

Community Perceptions towards Participatory Forest Management, A Case of Kazimzumbwi Forest Reserve in Kisarawe, Tanzania

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Abstract: Forests are vital resources in the earth ecosystem. They play an important role in the survival of human beings and the whole ecological system. The effective community based conservation and management of these resources is a necessary step to their sustainability. This paper assessed the Community Perceptions towards Participatory Forest Management at Kazimzumbwi Forest Reserve (KFR). A cross-sectional study was carried out to assess the Community Perceptions towards Participatory Forest Management by using questionnaire survey, focus group discussion, field visits and documentary review. The study was carried out in Kazimzumbwi and Chanika villages which are among the five villages surrounding the reserve and a total of 100 households were participated during questionnaire survey. The data were analyzed by the use of Statistical Package for Social Sciences (SPSS), Microsoft Excel and Geographical Information System (GIS). The study revealed that, 97.3% of respondents showed negative perceptions towards top-down forest management regime. The main reasons behind negative perceptions are the increased rate of deforestation, conflicts between local community and government, poor community involvement in forest management and strict regulations that do not allow them to access the forest resources. Factors behind perceptions are social, economic and political systems within the society. Level of education, degree of access to forest resources, improvement of local people's livelihoods and awareness of the strict forest regulations have a significant relationship with the rejection of the regime. The results indicated that, the majority of the respondents proposed Active Joint Forest Management that addresses the root causes and immediate causes of negative perceptions of forest management regime. Due to poor performance of the top down forest management regime, the study recommended that, the local people should be actively involved in the management of the resources. Also, clear buffer zone area should be established around the forest reserve in order to halt deforestation that would ensure the sustainability of forest ecosystem for current and future generations.

Index Terms: Kazimzumbwi Forest Reserve, Community Perceptions, Participatory Forest Management, GIS

I. INTRODUCTION

The forest sector plays an important role in the economic development of many countries and livelihoods of many communities in the world (World Bank, 2001). Ecologically, forest ecosystems contribute to the protection of watersheds. Forests are key elements in the regulation of hydrological cycles, climate and the reduction of atmospheric pollution and they play an essential role in the global carbon cycle (FAO, 2011). Almost, 1.6 billion people in the world rely heavily on forest resources for their livelihoods (WB, 2001). Also, forests account for about an average of 6 per cent of Growth Domestic Product (GDP) in the African regions which is the highest in the world (WB, 2003).

Many forest resources in the world have been designated as forest reserves, national parks and nature reserves as the best way of biodiversity preservation (Pimbert and Pretty, 1995). One-fifth, approximately 21% of the global forest resources are managed primarily for conservation and protection (UNDP, 2007). About 13% of forest resources in Europe, 30% in Asia and the Pacific, and 21% in Africa are managed under protection and conservation (UNEP, 2007).

In developing countries, many forest reserves are managed through Participatory Forest Management (PFM) as stressed in many African countries' forest laws and policies like Gambia, Ethiopia, South Africa, Zambia, Uganda and Kenya, among others (Wily, 2002). For instance, the PFM approach is widely spread in many African countries, like Penessaulou Reserve in Benin, State Forests of Oromiya Region in Ethiopia and Mafungabusi Forest Reserve in Zimbabwe (Wily, 2002).

In Tanzania, PFM is adopted and in 1998 Tanzania Forest Policy was introduced, and 2002 Tanzania Forest law was to use PFM in managing her forest resources (URT, 1998). Despite the adoption of PFM in Tanzania, like other developing countries, deforestation and conflicts on forest resources management are still persisting in many forest reserves. Kazimzumbwi, in particular, is characterized by conflicts and violation of human rights. For instance in 1998, the Tanzanian police forcibly removed approximately 1000 people from their homes, burned homes and agricultural fields, a villager was killed (Yonge Nawe Environmental Action Group, 2003) and at least 700 people were injured (WRM, 1999). Therefore, this study intended to explore community perceptions towards Participatory Forest Management to the community around KFR.

II. MATERIALS AND METHODS

2.1 Study area

The study centred on KFR in Kisarawe district, Tanzania. The rationales for selecting this district were, first the reserve has an increasing rate of deforestation (Mchome, 2001); secondly, its management is challenged by

frequent conflicts between the central government and surrounding villagers (Yonge Nawe Environmental Action Group, 2003). The third reason was its easy accessibility. KFR is located on the Pugu hills 20 km southwest of Dar es Salaam. The reserve lies between latitudes 6° 55' and 7° 02'S and longitude 39° 02' and 39° 04'E covering an area of 3800 hectares. Climate of KFR and the surrounding villages is generally influenced by south and monsoon winds. The area receives annual total rainfall between 1000 mm to 1248 mm which falls within two periods: the short rain period begins in November and ends in December, and the long rain is experienced between January to mid-March (Ndumbaro, 1999). KFR is a catchment area of Msimbazi River that flows to the Indian Ocean. It is also a source of streams and rivers of Dalu, Mzumbwi, Nyebura, Vikongoro, Mzinga, Bulampaka, Nzasa, Mnyundo, Kinyamwezi and Kimwani. There are also two wetlands namely Dalu and Ng'azi in the reserve. Vegetation cover in the forest reserve has been described as Zanzibar-Inhambane Undifferentiated Forest which has a characteristic of ridged, valley slope and valley bottom variation (Ndumbaro, 1999). Ridge tops and steeper slopes support dry evergreen forest while gentler slopes support moist forest stands dominated by *Antiaris toxicaria* and *Dialium holtzii* and transition woodland predominates on the lower slopes grading to wetland species in the valleys (Mung'ong'o *et al.*, 1997).

