The Role of Village Land Forest Reserves in the implementation of Land Use Plans: Experience from the REDD+ initiative, Tanzania

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SUMMARY

The role of Village Participatory Land Use Plans (VPLUPs) and associated Village Land Forest Reserves (VLFRs) under the REDD+ initiative is a fairly new concept with limited information on the success of its implementation. This study examined community perceptions of VPLUPs as well as their perceptions of the inclusion of VLFRs in these plans in the Kilosa district of Tanzania. A mixed method research design, which integrates participatory community mapping (PCM), focus group discussions (FGDs), key informant interviews (KIIs), direct observations and household interviews were applied. Results indicated a significant involvement of the respondents (84%) in the process of implementation of VPLUPs, especially in meetings (95%). A significant majority (91%) favoured the inclusion of VLFRs in VPLUPs. Most of the respondents (85%) were satisfied with the implementation process of VPLUPs and most (94%) were willing to adhere to VPLUPs initiatives. Both challenges to and supportive factors for the implementation of VPLUPs were identified by the respondents. Due to the current high levels of participation in the initiative and potentially agreeable outcomes, it is concluded that VPLUPs and VLFRs might contribute to sustainable implementation of the REDD+ initiative.

Keywords: challenges, community perceptions, supportive factors, Reduced Emission from Deforestation and forest Degradation, Village Land Forest Reserves, Village Participatory Land Use Plans

INTRODUCTION

One of the key elements during the implementation of Village Participatory Land Use Plans (VPLUPs) in Tanzania is the allocation of land to different uses (preparation of land use plan) in a participatory manner by involving the community who are the users of the land (Kalenzi 2016, NLUPC 1998, URT 2007). In the Tanzania's Land Use Planning Act of 2007, Village Land Forest Reserve (VLFR) is among the land uses proposed to be part of village land use plans. Thus, in the land use allocation process, among other land uses, villagers need to participate, deliberate over the inclusion of VLFRs and declare an area (specifying it's size and location) for VLFR (URT 2007). As such, a participatory land use plan is meant to ensure that local land users are given the opportunity to play a role in the activities and decision-making process regarding land and resource use from which they derive their means of livelihood.

Participatory land use planning brings stakeholders together to develop a common pool of ideas, agree upon a way forward regarding proper land uses, and promote the resolution of land use conflicts (GIZ 2011). According to IFAD (2014), it provides an opportunity for marginalised groups such as women, youths, pastoralists, fishers, hunters and gatherers to take part in a Land Use Planning (LUP) process. Participation is conceptualised in a variety of ways (Chowdhury 2004, Reed 2008, Rowe *et al*. 2004). While some have conceptualised that participation denotes empowering communities (Eilola *et al*. 2015), others conceptualise participation as the involvement of various stakeholders in planning, designing, implementation and evaluation of actions (Reed *et al*. 2009). In addition, according to FAO (2012) and Hoben *et al*. (1998), participation is defined as a process through which various stakeholders come together to influence policy creation, share control over development initiatives and resources related to them. In this study, participation is viewed as community involvement in the implementation of activities and decision-making and how they are involved in creating VPLUPs and related activities. According to Pretty (1995), participation may be manifested in various forms ranging from manipulation to self-mobilisation (Figure 1).

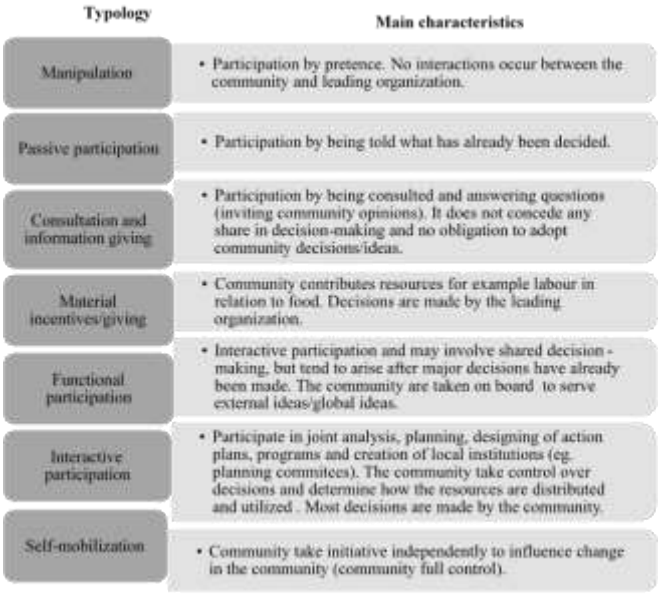

FIGURE 1 *Typology/scales of participation*

Source: Pretty 1995.

Several studies emphasise the importance of community participation in conservation initiatives and the successful implementation thereof (Ferranti *et al*. 2010, Kaswamila and Songorwa 2009, Maier *et al*. 2014, Pretty 1995, 2003, Silori 2007). While, it is apparent that the involvement of community in conservation initiatives helps to ensure success in the implementation and positive outcomes of the initiative (Pretty 2003), lack of community involvement can be detrimental to the successful implementation of a conservation initiative (Kaswamila and Songorwa 2009, Silori 2007). Community participation reduces marginalisation of disadvantaged groups, for example, women and youths and promote social cohesion (Stringer, 2006). It is emphasised that if a community makes decisions over a conservation initiative, it is likely to receive greater acceptance, and thus facilitate its sustainable implementation (Ferranti *et al*. 2010, Maier *et a*l. 2014). McNeely (1995) and Wells and Brandon (1992) noted that, if a community participates in the management of natural resources, it will more likely support conservation activities. Thus, it can further be hypothesised that involvement of community in the implementation of a conservation initiative would lead to community satisfaction with that initiative. In the same vein, willingness to adhere to the conservation initiative would be associated with involvement in its implementation process, agreement with the implemented activities and general satisfaction with the implementation process. Lastly, satisfaction may also be driven by involvement and agreement with the implementation of the conservation initiative.

