

Article

Tenure Issues in REDD+ Pilot Project Sites in Tanzania

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Abstract: REDD+ has been proposed as a viable option for addressing climate change in the near term, and at relatively low cost. There is a broad consensus that clearly defined tenure rights are important for the implementation and success of REDD+, both to manage forests effectively and to protect local communities' livelihoods. We use primary data from 23 villages in six REDD+ pilot sites in Tanzania to identify causes of deforestation and forest degradation, and tenure rights issues, at the village level prior to project implementation. Further, interviews with project proponents and examination of project documents yields insights into how the proponents plan to address tenure issues. Most villages perceive their tenure as secure and have exclusion rights, while collective action challenges are prevalent in villages experiencing deforestation and forest degradation. These findings suggest that the main tenure issues are related to internal institutional arrangements. While we find that tenure is high on the agenda for all the project proponents, they are mainly focusing on formalization and securing tenure rights from state to community level. Though we do find this to be a precondition for reducing deforestation and degradation, some of their focus should be shifted to strengthening village institutions and enhancing internal compliance.

Keywords: community forestry; property rights; deforestation; forest degradation; tenure; Tanzania

1. Introduction

Reducing emissions from deforestation and forest degradation and enhancing forest carbon stocks in developing countries (REDD+) has been recognized as a viable option for addressing climate change early and at relatively low cost [1]. REDD+ can potentially facilitate large reductions in greenhouse gas emission by compensating forest owners and users for lost forest income and livelihood opportunities [2]. Tanzania is a UN-REDD Programme Partner Country, and also a member of World Bank's Forest Carbon Partnership Facility (FCPF) along with 12 other African countries [3]. Tanzania signed a bi-lateral agreement with Norway in 2008 that provides funding (NOK 500 million) for REDD+ readiness activities, pilot projects and policy reforms. As of 2013, there are nine national and international NGOs implementing local REDD+ pilot projects in the country [4].

A broad consensus exists among national governments, donor organizations, third party certifiers, and civil society on the importance of clarifying tenure prior to the implementation of REDD+. The Stern Review [1] states that clearly defined property rights to forest land at the national level are key for effective forest management. The Climate, Community and Biodiversity Alliance (CCBA) requires that tenure is given early attention in their third party certification standards for REDD+ projects, as part of the implementation of REDD+ safeguards [5]. Beyond these standards, there is a growing body of literature on the general importance of secure tenure rights for effective forest management [6] and REDD+ implementation in particular [1,7]. Secure tenure rights can contribute to the success of REDD+ in several ways. A core idea of REDD+ is conditional payments to forest carbon rights holders. This requires that the rights-holders are rewarded for maintaining or enhancing the carbon sequestration and that the right holders can be held accountable, in case they fail to fulfill their obligation. Further, even without performance-based payments, legitimate and clear rights and responsibilities are needed to avoid a land rush. Finally, pre-existing access and management rights need to be protected to maintain or enhance local livelihoods [8].

Clarification of user rights and responsibilities and greater participation by local forest users in forest management have been recognized among the important factors for more effective forest governance [9]. Decentralization of tenure rights from the state to village level has been an ongoing process in Tanzania since the early 1990s as a means to achieve sustainable forest management and development, but the process has been slow. By 2008, approximately 10% of the forest area was registered and reserved or managed by communities, while 90% of the forest estate in Tanzania was both owned and managed by the government [10]. A key element of the Tanzanian national REDD+ strategy is to speed up this process and strengthen community rights and local management of forest resources [11]. Thus, land tenure as it relates to REDD+ is particularly salient in Tanzania, where tenure reforms and REDD+ implementation will move in tandem over the next few years.

While attention to decentralization and clarifying formal boundaries and statutory tenure rights are necessary for the success of REDD+, there is also a need to assess whether the existing institutional

arrangements in the villages are sufficient to overcome collective action challenges. Secure tenure rights for the users of natural resources provide incentives to invest in conservation [12], but to what extent this is achieved depends on how they organize to ensure a high level of compliance with resource use rules to avoid maximizing individual gains at the expense of the group [13,14].

This paper addresses three research questions: (1) what are the drivers of deforestation and forest degradation in REDD+ pilot project villages; (2) what are the land tenure issues identified by the villagers; and (3) what are the land tenure issues identified by the proponents and how are they planning to address them? The unit of analysis is the village, and we use data from key informant interviews and focus group interviews held in 23 villages and from six pilot sites in Tanzania prior to REDD+ project implementation, as well as interviews with the NGOs implementing the pilot projects (referred to as the proponents) and project documents. We make no attempt to address the full range of factors determining effectiveness, nor do we address questions of efficiency (costs) and social equity.

The article is organized as follows: Section 2 provides background information on the importance of tenure for the success of REDD+ and how tenure has an impact on community forests; Section 3 presents the study area and methods of data collection and analysis; Section 4 presents the findings of the empirical analysis, followed by discussion and conclusions in Sections 5 and 6.

2. Why Tenure Matters for the Level of Deforestation and Forest Degradation

2.1. Definition and Concepts

Kiser and Ostrom [15] identify three categories of variables that influence how decisions regarding management of natural resources are made: (1) the institutions and rules used by the community to organize resource use; (2) attributes of the goods the natural resource provides; and (3) characteristics of the community.

Institutions and rules include both property and tenure rights. *Property rights* are the “authority to undertake particular actions related to a specific domain” ([16,17], p. 250). Within this context, the word *property* is not restricted to an area of land, but to the full range of benefits derived from a resource. *Tenure* is defined as institutions and rules which regulate property rights and resource use, and determine who can use what resource, under what conditions and for how long [18].

Bromley [19] identifies four possible stylized property rights regimes: (1) open access or non-property; (2) state property; (3) private property; and (4) common property regimes. While a useful first classification, real-life property regimes are more complex. The regimes can overlap with one another and occupy the same physical space, different users can benefit from the same resource, the same resource can provide several different benefits to different rights holders, and *de jure* and *de facto* rights differ.

