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RESEARCH PAPER

Lessons for REDD+ implementation: Insights from assessment of forest governance in the joint forest management system in Zambia

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Abstract
To draw lessons for informing strategies for reducing emissions from deforestation and forest degradation and fostering conservation, sustainable management of forests and enhancement of forest carbon stocks (REDD+), this study assessed community members' perceptions of the quality of forest governance in the joint forest management program relative to the ideal forest governance quality using the Katanino Joint Forest Management study area in Zambia. The study focused on six elements of good governance, namely participation, transparency, accountability, equity, efficiency and effectiveness. Using a two stage sampling procedure, data for this study was collected using questionnaires administered to 120 randomly selected community members who participated in the Joint Forest Management program in Serenje, Biwa and Bwengo villages of Katanino Joint Forest Management pilot area. Results showed considerable gaps between ideal quality of forest governance and the perceived quality of forest governance. One sample t-test results showed that the perceived quality of all the six governance elements were statistically different from the ideal quality of forest governance at the 95 % confidence interval, participation ($t_{(119)} = -76$, $\rho < 0.05$), transparency ($t_{(119)} = -130$, $\rho < 0.05$), accountability ($t_{(119)} = -82$, $\rho < 0.05$), equity ($t_{(119)} = -53.47$, $\rho < 0.05$), effectiveness ($t_{(119)} = -60$, $\rho < 0.05$), efficiency ($t_{(119)} = -87$, $\rho < 0.05$). Implications of these findings are highlighted through a governance lens to inform strategies for REDD+ implementation.

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Introduction

Reducing emissions from deforestation and forest degradation and fostering conservation, sustainable management of forests and enhancement of forest carbon stocks (REDD+) has emerged as a key international strategy to halt land-use related emissions in developing countries (Corbera and Schroeder, 2011; Leventon *et al.*, 2014; Matakala, 2016). A central tenet of the REDD+ mechanism involves performance-based payments that incentivize reductions in greenhouse gas (GHG) emissions from deforestation and forest degradation (Sekeleti, 2011). It is envisaged that well-designed REDD+ mechanisms will have positive effects on biodiversity, ecosystem conservation and the livelihoods of forest-dependent communities (Broekhoven *et al.*, 2012; Kokwe, 2012). While REDD+ is intended to prevent forest loss (Leventon *et al.*, 2014) and is not primarily a governance reform per se, it is argued that it will affect or could be affected by existing forest governance to a considerable extent (Iqbal and Hussain, 2013; Larson and Petkova, 2011).Moreover, in the recent past, the 'writings' on REDD+ mostly stress the need to focus on governance issues (Gregersen *et al.*, 2010; Cobera and Schroeder, 2011) given that increasing the quality of governance tends to be associated with a decrease in deforestation rates and long-term carbon storage globally (Umemiya *et al.*, 2010).Thus, to draw lessons for informing strategies for REDD+ implementation, this study assessed community members' perceptions of the quality of forest governance in the joint forest management program relative to the ideal forest governance quality using the Katanino Joint Forest Management study area in Zambia.

The Republic of Zambia is one of the developing countries piloting the UN-REDD programme, which is aimed at preparing countries for REDD+ implementation by building institutional and technical capacity (Matakala, 2016). As part Zambia's participation in the UN-REDD programme (Leventon *et al.*, 2014), Joint Forest Management (JFM) has been identified as a forest management approach for implementing REDD+ (UNDP *et al.*, 201; Kokwe, 2012).

JFM is a forest management strategy under which the government represented by the Forestry Department and the local communities living adjacent to the local forests enter into an agreement to jointly protect and manage forests while sharing responsibilities and benefits (Kokwe, 2012; Matakala, 2016). The JFM approach enables local communities, by virtue of their rights over land, to invest in and derive benefits from the sustainable management and utilization of forest resources in their area (Mbewe, 2007).

