Effects of Participatory Forest Management on Communities' Livelihoods in Arc Forest of South Nguru Mountains in Mvomero District, Tanzania

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ABSTRACT

This paper examined the effects of Participatory Forest Management (PFM) on people's livelihoods around the South Nguru in Mvomero District where two Participatory Forest Management approaches namely: Joint Forest Management (JFM) and Community Based Forest Management (CBFM) were adopted. Data were collected from 200 households randomly selected from the villages of Kanga, Mziha and Difinga using structured questionnaires. The collected data were analyzed using paired sample T-test to examine the effects of Participatory Forest Management on people's livelihoods before and after the adoption of these approaches. The results revealed that CBFM had more significant effects on livelihood improvement compared to JFM, mainly due to the fact that in CBFM approach, the communities had upper hand on the use of forest resources such as timber, poles and logs. These consequently improved services like education, health, water and roads in villages where CBFM is practiced. Based on the findings of the study, it is recommended that, in order for communities to manage and use forest sustainably, more emphasize be on CBFM approach as communities involved have more access to forest resources that can be used for their livelihood improvement.

Keywords: Community Based Forest management; Joint Forest Management, Livelihood

1.0 INTRODUCTION

Forest resource degradation in many countries continued to be a major challenge to the environment and economic development in the last decade (Lamenih and Bekele, 2008). In the conventional forest management approach, it perceived local communities as 'enemies' of the forest, and thus ought to be controlled in the use

of forest resources. This however, failed to achieve the forest conservation objectives of many countries and resulted in recurrence of conflicts which increased forest resource degradation (Lamenih and Bekele, 2008). In response to the escalating conflicts which adversely affected forest resources, many governments considered the inclusion of communities in the management of forest resources as an important ingredient to sustainable forest conservation. Many countries in Asia and almost all countries in Africa, are promoting the participation of rural communities in the management and utilization of natural forests and woodlands through some form of Participatory Forest Management (PFM) (Lamenih and Bekele, 2008).

Through the use of PFM, there is great variability in the institutional arrangements, ranging from community ownership and management of forest resources to partnership in forest management between the state and local communities (Arnold, 2001; Edmunds, 2004). In this case, two main strategies for PFM have been developed; namely, Joint Forest management (JFM) and Community Based Forest Management (CBFM) (Blamley and Raadhani, 2004). While JFM is a collaborative approach between government and adjacent communities, in CBFM, communities take full ownership and management responsibility in the forest areas under their jurisdiction.

Tanzania is one of the countries in Africa which adopted PFM approach in the forestry sector following its inclusion in the National Forest Policy in 1998 and the Forest Act of 2002. The move towards PFM has been driven by the recognition that neither central government nor local government have the capacity to manage the nation's forest resources in a sustainable way without the support of communities living close to the forest and that, there has been a political will to decentralize government functions to the lowest level of government. Further, the policy shift in forest sector has been influenced by a broader discourse about decentralization of natural resources management during the sustainable development debate in the 1970s and 1980s. Recognition emerged that, communities need to be enabled to care for their own environments, which was manifested in Principle 22 of Agenda 21 (Hobley, 1996). The adoption of Poverty Reduction Strategies (PRSP) in the 1990s by the Government of Tanzania as a major national development agenda again shifted focus in the forest sector on demonstrating its contribution to poverty reduction. Nevertheless, in Tanzania the PRSP process has further increased the momentum for PFM and led to the inclusion of forestry into the National Poverty Monitoring System. Achieving

local and social situation that can ensure both ecological sustainability of the forest and improved livelihoods has become a key challenge of forest management. These efforts all together were trying to ensure among other things improvement in communities livelihood in a sustainable way. For instance, in the Arc forest in the South Nguru Mountains of Tanzania, PFM has been adopted for a long time to deliver two broad policy outcomes; improvement of forest conditions and people's livelihoods in a manner congruent with the general national poverty reduction processes as well as contribution to the rehabilitation and maintenance of forest condition including biodiversity (Blomley and Ramadhani, 2006).

Forests have further been recognized as an asset offering numerous goods and services in the national economy and to local communities' livelihoods. In Tanzania, the agriculture and forest sector's contribution to the economy is 26.8% of total GDP (NBS, 2012) although evidence suggests that the cash and non-cash contributions made by forests and natural resources to household income are not accurately captured by official statistics (Salmi and Monela, 2000). Forests and woodlands are recognized as an important resource base for Tanzania's social and economic development, and for provision of many basic benefits and opportunities to rural and urban communities (Mariki, 2001). Values of forest goods and services obtained from forests include non-marketed timber, non-timber forest products, forest products harvested illegally (possibly up to 80% of all forest harvesting), tourism and recreational services, and ecosystem services such as positive influences of forests on agricultural production, water quantity and quality, energy sources, carbon storage, and biodiversity protection (Mariki, 2001). FAO (2009) estimated that Tanzania has 35.3 million hectares of forests accounting to 39.9% of the total land area. Out of this area, 4,122,500 hectares are under PFM which is equivalent to 12.8% of the total forest area (URT, 2008). The fact that PFM enables communities concerned to benefit from forest resources implies that the livelihoods of the people are expected to improve. However, in many areas of Tanzania where PFM has been adopted, there is scant information on the extent of livelihood improvement associated with the use of this approach. The objective of this paper was to assess the effect of PFM approach in livelihood improvement in South Nguru Mountains of Tanzania specifically in Mvomero district.