The focus of this paper is common property regimes, which are governed by two main sets of rules. First, there are access rules to define outsiders and insiders. If there are no such rules, or they are not enforced, the resource is a *de facto* open access regime. Second, there are rules that regulate the use of the resource. Following Baland and Platteau [20], regimes that impose and enforce user rules can be defined as *regulated* common property, while regimes that have no rules or do not enforce them can be defined as *unregulated* common property. We find this distinction useful in the empirical analysis, *i.e.*,

access rules, regulating the external relationship between the group and outsiders, and *user rules*, regulating the internal rules for resource use and management.

The nature of the rights varies: *de jure* rights are based on official laws, while *de facto* rights are based on local practices. The former, statutory tenure system is enforced by governments and recognized by legal, formal institutions, while the latter, customary tenure system is based on oral agreements and tradition [10]. In developing countries, customary regimes often exist alongside the formal legal tenure system [21]. The result of this can be both overlapping and contradicting rights to particular resources. The state claims ownership to most of the forested area in developing countries, while people living in the forest often oppose state control and continue to claim customary rights. They may also co-exist more harmoniously, if statutory rights acknowledge and validate customary claims [10], and the differences between the two classes of rights are not apparent unless the *de facto* rights are challenged [17].

The second category of variables identified by Kiser and Ostrom [15] is the attributes of the goods the natural resource provides. The goods from common pool resources, such as forests and other natural resource systems, are characterized by problems of excludability (ability to exclude competing claimants) and rivalrous consumption. Excludability can be both too costly and/or undesirable, and may lead to problems of overuse and low investment in maintenance. Further, the goods that affect the level of deforestation and forest degradation are characterized by high levels of subtractability or rivalry in consumption. This means negative externalities arise and the resource can be depleted. If common pool resources are managed as common property, the externalities can be internalized [22].

Still, when a group of resource users organizes to manage a resource, collective action problems can occur [13,23,24]. To what extent individuals in a group act to achieve a common interest differs, depending on the incentives to do so. These incentives can be of monetary value or in the form of formal laws and informal norms [25]. This is what we refer to as the *internal factors*. They are related to the third variable identified by Kiser and Ostrom [15]: the characteristics of the community. This includes the strength of village institutions governing the use of forest resources, local leadership and organization, overall level of compliance with forest use rules, rule enforcement and sanctioning of rule breakers and community incentives and interests in organizing community forestry.

2.2. The REDD+ Context

In addition to the Stern Review [1], several studies emphasize the importance of tenure rights clarification for the implementation and success of REDD+, including Sunderlin *et al.* [26], Streck [27], Larson [28], and Corbera and Schroeder [29]. Tenure rights tend to be insecure for communities living in forested areas in the countries where REDD+ projects are implemented. In the 30 most forested countries in the world covering 85% of the global forest estate, the government owns most of the forest estate and the area of forest where communities and indigenous groups have statutory access or ownership rights tends to be small [10]. Customary claims to forest tenure are often unrecognized, leaving people living in forests vulnerable to exploitation [30,31]. To what extent REDD+ will benefit or marginalize forest communities depends on resource tenure arrangements [32] and incentive schemes. In studies on REDD+ and tenure, much focus has been on tenure security and decentralization

of rights from the state to the communities, while less focus has been given to the internal factors, such as community incentives and interests in organizing community forestry.

Identifying the holders of rights and responsibilities in a community are important for the success of REDD+ as well. A core component of REDD+ is to provide incentives to parties who successfully reduce deforestation and forest degradation, but these incentives must be conditional on documented improvement relative to counterfactual scenarios [33]. This is also reflected in the common standards used in the voluntary carbon market, e.g., the VCS [34]. To enable payment of incentives, the responsible party/rights-holders to that benefit stream must be identified. Further, REDD+ can potentially give value to a new commodity, forest carbon; in order to prevent a resource rush, the rights and responsibilities must be legitimate and clear. Lastly, REDD+ will, to varying degrees, reduce certain uses of forest resources, and tenure rights must be clarified in order to make sure pre-existing rights are not violated without due process [8].

2.3. Tenure in Tanzania

All land in Tanzania is held in trust by the president on behalf of the nation [35], and the nation is the only body that can alienate property rights. This means the state is the *de jure* owner of land according to the statutory tenure system. The state has retained exclusion, management, access and withdrawal rights for all land categorized as “Reserved Land”. This category is land set aside for special purposes, including forest. For other categories of land, rights are decentralized. For example, Village Land is allocated to villages under long term management agreements and the state is no longer considered to be the statutory manager. On General Lands, the manager is not identified, and forests on General Land are characterized as “open access” [11].

During the period 2002–2008, the area for community forestry increased significantly worldwide at the expense of state property. The same development took place in Tanzania, where the forest area registered and reserved or managed by communities increased from 1% to approximately 10% [10]. This increase was carried out using participatory forest management (PFM). There are two main approaches for PFM in Tanzania that differs in the level of decentralization of rights and responsibility. The first approach, covering the largest area of forested land, is *community based forest management* (CBFM). CBFM takes place on land registered under the Village Land Act [35] and managed by the village council. Village forest reserves are designated by the village and district government and managed by a village natural resource committee, a group or an individual. The village has management responsibility and retains all forest-generated revenue [36]. The second approach is a collaborative management approach, called *joint forest management* (JFM). It takes place on national forest reserves or local government reserves. Forest management responsibility and revenues are divided between the state and the community and formalized through a joint forest management agreement [37].

