

**The influence of certified forest management on community socioeconomics:
Implication for REDD+ safeguard standards implementation in Tanzania.**

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Abstract

Forest certification has been promoted as means to contribute to individual and community livelihoods condition. However, it has been evaluated very little to this effect. By using economic valuation methods and governance indicators, the study assesses the influence of forest certification approach to forest management on individual and community livelihoods in Kilwa, Tanzania by comparing livelihoods condition in communities with certified forests under community based forest management (CBFM) to those village forests without CBFM and certification. Results reveal that certified communities (FSC) offer a higher forest income US\$106/annum and US\$86/m³/annum per household and village, respectively and more incomes to people in the community than non-certified communities with US\$43/annum and US\$10/m³/annum per household and village, respectively. The difference of livelihoods condition between the certified CBFM and communities without CBFM and certification is statistically significant ($p = 3.128e-05 < 0.05$). The actors from certified forest communities exhibit lower income inequity ($G = 0.3986$) than NoFSC forests ($G = 0.5883$) and the difference is statistically significant. This highlights positive influence of certified CBFM on livelihoods condition as an incentive for communities to responsibly manage their forests, including REDD+ projects more effectively, efficiently and sustainably. The policy implication from this is that incorporation of forest certification standards into REDD+ social and environmental safeguard standards implementation would motivate communities to participate effectively in REDD+.

Key words: *Forest income, CBFM, equity in income, REDD+, FSC*

1.0 Introduction

There are several forest certification schemes globally; Forest Stewardship Council (FSC) is one of them. FSC is an international, multi-stakeholder organization established in 1993 by the world's leading environmental groups and their allies to promote responsible management of the world's forests, as a result of governments failures to manage forest resources (Bass et al. 2001; Karmann & Smith 2009; Nussbaum & Simula 2005). FSC through its Forest certification (FC)

scheme, it certifies forests and forest products to address the relationship between forest use and the natural functioning of forest ecosystems through criteria and indicators of sustainable forest management (SFM). FC is being promoted by environmental non-governmental organisations (ENGOs) and development partners as a way to encourage and recognise sustainable community-based forest initiatives (Cashore et al. 2006; Karmann & Smith 2009; Murray & Abt 2001).

FC for community-based forests provides a variety of benefits to communities (Harada 2013) such as improved labour conditions and employment, land tenure security and livelihood rights including

access to forest resources, and provides financial support (Molnar et al. 2004; Tikina et al. 2010) through the concepts of community forestry (McDermott & Schreckenber 2009). It leads to the development of effective institutional arrangements (standards: principles, criteria, indicators and verifiers) for community control over forest management for the improvement of their livelihoods (Harada 2013; Karmann & Smith 2009). It enhances social and ethical commitments regarding equity in benefits distribution (Harada 2013; Wiersum et al. 2013) as a result of higher prices and greater market security for forest products (Markopoulos 2003; Quaedvlieg et al. 2014).

The scientific community seeks not only to better understand complex ecosystem processes (Hubbell & Foster 1992), but also to manage forests in ways that recognise rights of poor forest-dependent people and improve their livelihoods while maintaining forest integrity (Kaimowitz & Sheil 2007; Robinson 2006; Thornber et al. 1999).

Studies from certified forest communities and corporates in Latin America and Southeast Asia (see e.g., Harada 2013; Ingram & Bongers 2009; Karmann & Smith 2009; Markopoulos 2003) have assessed the influence of certified forest management on community socioeconomic and provide qualitative evidence that FSC operations contribute to community well-being and economic stability. Through social justice, FSC promotes equitable distribution of benefits emanating from forest resources to

communities (Karmann & Smith 2009). Quantitatively, little effort has been devoted to studying conditions under which communities have achieved and maintained forest management goals through their stewardship (Agrawal & Redford 2006; Poteete & Ostrom 2004) like forest certification to achieve their livelihoods in Africa, and particularly in Tanzania. Yet, equity aspects of certified community forests have not been fully examined quantitatively (Beauchamp & Ingram 2011; Pinto & McDermott 2013) for the different actors.

