

Human Activities Influencing Deforestation on Meru Catchment Forest Reserve, Tanzania

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ABSTRACT Identifying human activities which influence degradation of catchment forests offers input/solutions for its management to the benefit of communities who depend on resources from the forest. Data were collected in 4 villages using questionnaire, in-depth interviews and focused group discussions. Results revealed that the main human activities disturbing Meru forest are cultivation along the boundaries (29%), firewood collection for commercial and family use (21%), illegal lumbering (18%), fodder collection (12%), bushfires (11%) and traditional honey harvesting (9%). These contribute to forest ecosystem fragmentation and forest cover change. Raising awareness and capacity building on participatory forest management to communities adjacent to the forest could have social and economic incentives for conserving forest resources. Policy and legislation framework to address impact of human activities towards forest degradation are necessary.

1. INTRODUCTION

Tanzania has about 33.5 million hectares of forests and woodlands, which is about 36 per cent of the total land area (MNRT 1998). Out of this area, about 13 million hectares have been gazetted as forest reserves; and about 1.6 million hectares are under water catchment management (MNRT 1998). The catchment forest is an area surrounding watercourse and providing it with water (Berglund et al. 2003). Tanzania's catchment forests are increasingly becoming important resources in supporting livelihood of the majority rural and urban populations as well as conserving potential ecological areas for continuously discharging of water (URT 2002). Despite this overdependence on water for economic development there is incredible and haphazard destruction of catchment forest reserves for various human needs. MEA (2005b) reports that as humans try to meet their daily needs, they are subjecting forests, woodlands and grasslands to the highest rates of change that have ever been recorded for large regions. Tanzania's forests and other natural vegetation types are of no exception. Population growth and migration to areas deemed favourable for agriculture is a concern in tropical regions worldwide because of the resultant rapid deforestation and ecosystem fragmentation (Mistry 2000). Water discharge, the basic human right has been reported decreasing yearly due to severe human-based ecological disturbances (Lovett and Pocs 1993). Land cover

change due to human activities affect water discharge (Sharma et al. 2001; Miller et al. 2002) such changes can lead to severe consequences such as water shortages, desertification and habitat destruction (Patz 2001). This paper assesses human activities influencing deforestation on Meru catchment forest reserve. Specifically it identifies different human activities carried out in the Meru forest and their effects. Identification of human activities and their effects on Meru catchment forest provide good benchmarks for wise decision making in trying to establish a people-based management approaches aimed at sustaining the forest, in order to ensure sustainable discharge of water resources and other productive functions for both rural and urban populations.

2. METHODOLOGY

2.1 The Study Area Description

Meru Catchment Forest Reserve is located at latitude 3° 15'S and longitude 36° 45'E. It is 20 km North of Arusha town, 5 km from Arusha-Namanga trunk road. It is among the two catchment forest reserves in Arumeru District. The reserve covers the outer slopes of Mount Meru in a U-shaped, open to the East, from approximately 1500m to 3000m above mean sea level. Arusha National Park covers the crater floor and a corridor to it from the East. Economic activities of the people surrounding Meru Catchment Forest Reserve are livestock keeping, cul-

tivation, timber harvesting and trading. Communities which surround the catchments at Western side are mainly dealing with livestock keeping and cultivation whereas, communities which surround the catchments at Eastern side are dealing with timber harvesting and trading. The most traded tree species are those ones with high water catchment value.

2.2 Data Collection

Questionnaire survey, in-depth interviews and focused group discussions were used to collect information on the human activities influencing deforestation on Meru catchment forest reserve in Arumeru District. Four villages were purposively selected based on their closeness to forest reserve. Within these villages, random sampling was further used to select household heads for interview, 120 respondents across the selected villages were interviewed, taking into account representation of both genders.