PFM is an important element of the national framework for REDD+, and access to REDD+ finances might potentially facilitate and speed up the PFM process [11]. The intention of the Village Land Act of 1999 (implemented in 2001) was to protect community land rights and acknowledge the customary tenure system. In the latest draft of The National REDD Strategy [11], on the other hand, the customary tenure system does not seem to be recognized and is in conflict with the statutory rights as phrased in the Village Land Act. The Village Land Act states that Village Land shall consist of

“land, other than reserved land, which the villagers have been, during the twelve years preceding the enactment of this Act regularly occupying and using as village land”, and that this applies “whether that demarcation has been formally approved or gazetted or not” as long as the boundaries are agreed upon with the neighboring villages and/or other users of the land ([35], Art. 7). In the latest draft of the National REDD Strategy the Village Land category does not include unregistered land. It is stated that “most of the villages are not yet registered and their lands may be categorized as General Land” ([11], p. 25), and further, that 57% of all forest in Tanzania is on general lands with open access. Whether or not unregistered land within village boundaries is recognized as Village Land has an impact on what tenure arrangements apply to areas designated for REDD+ project activities [38]. Whereas forest reserves on land registered as Village Land can be managed as CBFM with extensive management rights to the communities, forest reserves on general lands are considered state property and should therefore be managed as JFM.

3. Data and Methods

Our data set is part of the Global Comparative Study on REDD+ (GCS-REDD) conducted by the Center for International Forestry Research (CIFOR) and its partners [39]. This is a comprehensive research project on REDD+ projects in nine countries. In this paper, we present research conducted by module 2, which focuses on 23 REDD+ project sites in six countries and aims to understand the effectiveness, efficiency, equity and co-benefits of design and early implementation. It involves collecting both qualitative and quantitative data before and after implementation of REDD+ at the national, project, village and household levels. In selected project sites, we also collect data in villages that are comparable with respect to a set of variables, such as market access and tenure rights, but not engaged in a REDD+ project [40]. These villages function as “control villages”, although they may not fully qualify as such in our analysis, given the small number of villages.

In this paper, the units of analysis are projects and villages, and we use information from focus group interviews in 23 villages included in six different REDD+ pilot project sites in Tanzania and proponent appraisals with the five implementing NGOs (Table 1).

We use GCS-REDD baseline data only, collected between March and July 2010, at a very early stage of project implementation. Initially, four villages were selected in each REDD+ project site. In the case of Kilosa, one village had to be dropped because the proponent decided not to include the village in their project at a later stage. We interviewed 2–3 key informants in each of the 23 villages, such as village and sub-village chairmen and village executive officers. We also arranged village focus group meetings with 10–15 participants to collect perceptions of forest cover change and tenure security over agricultural and forest resources, causes and drivers of change in forest cover and tenure security, as well as the participation of local population from the early stage of REDD+ project in their different areas and their current perception of the orientations and expectations from REDD+ in terms of livelihoods and conservation. Separate women’s group meetings were also conducted, using similar survey instruments to the village focus groups. For some of the questions, this enables us to compare responses from both groups in order to check the consistency of our data. Formal survey interviews with technical staff of the proponent organizations were conducted and we also use project documents publicly available and/or provided by the proponents.

Table 1. Overview of REDD+ Pilot Project Sites Included in the Study.

Abbreviation	Name of REDD+ project (Region)	Proponent	Description of the project
TaTEDO	Community Based REDD Mechanisms for Sustainable Forest Management in Semi-Arid Areas (Shinyanga)	Tanzania Traditional Energy Development and Environmental Organization	The project is targeting <i>Ngitili</i> owners in two different districts in Shinyanga. <i>Ngitili</i> is a local word meaning enclosure, and involves conservation of forest, grazing and fodder lands by encouraging vegetation regeneration and tree planting. The project “aims at promoting sustainable natural resource management and reducing greenhouse gas emissions from deforestation and forest degradation from restored Ngitilis. Through this project a robust local institutional framework to help Ngitili owners manage forest and benefit from carbon funds will be established” ([41], p. 4).
TFCG Kilosa	Making REDD work for Communities and Forest Conservation in Tanzania: Kilosa (Morogoro)	Tanzania Forest Conservation Group	The project is implemented in two biodiversity hotspots in Tanzania, and they target areas with relatively moderate levels of deforestation. The project “aims to reduce greenhouse gas emissions from deforestation and degradation in Tanzania in ways that provide direct and equitable incentives to communities to conserve and manage forests sustainably” ([42], p. 2). They will support the development of a community carbon cooperative that will aggregate voluntary emission reductions to be marketed according to internationally recognized standards. The drivers of deforestation and forest degradation in the area include wildfires, shifting cultivation, timber logging, fuel wood collection and charcoal making.
TFCG Lindi	Making REDD work for Communities and Forest Conservation in Tanzania: Lindi (Lindi)	Tanzania Forest Conservation Group	The project is implemented in two biodiversity hotspots in Tanzania, and they target areas with relatively moderate levels of deforestation. The project “aims to reduce greenhouse gas emissions from deforestation and degradation in Tanzania in ways that provide direct and equitable incentives to communities to conserve and manage forests sustainably” ([42], p. 2). They will support the development of a community carbon cooperative that will aggregate voluntary emission reductions to be marketed according to internationally recognized standards. The drivers of deforestation and forest degradation in the area include wildfires, shifting cultivation, timber logging, fuel wood collection and charcoal making.
HIMA	HIMA—Piloting REDD in Zanzibar through Community Forest Management (Unguja/ Zanzibar)	CARE	The project is located in Zanzibar, where the organization has been working since 1995. Their REDD project specifically aims to “promote a pro-poor gender-equitable approach to community forest management in Zanzibar” using Community Forest Management ([43], p. 1). The strategy emphasizes securing property rights and distributing rewards in an equitable manner.
JGI	Building REDD Readiness in the Masito Ugalla Ecosystem Pilot Area in Support of Tanzania’s National REDD Strategy (Kigoma)	Jane Goodall Institute	The project is working in the western part of Tanzania, where they plan to work with communities surrounding the Masito Ugalla Ecosystem, which is at this point largely open access. They plan to use participatory methods to assign forest rights and management responsibilities to sections of the Ecosystem so that the communities can capture the benefits of the forests and REDD and the system can be better managed [44].
MCDI	Combining REDD, PFM and FSC certification in South-Eastern Tanzania (Lindi)	Mpingo Conservation and Development Initiative	The project is targeting three causes of deforestation and forest degradation: illegal logging, charcoal burning, and forest fires. They plan to use the revenue generated by REDD credits to maintain accreditation as a carbon credit seller, expanding MCDI’s forest certification scheme, provide interim income to communities where timber stocks need time to regenerate, support local fire management regimes, and provide long-term payments to reduce incentive to deforest in the future [45].