This study assesses the influence of forest certification approach to community forest management on community socioeconomics. By using economic valuation methods and governance indicators, the study comparatively assesses qualitatively and quantitatively the influence of forest management regimes (FMRs) by analysing individual (household and actors) and community forest income emanating from certified CBFM communities (FSC) and non-certified village forests (NoFSC) and its distribution to actors to understand the actual economic benefits derived from forests for their livelihoods. The study also analyses the relationship between forest resources management and forest governance and institutions in Kilwa District, Tanzania.

2. Materials and methods

Study area

This study was undertaken in four villages: Kikole and Kisangi villages with certified community forests (FSC) and Mchakama and Likawage villages with non-certified community forests (NoFSC) of Kilwa District, Lindi, Tanzania (Fig 1).

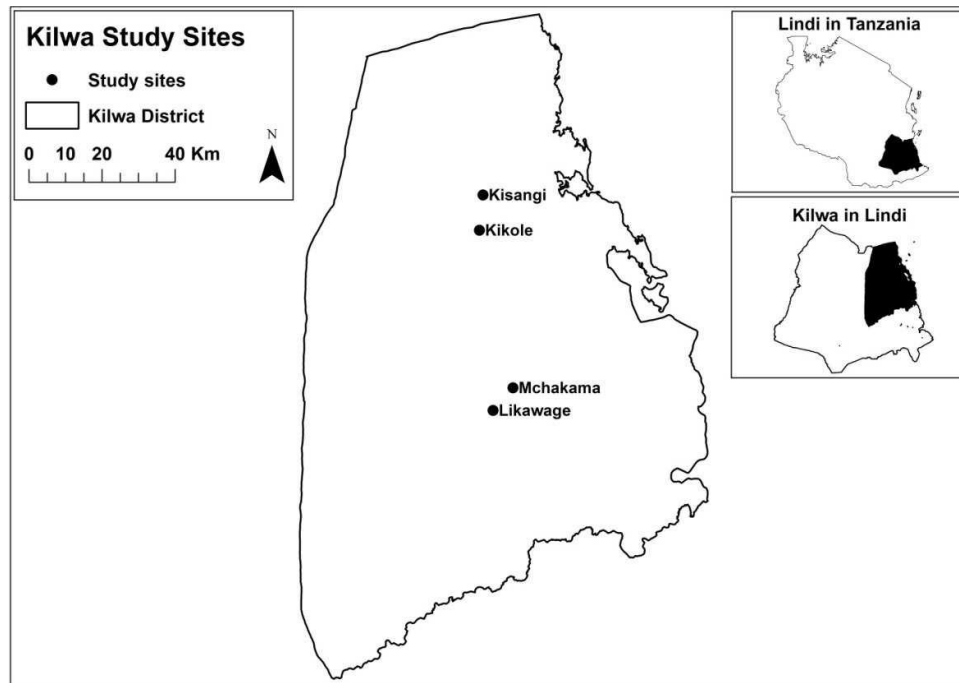


Figure 1: Map of Kilwa showing relative location of study sites.

Kilwa District's economy hinges on crop production whereby agriculture is the main economic activities engaging 81% of the total labour force; livestock keeping; employment and trade. However, the vast majority of people in Kilwa are reliant on forest resources (miombo woodlands) to meet their daily needs both socially and economically. These resources are, however, everywhere under threat from increasing fragmentation (KDC 2008).

The choice of this area was guided by the REDD+ project being piloted in this district and the on-going FSC certified Miombo Woodlands management project under community involvement which seeks to implement CBFM in Kilwa District under the coordination of 'Mpingo Conservation and Development Initiatives (MCDI) in collaboration with Kilwa District Council. This is a strategy for the reduction of human pressure on natural forests by creating alternative of livelihood such as sustainable timber harvesting to improve forest-communities relationships that contribute to poverty reduction

initiatives (Ball 2009).

