

Full Length Research Paper

Attitudes of Local Communities Towards Biodiversity and Conservation: A Case Study of Mount Kilimanjaro and Usambara Mountains Surrounding Villages

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An important question in conservation is how to conserve both the renewable natural resources and abiotic elements of the environment in the face of changing human use patterns. Given that the livelihood of many people depends on the environment, the current challenge facing many nations is no longer deciding whether conservation is a good idea. Rather it is important to know how resources can be conserved in the national conservation interest without affecting the livelihood of the communities dependent on them. It was therefore the aim of this study to document and incorporate some understanding of the local people's attitudes towards conservation and see how this can be integrated into a programme for the sustainable conservation of natural resources. In order to investigate the attitude of local communities around protected areas/reserves towards the forest and wildlife of their area and to understand the views of a local community about conservation of the area, the use of sample surveys using a semi-structured questionnaire was implemented. A total of 200 people were interviewed, from two villages adjoining Mount Kilimanjaro Forest Reserve (PA), and another two villages located adjacent to a Forest Reserve in the West Usambara Mountains. Results show that the attitudes of people towards conservation differed between the two study areas. A majority (64%) of West Usambara villagers showed a negative attitude whereas 95% of Mount Kilimanjaro villagers supported the need for conservation. This suggests that, in a large country like Tanzania, with diverse ecological zones, cultures and attitudes, different conservation approaches are needed in different areas to cater for these disparities.

Keywords: Conservation, attitudes, Mount Kilimanjaro, Usambara Mountains

INTRODUCTION

Mount Kilimanjaro and West Usambara mountains villages are both located in North Eastern part of Tanzania, situated some 150 kms apart. While the formation of Mount Kilimanjaro is recent: 750 years ago (Greenway, 1955; Odner, 1971) compared to the very old formation of West Usambara Mountains dating back 25 million years ago (Lovett and Wasser, 1993), but the surrounding villages in both areas were formed more or less in the same period about 250 years ago (Fosbrooke and Sassoon, 1965; Schmidt, 1989; Iversen, 1991).

Mount Kilimanjaro Villages

Humans or their ancestors were probably gathering plant foods and hunting animals around Mount Kilimanjaro

throughout the mountain's history, although nothing of great antiquity has been found on the mountain, there is plenty of evidence of ancient human occupation at nearby sites throughout the Rift Valley. Stone bowls and rings, made from local lava, have been found on the western slopes of Mount Kilimanjaro (Fosbrooke and Sassoon, 1965). Also found in the area are obsidian flakes and tools, pottery fragments and a stone axe. Similar stone bowls from elsewhere have been dated as more than 2,000 years old and one can only guess that the stone bowl makers left the mountain before the arrival of the more recent peoples. Most of the artifacts found on Mount Kilimanjaro can be traced to the Wachagga people who immigrated into the area some 250 or more years ago. The Wachagga were agriculturists and they soon settled down to farming

Table 1: Human population in districts of Kilimanjaro region.

Kilimanjaro region (Districts)	Number of people and percentage of the total district population				
	Age class				
	0-14	15-34	35-54	55	Total
Moshi rural (study area)	15,4547 (54%)	83,868 (27%)	44,795 (14%)	28,741 (9%)	311,951 (35%)*
Rombo	80,527 (51%)	42,899 (27%)	20,639 (13%)	13,674 (9%)	157,739 (17%)*
Hai	83,484 (48%)	49,516 (29%)	24,995 (15%)	14,322 (8%)	172,317 (19%)*

Source: Bureau of statistics (1978)

() * District total population as % of the (administrative) regional total human population

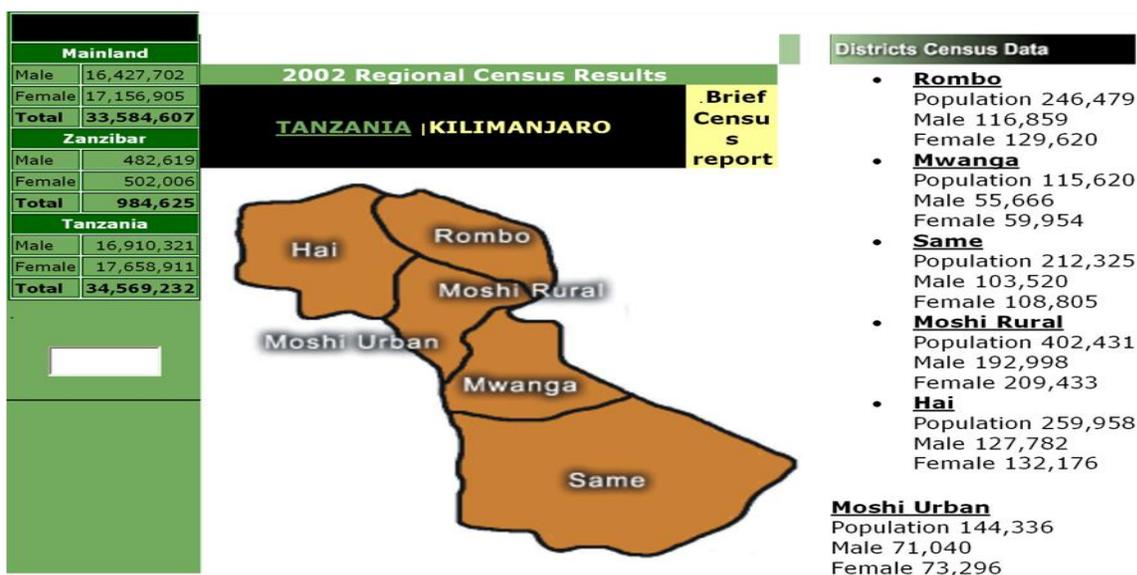


Figure 1: 2002 Regional Census Results. Source: United Republic of Tanzania, 2002 Population and Housing Census (Bureau of Statistics, 2002).

Mount Kilimanjaro's slopes, using the abundant water from the forest, making dams and irrigation furrows, building "forts" and in many ways leaving their mark on the landscape. Mount Kilimanjaro, considered the oldest protected area in Africa, was first declared a game reserve by the German colonial government in the early part of the 20th century, and further gazetted by the British as forest reserve in 1921. However, as noted above, the Wachagga were then already occupying the mountain and used its resources mainly for agriculture and hunting.

The area above the forest line (2,700 metres) was reclassified in 1973 by the Tanzanian government to form a National Park. In 1978, the park was included on the World Natural Heritage list of outstanding universal value. The current boundaries of the World Heritage Site include all of the mountain forest, and the ericaceous and alpine zones of the mountain. Although gazetted as a Protected Area since the 1920s and listed as a World Heritage Site in 1987, Mount Kilimanjaro National Park

and its adjacent forest belt is threatened by logging, quarries, livestock grazing, cultivation within the forests, charcoal production and outbreak of fires. The human population on the slopes of Kilimanjaro is high, especially within the banana-coffee belt where there is high mean annual rainfall about over 1000 mm per annum. According to reports (e.g. Mwihomeke, 1989), overpopulation of the slopes of Mount Kilimanjaro is an old problem. Recently, a human population density of 500 people/km² has been reported (Mwihomeke, 1989). Within the banana-coffee belt, home-gardens range from 0.2–1.2 ha in extent, the majority being about 0.6 ha. The high and rapidly increasing human population (Table 1) causes parallel increases in demands for food and fuel-wood. Yet the severe shortage of land and the fact that all available land is already intensively cultivated hinders traditional efforts to increase production of food and wood to satisfy the demand.

However, the latest census results, made in 2002, are illustrated in Figure 1.

Table 2: Distribution of agricultural crops in the agroecological zones of West Usambara Mountains.

Agroecological zone	Crops
Eastern and south-eastern areas	Maize, bananas, sweet potato, common bean, tea, coffee, cassava
Central western and southern areas	Maize, coffee, sugarcane, vegetables (cabbage, tomatoes, cauliflower, carrots and onion), sweet potato
North western	Maize, beans, temperate fruits
North-eastern (dry areas)	Cassava, maize and common bean

West Usambara Mountains Villages

In the West Usambara Mountains archeological discoveries have revealed that settlements of iron-working communities were present about 300 years ago (Mwihomeke, 1989; Schmidt, 1989). Bantu-speaking people migrated from the Congo about 200 years ago, and may have integrated with the original inhabitants of the mountains (the Hamites), constituting the Sambia people of today.

