Socioeconomic surveys around the Misotshi-Kabogo forest In south eastern Democratic Republic of Congo

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EXECUTIVE SUMMARY:

In 2007 a survey of the Misotshi-Kabogo Forest showed the area to be very rich in biodiversity and that it contains several unique species, endemic to the massif. It was clear that the forest and the surrounding savanna galleries deserved global recognition and support and the international press picked up on the discoveries of six new vertebrate species during the survey. A second survey was therefore planned to visit the main villages located around the forest and to assess their livelihood options, in particular their current use of the forest and also to obtain their thoughts and inputs into the design of any protected area for the region. This report summaries the results of this socioeconomic survey.

The report shows that people living in this area are very poor and have similar incomes to other areas within the Albertine Rift region. 64% of people are under 20 years old indicating very high child mortality rates. Most people were illiterate or had some basic primary education.

Access to the forest is important to households and contributes 4-7% of total household income. Although this percentage seems to be low the report shows that sale of forest products contributes significantly to a household's additional cash once the main expenditures on food, education and health are removed from the annual budget. Villages along the lake shore tended to be more wealthy in terms of income because of their access to fishing and a means of creating an income.

Most of the people intereviewed were in favour of creating a protected area for the forest and 85-90% suggested that national park status would be preferable because it woud bring development to their area. However, it is clear that people also want to have access to the forest to obtain forest products, particularly building poles, fuel wood, ropes/lianas, medicinal plants and also have access to cultural sites of religious significance. National Park status may not be compatible with this and the report suggests some options for the creation of a protected area of some sort for the region. This might include creating a faunal reserve with some form of zoning plan with different access rights or creating a core national park with a surrounding buffer of faunal reserve for instance.

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CHAPTER 1. Rationale for and design of the socioeconomic survey

Introduction

The Albertine Rift region of Africa has been identified as an Ecoregion, Endemic Bird Area and is part of the Eastern Afromontane Biodiversity Hotspot (Plumptre et al., 2007). Six major landscapes in the Albertine Rift have been identified as part of a strategic planning process for the conservation of the biodiversity of this highly species rich region of Africa (Plumptre et al., 2007). The region around an area that has historically been called Mt Kabobo in the Democratic Republic of Congo (DRC), north of the town of Kalemie, formed part of the 6th landscape (figure 1.1). However, this region is one of the most poorly known of all the landscapes having been difficult to access for many years because of civil strife in the DRC. Biological surveys made of this region in 2007 identified the forest as being rich in species with at least 1,135 plant species, 71 mammal species, 305 bird species, 14 amphibian and 26 reptile species. These surveys led by the Wildlife Conservation Society (WCS) discovered six new vertebrate species for the world; 2 mammals and 4 amphibians (Plumptre et al. 2003; 2008). It is also recognized as an important bird area (Fishpool and Evans, 2001) because of the endemic Kabobo Apalis which is only found in this region and the species richness of its birds.

Misotshi-Kabogo is an area of about 804 km^2 of main forest block with an additional 834 km^2 of gallery forest within a savanna grassland matrix. An area of about 2,000 km^2 contains no permanent human settlement and encompasses the forest block and the gallery forest (figure 1.2). It is within this area that WCS believes it should be possible to create some form of protected area that would conserve the biodiversity of this region and also conserve the ecosystem services that benefit the people living around this region.

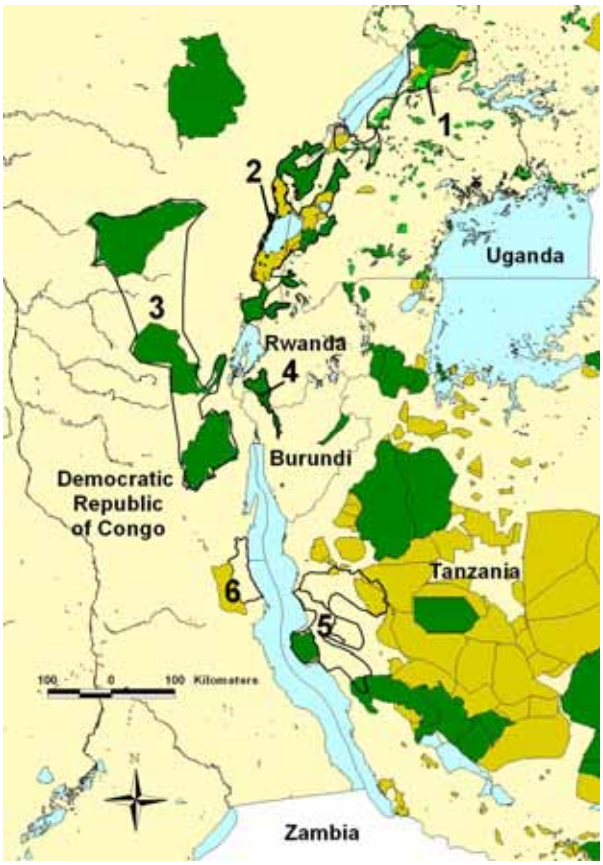

Figure 1.1. Map of the Albertine Rift region showing the six core landscapes:

1. Murchison-Semuliki
2. Greater Virunga
3. Maiko-Itombwe
4. Congo Nile divide
5. Greater Mahale Ecosystem
6. Misotshi-Kabogo

Protected areas in green (parks and forest reserves) and beige (wildlife reserves/savannas)

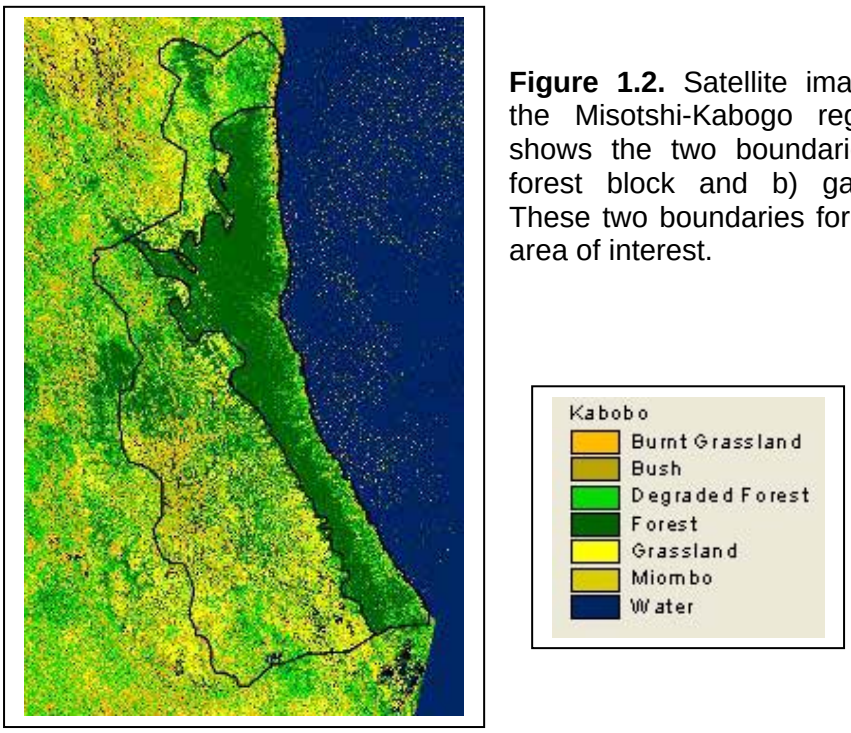

Figure 1.2. Satellite image classification of the Misotshi-Kabogo region. The image shows the two boundaries of the a) main forest block and b) gallery forest region These two boundaries form the border of the area of interest.

This region has been the focus of a protracted period of insecurity since the 1960s. It is the area where Laurent Kabila started his rebellion against the regime of Mbuto Sese Seko and he maintained a presence here and further north until the early 1980s. Following this he was ousted from Misotshi-Kabogo after a major battle in the forest and he fled to Tanzania. However, remnants of his rebel forces hid out in the forest and it remained insecure to visit. The war in DRC that brought Kabila to power and then the subsequent insecurity meant that this region was effectively insecure from 1960 to the mid 2000s (Plumptre et al. 2008).

The people living around this area are either living in fishing villages along the shores of Lake Tanganyika or in villages along the road that links Kalemie to Fizi. The only people living within the proposed area are men who are mining for gold in the forest on a temporary basis. Interviews with these miners showed that most came from Bukavu or outside the region and few of the local people felt it was worth mining the area because the revenue it generated was little (Plumptre et al. 2008).

Given the high conservation value of this forest WCS decided to start a process of investigating whether some form of protection could be given to the area. As part of this process WCS decided to undertake a socioeconomic survey of the main villages surrounding the potential protected area in Misotshi-Kabogo. This survey aimed to better understand the development needs of the region, people's use of the forest and how it contributes to their annual livelihoods and income, and to obtain their input and ideas about the potential creation of a protected area of some sorts.

