ECHUYA FOREST RESERVE AND ITS USERS

BY

IFRIC RESEARCH TEAM

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BY

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1.0 Introduction

Echuya Forest Reserve lies in the South West corner of Uganda in the districts of Kabale and Kisoro. Its southern boundary is also the international border between Uganda and Rwanda. On the Rwanda side of the border, the forest was never gazetted and has been cut for cultivation or settlement.

The boundary between the districts of Kisoro and Kabale runs roughly through the middle of the reserve in a NW-SE direction. The reserve, which is 3.2 km wide and 14.4km long covers an area of 3403 ha. It lies along the high ground separating Lake Bunyonyi in the East from the Muhavura lava plains in the west. The elevation of the forest lies between 2100 and 2400m above sea level.

Along the centre of the reserve is a narrow Muchoya swamp that lies at about 2200m average elevation. The swamp slopes and drains to both ends of its long axis. On either side of the swamp are rather irregular chains of rounded, steep-sided ridges. The reserve forms the catchment area for Muchoya swamp and Chay, Mukoshaya and Kashasha rivers.

2.0 The History of Echuya Forest Reserve

Although Forest Department Officials visited Echuya forest prior to its reservation in 19--, there is little recorded information about the forest at that time. However, by the early 1920s the forest was settled only by pygmies who were not cultivators. It can, therefore, be assumed that the dense bamboo forest was in no danger of being cleared for cultivation at that time and covered more extensive areas than the present forest reserve.

Between 1935-1940, settlers from Kisoro who were cultivators arrived in the area in search of land and started cultivating large patches of the forest. The reserve was first constituted in 1939 but was not demarcated until 1944. The demarcation exercise was completed in 1947 and the forest legally gazetted in 1951. Many pockets of bamboo were excluded from the reserve. However, the population has since greatly increased and land pressure forced the residents of the surrounding settlements to cultivate right up to the reserve boundary.

The first working plan for Echuya was written in 1956 with the following objectives:

- preserving vegetation cover to prevent soil erosion and improve water supply;
- supplying bamboo for limited local use; and
- preserving the amenity of the area in general.

In order to manage the forest with the above objectives in mind, the forest was divided into three working circles. These were the bamboo working circle, the amenity working circle, and the research working circle.

Late in 1955, a small portion of the Echuya Forest Reserve was used by a commercial firm for the growing of pyrethrum. This was an attempt to establish pyrethrum as a peasant crop. It was envisaged that 75 acres of pyrethrum would be established annually for five years after which the area would be afforested with softwood species such as *Pinus patula* and *Pinus carribea* by the Forest Department. However, the local community did not embrace the scheme and the project collapsed.

3.0 The History of Kagano/Rwaburindi Settlements

Kagano and Rwaburindi are the two settlements adjacent to Echuya forest that were selected for the study. These villages were not settled until 1935. Before then the area was completely forested with a lot of wild game.

The first settlers who included Bayanga and Yafesi Sengwale, then teenagers, arrived in 1935 from Bufumbira sub-country. Other five families from Chai sub-county in Kisoro also migrated to these villages. Each family settled on five hectares of land. The new settlers cultivated the slopes of the hills and settled on the hill tops. The wetlands in the valleys were not utilized. At that time shifting cultivation was carried out. The soils were very fertile, the yields high, and—because of the favourable climate—diseases rare. Consequently, the population grew rapidly.

In the mid 1940s government demarcated part of the area as a forest reserve. Access to land in the reserve became so restricted that it led to the drainage of previously unutilised swamps for cultivation. However, this development did not solve the problem of land shortage. In fact, large families which had limited land sold it and were assisted by government to migrate to Rwampara county in the neighbouring Ankole district. This practice marked the start of commoditisation of land in the area.

In the 1950s, access to the forest reserve to harvest bamboo was restricted. According to the law, a person was allocated 60 bundles of 30 bamboos each in one year. If one exceeded his quota, he had to pay two cents per bamboo. By 1960, land shortage had drastically escalated due to the rapid population growth. Many families sold their land and migrated to Toro and other parts of Ankole. The cost of land varied between Shs. 2000/= and 4000/= per hectare. Today a piece of land equivalent to 0.25 ha. costs between Shs 200,000 and 400,000/= .

The 1975 Land Decree nationalised all land in Uganda. Land had become subdivided and fragmented and there was a lot of land conflicts in the area. This encouraged many people from this area to migrate further to Toro and Bunyoro.

The civil war in neighbouring Rwanda which started in the early 1990s also greatly affected the livelihood of the people in this community. Rwanda used to provide a lucrative market for agricultural produce from this area. However, since the beginning of the war in 1990, the Uganda-Rwanda border was closed and trade drastically reduced.

4.0 Rights and Privileges of the Residents of Kagano/Rwaburindi

The rights and privileges of the forest users are specified in the Forest Act of 1964. The Act states that Ugandans may take reserved forest produce in reasonable quantities for their own use. "Reasonable qualities" was interpreted at the time of gazetting to be up to 20 green bamboos and 200 dead bamboos per person per year. Apart from the bamboo, all other tree species are reserved and the people of the area have no right to harvest these species. This policy has resulted in a dramatic increase in the number of trees.