Logging has been carried out in the West Usambara Mountains for many years, since about 300 years ago, when the iron-working communities immigrated to the area (Iversen, 1991), and this activity has been continued as a main source of income up to the present time. Two types of logging are being practiced, namely illegal and legal, but there is a lack of data on illegal logging. Logging is not legally permitted in a Forest Reserve (Hipkiss, 1997), and only by permit on public land. Illegal logging is being conducted in the forest reserves by the local villagers (confirmed during this study, 2001), fetching a good profit from timber markets in urban centres such as Dar es Salaam, Arusha, Moshi, Morogoro and as far away as Zanzibar. In these areas the building and furniture industries are large and there is a considerable demand for wood. Timber from West Usambara Mountains also finds a ready market overseas in countries such as Italy, Germany, Japan and various Middle-eastern states.

Beekeeping is reported to have been practiced in the Usambaras for at least 200 years (Ruffo, 1989) and has provided some income for the Sambia people. During this study no evidence was found of beekeeping activity.

Crop Production

The dominant crop production system in the West Usambara Mountains is small-holder rainfed cultivation of maize, beans and other vegetable crops, and temperate fruits such as plums, apples, pears and apricots. Other important crops are: sweet potato, cassava, banana, sugarcane, white potato (*Solanum*), taro and tania (yams). Coffee is also grown on the small-holder plots.

In contrast, tea is very largely grown in commercial plantations, although farmers are also encouraged to

grow it. There is potential for introducing other agricultural crops like spring wheat, sorghum and finger millet, because the local climatic and edaphic conditions are suitable for these plants.

Table 2 shows the distribution of the various agricultural crops by agro-ecological zone. Maize, sweet potato, beans and sugar cane, which are adapted to wide ranges of temperature, are planted both in the cooler areas on the plateau and on the warmer lower slopes. Maize and common beans are the major food crops grown, and occupy the greatest area of all crops. These crops, being strong light demanders, respond well to cultivation in open areas. However, in the West Usambara Mountains they are commonly grown as inter-crops in the more humid eastern and southeastern parts, where competition for moisture probably has less effect on lowering their yields (Lundgren and Lundgren, 1979). Cassava, sugarcane and fruit trees are grown in mixed plantations on farmlands where annual crops like maize and beans are also grown. Sugarcane and fruit trees are important cash crops of the area. In addition, they are useful for soil erosion control on steep slopes, if they are properly planted. Cassava is an important reserve food crop in the West Usambara Mountains because of its drought-hardiness. It yields well on soils with poor fertility and high acidity that are unfavourable for other crops. Thus cassava is normally grown on "fallow" lands.

Livestock

Livestock production in the West Usambara Mountains has declined sharply following the increasing excision of grazing land for crop production. High animal stocking occurred in the 1930s, but recently it has been estimated that the average household owns only 1.3–2.6 livestock units (Wiersum et al., 1985). Shortage of livestock has led to critical shortages of animal protein derived from meat and milk, and unavailability of manure needed for improving soil fertility in croplands.

Socioeconomic Factors

According to the last human population census held in 1977, there were 280,962 people in Lushoto district (Bureau of Statistics, 1978). In 1967, the corresponding

Table 3: Human population in Lushoto district and its distribution by age class.

Age class (years)	Number of people	Percentage of the total district population (%)
0-14	146,074	52
15-34	79,960	28
35-54	38,223	14
55	16,705	6
Overall total	280,962	(26)*

* Lushoto district population as percentage of the total Tanga region population.

Table 4: Human population in Lushoto district distribution by age groups and sex

Age class (years)	Total			Rural			Urban		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
1-20	253,079	124,227	128,852	243,148	119,474	123,674	9,931	4,753	5,178
21-40	93,340	36,532	56,808	92,367	36,504	55,863	4,973	2,028	2,945
41-60	49,180	19,184	29,996	43,214	16,281	26,933	1,966	903	1,063
61-79	18,399	8,696	9,703	17,745	8,388	9,357	654	308	346
80+	4,654	2,234	2,420	4,518	2,178	2,340	136	56	80
TOTAL	418,652	190,873	227,779	400,992	182,825	218,167	17,660	8,048	9,612

Source: United Republic of Tanzania, 2002 Population and Housing Census

figure was 177,000. Rapid growth is evident. Table 3 shows the distribution of the 1977 population by age classes. Human population densities of 270 people km² are reported in the West Usambara Mountains by Wiersum et al. (1985), with an average farm size of about 1.7 ha. With the rapidly increasing human population, farm size is becoming fragmented and much smaller. This is occurring particularly on the most densely populated areas of the plateau, and the lower slopes that receive favourable rainfall for crop production. During this study it was found that the average farm size in the areas surveyed was only 0.6 ha.

The most recent population and housing census made by the Bureau of Statistics (2002) has also revealed rapid population growth as illustrated in Table 4.

MATERIALS AND METHODS

In order to investigate the attitude of local communities around protected areas/reserves towards the forest and wildlife of their area, and to understand the views of a local community about conservation of the area, the use of sample surveys was implemented (Cochran, 1977). Such surveys need to elicit responses that are reliable and unbiased. The critical first step is to identify the target group and to determine which method of sampling survey would be suitable for this research. There are several methods/designs such as simple random sample, systematic sampling, stratified sampling etc. Stratified sampling was chosen but it could not be fully implemented due to problems encountered in the real field situation. The Stratified Sampling Technique (Cochran, 1977) involves classification of the population

into subgroups (strata) based on known characteristics e.g. age, gender, occupation etc. which can have an influence on the research questions that can be asked. The following was the plan of classification:

- i. Equal numbers of elders (men and women) over 60 years were to be selected.
- ii. Equal numbers of men and women were to be selected, age range 25–60 years.
- iii. Equal numbers of youngsters (boys and girls 13–24 years).
- iv. Children of between 8–13 years.
- v. The final category was selection of equal numbers of workers and farmers. Farmers in this context include all those who are not working for the government or NGOs.

But during the implementation of research I found it convenient to have three age categories i.e. (i) *Old*, over 60 years; (ii) *Young*, 13–60 years; and (iii) *Children*, aged 8–13 years.

Since I could not carry out stratified sampling technique as planned before, rather I used “opportunistic sampling” therefore conclusions on my findings is based on a qualitative way rather than statistical tests.

A total of 200 people were interviewed, to provide sufficient data in order to draw reasonable conclusions. Using a semi-structured questionnaire, interviews were conducted among a sample of households from two villages adjoining Mount Kilimanjaro Forest Reserve (PA), and another two villages located adjacent to a Forest Reserve in the West Usambara Mountains. The 200 people interviewed came from 200 different households (one person per one household). Residents of all these four villages, in one way or another, depend on the resources from these forest reserves. Some of their ancestors, or some of them (who were interviewed)

Were born in these forest reserve areas before they were azette. Thus the feelings, opinions and attitudes of these people towards conservation are valuable data, particularly for understanding what is needed to plan a sustainable approach to the conservation of natural resources. Each interview began with questions to elicit demographic and socio-economic data, including the respondent's age, sex, residence, family size, marital status and other information associated with the economic activities of the household. The interview continued with a series of dichotomous questions requiring people to express their positive or negative responses regarding their attitudes towards conservation in general, and conservation of butterflies in particular.

The questionnaire was administered to households in a random sampling manner on the basis of first-come, first-served, and alternating male and female respondents as much as possible instead of the intended stratified random sampling. This is because what I found in reality in those villages was that, if I used a stratified random sampling technique, I could not reach the target of interviewing 100 people without a lot of difficulty. The first-come-first-served technique was far easier, as many people were not found in their houses, being occupied with outdoor activities.

The questionnaire was originally set in English but later (during the execution of the survey) it was translated in Swahili (Tanzanian national language) because most, if not all of the respondents were conversant in Swahili but did not understand English well. Some understood very little English, so it was much better to ask them in Swahili in order to get more reliable answers. In order to make sure that at least people were telling the truth about their answers, especially about questions that required them to divulge information about their economy, such as their land holdings, livestock they possessed and quantities of crops harvested, I first spoke to the village leaders of each village I visited, some months before the survey took

place. I explained in detail who I was and the objective of my research. It was essential to do all this well in advance so that the village leaders knew me before I conducted my survey. By gaining their trust, I could then depend on the village leaders to assure the villagers of their respective villages that I represented no harm to them, and that my research goals might even be of benefit to them sometime in the future; therefore they should answer me the way they feel from their hearts so that I could fulfill my objectives. Only through such a process of building confidence among the villagers is it possible for someone who wants to conduct a sample survey in the villages to get realistic answers. If you were to decide to go to any village in Tanzania without such prior arrangements, villagers would be most unlikely to respond to you positively. Villagers are always afraid of strangers. Even if you state your intention clearly and honestly they will not believe in you. If you then persist in asking questions they will give you false answers, especially on questions concerning their wealth. It is considered to be very bad, according to tradition of many tribes, to ask how wealthy someone is. You can only ask such kinds of questions by prior arrangement and especially through village leaders, because they have been elected by the villagers themselves and are thus trusted representatives.