Goals and Objectives

The overall goal of the survey was to better understand the economic and social environment of people living around the potential protected area in Misotshi-Kabogo and to better understand the people's view and attitudes towards the conservation of the forest. Specific objectives included:

1. To collect data to understand the economic situation in which people living around Misotshi-Kabogo find themselves
2. To understand people's use of the forest and how much this use contributes to their livelihoods
3. To understand their attitudes towards the conservation of the forest and their ideas about what they would like to see created to protect the forest.

Methods

A team of 2 people hired a boat to travel up Lake Tanganyika from Kalemie. They visited all the major villages along the coast (where there was a village chief and village committee). Some settlements fall under the oversight of a village chief and committee from a neighboring village and not all of these settlements were visited because of time constraints. In each village, interviews were held with the village chief and his committee initially to explain the study and to find out information from the village leaders. This was followed up by interviews with 15 different households in the village if the village was large enough and if not then all households were interviewed except those that had been represented in the meeting with the village chief and his committee members. A member of the village committee helped the researchers select 15 households in each village with five relatively wealthy, five of medium wealth and five relatively poor households. Interviews took on average two hours to complete all the questions

The survey team then traveled along the road between Kalemie and Fizi and carried out the same surveys in each village they encountered along the road (fig 1.3).

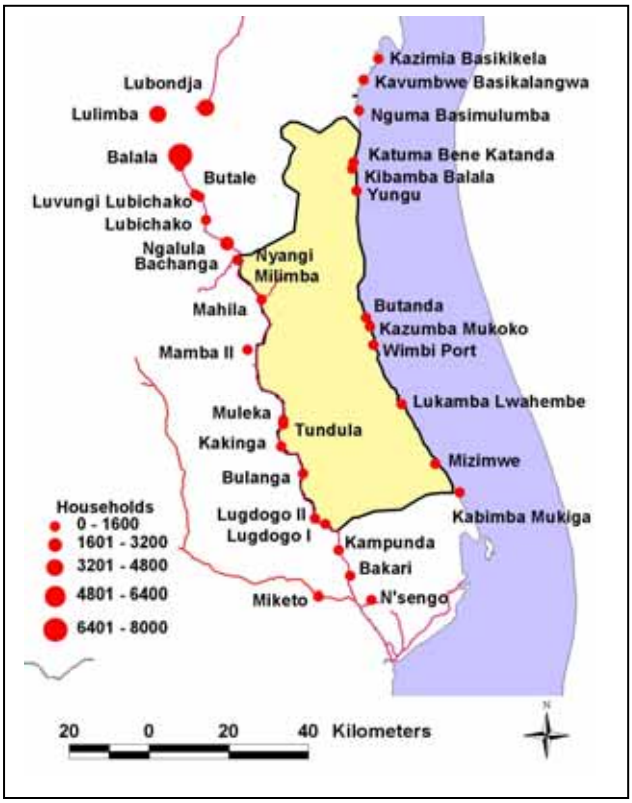

Figure 1.3. Villages surveyed during the socioeconomic assessment showing their location around the area of interest (beige) and their relative size in terms of number of households.

The questionnaires administered included questions about the household, its members, ages, sex, education levels and occupation, followed by questions about house structure, possessions, livestock and number of fields they farm. These were followed by questions about their use of the forest, fuel wood collection, and collection of water. Questions were then asked about what the household consumed each month and also how much they produced in their fields and the value of these products in the market. Use of forest products was similarly quantified to estimate the value of the resources collected from the forest to the annual income of the household. This was followed by questions about fishing and its income to the household and the questionnaire finished with open-ended questions asking for responses to the idea of creating a protected area, how might it benefit them and how might it be a problem for them and also asking them about sacred sites they would want to have access to. The questionnaires for the village chief and his committee and for the household are given in appendices 1 and 2 respectively.

The following three chapters summarise the results of the surveys with chapter 2 focusing on the household structure and livelihoods, chapter 3 gives results for the use of the forest by people and chapter 4 summaries people's attitudes towards the creation of a protected area. The last chapter (5) pulls all the information together to propose how a protected area might be created that is acceptable to most people living around this region.

CHAPTER 2: Socioeconomic status of households

Household structure

A total of 191 households were sampled in 14 villages along the lake shore and 222 households in 24 villages along the road. The structure of the households is similar to many of the rural communities in the Albertine Rift region with 64% of the population below the age of 20 (fig 2.1 and 2.2).

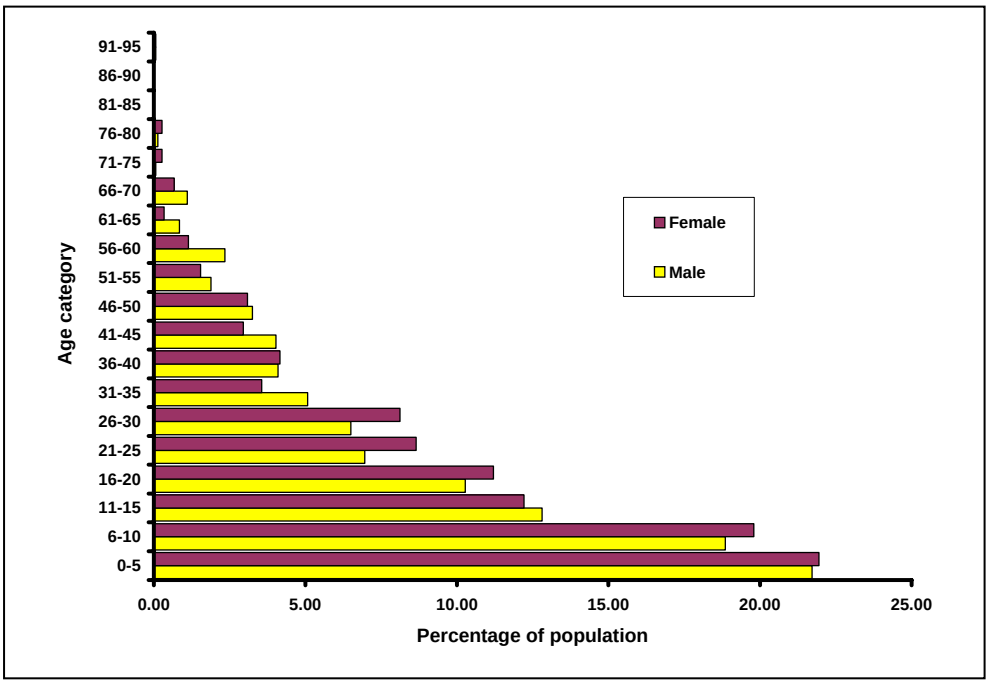

Figure 2.1. Age structure of the population of all households combined in five year groupings from 0-95 years. The percentage of male and female household occupants is given for each age category.

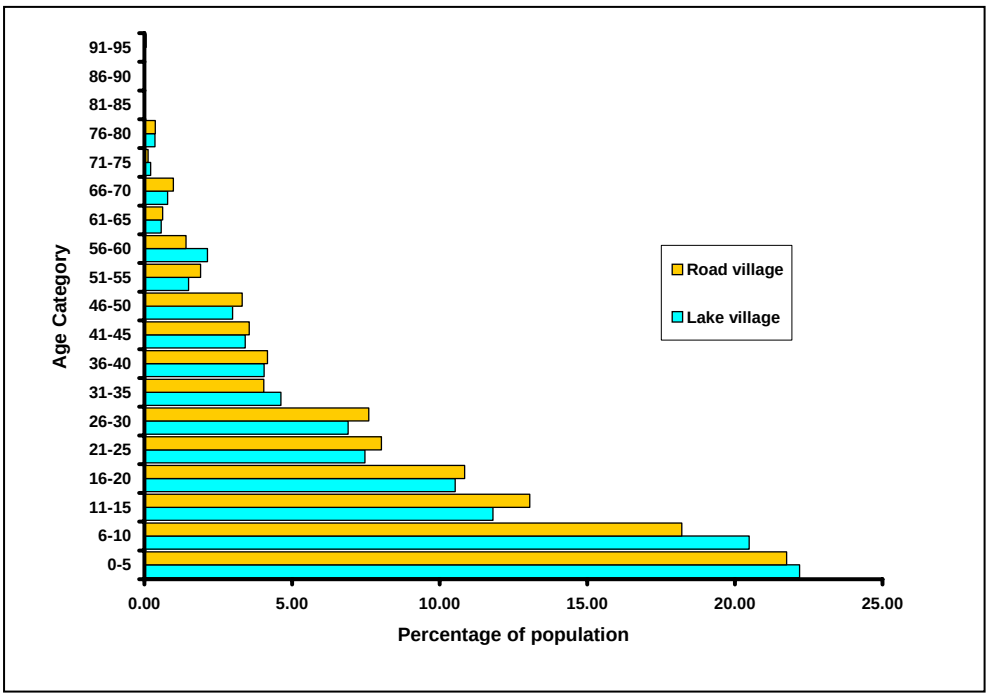

Figure 2.2. Age structure in villages along the lake shore and along the road between Kalemie and Fizi.