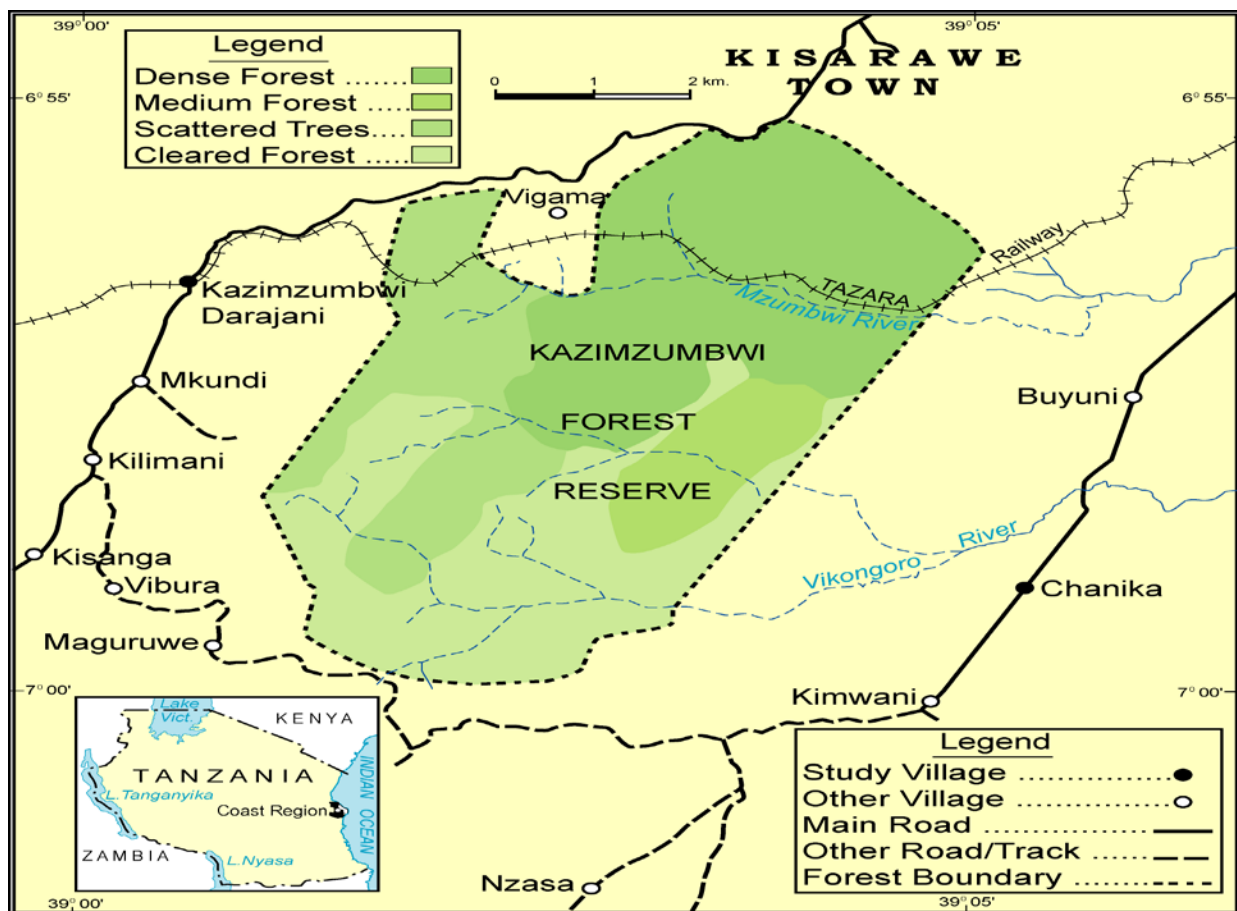


Figure 1: Location of Kazimzumbwi and Chanika villages and KFR

Source: UDSM Geography Department Cartographic Unit

2.2 Sampling Procedures

Both probability and non-probability sampling methods were employed. Probability sampling included simple random sampling to obtain representative of community members from the villages around forest reserve while non probability sampling using purposive sampling method was used to select key informants. Purposeful sampling was done for the selection of head of forestry department , head of water department, head of environmental department, head of agriculture department, head of livestock department, community development officers, environmental conservationists, Non-Governmental Organization (NGOs), village and ward executive officers.

2.3 Data Collection Methods

Primary data were done through questionnaires survey using structured questionnaire, focused group discussion (FGD) by using check list or guide questions and key informants interview by using interview guide. According to Berg, (2009) FGD is the method that provides in-depth qualitative insights gathered from a relatively small group of people concerning behavior, past experience, differences in perceptions, opinions and suggestions. FGD comprises 8-12 of people from both villages around KFR. These are dwellers, farmers/peasants and livestock keepers. This approach was used to provide room for effective interaction of all members and therefore various issues for example the main reasons behind negative perceptions are the increased rate of deforestation, conflicts between local community and government, poor community involvement in forest management and strict regulations that do not allow them to access the forest resources were discussed as well as the way forward. Also, it was used as a triangulation tool for incorporating other information which was collected by other methods. Secondary data were collected through review of various reports, books, journals and other publications related to the study. Data captured through use of survey method were sorted for clarity and then entered into SPSS software (20 versions) for analysis. Moreover, Content Analysis (CA) was used to analyze data collected through FGD and Key Informant interviews. Furthermore, Geographical Information Systems (GIS) was used for land cover detection in KFR and were analyzed based on the interpretation of satellite images. GIS analysis revealed the changing nature of deforestation of the reserve in three periods since 1956 to 2008. The analysis quantified the amount of forest being deforested, regrowth and the remained least disturbed forest cover.

III. RESULTS AND DISCUSSIONS

3.1 Education, household size, housing status, economic activities and land holding of the respondents

Based on level of education, it showed that, more than half (62%) of respondents had not attained formal education whereby Kazimzumbwi had a high rank (Table 1). In Kazimzumbwi, no respondent had attained tertiary education. Education is an important component of the human resource base because it influences

someone’s knowledge of and dependence on the Mother Nature including forest resources. This implies that, less educated people in the study area were much more dependent on the forest resources for their livelihood than their educated counterparts. There is large number of respondents without formal education because they are living along the forest reserve hence they do not give due importance to education. Mngumi et al, (2013) who reported that, the majority have got low education which can be a stumbling block towards utilizing forest resources sustainably.

Table 1: Education Level of the Household Respondents (N = 100)

Education	Villages				Total	
	Kazimzumbwi		Chanika			
	Freq	Percent (%)	Freq	Percent (%)	Freq	%
No Formal education	10	62	46	54	31	31
Primary education	5.9	37	30	35.7	42	42
Secondary education	0.1	1	16	7.1	15	15
Adult education	0	0	1	1.2	1	1
College/university	0	0	1	1.2	1	1
Total	16	100	84	100	100	100

Key: Freq = Frequencies

Regarding the household size, the findings depicted that, most households in Kazimzumbwi and Chanika villages comprised of six to ten family members and few households had more than eleven household members (Table 2). Household size is very important in determining the rate of exploitation of the forest resources. This is due to the fact that, more mouths to feed increase the demand for forest resources and thus encourages encroachment. Families with large numbers of household members positioned themselves to abject poverty as revealed by level of income, land holding and excessive dependency from the forest resources. As supported by Makunga and Misana (2017) who observed that, larger household size resulted to higher need of land for cultivation in order to meet food demand and forest products for generating income. Large family size in the study area is attributed by polygamous marriages which is likely to increase the number of children in the family.