RESULTS

Distribution Pattern of Interviewees

The distribution of the number of people interviewed did not work out precisely according to the original plan of equal numbers in each age category. Thus in the West Usambara Mountains villages, 49% of respondents were young, 31% old and 20% children (see figure 2).

In the Mount Kilimanjaro villages, 53% of respondents

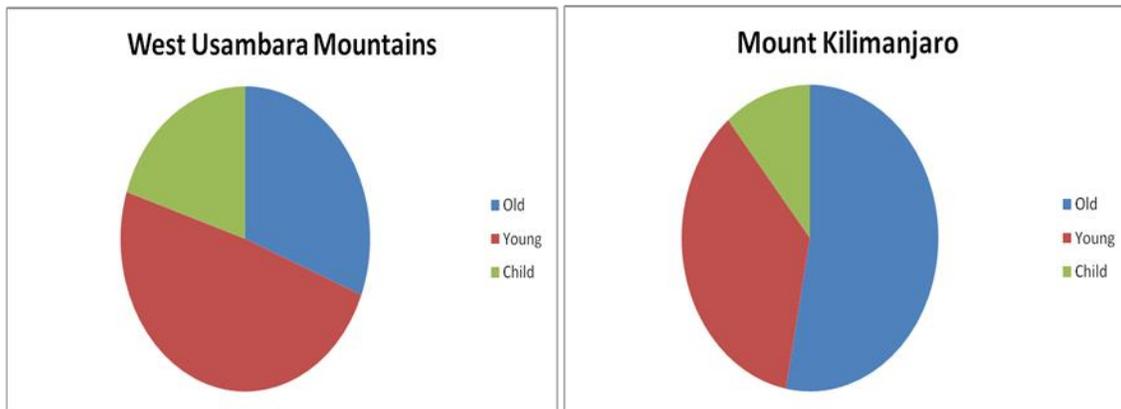


Figure 2: Distribution of people interviewed according to age category in West Usambara Mountains and Mt Kilimanjaro villages

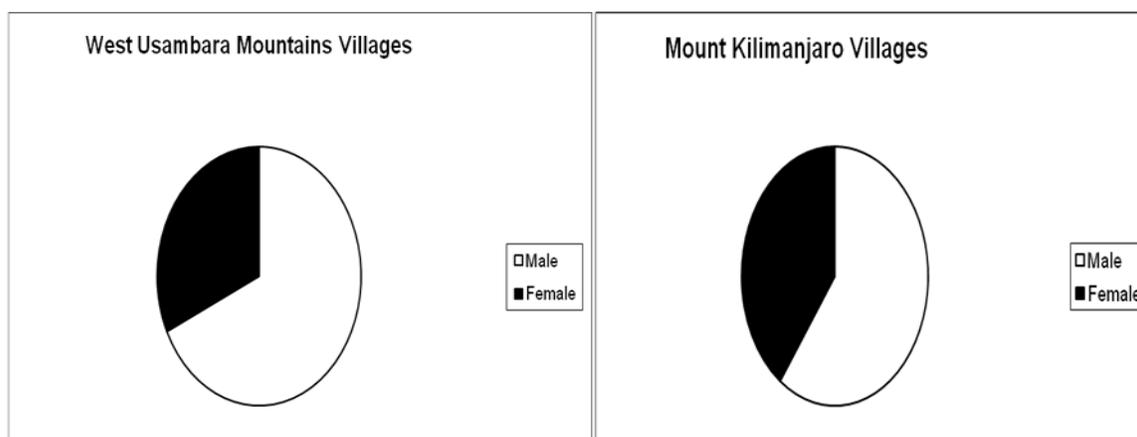


Figure 3: Distribution of people interviewed according to sex in West Usambara Mountains.

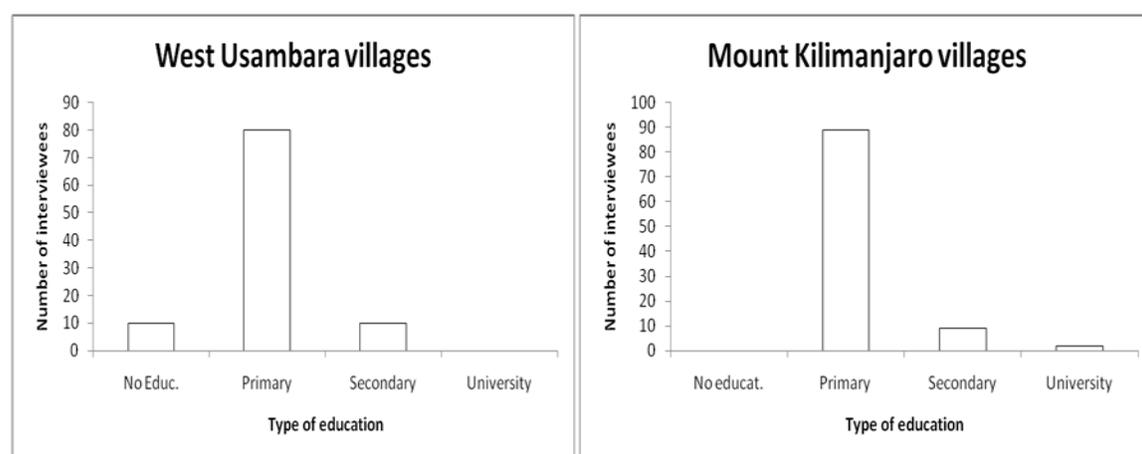


Figure 4: Education background of interviewees in West Usambara Mountains and Mount Kilimanjaro villages.

were old, 36% young and 11% children. These discrepancies arose because of the questionnaires were administered to households in a random sampling manner, on the basis of the first-come, first-served system, and alternating male and female, young, old and child respondents as far as possible.

In both the West Usambara Mountains and Mount Kilimanjaro villages more men were interviewed than women (in West Usambara Mountains 60% of respondents were male and 40% female, while in Mount Kilimanjaro 61% of respondents were male and 39% female). This difference may reflect the fact that women in the villages were engaged with more activities, such as fetching water, collecting firewood, tending crops and so on, to such an extent that sometimes it was very difficult to find any women at home during the day (figure 3).

Although an effort was made to get as much gender balance as possible, the distributions reported above were the best I could get. The educational pattern was

more or less similar in both places. A majority of people interviewed had a primary education: 80% of respondents in West Usambara Mountains and 89% of respondents in Mount Kilimanjaro. Some 10% of respondents in West Usambara Mountains had a secondary education, and 9% of respondents had a secondary education in Kilimanjaro. Up to 10% of those interviewed in the West Usambara Mountains had no education, while in Mount Kilimanjaro all the respondents were educated. No one in West Usambara Mountains had a university education, while 2% of interviewees in Mount Kilimanjaro did have a university education (figure 4).

The data gathered by questionnaire were analysed to determine general attitudes of people towards conservation in general in the West Usambara Mountain and Mount Kilimanjaro villages. A majority (64%) of West Usambara Mountain villagers showed a negative attitude, with only 34% supporting the idea of conservation, 2% didn't know, whereas 95% of Mount

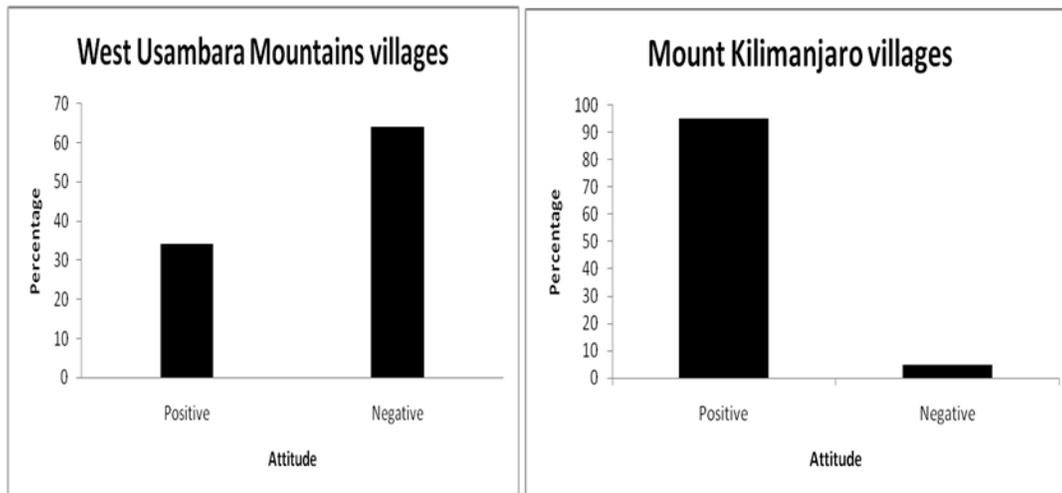


Figure 5: Attitudes of people towards conservation in general, in a sample survey conducted in West Usambara Mountains and Mount Kilimanjaro villages.

