THE FUTURE OF THE ULUGURU MOUNTAIN FOREST, TANZANIA

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Peter Mwita Nkombe[1]

ABSTRACT

The Uluguru mountain forest (UMF) lies immediately South of Morogoro town in Tanzania between latitude 7° and 8° S and longitude 37°-38° E. The forest is 180 km from Dar es Salaam, the capital city of Tanzania. The UMF has long been known for its unique biodiversity and is considered to be one of the top priorities for the conservation of biodiversity in Africa.

The climate of the area is not as favorable as it was in past years when forest cover was greater. Over an area of 527 km² 60% of the vegetation cover is said to have been lost.

Different socio-economic activities are carried out around the forest: agriculture is mostly carried out at subsistence level to produce both food and cash crops; hunting is also practised by the pastoralists (the Masai and Gogo) and the indigenous people. There has been an increasing rate of deterioration of the forest, poverty being among the causes. This paper looks at the ongoing threats to the mountain.

Despite its relatively small size, the UMF is extremely important and should be the target of intense national and international efforts to ensure that it is properly conserved. The paper recommends that since the forest is vital for life in and outside Morogoro, the limited funds currently available for conservation be targeted to the UMF where they are likely to have the most effect.

1. INTRODCTION

1.1 Location

The Uluguru mountain forest (UMF) lies immediately South of Morogoro town in Tanzania east Africa between latitude 7° and 8° S and longitude 37°-38° E. The UMF is approximately 180 Km from Dar es, and about 46 Kilometers long rise abruptly out of the coastal plain at approximately 300m above sea level to a peak of 2600m. U M F is covered by six forest reserves, which cover the total area of 404 Km².(See figure 1.1)

1.2 Climate.

The estimated rainfall is 1200 mm/year on the eastern slope of the mountain, 2900-4000 mm on the western slope. The mean annual temperature is about 24.3°C (with a maximum of 26.5°C in December and a minimum of 21.1°C in July) (Lyamuya *et al*., 1994). According to Jens et al, (1993) the mean annual temperature was 19.5° C (with a maximum of 22° C December and a minimum of 17° C July). However this is an evidence of small scale change in the climate of areas such as the Eastern arc mountains which might be due to the effect of human alteration of the habitat on those mountains specifically through deforestation. This can also be shown by the decline of rainfall and cloud cover (Hamilton, 1988).

1.3 Vegetation.

With the exception of rock out crops the mountain is entirely covered by moist submontane forest (canopy 30-50m tall). The number of the forest patches has also been quantified as one measure of fragmentation of the natural forest cover and according to literature an estimate of the loss has been estimated. On the average it is estimated that the Eastern arc mountain mountains (Uluguru, Usambara, Uduzungwa) have already lost (73%) of their original forest cover, while Uluguru alone have lost sixty percent (60%) (Po¢cs, 1974; 1976). According to the data produced by Newmark, (1998) the Uluguru natural forest was 527 km^2. With 5 Km^2 of the forest patches and the closed forest was about 120 Km^2 and the total forest cover lost was about (60%).

2. SIGNIFICANCE OF THE ULUGURU MOUNTAIN FOREST

2.1 Biodiversity.

The Uluguru mountain forest has long been known for its unique biodiversity and is considered to be one of the top priorities for the conservation of the biodiversity in Africa. The Uluguru mountain forest has many animals and plant species found no where in the world, true endemic.

Bird species of special conservation value include five threatened species and three near threatened species, two of which are endemic to the Ulugurus, the Uluguru Bush shrike (*Malconotus alius*); Loveridge's sunbird (*Nectarinia loveridge*) near threatened. The other threatened and near threatened bird species known from the Uluguru are Moreaus's warbler (*Bathocercus winifredae*); White winged Apalis (*Apalis chariessa*); Banded green Sunbird (*Anthreptes rubritoques*); Tanzania mountain Weaver (*Ploceus nicolli*) Southern banded Snake Eagle (*Circaetus fasciolatus*) and the Uluguru Violet-banded Sunbird (*Anthreptes neglectus)*

Mammals of special conservation value include two shrew species, which are endemic to the Uluguru mountain forest, *Crocidura telfordi and Myosorex geata* .The subspecies *Tropichalis* of the insectivore Golden mole (*Chrisochloris stuhlmanni*) is also endemic. Three threatened mammal species are Zanzibar Galago *(Galago zanzibaricus*); black and rufous elephant Shrew (*Rhynchocyon ptersi*) and Abbott's Duiker(*Cephalophus spadix*), the last one being endemic to the Eastern arc forests.