Forest governance arrangements that determined how central questions regarding forests, livelihoods and sustainability have been answered to date will also determine how they will be answered under REDD+ (Larson and Petkova, 2011). Thus, lessons and experiences from previous forest-related initiatives explored through a governance lens (Kanowski *et al.*, 2011) are critical for informing strategies for REDD+ implementation. Identifying governance gaps (Pedroni *et al.*, 2009) in previous forest-related initiatives in ways that are consistent with the principles of good forest governance is essential for REDD+ success (Kanowski *et al.*, 2011). However, comprehensive studies focused on drawing lessons and experiences from JFM to inform strategies for REDD+ initiatives through a governance lens are rare in Zambia. Therefore, to address this gap, this study was aimed at assessing perceptions of the quality of forest governance in the joint forest management program relative to the ideal forest governance quality using the Katanino Joint Forest Management pilot area in view of informing strategies for REDD+ implementation. The study focused on six elements of good governance namely participation, transparency, accountability, equity, efficiency and effectiveness. This is because good forest governance is associated with structures and processes that ensure multi-stakeholder participation, accountability of actors and decision makers, transparency of decision- making, efficient and effective management of forest resources, as well as fair and equitable allocation of resources and benefits (Larson and Petkova, 2011; Sekeleti, 2011).

Material and methods

Study site

The Katanino JFM pilot area lies 80 km from Ndola and is traversed by the Ndola-Kapiri Road, the main highway that links Copperbelt Province to Lusaka, the nation's capital. Situated in Masaiti District in the Copperbelt Province of Zambia, Katanino JFM pilot area constituted one of the seven JFM pilot sites under the Provincial Forestry Action Programme (kokwe, 2012; Matakala, 2016). Villages situated in close proximity to Katanino Local Forest, with a population size of 3,842, were organized into four zones for purposes of JFM piloting. Katanino JFM area was chosen as a case study because it represents a hotspot endowed with richness of complex data ideal for governance exploration critical for informing strategies for REDD+ implementation. Notwithstanding the restriction of generalizing the findings of this study to other JFM areas, results of this highlight the governance issues that need to be considered in each context.

Research instrument

The questionnaire used in this study contained indicators reflecting elements of good governance (FAO &PROFOR, 2011). The elements included accountability, effectiveness, efficiency, equity, participation and transparency. These elements were chosen because they are comprehensive in nature and have a global relevancy (Iqbal and Hussain, 2013). Each element was measured using six indicators which represented differing facets of the elements to obtain a more well-rounded perspective of the elements (Hair et al., 2010).Modified to suit the local context, the indicators were adopted from Giri (2006), Gyawali (2009) and Iqbal and Hussain (2013). The indicators were scaled on a four-point Likert scale, 1 to 4 in an increasing order of poor, medium, good and excellent forest governance quality. Score 4 on the scale represented the ideal forest governance level. The questionnaire was pretested on 15 community members who participated in the JFM program in Serenje, Biwa, and Bwengo Villages in April 2017.

Reliability assessment results showed that the indicators used to measure perceptions of participation, transparency, accountability, equity, effectiveness and efficiency had acceptable internal consistency with Cronbach's alpha ranging from 0.8 to 0.85. All items in the questionnaire were retained although some items were slightly modified in wording to improve comprehensiveness based on feedback from the pretest.

Sampling design and sample size

A two-stage sampling procedure was used in this study. In the first stage, three of the four villages organized during piloting the JFM program were randomly selected given that organization of the four villages was done arbitrarily (Umar and Vedeld, 2012). In the second stage, participants from three villages who participated in the JFM program were selected using simple random sampling.

The minimum sample size for this study was determined using the confidence interval approach (Burns and Bush, 1995; Kwenye and Freimund, 2016). To obtain a 90% desired accuracy at the 90% confidence level with the response and usable rates set at 70 % and 10 % respectively, the required minimum sample size was 110. A total of 120 community members who participated in the Katanino JFM program were randomly selected in Biwa, Bwengo and Serenje villages. Data for this study was collected in April and May 2017.

