them. I regret for the time wasted in building the huts and caring
for them. I don't think we would agree to such projects in the future..."

Beekeeping story

TFCG introduced a beekeeping project to five groups of seven members of mixed gender in
Ruhoma village to further encourage adoption of forest friendly land uses. However, this
project did not succeed as well for a number of reasons. Some villagers observed that they
were not interested in the project because it was new to them. An elderly man sarcastically
commented that "...how can a mighty human rely on something that a tiny insect like bee
makes?...". These reactions indicates beekeeping projects are not part of their culture such that
their adoption would require continued demonstration of their benefits.

No-till conservation agriculture

Through its comprehensive agricultural development strategy, TFCG introduced no-till
conservation agriculture as an alternative farming practice that has minimal impact on forests.
The argument behind no-till conservation agriculture is that it will significantly reduce the weed
encroachment problem which is the main reason why most farmers relocate their farms every
two years. Through an agricultural extension officer, TFCG formed farm classes in ten of the 17
villages and worked on demonstration plots. The success in terms of crop yield and less weed
encroachment was vivid. However, initially most villagers did not adopt this farming practice

giving different reasons. Some argued that it takes too much time preparing the farm and planting in straight lines. One Somoe Makadara commented that

> "…it takes about 4-5 days to work on a piece of land that would usually take one day using traditional farming systems…that time wasted in making the lines is time that I could have spent on social activities in my community (kupitwa na umbea)…"

Bi Kidawa Mgeni strongly argued that

> "…in our village we have animal vermins as early as the planting season. Immediately after you saw the seeds, they dig them up and eat them. Traditionally we plant randomly with no particular number of seeds per hole to confuse and saturate the vermins such as rats, velvet monkeys and guineafowls. However, if you plant 3-4 maize seeds per hole and in a straight line, don't you think you would have simplified it for them to dig up the seeds? And once they dig up and eat the seeds, where am I going to get more seeds to replant?..."

As a result, only about one in five households had adopted no-till conservation agriculture farming systems after one year of demonstration in June 2012. However, by July 2014 in Mkanga Moja, over 80% of villagers reported adopting that strategy because it has helped them generate higher revenues. No-till conservation agriculture is the only intervention that so far has the potential of encouraging adoption of farming practices that have less impacts on forests in Lindi district.

DISCUSSION

This paper aimed to empirically investigate on three questions. First, what are the different types and amounts of carbon payments that have been delivered to the participating communities and who has received these payments? Second, have carbon payments influenced behavioural transformations to align local people's practices to REDD+ goals? Third, under what conditions would carbon payments attain REDD+ imaginations in *miombo* woodland commons?

Results reveal that REDD+ project interventions have delivered a variety of direct and indirect benefits to the local forest residents. Some benefits are injected at the household level and some are injected at the community level. The MCDI REDD+ project in Kilwa is innovative in that it aims to maximize revenues by combining two otherwise competing forest uses: FSC certified selective logging and revenues from carbon credits. This approach has proven to yield significantly higher per hectare revenues to participating communities compared to situations where REDD+ projects completely prohibit logging practices. However, MCDI's mechanism for delivering carbon revenues by injecting them at the community level achieves minimal impact since those benefits hardly trickle down to he households and individuals whose actions adversely affect forests.

The TFCG REDD+ project in Lindi District is innovative in two ways. First the project has applied a simulated carbon market to deliver payments to individuals in addition to a variety of alternative income generating activities. Local residents like the individual carbon payments more than community level development support. Second, the introduction of no-till conservation agriculture aimed at striking a balance between increased agricultural productivity while reducing the effects of slash-and-burn shifting cultivation on forests.