Reptiles of special conservation value, of the twenty two forest species known to occur in the Uluguru, six species are endemic lizard known only from Kibonza forest are *Lygodactylus williamsi,Cnemapsis barbouri*, *Scelotes Uluguruensis* (a skink), Typhlops Uluguruensis (a snake), Prosymna ornatissima (a snake) and Geodipsas procterae (a snake).

Amphibians of special conservation values, of the twenty-six forest species known to occur in the Ulugurus five are endemic; *Nectophrynoides cryptus* (a toad), *Probreviceps Uluguruensis* (a microphylid frog), Halophryne Uluguruensis (microphylid frog), Afrocaecilia Uluguruensis (a caecilian) and Scolecomrphus uluguruensis (a caecilian).

Endemism is very high in the invertebrates, example for millipedes 28 taxa known from the forests, 23 are endemic Linyphiid dwarf spiders, 14 which is equivalent to (86%) of the 17 species are endemic. 10

butterflies, which are equivalent to (27%) of the 37 species, 41 montane ground beetles, which are equivalent to (95%) of the 43 species, are endemic.

2.2 Water Catchment and Supply

UMF is the major source of river flows supplying water to major urban centers of Morogoro and Dar es Salaam the major city of Tanzania, The forest provides fuels, maintenance of humid climate suitable for agriculture, secure stable and good water supply and the main source of water for the urban and industrial uses in Tanzania's most populous city Dar es salaam through the Ruvu river and preventing soil erosion on steep slopes. The Catchment forest reserves are part of the life of the people living in the Uluguru slopes and in general they recognize its' importance and they pay great respect to the forest.

The value of the Catchment function of the Uluguru mountain forest has not been estimated in monetary terms. However, as most of the economic activities depend on water from this forest, the value must be billions of dollars over a ten-year period. However this is all jeopardized by the loss of the forest cover, woodlands and other trees from the mountain. Similarly water from the Uluguru provides an opportunity for fishing and the water have been used or irrigation practices particularly for horticulture crops.

However although water is relatively abundant, access to clean water is a serious problem in some areas. Even the supposedly clean and safe water is not protected and the springs are subject to sources of pollution and contamination. Water intakes are similarly contaminated due to farming and logging activities. So water from the rivers is considered unsafe. (See table. 2.2).

Table 2.2 Indicates accesses to safe and clean water in study village in the Uluguru mountain forest.

VILLAGE	SOURCES OF WATER	ACCESS TO CLEAN WATER	ACCESS TO IRRIGATION	REMARKS
Tandai	Permanent rivers, Streams, springs and shallow well	Yes but not adequate	Limited	Improve small scale local irrigation skills, More water taps
Bunduki	Permanent rivers, streams and taps	Yes	Yes	Improve small scale local irrigation systems, More taps
Mbete	Permanent rivers, stream/springs	Not adequate	Limited	Improve small irrigation install taps in pipes passing through village
Bigwa	Seasonal rivers and streams	No	No	Local irrigation possible
Tawa	Permanent rivers and taps	Not adequate	Limited	Improve small irrigation
Kaswira	Permanent rivers, streams and taps	Not adequate	No	Improve small-scale irrigation, increase crop production.
Tangeri	Permanent rivers, streams, springs and taps.	Yes	Yes	Improve small scale local irrigation skills, more water taps
Nyandira	Permanent rivers and tap	Yes but not adequate	Limited	Improve local irrigation and more shallow well
Singisa	Permanent rivers	No	Limited	Improved local irrigation
Bwakila juu	Seasonal rivers and shallow well	Not adequate	No	Improve local irrigation and more shallow wells
Mwarazi	Seasonal rivers streams/ springs, shallow well	Not adequate	No	Potential for irrigation

Source: Ministry of Water and Livestock Development Morogoro, Tanzania

2.3. Fuel

Fuel wood is one the major befits the poor peasants accrue from the forest. This is due to lack of alternative source of fuel such as kerosene and electricity due the existing poor living standards of majority of the residents. Hence demand for fuel wood is very high and estimated that nine percent of woodcutting is for fuel wood. Apart from cooking, fuel wood is used for burning bricks, fish smoking, ripening banana, ironing and keeping warm during cold weather. Some of trees are used to make charcoal for both domestic uses and for sale to generate income.