Data analysis

Data for this study was analyzed using STATA 13.0 and Excel. Gap analysis, One-sample t-test and analysis of variance (ANOVA) at a significance level of $\rho \leq 0.05$ were used to analyze the survey data. One sample t-test was conducted to determine whether the perceived quality for each of the six elements of forest governance were statistically different from the ideal quality of forest governance. Consequently, the mean score for each of the six elements of forest governance were compared with the mean score of 4 and six null hypotheses were tested: (i) H_0: actual mean scores of participation = ideal mean score of 4,

(ii) H_0: actual mean scores of transparency = ideal mean score of 4, (iii) H_0: actual mean scores of accountability = ideal mean score of 4, (iv) H_0: actual mean scores of equity = ideal mean score of 4, (v) H_0: actual mean scores of effectiveness = ideal mean score of 4, and (vi) H_0: actual mean scores of efficiency = ideal mean score of 4.

The one way ANOVA was conducted to determine if there were statistically significant differences in the mean of respondents' scores (i.e. actual mean scores) for participation, transparency, accountability, equity, effectiveness and efficiency based on the three villages - Serenje, Biwa and Bwengo. Gap analysis between respondents' scores on the quality of forest governance and the score for the ideal quality of forest governance was undertaken using the spider chart, mean scores and percentages.

Outliers and distribution of all measured variables were examined to purify the data and reduce systematic errors. Normality assessment results showed that the data did not deviate from multivariate normality. Outlier detection results showed that there were no outliers in the data.

Results and discussion
Demographic characteristics of study sample
General demographic characteristics of the study sample are provided in Table 1.

Table 1. General demographic characteristics of study sample.

Characteristic	Percentage
Sex	
Female	60.0
Male	40.0
Age	
40-45	37.5
46-55	38.3
56-65	22.5
> 66	1.7
Annual household income	
< K10,000	75.0
K10,000 - K20,000	25.0
Education level	
Primary	57.0
Secondary	43.0

An analysis of the study sample shows that males were in the majority (60 %) with the most represented age group being 46-55 years old (38%).

The results also showed that majority of the respondents earned less than K10, 000 annually (75 %).

Summary statistics of respondents' perception of the quality of forest governance
Summary statistics for respondents' perceptions of the quality of the six forest governance elements are provided in Table 2.Participation had the highest mean score of 2.79, while equity had the lowest mean score of 2.01.

Table 2. Summary statistics for the governance elements.

Forest governance element	Mean	SD
Participation	2.79	0.17
Transparency	2.31	0.14
Accountability	2.02	0.23
Effectiveness	2.44	0.28
Equity	2.01	0.41
Efficiency	2.42	0.20

A comparison of respondents' mean scores and the ideal score of 4 representing good forest governance showed that respondents' mean scores for all the six elements of forest governance were below the ideal score (Table 3).

Table 3. Comparison of ideal and actual quality of forest governance elements: Achievement and gap analysis.

Elements of Forest Governance	Mean score (Ideal)	Mean score (Actual)	Achievement (%)	Gap (%)
Participation	4	2.79	69.75	30.25
Transparency	4	2.31	57.75	42.25
Accountability	4	2.02	50.50	49.50
Equity	4	2.01	50.25	49.75
Effectiveness	4	2.44	61.00	39.00
Efficiency	4	2.42	60.50	39.50

Comparison of actual and ideal forest governance by achievement and gap analysis

Gap analysis results showed that respondents' actual scores for equity had the largest variance from the ideal score for good forest governance (49.6%) while participation had the smallest variance (30.3%).

In terms of closeness to the ideal standard for good forest governance, the achievement analysis results showed that participation had the highest achievement (69.8%) while equity had the lowest achievement (50.3%).

Table 4. Mean score and a comparison of ideal and actual quality of forest governance elements in Serenje, Biwa and Bwengo villages: Gap analysis.