Kilimanjaro villagers supported the need for conservation. These assessments were based on the following set of questions: '1: What is your opinion about having a Protected area/National park close to this village? 2: Are there any disadvantages to be living next to the National Park/Forest Reserve? And 3: Should this National Park/Protected area be abolished?' (see figure 5).

A higher percentage of children (85%) in the West Usambara Mountains villages supported conservation while both the young (77%) and old (80%) did not support the need for conservation. In Mount Kilimanjaro villages all the age categories supported conservation by a very high percentage. Traditionally, in many tribes in Tanzania, it is impolite to ask someone their age, so during this survey I estimated the age categories. When I looked at the respondent I judged which age category she/he was in. That was the reason for initially categorizing and not giving the exact age of respondents, because I knew I could not ask them to tell me their ages (figure 6 below).

Economy

The major means of peoples' income in the West Usambara Mountains villages comes from growing agricultural crops: potatoes and beans are among the major cash crops; livestock keeping is very unpopular and does not contribute to the economy. In Kilimanjaro the economy also depends on agricultural crops, but here keeping livestock also plays an important role as well. The land size recorded during this survey was in hectares, all agricultural crops were recorded in bags (1 bag is approximately 100 kg), and livestock was

recorded by number of individual animals i.e. 100 means 100 individual cows/sheep/goats etc. The economy data recorded from Children are those of their parents/households. The relationships among these various major economic factors are further illustrated in Figure 7.

A comparison of the economies of the West Usambara Mountains and Mount Kilimanjaro villages was made based on land, livestock and agricultural crops. There was a difference in the size of land owned by the individuals between West Usambara Mountains ($n = 100$; total = 60.5 mean = 0.65 sd = 0.43) and Mount Kilimanjaro ($n = 100$ total = 120.7 mean = 1.2 sd = 0.66) villages. Thus almost twice of the amount of land was owned by people living in Mount Kilimanjaro compared to the same number of people living in the West Usambara Mountains. Fewer cows were possessed by West Usambara Mountains villagers ($n = 100$ sum 12 mean 0.12 sd = 0.43) compared to Mount Kilimanjaro villagers ($n = 100$ sum = 194 mean = 1.9 sd = 0.99), and the same trend was even more extreme for sheep (West Usambara Mountains villages: $n = 100$ sum = 1 mean = 0 sd = 0.1; Mount Kilimanjaro villages: $n = 100$ sum = 107 mean = 1.07 sd = 0.96). This marked difference is also true for the remaining livestock (goats and hens). Hens are referred to here as "local hens", that is they essentially provide meat only; no layers are kept in the villages. The cows kept in Kilimanjaro are mainly dairy cows. In contrast, maize and beans production was slightly higher in the West Usambara Mountains than in Mount Kilimanjaro (Usambaras: $n = 100$ sum = 614 mean = 6.14 sd = 3.1; Mount Kilimanjaro: $n = 100$ sum = 592 mean = 5.9 sd = 4.5). In the villages surveyed in the West Usambara Mountains, coffee was not produced at all; on the other hand, in the

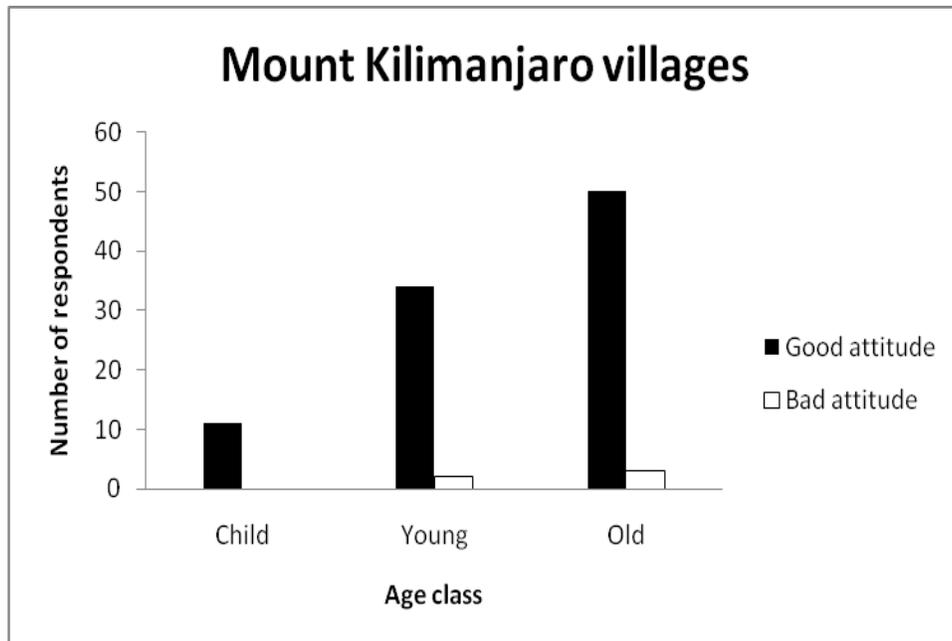
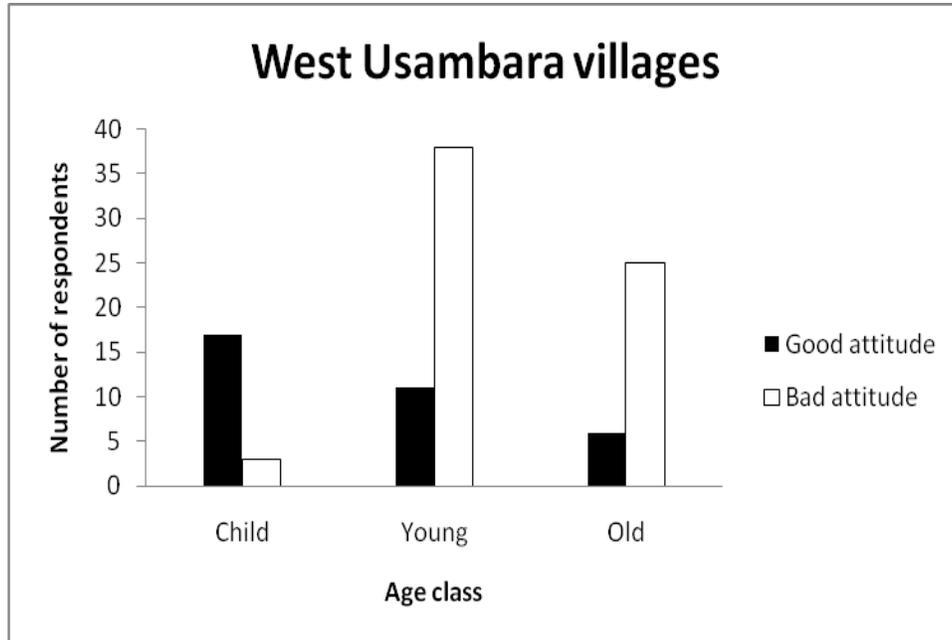


Figure 6: Attitudes of people living around protected areas of West Usambara mountains and Mount Kilimanjaro towards conservation

villages surveyed on Mount Kilimanjaro very little potato was produced. The overall results reveal that both livestock and crops are contributing to the economy in the Mount Kilimanjaro villages, while in the West Usambara Mountains the villagers apparently depend mainly on their agricultural crops for income. There was a linear (positive) relationship between land and agricultural crop production: i.e., the greater the land

size the higher the production of crops, but this trend was not true in relation to land area and livestock production (see Figure 7 below).