The variables from the focus group interviews we used for our analysis is described in Table 2. In addition to the data collected in 2010, we use information from a supplementary survey interview on tenure with the proponents in 2011. Household level data is available for a total of seven villages in two of the sites, but given that community tenure, deforestation and forest degradation are village level issues, we chose to limit our analysis to village and project level only.

Table 2. Overview of the Main Variables Used in the Analysis.

Variable	Definition
Changes in forested areas	Perception of changes in the forest areas between June/July 2008 to June/July 2010. The variable indicates increase, no change or decrease. <i>Then, list the causes of forest cover change in rank order.</i>
Changes in forest quality	Perception of changes in the quality of the forest between June/July 2008 to June/July 2010. Quality refers to availability of goods and services; density of woody material, forest health, and biological productivity and diversity. The variable indicates increase, no change or decrease. <i>Then, list the causes of forest cover change in rank order.</i>
Distance to market	Number of kilometers from the village center to the nearest market for durable goods.
Exclusion rights	Exclusion rights indicate that the village has the right to exclude unauthorized outside users from forests within their village boundaries “Yes” indicate that the village focus group perceive that the village has this, either by customary and/or formal/statutory law.
Tenure security	Tenure security is defined as confidence that the households in the village would continue to be able to use all the land and forest they benefit from in at least the next 25 years. A binary variable. “Yes” indicate that the focus group as a community was confident their rights were secure for <i>all</i> the areas within the village boundaries and “no” indicate the group was not confident in their rights for at least one area within the village boundaries.
Compliance	Village focus group’s perception of the overall village compliance with forest use rules. Three alternative answers: Low (people often do not follow the rules), moderate and high.
Enforcement	Village focus group’s perception of whether rules are enforced and rule-breakers sanctioned. Four alternative answers: no or rarely, sometimes/selectively (shortened to “sometimes” in Table 2), often, and always.

Our analysis relies on perception-based assessments of changes in forest cover and quality. Ideally, we would be able to do a validity test of the data, and compare the village focus group’s perceptions with biophysical data, but this kind of data is not available to us. Relying on perceptions is not uncommon. In a meta-study of 52 articles comparing community forestry and forest conservation, Casse and Milhøj [46] found that 21 depended on perception based assessments of forest changes. When comparing forest conservation outcomes reported in the studies (positive, ambiguous, negative, none), they find no significant difference between inventory, remotely sensed, and perception based data.

We collected data in six project sites, covering six of the nine REDD+ project sites launched in Tanzania. While only 10% of the forested area is under some form of community management [10], all the project sites in our study involve community user rights of forests either by statutory and/or

customary law. Thus, the sites are not representative for the overall forest tenure conditions in the country. However, since PFM is an important element of the national framework for REDD+, our results provide useful insight for the ongoing REDD+ process as we cover a significant share of the REDD+ pilot projects launched to date. To assess the representativeness of our intervention (pilot) villages, we compare some of them with the control villages in Kahama and Kilosa.

Deforestation and forest degradation are not taking place in all villages included in the REDD+ pilot projects in our sample, and focus groups in some villages report that both the forested area and the quality of the forest are increasing. This may indicate that some of the REDD+ projects are undertaken in areas where forests are already managed relatively well. It may also be an indication of at least partial success of efforts to reduce deforestation and forest degradation—either by the proponent organization or by other organizations—that predate REDD+. This has implications for REDD+ and the degree of additionality, as well as the potential to scale-up the pilot experiences to other more challenging areas. When selecting villages to include in their projects, some of the proponents included in our sample targeted villages where tenure rights to land and forests were relatively clear, and areas where deforestation and degradation were not severe. This makes sense, given the costs and difficulties of implementing a project in an area where borders are contested. We know of at least two instances of villages that had to be excluded from the REDD+ projects due to border disputes that the NGOs were not able to solve. Choosing areas with moderate levels of deforestation and forest degradation in the pilot phase also makes sense, given limited budgets and high opportunity costs of forest conservation in areas where deforestation and forest degradation is severe.

4. Results

4.1. Extent and Drivers of Deforestation and Forest Degradation

We asked the village focus groups about their perceptions of changes in the forested areas and the quality of the forests within their village boundaries compared to two years prior to our visit. With the exception of MCDI in Kilwa and JGI in Kigoma, a majority of the village focus groups in each site claimed that the forested area within the village boundary had decreased (see Table 3 for details). Only a third of the village focus groups reported a decrease in the quality of the forest. When asked to describe the change in forest quality, their main concerns were a decrease in trees in general and particularly large trees.