Despite innovation in these two arrangements, carbon payments are not achieving intended effects for a number of reasons. First the amounts delivered remain significantly lower compared to income generated from traditional land uses such as sesame and maize farming. In a hypothetical scenario, increasing carbon prices from $5 to $20 per ton would have generated sufficient revenues for avoided deforestation to be a competitive land use in miombo ecosystems. However, regulated and voluntary carbon markets remain in their infancy and prices have stagnated since 2008. At the same time, prices for alternative commodities such as farm crops, charcoal and timber have been steadily increasing during the same time making it more profitable to clear forests. For instance, sesame prices have increased from about $0.50 in 2010 to $1.5 per kilo in 2013/14.

Second the payment arrangements are not achieving intended effects because they are not injected at the appropriate unit and time where decisions affecting forests are made. MCDI and TFCG's approaches to deliver community development support projects such as building/rehabilitating classrooms, village offices,health centers, and water sources have positively improved the provision of services at the community level. However, these interventions have indirect effects on people's practices affecting forests. Babu Ali from Kikole village stressed that "…they prevent us from clearing forests to cultivate sesame, instead they build classrooms, but we do not eat those classrooms…do you?…" Furthermore TFCG's individual carbon payment arrangement while passes equity scrutiny, it assumes that all individuals have the same impacts on forests and hence equal individual payments. This approach makes some villagers very happy particularly those who are less dependent on forests and some not so happy particularly those whose survival depends more on forests. Those who engage in charcoal production and selective logging are particularly affected and the payments remain inadequate in encouraging them to adopt sustainable practices.

Moreover, initially TFCG delivered carbon payments during the dry season (July – December) when logistically it was easier to organize communities as they were finishing farming activities and also the roads were in better condition. However, my observation and discussion with carbon payments recipients revealed that most of the money was allocated to non-essential uses such as entertainment because they already had money from sale of sesame and maize. As a result, the meagre carbon payments received were not helping in encouraging adoption of sustainable forest management practices among farmers. Following this observation, I suggested to TFCG that they should try to deliver the payments during January-March. During January-March, farmers would engage in casual labor and charcoal production to generate income and supplement depleting food reserves. Coincidentally, January-March is the beginning of the farming season when crops have germinated and need weeding. As a result, farmers spend much less time on their farms and instead engage in casual labor and charcoal production. Consequently weed infestation affects overall crop yield and hence food produced remains insufficient to last until the next farming season. From interviews conducted during

July 2013 most villagers (87%, n=43) who received payments during January-March of 2013 allocated the funds to buying food instead of non-essential uses reported during November 2012. Having food in the house enabled them to spend more time tending their farms and 80% of households interviewed reported significant increase in food production comparing 2012 and 2013. Therefore, despite the carbon payments being inadequate, they have the potential of achieving intended effects if injected at the appropriate spatial unit (targeting individuals whose actions affects forests more) and at the appropriate timing (such as the January-March when charcoal production to supplement depleting food reserves is at its peak).

CONCLUSION

In this paper I argue that application of REDD+ payments for the aim of encouraging adoption of sustainable forest management practices in *miombo* ecosystems is not feasible for two main reasons. First the payment amounts remain inadequate in making avoided deforestation a competitive land use against traditional land uses. Second the payments are not injected at the appropriate spatial and temporal scales where decisions affecting forests are made.

The success of REDD+ in human dominated *miombo* ecosystems of southern and eastern Africa is dependent not only on how much the payments are going to be but also on how the payments are delivered for effective transformation of local cultural-ecological practices of slash-and-burn shifting cultivation and charcoal production.