Table 2: Household Size (N = 100)

Family members	Villages				Total	
	Kazimzumbwi		Chanika			
	Freq	%	Freq	%	Freq	%
1-5	6	37.5	31	36.9	37	37
6-10	9	56.2	33	39.3	42	42
11+	1	6.3	20	23.8	21	21
Total	16	100	84	100	100	100

Field observation revealed that, some of the houses in Kazimzumbwi village were built of poles and roofed by grass as supported by Figure 2. Conversely, Chanika village, a peri-urban area located about 20.1 kilometres

from Dar es Salaam City centre, has houses built of bricks and roofed with iron sheets. Housing status is very crucial in assessing the level of livelihood and their relation to Mother Nature. The nature of housing of the population detects the way these people view nature. The nature of houses in Kazimzumbwi particularly in Vibura sub-village reflected the way villagers were dependent upon Mother Nature for poles, grass and thatches. Chanika, on the other hand, a more modernised village, brick-iron sheets houses dominated the area which signifies reduced reliance on the forest resources for construction purposes.



Figure 2: A thatch-roofed house built with small poles and mud reflecting reliance on Mother Nature in Vibura sub-village in Kazimzumbwi village

The majority (87%) of villages around Kazimzumbwi were involved in agricultural activities while the rest (13%) in Chanika were government employees as well as petty traders (Table 3). The kind of crops grown include cassava, sweet potatoes, paddy, cashew nuts, vegetables like cabbages, cucumber, okra and fruits such as mangoes, jack fruits and water melons. This implies that, the community in Kazimzumbwi villages were predominantly engaged in subsistence farming which is heavily affects the forest resources. Also, discussion with key informants revealed that, during the dry season youths engaged in harvesting forest resources within KFR for charcoal and poles as a substitute to agricultural activities. As revealed by Kahyarara et al, (2002) who pointed out that, communities living closer to KFR are affected by poverty and limited sources of income hence the involvement with forest products is the simplest way to generate income.

Table 3: Occupation of respondents

Economic activities	Villages				Total	
	Kazimzumbwi		Chanika		Freq	%
	Freq	%	Freq	%		
Agriculture	14	87.5	51	60.7	65	65
Petty trading			5	6	5	5
Wage employment			9	10.7	9	9
Petty trading and agriculture	2	12.5	18	21.4	20	20
Non income generating activity			1	1.2	1	1
Total	16	100	84	100	100	100

Field observations and discussion with key informants revealed that, farming activities are encroaching to the KFR (Figure 3); contributing to the degradation of forest resources hence threatened the sustainability of forest

resources in Kazimzumbwi. As supported by Mdem et al, (2012 in Mulungu 2007) who portrayed that, illegal activities carried out by human beings in the forest reserve like logging, charcoal burning, farming, cutting of trees for construction purposes and gravel quarrying resulted to degradation of the forest.



Figure 3: Picture showing Cassava farming closure to KFR

Based on land holding, field observation found out that, most of respondents in both villages owned farms ranging from 3 to 4 acres. About 25% of respondents in Kazimzumbwi village held farms greater than seven acres by size while none of the respondents in Chanika owned a farm more than seven acres as depicted (Table 4). Farm sizes of respondents have implications both on the utilization of land for different uses and the impact on the forest reserve. Also, during FGD, Nzasa respondents disclosed that villagers especially who live closure to KFR and who owned small portions of land, and had large families, tend to cultivate crops by crossing the forest reserve border so as to increase food production for their livelihoods. Furthermore, the interview with the executive village officer at Nzasa revealed that, Chanika experienced competition over land due to its location near Dar es Salaam City. This was contributed by transformation from peri-urban and rural lands to the urban fabric. The competition over land does not concur with the conservation objectives of the reserve. As supported by Mulungu (2007) who revealed that, those who have owned 1 and 2 acres are regarded as poor while those who have owned more than 4 acres are considered as well-off families and these are people who moved from Dar es Salaam or still conduct their activities from Dar Salaam City.

Table 4: Land Holding of the Household Respondents in Two Villages (N = 100)

Size of a farm (acre)	Villages				Total	
	Kazimzumbwi		Chanika			
	Freq	%	Freq	%	Freq	%
None			15	17.9	15	15
1-2	1	6.2	25	29.8	26	30.6
3-4	6	37.5	33	39.2	39	45.9
5-6	5	31.3	11	13.1	16	18.8
7+	4	25			4	4.7
Total	16	100	69	100	100	100

3.2 Effects of KFR degradation

Field observation and during FGDs, it was revealed that, deforestation of KFR has resulted to degradation of the forest ecosystem and consequently has exacerbated poverty among the residents surrounding the reserve. The majority of respondents were able to identify the effects of deforestation including variation of rainfall pattern in terms of quantity and season, food insecurity and floods as narrated in Box 1. Also, Lupala et al,

(2014) observed that, the degradation of forest reserve resulted to the vanishing of honey, waxy, mushrooms as well as the drying of river sources due to anthropogenic activities.

Currently we are facing floods in my homestead during rainy seasons. My homestead is often covered by rainwater; we cannot walk out of the house until flood recedes. That situation was rarely seen in the 1980s when I settled in the area (village).

Box 1: Narration of a woman respondent during FGD in Kimwani sub-village at Chanika village.

3.4 Residence Time of the Respondents

A substantial number of respondents (75%) had been in their villages for more than twenty years and none of the respondents had been at Kazimzumbwi village for less than ten years (Table 5). Chanika experienced in-migrants comprising of 14.3% of all respondents in Nzasa and Kimwani sub-villages of Chanika village. Residence time was fundamental in assessing the perceptions of local people on conservation and management initiatives of forest resources. The longer the residence time the more people get used to the importance of the forest resources. Despite the existence of forest regulations, people who had longer interaction with the resource tend to struggle to access the forest resources because of the hidden value of the resource on which their livelihood is dependent upon. In-migrants (14.3 %) in Chanika village based on urban-rural migration were poorly informed of the hidden value of the forests to the surrounding environment. These findings are in line with Mdemu, et al.; (2012) who observed that, population increase due to the growth in per-urban areas have created pressure on natural resources especially in KFR as almost the communities surrounding it are overdependence for the last twenty years and they still depend on it.