Data collection

The data were collected in June - September 2011 as part of a large survey carried out in Kilwa District for a research project titled "Comparative Study of Incentive Options for Forest-based Emissions Reductions, Biodiversity Conservation and Livelihood Improvement: Case of Kilwa and Lindi Districts in Lindi Region", for Climate Change Impacts, Adaptation and Mitigation (CCIAM) programme in Tanzania. The data for household incomes were collected using mixed methods including qualitative (participatory rural appraisal for focus group discussion and Key informants using semi-structured interviews) and quantitative (household survey using questionnaires). Stratified random sampling procedure was used to identify households for the survey from the village register. A total of 176 households were identified. Basing on *recall method* (see Maharjan et al. 2009; Wollenberg 2000) these households were

interviewed to collect household's information: socioeconomic, demographics, access to forest and their relationship to forest governance and institutions, i.e. rule compliance (see Kaufmann et al. 2007). Households provided estimates of the total quantity and total value (or prices per unit) of forest products consumed and sold. Data to assess forest income equity was collected from a total of 40 actors who were purposively sampled producers to traders along the chain. They provided information about quantities and prices for forest products they produced, processed and traded and their associated costs; as well as bylaws governing their businesses using value chain analytical framework (see Gereffi et al. 2005; Kaplinsky & Morris 2001). Key informant interviews were administered to individuals and organisations with knowledge about the influence of forest resources on communities' socioeconomics.

Data analyses

The estimates and written records data for the year 2010-2011 for all forest products were valued according to the actual prices and cost information provided by the households, villages and actors (see e.g., Cavendish 2002; Vedeld et al. 2004; Wollenberg 2000). Labour was valued (see Cavendish 2002; Godoy et al. 1993) using national minimum wage rates on rural wages (see URT 2010). These estimates were used to calculate the net incomes (total revenue minus total costs) as per Wollenberg (2000) and Vedeld et al. (2004) per forest product per household, village as well as per actor along the chain. The influence of FC on community livelihood condition was assessed by modeling the household's forest income between FMRs using generalised linear model (GLM) (*Model 1*) employing *quasipoisson* family (*identity* link) (Crawley 2009). The contrasting option for

FMRs (FSC and NoFSC), setting sum to zero (control sum) and then setting reference level (control treatment) to compare differences of FMRs by examining the magnitude and signs of the estimated coefficients of the parameters was used. Gini coefficient (Charles-Coll 2011; Farris 2010) was used to measure equity in income distribution among the actors.

Where,

HFi = Household Forest Income
 $FMRi$ = Forest Management regimes:
 FSC,0 and
 NoFSC,1

i = Observations ($n = 1, \dots, 176$)

β_0 = the intercept coefficient
 FMRs

β_1 = the slope coefficient for
 FMRs

To understand the influence of FC approach of forest management on local livelihoods conditions, implementation of institutional arrangements were assessed to establish the relationship between livelihoods conditions and rule compliance for the different FMRs.

3. Results

1.1 Household characteristics' description

The sampled households ($n = 176$) were on average 46.5 years old with average household size of 5 members for all the FMRs: FSC and NoFSC. About FSC = 52.7% and NoFSC = 47.3% of the sample had primary school education, respectively. Generally, the sampled households in the study area had similar household characteristics between the FMRs (Table 1)

Table 1: Similarities in households' characteristics in Kilwa District, Tanzania

Variables	FMRs	2010-2011	
		Statistical tests	Tests results
Household size	FSC vs NoFSC	Wilcoxon	W = 4255.5, p = 0.25
Age	FSC vs NoFSC	Wilcoxon	W = 3572.5, p = 0.3761
Education	FSC vs NoFSC	Pearson chi-square	$\chi^2 = 10.7, p = 0.1519$

The households and villages obtained direct economic benefits from the forests through: a) Access to forests products for subsistence and cash income, e.g., timber, poles, fuelwood, thatching grass, honey, plant foods, medicinal plants; b) Employment, e.g. as forest guard or in forest management activities (firebreaks slashing and controlled burning, harvesting, inventory, monitoring and forest protection); c) Village Natural Resources Committee

(VNRC) allowance for members.