As elucidated earlier that VLFRs are part of VPLUPs they are, also among others, viewed as building blocks for the promotion and implementation of Reduced Emission from Deforestation and forest Degradation plus (REDD+) initiative. In this case, they are key components of VPLUPs within the context of the REDD+ initiatives. Thus, the implementation of VPLUPs as a prerequisite of the REDD+ initiative in the Kilosa district of Tanzania was associated with the allocation of land for VLFRs among other land uses. Villagers were the main stakeholders involved during the implementation process of VPLUPs, and as stipulated by Tanzanian policies, they were required to declare their interest or lack thereof in including VLFRs in the plans, and to stipulate the size and location of the forest reserve (VPLUP Reports 2010, 2011). However, since the establishment of VPLUPs and the decision to make VLFRs part of the plans, information on how the community perceived the implementation process and the inclusion of VLFRs in the plans has been minimal and neither fully explored nor documented.

As observed by Logomo (2009), understanding community perceptions is of great importance in natural resources management and conservation. Community perceptions are thus necessary for the effective implementation of VPLUPs and in the management and conservation of forest resources because they provide important information on how the community perceive the plans. In this study, "community" is viewed as the collection of individuals or groups of people who live in the same place and have diverse characteristics in terms of their interests and perceptions (Agrawal and Gibson 1999). In addition, while community perceptions combine individual experiences to form a collective experience or belief, perceptions refer to the process by which individuals analyse a phenomenon and provide a meaningful experience about that phenomenon (Alder 2008). Perceptions explain the subjective way in which individuals or groups of people experience, understand their environment, and associated processes (Beyerl *et al.* 2016, Htun *et al.* 2011). It is further conceptualised that although a community might have a common objective of conservation, the individual actions or activities and experiences of the conservation initiative might vary (Agrawal and Gibson 1999). Thus, understanding how VPLUPs were implemented and what community perceptions are of the inclusion of VLFRs in the plans is crucial for the decision-making process. This knowledge is important for the success (the achievement of an objective or purpose) in implementing both VPLUPs and VLFRs under the REDD+ initiative, but in particular for the planning process and associated decision-making.

The objective of this research was to examine the implementation of VPLUPs and evaluate community perceptions of the use of VLFRs. Specific objectives were to: i) assess community involvement in the VPLUPs process; ii) explore community perceptions of the inclusion of VLFRs in VPLUPs; iii) determine the level of community satisfaction with the implementation process and willingness to adhere to or comply with VPLUPs; and iv) assess both challenges to and supportive factors for VPLUPs implementation. This analysis was based on a case study of the REDD+ initiative in the Kilosa district of Tanzania. This REDD+ initiative was one of the nine REDD+ pilot projects in Tanzania. This pilot project was led by the Tanzania Forest Conservation Group (TFCG) (a non-governmental organisation on forest conservation) in collaboration with Tanzania Community Forest Conservation Network (MJUMITA).

The REDD+ initiative aims to manage and conserve VLFRs through Community Based Forest Management (CBFM) and ensure that forests serve as a platform for carbon storage and community's livelihood, and also enhance local level governance structures (Kajembe *et al*. 2015, TFCG 2012, Vatn *et al*. 2013). Thus, the community would benefit from both non-carbon benefits (NCBs) and selling carbon credits (carbon funds) when they manage and conserve their forests (*ibid*). NCBs denote benefits under the REDD+ initiative that go beyond forest carbon storage and sequestration such as livelihood improvement, biodiversity conservation, improving forest governance including tenure security, and environmental goods and services (Angelsen *et al*. 2009).

The implementation of the Kilosa REDD+ initiative and related activities employed a participatory approach embedded in the principles of free prior and informed consent (FPIC) (communal orientation, communal consent and communal participation) (Dyngeland *et al.* 2014, Forrester-Kibuga *et al.* 2011). This approach was used to inform and involve the majority of villagers in the process (Dyngeland *et al.* 2014).

METHODOLOGY

Description of the study area

The study was conducted in the villages of Chabima, Dodoma Isanga, Kisongwe and Mfuruni in the Kilosa district of Tanzania. The Kilosa district was chosen because it has the characteristics relevant to the research focus, such as being the district where the REDD+ project was first piloted in Tanzania, it adopted the CBFM approach, and the community perceptions of VPLUPs and the inclusion of VLFRs in these plans have not been fully

explored and documented. The studied villages were selected based on their involvement in the REDD+ initiatives, and their execution of VPLUPs for a minimum of five years. In addition, they covered both the highland (Kisongwe and Mfuruni) and lowland areas (Chabima and Dodoma Isanga). The inclusion of two locations were necessary as they had different characteristics in terms of topography, infrastructure and accessibility.

The Kilosa district is one of the six districts of the Morogoro region. This district lies between 6°00' and 8°00' S latitude and 36°30' and 38°00' E longitude (Figure 2) at an altitude ranging from 550 m to 2 200 m above sea level (a.s.l.) (KDC 2012). The district receives a mean annual rainfall that ranges between 500 mm and 1 600 mm and has an annual temperature of between 25°C and 30°C. The rainfall distribution is binomial, characterised by two rain peaks per year, with dry spells separating the short rain period between October and December from the longer rain period between February and May (KDC 2012, Mutabazi *et al.* 2014). The vegetation in the area is classified as Miombo woodlands dominated by *Brachystegia boehmii, B. spiciformis, B. microphylla, Commiphora spp, Combretum spp* and *Albizia spp* (Shishira *et al.* 1997). The total population of the district is 438 175 (URT 2013) and their main economic activity is agriculture, which is practised by 80% of the people (Derman *et al.* 2007, Kajembe *et al.* 2013).