Table 5: Respondents' Residence Time in the Study Area

Residence time (years)	Villages				Total	
	Kazimzumbwi		Chanika			
	Freq	%	Freq	%	Freq	%
Less than 10	0	0	12	14.3	12	12
6-10	4	25	36	42.9	40	40
20+	12	75	36	42.9	48	48
Total	16	100	84	100	100	100

3.5 Community Awareness of the Forest Resources within KFR

Results (Table 6) showed that, majority (87%) of all respondents interviewed acknowledged the existence of the KFR with the identification of tree species like *Brachystegia microstachys*, *Pterocarpus angolensis*, khaya antothica, ruber, cassia, eucalyptus, pine, shrubs and grasses including elephant grass; wild animals included wild pigs, monkeys and baboons; there were also insects and a stream/river (Mzumbwi River the only permanent river that has remained in the reserve). However, 13% did not recognize or disregard the existence of the reserve. This implies that, although they lived with forest resources, did not know or neglect if the resources were protected. The large percent of the respondents in Kazimzumbwi Village recognized the

existence of the reserve mainly due to the fact that, the village was located in remote areas close to KFR with less influence of urban culture unlike semi-urban Chanika village which is located near Dar es Salaam City. As supported by Mngumi et al.; (2013) who portrayed that, the communities around KFR have taken it as the backbone for their livelihoods.

Table 6: Natural Forest Resources Found within KFR*

Natural Resources	Freq	(%)
Vegetations	87	46.8
Streams/rivers	3	17.2
Wild animals	33	17.7
Insects	34	18.3
Total	186	100

*Multiple responses

3.6 Local community participation in the Management of KFR

The aim here is to identify if the communities were fully involved in the conservation of KFR. It showed that, a vast number (89.5%) of respondents interviewed reported that they were not involved in the conservation and management while the rest (9.5%) accepted that, they were involved in the management as indicated in Figure 4. During FGD, it was revealed that, forest education was only provided to the few forest committee members and it had been undertaken in previous years when the Wildlife Conservation Society of Tanzania (WCST) sponsored by Care International Organization was working in the study area. At the time of study, there was no active participation of local community. This indicated that local people who were also part of forest ecosystem were denied their rights to care their Mother Nature from where their livelihood accrued. These findings are in line with Shabani (2009) who pointed out that, there is poorly participation of the communities surrounding KFR in the management of the reserve due to the failure of the management approach (top-down approach) which does not allow fully involvement of the communities.

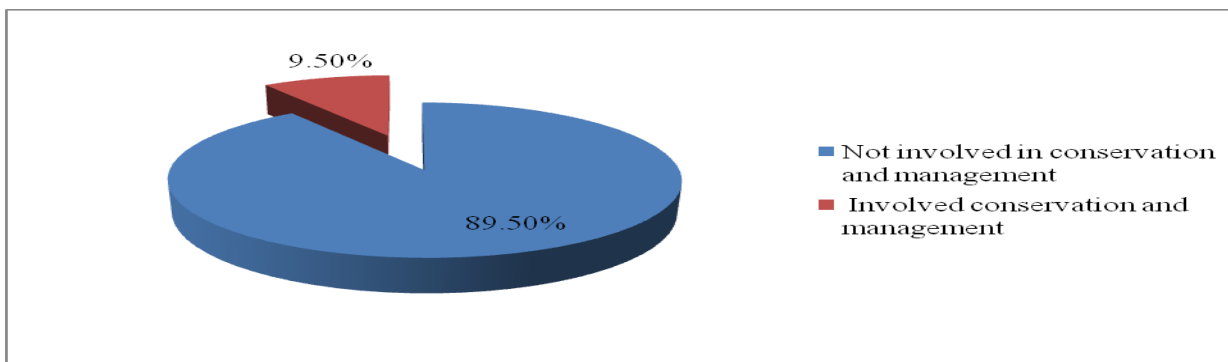


Figure 4: Local community participation in the Management of KFR

3.7 Types of participation to small number of the community

Based on community participation as indicated (Figure 4), it showed that, a small number of respondents (9.5%) who were involved in conservation and management reported that, they participate only in tree planting (52.8 %) and education and training (41.2%). During FGD, the chairman of Forest Management Committee in Kazimzumbwi village revealed that, they occasionally planted trees especially on 1st January (National Tree Planting Day). This, however, was not observed every year, as reported by Nzasa Village Executive Officer, none of the respondents in their area participated in the action in this year (2018). Also, it was observed that, none of the respondents were involved in decision making and planning concerning the issue of forest resources conservation and management. This kind of management generally suggested that, there was no active involvement of the local community in the management of KFR. As supported by Shabani (2009) who revealed that, there is poorly participation of the communities surrounding KFR in the management of the reserve due to the failure of the management approach (top-down approach) which does not allow fully involvement of the communities.

3.8 Communities awareness of Forest Regulations Guiding Management of KFR

With regard to forest regulations or laws guiding the use and management of KFR, the study (Figure 5) revealed that, 97.3% of respondents were aware of the existence of forest laws while only few respondents (2.7%) seemed unaware. This implies that, minority (2.7%) of respondents were freely accessing the forest resources. About 97.3% of respondents who approved the existence of the forest laws mentioned that, they were not allowed to access the forest resources within the KFR as expressed by 50% of all responses. It was also prohibited to undertake any kind of human activities within the reserve (40%) including agriculture, settlement, charcoal making and lumbering as well as they were not allowed to set fire within the reserve (10%). During FGD, it was revealed that, most of the respondents used to acquire information from their fellows, the media, NGOs previously working in the study area, and also from various meetings conducted by the government officials especially during the conflict periods. This implies that, forest officials were not actively engaging in disseminating information concerning forest laws to the local people. There were also no specific laws for managing KFR; they only used the Forest Act of 2002 in managing the reserve. Despite using it, there were no sufficient copies available at the district forest offices or at village level. Harsh laws and regulations practiced during colonial rule for management of forest reserves were inherited by the independent states which prohibited illegal utilization of these natural resources (IIED, 1994). The use of similar harsh laws and regulations accompanied with brutality to protect forest reserves from encroachment and poaching has created hatred behaviour from the indigenous people against the forest resources (Pimbert and Pretty, 1995).