We asked the group to list the agents of forest cover change in rank order. Fourteen of the 15 focus groups that reported a decrease in net forested area within their village boundaries said that the main agents of deforestation were the villagers themselves. Other responses were drought, forest fires and harvest of forest products by people from neighboring villages. We also asked whether there were particular underlying driving forces related to the forest cover changes. The need for new agricultural land was the most frequently mentioned driver of deforestation, while increased demand and prices of forest products such as charcoal and building poles were ranked second. Other driving forces mentioned were lack of rule enforcement, lack of rules in general, lack of knowledge of conservation and population pressure. When asked about the causes of forest quality change (degradation), the villagers said they themselves were the main agents, mentioned in all seven villages reporting a decrease in

overall quality of the forest, while people from neighboring villages were mentioned as the second most important cause in three of the villages. Driving forces related to reduction in forest quality were lack of rules and rule enforcement in four of the seven villages, while increased profitability from charcoal production were the driving force in the remaining three villages. The groups reporting an increase in forested area and/or quality in the JGI site said this was due to conservation education, while the village in TaTEDO's site emphasized strong rules as a driver for the increase in the forested area. The groups reporting an increase in the overall quality of the forest also emphasized the role of conservation education. Reduced frequency or lack of forest fires and strong rule enforcement was other causes mentioned by the village focus groups.

Table 3. Overview of Study Villages. Market Access, Institutions and Rules, and Perceived Changes in Forest Cover and Quality.

Village	Distance to market (in km)	Tenure secure for all land	Have exclusion rights	Overall level of forest user rule compliance	Forest user rules are enforced and sanctioned	Change in area of forest	Change in quality of forest
Tatedo_1	13	No	Yes	High	Always	Decreased	Decreased
Tatedo_2	4	Yes	Yes	High	Always	Decreased	Decreased
Tatedo_3	18	No	Yes	Moderate	Often	Decreased	Decreased
Tatedo_4	15	Yes	Yes	High	Always	Increased	Increased
TFCG_K1	30	Yes	Yes	Moderate	Often	No change	No change
TFCG_K2	10	Yes	Yes	Moderate	Sometimes	Decreased	Decreased
TFCG_K3	32	No	No	Low	No/rarely	Decreased	Decreased
TFCG_L1	40	No	Yes	Low	No/rarely	Decreased	Decreased
TFCG_L2	40	Yes	Yes	Low	No/rarely	Decreased	No change
TFCG_L3	29	No	Yes	Moderate	Missing	No change	No change
TFCG_L4	10	Yes	Yes	Moderate	Always	Decreased	No change
HIMA_1	65	No	Yes	High	Always	Decreased	Decreased
HIMA_2	4	Yes	Yes	High	Sometimes	No change	No change
HIMA_3	64	Yes	Yes	High	Sometimes	Decreased	Increased
HIMA_4	53	No	Yes	High	Sometimes	Decreased	Increased
JGI_1	10	Yes	Yes	Moderate	Sometimes	Decreased	Increased
JGI_2	40	Yes	Yes	High	Sometimes	Increased	Increased
JGI_3	170	Yes	Yes	High	No/rarely	Decreased	Increased
JGI_4	26	Yes	Yes	High	Sometimes	Increased	Increased
MCDI_1	26	Yes	Yes	High	Missing	Decreased	No change
MCDI_2	0	Yes	Yes	Moderate	Often	Decreased	No change
MCDI_3	5	Yes	Yes	Moderate	Always	No change	No change
MCDI_4	15	Yes	Yes	Moderate	Always	No change	Increased
Total	31.3	7 no 16 yes	1 no 22 yes	3 low 9 moderate 11 high	4 no/rarely 7 Somet. 3 often 7 always	3 increased 5 no change 15 decrease	8 increased 8 no change 7 decreased

In order to check the validity of the data, we compared the responses from the village focus group to the responses from the women's focus group in the same village. In some cases, the groups disagree

on the direction of overall changes in forest cover and quality, but the responses from women's groups support the findings on the agents of deforestation and forest degradation. All the women's groups that reported a decrease in the net forested area said the main agent of deforestation was the villagers. The same is true for twelve of the 15 groups that reported a decrease in the quality of the forest.

Access to markets is commonly found to be an enabling factor for marketing of forest goods, such as timber and charcoal, and thus market access can be an important driver of forest degradation. When calculating the mean distance to the nearest market for durable goods, we find that villages experiencing degradation are on average closer to the market compared to villages that did not experience degradation (26 compared to 32 km). The pattern is different when we look at distance and change in forest area: the villages experiencing deforestation are on average the most market remote (37 km compared to 20.5 km).

4.2. What Are the Land Tenure Issues Identified by the Villagers?

In order to identify critical tenure issues in the REDD+ sites, we asked about both external and internal tenure factors. We asked each focus group about their perception of their right to exclude unauthorized users of forest areas within their boundaries (Table 3). Twenty two of the 23 villages concluded that they have this right either by customary (18 villages) or statutory law (four villages). With the exception of two villages, the focus groups also claim their villages can enforce this right, and that they are *usually* able to exclude unauthorized users as needed. In total, only three villages reported unsuccessful attempts to exclude unwanted outsiders' using their forest over the two years prior to our visit. This is in line with the responses analyzed in the previous section, where we found that pressure from outsiders was less of an issue in the study sites than the villagers themselves. In order to assess the representativeness of our villages relative to non-pilot REDD+ villages, we compared these findings with data from eight control villages in Kahama and Kilosa. Six of the eight control villages report that they have exclusion rights, three by statutory law and three by customary law. The two villages without exclusion rights claim that there are no unwanted outsiders and in neither of these villages are there external users to the village using the forest.

While we recognize there are intra-village threats to household's tenure security, the variable included in the analysis captured external threats to tenure security only (Table 2). Sixteen out of 23 of the focus groups responded that they were confident about their rights to continue to use *all* the land within their village boundaries, while the focus groups in seven villages were not confident about their rights for at least a part of the land within the village boundaries. In four of these villages, the area of land perceived to be insecure was in places where the government was the statutory owner/manager of the land. The focus groups were not sure the households in the village would be able to continue to use the areas because the village did not hold a title to the areas (two villages) or that there were restrictions on land use by the government and that it might be taken away from the village (two villages). In the remaining three villages, the focus groups claimed that the community was the statutory owner/manager of the land and that the land was used by the community and not individual households. Yet, the focus groups in all three villages said that these rights could be easily revoked. One focus group worried that if they did not work the land, the government would take it. Among the control villages in Kilosa and Kahama, five villages (out of eight) perceive their tenure rights as secure against external threats for *all*

the village land, while three villages perceive their rights as insecure for a share of the land. Although our sample of control villages is small and not matched to all study sites, we believe the findings from the sampled villages have broader relevance for how people in villages with community user rights in Tanzania perceive the external tenure situation.