Chapter Five: Conclusion

This dissertation was set out to empirically examine tropical forest governance in a carbon-challenged world and has identified the motivation, design, implementation dynamics and outcomes of emerging and complex forest management arrangements that often involve competing local to global actors, values and powers. Using the case of the recently introduced international program to reduce emissions from deforestation and forest degradation (REDD+) in Tanzania, the study has also sought out to know the composition of actors, their roles, responsibilities, powers and regulatory institutions introduced to achieve triple goals of climate change mitigation, livelihood improvement and sustainable forest management in the tropics, simultaneously. The study was motivated by the coexistence of both deforestation and emergence of innovative management arrangements over the last four decades. The general theoretical literature on emerging complex forest governance arrangements involving multiple state and non-state actors with different interests and powers guided by multiple climate-conservation-development narratives and specifically in the context of Africa is inconclusive in several important questions. Most importantly, the existing literature on forest governance has paid little attention in understanding the design, implementation and outcomes of emerging forest institutions from the perspectives of the people living in and around forests in the tropics. Using the case of REDD+ implementation at the community level in Tanzania and focusing on local people's articulation, negotiation and appropriation of introduced complex forest governance landscapes, this dissertation sought to answer three questions:

1. How do local people and their actions (and inactions) affect forests under the context of recently decentralized community based forest management arrangements?

2. Does the adoption of democratic and participatory processes for decision-making result in making fair and acceptable forest institutions?

3. Has the introduction of innovative carbon payment succeeded in avoiding deforestation in miombo ecosystems?

Summary of empirical findings

The main empirical findings are summarized within specific empirical chapters two, three and four corresponding to the three main research questions presented above. This section synthesizes the empirical findings to answer the study's three research questions.

1. *How do local people and their actions (and inactions) affect forests under the context of recently decentralized community based forest management arrangements?*

People-forest interactions in Kilwa district have dramatically changed and emerging interactions are causing undesirable forest changes. Farm sizes have expanded fueled by faster techniques of forest clearance concurrent with increase in number of people cultivating crops such as sesame that require constant spatial relocation of farm plots and targeting matured forests resulting in rapid forest clearance. These changes in turn are influenced by increased market accessibility following roads and bridges construction over the Rufiji river delta, growing demands for sesame in oil factories in nearby big cities and rapid increase in agricultural and forest products. Local people's use of emerging technologies of mobility such as motorcycles speed up transportation of people and forest and agricultural products while the use of cellphones readily connects local residents to markets and market information.

Moreover, in practices, contemporary decentralized forest institutions are producing harsh state-like effects comparable to effects produced the colonial and socialism states. As a result, local people have demonstrated creative abilities in using both technologies of mobility and

contemporary discourses of forest management in performing otherwise banned cultural ecological practices. This detailed ethnographic description of how shifting cultivation and wood extractions result in deforestation and forest degradation strengthens causal relations between proximate and underlying drivers of forest change and provides explanations of forest loss as analyzed by others through forest assessments and analysis of remotely sensed images (see e.g. MCDI's forest assessment reports).

2. *Does the adoption of democratic and participatory processes for decision-making result in making fair and acceptable forest institutions?*

This question focused on analyzing the paradoxical eruption of violent and non-violent resistance towards the recently introduced international program to reduce emissions from deforestation and forest degradation (REDD+). Analyzing resistance against REDD+ from a deliberative perspective provides two key insights. First, my analysis suggests that the introduced democratic spaces are not as democratic as intended because there are several factors that limit effective attendance and participation in democratic spaces by local residents. Attendance in meetings is constrained by organization of meetings at times or seasons that make it difficult for residents to abandon their farm activities to attend meetings, and a history of unproductive past meetings further discourage residents from attending meetings. Deliberation in meetings is affected by use of strict rules of deliberation, inadequate information and knowledge on the issues being discussed (the concept of REDD+ remains unclear to most residents), fear of retaliation from leaders incase one's participation is perceived as challenging the leaders, verbal threats, scorn and public ridicule. As a result the democratic spaces created for making specific local REDD+ institutions remain alien to the residents. This poor attendance and participation result in formation of legally legitimate but democratically illegitimate and unfair forest institutions.

Second, since villagers fail to use the created democratic spaces to challenge and reform the introduced institutions, they have opted for violent and non-violent resistance as alternative

claim making mechanisms. These resistances range from creative appropriation of the introduced institutions to challenge the same institutions, appropriation of discourses of democracy and participation in asserting their claims over forested landscapes to use of violence. Resistance is triggered by both actually experienced effects of introduced institutions and expected or imagined effects triggered by powerful social memories of past harsh state interventions. My analysis further suggests that resistance is an important moment and space where formal and informal deliberation sites, actors and communication styles are forced to dialogue.