There was little difference between villages along the road between Kalemie and Fizi (road villages) and those along the shores of Lake Tanganyika (Lake Villages) in household age structure. Average household size was also very similar between lake villages (7.4 people per household) and road villages (7.4 per household).

Education level

Most people in the household had little education or only basic primary education. Only 4% of people in lake villages and 21% in road villages had secondary education or higher and only 0% and 0.1% respectively had university level education (fig 2.3).

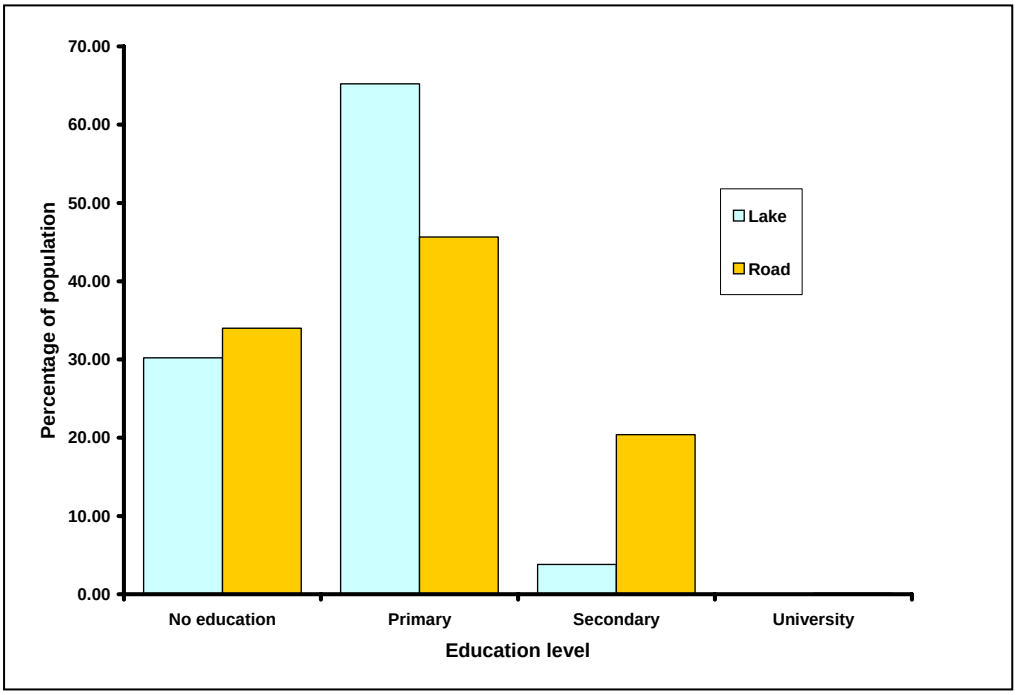

Figure 2.3. Percentage of household members with no, primary, secondary or university education for the lake and road villages.

Property/possessions

The types of houses and property people owned were assessed for each household to obtain a measure of the types of living conditions and wealth of households. Most people are obviously poor, living in houses with houses made out of mud bricks that have not been fired and grass or grass mixed with iron sheet roofs (table 2.1).

Villages along the lake appear to be a little wealthier with most houses having some metal sheets on their roofs (74%) as opposed to mainly grass thatch (67%) in villages along the road. About 1/3 of households in the lake villages have a canoe and 11% have fishing nets which distinguish them from the households in the villages along the road (table 2.1).

About 50% of households own a radio but fewer than 5% own any other possessions other than the fishing equipment. This can be attributed to the fact that 94% of household members in the lake villages and 92% in the road villages are either students at school or unemployed farmers working cultivating their land for themselves (fig 2.4).

Table 2.1. The percentage of households with different house structures and possessions for villages by the lake and those on the road.

Item	Detail	Lake	Road
House wall	Wood planks	0.00	0.45
	Brick (non fired)	80.63	73.87
	Grass	15.18	25.68
	Mud plaster	1.57	0.00
House roof	Grass	8.38	67.12
	Tiles	0.00	1.35
	Metal sheets	10.99	21.17
	Tarpaulin	4.19	3.15
	Metal sheet and grass	73.82	5.86
Possessions	Radio	56.02	50.45
	Bicycle	11.05	35.45
	TV	3.14	2.25
	Canoe	32.46	1.80
	Motor	1.57	0.45
	Gun	0.00	0.90
	Motorbike	0.52	4.05
	Nets	10.99	2.25

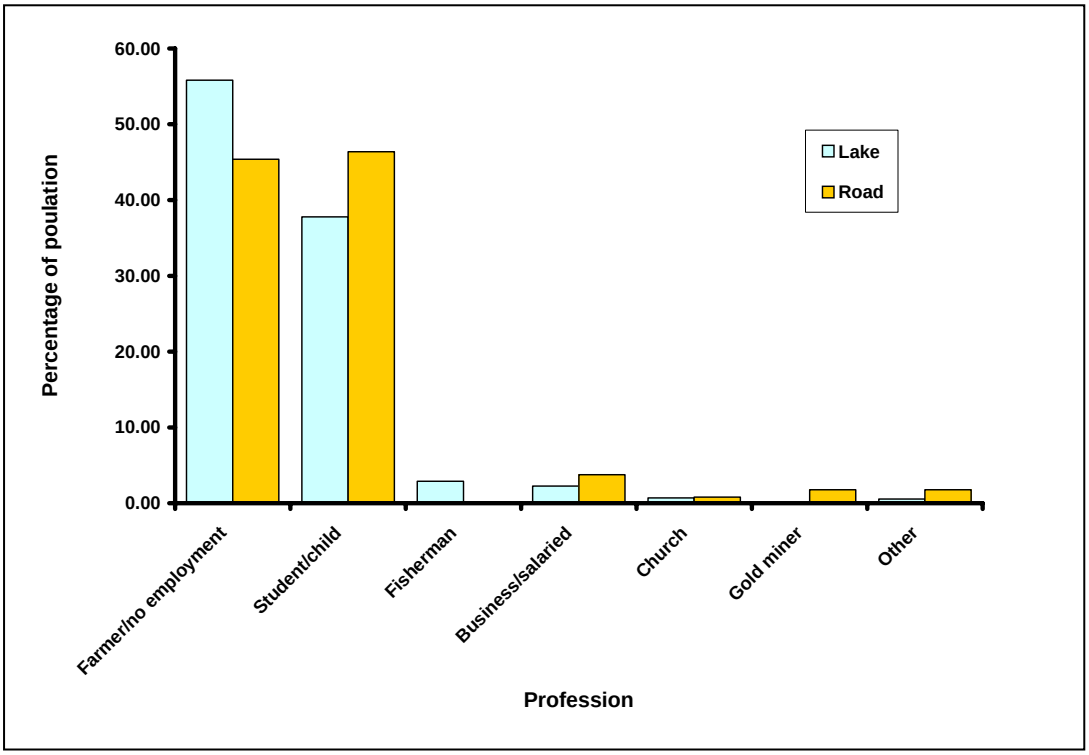

Figure 2.4. Percentage of household members with different professions/roles.

Livestock ownership and area of land cultivated were also assessed for each household and show that the area framed by households along the road tended to be slightly larger and they also owned more livestock for the most part (table 2.2), although villages on the lake tended to have more goats and chickens.

Table 2.2. The number of different types of livestock, and the average number of field and their size, owned on average per household.

Item	Detail	Lake	Road
Livestock	Goats	4.5	3.7
	Sheep	0.2	2.0
	Pigs	1.0	5.3
	Chickens	6.6	5.4
	Ducks	0.0	6.3
	Pigeons	0.0	7.5
	Rabbits	0.2	0.0
	Cows	0.2	2.0
Land holdings	Number of fields	2.11	2.35
	Agriculture (ha)	1.28	1.63
	Plantations (ha)	0.01	0.13
	Total area (ha)	1.29	1.76

Conclusion

The percentage of household members 18 or under was 59% for both village types which compares with communities living around other protected areas in the Albertine Rift: Rwanda: Nyungwe 59%; Parc National Des Volcans 57%; Uganda: Bwindi 58%; Echuya 56%; Mgahinga 51%; DR Congo: Virunga 54% (Plumptre et al. 2004). Ownership of goods and livestock is similar to these sites also although the households in this study tended to have slightly more chickens, goats and cows than elsewhere in the rift and also more households in road villages owned bicycles. Levels of education were very similar with about 20% of the population in these other sites having secondary education or higher (similar to the road villages but not the lake villages) and only 1-2% with university education. The percentage of people with primary education, however, was higher in Uganda and Rwanda than in this study as most people had some level of primary education unlike here where 32% had no primary education at all. This is obviously a legacy of the long period of civil war and insecurity that has taken place in this part of the world.