When the villagers were asked if there were any activities that were not legally permitted to do in the National Park/Forest Reserve that they would like to be able to do in the future, if they were allowed, each

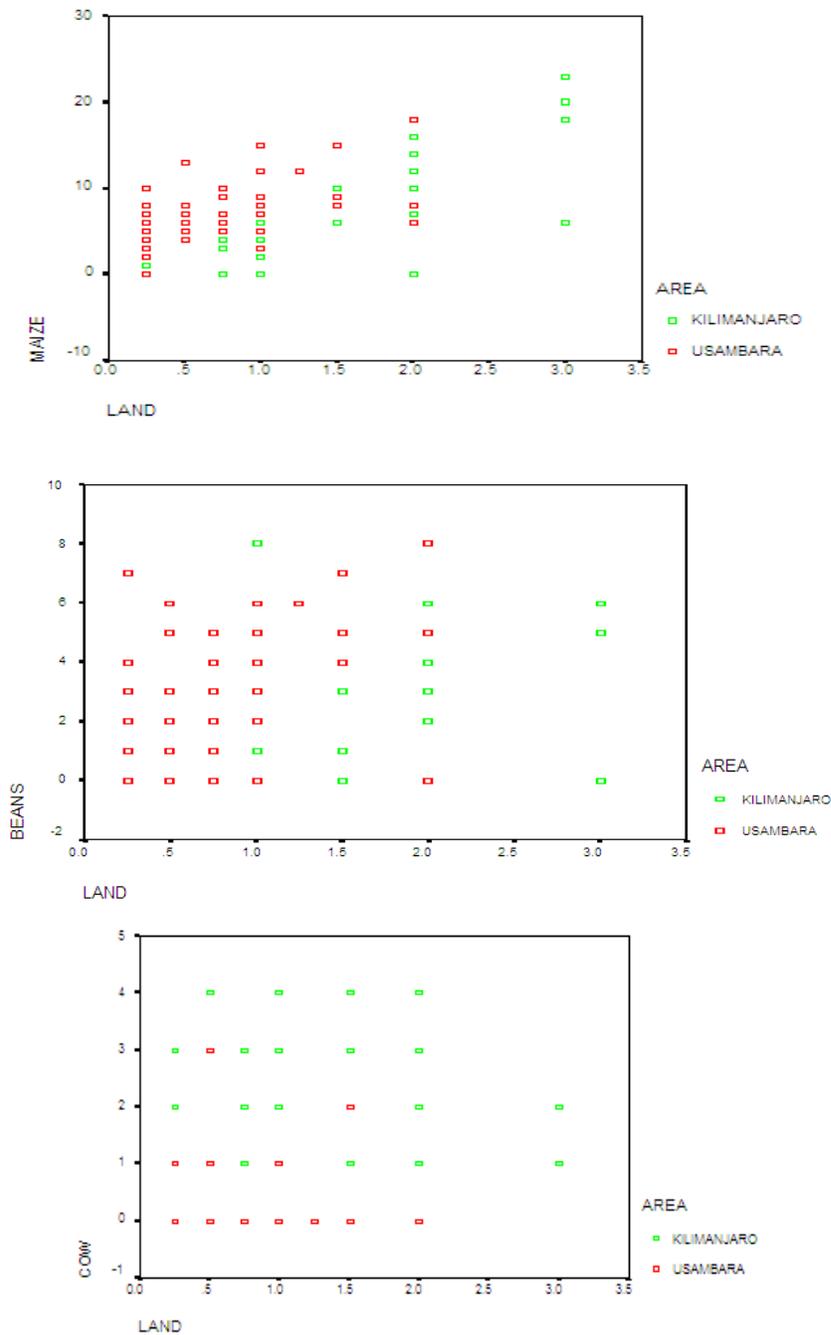


Figure 7: Relationship between land and other factors of economy: area in hectares, crops in bags and cows in number of individuals.

respondent could name as many activities as possible. Their responses are illustrated in Figure 8 below.

Traditional Beliefs

The survey included one question that inquired "do you have any special belief about this forest?" The replies

indicated that there were a number of special local beliefs about the Mount Kilimanjaro forest, but there were no similar responses from those interviewed in the West Usambara Mountains. Only the different beliefs recorded are listed here; their relevance to conservation is discussed in discussion section below:

If an ox is taken to the centre of the forest, and slaughtered there, so that it should rain, it will always

rain after this has been done.

- During the prolonged drought, if every family provides the youngest son or daughter with a sheep and the village elders go with them to a place deep in the forest known as "fuvu la mkuu", and when they arrive there

they slaughter the sheep and pray for the rain to come, sometimes it starts raining even before the praying is over.

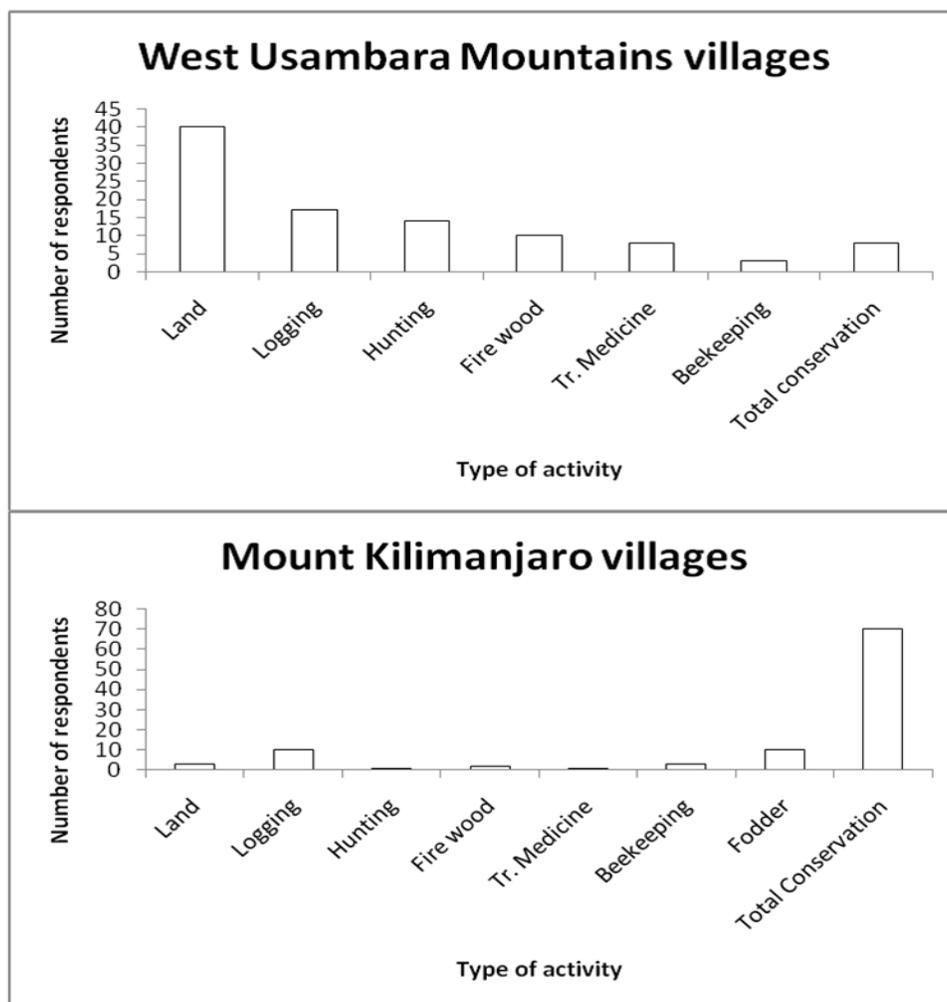


Figure 8: Type of activities wished by the villagers to be permissible in the forest reserves

- The 'Mushi' clan was the only clan who had the authority to go in the forest and perform ritual dances and slaughter an ox, for the rain to come or to end hunger, but all this is not done now due to the coming of the white Missionaries, they brought Christianity and abolished the traditional religions (a comment from one respondent).

Ten respondents out of 100 gave one or other version of these stories about traditional beliefs of the forest. Thus all of them had the same theme of 'going deep in the forest to pray for rain or end the hunger.' These processes were all associated with traditional religions,

and all the ten respondents were classified in the old age category.

Attitude of People Towards Conservation of Butterflies

During this sample survey I was also conducting research on butterfly diversity; I therefore was also interested to know attitudes of people towards conservation of butterflies. In both study areas, the West Usambara Mountain and Mount Kilimanjaro villages,

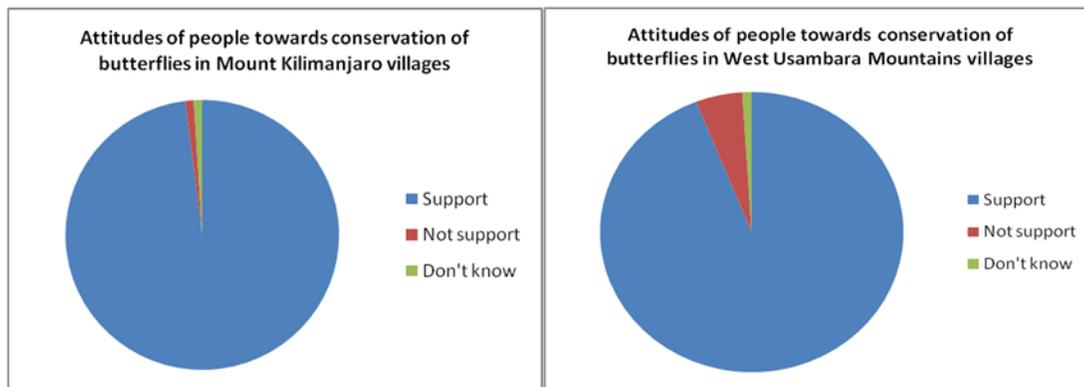


Figure 9: Attitude of people towards conservation of butterflies in two study areas

people were very positive towards the conservation of butterflies: 94% of respondents in West Usambara Mountains and 98% of respondents in Mount Kilimanjaro supported butterfly conservation (see figure 9).

