

The role and performance of existing governance structures in prevention and management of wildfires in Miombo woodland, Tanzania

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Abstract

Although wildfire remains a persistent threat to the forest resources and human livelihood, very limited information exists about the role and performance of existing local governance structures in the prevention and management of wildfires in Miombo woodlands. This study was conducted in nine villages of Handeni, Kilosa and Kilwa Districts, eastern Tanzania to examine how existing local governance structures were actively involved in prevention of wildfires in forests under differing management regimes. All the surveyed villages had both formal and informal governance structures responsible for prevention and management of wildfires with over 50% of respondents aware of their existence. Available formal structures included village councils, Village Environmental Committees (VEC)/Village Natural Resource Committee (VNRC), ward development committees and primary courts. These structures were charged with ensuring security in the respective villages including protecting forests against deforestation and degradation. Despite their existence in every village, most suffered poor coordination, severe under funding and poor support from the villagers who see torching of forests as their sole right to getting access to their livelihoods. The study established that existing local fire management structures are unlikely to guarantee effective prevention of this environmental threat unless the existing impediments are effectively addressed. Management of forest fires should therefore be handled through a well coordinated framework that accommodates all key stakeholders in the country and should empower existing local fire prevention machinery at the village level.

Key words: *forest management regime, human livelihoods, local institutions, miombo forests, wildfires prevention, village governance structures, Tanzania*

Introduction

Wildfires are a salient feature across the miombo woodlands affecting the potential for the miombo to provide ecosystem goods and services. Recent burn data indicate that, on average, Tanzania loses more than 11 million ha of forests to wildfire annually (Rucker and Tiemann, 2012). Most of these burns occur in protected forests and rangeland ecosystems (MNRT, 2009, Kideghesho et al., 2013) rendering severe costs to the poor, and challenges for biodiversity conservation and ecosystem management (de Groot et al., 2012; Kideghesho et al., 2013). Most wildfires in the miombo and other

rangelands are of anthropogenic origin (Butz, 2009; Kideghesho et al., 2013) and occur accidentally or deliberately (Madoffe et al., 2012). In Tanzania, wildfire incidences are most common in Tanga, Morogoro, Lindi, Mtwara, Ruvuma, Iringa, Mbeya, Rukwa, Kigoma, Kagera and Tabora regions (Kideghesho et al. 2013). The main effects of wildfires are carbon emission to the atmosphere that lead to global warming; changes in productivity and population structure of a species (Zolho, 2005); reduction of plant biomass and litter; and killing animals that are unable to escape or avoid excessive heat (Frost, 1996). Herbivorous mammals are also affected by fire through changes in

their habitat (used for cover, shelter, and structure and breeding conditions), food supplies, changes in grazing pattern and forage preference (Hassan and Rija, 2011).

The major problems facing wildfire protection in Tanzania are numerous emanating from the colonial and post-colonial forest policies that dissociated the local communities from their traditional access and utilisation of the forests (Barrow et al., 2002). Forest policies established by the Germans (1885-1916) and the British (1918-1961) authorities considered indigenous people surrounding forests as dangerous to the environment and legitimated itself in controlling all the important resources by ensuring that the indigenous people had no ownership rights over the forests (Katani, 2010; Luoga et al., 2005). As a result, through relevant legal instruments, forests became the property of the colonial state. This situation enabled only the colonisers to exploit forests and other resources, including labour (Rugumamu, 2001) and large areas of forest were cleared to establish large scale export crop plantations of coffee, tea, sisal, rubber, tobacco and cotton (Mbonile, 2005; Ylhäisi, 2003). Local communities were displaced from their ancestors' land and the authority of traditional institutions that used to control natural resources started to erode (Katani, 2010). After independence in 1961, Tanzania's forest resources were controlled by the state with management policies being characterised by centralised decision-making processes (Luoga et al., 2005). The government continued to be the custodian of most forests reserves while local communities were barred from the resources. For example, in certain instances, the local villagers were not allowed even to collect firewood from the forest reserves. Such alienation detached local communities and became indifferent to their environment. As the consequence,

in 1990s the country experienced severe forest degradation caused by tree cutting and wildfires (Blomley and Ramadhani, 2007).

Fighting and prevention of wildfire have been particularly difficult due to the limited financial resources, administrative, technological and law enforcement capacities of the states, as well as insufficient information concerning forest ecosystems. There is also the failure to recognise customary rights to land. Consequently, the Tanzanian Government revised national forest policy to enhance sustainable resource management and support local development through emphasizing a shift towards decentralization by devolution of government power to the local government levels (Pfliegner and Moshi, 2007). The National Forest Policy of 1998 puts emphasis on co-management approach termed as Participatory Forest Management (PFM) (URT, 1998). The PFM is well stated in forest policy and implementation has legal basis from the Village Land Act (1999), the Local Government Act (1982), the Forest Act (2002) and the Forest Regulations of 2004. This shift toward PFM in the 1990s was marked as emergence of new forest governance due to different actors becoming involved in the management of forest resources (Katani and Babili, 2012).