Questions to the village chiefs about the impact of the war indicate it was high. Of the 38 villages visited (14 along the lake and 24 along the road) all had seen houses burnt, displacement of people and a reduction in the size of the village as a result. Pillaging took place in 95% of the villages, killings in 87% and rape of women in 71%. All of these variables were higher in lakeshore villages except for killings which were a similar percentage. The village chief's were also asked how the war had impacted their village and how much it had reduced the population during the war. Lakeshore villages had been reduced by 82% and road villages by 91% on average during the war. Some villages were completely abandoned at times because of insecurity.

It is clear from these summaries that the people living around the region that might be created as a protected area show the characteristics of a human population that is living in poverty. The human demographic structure is typical of a population that suffers from high child mortality, levels of education are low and ownership of goods is limited. It is pretty similar to other areas in the Albertine Rift where some of the poorest people in Africa reside.

CHAPTER 3: Use of the forest and its importance for income to the household

Forest Management

The village chief and his committee were asked who had management jurisdiction over the forest and 42% responded that they and the government manage the forest while 58% thought that they had full jurisdiction. Of these 57% of lakeshore villages thought there was joint management authority while only 33% of road villages believed this. However, 92% of lake villages and 46% of road villages thought that the Ministry of Environment had a role in the management of the forest indicating a higher percentage who believed that government has some role. The road villages are further from the forest than the fishing villages and this may reflect this difference. It is probable that the ministry plays a role in timber extraction and is more active in fishing villages as a result. All road villages and 79% of lake villages also thought the customary chiefs had jurisdiction over the forest.

Forest use

Most households in both the lake villages (93%) and in the road villages (95%) used the forest to obtain forest products. The forests tended to be used seasonally with more use during October-March than at other times of the year (fig 3.1). This is also the time identified by households when there is less food available in people's fields and food is expensive to buy (particularly between January-March when rainfall is heavy). This 'hungry period' is also the time when the 4-5% of households that admitted to looking for gold went into the forest to search for it.

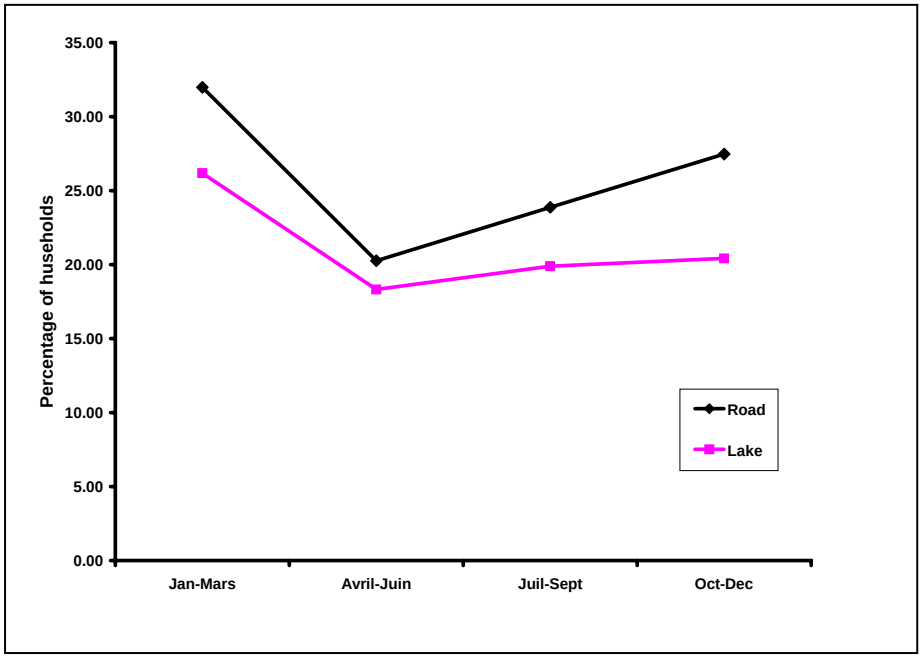

Figure 3.1. The percentage of households using the forest at different seasons of the year. The rainfall in this region is unimodal with the wet season between October and April and the dry season between May and September.

Many different products were harvested from the forest (table 3.1) with several clear differences between villages on the lake and those on the road. Villages on the lake tended to harvest building poles and thatching grass (30%) followed by mushrooms

(11%) and planks of timber (11%) and medicinal plants (10.5%). Villages on the road harvested more from the forest with mushrooms (46%), thatching grass (42%), planks of timber (39%) building poles (37%), rattan cane (24%), medicinal plants (22%), gold (20%), wild ginger (aframomum-16%), rats and snakes (both 10%) all harvested by at least 10% of households. Not all households may have admitted to harvesting all of these products but it is not illegal in this region to harvest these products (except possibly chimpanzees) so there was no fear of admitting to any harvesting.

Table 3.1. The percentage of households admitting to harvesting various forest products..

Product	Lake	Road
Building poles	30.53	36.65
Thatching grass	30.53	41.63
Mushrooms	11.05	46.15
Planks and cut timber	11.05	38.91
Medicinal plants	10.53	22.17
Wild Yams	6.84	6.79
Firewood	6.84	1.81
Rats	6.32	10.41
Rattan cane	5.26	24.43
Honey	4.74	5.43
Porcupines	4.74	1.36
Timber	4.21	1.36
Large pieces of timber	4.21	4.07
Monkeys	3.68	4.52
Aframomum	3.16	15.84
Hares	3.16	7.69
Charcoal	3.16	1.81
Small antelopes	2.63	8.60
Snakes	2.63	10.41
Francolins	2.63	6.33
Gold	2.63	20.36
Stones	1.58	0.00
Palms fruits	1.05	0.00
Tamarind	1.05	9.95
Mats	1.05	7.24
Ducks	0.53	4.07
Chimpanzees	0.53	0.00
Clay	0.53	0.00
Other minerals	0.53	0.00
Bamboo	0.00	0.90
Large antelopes	0.00	1.81
Bushpigs	0.00	1.36

Annual household economy

Data were collected on income from products that the household farmed or businesses that they were involved in to obtain a measure of cash earned from various sources to the household. Income from sales/in cash was significantly higher in lake villages (T=2.034, df=411, P=0.043). Houses that were classified as rich also earned significantly more than those classified as medium and poor (F=3.63, df-2, 338; P=0.028) although there was no significant difference between medium and poor households (Average income: Poor - $544; Medium - $969; Rich - $5,816). These two sets of measurements were used to estimate how important access to the forest is in terms of the annual household income (table 3.2).

Similarly the amounts of forest products harvested in the past month or season were estimated by each household interviewed and local costs for each unit of measurement recorded. The amount consumed in the home and the amount sold to obtain cash was also estimated. This was used to obtain a measure of income that households generate by having access to the forest.

Table 3.2. Estimates of annual income ($US) to households from various activities. Numbers are the average income per household for villages at the lake shore and along the road separately.

Source	Income in cash/sales		Consumed at home		Total income	
Agriculture/commerce	**Lake**	**Road**	**Lake**	**Road**	**Lake**	**Road**
Salary	10	54			10	54
Trading	17	143			17	143
Subsistence agriculture	335	239	1,092	8,888	1427	9,126
Vegetables	7	3	1	13	8	16
Fruits	10	1	5	0	15	1
Trees	15	1	15	20	29	21
Livestock	15	16	6	7	21	23
Fishing	1,924	1	3,692	49	5,617	50
Crafts and small businesses	754	196			754	196
Gifts	2	5			2	5
Total income	***3,089***	***659***	***4,811.8***	***8,975***	***7,901***	***9,635***
Forest income	**Lake**	**Road**	**Lake**	**Road**	**Lake**	**Road**
Food plants	2	2	4	3	6	4
Small animals	24	4	10	3	34	8
Large animals	1	1	0	1	1	2
Fire wood	8	0	2	0	10	0
Charcoal	93	1	2	0	95	1
Gold	2	364			2	364
Medicinal plants	0	0	0	0	0	1
Timber	136	3	140	4	276	7
Building poles	11	5	14	6	25	11
Rattan/basket materials	1	1	1	1	2	2
Thatch	33	1	90	5	123	6
Forest income	**310**	**382**	**262**	**23**	**572**	**405**
Combined income	**3,399**	**1,041**	**5,074**	**8,998**	**8,473**	**10,039**

Forest income therefore formed about 6.8% of annual income from lake forests (for total income both consumed in the home and in cash from sales) and 4.0% for villages along roads. In terms of additional cash to the household during the year the

forest provided on average 9.1% of household income for lake villages but 36.7% for road villages.