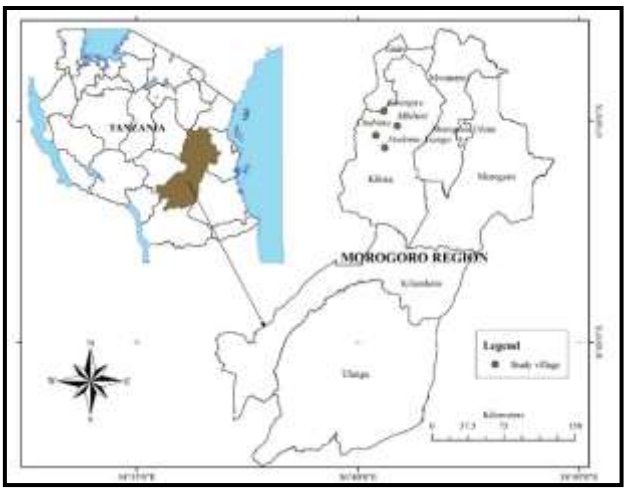

FIGURE 2 *Location of the study area*

Research design and sampling procedures

This study sought to answer the 'what' and 'how' questions, which are often associated with quantitative and qualitative research respectively (Donley 2012). Thus, a mixed method research design was used (Creswell 2014). This design allows the collection, analysis, integration and interpretation of data based on both qualitative and quantitative approaches

(Creswell and Plano 2011). The survey employed a multistage sampling technique whereby the studied villages were selected purposively, focusing on villages involved in the REDD+ project, with two villages from the highland (Kisongwe and Mfuruni) and two from the lowland areas (Chabima and Dodoma Isanga). Purposive sampling was also used to select participants for participatory community mapping (PCM), focus group discussions (FGDs), key informant interviews (KIIs) and field observations (random transect walks) (Donley 2012, Patton 2002). Simple random sampling (Donley 2012, Sapsford and Jupp 2006) was used to select 328 households from a sampling frame of 1826 households for the household survey.

Data collection

Data were collected between July 2016 and January 2017. Both quantitative and qualitative data collection techniques were designed to capture data on community's involvement and participation in VPLUPs process and their perceptions of the inclusion of VLFRs in VPLUPs (Creswell 2014, Donley 2012). Other data collected focused on community satisfaction with the implementation process, community willingness to adhere (follow or comply) to VPLUPs, and perceived supportive factors and challenges for the implementation of VPLUPs. Quantitative data were collected through household interviews using a questionnaire, while qualitative data were collected through PCM (four cases), FGDs (12 cases), KIIs (16 cases) and field observation methods by using a checklist (guiding questions). PCM involved people who were knowledgeable about the village boundaries and were involved in VPLUPs implementation. FGDs involved three groups that included: i) institutions (comprised of representatives from educational institution, village groups such as Village Community Banks (VICOBA), beekeeping, livestock keepers, farmers and Village Government); ii) Village Land Use Management Committee (VLUMC); and iii) Village Natural Resource Committee (VNRC). KIIs involved a District Natural Resource Officer (DNRO), the REDD+ project officers, the Village Executive Officers and the representatives of people from each village who were knowledgeable about the research issues.

Data analysis

Quantitative data were organised and analysed to generate both descriptive and inferential statistics using Statistical Package for Social Sciences (SPSS) (version 24) and Microsoft Excel 2016 (Landau and Everitt 2004). Descriptive statistics were used to analyse community involvement in the VPLUPs process, community perceptions of the inclusion of VLFRs in VPLUPs and community satisfaction with the implementation process. Descriptive analysis

were carried out on the community's willingness to adhere to VPLUPs, and supportive factors and challenges for the implementation of VPLUPs. The Binomial test was used to test whether proportions from a single dichotomous variable (yes=1 and no=0 responses) were significantly different. The significance level considered was 5%, thus a p-value (probability value) of ≤ 0.05 was considered statistically significant. The Chi-square (χ^2) test was used to analyse the level of dependence, as indicated in Table 1. Pearson's value was considered for a 2x3 matrix, while Yates' correction for continuity (Yates Chi-square test) was considered for a 2x2 matrix (Musyoki *et al.* 2013, Pallant 2013).

TABLE 1 *Different hypotheses tested*

Hypothesis	**Dependent variable**	**Independent variable**
1. There is no significant difference between gender (male and female) and involvement in the implementation process of VPLUPs	Involvement in the implementation process of VPLUPs	Gender (Male and Female)
2. There is no significant difference between age groups and involvement in the implementation process of VPLUPs	Involvement in the implementation process of VPLUPs	Age (18–44, 45–64, >64)
3. There is no significant difference between agreement with the inclusion of VLFRs in the plans and involvement in the implementation process of VPLUPs	Agreement with the inclusion of VLFRs in the plans	Involvement in the implementation process of VPLUPs
4. There is no significant difference between satisfaction with the implementation process of the plans and involvement in the implementation process of VPLUPs	Satisfaction with the implementation process of the plans	Involvement in the implementation process of VPLUPs
5. There is no significant difference between satisfaction with the implementation process of the plans and agreement with the inclusion of VLFRs in VPLUPs	Satisfaction with the implementation process of the plans	Agreement with the inclusion of VLFRs in VPLUPs
6. There is no significant difference between willingness to adhere to the plans and involvement in the implementation process of VPLUPs	Willingness to adhere to the plans	Involvement in the implementation process of VPLUPs
7. There is no significant difference between willingness to adhere to the plans and agreement with the inclusion of VLFRs in VPLUPs	Willingness to adhere to the plans	Agreement with the inclusion of VLFRs in VPLUPs
8. There is no significant difference between willingness to adhere to the plans and satisfaction with the implementation process of VPLUPs	Willingness to adhere to the plans	Satisfaction with the implementation process of VPLUPs

Qualitative data obtained mainly from PCM, FGDs, KIIs, direct observations and documentary reviews were analysed using qualitative content analysis techniques focusing on the content, underlying themes and meaning of text (Bless *et al.* 2016, Donley, 2012, Patton 2002).