Elements of Forest Governance	Serenje Village			Biwa Village			Bwengo Village		
	Mean score (Actual)	Mean score (Ideal)	Gap (%)	Mean score (Actual)	Mean score (Ideal)	Gap (%)	Mean score (Actual)	Mean score (Ideal)	Gap (%)
Participation	2.79	4	30.3	2.79	4	30.3	2.78	4	30.5
Transparency	2.33	4	41.8	2.31	4	42.3	2.31	4	42.3
Accountability	2.04	4	49.0	2.03	4	49.3	1.99	4	50.3
Equity	2.02	4	49.5	1.98	4	49.5	2.04	4	49.0
Effectiveness	2.45	4	38.8	2.42	4	39.5	2.45	4	38.8
Efficiency	2.42	4	39.5	2.44	4	39.0	2.41	4	39.8

This is finding is consistent with the spider web chart results in Figure 1 which showed that respondents' mean score for participation had the smallest gap from the ideal score for good forest governance while equity had the largest gap. Similarly, as shown in Table 4, gap analysis results for Serenje, Biwa and Bwengo villages showed that the respondents' mean scores for each of the six elements of good forest

governance were below the ideal score of 4. Additionally, for all the three villages, results showed that participation had the smallest variance from the ideal score for good forest governance. Overall, an analysis of respondents' mean scores and the gap analysis results showed that respondents perceived good forest governance to have been reflected more through participation, effectiveness and efficiency than through equity, accountability and transparency. This finding is in contrast with Iqbal and Hussain (2013) whose results showed that good forest governance was reflected more through transparency and equity than through participation and effectiveness using a Pakistan setting.

Table 5. ANOVA results for statistical differences between groups: Serenje, Biwa and Bwengo villages.

Element	Source	DF	SS	MS	F	ρ
Participation	Between groups	0.005	2	0.003	0.09	0.914
	Within groups	3.603	117	0.031		
	Total	3.609				
Transparency	Between groups	0.014	2	0.007	0.36	0.697
	Within groups	2.319	117	0.020		
	Total	2.333				
Accountability	Between groups	0.054	2	0.027	0.49	0.612
	Within groups	6.421	117	0.054		
	Total	6.475				
Effectiveness	Between groups	0.020	2	0.010	0.12	0.886
	Within groups	9.563	117	0.082		
	Total	9.583				
Equity	Between groups	0.060	2	0.030	0.18	0.838
	Within groups	19.672	117	0.168		
	Total	19.731				
Efficiency	Between groups	0.018	2	0.009	0.23	0.795
	Within groups	4.591	117	0.039		
	Total	4.609				

Comparison of respondents' perceptions of the quality of forest governance across the three villages

Table 5 showed that for all the six elements there were no statistical differences between respondents' perceptions of the quality of forest governance in the three villages namely Biwa, Serenje and Bwengo at the 95 % confidence interval. Thus, it has been demonstrated that perceptions of respondents were consistent across the villages. Results of this study are in line with Iqbal and Hussain (2013) who also reported consistence of the perceptions of their respondents using a Pakistan setting.

Comparison of actual and ideal quality of forest governance

Table 6 showed results of the comparison of the mean ideal score and the mean scores for each of the six elements of forest governance. The results showed that respondents' mean scores for the six elements were statistically different from the ideal mean score of 4 at the 95 % confidence interval. Therefore, all the six null hypotheses tested in this study are rejected. Rejection of the null hypotheses has demonstrated that the perceived quality of each of the six elements of forest governance differed from the ideal quality of each of these elements.

Lessons for REDD+ implementation in Zambia

Empirical evidence in this study has shown that respondents perceived the quality of forest governance in the JFM program to be lower than the ideal quality of good forest governance. That is, all the six elements of good forest governance were perceived to be lower than the ideal quality of good forest governance. Consequently, this study's finding provides lessons for REDD+ implementation in Zambia. Specifically, it reveals the need for forest governance reforms when employing the JFM model, in particular around mechanisms for equitable decision making processes, as well as mechanisms for fostering and strengthening transparent and accountable institutions and decision making processes. Forest governance reforms tailored to addressing equity require ensuring that all the stakeholders, particularly the most vulnerable have the opportunity to participate in the decision making process. Moreover, their interests need to be considered by decision makers in the decision making process.

Table 6. One sample t-test results.