DISCUSSION

Virtually all major managerial problems facing PAs today have a human component. In Africa, the most common of these relate to the increasing human settlement of adjacent lands and unauthorized harvesting of resources within the PAs. As human populations increase and the demands for resources grow, the frequency and intensity of conflict between protected areas and local people will increase (Goliber, 1985; Balmford et al., 2001). PA managers/directors have traditionally relied upon law enforcement techniques to resolve conflicts with local people. However, given the nature of these conflicts in Africa, such techniques will be insufficient and in many cases inappropriate. Alternative approaches to reduce conflict will need to be developed that provide tangible benefits to local communities and empower local communities to manage natural resources. Such programmes are starting to be developed in Africa (e.g. Martin, 1984; Lewis et al., 1990). However, before they can be designed, the relationship between PAs and local people must be clearly understood. In an endeavour to understand the relationship between the PAs and people, a sample survey was carried out during this study in an attempt to assess the attitudes of local people towards conservation. Tanzania is a large country with a vast range of different geographical zones and ecology. Likewise people have different cultures, customs and economical requirements that may cause them to have different attitudes towards conservation, as found in this study. A greater percentage of Kilimanjaro villagers supported conservation (95%) than villagers in the Usambaras (34%). This may be because the available land area in the West Usambara Mountains was significantly less than that in Mount Kilimanjaro.

There was a positive linear relationship between land area available for farming and the production of cash crops (Figure 7), and this relationship explains why people in West Usambara Mountains villages feel the need for more land to increase their productivity and economic wellbeing. Presumably the extra land in Mount Kilimanjaro is mostly used to graze cows and sheep. The villagers in the West Usambara Mountains are regarded as subsistence farmers, since they don't have real cash crops and the beans and maize they cultivate are used for food and very little is sold. Mount Kilimanjaro villagers have real cash crops that are raised for sale only i.e. coffee and milk from dairy cows. This has an impact on conservation, as the closer you are to subsistence perhaps the less keen you may be on conservation ideas. Moreover, Mount Kilimanjaro is a huge source of income and the major employer for people living adjacent to the highly visited NP. From the porters who carry tourists camps up and down the mountain to the shopkeepers who supply the expeditions, employment is generated by PA-based tourism. This may also be a reason why attitudes towards conservation on Mount Kilimanjaro were positive and why 95% of respondents supported conservation. To maintain this trend the Government, through its responsible parastatal organizations such as TANAPA, should continue and find other means of promoting the mountain in order to attract more tourists. One of the young men interviewed answered "So long Kipoo (Kibo summit) still remain there, I am 100% sure that I will not die of hunger...the tourists will still come and I will still get my daily bread." This shows how people benefit from this mountain, and they know the tourists are attracted by its natural beauty. That is why they support the conservation of Mount Kilimanjaro forest.

Traditional beliefs may also influence attitudes towards conservation, results show that during sample survey there were a number of special local beliefs about the Mount Kilimanjaro forest, but there were no similar responses from those interviewed in the West Usambara

Mountains. Most of these beliefs on Mount Kilimanjaro were associated with various groups of elders going deep in the Mount Kilimanjaro forest to pray and carry out traditional rituals in order for the rain to come when there was a prolonged draught. These kinds of beliefs might have played an important role in the conservation of Mount Kilimanjaro forest, insofar as the natives felt obliged to conserve the natural ecosystem in order to maintain places with “thick, deep forest” suitable for performing the traditional rituals. If they did not conserve the forest, then there would not be any suitable areas for their prayers. It may therefore be that as a result of this superstition that they were able to conserve the Mount Kilimanjaro forest over a long period. This historical culture could also be one of the reasons why the majority of people in Mount Kilimanjaro villages support conservation compared to those of the West Usambara Mountains.

There is increasing evidence that areas of outstanding conservation importance may coincide with dense human settlement or impact (Balmford et al., 2001). Human density shows that conflicts between conservation and development are not easily avoided because many densely inhabited zones contain species found nowhere else (Balmford et al., 2001). Dense human settlement is associated with a high threat to biodiversity. Areas with more people have undergone greater habitat conversion.

Within Africa, the most common of these relate to the increasing human settlement of adjacent lands and the unauthorized harvesting of resources within PAs. As human populations increase and the demands for resources grow, the frequency and intensity of conflict between PAs management and local people will increase.

A study by Newmark et al. (1993) in the five National Parks of Tanzania (Arusha, Tarangire, Lake Manyara, Serengeti and Ruaha) revealed that local people living adjacent to these conservation areas hold less positive attitudes towards PA staff than to the protected area itself. When asked, “What good things do NP staff do for you?”, 47% of all people interviewed answered *nothing*. If nil-response answers are combined, it appears that over 71% of all people living in the vicinity of these PAs probably hold either neutral or even negative attitudes towards PA staff. This lack of support for PA staff is also consistent with reported attitudes of local people towards park authorities in Natal, South Africa. Infield (1988) found that 68% of those residing close to the Umfolozi/Hluhluwe/Corridor Conservation Complex held either negative or neutral feelings toward the Natal Park Board.

During this study, conflicts between the Forest Management Authorities and the local people around were also reported during the interviews. More conflicts occurred around West Usambara Mountains FR than around Mount Kilimanjaro FR. This may be why 16% of West Usambara Mountains respondents showed a

negative attitude towards the forest rangers, while only 4% of respondents in Mount Kilimanjaro showed such an attitude. In West Usambara Mountains, most of the conflicts happened when the forest rangers interrogated people who went to the forest to carry out illegal activities, especially timber harvesting and hunting. The local people said they were severely harassed, sometimes even physically abused by the rangers when they were caught. In Mount Kilimanjaro those harassed were mainly timber harvesters. The negative attitude of local people towards FR staff experienced during this study was much lower compared with Newmark (1993). In his study a high percentage of respondents held negative attitudes towards the NP staff. However, the time difference between these two studies in 1992 and 2003 may be significant. In 1992, law enforcement as widely practiced by NP staff may have been harsher. In contrast, my study was undertaken when community based conservation, whereby the local people are incorporated in many conservation decisions, has been emphasized. Hence this may have been a reason for the lower levels of conflict and less negative attitude towards the PA staff seen in my results.

In both areas they support butterfly conservation, this is because may be butterflies are beautiful and not harmful like other insects. But no one knew how useful butterflies are, for science, like for genetic and evolution experiments, or as a measure of ecosystem health, including their pollination services and food for birds etc. This may be due to a lower standard of education as majority of residents in both study areas just have a primary education, which basically covers little more than learning how to read and write. In both study areas there are no local names for different species of butterflies as compared to birds. In contrast every species of bird has a local name, whereas butterflies are classified only according to their general colours: the whites, browns, dark etc. and in both places they have a general local name for butterflies: in West Usambara Mountains butterflies are called '**Mahoho**' and in Mount Kilimanjaro they are called '**Matandauryi**'. In Swahili the National language spoken throughout the country, butterflies are called 'Kipepeo' that has a meaning of flying object. Tanzania has about 114 vernacular/tribal languages, which differ from one area to another including Usambara and Kilimanjaro, which is why you get different names for the same thing. During the interviews I also learned from some old men that, formerly, the appearance of particular species/ groups of butterflies was taken by some elders in rural areas to be a signal that the rainy season was about to start, and so it was time to prepare the fields and for this reason it explains why butterflies are liked by everyone to be conserved to play the role as natural indicator.

CONCLUSIONS AND RECOMMENDATIONS

The issues surrounding the management of Forest

Reserves in Tanzania have been analysed and reviewed for the development of a new Forest Policy (FBD, 1998). For the first time, this policy allows for much more involvement of local communities in the management of Tanzania's forests, and also requires that private companies take some responsibility for the management of forest resources. It is imperative that this policy is implemented by all stakeholders in Tanzania's forests.

One of the main management problems facing the Forest Reserves of West Usambara Mountains and Mount Kilimanjaro is the lack of a coherent strategy for the conservation and wise use of these areas. Various factors contribute to this problem. For example, the administrative and institutional framework for managing forests is complex and uncoordinated, both in these forests and throughout the forests of Tanzania. Three parallel administrative structures control forest resources within central, regional and local governments. Forest reserves are found at all levels in this structure, but the lines of management control differ and ultimate responsibility rests with different Ministries. Mount Kilimanjaro offers a typical example: from 0 m up to 2500 m, it is a forest reserve under the Forest Division, but above 2500 m the same forest is managed by Kilimanjaro National Park and the Wildlife Division. There is no coordination between these two divisions, yet this is vital to enhance conservation development.