RESULTS AND DISCUSSIONS

Community involvement in the implementation of VPLUPs

Results showed significant evidence that the majority (84%) of respondents were involved in the planning and implementation process of VPLUPs (Table 2). Of the participating respondents, 95.3% claimed that they were involved in the implementation process through meetings (village assembly and sub-village meetings), 33.1% through seminars and workshops, while only 16.1% participated through village land use boundary demarcation. Further analysis showed that there were no significant differences within either the gender (χ^2 =0.166; p>0.05) and age (χ^2 =1.09; p>0.05) categories in participating in the implementation process, indicating equal participation of males and females and all age groups in the implementation process of VPLUPs (Table 2).

TABLE 2 *Community involvement in the implementation process (N=301)*

Variable	Involvement in the implementation process		Total	Chi-square (χ^2) value	Sig value
	No	Yes			
Gender					
Female	18 (6%)	106 (32.2%)	124 (41.2%)		
Male	30 (10%)	147 (48.8%)	177 (58.8%)	Continuity	0.684^{ns}
Total	48 (16%)	253 (84%)	301(100%)	(0.166)	
Age					
18–44	31 (10.3%)	143 (47.5%)	174 (57.8%)		
45–64	14 (4.7%)	92 (30.5%)	106 (35.2%)	Pearson	0.58^{ns}
>64	3 (1%)	18 (6%)	21 (7%)	(1.09)	
Total	48 (16%)	253 (84%)	301 (100%)		

Note: ns= not significant at 0.05

These results on community involvement were also confirmed during various discussions with discussants (participants of various discussions during PCM, FGDs, KIIs) who insisted that the process of implementing VPLUPs was participatory and provided the opportunity for many villagers to be involved, especially as it started at sub-village level. The discussants further confirmed that during the meetings they were free to ask questions and make

suggestions on the issues regarding the initiative. It was also noted that the use of sub - village meetings attracted fairly a good number of villagers including women (Dolloite 2012) and was more successful in attendance than the previous initiatives led by public authorities in the area (Vatn *et al*. 2017). More importantly, there seemed to be equal extent of participation of both gender and age groups in the implementation process. This is important because involvement of marginalised groups such as women and youths in decision-making is limited in Tanzania, as elsewhere, even though various policies promote and support participation of marginalised groups in conservation and development programmes (Campese 2011, Kaswamila and Songorwa 2009; Sharma *et al*. 2017). The gender and age groups involved may be attributed to the fact that every member of the community was invited to participate in the initiative and as noted above, the villagers were free to be involved in the discussions. Overall, the community engagement may have been partly motivated by the high interactions at the sub-village level, the high demand for land and villagers' eagerness to know what is happening on their land. Thus, despite the fact that VPLUPs were implemented as part of the REDD+ initiative, which is an external idea/global initiative, the establishment of VPLUPs seems to have succeeded in eliciting villagers' participation and decision-making in VPLUPs implementation process. This pattern embraces some characteristics of "interactive participation" (Pretty 1995).

These results are in line with the aims of VPLUPs in both Tanzania and elsewhere in Asia, which guarantee high engagement of the community in the implementation process (Bourgoin 2012, NLUPC 1998). Similarly, high levels of participation were reported in the southern part of Tanzania (Hart *et al.* 2014b). However, these results are contrary to other studies elsewhere in Tanzania (Kaswamila and Songorwa 2009, Walwa 2017) and in Asia, where low community participation in LUP was reported (Evrard 2004, in Bourgoin *et al*. 2013, Lastrelin *et al.* 2011). The reason for the low participation is that, in most cases, the communities are represented by committee members in making most decisions (Giri 2012). However, in the case of the Kilosa REDD+ initiative, despite having two committees (VLUMC and VNRC), decisions were made starting at sub-village (hamlet) meetings and finally at village general meetings. The major roles of the committees were to facilitate and ensure implementation of the decisions. Experience showed that there were generally low community participation in village general meetings (village assembly) (TFCG 2012), and upon realising this, the project proponent emphasised sub-village meetings to encourage greater participation by the community (Deloitte 2012, TFCG 2012).

Community perceptions of the inclusion of VLFRs in VPLUPs

A significant (Binomial test, $p<0.05$) proportion (56.8%) of the respondents were involved in the decision-making process on the inclusion of VLFRs in VPLUPs (allocation of village land for VLFRs), while 43.2% of the respondents were not involved. The high level of involvement of the community in the decision-making process for the inclusion of VLFRs in the plans was also confirmed during various discussions. The meetings informed the participants about the importance of VLFRs as it is linked to forest management and conservation and the participants were thus free to either accept or reject the inclusion of VLFRs in the plans. The inclusion of the community in decision-making in this study implies improved village governance. Their involvement provide them with an opportunity to influence or challenge the way initiatives are implemented, thereby improving the implementation process. This holds true as evidenced by the previous results that villagers participated in decision-making regarding the implementation of VPLUPs and related activities. There was also freedom of expression that enabled them to provide their opinions and concerns.