3. *Has the introduction of innovative carbon payment succeeded in avoiding deforestation in miombo ecosystems?*

In human dominated miombo ecosystems, carbon payments from REDD+ projects remain significantly lower than revenues from traditional land uses such as crop farming and logging for timber. However, this study suggests that the small carbon payments have a greater chance of encouraging sustainable forest management practices if they are aligned to seasonality and spatial scale at which decisions affecting forests are made.

Moreover, while most other indirect benefit schemes delivered to the community have also failed to discourage unsustainable forest clearances in the region, the no-till conservation agriculture has the potential of achieving the intended effects. The failed interventions included awareness raising activities on the importance of forest management and several alternative income generating activities such as beekeeping, poultry and vegetable gardening projects. Households that adopted no-till conservation agriculture reported significant increases in agricultural yields.

Theoretical implication

Broadly, this dissertation was set to empirically explore the REDD+ program which is based on the premise that devolving forest management rights and powers to the people living in and around forests while promoting equitable sharing of forest conservation costs and benefits will heal historical people-state enmity and achieve climate, livelihood and conservation goals sustainably. While this theory still holds, this dissertation has demonstrated that such simplistic assumptions are not always working. This dissertation makes several contributions to this theory. First, people-forest relations are not at a balance resulting into unsustainable outcomes. Second, rights and powers devolution is a good starting point but not the holy grail in achieving community participation in forest management. In the context of tropical developing countries where current people-forest relations are a result of decades of harsh state interventions on people-forest relations, it is important to incorporate historical factors in refining the theory of community based forest management. Third, in the context of human-dominated forest ecosystems, carbon payments remain insignificant in promoting positive behavioral changes among forest residents. This study has also contributed to methodological development in jointly investigating innovative payment for environmental services and recently decentralized community based forest management aimed at attaining triple conservation, community and climate goals.

As the theory of deliberative democracy has expanded the sites of deliberation, suitable actors and communication styles, my analysis suggests that it is important for participatory forest management to embrace these developments for the aims of wider deliberation beyond formal processes. However, further research is needed in establishing how different actors, communication styles and sites could all be combined instead of the spontaneous eruption of resistance as a way of bringing these together. This study also provides the needed empirical evidence on the feasibility of deliberative democracy particularly in locations and contexts not covered in the existing literature. Existing literature has analyzed deliberative democratic processes in urban settings and related to political-economic issues (with the exception of

Shrimer et al, 2015). My study takes deliberative democracy to new locations (rural tropical developing countries) and new topics (making and applying forest institutions) and shows these nuances challenge the theory and practice deliberative democracy.

The uncritical adoption of deliberative democracy is failing to serve as an effective mechanism for negotiation and consensus building among diverse local actors with diverse interests. This is because deliberative democracy remains insensitive to pre-existing local systems of deliberation and decision-making. While these resistances are viewed as adversely affecting efficiency of current REDD+ institutions, they are very crucial in the making of durable institutions for attaining sustainability in complex social-ecological systems.

Policy implication

On paper, REDD+ designs at the local, national and international levels are full of progressive strategies that aim at balancing between often competing conservation and livelihood goals and now with climate change goals added. However, in practice, this study makes several suggestions for improved forest governance in a carbon challenged world. First is the need to adopt landscape level approaches that combines forest conservation and livelihood improvement goals such as agricultural development or food production systems. Second is the need to practically embrace people living in and around forests as capable actors and partners in sustainable forest management projects. Currently, such projects are still dominated by simple apolitical and ahistorical narratives that treat local forest residents as threats to conservation and that delivery of different benefits will easily transform them into positive forest stewards. Practitioners need to realize that it has taken over a hundred years of alternating episodes of advancing and retreating active and harsh state intervention to produce the behaviors observed among local forest residents in contemporary times.