During the questionnaire survey, participant group meetings were conducted and research objectives explained. Thereafter, in-depth interviews were conducted on 12 key informants knowledgeable about the forest reserve, including one Regional Forest Officer, two District Forest Officers, three village leaders and six village elders. One focused group discussion with village environmental committee for each village was made to provide additional information about the issues emerging from the impact of human activities on water catchment areas. Each discussion comprised of 6 community members.

2.3 Data Analysis

The Statistical Package for Social Sciences (SPSS) was the main tool for quantitative data analysis. Formal data analyses were preceded by cleaning up of the data and coding that facilitated further analysis. Descriptive statistical analysis using frequency counts and percentages was used to explain socio economic characteristics of communities adjacent to the forest reserve. Qualitative data were analysed using content and structural functional analytical techniques in which components of verbal discussions from different respondents were broken down into the smallest meaningful units of information, values and attitudes of respondents (Kajembe 1994). This helped the researchers in ascertaining values and attitudes of the respondents.

3. RESULTS AND DISCUSSION

3.1 Socio-economic Characteristics of the Respondents

A total of 120 household heads from four selected villages were interviewed during questionnaire survey (Table 1). Results indicated that 65% of the studied households were male headed while 35% were female headed. This reflects the typical situation in Tanzania and more particularly in rural areas where most households are headed by males. Regarding education, 85% of the interviewed household heads had primary school education, 8% had attained secondary school education and 8% had no formal education. Furthermore, the study found that 50% of

Table 1: Socio- economic characteristics of households adjacent to Meru Forest reserve

Category	Measurements			Villages			
	Variables	Total Count (n=120)	%	Sambasha %	Olmotonyi %	Sakila %	Oldonyosambu %
Gender	Male	78	65.0	17.0	16	15.5	16.5
	Female	42	35.0	07.5	9.0	8.0	7.9
Age group	18-25	11	09.2	0.8	3.3	1.7	3.3
	26-35	38	31.7	6.7	10.8	6.7	7.5
	36-45	30	25.0	7.5	4.2	5.8	7.5
	40-55	19	16.0	4.2	4.2	4.2	3.3
	>50	22	18.0	5.0	3.3	4.2	5.8
Education	No formal	8	6.6	3.3	0.8	0.7	0.0
	Primary	102	85.0	20.8	20.0	21.7	22.5
	Secondary	10	8.0	2.5	1.7	0.8	3.3
Occupation	Pastoralist	60	60.0	15.0	15.0	15.0	15.0
	Farmers	36	30.0	7.0	8.0	7.0	8.0
	Traders	19	16.0	4.0	4.0	4.0	4.0
	Workers	5	4.0	1.0	1.0	1.0	1.0

the respondents were livestock keepers, 30% subsistence farmers while only 16% were timber traders and 4% were government workers.

3.2 Activities Contributing the Disturbances of Meru Catchment Forest Reserve

Majority of the respondents (79%) acknowledged that there are different activities being carried out around and within the forest reserve. Relatively few (21%) not knowing any activities taking place around and within the forest reserve. Activities which are taking place were identified as cultivation along the boundaries (29%), firewood collection for commercial and family use (21%), illegal lumbering (18%), fodder collection (12%), bushfires (11%) and traditional honey harvesting (9%) (Fig. 1). Population increase and poverty could be the reasons that led local communities to engage in these activities. The population size of Arumeru District for the year 2002 was 320,000 and projected population size for the year 2010 is about 341,136 (Bureau of Statistics 2002). According to FAO (2003) population size and density have major consequences for the intensity of resource use. Elsewhere Mitinje (2007) highlights that human activities are deeply rooted on daily needs of the communities in terms of forest products needed to cater for the growing human population. For example, a study by Cunningham (1996) in Sierra Leone shows that firewood provides the first cash income from land cleared for rice production.