The result of this study reflects the observation by Blomley *et al.* (2017) that TFCG made efforts to ensure key components of REDD+ process were understood and agreed to by the community within the FPIC approach. Obua *et al*. (1998) in Uganda noted that local community involvement in decision-making processes and the management of forests serves to promote public interest and confidence. Furthermore, it builds credibility and transparency in forest management, reduces forest degradation and increases the benefit flow to the community. Lyster (2011) reported on the importance of involving the community in decision-making regarding LUP as a way of empowering the community, promoting community-based monitoring and ease discussions on LUP issues. Another study elsewhere in Asia has reported low participation in decision-making regarding zoning and planning village land uses in LUP processes (Lastrelin *et al.* 2011). This could be attributed to low participation, accompanied by limited community influence on LUP (*ibid*).

However, whether respondents were involved in decision-making or not, a significant majority (90.8%) agreed to the inclusion (agreed allocation, size and location) of VLFRs in VPLUPs. This high level of agreement was confirmed during various discussions where it was highlighted that the inclusion of VLFRs in the plan could pave the way for improved management and conservation of the forest resources and thereby link them to the aim of the

REDD+ initiative. The discussants referred to the fact that, in the past, villagers were practising shifting cultivation which resulted in the destruction of the forests. The establishment of forest reserves, however, could control this practice. The community's consent to include VLFRs in the plans implies that they were committed to manage and conserve the forest, which is necessary for the REDD+ initiative. This also implies that they were not forced to join the REDD+ initiative, which entails management and conservation of forests. At the same time, it was noted that some respondents who agreed with the allocation of VLFRs in the plans were also concerned about the size of the forest, claiming that it was too large. This is an important concern raised by the community because the Tanzanian forest policies and legislations are silent on the degazettement of VLFRs when the villagers need to change entire reserves or parts thereof for alternative activities. Notably, the discussants passionately believed that those few who disagreed with the inclusion of VLFRs in the plans were mostly the ones who owned land inside the area earmarked for forest reserves. This was evidenced by argument by this small group who disagreed with the inclusion of VLFRs in the plans because of being relocated to the new areas with insufficient and infertile land for agriculture. For this reason, a resolution was adopted to demarcate the areas for those villagers inside the area earmarked for forest reserve (who refused to be relocated) on the condition that they would not be allowed to expand the areas and that they would be responsible for any further encroachment in the forest, especially in the areas where they live. In this case, they were surrounded by the forest reserve and it was referred to as "ring plan". However, it was further noted that those surrounded by VLFRs were willing to leave if the village authorities found better places for them to continue with their agricultural activities. It is possible that over time, as the forest matures, vermin animals would be attracted to the forest and endanger the inhabitants and their farms. Thus, it is likely that they may eventually decide to relocate on their own. The possibility of the forest being repopulated by vermin animals was revealed by the villagers during various discussions. The villagers inside the VLFRs may also deliberately refuse to be relocated because they have easy access to the forest resources. The main challenge in the end will thus be to ensure that the people surrounded by VLFRs obey the rules. All the above findings concur with the aim of VPLUPs, which is to ensure greater involvement of the community in decision-making during the implementation process (NLUPC 1998, Bourgoin 2012). The findings further imply that despite having a slightly higher percentage of the villagers involved in decision-making on the inclusion of VLFRs compared to those not involved, an overall majority consented to

VLFRs being part of the plans. This shows the importance of VLFRs to the community and their voluntarily acceptance of managing and conserving the forests. The community must consent to the inclusion of VLFRs in VPLUPs in line with the principles of obtaining FPIC, as noted earlier (Dyngeland *et al*. 2014, Rahman and Miah 2017). It is also assumed that for the management and conservation of VLFRs to be effective, the community involved must accept its inclusion in VPLUPs.

Another plausible explanation for the observed communal acceptance of VLFRs' inclusion in VPLUPs could be attributed to the emphasis by the project facilitator TFCG on the need for the inclusion of VLFRs without which the community would not have been entitled to incentives associated with the conservation of their forest resources under REDD+. This could be the case as more that 90% agreed with the inclusion of VLFRs in the plans.

Additionally, the χ^2 test results indicated a significant ($p<0.05$) association between community involvement in the implementation process of VPLUPs and agreement with the inclusion of VLFRs (Table 3). These results imply that those who are involved in the implementation process of VPLUPs are more likely to agree on the inclusion of VLFRs. Thus, the earlier observed high levels of community agreement with the inclusion of VLFRs in the plans could be maintained by high community participation in VPLUPs implementation process. This further gives significant evidence to REDD+ proponents on the importance of community involvement in VPLUPs process.