With respect to internal tenure conditions, the level of village compliance with forest use rules is high in eleven villages, while it is moderate or low in the remaining twelve. Both TFCG sites have relatively low levels of compliance. Rules are enforced and rule-breakers sanctioned in an even smaller share of the villages, but there are large variations across sites. Both the TaTEDO and MCDI sites can be characterized by high level of rule enforcement, while the same is not true for the JGI site and the TFCG sites. Our overall findings on the internal factors, compliance and enforcement, indicate that the local institutions are weak in some of the villages. This is in line with the findings in the previous section, where lack of rule enforcement and lack of rules in general was mentioned by several of the village focus groups as the main reasons for deforestation and forest degradation.

In order to see how the external and internal factors are linked with forest outcomes, we compare the four tenure variables across villages experiencing either increasing or decreasing forest area/quality. Overall, we find that a higher share of the villages experiencing an increase in the forested area/quality had exclusion rights, tenure security and compliance with forest user rules compared to villages that experienced a decrease in forest area/quality. We see that the three villages experiencing an increase in the forested area had favorable external tenure conditions; they all had exclusion rights and they perceived their tenure rights as secure. The same is true for the eight villages that experienced an increase in the quality of their forests, except for one village that was not tenure secure for all land within the village boundaries. The level of compliance with forest use rules is also clearly higher in villages where area and quality increased compared to the villages where it decreased. Most of the villages experiencing a decrease in the forested area had unfavorable internal tenure conditions (low level of compliance and enforcement) compared to the villages that experienced an increase in the forested area, but there are noteworthy exceptions among these villages. Two villages that experienced decreased area had favorable internal tenure conditions with high levels of rule compliance and were always enforcing rules. They were, however, among the villages that were not tenure secure.

4.3. What are the Land Tenure Issues Identified by the Proponents and How are They Planning to Address Them?

All proponents acknowledge that there have been issues regarding tenure over land, forests or carbon that require their attention, and all the proponents have attempted to address these issues. The proponents already have introduced (or plan to introduce) restrictions on the use of village land, forests and resources. The nature of these restrictions will differ across the sites, and include establishing community forest reserves, forest patrols undertaken by villagers, and measures to reduce charcoal production. These responses are presented in Table 4.

The most frequently mentioned issues are related to the external tenure conditions, such as lack of tenure clarity to both forest and carbon in the national policies, length of management agreements, village land certificates and unclear village boundaries. Issues related to the internal tenure conditions are mentioned less frequently, two exceptions being elite capture in the HIMA project in Zanzibar, and

how logging and livelihood needs undermine sustainable forest management in the MCDI site in Kilwa.

Table 4. Changes in Resource Use and Tenure Issues Identified by the Proponents.

Site	Undertaken (U) or planned (P) restrictions on village land, forest or resource use	Tenure challenges that have required attention by the proponents
TaTEDO	Reduced land for grazing, especially for outsiders who used to bring big number of cattle to the project villages (U). Reduced charcoal making in ngitilis included in the project (U).	Lack of clarity on rights of communities to directly access benefits from carbon credits attributable to their village land. There is no policy to ensure that villages retain ownership over carbon in their forests.
TFCG Kilosa and Lindi	Have set up community forest reserves, but these are restrictions agreed to by community (U).	National policy unclear on who owns/has the right to access revenues from carbon. Classification of land as village land rather than general land. Most villages do not have land certificates yet need them for REDD. To get certificates villages must develop land use plans. In Kilosa village boundaries defined years ago but not done well and this is causing conflict.
HIMA	Land use zoning, forest patrolling, environmental education <i>etc.</i> (P)	In the past, local leaders have taken advantage of customary practice to give favors to the elite. Need for stability and transparency for REDD; modify CFM template from 5 to 20 years.
JGI	Village patrols regulate but do not restrict forest use. It is up to villagers to decide what to do (U). We will facilitate the restrictions by villagers and will not impose ourselves. This might have some negative effect on livelihoods (P).	There is need for clarification of ownership by CBOs. The time frame of the tenure is unclear. Forest law can say 99 years but land law can say 3 years.
MCDI	Forest is set aside in all villages (U). Limited logging rotation period, prohibition against hunting, fire restrictions, reduced forest clearing for agriculture, and reduced charcoal production (P).	The government did not map village boundaries accurately. People engaged in logging undermine sustainable forest management. There is a boundary dispute between 2 villages, mediation has not solved it. There was a land purchase deal that went awry.

In all the villages where restrictions were already introduced, the villagers have in one way or another been part of designing the management plan. HIMA at Zanzibar had not yet introduced restrictions at the time of the interview (May–June 2011), but did plan to do so in a participatory

manner. Development of land use plans is a first step for villages to attain certificates to the land within the village boundaries.

In addition to the interventions planned and implemented related to strengthening tenure rights (both formalizing the devolved rights and strengthening internal village forest management), all proponents are also planning/implementing interventions to reduce household demand for forest products and/or support livelihoods through alternative income-generating activities. This includes introduction of fuel efficient stoves to reduce the demand for fuel wood in the village, beekeeping for honey production, agricultural extension services to improve productivity and small scale solar- and bio-plants to support business activities such as charging electric devices and bakeries. Some of the livelihood enhancements are non-conditional (requiring no forest protection activities as basis for obtaining the benefit), whereas some are conditional.