Traditionally, there has been no will to involve all stakeholders, especially local people, and a resulting lack of stakeholder priority and interest in biodiversity conservation eg during sample survey of this study it was revealed that 64% of villagers in West Usambara Mountains held negative attitudes towards biodiversity conservation. Further problems involve conflicts of interest over land and forest use in these mountains, a general lack of capacity and resources within government and community institutions, and poor governance and lack of equity at many levels within society, including corruption.

A number of other problems affect management of these forest reserves. The first is the relationship between poverty and population increase, where the poorest communities typically have the highest population growth rates (e.g see Kurji, 1980). Until recently the forest policy mechanisms of Tanzania did not allow communities adjacent to forests to use them at all. Therefore, their actions within the forests were illegal although frequent, and hence they had no incentive to support forest conservation, Indeed, if they were cleared, then it would actually be beneficial to their short-term interests in providing land to use for other purposes.

The overall decline in the funding capacity of the Forest Department has also meant that the boundaries of the reserves are sometimes indistinct. This situation is more alarming in West Usambara Mountains than in Mount Kilimanjaro. This is a further management problem, as a lack of boundaries means that it is difficult for anyone to know if they are permitted to farm or

collect fire wood within an area. Also such a situation can be used to the advantage of some people who log areas and then claim that they were outside the forest reserve, or of local people who farm areas and then say that they did not know they were inside the forest reserve.

Maintenance of the forest reserve boundaries is perhaps the most important management activity recommended by this study. Successful implementation of forest management approaches would allow Tanzania to meet its obligations to the global *Convention on Biological Diversity*. Improved management could also assist national economies (Iddi, 1997). However, there is still much to learn in order to make forest management systems work in practice, and there is much experience to gather from local people living around the forests.

A different conservation approach is required in the West Usambara Mountains. Ever since this forest reserve was established, neighbouring residents have not been allowed to carry out traditional activities in the reserved forests. Therefore, local people do not derive any direct benefit from the forest and this explains why 65% of local people did not support conservation.

In West Usambara Mountains villages, livelihoods mainly derive from growing agricultural crops, such as potatoes and beans, which were regarded as major cash crops. Livestock keeping was very unpopular and did not contribute significantly to their economy. By contrast, the livelihoods of Mount Kilimanjaro villages also depended on cash crops, but livestock keeping played an important role as well.

Data for land ownership in West Usambara Mountains villages showed that the average parcel of land owned by the villagers was 0.6 ha, the minimum land area owned was 0.25 ha and the maximum was 2.0 ha. Hence, West Usambara Mountains villagers cannot be expected to support conservation, given this means that no more land will be available to them. In contrast, Mount Kilimanjaro villagers can pursue supplementary activities and earn additional money from tourism.

To improve biodiversity conservation in the study areas addressed in this study areas and in the rest of Tanzania, it is crucial that a new framework for conservation be developed. Thus the frame work should allow decision makers to strengthen their efforts to maintain biodiversity by implementing sound sustainable development strategies, based on wise management of biological resources, those that are economically and socially productive while simultaneously protecting biodiversity. Details on how this would be implemented will vary between the areas depending on the ecological and human conditions.

Local knowledge systems, traditions, institutions and environmental conditions are fundamental to biodiversity conservation. The task of modifying or limiting activities destructive of biodiversity is simplified if efforts are made to respect, reinforce, and further develop local practice or traditions that are already consistent with biodiversity

conservation (Balakrishnan and Ndhlovu. 1992).

All biological resource users should be treated fairly and equally. Broadly based participation is essential. Local people must be involved at every step from planning and implementation to evaluation and redesign. Initially, governments and other funding agencies may need to suggest new integrated projects and take the lead in motivating local communities to make projects a reality. In time, local communities and the private sector should be initiating similar projects. Projects should never be carried out for local communities, but with them.

Appropriate incentives are needed to encourage all participants to become involved with conservation. All people are rational decision makers and balance cultural, social, and economic considerations. Local community participation in biological resource governance is often, of itself, an incentive to sustainable management. Secure land tenure can stimulate investment in those resources and gives individuals the incentive to manage their resources more wisely. Direct economic benefits from conservation efforts encourage local communities to adopt better resource management practices. Government officials need incentives for effective work in rural areas. Finally, disincentives should be applied to actions destructive of biodiversity.

People will continue to use and depend on biological resources, but it is the kind and intensity of resource uses that are important. Most conventional conservation efforts have advocated resource protection without human use (Noss, 1996; Svancara et al., 2005). Conversely, modern agricultural systems have emphasized production without conservation. The move now must be toward programmes and projects that meet human needs in ways less destructive to the environment.

Conservation efforts in Africa demand a level of political will, administrative skill, and long-term persistence that is not easily mobilized e.g see Lewis et al. 1990. This depends on a complex matrix of continued motivation, including pride in the local flora and fauna, knowledge about it, national and international recognition, research activities, field stations, economic viability, and the support of the local population in and near conservation areas, who today often view the forests as inherently hostile.

With the increasing interest and concern for biodiversity, the activities of international organizations, and the mounting evidence of irreversible environmental damage, there is growing understanding for conservation among the African elite. There has been less effort to involve the local population in conservation, although this too is beginning. And local villagers do have pride and interest in the environment. They may not have thought about butterflies before, but when you tell them that there are more than 1200 butterfly species in Tanzania, almost one third of the total number of species found in Africa, and that *this* one has never been

found anywhere else than in their little patch of forest, the reaction is normally very positive.

Based on this study, I propose the establishment of butterfly projects which may be suitable in Mount Kilimanjaro and West Usambara Mountains as alternative sources of income. In other words, local people would be much more willing to conserve the forest due to the benefit that they might receive from butterfly projects. The following are some potential butterfly projects that could be undertaken and would require the involvement of the local people from the beginning:

1. A priority need is *butterfly inventories from key forests* all over Tanzania. Hardly any such inventories exist, yet they could be used to prioritize conservation actions, support habitat conservation and the integration of general ecological studies. They would also be useful for assessing the minimum size of nature reserves and rates of extinction in small, isolated forests. These might be organized through a system whereby entomological societies 'adopt' key forests and run the scheme in collaboration with local conservation bodies.

2. *Ecological tourism* is a sector of the tourist market that is growing fast. When suitable accommodation is available close to good butterfly habitats, the potential of butterflies to feature in ecotourism is considerable. Danger of over-collecting is slight, and a liberal policy of issuing collecting permits would carry little risk. Some special management to make nature trails, clearings, observation towers, and so on may be needed. In the Amazon area of Ecuador, private hoteliers now conserve patches of forest (Larsen, 1995). This kind of project could well be established in Mount Kilimanjaro Forest Reserve, where a good number of tourists already come to climb the mountain, where the infrastructure is also good with easy access to Kilimanjaro, and with well-established trails, promotion of ecotourism may raise the number of tourists coming to visit this mountain, hence the local people will get more business and other activities associated with additional visits.

3. *Commercial exploitation of butterflies* could be of four kinds: 1) the sale of specimens to collectors, 2) the breeding or ranching of selected butterflies for sale, 3) the sale of decorative butterfly collections as souvenirs, 4) the use of butterflies in decorative art (as in the Central African Republic: Larsen, 1995). There is also commercial potential for many species of *Charaxes*, commercial exploitation of these butterflies could be established in West Usambara Mountains. It is critical to provide alternative sources of income before telling people they must stop cutting trees for timber or felling forests for farmlands. Moreover, the West Usambara Mountains forest possesses many beautiful butterflies that could fetch high prices on world markets. In Kenya, such a project was established in Arabuko-Sokoke Forest, known as the 'Kipepeo Project'. ICIPE has also supported sustainable butterfly farming projects in the Taita Hills (<http://www.kipepeo.org/>) and the Amani

Butterfly Farm

(<http://www.amanibutterflyproject.org/market.htm>) in the East Usambaras supported by the Tanzania Forest Conservation Group (<http://www.tfcg.org/>). Villagers around the forest reserve were incorporated in the project (S.J. Collins, *pers. comm.*, 2001), they breed certain species of butterflies and sell pupae to foreign countries, and receive significant amounts of foreign currency from the sales. As a result, local people have now stopped cutting down trees because they receive more income from butterflies. They are now actively taking part in conserving their forest, which if they know becomes degraded, cannot raise enough butterfly pupae for the foreign market.