Element	Mean	SD	t-value	DF	ρ
Participation	2.79	0.17	-76.27	119	0.000
Transparency	2.32	0.14	-130	119	0.000
Accountability	2.02	0.23	-91.94	119	0.000
Equity	2.01	0.41	-53.47	119	0.000
Effectiveness	2.44	0.28	-60.10	119	0.000
Efficiency	2.42	0.20	-87.89	119	0.000

With regards to accountability, reforms should be tailored to establishing mechanisms that ensure that institutions with decision making authority have an obligation to report, explain and be answerable for the consequences of decisions they make. Such mechanisms include, for example, establishing clear criteria for evaluating the performance of decision makers. Furthermore, establishing internal and external audits to provide checks and balances is critical for fostering accountability. Linked with accountability is the issue of transparency (DESA, 2009). Transparency in decision making is considered as an important factor in improving the ability of stakeholders to hold key decision makers accountable for their actions (Broekhoven *et al.*, 2012). Moreover, it helps to build trust between stakeholders and break down barriers between historically opposed parties (Sekeleti, 2011). Results of this study have shown that if the JFM model is to be used to implement REDD+ strategies, there is need to ensure that stakeholders, particularly the local communities follow and understand the decision making process.

This requires involving them at every stage of the decision making process. Further, clarity on how and why decisions are made is fundamental for fostering transparency. This requires ensuring that information on decisions and the decision making processes are available and accessible by all the stakeholders (DESA, 2009).

Safeguards intended to ensure that REDD+ delivers win-win scenarios whereby forests are conserved alongside community development (Harvey *et al.*, 2010; Kelly, 2010) include requirements for full and effective participation of relevant stakeholders including local communities (UNFCCC, 2010). A critical aspect that fosters participation is the involvement of multi-stakeholders in the decision making process. Therefore, if JFM is to be used as a model for delivering REDD+ with safeguards, greater attention must be paid to strengthening multi-stakeholder participation. This necessitates the need to avoid peripheral involvement of sectors that influence forest management such as agriculture and energy among others.

Enhanced intersect oral collaboration linked to village and forest area management governance structures is fundamental in view of considering REDD+ within the wider livelihood activities of forest communities (Leventon *et al.*, 2014). Such an endeavor requires developing sustained structures for intersect oral collaboration. Intersect oral collaboration is fundamental in ensuring that REDD+ creates incentives that ensure lasting and achievable emission reductions while maintaining and improving other ecosystem services that forest provide (Sekeleti, 2011).

Forest governance reforms will need to be complemented by reforms across sectors that affect forests. This is because policies outside the forestry sector have a significant impact on forests (Broekhoven *et al.*, 2012; Sekeleti, 2011). Furthermore, the governance reforms will need to be supported by implementation actions at the village level in order for REDD+ to be an opportunity for delivering community benefits (Leventon *et al.*, 2014). Moreover, designing transparent financial structures for the performance-based implementation of the REDD+ strategy that allows for an equitable distribution of benefits is critical. Additionally, understanding the community context and the way that the design of REDD+ initiatives fits to this context as well as the role of the broader policy context in shaping support for JFM operations is fundamental.
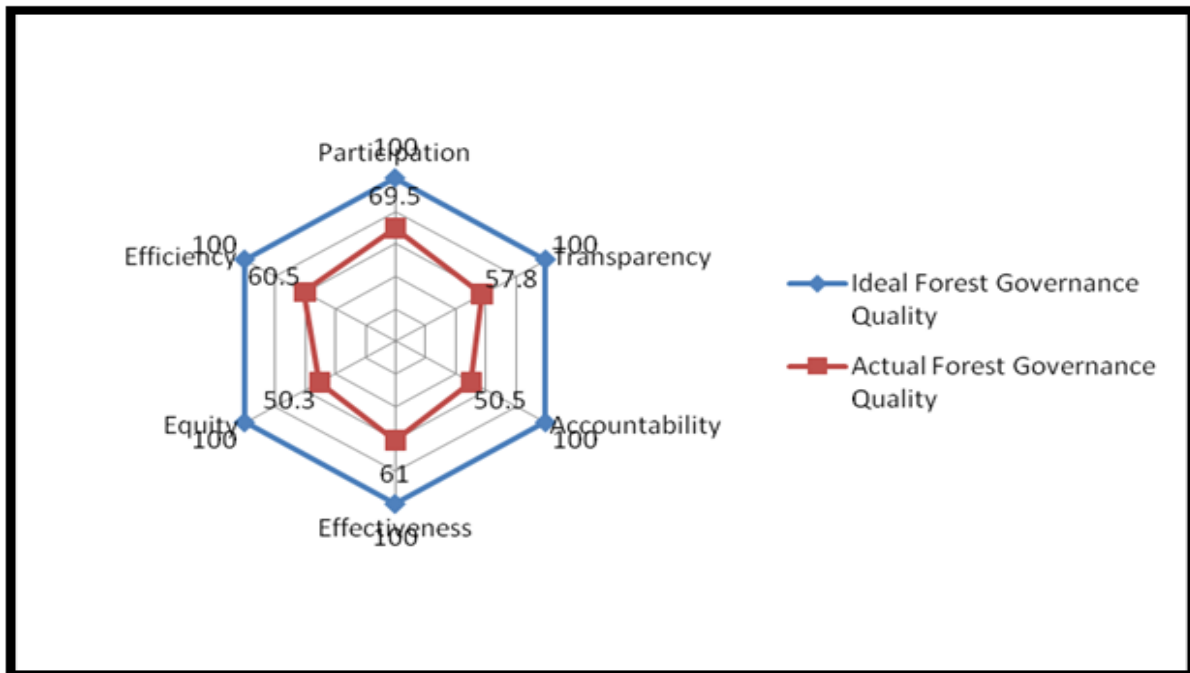
Fig. 1. Comparison between actual and ideal scores for six elements of good forest governance.