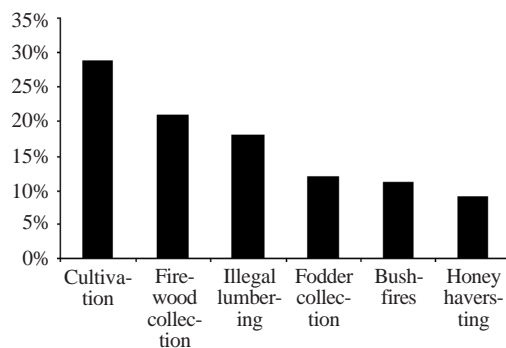


Fig. 1. Activities which contribute to degradation of Meru catchment forest reserve

3.3 The Effects of Degrading Meru Catchment Forest

All respondents (100%) who were interview-

ed are aware of what would happen to their normal lives if Meru catchment forest would be degraded by one activity or another. The respondent highlighted that the following effects might occur: unreliable water (50%), drought (25%), lack of animal fodder (11%), occurrences of soil erosion (7%), extinction of wildlife (4%) and lack of firewood (3%) (Fig. 2). Field observation revealed that human activities bring about decrease of the forest by either altering or depleting the forest cover. The alteration affects forest structure and species composition through selective removal of individual trees (Schwartz and Caro 2003). The intensity of disturbances also varies within a landscape as a function of accessibility, land-use and the type of vegetation present. However, the increase in dominance of small woody trees in harvested areas in the forest suggests that the forest may degrade to shrub lands following anthropogenic pressures (Luoga 2000). According to (Ingram 2005; Oyugi 2007) human activities have significant impact on species composition, diversity and forest cover changes. Population growth and poverty could be one of the very crucial factors accelerating human activities on forests in Tanzania.

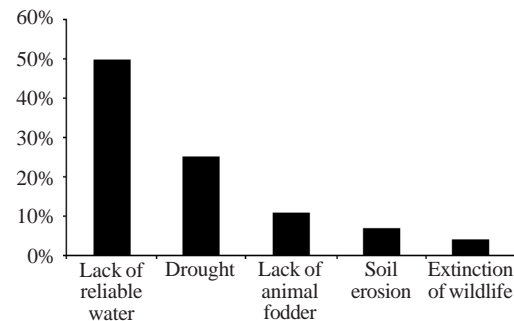


Fig. 2. The consequences of degrading Meru catchment forest reserve

3.4 Reasons for Accessing the Forest Reserve

Respondents acknowledged that (75%) of those who access the forest reserve for collection of different materials are women, (21%) are men while relatively few (4%) are children. Of these who are accessing the forest reserve, most of them (27%) said they look for food supplement (examples Mushrooms, honey, fruits, vegetables), (23%) said they go in the forest for looking an alternative sources of income (such as hunting, lumbering), (16%) said

to get firewood, (20%) said to get drinking water while relatively few (14%) said to get animal fodder. This result showed that it is relatively difficult to manage this forest due to the fact that reasons which force the community to access the forest reserve are deeply rooted on daily needs of the communities in terms of forest products. In this context, a delicate forest resource management that takes care of the needs of the community should be considered if Meru catchment forest reserve is to be sustainable. Similarly, Fabricius (2004) found that benefits from natural resources management result in benefits to the natural resource and the community; it is mutually reinforcing relationship between the two. Majority of respondents said it was necessary to access the forest because it provides means of getting firewood, fodder and honey for household's consumption and sale. However, key informants mentioned that the frequency and amount collected for both consumption and sale currently is more than what a forest can support.

4. CONCLUSION AND RECOMMENDATION

Meru forest just like other forest reserves in the world provides human beings with service and productive functions such as fuelwood, timber, poles, fruits and traditional medicine as tangible benefits. It also provide service benefits such as shade, windbreak, rainfall, protection of soil, protection of water sources (rivers and streams), and improvement of soil fertility. However, availability of both service and productive functions to the communities have been decreasing yearly due to various human activities particularly, overexploitation of forest for timber, firewood and charcoal, illegal grazing, agricultural encroachment and deliberate fire setting. The reason for encroachment is to search for basic needs of the communities in order to sustain life. It is, therefore, important that effective ways to address the daily needs of the communities are identified and implemented.

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