From 1960, the rights and privileges of the users were further amended. For purposes of harvesting, bamboo produce was divided into three categories, i.e., dead bamboo, green bamboo (less than one year old), and middle age bamboo. For the dead bamboo the amount to be harvested is not limited. Any person is allowed to buy a license for dead bamboo which can be cut anywhere in the reserve. The green bamboo (used for making handicrafts such as baskets) was supposed to be controlled by restricting access to different compartments every year, and restricting the number of licenses. The cutting of middle age bamboo is restricted because it is considered to be wasteful. The product is non-durable and the practice reduces the yield of naturally dead borer resistant stems. The product can only be harvested with the permission of the District Forest Office (DFO).

Grazing of goats and cows and harvesting of trees in the reserve is prohibited. However, in special circumstances the DFO can issue a license to harvest building poles. In order to police the harvesting of the forest produce, access to the forest by the local inhabitants is restricted to only two days a week. If a person is found in the forest on a wrong day, he/she is fined or prosecuted.

5.0 The History of the Batwa (Pygmies)

The Batwa are pygmies who live in Echuya forest. The Batwa live in a small village called Kyaruhinga. They migrated from a place called Kalerankuba in Kisoro district and arrived at Kyaruhinga in 1989. However, the Batwa believe that their ancestors must have camped in this village over 50 years ago. The local elders of Kagano/Rwaburindi community confirmed that long ago, the forest was inhabited by both wild animals and pygmies.

Like other pygmies, the Batwa do not possess any land or other property. In the past, they were hunter/gatherers but today, because of the limited wild game in the forest, they eat food provided by local communities in exchange for manual labour.

The Batwa live a communal life. Parents stay with the young children in the same house/home. Once the girls grow up they go out and stay in a village hut meant for all girls in the village where they cook and cater for themselves. The boys stay in another village hut separate from that of the girls. However, their mothers continue cooking for them until they marry. Members of the household interact and work together on other peoples fields.

There is limited social interaction between the Batwa and the local communities. Each group despises the other, so they can not intermarry. The Batwa collect their water from a well which the local people do not even consider fit for their livestock. They live in their own village and have their own local administrative system. They do not pay tax; and none of them has ever been to school or health centre. Most of the diseases are treated by their medicine men using local herbs.

6.0 Property rights of the Batwa

The Batwa depend mostly on the forest for their survival. They are authorised users and have rights of access to the forest. They have the right to settle, collect firewood, poles, wild game, and fruits for domestic use without a license. However, when they collect the above products in large quantities for sale, then the person who buys is supposed to pay for the license.

7.0 User Groups of Echuya Forest

The people of Kagano and Rwaburindi villages have many uses for this forest. The respondents indicated that the forest provides bamboo for building, craft and fuelwood. Other plant species provide fibres, food, and medicines.

In Echuya forest, the following three user groups were identified:

- the women of Kagano/Rwaburindi settlement;
- the men of Kagano/Rwaburindi settlement; and
- the Batwa.

7.1 The Women of Kagano/Rwaburindi

This user group comprises girls and women. Table 1 below shows the products this user group harvest from the forest.

7.2 Men of Kagano/Rwaburindi

There are over 100 men living in the settlement, the majority of whom are married to more than one wife. Although it is the men who own the land (average landholding is about 0.5ha.), not many of them are engaged in cultivation. About 60% of the men are engaged in bamboo harvesting for both domestic and commercial use. There is mature bamboo that is harvested for construction, green bamboo for weaving, and bamboo shoots for vegetables.

The mature bamboo is available throughout the year, with availability sometimes exceeding demand. Each bundle of 10 bamboo stems costs Shs. 500/= and is sold at the nearby market at a profit of about shs. 300/=. The annual average harvest of this product by this user group was estimated at 1000 bundles. However, much as there is a very high demand for this product in the neighbouring towns of Kisoro and Kabale, very little of it is marketed there. This may be due to high transportation costs.

The method of harvest of this product is by selective cutting of the mature stems using machets. Big stems of about five centimetres DBH and more than 20 metres tall found on good sites are preferred to the small and short bamboos. Harvested bamboo is carried on the head from the forest to the settlement on Tuesdays and Thursdays. Substitutes for this product which are available through agro-forestry practices and from other government forests include eucalyptus and timber. However, these substitutes are more expensive than the bamboo, and therefore exclusive.

Bamboo for handicrafts is harvested when the stem is still young and able to bend. This product is available for harvesting only 3 months a year (November to January). The quantity available for harvest varies with the climatic conditions that season. Users must obtain a license before they can be allowed to harvest this product. The permit costs Sh.3000/= and is valid for 3 months, the period in which this product is available. One head load of young bamboo is sold at shs. 500/= in the settlement and shs. 800/= in the nearest market. It is estimated that a total of 800 head loads are harvested annually by this user group.