Implementing the elements of good forest governance needs to begin with defining priorities as well as a sequence for Zambia to develop the capacity of stakeholders to administer the components of good governance. Furthermore, a strategic and practical approach to improving governance should be dynamic and responsive to emerging topics and interests (Broekhoven *et al.*, 2012). In this regard, what may be considered as the focus of governance reforms currently should not be considered 'good enough' a number of years from now. Rather, it should be viewed as part of a planning process on how to move forward and build on achievements. In addition, there is need to promote forest governance monitoring which will aid in making changes that respond to new priorities, address new weaknesses and build on new strengths.

Conclusion

This study has shown considerable gaps between the ideal quality of forest governance and the perceived quality of forest governance. Among the six elements of forest governance, equity had the largest variance from the ideal quality of forest governance (49.6%) followed by accountability (49.5%) and transparency (42.3%) with participation had the smallest variance (30.3%). Achievement analysis showed that participation had the highest achievement (69.8%) followed by effectiveness (61%) and efficiency (60.5%) with equity had the lowest achievement (50.3%).

For all the six elements there were no statistical differences between the perceptions of respondents in the three villages namely Biwa, Serenje and Bwengo at the 95 % confidence interval, participation ($F(2,117) = 0.09$, $p = .913$), transparency ($F(2,117) = 0.36$, $p = 0.697$), accountability ($F(2,117) = 0.49$, $p = 0.612$), equity ($F(2,117) = 0.18$, $p = 0.838$), effectiveness ($F(2,117) = 0.12$, $p = 0.886$) and efficiency ($F(2,117) = 0.23$, $p = .795$). Thus, the study has shown that respondents' perceptions of the quality of forest governance as reflected by participation, transparency, accountability, equity, effectiveness and efficiency were consistent across the three villages.

The perceived quality of all the six governance elements were statistically different from the ideal quality of forest governance at the 95 % confidence interval, participation (t (119) = -76, $\rho < 0.05$), transparency (t (119) = -130, $\rho < 0.05$), accountability (t (119) = -82, $\rho < 0.05$), equity (t (119) = -53.47, $\rho < 0.05$), effectiveness (t (119) = -60, $\rho < 0.05$), and efficiency (t (119) = -87, $\rho < 0.05$).Therefore, the study has shown that the perceived quality of each of the six elements of forest governance differed from the ideal quality of each of these elements.

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