1.2 Influence of Forest Certification Management approach on socioeconomic situation

1.2.1 Economic aspect

The GLM (*Model 1*) yielded the following outputs as presented in [Table 2](#)

Table 2: GLM regression of household forest incomes against FMRs in Kilwa District, Tanzania 2010-2011

Parameterisation	Coefficient	Estimates	Std error	t-value	p-value
<i>Sum to zero:</i>	(Intercept)	74.663	9.558	7.811	5.12e-13***
	FMR(FSC)	31.271	9.558	3.272	0.00129**
<i>Reference level:</i>	(Intercept)	105.93	16.1	6.579	5.35e-10***
	FMR(NoFSC)	-62.54	19.12	-3.272	0.00129**

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Dispersion parameter for quasipoisson family taken to be 215.3621)

Comparing the coefficients (FSC and NoFSC) for the parameterisation, there were differences in the magnitude and signs of the coefficients. The *Sum to zero* (control sum) model showed that the FSC and NoFSC FMRs differ by US\$74.663 and US\$31.271, respectively per household from the annual average FSC household forest income; whereas, the *Reference level* (control treatment) model showed that NoFSC has an annual average

of household forest income value of US\$62.54 per household lower than FSC household forest income of US\$105.93 which is the intercept in NoFSC model ([Table 2](#)). Certified communities (FSC) earned higher forest income of US\$106/household/annum than non-certified communities (NoFSC) with US\$43/household/annum. The difference in household forest incomes between FMRs was statistically significant ([Fig. 2](#)).

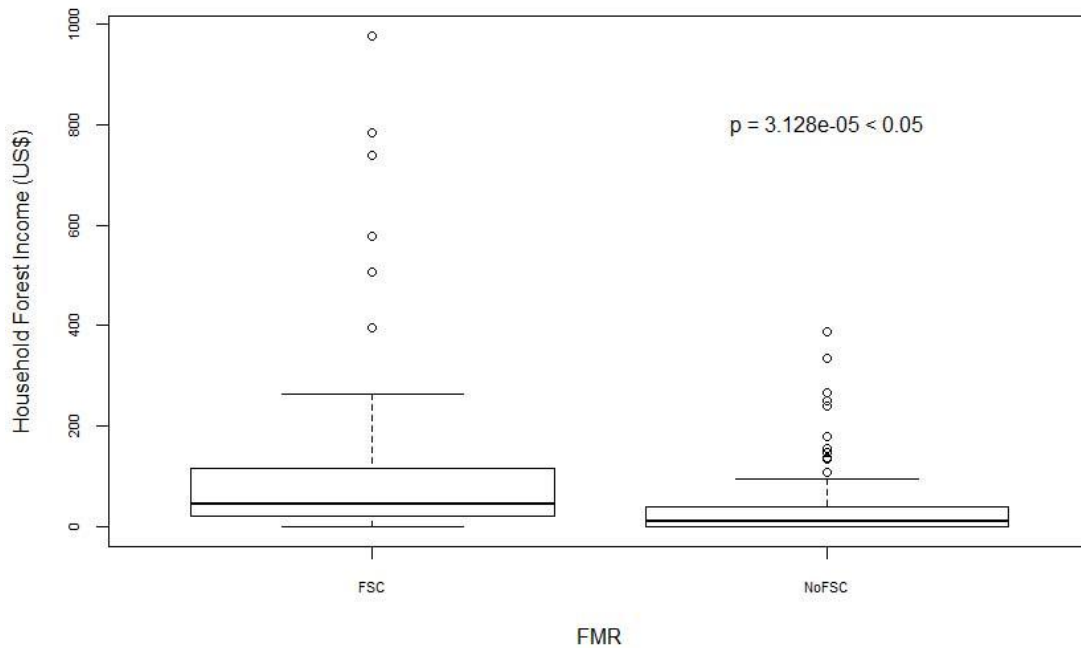


Figure 2: Comparison of household forest income between FMRs in Kilwa district, Tanzania 2010-2011

Actors traded logs, timber and products derived from timber. Among the actors, FSC communities earned higher net income of \$86/m³/annum than NoFSC communities with \$10/ m³/annum. FSC and NoFSC villages had difference arrangements on how to share forest incomes. FSC villages earned 95% of the revenue/m³ (about \$86/m³) from sale of logs, whereas the NoFSC villages earned \$0.125/plank (about \$8/m³) from timber

dealers, while 100% from sale of logs was earned by the district.