TABLE 3 *Results of different variables tested (N=301)*

Dependent variable	**Independent variable**	**Chi-square (χ^2) value**	**Continuity (sig value)**
Agreement with the inclusion of VLFRs in the plans	Involvement in the implementation process of VPLUPs	14.110	0.000*
Satisfaction with the implementation process of the plans	Involvement in the implementation process of VPLUPs	15.523	0.000*
	Agreement with the inclusion of VLFRs in VPLUPs	38.671	0.000*
Willingness to adhere to the plans	Involvement in the implementation process of VPLUPs	3.479	0.062^{ns}
	Agreement with the inclusion of VLFRs in VPLUPs	18.053	0.000*
	Satisfaction with the implementation process of VPLUPs	16.957	0.000*

Note: Significant level = 5%, * = significant at 0.05; ns = not significant at 0.05;

Community satisfaction with the implementation process, compliance with the village land use boundaries and willingness to adhere to VPLUPs

Community satisfaction with the implementation process of VPLUPs

The results indicated that a significant majority (84.8%) of the respondents were satisfied with the implementation process (in the making of the plans and after the plans were made) of VPLUPs, while 5.2% were not. The observed satisfaction with the implementation of the plans was also supported in various discussions. The discussants justified their satisfaction with reference to a transparent and participatory implementation process. As noted earlier, they further made known that the meetings were open and, as such, community members were free to express their opinions and ask any questions about VPLUPs. Nevertheless, the discussants again indicated that the small group who were not satisfied with the implementation process mostly comprised of villagers who were residing in the area allocated for forest reserves (now surrounded by VLFRs). These villagers expressed the same reasons as for their disagreement with the inclusion of VLFRs in the plans that they were resettled from their productive land to infertile land, but also adding that the areas allocated for VLFRs were too large. In this scenario, it is likely that these villagers would be less likely to adhere to the plans, thus presenting a risk for future implementation of VPLUPs and ultimately REDD+ sustainability. In addition, even though these villagers are surrounded by the forest with clear demarcation of their areas, they can easily access forest resources and continue deforesting and degrading the forest. Thus, there is a need for effective monitoring of these villagers surrounded by VLFRs.

Overall, it can be hypothesised that the high number of villagers who are satisfied with the implementation process is a good indicator of their support of the plans and its associated land uses, including VLFRs. It could also mean that the community is happy with the implementation strategy used and the performance of VPLUPs, which can serve as an important input to policy and conservation interventions. Thus, with this high level of satisfaction, it may be easy to promote meaningful participation in VPLUPs interventions. These results support the findings of Vatn *et al.* (2017) in the same study area that showed that a significant majority of the villagers were quite positive to the process of REDD+ implementation because of its inclusiveness and transparency.

Moreover, relating community involvement and satisfaction, the χ^2 test results indicated a significant ($p<0.05$) relationship between community involvement in the implementation process of VPLUPs and their satisfaction with the implementation process of the plans (Table

3). This result was also confirmed during various discussions and may imply that those who are involved in the implementation process of VPLUPs are more likely to express their satisfaction with the implementation process. It is possible that the community is not only satisfied with their involvement but also with the level or extent of participation. The level of participation has been reported to determine the level of influence in this context of satisfaction (Teder 2017).

Finally, the χ^2 test results indicated a significant ($p<0.05$) relationship between community agreement with the inclusion of VLFRs in VPLUPs and their satisfaction with the implementation process of the plans (Table 3). This indicates that those who agreed with the inclusion of VLFRs in VPLUPs (in addition to community involvement in the implementation process of VPLUPs, as noted earlier) are more likely to express their satisfaction with the implementation process of VPLUPs. These results give an impression that community consent on certain issues during implementation of an initiative plays an important role in their appreciation of the implementation process. This is important information to the REDD+ proponents, namely that, in order to maintain community satisfaction with the implementation process of VPLUPs, involving community members in the implementation of the plans and securing their agreement with the inclusion of VLFRs are important.

Community perceptions of compliance with the village land use boundaries

Regarding villagers' perceptions of how well the land use boundaries, especially forest boundaries, were adhered to, the degree of obedience varied among the respondents, with most of them believing that the boundaries were often obeyed (56%) (Figure 3).

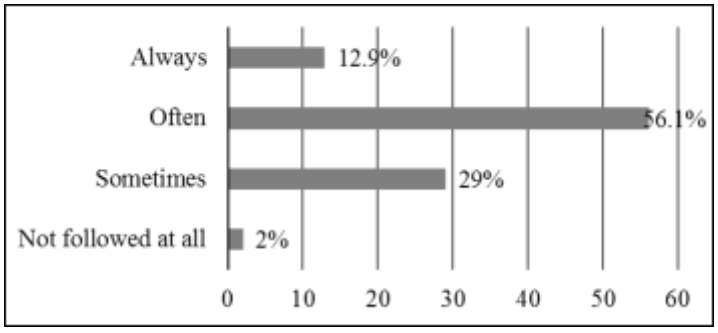

FIGURE 3 *Opinion on how well the land use boundaries are obeyed*

The results are rather controversial as manifested by various discussions, which indicated general support to land use boundaries. Also, the fact that the discussants claimed presence of boundary violations that occurred when immigrant pastoralists occasionally allow their

livestock to graze on portions of VLFRs and when some farming activities and burial practices occurred in areas not designated for such activities may support this paradox. Similarly, previous results by Vatn *et al*. (2017) reported that illegal logging and charcoal production were still carried out on portions of VLFRs. Thus, while there was a general view that the land use boundaries were followed, the 'law breakers' did not want to be seen as not abiding to the new institutional arrangement for VPLUP under the REDD+ initiative. Thus, it can be postulated that the community might have been following the land use rules imposed but only to a certain extent. Dokken (2014) made comparable observations on forest users' rule compliance elsewhere in Tanzania, especially in the Angai forest.

Generally, the fact that people somehow adhere to the boundaries is a good indicator of conformance to VPLUPs and VLFRs boundaries (Feitelson *et al*., 2017), which may potentially lead to successful implementation of VPLUPs and the REDD+ initiative. The conformance might be because the community remains involved in the implementation process as indicated above and the clear defined boundaries of the land uses as evidenced by the presence of signboards. This partly reflects the findings of Ostrom and Nagendra, (2006) who noted that when the community is engaged in the implementation process, it is likely to obey the rules imposed.