PFM entails two concepts: Community Based Forest Management (CBFM) and Joint Forest Management (JFM). CBFM takes place in forests on "village land" (land which has been surveyed and registered under the provisions of the Tanzanian Village Land Act (URT, 1999) and managed by the Village Council. Under CBFM, villagers take full ownership and management responsibility for an area of forest within their jurisdiction and it is "declared" by village government as a Village Land Forest Reserve (VLFR) and registered

by the respective District Council. The underlying policy goal for CBFM is to progressively bring large areas of unprotected woodlands and forests under village management and protection. JFM is collaborative management approach which takes place on National Forest Reserves (NFRs). PFM arrangement was aimed at achieving sustainable forest management including reducing incidences of wildfires by promoting the management or co-management of forest and woodland resources by the communities living closest to the resources. This has been achieved through improving forest governance by establishing or strengthening effective and representative village Natural Resource Management institutions (Blomley and Ramadhani, 2005). Forest governance entails interactions among structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken, and how citizens or other stakeholders have their say in the management of forest resources including biodiversity conservation (IUCN, 2004). On the other hand, good forests governance is about getting governance right and entails eight characteristics namely accountability, transparency, equity and inclusiveness, rule of law, participation, responsiveness, effectiveness and efficiency (UNESCAP, 2007).

In spite of a long history (decades) of PFM in Tanzania, wildfire problem remains a great threat and in most parts of Tanzania, fire incidences are believed to be increasing (Rucker and Tiemann, 2012). This poses the question on the effectiveness and performance of the established governance structures in wildfire prevention in the country. This study analysed the governance structures available at local village levels to examine their effectiveness in wildfire prevention in forests under different forest management regimes. The study

further entailed examination of most influential governance structures and their power source, roles of existing governance structures and performance of existing governance structures. The present study is underpinned by the fact that understanding the roles and performance of existing governance structures under different management scenarios as well as the overall socio-economic situations at local levels can help to develop effective fire management strategies that would serve as a tool for carbon storage and sequestration in the Miombo ecosystem. Such information may provide a direction toward the formation of National Fire Policy in Tanzania.

Methods

The study area and data collection

This study was conducted in nine villages, three villages located in each district of Handeni (Tanga region), Kilosa (Morogoro region) and Kilwa (Lindi region) (Fig 1). The villages were chosen based on their proximity to the forest reserves and with the assumption that the local communities would be involved in protecting the forests against destruction and forest fires. This study is part of large project investigating the influence of forest fires on the carbon stock and sequestration in Miombo woodland at Sokoine University of Agriculture. The forest reserves across the study villages are predominantly covered by miombo woodland (Madoffe et al., 2012) and the village communities surrounding these forest reserves are highly dependent on agriculture as major livelihood activity. Forest products such as fire wood, building poles and timber as well as local medicines and bushmeat are popular resources sought for by the villagers from the surrounding forest reserves.

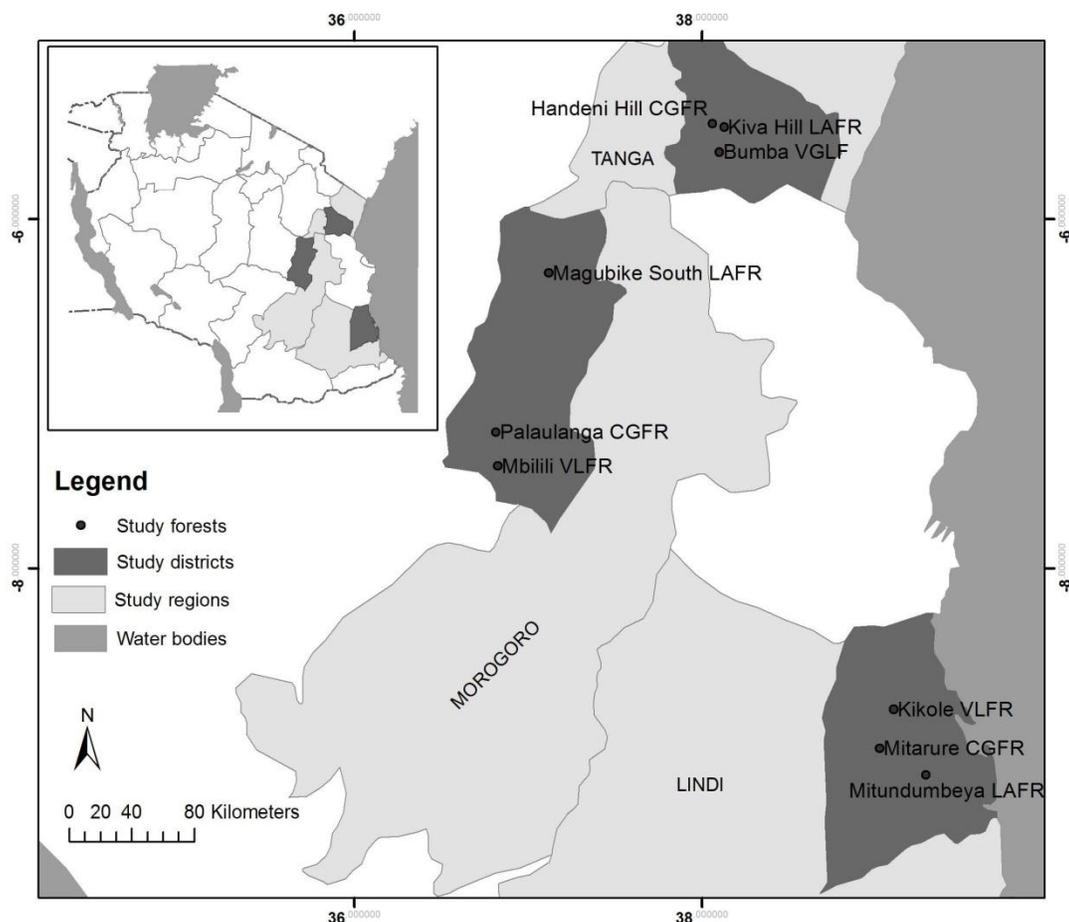


Fig. 1. Map of the study area showing the forest reserves in the three districts where sampling was done. One village closest to the forests was chosen for data collection for this study (see Table 1)