4. *Long-term research facilities:* Any type of butterfly research not only provides data that can help in conservation but also brings funding, foreign exchange, potential prestige, and a greater understanding that nature and butterflies are important. It also brings researchers, and eventually field stations, into the forests and this raises the physical security of the forest. Research should use workers recruited from the local area as far as possible, and involve the local population in the activities.

Finally, research findings can raise the prestige of the country where the research was conducted. However, it is important that the findings are disseminated widely, not just to scientific circles, but to the general public and to people in the local area. In most of Africa, literature is not easy to get hold of, and any projects should build *dissemination of their results* into the budget and plan of operations.

The philosophy of conservation in Africa, important as it is, was to a large extent inspired from abroad—often by people and groups with little understanding of the needs of Africans in Africa. Botswana, for instance, has many more elephants that it knows what to do with. It is hardly surprising that people there get somewhat cynical about campaigns for elephants as 'threatened' species. And by no stretch of imagination can the elephant be considered threatened, even though that might be the case for individual populations.

There is a growing understanding among the elite in East Africa that conservation is important, partly due to international conservation efforts. This is promising, and deserves the support it is receiving. However, ultimately there is probably no substitute for ensuring that local people have a vested interest in conservation and proper management of the forests where they live. This will demand the creation of forest-related jobs, the employment of local people in Forestry Departments, ecological tourism, research activities, and so on. Conservation of biodiversity will have to be paid for; it will not come for free.

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REFERENCE

- Balakrishnan M, Ndhlovu DA (1992). Wildlife utilisation and local people: a case study in Upper Lupande Game Management Area, Zambia. *Environmental Conservation*, 19:135-144.
- Balmford A, Moore LJ, Brooks T, Burgess N, Hansen AL, Williams P and Rahbek C (2001). Conservation conflicts across Africa. *Science* 291: 2616–2619.
- Bureau of Statistics (1978). Population census. Preliminary report. Ministry of Finance and Planning, Dar es Salaam.
- Bureau of Statistics United Republic of Tanzania. (2002). Population and Housing Census. Final report. Ministry of Finance and Planning, Dar es Salaam.
- Cochran WG (1977). *Sampling Techniques* (3rd edn). Wiley, New York.
- FBD (1998). *National Forestry Policy*. Ministry of Natural Resources and Tourism, Dar es Salaam.66pp.
- Fosbrooke HA and Sassoon A (1965). Archeological remains on Kilimanjaro. *Tanzania Notes and Records* 64: 62-64.
- Goliber TJ (1985). Sub-Sahara Africa: Population pressures and development. *Population Bulletin* 40: 1-47.
- Greenway PJ (1955). Ecological observations on an extinct East African volcanic mountain. *Journal of*

Ecology 43: 544-563.

Hipkiss AJ (1997). Editor's column. *The Arc Journal* 5: 1-2.

<http://www.kipepeo.org>

<http://www.amanibutterflyproject.org/market.htm>

<http://www.tfcg.org>

Iddi S (1997). Management of Forests in Tanzania in N.D. Burgess, M. Nummelin, J. Felds , K.M. Howell, K. Lukumbuzya, L.Mhando, P. Phillipson, and E. Vanden Berghe (Eds.). 2000. Biodiversity and Conservation of the Eastern Arc Mountains of Tanzania and Kenya. *Journal of East African Natural History* 87: 1/2, (1998), 367 pp.

Infield M (1988). Attitudes of a rural community towards conservation and a local conservation area in Natal, South Africa. *Biological Conservation*, 45:21-46.

Iverkiksen ST (1991). *The Usambara Mountains, NE Tanzania: History, vegetation and conservation*. Uppsala Universitat, Uppsala.

Kurji F (1980). *Human population densities and their changes around the major conservation areas of Tanzania*. BRALUP Research Paper 51, University of Dar es Salaam.

Larsen TB (1995). Butterfly biodiversity and conservation in the Afrotropical region. in Pullin, A. S. (ed). *Ecology and Conservation of Butterflies*. Chapman and Hall, UK:290-303.

Lewis D, Kwaech GB and Mwenya A (1990). Wildlife conservation outside of protected areas—lessons from an experiment in Zambia. *Conservation Biology* 4: 171-180.

Lovett JC and Wasser SK (eds.). (1993). *Biogeography and Ecology of the Rain Forests of East Africa*. Cambridge University Press, Cambridge, United Kingdom.

Lundgren L and Lundgren B (1979). Rainfall, interception and evaporation in the Mazumbai Forest Reserve, West Usambara Mts., Tanzania and their importance in the assessment of land potential. *Geografiska Annaler A* 61: 157-178.

Martin RB (1984). Communal area management plan for indigenous resources (Project Campfire). In R. H. V. Bell and E. McShane-Caluzi (eds), *Conservation and Wildlife Management.*, US Peace Corps, Washington, pp. 221-231.

Mwihomeke S (1989). *Land use in densely populated mountains of Tanzania*. MSc Thesis, Sokoine University of Agriculture, Morogoro, Tanzania.

Newmark WD, Leonard LN, Sariko HL, Gemassa DM (1993). Conservation attitudes of local people living adjacent to five protected areas in Tanzania. *Biological Conservation*, 63:177-183

Noss RF (1996). Protected areas: How much is enough? Pages 91-120 in Wright RG, ed. *National Parks and Protected Areas: Their Role in Environmental Protection*. Cambridge (MA): Blackwell Science.

Odner K (1971). A preliminary report on an archeological survey on the slopes of Mount Kilimanjaro. *Azania* 6: 131-150.

Ruffo CK (1989). Some useful plants of East Usambaras. In A. C. Hamilton and R. Bensted-Smith (eds), *Forest Conservation in the East Usambara Mountains, Tanzania*. IUCN, Gland and Cambridge, pp. 185-194.

Schmidt PR (1989). Early exploitation and settlement in the Usambara mountains. In A. C. Hamilton and R. Bensted-Smith (eds), *Forest Conservation in the East Usambara Mountains, Tanzania*. IUCN, Gland and Cambridge, pp. 75-78.

Svancara LK, Scott RJ, Groves CR, Noss RF and Pressey RL (2005). Policy-driven versus Evidence-based Conservation: A Review of Political Targets and Biological Needs, *BioScience* 55 (11): 989-995.

Tanzania Population and Housing Censuses, 1978, 1988, 2002.

Wiersum KF, Anspach PCL, Boerboom JHA, de Rouw A and Veer CP (1985).

Development of ecological methods of upland farming in West Usambara Mountains, Tanzania: In *Changes in Shifting Cultivation in Africa*: FAO Forestry paper (5): 55-82

APPENDIX

Semi structured questionnaire

I. GEOGRAPHICAL LOCATION

- 1: NAME OF THE VILLAGE _____
2: WHICH PART OF TANZANIA GEOGRAPHICALLY _____

II. PERSONAL PARTICULARS

- 1: NAME OF THE HOUSEHOLD HEAD _____
2: GENDER _____
3: AGE CATEGORY: OLD/YOUNGSTER/CHILD _____
4: TRIBE _____
5: EDUCATION: PRIMARY/SECONDARY/OTHERS _____
6: SIZE OF THE HOUSEHOLD/COOKING POT _____
7. a) Were you born here? Yes/ No
b) If no, where were you born _____
c) If migrated when (year) _____
d) Why did you migrate here _____

III. ECONOMY

- 1: a) Do you own land? Yes/ No
b) If yes, of which size _____
c) Which crops do you grow? _____
2: a) Do you own livestock? Yes/ No
If yes, which one:
Cattle
Sheep
Goats
Chicken
Others _____
b) Where do you normally graze your livestock? _____
c) Where do you prefer to graze your livestock _____
____ why? _____

- 3: Do you also have other sources of income?
e.g. employment/casual labour/others (mention)

- 4: Do you get any assistance from Government, NGO or any one else?
Organization _____ Type of assistance _____

VI. CONSERVATION IN GENERAL AND CONSERVATION OF BUTTERFLIES

- 1: What is your opinion about having a Protected area/National park close to this village?
Good/bad/don't know
2: Are there any disadvantages to be living next to the National Park/Forest Reserve? Explain

3: Should this National Park/Protected area be abolished?
Yes/No/Don't know
Explain why to express your views _____
4: Do you have any special belief about this forest?
Yes/No/Don't know
If yes, can you tell what are they? _____
5: Are there any activities, which you are not legally permitted to do in the National Park/Forest Reserve, that you would like to be able to do in the future?

6: a) Do you know butterflies?

Yes/No

b) Can you name any species?

Name of the Butterfly _____ What can you tell me about it _____

7: What sorts of advantages do you think you can get from butterflies?

8: a) If you are told to protect butterflies will you support the idea?

Yes/No/Don't know

b) Why? _____