5. Discussion

5.1. Internal Drivers of Deforestation, Market Drivers of Forest Degradation

Given that we rely on perceptions of changes in forest cover and quality rather than quantitative assessments the results linking forest outcome and control should be interpreted with caution. The fact that a higher share of the villages with improved forest outcomes report that they have favorable external and internal tenure conditions can be biased by strategic answering or a tendency of villages that perceive to be in control also are more likely to perceive improved forest outcomes. On the other hand, in subjective reporting, we would expect the focus groups to be biased toward blaming others. The main issues in the villages where the participants in the focus group perceive a decrease in forested area and/or quality are the internal factors, with low levels of compliance and rule enforcement. Adding to this, they do not blame others for causing the negative changes, but rather report that they are responsible themselves for the activities causing deforestation and forest degradation.

In a meta-analysis of forest cover change studies, Rudel [47] found that state-initiated deforestation shifted to enterprise-driven deforestation in Asia and Latin America between 1970 and 2000. Large-scale agricultural producers and cattle ranchers expanded at the expense of forests, while in many countries in Africa, smallholders are the main source of deforestation. In our study sites in Tanzania we find the same. Large enterprises are not the main drivers of deforestation and forest degradation, nor is it caused by migrants or colonists from outside. We find that both deforestation and forest degradation are mainly caused by actions by the villagers themselves. Deforestation is mainly driven by household food and income needs. Our findings are in line with other studies from Tanzania, such as Fisher *et al.* [48]. Over the last decade, population has increased by 2.6%–3.0% per year [49], and although agricultural productivity has also increased [50], there has still been a need for more crop land. We generally find this to be the situation in our sampled villages as well.

The dynamics for deforestation in the villages included in our sample are different from those of forest degradation. While deforestation is driven by subsistence needs in the form of higher demand for agricultural land because of population growth, degradation is primarily driven by the market demand for charcoal. Firewood is the main energy source in rural households, while the urban population is still reliant on charcoal for cooking [48]. Making and selling charcoal is prohibited in

most of the villages, even in the private *ngitilis* in Kahama, but the rules are not enforced and/or the income generated from the activity is worth the risk of getting caught and fined, as production of charcoal is an important income source for many households. Previous efforts to halt the unregulated production of charcoal have been unsuccessful, due to both protests from the urban consumers and lack of incentives and capacity to monitor and enforce regulations at the local level [51].

5.2. Mismatch Between Local Perceptions and Proponents' Interventions?

The second major finding is the apparent mismatch between what villagers and proponents perceive as critical tenure issues in halting deforestation and forest degradation at the early stage of project implementation. While proponents have their main focus on formalizing and strengthening the external, devolved rights, village focus groups identify internal, collective action issues such as low level of compliance with forest use rules and lack of enforcement as the underlying drivers of deforestation and forest degradation. The focus groups perceive the land rights of the village secure for the next 25 years in a majority (70%) of the villages, and a higher share of the village focus groups also perceive they have the rights to decide who can and cannot access the forest within the village boundaries. This indicates that there is a discrepancy between what proponents and villages identify as pressing tenure issues in the early implementation phase of REDD+.

To limit deforestation and forest degradation, our findings indicate that both external and internal tenure arrangements must be favorable. Tenure security and enforceable rights of exclusion are important because REDD+ presumes local stakeholders are responsible for forest management and can protect forests without outside interference. Further, all villages that experienced an increase in the forested area over the past two years perceive their rights as secure, that they have the right to decide who can and cannot access their forests and that they are able to exercise this right, and the same is true for all but one of the villages experiencing an increase in the quality of the forest. This supports the theory that favorable external tenure conditions are enabling factors for effective forest management at the local level in Tanzania. Perhaps surprisingly, neither tenure security or exclusion rights are reported to be a major problem by the focus groups in the villages in our sample. Whereas perceptions do not necessarily reflect villages' formal, *de jure* rights, perceptions are important because they shape the actions of the villagers.

The picture is different when considering the internal tenure conditions. Gibson *et al.* [52] argue that local enforcement of rules is necessary for successful resource management. Weak institutions at the local level seem to be a limiting factor for effective forest management and lead to collective action challenges in the REDD+ project sites as well. In our sample, eleven of the villages that perceived a decrease in the forested area have low or moderate compliance and/or sometimes no enforcement of forest use rules. Compliance with forest use rules and sanctioning of rule-breakers are important indicators of whether the village institutions are strong enough to ensure sustainable management of the forests within the village boundaries. With the enforcement variable we measure to what extent the village leadership institutions are *able* to enforce the forest use rules and sanction rule breakers, but the answer we get may also reflect to what extent there is a *need* for enforcement and sanctioning in the village. Among the eleven villages reporting low enforcement (no/rarely or sometimes/selectively) six state that the levels of compliance with forest use in the village is high. In these villages, there may be

less need for enforcement of forest user rules, and/or it may not be necessary because the rules regulating forest use are few.

In the process of attaining a certificate for the land within their boundaries, the village develops a land use plan. Most of the villages in our sample already had village rules and regulations dictating which forested areas could be accessed and which products could be harvested for subsistence and/or commercial purposes prior to REDD+ implementation. REDD+ interventions may provide additional incentives to conserve the forest, but strengthening of existing village institutions is needed in order to be able to achieve compliance and enforcement of the rules and regulations in the plan. Judging from the responses from the proponents during the early phase of implementation, there does not seem to be an immediate plan as to how to achieve this. Most of the focus appears to have been on ensuring the decentralization of tenure rights from the government level to the village level, while less focus has been on internal tenure issues.