Estimates of the annual costs per household were also made for basic living, health and education needs (table 3.3). These show that little money remains after these basic costs are paid for. Forest income from sales of forest products contributes to 32% of the remaining budget after costs for lake villages and an average of 96% for road villages. Access to the forest is therefore very important to people living in this region in terms of their livelihood needs.

Table 3.3. Estimates of the annual costs required to maintain a basic level of livelihood for lake and road villages separately. Lake shore villages also have additional costs of fishing which were also estimated. Net spare income is therefore estimated as the total income in cash/sales of goods (table 3.2) minus the living and fishing costs.

Costs	Source	Lake	Road
Living costs	Education	99	36
	Health	133	45
	Food	973	422
	Clothing	187	57
	Drinks	46	21
	Travels	148	27
	Others	63	34
	Total	**1,647**	**643**
Fishing costs	Canoes cost	89	0
	Annual expenses	209	0
	Annual wages for employees	10	0
	Nets cost	484	0
	Total	**793**	**0**
Income after costs	Income in cash	3,399	1,041
	Costs in cash	1,647	643
	Fishing costs	793	0
	Net income	**960**	**398**

Villages along the lake appear to have more spare cash than those along the road. This is despite the fact that if people were to sell everything they grow or harvest the road villages would make more income (table 3.2). Much of the produce though in road villages is consumed in the home, the bulk of the subsistence agriculture being dominated by manioc production. Fishing is obviously a useful additional income earner in villages along the lake and provides household members with additional cash they can use despite the fact that the cost of living is higher in these villages.

It is clear that the creation of any protected area needs to factor in the needs of these people and their access to natural resources from the forest. Excluding people from this access could have significant impacts on their livelihoods. Either a protected area needs to be created at some distance from the villages so that they still have access to natural forest or there must be a system of zoning of the protected area that allows for human use areas within the protected area.

CHAPTER 4: Attitudes towards conservation and the idea of a protected area

Reaction to idea of protected area

The village chief and his committee were asked what they thought about the creation of a protected area of some sort following a description of the findings of the biological surveys which showed the area to be globally important. Most villages thought that creating a protected area would be a good idea with 86% of lake villages and 92% of road villages supporting this idea (fig 4.1). Only three of the 38 villages thought it was a bad idea and these villages represent about 2% of all households in all villages visited.

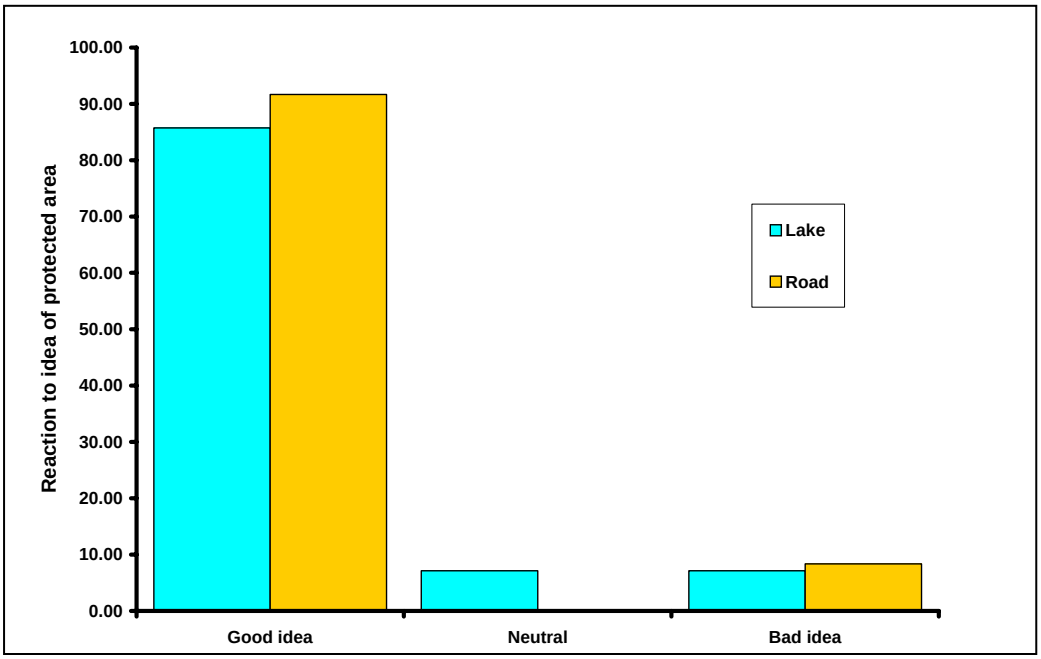

Figure 4.1. The percentage of villages supporting, neutral or not supporting the idea of creating a protected area.

A similar percentage of reaction was obtained from the household surveys where the same questions were posed. 84% of households thought that creating the protected area was a good idea with only 8% against it. The remaining 8% thought it was up to the village chief and his committee to decide based upon the importance of the forest.

Different possible protected area types were presented to the village chief and his committee and they were asked to express a preference for a particular protected area type. Most villages wanted a national park to be created with some of the road villages preferring a community reserve. Few wanted a faunal reserve and some villages suggested this should be discussed at a meeting of all the chiefs and local politicians (fig 4.2).

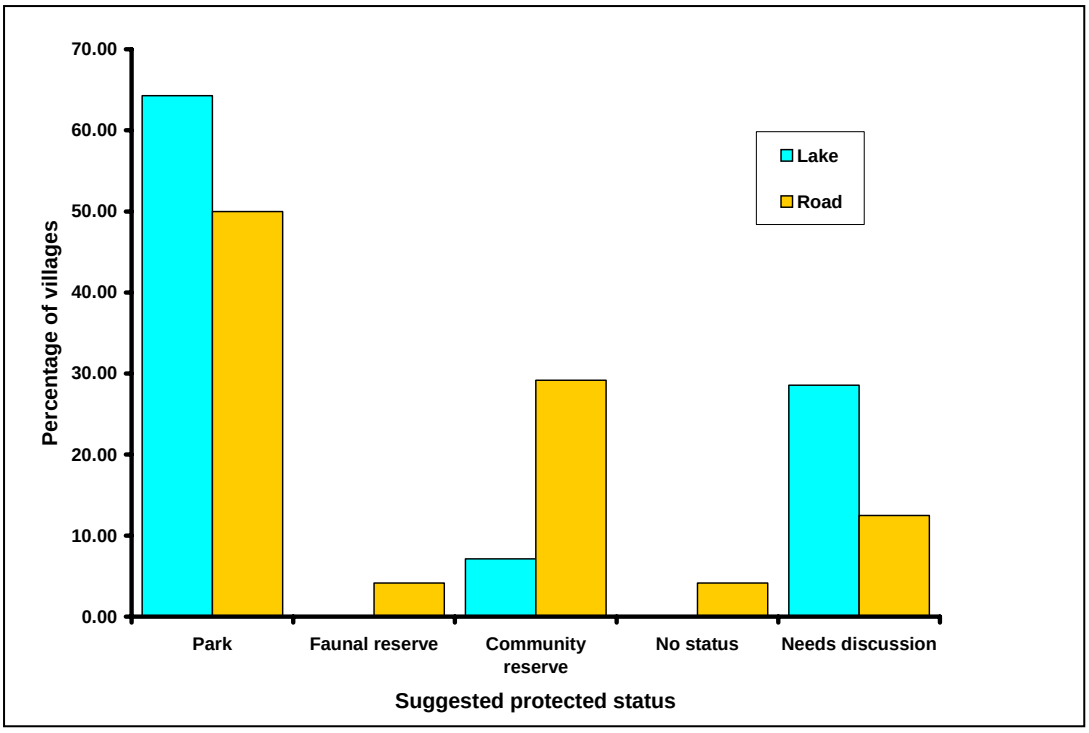

Figure 4.2. The percentage of village chief's and their committees who preferred a particular protected area designation.

In general therefore the villages and households were in favour that some form of protected area is created and most suggested that a national park would be a good idea.