Purposive and simple random sampling techniques were employed to select study areas and sampling unit. The study districts were chosen based on availability of Miombo woodland, prevalence of fire incidences and different forest management regimes. In each district three forests (Blocks) one under Central government, Local government and Village government were selected for the study. Similarly, one village closest to the selected forest was selected for assessment of existing local governance structures responsible for wildfire prevention and management (Table 1).

Data on occurrence of forest fire incidences, institution responsible for

forest fire management, governance structures available, support structures available, roles and performance of governance structures were collected using a combination of methods; Participatory Rural Appraisal (PRA) methods, key informant interview and household questionnaire survey. The PRA method was conducted through participatory mapping and matrix scoring. Ten village participants of different knowledge background were used for the PRA exercise. The PRA team involved women and men, young and old, newcomers and old-timers, different occupations (pastoralists, agriculturists and merchants) and different professional (teachers or agricultural agents). Direct

observation was used and helped the researchers to cross check the validity of the information obtained from other methods and to gain more understanding of the real situation on socio-economic activities, fire incidences, forest conditions and organization of existing governance structures in implementing their roles. Questionnaires were administered to a total of 270 households selected randomly from the study villages. Further, a semi structured interviews were conducted to key informants in order to supplement information collected through PRA approaches, direct observations and structured questionnaire surveys. Key informants were heads of formal and informal institutions such as district natural resources officers (DNROs), leaders of village government, members of VEC/VNRC, non government organizations (NGOs), community based organizations (CBOs), projects, district

resources officers (DNROs) and faith based organizations (FBOs) and informal groups/individuals dealing with forest management (village elders, clan leaders, traditional healers, head of rituals).

Data analysis

Content analysis was used for the qualitative data collected through PRA and key informant interview. This method involved breaking down the components of recorded discussion with the respondents into smallest meaningful units of information or themes. The method helped in ascertaining the types, patterns, sequences and process of issues related to forest fire management and general forest management. The quantitative data collected through household questionnaires were analysed using simple descriptive statistics under SPSS version 16.

Table 1: Information of the selected study areas natural

District	Forest name ¹	Forest tenure/block	Village name
Handeni	Bumba VGLF	Village land	Madebe
	Kiva Hill LAFR	Local Authority	Kwedibangala
	Handeni Hill CGFR	Central government	Vibaoni
Kilosa	Ihombwe VLFR	Village government Local	Ihombwe
	Magubike LAFR	Authority	Mamboya
	Palaulanga CGFR	Central government	Madizini
Kilwa	Kikole VLFR	Village government	Kikole
	Kiwawa LAFR	Proposed Local Authority	Kiwawa
	Mitarure CGFR	Central government	Migeregere

¹VGLF = Village General Land Forest
LAFR = Local Authority Forest Reserve
CGFR = Central Government Forest Reserve

Results and discussion

Governance structures at local level

In this study, about 57.4% of respondents acknowledged presence of informal and formal governance structures while 42.6% were not aware of their existence. The stated

informal governance structures were beekeeping groups in Vibaoni and Kwedibangala villages in Handeni District. The elders performing rituals within forest reserve were effective informal governance structure in the past as they gained much respect in the village. For instance, in

Kwedibangala village it was forbidden to start forest fire due to the belief that it would kill ancestors who are in the forest collecting firewood. This result is consistent with Msuya and Mugasha (2009) who reported that in the Northern and Southern Pare Mountains, traditional institutions have been effective in protecting traditionally managed forests against human disturbances. However due to the changing attitudes in local traditions/institutions and beliefs among many youths, informal structures are increasingly losing popularity and effectiveness in protecting resources in many areas across Tanzania. Increased ethnic intermarriage, immigration, modernization and technological intervention are presently threatening and transforming or eroding the cultural rules, beliefs and taboos governing the management of forests (Katani, 2010).

Further, the formal governance structures identified in the villages include Village Government (VG), Village Council (VC), Village Natural Resource Committee (VNRC) or Village Environmental Committee (VEC), Ward Development Committee (WDC) and

Primary court (Table 2). All structures have been established in accordance to formal laws such as local government Act No. 167 of 1982, Forest Act No. 14 of 2002 and Environmental Management Act No. 20 of 2004. According to the local government Act, village governments are autonomous government and are liable to establish various committees from members of her village council including defence and security, planning and finance and social welfare. Matrix ranking based on activeness of the structure on forest protection revealed that VEC/VNRC was leading followed by VC while WDC ranked third and Primary court was least effective. The highest rank for VEC/VNRC was due to the nature of their seminal roles of protecting village environment including forests. This study found that Villages with VNRC were those implementing PFM whose members are democratically elected and are non-members of VC (Table 2). Furthermore, VEC is sub-committee and formed from members of social welfare committee. Its establishment is in line with Section 38 of Environmental Management Act No. 20 of 2004.