Community's willingness to adhere to VPLUPs and perceptions of its sustainability

According to various discussions, since the establishment of VPLUPs, forest boundaries have not been maintained as some of the signboards indicating boundaries had been destroyed without replacement. However, still an overwhelming (94.4%) number of the respondents were willing to adhere to the plans. The fact that people are willing to adhere to the plans, implies that future compliance with the land use rules might be high, thus reducing the risks of land use boundary conflicts. However, the observed small proportion (5.6%) of those who did not show interest in adhering to the plans mostly comprised of timber and charcoal dealers who have been against the project since its inception. The reason for being sceptical could be attributed to the benefits they accrued from the previous open access forest, while their current access to these benefit is controlled by VPLUPs. This idea was reflected in various discussions as: "*The timber and charcoal dealers were the ones against these VPLUPs because they knew that there would be no more free access to the forest for harvesting timber and charcoal production, and so they would lose their incomes.*" As argued by Loomis and Philbeck (2008), people may report their impressions differently due to their ability

(intentional, intellectual or physical). Thus, this result holds true that people who were freely accessing and benefiting from forests may intentionally have negative perceptions of the implementation of VPLUPs.

The fact that those who are against the plans are those who obtain their livelihoods from the forest in addition to those who are surrounded by VLFRs means that deforestation is likely to continue because the majority who are low-forest users are the ones who are in favour of the plans. Moreover, villagers have high expectation on future carbon payments as confirmed by various discussions, but in reality, no more carbon payment is expected in the near future due to uncertainty of the carbon markets (Lokina 2014, Vatn *et al.* 2013). Thus, this may present challenges in terms of future implementation of VPLUP and sustainable management and conservation of forests under the REDD+ initiative. For example, villagers may pressurise village government to amend the village by-laws toward their interest, which might be against REDD+. This scenario calls for the need to enhance the current and promote more alternative livelihood activities for the community especially for the frequent forest users. Unlike the findings of this study, other studies in Asia have reported relatively little adherence to the land use plans (Lastrelin *et al.* 2011, Evrard in Bourgoin *et al.* 2013). This may be explained by low awareness and participation in the planning process (*ibid*).

The χ^2 test results furthermore indicated no significant ($p>0.05$) relationship between community's involvement in the implementation process of VPLUPs and their willingness to adhere to the plans (Table 3). It is worth noting that the probability value was 0.06, which is very close to be significant. This could be the case as one might expect that peoples' willingness to adhere to the plans would be motivated by their involvement thereof. However, it could also be inferred that community willingness to adhere to VPLUPs was more likely driven by the village land use by-laws, which require every community member to adhere to VPLUPs.

Moreover, the χ^2 test results indicated a significant ($p<0.05$) relationship between community agreement with the inclusion of VLFRs in VPLUPs and their willingness to adhere to the plans (Table 3). At the same time, there was a significant ($p<0.05$) relationship between community members' satisfaction with the implementation process of VPLUPs and their willingness to adhere to the plans (Table 3). These results confirm the potential need for community agreement with the inclusion of VLFRs in VPLUPs and satisfaction with the implementation process of VPLUPs. Thus, it is likely that, with enhanced community satisfaction with the implementation process of VPLUPs (in addition to community

agreement with the inclusion of VLFRs in the plans), the community would be more willing to take actions in accordance to the plans and achieve the intended objectives of the plans and the REDD+ initiative at large.

Finally, regarding respondents' opinion on the sustainability of VPLUPs: a significant (Binomial test, $p<0.05$) majority (85.1%) anticipated that VPLUPs would be maintained in the long-run. These results were also confirmed during various discussions, which reflected the real need for maintaining VPLUPs for posterity's sake. The villagers' opinions that VPLUPs would be maintained in the long-run may be explained by the marked community involvement, satisfaction and willingness to adhere to the plans. This observation partly supports Ferranti et al. 2010 and Maier et al. 2014 who proposed that community involvement in a conservation initiative might help to ensure its sustainability.

It is possible that, if proper implementation processes continue, VPLUPs would be a long-term initiative and long-term benefits of VLFRs and the REDD+ project at large would be ensured. Lastly, it was observed that there is willingness in the community to adhere to the plans, but also the willingness can be significantly influenced by both community agreement with the inclusion of VLFRs in the plans and satisfaction with the implementation process of VPLUPs. It is thus important for the REDD+ proponents to maintain these levels of satisfaction and agreement.

Perceived main challenges and supportive factors for VPLUPs implementation

Perceived main challenges for supporting the implementation process of VPLUPs

From household interviews, fifteen key challenges (barriers) were identified concerning VPLUPs implementation. Poor knowledge about VPLUP process was the main (23.9%) challenge. Lack of village land certificates, poor infrastructure and lack of motivation and/or tokens to VLUMC were the least challenges (1.6%) (Table 4).

TABLE 4 *Perceived main challenges for supporting the implementation of VPLUPs (N=255)*

Type of challenge	Challenge	Frequency	Percent (%)
Material related	Inadequate land/land scarcity	5	2.0
	Lack of village land certificates	4	1.6
	Poor infrastructure (e.g. roads)	4	1.6
Social related	Poor knowledge about VPLUP steps	61	23.9
	Land use boundary conflict	18	7.0
	Lack of motivation/incentives to VLUMC	4	1.6
Institutional/	Inadequate law enforcement	33	12.9

management related	Non-compliance to by-laws/rules	20	7.8
	No clear farm boundaries	18	7.0
	Farmland acquisition/confiscation	14	5.5
	Cultivation in water sources	11	4.3
	Bureaucracy among village leaders	6	2.4
	Conflict of power and responsibilities between VLUMC and VNRC	5	2.0
Forest related	Forest fires	26	10.2
	Human encroachment on the forest	26	10.2

These challenges were further categorised into four groups: institutional (41.9%), social (32.5%), forest related (20.4%) and material related (5.2%) (Table 4). These results imply that most problems occur with the institutional arrangements in the implementation of VPLUPs in the area. Overall, it is possible that poor knowledge about the VPLUPs process was a major challenge because implementation of VPLUPs requires adequate knowledge of the VPLUP process and related principles and policies. Furthermore, despite high levels of participation in the community, their knowledge of VPLUPs steps is poor, indicating inadequate knowledge acquisition of VPLUPs steps during the implementation process.