Both households and the village chief and his committee were asked why they favoured the creation of a protected area. Reasons included:

- Employment (Lake villages: 14%; Road villages: 13%)
- It would conserve the wildlife (Lake villages: 57%; Road villages: 50%)
- Tourism opportunities (Lake villages: 7%; Road villages:4%)
- Global importance (Lake villages: 0%; Road villages:25%)
- Conserve the environment for children (Lake villages: 0%; Road villages:14%)

Reasons not to create the protected area included:

- Loss of crops (Lake villages: 7%; Road villages:4%)
- Loss of access to forest resources (Lake villages: 0%; Road villages: 4%)
- No more bushmeat (Lake villages: 0%; Road villages: 3%)

Access needs of the villages

Village chiefs and their committees were also asked what form of access needs would be necessary within the protected area so that their livelihoods would not be adversely affected. Chapter three showed that the forest was important in helping households gain some additional income each year and it is important that this is acknowledged in the design of any form of protected area. Responses mainly focused around access to the forest for specific resources (fig 4.3).

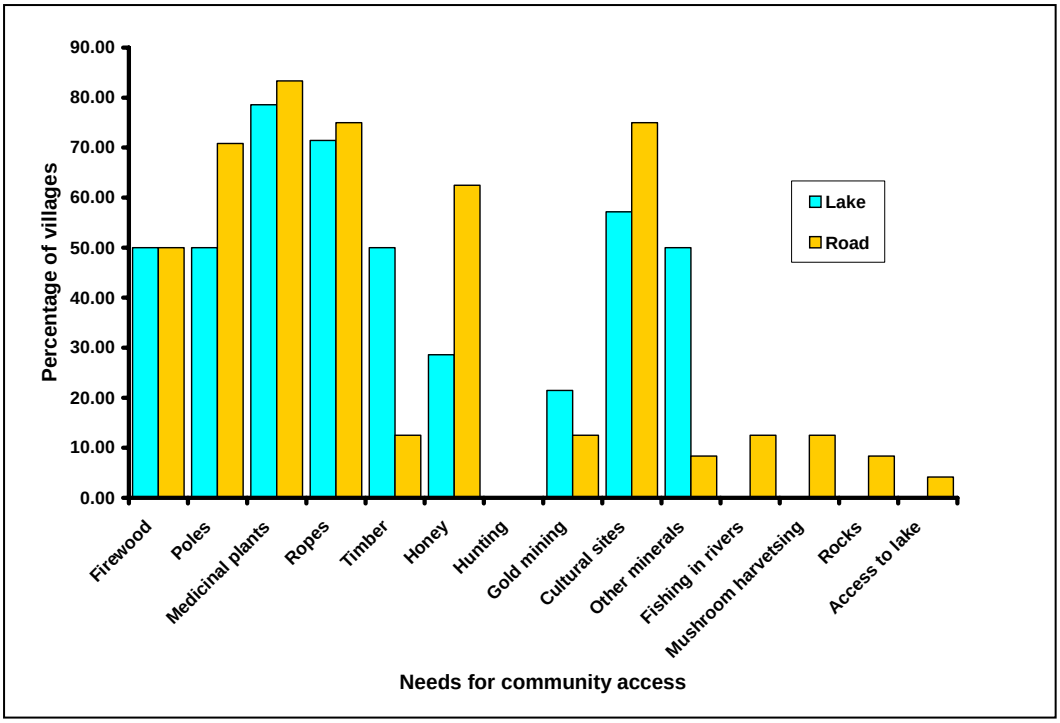

Figure 4.3. Access needs requested by village chiefs and their committees if a protected area were to be created.

The main access requirements are for medicinal plants, ropes/cords, cultural sites, firewood, building poles for houses, timber honey and other minerals. Interestingly no chiefs cited bushmeat as being important and access for gold mining was limited also. However it is clear that the village chiefs and their committees considered access to forest products to be of great importance. This is somewhat incompatible with a national park status where access is usually limited except for tourism and non-consumptive uses. A faunal or community reserve would be more compatible with such use.

People were asked what conditions they would need to have in place in order to create a protected area. Responses included:

- Boundary is well demarcated (Lake villages: 29%; Road villages: 4%)
- Support social needs (Lake villages: 21%; Road villages: 13%)
- No conditions needed (Lake villages: 50%; Road villages: 58%)
- No settlement of outsiders (Lake villages: 0%; Road villages: 4%)
- No sale of land by government (Lake villages: 0%; Road villages: 13%)
- Control wild animals (Lake villages: 0%; Road villages: 4%)

Cultural sites

People were asked a bit more about cultural sites to obtain more information about them. 70% of lake households and 34% of road households confirmesd the existence of cultural sites in the forest. 83% of lake households and 90% of road households thought that a protected area designation would be compatible with these cultural sites provided access was still possible and the chiefs informed the ancestors in advance about it.

Conclusion

It is clear that most of the people living around the forest would be willing to have some form of protected area created for the forest in the Misotshi-Kabogo region. It is also clear that they would also want to have some form of access to forest products which we have shown are an important part of their livelihoods. The following chapter discusses what options might be available to create a protected area in this region.

CHAPTER 5: Conservation of Misotshi-Kabogo – suggested way forward

Protected area types

There are several options under Congolese law for the creation of a protected area. These include:

- National Park
- Faunal Reserve
- Community Reserve (will soon be possible under DRC law)
- Natural Reserve
- Forest Reserve

The first four of these are possible designations for the conservation of faunal diversity while the last, Forest Reserve, is more applicable for timber harvesting and management.

Although many of the people interviewed preferred the park's status (fig. 4.2) it is probably incompatible with the access needs of the people as specified in figure 4.3 and also with their livelihood needs as shown in table 3.2. National Park status tends to preclude harvesting of forest products. The Conservation Law of August 22, 1969 forbids entering, walking, camping and living in national parks. Furthermore, National Park status tends to preclude harvesting of forest products (article 5 of the 1969 Law). This is because National Parks are Integral Natural Reserves and although many of the people interviewed preferred this status (fig. 4.2) it is probably incompatible with the access needs of the people as specified in figure 4.3 and also with their livelihood needs as shown in table 3.2.

Faunal Reserves or Natural Reserves allow some access by local communities (IUCN category 6). Natural Reserves are de facto "community reserves". Because community reserves are not yet legally included in the Conservation Law, most DRC's community reserves have been named Natural Reserves: Itombwe and Sankuru. The Okapi Faunal Reserve's denomination is incorrect and should have been named Natural Reserve (ADT pers.com). The Tayna community reserve creation was actually illegal in the sense that it had no legal framework. In each decree that created Natural Reserve, there is an article that allow ICCN to "abolish" some restrictions that were part of the 1969 Conservation Law which applied only to Integral Natural Reserves. There are advantages and disadvantages of each designation depending on the goal of the conservation of this area.

The forest surveys WCS led in 2007 showed that the Misotshi-Kabogo forest is particularly rich in species and during a short period we discovered 6 new vertebrate species for the World. It is likely that there are other undiscovered species in the forest and therefore there is a need to have a fairly strong level of conservation and protection of the forest to ensure these unique species are conserved.

A further option might be to include areas of the lake as part of the protected area. These would be where the forest comes to the lake shore and where no human presence exists. There are few places left in the Albertine Rift region where forest spans the altitudinal range from 770 metres to 2.750 metres and it is important to conserve the forest where it occurs at its lower altitudes.

Options for protected area

There are two possible options when considering creating a protected area in the region of the Misotshi-Kabogo forest.

Option 1.

One option would be to create one large faunal reserve over the whole area (possibly with a marine reserve added to it). This would be managed by ICCN but allow human access to the reserve, possible with some form of zoning where core areas would be left for the wildlife and human access would be allowed outside these. Boundaries would be decided with the communities on the ground.

Option 2.

The second might be to create a core national park with a buffer of a faunal reserve or natural reserve around the villages where access would be allowed for forest products (also with a possible marine reserve in the lake). Both the park and the reserve would be managed by ICCN in this case but boundaries would be jointly decided with the communities.

The second option would provide core protection for some of the unique species found in the forest and would probably be preferable from a conservation point of view. Having a park status would also attract attention to the area and might encourage more investment in the area such as tourism opportunities. However both options need to be discussed with the local people and Government representatives in Kalemie and Fizi.

Access options

The types of access that will be allowed also need to be discussed and agreed upon. For instance, is bushmeat hunting going to be allowed to continue – will it be allowed throughout the forest or will hunting areas be designated. Most of the large mammals were very rare in the forest in the 2007 survey and there is a need to create areas where their numbers can rebuild and populate any hunting areas if allowed. Figure 4.3 shows that nobody interviewed wanted access for hunting but this needs formal agreement. The same discussions are needed for other products, particularly those that have a major impact on the forest such as timber harvesting, gold mining and mining of other minerals.

Next steps

Following the production of this report WCS will hold a meeting in both Kalemie and Fizi districts to bring together the village chiefs and the local and national government to present the findings of the biological surveys from 2007 and the socioeconomic survey summarized here. At these meetings there will then be discussion about the type of protected area that could be created, the access options and the products that people agree to being harvested. There will also be discussion about extending the protected area into the lake where there are no people to provide breeding areas for fish stocks for the fishing communities along the lake shore.