1.2.2 Equity in income distribution

With respect to income distribution among the actors, the Gini coefficient (G) was 0.3986 and 0.5883 for FSC and NoFSC actors, respectively (Fig. 3); with a difference of 0.1897 and standard error, SE = 0.0270 and the difference was statistically significant.

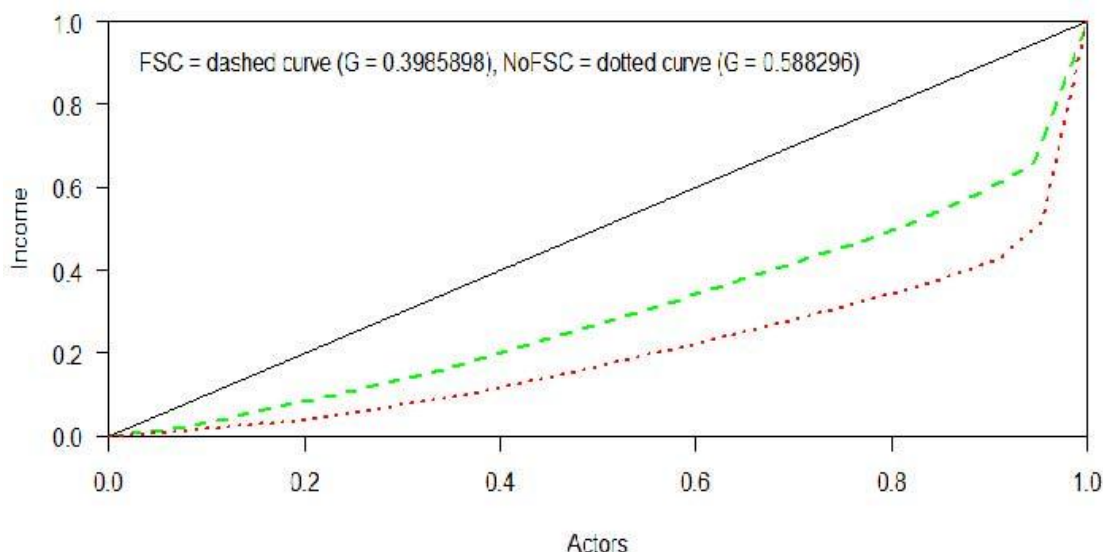


Figure 3: Equity in income distribution among actors for FSC and NoFSC in Kilwa district, Tanzania 2010-2011

1.2.3 Social aspect

The FSC villages forest governance systems and the institutional arrangements were not similar to NoFSC villages on the ground (Table 3), although similar in many aspects on papers. Village General Assembly, Village Council (VC) and Village Natural Resource Committee (VNRC) as governance structures at village level were found relevant to forest resources management. All the villages had legally and democratically elected VCs and VNRCs. VNRCs, as the institutions responsible for the management of forest resources at local levels were functional; and they were cooperating well with their respective VCs.

The communities had the mandate legitimately to develop and adapt their own forest bylaws for forest management. However, households for certified communities (FSC) were more aware (Table 3) of the forest bylaws (64.5%) than NoFSC (35.5%) through formal

meetings and informal training and that these bylaws were not only used for managing certified forests only but also all the forests in the village land. However, in all the villages, they did lack the basic legal knowledge on how to develop these bylaws. They also did not have copies of relevant pieces of legislation, policies and regulations.

In the NoFSC forests where the Kilwa forest office (KFO) is the forest manager responsible for the enforcement of bylaws, fines and sanctions were executed by forest officers who live in Kilwa Masoko, not by the villagers who live around and/or close to the forests and who are the forest resource users. This act made enforcement of the law ineffective. Monitoring or auditing was done by a third party auditor accredited by FSC for FSC forests and there was no audit for NoFSC forests, only enforcement by Surveillance Unit of Tanzania Forest Services, yet it was not effective

Table 3: Differences between FSC and NoFSC forest governance systems execution in Kilwa District, Tanzania 2010-2011