Table 2: PFM status and governance structures available in the surveyed villages

Village	PFM type	PFM status	Identified governance structures	Most active structure
Vibaoni		Not started	VG, VC, VEC and Court	VEC
Kwedibangala	JFM	exists	VG, VC, VNRC, WDC, Court	VNRC
Madebe	-	Not started	VG, VC, VEC	VEC
Madizini	JFM	Exist	VG, VC, VNRC VG,	VNRC
Mamboya	-	Not started	VC, VEC, WDC, Court	VEC
Ihombwe	CBFM	Exist	VG, VC, VNRC, VNRC	VNRC
Kiwawa	JFM&CBFM	Ceased	VG, VC, VNRC, WDC, Court	VNRC
Migeregere	JFM&CBFM	Ceased	VG, VC, VNRC, WDC, Court	VNRC
Kikole	CBFM	Exist	VG, VC, VNRC, WDC, Court	VNRC

The roles of VEC/VNRC and VG/VC are well elaborated in the respective regulations and or guidelines (Table 3). For instance, roles of VG (village assembly) and VC are well stated in Section 141 and 142 of Local Government Act No. 167 of 1982 while roles VEC are stipulated in Environmental management Act of 2004. On the other hand, VNRC roles have been elaborated in Forest Act No 14 of 2002 and PFM guidelines. Each forest reserve is supposed to have a Forest Management Plan to guide the forest manager and other actors to achieve the desired goals. These plans especially for forests under PFM contain rules and bylaws of respective villages that have

been put in simple language and presented in an easy way to understand. This study however, shows that only Kwedibangala, Madizini, Ihombwe and Kikole villages had management plans and by-laws in place. The roles of village government, village council and VEC/VNRC (Table 3) originated from the management plans, PFM guidelines and bylaws, Forest Act No. 4 of 2002, Local Government Act No. 167 of 1982 and Environmental Management Act of 2004. The roles of WDC with regard to forest protection have been extracted from section 32 of the local government Act No 167 of 1982

Table 3: Roles of existing governance structures in the surveyed villages

<i>Governance structure</i>	<i>Roles</i>
Village government (village assembly) Village council	-Discuss and approve draft of management plan and by-laws -Receive and evaluate quarterly report submitted by VEC/VNRC
VEC/VNRC	-Discuss and provide suggestions of forest management by-laws; -Receive and evaluate monthly report submitted by VEC/VNRC; -Control all revenues collected from natural resources ; -Dislodge VEC/VNRC if proved failure in performing its duties -Endorse expenditure of fund; -Awareness creation on PFM matters; -Coordinate decision making process; and -Enforce by-laws; -Plan and supervise everyday forest activities; -Provide forest related information to the meeting of villagers; -Fine all people caught committing illegal activity in the forest reserve as stated in the by-laws; -Plan and budget for all forest activities including forest patrol and fire prevention -Take criminals to the court once failed to pay approved fines as stated in the by-laws; -Propose draft of by-laws that govern management of the respective forest reserve; and -Enforce by-laws. -the formulation, and submission to the village councils or to the district council, of proposals for formulating by
WDC	-laws in relation to the affairs of the ward.

The existing structures of VG, VC and VEC or VNRC have institutional powers acquired from various formal laws (Box 1). For instance, VG (village assembly) and VC acquired powers from Local Government Act

No 167 of 1982. In accordance to the act, VG is an autonomous government which is mandated to plan, make decision and implement development project within their areas and administrative jurisdiction. In

accordance to Section 25 (b) of the Act, VC is capable of suing and being sued. Further, VNRC acquires institutional power from Section 33 of Forest Act of 2002. It requires villages to get involved in forest management and to establish such committee which will be

responsible for protecting forests within areas of jurisdiction. Moreover, Section 41 of Environmental Management Act No. 20 of 2004 granted VEC powers to protecting forests against disturbances such as wildfires

Box 1: Some institutional powers of village environmental committee

Powers of village environmental committee

Initiate inquiries and investigations about any allegation related to the environment (including allegation related to setting of wildfires) and the implementation or violation of the provision of the act;

-Require any person to provide information or explanation about any matter related to the environment (including source of wildfire); and

-Initiate proceedings of civil or criminal nature against any person, company, agency, department or institution that fails or refuses to comply with any directives issued by any of such committees

Institution/person responsible when wildfires erupted

The Forest Act number 14 (2002) sections 70–76 is dedicated to wildfire issues and restricts burning of vegetation (URT, 2002). The Forest Act clearly states on prohibition of fires in forested land and requires all individuals to participate in extinguishing wildfire whenever it occurs. Contrary to the requirement of the Act, we found most fire incidences being left unattended as reported by 55.7% of respondents. Respondents claimed that Village leaders (19%), the VNRC/ VEC (7%) and villagers (18.3%) were responsible for putting off forest blazes. These results suggest that most wildfires go un-extinguished causing significant losses of the forest resources. This further suggests great weakness in law enforcement especially at local level. Evidence points to irresponsibility on the part of implementing the existing laws. For example local regulations require any person permitted to light wildfire to give notice in writing of his intention to burn the vegetation and that the notice must be delivered by hand or orally. There was no evidence of this regulation being practiced despite presence of local structures at village level that could have enforced the laws. Key informants at district

and village levels revealed that no permits have been requested or offered to any person although many people continually clean their farms using fires. This was also confirmed by the villagers themselves. This study further revealed that no person has ever been taken to court or punished for causing wildfires. Torching forests is least appreciated as a criminal act punishable by law; however it becomes so when such wildfire causes damage to village properties such as houses. In situations where villagers cast limited efforts in protecting forests which themselves benefit from signifies erosion of traditional responsibilities in environmental conservation, the cause of which may be beyond resource ownership (Ylhais, 2003). The reasons for the continued forest fires may be linked to the limited benefits to the villagers and the high costs associated with protecting forest resources. Joint forest management in Tanzania has been criticized because of its failure to providing tangible benefits to the local communities relative to the disproportionately high forest protection costs incurred (Blomley & Ramadhani, 2006; Meshack et al., 2006; Pflieger & Moshi, 2007). Thus corroborates the findings of this study.