3. SOCIO- ECONOMIC HUMAN ACTIVITIES IN THE ULUGURU MOUNTAIN FOREST

3.1 Agriculture

The area is mostly inhabited by the Luguru who depend on subsistence lifestyle and agriculture is their main economic activity. Much of the areas are used for agricultural production, and there is potential for many areas which are broadly used for agriculture of both food and cash crops production which would in turn boost income and employment. Slash and burn and shifting cultivation are common in many areas. Inter cropping is another system applied in the Uluguru Mountains by Luguru farmers. Some the food crops grown includes; maize, beans, rice, cassava,, sweet potatoes, irish potatoes, sorghum, and vegetables. Cash crops produced in the area vary from place to place within the Ulugurus, they include bananas a variety of fruits such a oranges mangoes, guava. Coffee, sunflower seeds, coconuts, oil palm. The cash crops produced are normally sold in Morogoro town and some are exported to Dar es Salaam where the great market is secured. However as time goes production yield is continuously reduced due to the great disturbance of the climate as a result of deforestation.

3.2 Hunting and Pastoralism

Although live stock keeping is not a common practice due to land scarcity, culture and lack of technology of zero grazing, Pastoralism is among the activities carried out around the Uluguru mountain forest particularly in villages such as, Lukobe, Lugala, Kimambira by few pastoralist tribes the Masai and Gogo in the course of these activities results into deforestation through trampling of young trees which are killed in their young stages. Some browsers such as goats do prefer the shoot apex, which results to a retarded growth of some plants.

Hunting on the hand is carried out around the forest. Although hunting is not very intensive but the process of hunting is the major source of problems. This is due to frequently set fire in order to drive animals towards the snares or towards the direction of the hunters for easy catching of the animals, as a result the fires turns into wildfires which are uncontrolled and hence cause a great destruction to the forest.

4. REASONS FOR THE CONTINUOUS DEGRADATIONS OF THE ULUGURU MOUNTAIN FOREST

4.1 Population

There have been increasing rates of the human population with regard to the demographic data from the 1978 and 1988 census, which indicate that the population-increasing rate was 6.5. Per annum with a population density of more than 150 persons per each square kilometer of which in this case results to

over utilization of the forest and other resources available. Table 4.1 indicates the population by sex and house average size and number in the nine study wards in the Uluguru Mountain from the 1988 census data.

Tab. 4.1 Population by sex and house average size and number in the Uluguru Mountain.

WARD	POPULATION			NUMBER OF HOUSE HOLDS	AVERAGE SIZE
	Male	Female	Total		
Kinore	4946	5324	10270	1794	5.7
Bunduki	3544	4105	7649	1383	5.1
Kingolwila	10300	9537	19837	4013	4.9
Kisemu	5604	6422	12026	2368	5.0
Mzumbe	7600	6818	14418	2811	5.1
Chenzema	4196	5005	9201	1703	5.4
Bwakila juu	2233	2668	4901	982	4.9
Singisa	4421	5172	9593	1948	4.9
Mkuyuni	7065	7663	14728	2698	5.4

Source: Census and 1988

According to the data it is obvious that the carrying capacity of the arable land and the forest is low in relation to demographic pressure. Land in the Uluguru is scarce and population density in some mountainous areas, Chenzema and Kinole experience over exploitation of the resources available. Kingorwira has also a great number of population, but much of the area is relatively low-lying but even here over utilization of the resources such as ground water, trees shrubs organic matter and soil nutrient reserve are visibly exhausted. The average household size is 5.2 persons per household which is not high compared to the national average but the rate of population increase ranges up 6.5% per annum (Lyamuya et al, 1994) which is relatively high between 1978 and 1988 census (2.5-6.5%. It also showed that the population increase was highest in the categories of children and elderly people, who are not productive work force. Population increase is due to migration (most cases inter- village migration), in this case migration is significant in villages such as Nyandira, Bunduki, Bigwa and Tangeni. The major reason for this migration is the search of additional agricultural land, logging, and pit -sawing, charcoal burning, and hiring out labour for agriculture and mining. However due to the rapid increase of human population, people will demand more land for agriculture by encroaching at the edges. Often villagers who lack land tend to expand towards the forest. In order to ease work the villagers normally pay the pit sawyer to clear the forestland completely once he has extracted the valuable timber species. Also high population leads to rapid land deterioration, which results to loss of the soil fertility hence, degradation.