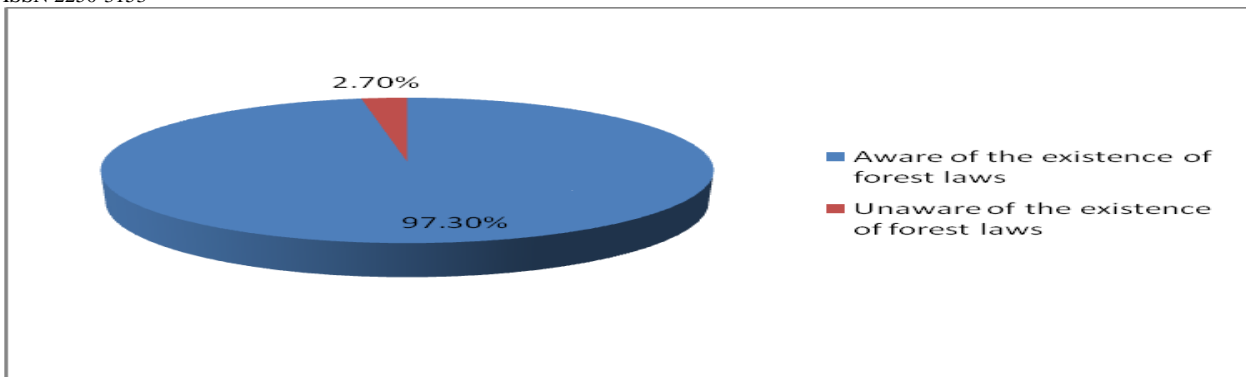


Figure 5: Communities awareness of Forest Regulations Guiding Management of KFR

3.9 Ineffectiveness of the Existing Forest Management Regime

Results (Table 7) showed that, a significant proportion (97.7%) of respondents revealed that, the forest management approach was not performing well while 2.3% of respondents on the other hand pointed out that it was doing well. During FGD, it was revealed that, the forest cover had been reduced in size over time since 2006. Also, discussion with some key informants revealed that, deforestation and degradation of forest resources due to farming, settlement, firewood, charcoal making and poles especially to areas closure to the communities. This implies that, there is a need to strengthen patrol activities to prevent destructives human activities within the reserve. These findings concurred with Mdem (2016) who observed that, KFR has declined its forest cover between 1980 and 1995 by 11.9% as well as 41.3% in 1995 and 2010.

Table 7: Reasons for Poor Performance of Existing Forest Management Approach

Indicators of poor performance	Freq	%
High rate of deforestation	83	29.3
Lack of local people participation	78	27.6
Conflicts	67	23.7
Strict laws	55	19.4
Total	283	100

***Multiple responses**

Field observation (Figures 6 and 7) witness clearance of forest areas was undertaken near Chanika village where there was an influence of urban-rural migration.



Figure 6: Deforestation and hence degradation of KFR near Chanika village reflected by the dominance of Guatemala grasses at the foreground.



Figure 7: Part of KFR being deforested due to charcoal making and poles cutting in Kazimzumbwi village being dominated by shrubs and stunted trees.

Apart from that, it revealed, that, the community was dissatisfied with the regime due to the persistence of deforestation and degradation (Box 2); the use of strict laws in managing the KFR that exclude local people from accessing the forest resources within the KFR; poor participation of local people; and conflicts between the government and local community surrounding the KFR as reasons behind their position.

During the 1970s the forest (KFR) was covered by numerous forest tree species including Pterocarpus angolensis and Brachystegia microstachys. In those times, even wild animals were abundant including Mbega the endemic specie to this reserve which could not be found in other areas. There were also plenty of streams and rivers flowing from the reserve through our village to Pugu Forest Reserve. Currently however, the reserve is a mere bare with tree), it is under bad condition and if no appropriate measures are undertaken to effectively manage the reserve, I do not know what will be status of the forest in five years later.

Box 2: Narration from one of the respondents in Kazimzumbwi village during FGD

Moreover, during FGD, the Chairman of WAHIPUKA at Kimwani sub-village in Chanika village complained that, the forest officials were responsible for the increasing rate of deforestation within the reserve. They rarely visited the reserve and there was no effective monitoring of the reserve surrounded by five villages namely Kazimzumbwi, Chanika, Maguruwe, Vigama and Kisarawe. Discussion from FGDs also revealed that, some forest officers were alleged to collect kickbacks (bribes) to people who participated in illegal activities within the reserve and some of them did collude with business people to illegally harvest forest resources and make charcoal within the reserve (Box 3). Furthermore, an interview with natural resources management officers, it was disclosed a weak cooperation in the management of the reserve, as the reserve is surrounded by two districts namely the Kisarawe and Ilala, but all the management is based only at Kisarawe. Due to this weakness the reserve has been reduced in its coverage. These findings coincide with WSCT (1999) which pointed out that, the pseudo-devolution of power gives Kisarawe district a mandate to conserve the reserves on behalf of the central government though it occupies two districts.

When we want to patrol within the reserve we have first to inform the forest staff at Kisarawe district, the forest officers secretly inform their people who carry out illegal activities in the reserve. When we go to the reserve we find nobody doing illegal activities. Sometimes, we can arrest their tools and then hand over to the district forest office; they tend to sell those tools without our knowledge. Those actions do facilitate the illegal activities within the reserve and eventually deforestation increases at a great rate.

Box 3: A complaint by one member of the Forest Management Committee during the FGD at Kazimzumbwi village

Field observation witnessed the least disturbed forest cover by human activities in the western part of KFR near Kisarawe district offices (Figure 8). FGD in Kazimzumbwi village pointed out that, the maintenance of least disturbed forest canopy being dominated by *Brachystegia microstachy*) species was due to reduced illegal harvest of trees, reduced fire occurrences as a result of being close to the Natural Resources offices at Kisarawe district.

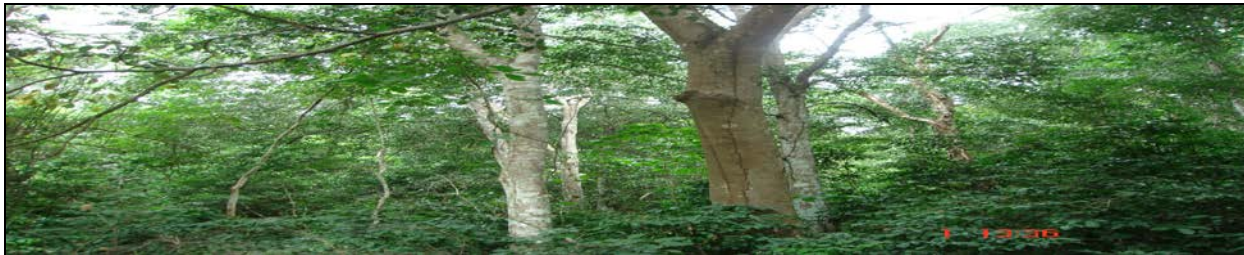


Figure 8: Least disturbed forest cover in the western part of KFR near Kisarawe district offices. Note *Brachystegia microstachy* species dominate the forest cover.