Supportive structures

The efforts of local governance structures in forest protection are backed up by informal and formal governance structures. In the study, formal structures identified include NGOs and CBOs. The most prominent NGOs in Kilwa District were Mpingo conservation Project (MCP) and Tanzania Christian Refugees Service (TCRS) (in Kikole village), Mama Misitu (in Migeregere village) and World Wide Fund for Nature (WWF) in Kiwawa village. In Mamboya village the World Vision and other religious institutions were representative. MCP deals with forest protection through supporting implementation of CBFM in Kikole while TCRS promotes the use of efficient energy stoves in the same village. Formal governance structures identified include district councils and central government through their relevant

departments. The most acknowledged ministry was Ministry of Natural Resources and Tourism (MNRT) through Forestry and Beekeeping Division (FBD). The ministry in collaboration with the district councils and people from villages adjacent to the forest reserves have been implementing PFM in Kwedibangala, Ihombwe, Madizini, Kiwawa, Migeregere and Kikole villages. These forest conservation initiatives offered support to local structures through provision of extension materials (e.g. posters and leaflets), installation of education signboards around forests, provision of environmental education and provision of technical advice to the local communities. Table 4 presents roles of supportive structures at district councils and MNRT as stated in forest management plan and PFM guidelines

Table 4: Roles of district councils and MNRT/FBD in forest protection

<i>Actor</i>	<i>Roles</i>
District Council (DC)	-Passing and approving forest management plans and by-laws; -Signing lawful agreement such as JMA for LAFR; -Providing technical advice on implementation of PFM; and -Enforcing forest rules and regulations.
MNRT/FBD	-Providing technical advice on implementation of PFM; -Signing lawful agreement such as JMA for CGFR; -Providing technical advice on implementation of PFM; and -Enforcing forest rules and regulations.

Performance of local governance structures in the management of wildfires

The study villages showed considerable disparities in the level of performance of village council (VC) and Village Environmental Committee/Village Natural Resource Committee (VNRC) (Fig 2). Across various governance indicators used; accountability, transparency, equity, rule of law, responsiveness, participation and effectiveness, performance differed across the villages. For instance, VC performed satisfactorily in Vibaoni, Madizini and Kikole villages but performed poorly in Madebe,

Kwedibangala, Ihombwe, Mamboya, Kiwawa and Migeregere villages. On the other hand VEC/VNRC performed satisfactorily in Vibaoni, Madizini and Ihombwe villages but poorly in Madebe, Kwedibangala, Maboaya, Kiwawa, Migeregere and Kikole villages. Overall, the performance of local governance structures in forest protection against wildfires was rated poor. This finding suggests that local structures have not been adhering to the principles of good governance. The reported increasing fire incidences and illegal forest extraction provide further evidence for the weakness of existing local governance structures

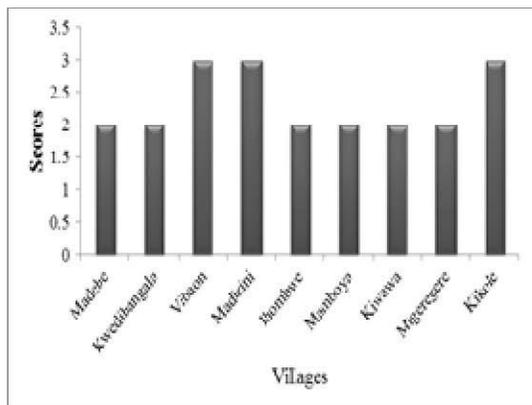


Figure 2a: Performance of VC

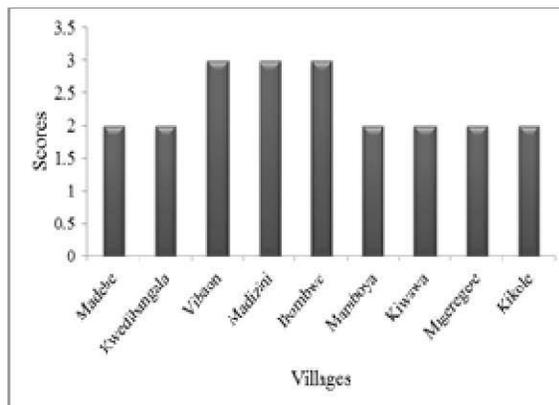


Figure 2b: Performance of VEC/VNRC

Fig 2: Performance of local governance structures in forest protection against wildfires in the study villages based on indicator scores of good governance based on 5 points scale (very good = 5, good =4, satisfactory =3, poor =2 and very poor =1).