It is hoped that these meetings will lead to agreement about the type of protected area that could be created, following whichb there will be a need for a team to visit the field and work with each village to agree on boundaries to the protected area and to start to delimit these.

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Appendix 1. Questionnaire for the village chiefs and their committees.

Questionnaire de l'étude socioéconomique aux alentours de Misotshi-Kabogo
Interview avec les chefs et les comités des villages

1. **Village ……**
2. **Nombre de ménages……**
3. **Nombre d'adultes …….. Enfants……**
4. **Coordonnées GPS au centre du village EW……. NS.……**
   Altitude……
5. **Quelles sont les activités génératrices des revenus pratiquées par les habitants dans ce village? Citez-les toutes :**
   a. Pêche ……..
   b. Agriculture de subsistance …….
   c. Culture de rente…….
   d. Chasse …….
   e. Creusage d'Or ……..
   f. Creusage d'autres minerais (spécifier?).....
   g. Commerce…
   h. Artisanat……..
   i. Autres (Spécifier)?.....
   …….
6. **Combien de temps ce village existe-t-il?……**
7. **Qui a la décision sur la terre dans ce village ou à qui appartient la terre dans ce village? …….**
8. **Avez-vous des services sociaux dans ce village? : Oui/Non Combien par catégories suivantes :**
   a. Ecole primaire :…..
   b. Ecole secondaire :…..
   c. Hôpital :……
   d. Centre de santé/Poste de santé :…….
   e. Autres (spécifier) :.....
9. **Quel est le statut légal de cette forêt ? (gouvernement ou traditionnel) Comment est gérée la forêt, par quelle autorité, suivant quelle réglementation d'usage ?**

……
…….
……
…….
……
…….

10. **Comment ce village a t-il été affecté par la série des guerres depuis 1996 ?.....……**
……
……
…..
……
…..
……
…..……
……..
……
…..
……..

11. **Est-ce que le village a diminué de taille (étendue) depuis le début des guerres:**
Oui/Non
De combien? : ……

12. **Comment appelez-vous ces montagnes qui se trouvent à l'Ouest du lac Tanganika (au Nord de Kalemie)? Avez-vous un nom spécifique pour la forêt ?.....**
.....
……
……
…….

13. **Quel nom pouvez-vous proposer pour toute la région?**
……
……
……
……

14. **Cette forêt ici est d'une importance mondiale pour la conservation et beaucoup des gens veulent assurer sa survie et celle des espèces animales qui y vivent. Quelques espèces d'animaux vivant dans cette forêt ne peuvent être retrouvées nulle part ailleurs dans le monde que dans cette forêt. Connaissez-vous quelques espèces qui soient importantes? Oui/Non**
Si oui, lesquelles?
    a. ……

b. ……
c. ……..
d. ……
e. ……..

15. Pensez-vous que c'est nécessaire de protéger cette forêt ? Quelle pouvait être votre réaction si la création d'une Aire Protégée semble le meilleur moyen de protéger cette forêt ?

a. Bonne b.Neutre c. Mauvais

Pourquoi et comment?.....
……
…
……
…

16. Dans la législation congolaise, il y a plusieurs catégories d'aires protégées :

a. **Parc National** où l'usage humain est quasi interdit exceptés le tourisme et la recherche scientifique ;
b. **Réserve Naturelle** où la collecte du bois de chauffe est autorisée mais la chasse d'animaux y est interdite ;
c. **Réserve de Faune** où l'on peut autoriser quelques utilisations par les communautés locales mais pas par la population extérieure de la réserve ; l'utilisation des ressources y est contrôlée et limitée ;

Si l'aire protégée est créée, laquelle de ces trois catégories pensez-vous que votre village préfèrerait?
Catégorie préférée :
……

17. Quelle sorte d'activités pouvez-vous vouloir continuer à mener dans l'aire protégée à créer?

a. Collecte de bois de chauffe ……..
b. Collecte de sticks pour la construction ……..
c. Collecte des plantes médicinales …….
d. Collecte des lianes et cordes…….
e. Coupe d'arbres ……..
f. Collecte du miel
g. Chasse …….
h. Creusage de l'Or ……..
i. Vénération/Pratiques culturelles ……..
j. Creusage d'autres minerais et les quels……..
k. Autres activités (spécifier)…….

……

18. Quel type de cohabitation souhaiteriez-vous voir entre les agents de l'Aire protégée et la population locale ?.....
……
……
……..

En cas de problème, comment penseriez-vous les résoudre ?

Problèmes prévisibles	Solutions à préconiser
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

19. Connaisez-vous parfaitement cette forêt? : Oui/Non

20. Quels sont les problèmes que vous avez déjà observés comme menaces pour cette forêt?

1. **la forte déforestation (coupe excessive des arbres)**
2. **le feu de brousse incontrôlé**
3. **le banditisme (abrite les hors la loi)**
4. **occupation ou exploitation par les non autochtones**
5. **les fortes sollicitations d'entreprises minières**
6. **autre (à spécifier)……**

21. Quelle mesure avez-vous prise (démarche que vous avez pu faire) pour résoudre ces problèmes et quelle a été l'issue de ces initiatives :

Menaceobsevrée Solution proposée Issue finale 1……. …….
…….
2……. …….
…….
3……. …….
…….

22. En cas de création d'une aire protégée, la population est-elle disposée à participer à sa délimitation ? Oui / Non

23. Avez-vous une idée de la zone à délimiter qui pouvait être érigée en Aire protégée ?

Oui / Non

24. Quelles seraient ses limites éventuelles par rapport à votre entité ou dans les entités voisines ?

25. Qui sont pour vous des personnes habilitées à décider de l'avenir de cette forêt ? Citez deux responsables et vrais propriétaires des terres et qui ont le mandat de la communauté :

Noms des personnes responsables	Moyens de contact
1.	
2.	

Nous vous remercions pour la collaboration et la disponibilité.

Appendix 2. Questionnaire for households visited.

Exploitation de la forêt de Misotshi-Kabogo par les communautés locales

Valeur Economico Environnementale des forêts aux communautés locales

Enquêteur :	**Date : Heure :**
Vérifié par :	**Date de vérification :**
Nom du Village/localité :	
Groupement :	
Collectivité :	**Nom de l'interrogé :**
Territoire :	**Sexe de l'interrogé :**
Nom de la région de la forêt :	**Niveau de richesse:**

1. **Composition du ménage**

De Combien des personnes est compose votre ménage?

Statut	Description	Age	Sexe	Niveau d'études	Occupation
Responsable du ménage					
Epouse					
Membre 1					
Membre 2					
Membre 3					
Membre 4					
Membre 5					
Membre 6					
Membre 7					
Membre 8					
Membre 9					
Member 10					

Description – *1) Epoux, 2) Epouse, 3) Enfant 4) Familier 5) Orphelin 6) Travailleur visiteur 7) Personne dépendant 8) Femme responsable du foyer*

Niveau d'éducation *– 0) Pas d'éducation formelle, 2) Primaire, 3) Secondaire 4) Education universitaire/Institut supérieur*

Occupation *– 0) Pas de travail 1) Agriculteur: inclut la subsistance 2) étudiant/élève 3) Commerçant 4) Ouvrier temporaire 6) Salarié 7) Enfant 8) Pêcheur 9) Autres –*

spécifier……..

Pour combien d'année votre famille vit dans ce village ou endroit?…….

1) Moins d'une année 2) 1-5 années 3) 5-10 années 4)10 années ou plus

2. **Avoirs/ Biens**

Matériels utilisés pour les maisons d'habitation (essayer de faire une observation discrète à l'approche de la maison)
Murs : 1) Bois/planches 2) Briques 3) Boue 4) Tôles 5) Bâches

Toît : 1) En chaume 2) Tuiles 3) Tôles 4) Bâches

Avez-vous un vélo? : Oui/NOn

Si Oui, combien? :

Et ces autres biens détaillés en dessous?
1) Radio 2) Télévision 3) Pirogue 4) Moteur horsbord
5) Vélo 6) Moto 7) Camionnette/ Camion ou voiture 8) Filets

Animaux domestiques
Avez vous combien d'animaux dans votre maison?