GIS analysis revealed the changing nature of deforestation of the reserve in three periods since 1956 to 2008. The analysis quantified the amount of forest being deforested, regrowth and the remained least disturbed forest cover. Between 1956 and 1981 GIS analysis revealed that, about 915 hectares out of 3800 ha of the forest were deforested (Figure 9). According to Kisarawe district forest officer, the reserve faced human pressures as a result of villagilization policy adopted in early 1970s. During this period the reserve experienced severe deforestation because of resettlement of people into villages particularly at Chanika and Vigama villages. The officer explained further that, the situation was contrary to the one observed during the period after 1954 (time of gazettement of the reserve) when British colonial government prohibited all human activities to be undertaken in the reserve. The prohibition was accompanied by strict colonial laws which helped to maintain the protected forest into its original state.

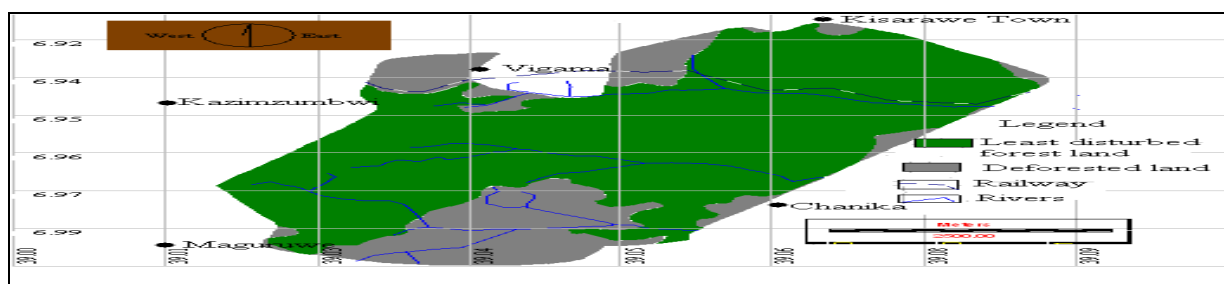


Figure 9: Change in forest cover between 1956 and 1981

The analysis between 1981 and 1996 showed that, about 790ha of forest were deforested and 362ha regrew (Figure 10). Kisarawe district forest officer revealed that, the restoration of the forest cover was due to the operation of the WCST in 1991. The NGO employed eight forest guards that greatly helped to reduce the level of illegal activities in the reserve through arresting illegal loggers and charcoal burners. WCST was also used to

raise awareness on the importance of forest resources to the communities. As a result, pressures and threats including illegal timber harvest, pole cutting and encroachment for farming greatly reduced to the level that put more promises of the improvement of the reserve. In response to the efforts of the NGO, local people planted trees around their residential areas, schools, and farm areas. This aimed at reducing pressure on the future of forest-based resources. However, following the liberalisation of the Tanzanian economy in early 1990s where the private sector was allowed to engage in trade, the conservation initiative failed to achieve its goals. This led to a new deforestation of the reserve. During FGD in Nzasa sub-village, villagers reported the actions of the business people to be involved in the illegal harvest of the forest resources (Box 4).

During the early 1990s, business people with their tracks carrying tonnes of poles, used to pass our village during the night hours for the fear of being arrested by the forest officers and policemen. At that time also, illegal harvest of the forest resources were openly undertaken in the reserve. This was fuelled by corruption that operated in that time.

Box 4: A respondent at Chanika village explaining the impact of traders on the KFR

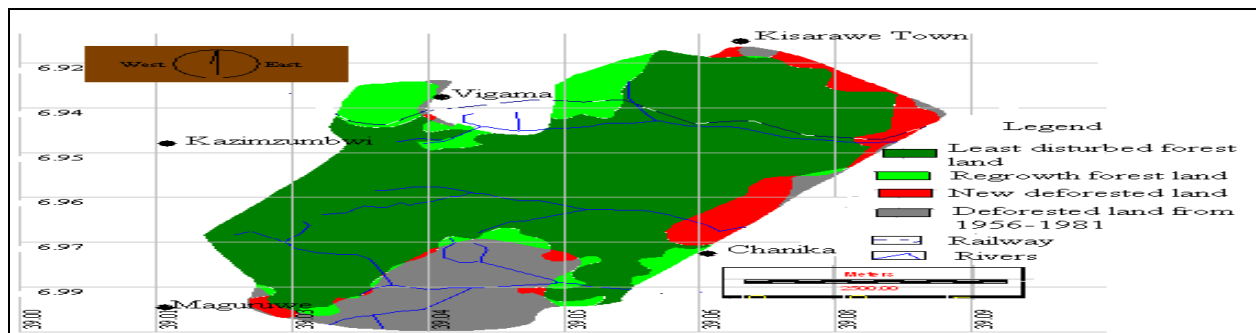


Figure 10: Change in forest cover between 1981 and 1996

Findings of the GIS analysis tool depicted that, between 1996 and 2008, the reserve faced severe deforestation of about 1446ha with a minor regrowth of 160ha (Figure 11). According to Kisarawe district forest officer, the high level of deforestation was due to increased urban-rural migration resulting to the rapid expansion of Dar es Salaam City in the turn of the century as some indigenous people tend to sell some portions of land with the reserve to the city residents. The expansion also is reported to have also caused high demand for charcoal, poles and timber. This situation was an obstacle to the achievement of the conservation goals. The causes of deforestation were also reported by the villagers in both villages. They reported that, corruption among dishonest officers, poor involvement of local people in the management and poverty were the major causes of deforestation. According to these respondents, these causes were more pronounced after the phase out of WCST in 2005.