Limitation of the study

Despite the contributions made from this study, there are several limitations that future studies can pay attention to. First, focusing at the local level leaves a lot of desire to understand what happens at the national and international levels. Given the logistical challenges of paying adequate attention to all REDD+ processes at the local, national and international level, this study decided to focus on the local level – an aspect that has received the least attention.

Assessment of forest changes and drivers of forest change did not use data on actual forest cover and condition changes due to lack of comparable historical data and lack of spatial analytics by the researcher. My plan was to collaborate with a spatial analytics expert, but the person identified accepted a job offer right when this study was beginning. This reason, combined with a limited budget for undertaking meaningful spatial analytics resulted in the application of ethnographic field data to understand mostly the human side of forest change: an area that has also received limited attention in the tropics.

Historical data on miombo-ecosystems of south-eastern Tanzania and most areas in eastern and southern Africa is affected by low attention paid to these ecosystems by researchers in the past. This was a result of several interacting factors including logistical challenges in accessing miombo-ecosystems. Accessibility to miombo ecosystems is prevented by lack of all season roads since most of the areas have been preserved for the rich wildlife values as national parks and game reserves since the colonial period.

Furthermore, analysis of Implementation aspects in this study did not pay attention to conventional project evaluation criteria of appropriateness, effectiveness, efficiency, sustainability, gender balance, cross-cutting issues, etc.

Assessment of outcomes did not compare actual changes in carbon stocks, livelihood and forest conditions. This is partly due to lack of comparable historical data on these parameters and also due to the short duration (5 years) for assessing changes in these conditions. While there is evident of changes in forest governance and reduced unsustainable forest utilization (e.g. assessed through evidence of forest disturbance), changes in other variables such as carbon stocks, tree density per unit area, tree sizes and species abundance and richness requires longer time given slow growth in miombo ecosystems. As a result, the data gathered from the forest inventories in this study during summer of 2011 and 2014 will be used as references for assessment of forest changes in the future.

Conclusion

This dissertation makes several contributions to the study of tropical forest governance in a carbon challenged. First it articulates emerging and complex forest governance landscape following the realization that tropical forests play a crucial in climate change mitigation and adaptation. Second it resurrects and provides several key insights regarding the resurgent interest to regulate local cultural-ecological practices of shifting cultivation and wood extraction. Third, this dissertation provides a critical empirical interrogation on the adoption of deliberative democracy in reconciling between multiple competing forest values in the tropics. Finally, the dissertation provides timely methodological and substantive contributions on the concurrent assessment of climate, community and conservation outcomes from contemporary integrated conservation-development programs.

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ⁱ Shifting in this sense does not imply leading nomadic lifestyles; instead the homestead remains sedentary while the cultivated plot is constantly changed over time and space. Several social-environmental factors produced and maintained this practice including low levels of soil nutrients, problem animals, and weed encroachment. Initially, burning of vegetation in preparing a farming plot deposits nutrients from burned plant materials. Over time, opportunistic weed encroaches into the farm while nutrients deposited from vegetation burning deplete. Weeds are a serious problem affecting agricultural yield. Weeds are shade intolerant and hence following forest clearance weeds would encroach into open farmlands. Miobo ecosystems provides habitat to largest populations of diverse wild animals. To deal with problem animals such as bush pigs and elephants, farmers have evolved what I call quasi-communal farming arrangement whereby they would have individual farm plots next to each other for collective protection against wild animals and also to saturating the vermins (sharing/distributing the risk of crop raid). However, when problem animals become too much to deal with, farmers decide to relocate their farmlands elsewhere. These spatial-temporal shifting in farming, vegetation regeneration, vermin and nutrient deposition is a common cultural-ecological knowledge among many smallholder farmers in eastern and southern Africa