4.2 Education.

Education acts as an instrument in rising awareness towards environmental conservation. However through critical analysis it has been observed that most the Waluguru have no adequate formal education hence poor conservation education. In this case people don't know the existing complexity between forests and climatic change. Some still believe in local beliefs thinking that rain can be brought about by magic power. Inadequate formal education is attributed by so many factors. Apart from the reluctant behavior of the Waluguru, the government also have contributed to its level For example there are at least government school except in Bigwa village, despite the presence of these schools there is an acute scarcity of necessary facilities such as classrooms, desks and teachers which have greatly contributed to the decline of the standards of education provided in these schools. Table 2 illustrates literacy by broad groups in Morogoro rural District.

Table 2. Literacy by broad groups, Morogoro Rural District.

AGE GROUP	TOTAL	LITERATE		ILLITERATE	
		Males	Females	Males	Females
Children 10-14 years	55943	19598 (35%)	20340 (36%)	8295 (15%)	7710 (14%)
Youth 15-34 years	112787	44620 (39%)	31740 (28%)	9695 (9%)	26732 (24%)
Adults 34+	113350	27945 (25%)	11695 (10%)	25720 (23%)	47990 (42%)

Source: Compiled from the 1998 census data in Tanzania

4. CONSERVATION POLICY

Through the forest conservation policy of Tanzania which was under exclusive management and control of the forest through various levels of forest officers, instigated the local community to exploit the forest with the ideology of not feeling as the forest belong to them .On the other hand the forest officers engaged in taking bribe to meet their desire while the forest degraded. In the Uluguru this was echoed very strongly to some villages such as Bigwa, Tangeni, Tandai, Mwaranzi and Nyandira where acrimonious relationships have ensued between villagers; village elders and the village foresters over the use of the forest. However the best way of conserving the forest is through participatory management inorder to build a positive altitude of the people towards the resource.

5. MAJOR THREATS TO ULUGURU MOUNTAIN FOREST

The Uluguru mountain forest is among the most critically threatened due to the following arguments;

- An increased demand for fire woods and building poles with subsequent depletion of these items out side forces people to obtain these materials from the forest
- Poor and rapid growth of human population (6.5% per annum) with poor agricultural techniques, which result to soils depletion for nutrients, and hence demands more land every year for farming.
- Wide spread burning is a serious threat to the wood lands and forest edges.
- Soil erosion is also a big problem where farming is carried out on very steep slopes and most of them no measures are taken to prevent soil erosion.