2.0 METHODOLOGY

The study employed a cross sectional research design. The sampling frame involved households residing adjacent to the South Nguru Mountains whereby purposively sampling was used to select Kanga, Difinga and Mziha villages as these are the villages adjacent to the forest reserve practicing PFM approach. The sample size was 200 households (10% o the total number of households in each village) to represent all households in the study area. The distribution of respondents from the villages are: Difinga (practice CBFM and JFM) 70, Kanga (practice JFM) 65 and Mziha (practice JFM) 65. Participatory Forest Management approach was introduced in the study area in 1991 with CBFM in Difinga village. In 1994, JFM was introduced in Difinga, Mziha and Kanga villages. Therefore, 1991 can be taken as a base year for CBFM and 1994 for JFM. Structured interview was used in data collection whereby data on access to livelihood capital assets were collected. Effects of PFM on communities' livelihood in the arc forest were measured basing on the indicators of livelihood capital assets (physical capital. Financial capital, human capital and social capital) in both JFM and CBFM approaches. Indicators of livelihood capital assets were assessed using *Likert* scale from 1 to 5. The collected data were analyzed using paired sample *t*-test to examine whether there was significant difference (in terms of mean score) in livelihood access to capital assets before and after adoption of PFM.

3.0 RESULTS AND DISCUSSION

3.1 Physical Capital Assets

Physical capital assets were assessed through quality houses (corrugated iron sheets, bricks and concrete floor), quality roads (gravel roads with bridges where needed), construction materials, social services such as school and energy (Fuel wood). Adequacy and accessibility to these assets were used in this study in describing the physical capital. The results in Table 1 indicated that there was no significant difference ($P \leq 0.01$) between indicators of livelihood, access to quality roads, access to educational services, access to construction materials and access to energy before and after JFM. Access to quality houses was significant higher after the adoption of JFM ($P \leq 0.01$) implying that PFM improved quality of houses. However, after the adoption of CBFM, all indicators of livelihood were significantly higher ($p \leq 0.05$) indicating positive improvement. These results are similar to those of Luoga *et al*. (2000) who also revealed that availability of forest resources improved roads infrastructures, school buildings and health services in communities living adjacent to the forests under CBFM.

3.2 Natural Capital

Natural capital included farm land, water and forest resources. These assets were considered to basic for livelihoods of rural communities in the study area. Results in Table 2 showed that access to land, water and forest resources under JFM were not significant ($p \leq 0.05$) before and after adoption of this approach. However, under CBFM, access to water was significantly different at ($p \leq 0.01$) indicating that CBFM improved access to natural capital assets. Similar results were obtained by World Bank (2000) which indicated that the bigger share of natural assets ownership in rural context influenced improvement of economic growth at household level.

Table 1: Access to physical asset through JFM and CBFM

Indicators	JFM Mean Score				CBFM Mean Score			
	Before JFM	After JFM	Difference	Sig. (2-tailed)	Before CBFM	After CBFM	Difference	Sig. (2-tailed)
Access to quality houses	1.82	2.18	0.36	.00	2.16	3.32	1.16	.00
Access to quality roads	3.57	3.65	0.08	0.39	2.10	3.48	1.37	.00
Access to education services	2.01	2.17	0.16	0.21	2.12	3.34	1.22	.00
Access to construction materials	3.48	3.48	0.00	1.00	2.60	3.08	0.48	.00
Access to energy (Fuel wood)	1.00	1.01	0.00	0.31	1.14	1.12	-0.01	.32

Note: CBFM = Community Based Forest Management; JFM = Joint Forest Management

Table 2: Access to natural assets through JFM and CBFM approaches

Indicators	JFM Mean Score				CBFM Mean Score			
	Before JFM	After JFM	Difference	Sig. (2-tailed)	Before CBFM	After CBFM	Difference	Sig. (2-tailed)
Access to land	2.28	2.41	1.33	.199	3.14	2.92	-0.22	.08
Access to water	3.04	3.04	0.00	1.00	2.81	3.37	0.56	.00

Access to forest resources	3.38	3.25	-0.13	.248	3.00	2.82	-0.18	.16

Note: CBFM = Community Based Forest Management; JFM = Joint Forest Management

3.3 Human Capital Assets

Human capital is one of the most important assets for rural livelihoods. In this study, environmental education and awareness, quality health services and labor force were considered to be human capital indicators. The economic gain that is generated by the input of labour is seen as been synonymously to financial capital, natural capital and machinery. In this regard, the economic gain as a result of JFM and CBFM can influence one to access human labour force for activities that cannot be done by household labour. In addition, labour force is also needed in performing different activities related to CBFM and JFM like harvesting of forest products, conservation related activities like forest patrol etc. Results in Table 3 indicated that among the indicators used, access to quality health services and labor force were significant higher ($P \leq 0.05$) before and after adoption of JFM approach. However, in CBFM approach, all indicators were significantly higher ($P \leq 0.01$) before and after adoption of this approach indicating that CBFM had more beneficial effect on human capital assets indicators as compared to JFM. It should be noted that issues related to environmental education and awareness are usually obtained through seminars and training given to the communities. Kanel (2006) also noted that through series of trainings, workshops, exposure visits and interactive dialogue with external actors including government officials, the community gained more knowledge on environmental issues, created more awareness and confidence in handling forest conservation matters in Nepal.