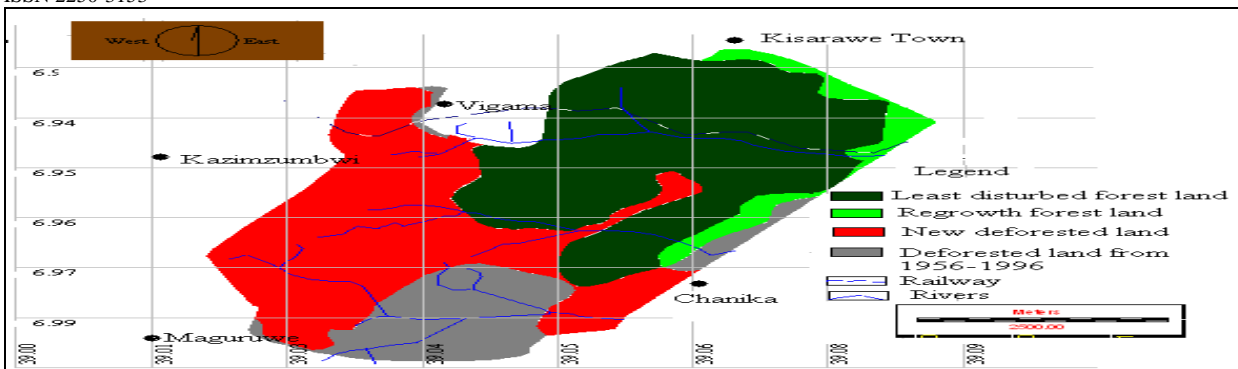


Figure 11: Change in forest cover between 1996 and 2008

3.10 Factors influencing low Perceptions of Local Community's towards KFR

The findings showed that, the majority of respondents were not satisfied with the way the government conserved and managed the KFR; hence they held negative perceptions toward the existing forest resources management regime (Figure 12). The reasons behind the dissatisfaction with the regime were the increasing rate of deforestation (31% of responses), lack of improvement of local people's livelihood (29%) persistent conflicts (26%) and lack of community participation (14%). As supported by Mchome (2001) who observed the persistence of conflicts between the central government and the local communities residing in the study area as sign of dissatisfaction of the regime which resulted to the filling of a case by the local communities to the court due to change of border.

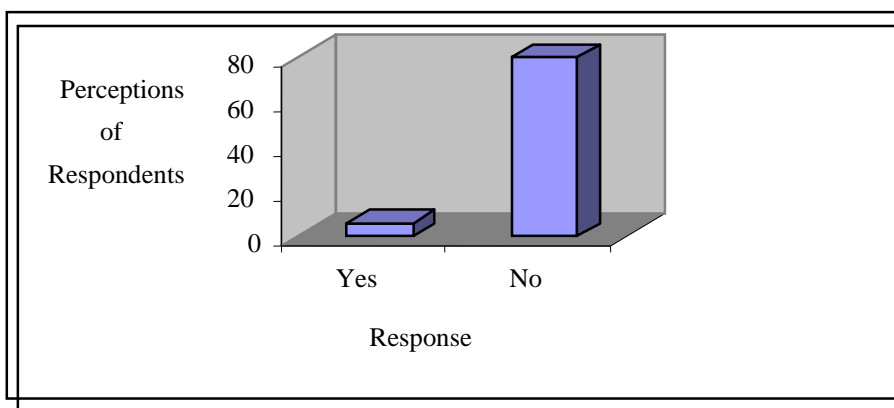


Figure 12: Response on the satisfaction of the existing forest management regime

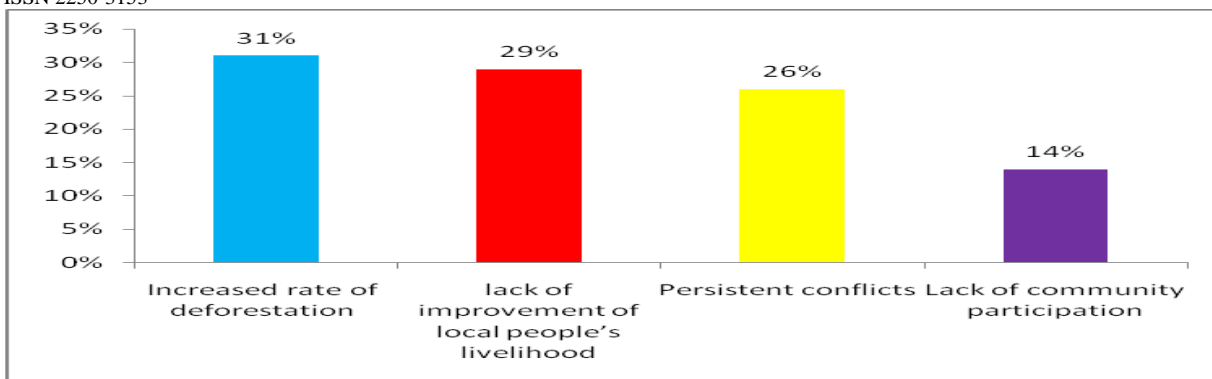


Figure 13: Reasons behind the dissatisfaction with the regime

3.11 Ways for Ensuring Sustainable Management of Kazimzumbwi Forest Ecosystem and Improved People's Wellbeing

3.11.1 Harmonising Environmental and Human Factors

The majority (69.8%) of respondents proposed Active Joint Forest Management (AJFM), the other 25.6% of respondents were excited to witness the reserve being privately managed while 2.3% recommended retaining the centralised forest management regime (Figure 14). During FGD at Kazimzumbwi, it was revealed the intention of local people to change the management system from centralised to AJFM approach in which the local community would also benefit from the management of the reserve. AJFM entails collaboration between local people, forest management, Community Based Organizations (CBOS)/NGOs and central government in managing KFR. Also, the supporters of AJFM were able to indicate the strategies to be incorporated in the management of the reserve which included participation (16.9%). According to the findings, participation of local people meant the active involvement of inhabitants in the conservation and management of KFR that would help to empower people in terms of knowledge and income. In addition to that, the training and education were also suggested that consisted of 16.4% of responses. Education concerning wise forest management was preferred by local people in order to ensure sustainable forest ecosystem featured with improved people's livelihood. Other suggestions were active forest management committee (9.2%), active forest management CBOs/NGOs (8.3%), alternative income generating activities (11.1%), development of socio-economic infrastructure (8.6%), government support (9.7%), conflict resolution (8.1%) and clear buffer zone establishment (11.7%).