6 CONCLUSION

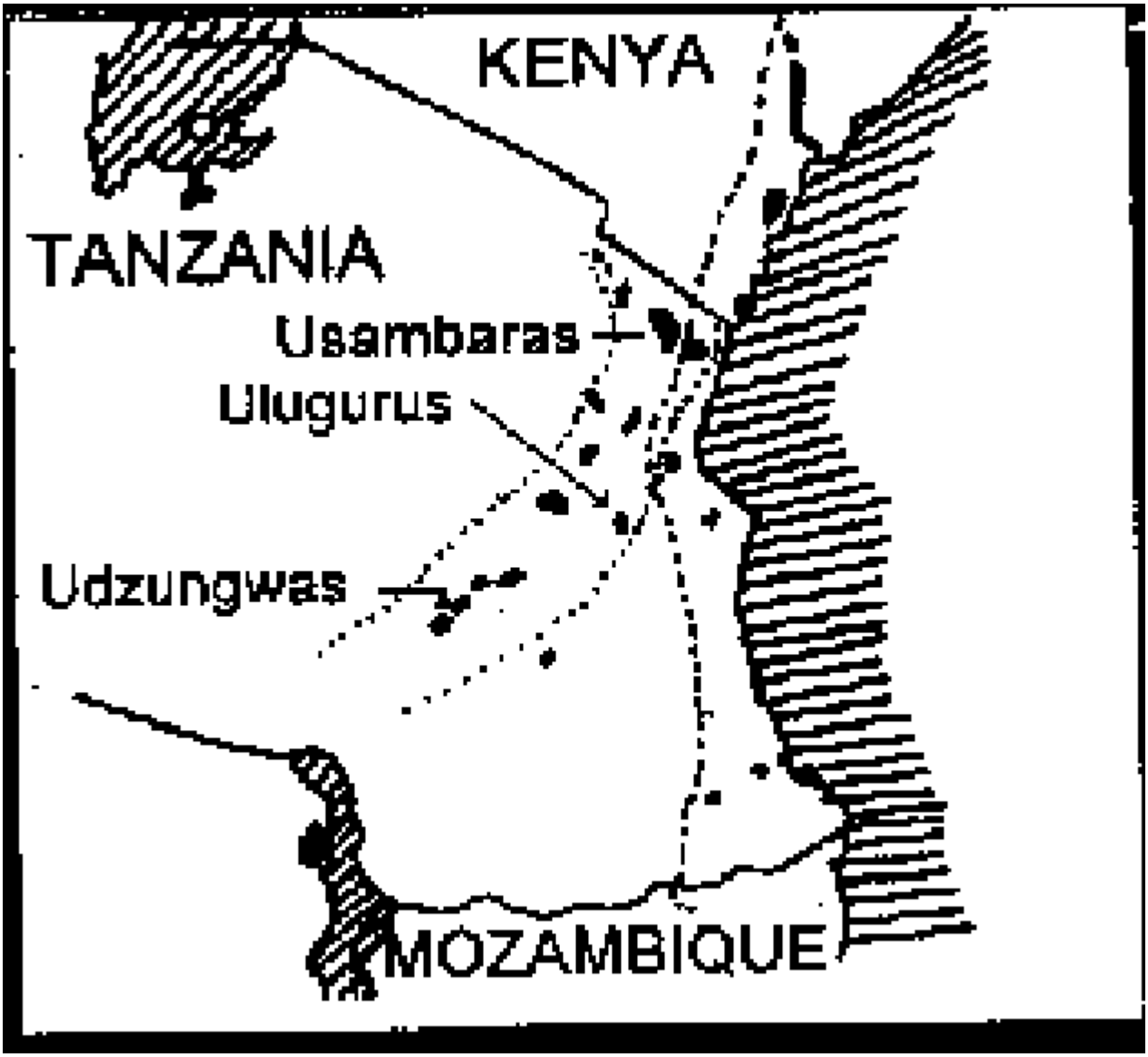
Through this striking information on the Uluguru mountain forest as the water Catchment serving different areas in and outside Morogoro, as a climatic regulator, possession of exceptional species of both animals and plants, also as the area with a great diversity of species, show that the relatively small area of the forest in the Uluguru mountain is of extreme importance and should be the target of intense National and International efforts to ensure its conservation over the prolonged number of years. The area provides an opportunity for foreign donors to initiate carefully designed activities. High water Catchment values (for Dar es Salaam and local villages) and biodiversity values can be protected and the living standards of the local people be raised by improving agricultural practices and providing fuel plantations through encouragement of afforestation. However it is recommended that the limited funds currently available, conservation needs to be effectively targeted to the UMF where they are likely to have the most effect to rescue the on going negative situation.

7. RECOMMENDATIONS

To this context, it is crucial for Tanzania politicians recognize the importance of basing the economic development models for the country on the investments mentioned above for solving the fundamental environmental problems such as the loss of natural water Catchment areas. Tanzania should start up stepwise the planning of large-scale donor supported land management programs. as the Tanzanian managing authority should first decide on the national priorities for initiating such programs.

However critical information on the uses of the forest by the local people, their attitudes to forests conservation and the pressures they face is still scant for the Uluguru Mountain forests area which is the serious barrier to their effective conservation.

Figure. 1.1 MAP OF TANZANIA SHOWING THE LOCATION OF MOUNTAIN ULUGURU FOREST IN MOROGORO TANZANIA.



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[1] Department of Wildlife Management, Faculty of Forest and Nature Conservation, Sokoine University of Agriculture, P.O. Box 3000, Morogoro Chuo Kikuu, Tanzania. Email: npmwita@yahoo.com