3. 4 Social Capital Assets

Social capital entails mutual trust, norms of reciprocity, collective identity and a sense of working together toward a shared future (Kremer and Florian, 2004). Results in Table 4 indicated that in JFM, only mean score for trust and relationship among people and governing institutions and participation in forest conservation activities were significantly higher ($p \leq 0.05$) after the adoption of this approach. On the other hand, all social capital assets indicators were significantly higher ($P<0.01$) after the adoption of CBFM approach. Similar results were obtained by Malla (2000); Kajembe *et al*. (2003); Pandey (2005) who revealed that that CBFM improved group cohesion and provided a good platform for other development activities. Pandey (2005) further pointed that meetings which is a common feature in CBFM provides a platform to communicate and interact with each other thereby enhancing good understanding among the communities.

Table 3: Access to human capital asset through JFM and CBFM approaches

Indicators	JFM Mean Score				CBFM Mean Score			
	Before JFM	After JFM	Difference	Sig. (2 tailed)	Before CBFM	After CBFM	Difference	Sig. (2 tailed)
Environmental education and awareness	3.02	3.18	0.16	0.057	2.25	3.50	1.24	.00
Access to quality health services	1.38	1.85	0.46	0.001	2.28	3.37	1.09	.00
Access to labor force	3.08	3.26	0.18	0.022	2.48	3.34	0.86	.00

Note: CBFM = Community Based Forest Management; JFM = Joint Forest Management

Table 4: Access to social asset through JFM and CBFM approaches

Indicators	JFM Mean Score				CBFM Mean Score			
	Before JFM	After JFM	Difference	Sig. (2 tailed)	Before CBFM	After CBFM	Difference	Sig. (2 tailed)
Trust and relationship among people and governing institutions	2.98	3.18	0.2	0.013	2.37	3.23	0.85	0.08
Participation to common development activities	3.57	3.65	0.08	0.380	2.54	3.55	1.00	.00
Participation in forest conservation activities	3.17	3.40	0.22	0.023	2.28	3.49	1.21	0.16

Note: CBFM = Community Based Forest Management; JFM = Joint Forest Management

3. 5 Financial Capital Assets

Financial capital is the debt capital, investment capital, tax revenue, savings, grant funds, and all financial tools that can be used by communities as the value of exchange (Florian, 2009). In this study, the indicators of financial capital used include access to income from forest products, access to income from agricultural products, access to financial institutions and access to forest related employment opportunities. The results in Table 5 indicated that there were no change in all indicators used in JFM while the same indicator were all significantly higher

($P \leq 0.05$) when the communities adopted CBFM approach. This might be due to the fact that under CBFM approach communities were allowed to use the forest for different purposes under permission from village government, thus improved their livelihood. Similar finding were reported by Luoga *et al.* (2000) who found that the engagement of communities in forest activities had contributed to raising incomes of local communities adjacent to the forests, thus improved the financial capital as people living adjacent to forests are engaged in collection of and/or trade in forest goods.

Table 5: Access financial capital asset through JFM and CBFM approaches

Indicators	JFM Mean Score				CBFM Mean Score			
	Before JFM	After JFM	Difference	Sig. (2 tailed)	Before CBFM	After CBFM	Difference	Sig. (2 tailed)
Access to income from forest products	3.36	3.33	-0.02	0.801	2.48	2.79	0.31	0.026
Access to income from agricultural products	2.80	2.81	0.01	0.871	2.57	3.40	0.82	0.00
Access to financial institutions	2.04	2.25	0.21	0.073	1.87	3.19	1.32	0.00
Access to forest related employment	2.77	2.82	0.05	0.603	2.10	3.20	1.10	0.00

Note: CBFM = Community Based Forest Management; JFM = Joint Forest Management

4.0 CONCLUSION AND RECOMMENDATIONS

It is hereby concluded that Community Based Forest Management approach has more beneficial effect to community's livelihood as compared to Joint Forest Management. It is therefore recommended that in order for communities to manage and use forest sustainably, the villagers should be given more support in terms of training, workshops and study tours to enhance their knowledge and skills in managing forest resources for their livelihood improvement

ACKNOWLEDGEMENT

The authors acknowledge the support from village leaders in the study area and government officials from Mvomero district council during data collection exercise. The authors also acknowledge for the financial support provided by

NICHE project which were very instrumental in financing all costs related to data collection

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