Forest governance systems	FSC	NoFSC
Village Natural Resource Management Committee (VNRC)	Yes	Yes
Demarcated area of forest on village land	Yes	Yes
Undertake Participatory Forest Resource Assessment (PFRA)	Yes	No
Forest management plan which includes harvesting plan	Yes	No
Bylaws that support forest management plan	Yes	No
Bylaws compliance or enforcement	Yes	No
Bylaws monitoring or auditing	Third Party	Surveillance Unit
District Registers the forests as Village Land Forests	Yes	Yes
Forests gazettement	Yes	No
Identify and mark trees that are of harvestable size before harvesting	Yes	No
Timber harvesting license/permit issuance	Village	KFO
Supervision of harvesting operations	Yes	No
Transit Passes issuance to allow movement of timber	KFO	KFO
Access rights	<i>de jure</i>	<i>de facto</i>

Key informants reported that FC had brought up more bylaws awareness to the FSC villagers due to regular training about forest resources management to VNRCs who then disseminated this knowledge to others in their respective villages. They also reported that FC allowed all stakeholders to enter into a process to identify their concerns and needs with respect to forest resources management. This process led to agreed objectives for a social forest management plan which aimed at satisfying any of the livelihoods needs in almost all the livelihoods category, compared to the non-certified villages (NoFSC) which did lack this process.

2.0 DISCUSSION

The strategies used to maintain a living depend on personal skills and characteristics, access and use of different tangible and non-tangible assets and combination of different activities (Abebaw et al. 2012; Tumusiime et al. 2011). Results show that the sampled households are almost homogeneous in household characteristics (Table 1), and have the same socioeconomic activities whereby they obtain direct economic benefits. This makes this comparative study unbiased in the sense that the differences in socioeconomic incomes emanating from forests are attributed to Forest Management Regimes (FMRs) influence. FMRs offer different means of access to forest resources (Table 3). Given differences in access to forest resources, households face different production possibility sets and consumption options, and their socioeconomic adaptations are defined by the pursuit of different income sources (Tumusiime et al. 2011).

The relationship of household forest income between the FMRs (FSC, NoFSC) indicates

that FMRs (*with and without* forest certification) have different influence on socioeconomic condition (Fig. 2). The influence of forest certification on socioeconomic condition shows that there are differences in the magnitude and signs of the coefficients (Table 2). Both FSC and NoFSC have statistically significant contribution to

household forest income, but with different contribution levels, NoFSC being the least contributor with statistical significant difference (Fig.2).

One of the most important objective and justifications for certification of CBFM is to increase the financial benefits at community and household level (Barr et al. 2012 ; Stewart et al. 2003) from forest resources. FSC villages earn higher net income/m³ than NoFSC villages. This is attributed to the way revenues are earned from the different forests. FSC villages as owners of the forests earn 95% of the revenue/m³, whereas the NoFSC villages as custodians earn \$8/m³ from producers/processors. NoFSC villages earn lower net income/m³ than FSC villages along the chain because they do not own the forests, and so 100% of the revenues/m³ goes to KFO. The results suggest that certified CBFM demonstrate positive influence on community socioeconomics and hence meeting the objective of certification compared to communities without certification (NoFSC). Results imply that higher income earned by FSC villages is not only a motivation for them to maintain the certificate, but also for NoFSC villages to certify their village forests.

The income distribution among the actors exhibit higher income inequity for both FSC and NoFSC villages than $G = 0.3758$ for Tanzania in 2007⁶. However, FSC have lower income inequity than NoFSC actors, and the difference is statistically significant because the difference in G for the two is more than three times the standard error ($G = 0.1897$; $SE = 0.0270$). The difference in income is not due to sampling

variability but rather due to the data itself (Cowell 2011). The higher the value of G means the income is taken by few highly earning actors, suggesting that

<http://www.tradingeconomics.com/tanzania/gini-index-wb-data.html>
Accessed on 17 Jan 2014

forest certification for Kilwa communities is pro-poor consistent to the National Forest Policy of 1998 compared to NoFSC. Villages' forest under certified forests regimes get better returns from their community forests as compared to those whose forests are not certified. The fact that FSC villages under FSC forest manage regime have lower inequity is attributed to the circumstance that institutions governing forest resources contribute to income equity (see Amendola et al. 2013). Furthermore, FSC enhances social change and transparent involvement of stakeholders (Karmann & Smith 2009) as a mechanism to ensure equity in benefits and their distribution. This ensures best ways for effective use of forest resources (Table 3) by all actors contrary to NoFSC where there is no such an arrangement resulting to higher income inequity.