Espèces d'animaux domestiques	Nombre
Chèvres	
Moutons	
Cochons	
Poules /Canards/ Pigeons	
Lapins	
Vaches	
Chiens	

3. **Ressources terriennes – Combien des champs avez-vous? Vous les exploitez à quelle fin?**

Type de Champ	Lieu (Unité de mesure locale)	Droit de propriété

Type de champ *– 1) Forêt naturelle/Savane arbustive, 2) Champ d'arbres, 3)Cultural, 4)Marécageux,*
5) savane herbeuse(Ferme) 6)Savane arbustive (ferme) 7) Cultures commerciales/ plantation

Droit de propriété *1) Possède 2) Location 3) N'a pas de terre*

Si jamais tu pouvais vendre ton terrain, combien peut-il coûter? : ……..FC/Ha

4. **As-tu un champ d'arbres? Si la personne a un champ d'arbres:**

Espèces d'arbres	Superficie (Ha)	Usage

5. Est -ce que les gens utilisent la forêt? : Oui/Non

6. A quelle distance se trouve la forêt? : ……Km

7. Combien de temps il faut pour atteindre la forêt? :
……..Minutes/Heures

8. Durant quels mois de l'année vous exploitez la forêt le plus?

Mois	**Raisons**

9. En quels mois de l'année la nourriture est rare ou chère?

Mois	**Raison**

10. Quelle source d'énergie que vous utilisez et quelle quantité par semaine ?

Source	**Utilisation**	**Volume (unité)**
Bois (fagot)		
Braise(sac)		
Pétrole(litre)		
Gaz		
Electricité		
Autres?		

Utilisation- 1)Cuisson 2)Eclairage 3)Chauffage 4) Autre (préciser)

11. Quelle distance vous parcourez en moyenne chaque jour pour la collecte du bois de chauffe? Est-ce dans la forêt? :…… m/Km Oui/Non

12. Qu'avez-vous observé comme changement durant les 5 dernières années dans la collecte de bois ?

1) Pas de changement (va a 15) 2) longue distance 3) courte distance
4) Autre (à préciser) :……..

13. Quelle est la raison de ce changement (s'il y a une)?
……
……
……
……

14. Où puisez -vous votre eau de boisson?

Puits	
Ruisseau/rivière	
Source aménagée	

Source non aménagée	
Etang/marre	
Lac	
autres (Spécifier)	

15 Votre eau vient-elle de la forêt? : Oui/Non

16. La source d'eau est à quelle distance de votre maison?.....

17. Dans votre ménage, qui puise l'eau?) :

a) le responsable
b) un membre de famille
c) paie le service (à quel coût ?) : …….

18. Combien des bidons de 20l utilisez-vous par jour? : ……

19. Quel type de traitement utilisez-vous pour purifier votre eau de boisson?

Rien	
Bouillir	
Bouillir et filtrer	
Chimique	

20. Quelle est la qualité de votre eau de boisson?

1. Excellent 2. Bon 3. Assez bon 4. Mauvaise

21. Collectez-vous des plantes médicinales? : Oui/Non

Quelle est la raison principale de cette collecte?

1) Propre consommation
2) Vente
3) Autre
(spécifier) :……..

Les questions suivantes sur les revenus des ménages et leurs consommations doivent avoir comme fondement le rappel des événements des 12 derniers mois :

22. Revenu de ménage/Consommation (autres sources que les produits forestiers)

Article			**Revenu annuel pour une saison culturale /travail**	**Consommation hebdomadaire pour une production**	

	Unité locale	**Récolte annuelle totale**	**Quantités vendues/recues**	**Quantités Consommées**	**Prix moyenne par unité**
Revenu agricole					
Café	Bol				
Thé	Kg				
Cacao	kg				
Tabac					
Canne à sucre	tonne				
Haricot (sec)	kg				
Aliment de base (feculent, mais, bananes etc):					
1Manioc					
2 Maïs					
3 Bananes					
4					
Legumes:					
1					
2					
3					
4					
5					
6					
7					
Fruits:					
1					
2					
3					
4					
5					
6					
Revenus sylvicoles					
Plantation d’arbres:					
1					
2					
3					
4					
Braise	Sac				
Moringa	Kg				
Graines	Kg				
Plantules	Piece				
Animaux domestiques					
Gros- bétail					
Petit- bétail					
Produits animaliers					
Location des animaux					
Pêche					
Poissons pêchés					

Location des filets					
Location des pirogues					
Salaire temporaire					
Sans qualification Agriculture/travailleur saisonier					
Employé qualifié permanent					
Autre travail					
Artisanat et petite enterprise					
Bière locale	Bidon				
Alcool (lotoko)	litre				
Vente d'oeuvres d'art	article				
Commerce					
Location des biens/matériels					
Revenus divers					
Revenue totale (à l'exclusion des revenus environnementaux)					
Revenus privés dons/donations reçus en espèces					
Dons réçus en nature					
Total des dons réçus					

23. Revenus de ménage/Consommation (Produits à base de forêt naturelle)

Avez-vous des problèmes avec les animaux sauvages qui détruisent vos champs? Oui/Non

Quelle espèce?

1) Buffle 2) Antilopes 3) Chimpanzé 4) Singes 5) Babouins 6)Porc-épic
7) Sangliers 8) Autres (Spécifier)……

Quelle est la technique que vous utilisez pour contrôler ces animaux ?.....

Quelle espèce est la plus problématique?.....

Est-ce que vous piégez quelques-uns de ces animaux?: Oui/Non

Est-ce que vous les mangez? : Oui/Non

Si oui, quelles sont les espèces qui sont souvent mangées ?.....
……
…….

Y a –t-il d'animaux sacrés (tabous) dans votre coutume ? : Oui/Non
Si oui,
lesquels :……
……
……

Est- ce que vous récoltez ou vendez quelque chose en provenance de la forêt?: Oui/Non
Si Oui, citez-les parmi les éléments repris dans le tableau ci-dessous :

Articles	**Unité locale**	**Unité récoltée et vendue annuellement**	**Unité récoltée et consommée par semaine**	**Prix unitaire**
Vente des produits forestiers				
Ignames	Tas			
Bamboo	Fagots			
Champignons	Panier			
Miel naturel	Litre			
Afromomum/Maninguete (Tungulu pori)	Tas			
Palmier à huile	Panier			
Café sauvage	Kg			
Tamarind	Fagot			
Petits animaux sauvages:				
Rats	Pièce			
Lièvre	Pièce			
Antilopes	Pièce			
Singes	Pièce			
Serpents	Pièce			
Porc-épic	Pièce			
Pintade	Pièce			
Perdrix	Pièce			
Grands animaux sauvages:				
Grand antilopes	Pièce			
Hippopotame	Pièce			
Chimpanzé	Pièce			
Eléphant				
Buffle	Pièce			
Autres produits:				
Stick de construction coupés dans la forêt	Pièce			

Grumes de la forêt				
Herbe pour la couverture du toît	Fagot			
Rotin	Fagot			
Bambou	Fagot			
Sable	Tas			
Argile	Tas			
Pierre	Tas			
Grande pièce de menuiserie	Pièce			
	pièce			
	pièce			
Petite pièce de menuiserie	Pièce			
	pièce			
	pièce			
Plantes médicinales	Kg			
Nattes/ articles tressés	Unité			
Objets d'art/panniers	Unité			
Bois de chauffe	Fagot			
Braise	Sac			
Or creusé	gr			
Minerai……	gr			

24. Pêche

Avez-vous votre propre pirogue ou vous louez une? : Oui/Non
Si Non, combien vous payez annuellement pour louer une pirogue?: ……..FC.

Combien coûte une pirogue?.....

A quelle échéance achetez-vous une nouvelle
Pirogue? :…….

Combien d'argent dépensez-vous annuellement pour le fonctionnement de votre pirogue? :
Réparations…….FC
Carburant…….FC

Est-ce que vous employez des pêcheurs?: Oui/Non

Si oui, combien?. :…….....

Combien vous payez par jour de pêche?. :…….....FC

Combien vous payez par an pour des emplois temporaires?.....FC

Combien coûte un filet?.....

A quelle intervalle achetez-vous un nouveau filet?.....

Combien de temps utilisez-vous un filet ? :…….

De tout l'argent que vous gagnez de l'agriculture et de la pêche, quel pourcentage dépensez-vous pour :

Besoins	**Pourcentage**
Scolarisation	
Santé	
Nourriture	
Habits	
Boisson alcoolisée	
Voyages	
Autres spécifier	

25. Attitudes sur la Conservation

Il y a une proposition de faire de cette forêt une aire protégée; quelle en est votre réaction ?
.....
……
……

Comment l'aire protégée peut-elle vous être bénéfique ?
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Comment l'aire protégée peut-elle vous créer des problèmes?.....
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Y a-t-il des lieux sacrés dans votre forêt? : Oui/Non
Si oui, quels sont ces lieux ?.....
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…….
Pensez-vous que ces lieux sont incompatibles avec les activités de la conservation de l'aire protégée ? : Oui/Non
Dans tous les cas, pourquoi ?.....
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Merci monsieur ou madame pour votre disponibilité