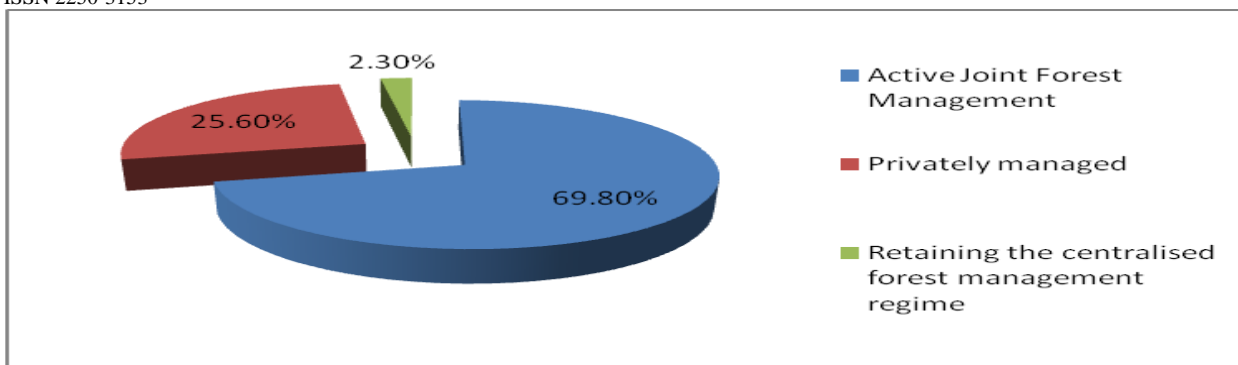


Figure 14: Communities suggestions for better KFR conservation

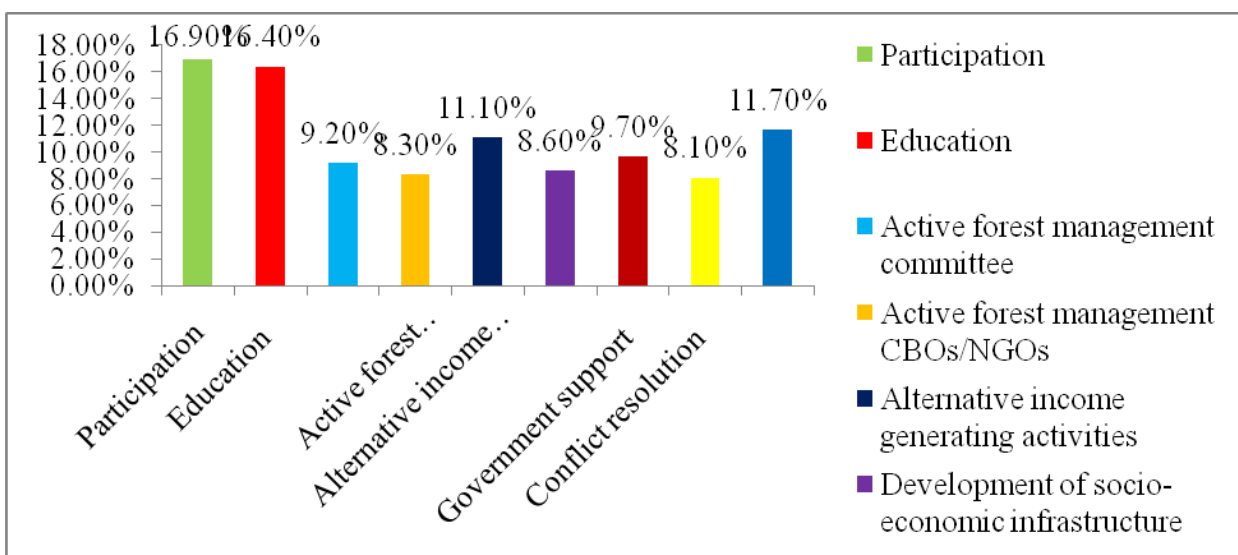


Figure 15: Additional communities' suggestions for better KFR conservation

Field observation and during FGD, it was observed that, all these responses signify an aspiration of the community to participate in the conservation and management of KFR due to the realization of the significance of the KFR to the surrounding communities as justified by one the respondent (Box 5).

It is better to conserve forest resources since conservation will bring more rain, reduce soil erosion, increase fresh air in our village and increase food. But to ensure sustainability of these resources, local people should be the guards and managers of the reserve in their respective areas. Hence, ineffective forest management should be discarded and another management approach that cares for local people and the forest simultaneously should be developed.

Box 5: Narration of a female respondent during FGD in Kazimzumbwi village.

3.11.2 Other suggestions based towards better Management of KFR

Field observation and during FGD with the villagers in Kazimzumbwi and Chanika villages, it was insisted that local people should be allowed to have a direct extraction of some species of the forest resources within KFR, but only at a reasonable amount which did not endanger the survival of the forest ecosystem while at the same time helping to satisfy their daily needs. Villagers continued to insist that, extraction of forest species should be

identified and there should be a replacement for the species harvested. Furthermore, villagers in Kazimzumbwi village contended that, they were facing a shortage of forest resources in the public forest land that had resulted to mounting pressures on protected forests, hence allowing them to access the resource base would help to meet their basic needs.

IV. Conclusion

Based on the findings, it can be concluded that local people are key and important stakeholders for effective and sound management of the forest resources. Hence, it is necessary to understand and integrate their perceptions of forest management in conservation of the forest resources so as to strike a balance between ecological objectives and societal goals.

Also, it was found out that, the majority of local community surrounding KFR had a low education level or had not attained the formal education. Almost all the households (87%) engaged in agricultural activities as their backbone of the economy. It is, therefore, evident that, given their poor socio-economic conditions, the local community lacking a forest management plan was mostly dependent on the Mother Nature for their survival and hence a threat to the forest resources.

Noting that, the majority of the respondents had negative perceptions on the regime, it would be safely stated that local community did not abide to the strict forest regulations a feature which signals future sporadic violent conflicts at national dimensions.

It is also pertinent to be stated here that, local community's perceptions of the forest management regime were greatly influenced by poverty and a poor and undemocratic political system in the management of KFR. It may be asserted that, active involvement of local people including provision of education and economic benefits, and participation in decision making in the conservation of forest resources is very crucial for them to feel that they are part and parcel of the management of the forest ecosystem.

Furthermore, it was observed that poor involvement of the communities and citizen groups like CBOs and NGOs prohibits public support in conservation and management of forest resources because they act as a platform where various aspects are channelled from the government to the local community. It is worth stating that, for effective community involvement, the role of CBOs and NGOs in changing local people's mindsets in conservation issues is of prime importance.

Given that the 2002 Tanzania Forest Act particularly in national forest reserves is more restrictive and discriminatory with respect to local communities, it may be concluded that such type of forest regulations increase poverty amongst forest dwellers and in turn exacerbates deforestation of the resource base.

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