Further, the performance level of VC and VEC/VNRC with respect to individual indicators of the good governance was highly variable (Table 5a&b). Both VC and VEC/VNRC were rated poor and satisfactory respectively upon looking at accountability. Also, in accordance with the approved management plans, VC and VEC/VNRC were accountable to the villagers. For example, the structure required VC and VEC/VNRC to submit technical and financial reports to the village assembly, but the study found little evidence of its implementation in most surveyed villages. Although regulations required the village assembly to convene four times per year, most villages refrained from doing so while others convened only once. Furthermore, even in such villages meetings, the agenda of forest protection

against wildfire did not feature in the discussions. Such situation denies rights of the villagers to access information regarding to forest protection, and potentially increases conservation threats to the forest. Interviewees reported low level of transparency amongst members of VC and VEC/VNRC. Members of the respective structures withheld information regarding to income and expenditure and often taking no action for offenders reported to them by villagers. This situation may have resulted into demoralisation and lowered commitments of the villagers in forest protection. Similar cases were reported by Rafael and Swai (2009) and Nuru et al. (2009) showing poor transparency in handling of forest destructive actions, thereby increase these actions

Table 5a: Interviewees opinion over the performance of VC in management of wildfires

Village name	Accountability	Transparency	Equity and inclusiveness	Rule of law	Responsiveness	Participation	Effectiveness and efficiency	Governance
Madebe	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor
Kwedibangala	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor
Vibaoni	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
Madizini	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
Ihombwe	Poor	Poor	Poor	Satisfactory	Poor	Poor	Poor	Poor
Mamboya	Satisfactory	Poor	Poor	Poor	Poor	Poor	Poor	Poor
Kiwawa	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor
Migeregere	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor
Kikole	Satisfactory	Poor	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Poor	Satisfactory

Table 5b: Interviewees opinion over the performance of VEC/VNRC in management of wildfires

Village name	Accountability	Transparency	Equity and inclusiveness	Rule of law	Responsiveness	Participation	Effectiveness and efficiency	Governance
Madebe	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor
Kwedibangala	Satisfactory	Poor	Poor	Poor	Poor	Poor	Poor	Poor
Vibaon	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
Madizini	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
Ihombwe	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
Mamboya	Satisfactory	Poor	Satisfactory	Satisfactory	Poor	Poor	Poor	Poor
Kiwawa	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor
Migeregere	Poor	Satisfactory	Satisfactory	Satisfactory	Poor	Poor	Poor	Poor
Kikole	Poor	Poor	Poor	Satisfactory	Satisfactory	Poor	Poor	Poor

Equity was reportedly satisfactory in some villages and poor in others (Table 5a and b). For instance casual forest activities were favourably conducted by the members of VC, VEC/VNRC and their close relatives. Consequently, it reduced morale of villagers to participate in forest protection. Both satisfactory and poor performance levels were reported in the surveyed villages based on the question of rule of law (Table 5a and b). Despite having laws and by-laws governing forest resources; they were not enforced effectively. This may have resulted in higher and continued wildfire incidences across the surveyed villages suggesting great weakness in law enforcement. Raphael and Swai, (2009) also reported failure of authorities to exercise granted institutional power to protect forests because of bad interpersonal relationship, nepotism and corruptive environment in Mufindi District, Tanzania.

In accordance with the village management plans, VC and VEC/VNRC were responsible for most activities related to forest protection. VC is charged with coordinating decision making process while VEC/VNRC is responsible for most forest activities including forest patrols and arresting of law breakers. However, the performances of the two committees were either poor or satisfactory in the study areas (Table 5a and b). This performance was perhaps due to limited village meetings to discuss forest related issues. Similarly very few forest patrols were conducted and law breakers were not punished accordingly. Our results show that majority (68.7%) of respondents claimed not to participate in forest protection owing to discontent over the ways the existing governance structures handle forest management activities. Furthermore, participants in PRA exercises and unstructured interviews revealed several reasons contributing to poor performance of the local governance structures. Poor coordination, severe under funding and poor support from the villagers

who see torching of forests as their sole right to getting access to their livelihoods were commonly cited. Poor coordination was revealed among local structures at district and national level leading to conflicts among local governance structures. Limited funding also contributed to poor performance of these structures. Fines from arrests of illegal activities within forests were reported to be only the source of funds directly taken by VEC/VNRC for forest protection. This source is unreliable and cannot be accounted for in the forest protection plans. Funds generated by the village government from other sources such crop levies were not allocated to forest protection. This resulted into members of VEC/VNRC lacking incentives and protection gears to execute forest protection duties. Additionally, local governance structures received limited support from villagers who appeared helplessly in need of livelihoods from the forest resources.

Supporting actors in wildfires management

Several actors in wildfire management were identified and assessed alongside the existing local governance structures. Each actor had some specific power to exercise with regard to forest protection. For instance, Village Executive Officer (VEO) and Ward Executive Officer (WEO) had institutional power to arrest any person found committing illegal activities within forest reserves. Similarly, the Village Chairperson (VC) and Ward Chancellor (WC), because of their political position, had strategic powers, which could influence decision making process and community participation in forest conservation activities. Furthermore, across the study districts, the District Forest Office (DFO) and Forestry and Beekeeping Division (FBD) had both strategic and institutional powers to influence the local communities and local village governments to effectively engage in forest protection. More particular, these actors had significant

roles to play such as direct participation in forest protection, organizing people participation through convening meetings, mobilizing resources and enforcement of existing laws. Despite having well

established roles across different actors, the opinion by the respondents with regard to involvement in the forest protection was mostly poor (Fig 3).