A lack of motivation/incentives of VLUMCs was among the least challenges mentioned in the household interviews. However, this challenge raised a serious debate during various discussions, for example, committee members indicated that sometimes they had to leave their income generating activities in order to participate in land use issues and therefore needed to be paid some allowances. The challenge of bureaucracy was also linked to dishonesty and unaccountability among village leaders. In addition, power struggles between VLUMC and VNRC was reported and associated with unclear boundaries on their power and responsibilities, especially on the issues related to VLFRs.

In addition, the cases of villagers' breach of land use by-laws were reportedly handled with frivolity and subsequently lead to no action taken against offenders. These results imply a weakness in governance among village leaders and thus call for urgent attention to enhance the collective actions for supporting VPLUPs.

From the findings, it is concluded that the challenges are well known to the community, thus, providing an opportunity to address them especially those related to institutional challenges. Similarly, part of these challenges were reported in other areas in Tanzania (Hart *et al.* 2014a, IFAD 2013), in Malawi (Senganimalunje *et al.* 2015) and in Southeast Asia, especially Lao People's Democratic Republic (Lastrelin *et al.* 2011).

Perceived main supportive factors for the implementation of VPLUPs

The findings revealed that the community perceived eight main supportive factors or resources that could be utilised in the implementation process of VPLUPs for forest management and conservation. The villagers' acceptance of VPLUP program was frequently mentioned (32.5%), while the least mentioned (1.6%) was the village being registered (Table 5). These supportive factors were categorised in three major groups namely: social (61.8%), institutional (30.4%) and material (7.8%), indicating that the supportive factors were more skewed on social related issues (Table 5).

TABLE 5 *Perceived main supportive factors for the implementation of VPLUPs (N=243)*

Type of supportive factor	**Supportive factor**	**Frequency**	**Percent (%)**
Material related	Available village land (the village land)	15	6.2
	Village being registered/recognised	4	1.6
Social related	Perceived to be a good programme/acceptance of the program	79	32.5
	Adequate awareness about the programme itself	66	27.2
	Villagers' willingness to allocate the village land for various uses	5	2.1
Institutional/ management related	Law enforcement	27	11.1
	Presence of Village Government /village leaders	26	10.7
	Regular occurrence of village meetings	21	8.6

These supportive factors were also confirmed during various discussions, while some additional supportive factors like presence of supporting laws (such as the Land Act of 1999 and the Land Use Planning Act of 2007) were mentioned. Others were political stability within the study area, peace and security and presence of land use experts from the district and TFCG. In line with this study, the creation of Tanzanian policy and legislations that support VPLUPs were also identified as supportive factor for the implementation of VPLUPs elsewhere in the country (IFAD 2013). The discussants believed that these supportive factors were important to support the implementation of VPLUPs.

Generally, the results signify that the community knows the supportive factors available for the implementation of VPLUPs thereby providing a useful entry point to utilise as well as enhance them. However, there is a need for more promotion of the institutional and material related benefits, which seems to be less known or appreciated by the community.

CONCLUSION AND RECOMMENDATIONS

The findings of this study provide evidence that there is significant community involvement in the implementation process of VPLUPs, especially in the form of meetings. This included the decision-making process and incorporation of VLFRs in the plans. This, in fact, is a hallmark of "interactive participation", which is important in the implementation of VPLUPs in order to achieve sustainable forest management under the REDD+ initiative. There were no significant differences in the extent of involvement of both gender and age groups in the implementation process. There was a general community satisfaction with the VPLUPs' implementation processes and willingness to adhere to VPLUPs, implying that the implementation process was generally transparent and inclusive. However, community satisfaction with the implementation process was significantly influenced by community involvement in the implementation process of the plans and community agreement about the inclusion of VLFRs in the plans. Furthermore, community's willingness to adhere to the plans was significantly influenced by community agreement about the inclusion of VLFRs in the plans and community's satisfaction with the implementation process.

Although it appears that there were enormous supportive factors available for the implementation of VPLUPs, it was noted that the community experienced many barriers as well. Thus, the post VPLUPs sustainability requires monitoring and targeted support in order to achieve the REDD+ objectives. This will ultimately also ensure improved management and conservation of forests as a component of the REDD+ initiative.

However, achievement of REDD+ objectives may be constrained by uncertain future carbon markets (Chirwa 2015, Lokina 2014, Turnhout *et al.* 2017, Vatn *et al.* 2013) and mismanagement of funds, as experienced in the trial payment of carbon funds (Deloitte 2012). In addition, there were those who do not agree with the plans and will therefore be less likely to adhere to the plans. Thus, there is need for close monitoring of the small community surrounded by the forest.

Finally, the community's concerns about the lack of clear boundaries between VLUMC and VNRC where power and responsibilities are concerned, suggest that regular training interventions are required whenever new committee members are elected. Furthermore, creating a policy to utilize part of the funds obtained from fines and levies as small allowances for the committee members could address the VLUMCs' lack of incentives to encourage them for their responsibilities.

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