5.3. Explaining the Apparent Mismatch

Without making an attempt to single out which is the most important, we identify four possible explanations to this mismatch. First, proponents understand the need to clarify and formalize local tenure arrangements as a requirement for stable forest management in REDD+, whereas village stakeholders, because they are not the initiators of REDD+, do not have this in mind. Villagers might underestimate the future external threats to their forest resources as REDD+ proceeds and the value of the forest increases, while the project proponents are aware of this, and are concerned about fulfilling the legal and administrative requirements for securing the villages' *de jure* tenure rights. Most of the village focus groups in our sample consider land and forests within their village boundaries as their own unless there is a government forest reserve. Previous mapping and boundary demarcation between villages has not necessarily been successful, and in the process of making land use plans as a step in the process of formalizing the villages' *de jure* rights, several of the proponents discovered unclear boundaries between villages, including TFCG in their site in Kilosa and MCDI in Kilwa. Further, forested land within customary village boundaries is not necessarily recognized as village land in the Tanzania National Strategy for REDD+ [11]. Community rights to forests and land within their village boundaries are weak in the latest draft, and land is categorized as open access general lands unless it is registered (gazetted). Thus, villager perceptions are likely to mainly be based on past experiences, which may not fully reflect the security and rights in the future if conflicts over forest land and its resources and services should arise due to REDD+.

The second possible explanation of the mismatch is that the proponents underestimate the threats from internal, collective action challenges in the villages within their project boundaries at the very early stage of project implementation. While strengthening of tenure rights is important to ensure reduced deforestation and forest degradation, it is also important to keep in mind the importance of forest products for people's livelihoods and the need for new cropland. REDD+ will ultimately rely on reducing the amount of land cleared for agricultural purposes and harvest of forest products. Agricultural extension advice and increased productivity may lead to reduced demand for agricultural land to support household needs and thus reduce deforestation, but may also have the opposite effect as the value of agricultural land increases. Although the key idea of REDD+ is to make forest conservation

more beneficial to local users compared to forest conversion and unsustainable use, it might be that the current and planned benefits of keeping forests are simply too small. Similarly, the short term benefits of unsustainable harvesting might outweigh the long term benefits of sustainable forest management. REDD+ interventions can alter this benefit–cost calculation of forest users, for example, by paying individual households for retaining forests (PES), as TFCG is doing in their sites in Lindi and Kilosa. Alternatively, it can be achieved by reducing the need for forest products in local livelihoods, as TaTEDO is doing by introducing improved stoves in their site in Kahama in order to reduce the amount of fuel wood needed for cooking. Introduction of beekeeping and other alternative livelihood activities may also replace lost income from charcoal production. Whether the sum of these measures will be able to reduce the rate of deforestation and forest degradation in the villages remains to be seen.

The third possible explanation for the mismatch is that by focusing on external factors and the formalization of the villages' *de jure* tenure rights at the early stage of implementation, the proponents might gain more collaboration from the villages within their project boundaries, rather than initiate conflict by interfering in the internal resource management regime in the village.

This is closely linked with the fourth and final explanation: the role of the proponents. Studies of common property institutions have highlighted the importance of locally designed access and management rules [53]. Against this backdrop, to what extent can external agents initiate change to community management tenure regimes? It might as well be that the proponents are better able to initiate change at the national level.

On the basis of the data available, we cannot give weights to the relative importance of these four explanations. Further investigation is needed on the apparent mismatch between villagers' perceptions and proponents' planned activities. We feel confident that this mismatch applies beyond our sample villages, *i.e.*, that the mismatch cannot fully be explained by selection biases of proponents' location of REDD pilot projects. Proponents are expected to select villages with a minimum degree of community organization (in order to have local partners), and proponents have had pre-REDD+ activities in some of the villages. Thus if anything, we expect the internal conditions to on average be better than in the full population of forest villages in Tanzania. As for external pressure, proponents may follow a triage principle in the selection [54]. We can then expect some of the high (external) pressure (and high deforestation/degradation) villages to be excluded as making a difference will simply be too difficult. However, the most remote locations are also expected to be excluded as the forest pressure is low and therefore with limited scope to make a difference.

6. Conclusions

Unclear and weak tenure arrangements jeopardize the realization of project goals, thus it is generally agreed by all parties that tenure clarification (where it is unclear) is key to achieving effectiveness (and equity) in REDD+. This is true for REDD+ proponents in Tanzania, and we find that formalization and securing tenure rights from the state to the village level is high on the agenda in the early phase of implementation.

Although a majority of the villages perceive their tenure rights as secure and assume they have the right and ability to decide who can and cannot access the forest within the village boundaries, their perceptions do not necessarily reflect their *de jure* rights. Land within village boundaries is not

necessarily recognized as Village Land in the Tanzania National REDD+ Strategy, and as REDD+ proceeds and the value of the standing forest increases, communities' *de jure* tenure rights can be more important and knowledge of these rights can change villagers' perceptions of security. This justifies the proponents' emphasis on formalizing village tenure rights.

Without underestimating the importance of tenure security and enforceable exclusion rights, we also emphasize that there should be a greater focus on strengthening village institutions to ensure higher levels of compliance and enforcement of forest user rules. Data indicate that the main threat to the effectiveness of REDD+ in the pilot sites in Tanzania is from activities undertaken by the villagers themselves, not outsiders. These circumstances mean concern about external claimants on local forests is less a concern than claims within project boundaries. The need for agricultural land to cover subsistence needs is a main cause of deforestation while degradation is mainly caused by charcoal demand from nearby towns, providing a possible source of cash income from production and sale for households in the villages. In many of the villages, these activities were prohibited prior to REDD+ project implementation. The REDD+ projects will introduce measures to increase agricultural productivity and various incentives that include forest access restrictions, fuel efficient stoves, alternative livelihood activities and payment for environmental services. These interventions are both important and necessary, but lack of compliance and enforcement of village forest use rules was prevalent in villages experiencing deforestation and/or forest degradation. This problem needs to be tackled side-by-side with the process of tenure formalization with the state, if REDD+ implementation is to succeed.

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Conflicts of Interest

The authors declare no conflict of interest.

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