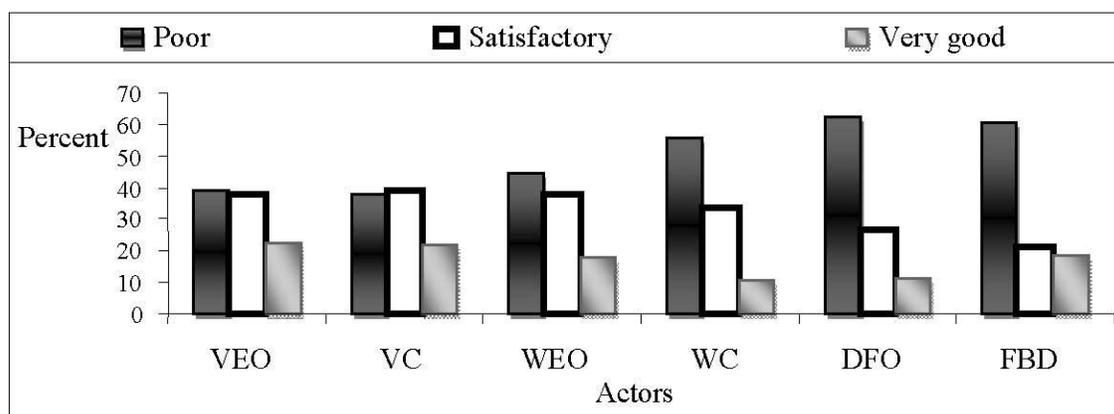


Fig 3: Performance of different actors in the prevention and management of wildfire in the Miombo woodland as rated by the respondent in the study areas based on point scale. Very good =3, satisfactory = 2 and poor = 1)

About 39.3% of respondents rated support provided by VEO as poor, 38.2% said it was satisfactory and only 22.5% rated it as very good (Fig. 3). Essentially, VEO is an administrative body of the village council and should play significant role in governing forest resources within village. This observation suggests very little is being done by this body to mitigate current wildfire problems. Similarly, the work by the Village Chairperson (VC) was rated by 37.8% respondents as poor with 22% saying it as very good. These ratings may suggest administrative ineffectiveness given that VC leads village council which is a supreme decision making body at the village level. This failure of administration at these levels may lead to increased deforestation and degradation. Moreover, the support of other actors such as WEO, WC, DFO and FBD were overall poorly rated by 44.4%, 55.6%, 62.2% and 60.4% of respondents respectively. Poor performance by these actors could be due to insufficient work force and limited forest conservation supporting

resources such as vehicles and other equipments. Investment in the local actors to capacitate them through provision of working gears and training may offer a long-term solution thereby reducing wildfires in the study forests.

Conclusion

Wildfires were common phenomena across the surveyed villages. At the village level, there were existing local governance structures responsible for protecting forests against deforestation and degradation. These structures however, appear to be less effective in performing their duties. Most of local governance structures suffered poor coordination, severe under funding and poor support from the villagers who inherently needed forest resources for survival. Given these challenges, deliberate efforts by the government and her agencies should provide support to the local governance structures in form of training

and other necessary resources if forest protection is to be realised at the village and district level. Winning trust from local communities by the existing governance structures is an important step towards uncovering illegal information and people who start wildfires in the study areas. Coupled with implementing existing rules and regulations, creating incentive mechanism at local and district level to detect planned illegal forest activities may help to improve forest conservation in the study area.

References

- Abdallah, J., Monela, G., 2007. Overview of Miombo woodlands in Tanzania. MITMIOMBO–Management of Indigenous Tree Species For Ecosystem Restoration and Wood Production in Semi-Arid Miombo Woodlands in Eastern Africa. Working Papers, vol. 50. Finnish Forest Research Institute, pp. 9–23.
- Barrow, E., Clarke, J., Grundy, I., Kamugisha-Ruhombe, J. and Tessema, Y. 2002. Analysis of stakeholder power and responsibilities in community involvement in forestry management in Eastern and Southern Africa, x + 154pp.
- Blomley, T. & Ramadhani, H. 2006. Going to scale with Participatory Forest Management: early lessons from Tanzania. *International Forestry Review*, 8, 93–100.
- Blomley, T., and Ramadhani, H. 2005. Participatory Forest Management in Tanzania: Participatory Forest Management and the Sustainable Livelihoods Approach. *Sustaining Livelihoods in Sub-Saharan Africa*, (17). Khanya–African Institute for Community Driven Development, South Africa.
- Blomley, T. and Ramadhani, H. 2007. Participatory forest management in Tanzania: An overview of status, progress and challenges ahead. *The Arc Journal* 21 (2):1-5.
- Butz, R. J. 2009. Traditional fire management: historical fire regimes and land use change in pastoral East Africa. *International Journal of Wildland Fire* 18, 442–450
- Chidumayo E. N. 1994. *Miombo ecology and management an introduction*. Intermediate Technology Publications. London
- Frost, P. 1996. The Ecology of Miombo Woodlands. In: *The Miombo in Transition: Woodlands and Welfare in Africa*. Center for International Forestry Research (Edited by B.M.Campbell), Bogor, Indonesia.
- IUCN 2004. Governance of Natural Resources: The key to a just world that values and conserves nature. [<http://www.iucn.org/themes/ceesp/2003.pdf>] site visited on 6/08/2013.
- Hassan S.N. and Rija A. A. 2011. Fire history and management as determinant of patch selection by foraging large mammal herbivores in western Serengeti, Tanzania. *International J. Biod. Sci. Ecosystem Service and Management*. 7(2): 122-133
- Katani, J.Z. and Babili, I.H. 2012. Exploring forest governance in Tanzania. In Arts, B. Van Bommel, S. Ros-Tonen, M. and Verschoor, G. (eds). *Forest-people Interfaces: Understanding community forestry and biocultural diversity*. Wageningen Academic Publishers, Wageningen, The Netherlands. pp 259-275.
- Katani, J.Z., 2010. The role of multiple institutions in the management of micro spring forests in Ukerewe, Tanzania. PhD Thesis, Wageningen University, the Netherlands. 202pp
- Kideghesho, J.R., Rija, A.A., Mwamende, K.A., Selemani, I.S. 2013. Emerging issues and challenges in conservation of biodiversity in the