FSC certified forest management strategy enhances local level governance. Higher socioeconomic condition in certified CBFM (FSC) compared to NoFSC is attributed to effective enforcement of forest bylaws (Table 3) in forest resource management by the local communities because of strong security of tenure and the benefits to individuals and communities from the forests at their disposal by adhering to FSC standards. The engagement of all villages in planning and decision making enhance agreed objectives for a social forest management plan which aim at satisfying any of the socioeconomic needs in almost all the livelihoods category, compared to the non-certified communities which do lack this process.

3.0 Conclusion and policy implication

Forest certification, because of its growing prevalence, its promotion as a market tool, and

its use as a regulatory mechanism, it is having an increasing positive influence on

how forest resources are managed. It has as well been identified as a means for measuring good forest management and for identifying legal production. Certified CBFM have a positive influence on communities' socioeconomic condition not only as *safety nets* and *gap-filler*, but also a *pathway out of poverty* for the participating communities. Certified CBFM also demonstrate social attitudes that could strengthen local communities to manage existing community forests more effectively, using FSC standards.

There is parallelism between the FSC standards and the National REDD+ social and environmental safeguard standards in achieving (SFM), with the aim of meeting communities' socioeconomic needs (Appendix 1) without compromising forest ecosystems integrity. These standards are different in content, recognition and credibility. The FSC standards have 10 principles, 70 criteria and about 209 indicators (currently under review at international level) which provide comprehensive details on how to effectively assess, on the ground, the performance of the principles. The FSC standards have international recognition and credibility. The REDD+ social and environmental safeguard standards have 8 principles, 40 criteria and 132 indicators with inadequate international credibility (see Nordeco & Acacia 2014).

Most of the REDD+ activities from pilot projects in Tanzania are currently taking place in non-certified forests. REDD+ safeguard standards are forest related and not standalone initiatives (URT 2013), and also REDD+ is an integral part of SFM. However, the National REDD+ safeguard standards which guide the implementation of REDD+ activities pose some implementation impediments as they do not have international credibility (Nordeco & Acacia 2014). The incorporation of the REDD+ safeguard standards into the National FSC draft standards which have clear intents and grounded

norms (FSC 2012) and international credibility will add clear operational value to the implementation of the REDD+ safeguard standards in Tanzania whereby they will gain international recognition and credibility. REDD+ activities in Tanzania will be eligible to access international markets for carbon trading and operational funds from international financial institutions such as the World Bank activities' implementation.

FSC forest certification scheme is a climate change mitigation tool whereby its standards support the maintenance and enhancement of carbon stocks in certified forests (Kalonga 2008). The FSC standard are applicable at the project, regional, and national levels (Merger et al. 2011). The FSC provides the context for which carbon management and carbon crediting can be harmonised with other uses and values of the forest (Kalonga 2008). At the national level, the FSC can be combined (Brotto et al. 2010) with the Climate, Community and Biodiversity Alliance: CCBA's REDD+ social and environmental safeguard standards to ensure SFM combined with the improvement of national REDD+ policies for improved forest management projects that deliver net GHG benefits (Appendix 2). REDD+ forests certified under the FSC forest certification scheme can apply FSC standards, as they provide a mechanism to value and monetise carbon stocks on these forests (Merger et al. 2011). FSC/REDD+ forests will contribute to individual and community socioeconomic improvement through forest works employment/use of forest products for subsistence/cash income; and sale of logs/timber, respectively. The income earned from carbon trading for the same will be re-invested in expanding more CBFM areas to meet the objective of REDD+. In addition, income from carbon will be given to communities not able to profit from the sale of logs/timber to meet

community development projects' needs. However, the authors acknowledge the challenges confronting certifying ecosystem

services; including carbon (see Meijaard et al. 2014). Nevertheless, these challenges should be met by the National REDD+ Task Force and the Working Group to ensure a smooth taking off of the REDD+ activities implementation in Tanzania.

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