- rangelands of Tanzania. *Nature Conservation* 6:1-29.
- Luoga, E.J., Witkowski, E. T. F. and Balkwill, K. 2005. Land Cover and Use Changes in Relation to the Institutional Framework and Tenure of Land and Resources in Eastern Tanzania Miombo Woodlands. *Environment, Development and Sustainability* 7 (1):71-93 pp.
- Meshack, C.K., Ahdikari, B., Doggart, N. & Lovett, J.C. 2006. Transaction costs of community-based forest management: empirical evidence from Tanzania. *African Journal of Ecology*, 44, 468-477.
- Madoffe, S.S., Rija, A.A., Midtgaard, F., Katani, J.Z., Mbeyale, G., Zahabu, E., Liwenga, E., Tarimo, B.C. 2012. Preliminary Assessment of Forest Structure, Management and Carbon Stocking in Tanzania Miombo Woodland. Proceedings of the first Climate Change Impacts, Mitigation and Adaptation Programme Scientific Conference, pp 106-117
- Mbwambo L. R. 2000. Species utilization preferences and resource potential of miombo woodlands: A case of selected villages in Tabora, Tanzania. MSc thesis library of the University of Stellenbosch.
- MNRT. 2009. National Forest Programme Implementation: Community-Based fire management component. Dar es salaam, Tanzania.
- Monela, G. C., Kajembe, G. C., Kaoneka, A. R. S. and Kowero, G. 2000. Household livelihood strategies in the miombo woodlands of Tanzania. *Tanzania Journal of Forestry and Nature Conservation* 73.
- Mpya.H., 2012. Assessment of opportunities and barriers in mitigating wildfires in Miombo woodlands under different forest tenure in Chunya District, Tanzania. Msc thesis, Library of Sokoine University of Agriculture.
- Msuya, T. and Mugasha, W. 2009. Effectiveness of traditional forest management in Tanzania: prospects and challenges of integrating traditional and conventional forest management institutions in North and South Pare Mountains. PFM final report submitted to TAFORI, Morogoro. 34pp.
- Nkwabi, A. K., 2007. Influence of wildfire on the avian community of the Serengeti National Park, Tanzania. MSc thesis, Library of University of Dar es Salaam
- Nuru, H., Rubanza, C.D.K. and Nezia, C.B. 2009. Governance of key players at district and village levels on health improvement of Urumwa Forest Reserve, Tabora: Ten years of Joint Forest Management. PFM final report submitted to TAFORI, Morogoro.
- Pfliegner, K. and Moshi, E. 2007. Is Joint Forest Management Viable in Protection of Forest Reserves? Experiences from Morogoro Region. *The Arc Journal* 21 (1): 17-20.
- Raphael, T. and Swai, G. 2009. The impacts of Participatory Forest Management and local people's perceptions on its implementation at the village level in Mufindi district, Southern Tanzania highlands. PFM final report submitted to TAFORI, Morogoro.
- Rucker, G., and Tiemann, J. 2012. Eleven years of MODIS burned areas: a GIS analysis for the territory of the United Republic of Tanzania. Project report for Tanzania Forest Services (TFS), Ministry of Natural Resources and Tourism, Dar es Salaam, pp 54.
- Rugumamu, W. 2001. A Forest Resources Co-Management Strategy for Tanzania: A Study of West Usambara High Canopy Forests. *UTAFITI* 4, 117-130
- UNESCAP, 2007. What is good governance? United Nations Economics and Social Commission for Asia and the Pacific. Available at: <http://www.unescap.org/huset/gg/governa>

nce,htm. Viewed on 26/09/2013.

- URT. 1998. National Forestry Policy.
Ministry of Natural Resources and
Tourism, Forestry and Beekeeping
Division, DSM, 57pp
- URT, 1999. Village Land Act No 5 of 1999.
Government Printer, Dar es Salaam,
Tanzania
- URT. 2002. The Forest Act No. 14 of 2002.
Government Printer, Dar es Salaam,

- Tanzania (Part IX and Section 91(a)-c).
- WCS. 2009. Activities and impacts reports on
Mount Rungwe Forest Reserve. Mbeya.
Tanzania.
- Zolho, R. 2005. Effect of fire frequency on
the regeneration of Miombo Woodland
in Nhambita, Mozambique. MSc thesis,
University of Edinburgh library, United
Kingdom