Bamboo sheath is used for thatching houses. It is collected from juvenile bamboo a few weeks after sprouting. The product is available for only one month each year. The

quantity of the product available varies each year depending on the amount of rainfall. This product is hand picked from the forest free of charge. However, a bundle is sold at shs. 500/= in the settlement and shs. 600/= in the nearby market. About 10-15 bundles are needed to thatch a two-bedroom house. The roof constructed using this material can last for 3-5 years. This product is the second most frequently used thatching material in the settlement. It is estimated that 1200 bundles of this material are harvested annually by this user group.

7.3 The Batwa User Group

The Batwa are recognized as indigenous forest dwellers. They have the right to settle in the forest and use its resources for survival.

Most of the products harvested by the Batwa are for subsistence. Occasionally, the Batwa sell firewood and fibres to the local communities. The forest is also extensively used for worshipping. Sacrifices are offered at a place called Mukirwa about 10 km from the settlement.

8.0 Forest condition

The bamboo, locally known as Mugano (*Arundinaria alpina*) is the dominant vegetation type. The bamboo was observed in 80 % of the sampled plots (See Table 4). The population density of bamboos was estimated to be below 2,800 stems per hectare on poor sites and over 19,000 stems per hectare on fertile sites. The average stocking was estimated at 5,565 stems per hectare (Appendix 4).

From records and observations by the local people, there is substantial evidence of bamboo stands losing ground to other vegetation. The major colonizing species is Murara *(Macaranga kilimandscharica)* which accounted for 40% of the trees recorded in the forest plots. Other dominant tree species observed were Mukole *(Dombeya geotzenii)*, Mubuzije (*Nuxia congesta*) and Muhotora (Xymalos *Monospora*). As expected of a montane forest, the tree diversity was extremely low. Only 18 different species were observed in the 30 plots.

All the trees in the forest are currently classified as reserved species and not harvested by the local communities. Less than 10% of the sampled plots showed no evidence of consumptive disturbance.

9.0 Conclusion and Recommendations

The Echuya Forest Reserve is currently under utilised in spite of the fact that it is situated in an area which is density populated. Overgrown and dead bamboos were numerous in the forest. Apart from a few areas mainly along the main Kabale-Kisoro road and the foot paths through the forest, most areas farther inside the forest had substantial numbers of mature and dead bamboo.

Due to the high stocking level of the bamboo and its fast rate of growth, a higher level of exploitation could be encouraged without compromising the forest sustainability. There is also a need to teach the local people how to make high quality bamboo products for both local and export markets in order to increase the commercial value of the forest.

Bamboo grows rapidly, attaining maximum size in a single season. However, there is a need to carry out research on its propagation

and regeneration. The Research plot which was established to monitor and determine the growth rate and physical rotation of bamboos is currently not being managed appropriately. Great attention has of recent been put on establishing pines (*Pinus patula).* Current plans include planting an area formally designated for research on barley with the pines. The second aspect which requires investigation is the invasion of bamboo by other hardwood tree species. Hardwoods are rapidly colonizing the forest and may eventually eliminate the bamboo. There is thus a need to assess the impact this situation would create on the forest conditions and the communities depending on the forest. The value of these hardwood species to the community needs to be established and management strategies developed for their exploitation.

Illegal cattle grazers entering the forest at night pose a potential threat to the forest because they can set fires to promote the development of fresh pastures. The Batwa also pose a similar threat because they sometimes light fires deep in the forest to warm themselves. The major threat to the forest, however, is most likely to emerge from the high demand for fuelwood, which has become a very scarce commodity in the neighbouring communities.

There is a severe land shortage in the surrounding communities. All the land has been cleared for cultivation up to the boundary of the forest. As the population increases, agricultural encroachment on the forest becomes very inevitable. When people from Kisoro settled around the reserve in the late 1930s, there were some pockets of bamboo outside the reserve. At present, all these patches have been cleared for agriculture.

METHODOLOGY OF THE STUDY

The methodology and data collected for the study can be divided into two categories. The first is the social data methodology regarding data on the communities that use the forest, including economic, cultural, institutional, political, and administrative data. The second is the physical data methodology regarding data on the forest itself and the species within it.

The determination of specific data needs for each category of information was based upon the questions contained in the series of 10 data collection instruments. These instruments were developed by the International Forest Resources and Institutions (IFRI) Research programme. Each form is designed to assist researchers in recording information about a different aspect of the forest, the people and communities around it, and how its resources are being managed. The forms are Site overview form, Settlement form, Forest form, Forest plot form, User group form, Forest association form, Governance form, Organisational inventory, and Inter-organisational arrangement form.

The forms applicable to this site were completed (not all forms are applicable to all sites) so that the information collected could be entered into the IFRI database, eventually to be reviewed and analysed by scholars associated with the programme.

This appendix describes the specific methods used to collect data for this particular site. It should be noted that this is the third site from

which similar data are collected in Uganda. This site was chosen because of its high attitude.

Social Data Methodology

Step 1: An initial reconnaissance of the site was conducted to select the forest area to study and the committees to work with.

Step 2: The Participatory Rural Appraisal (PRA) approach was employed to gather data about the user communities and how they interact with the forest. The PRA interviews were conducted within 10 days.

Forest Plot Methodology

The north western extreme portion of the forest covering an area of 1,200 ha. was selected as the site from which data would be collected. A grid was overlaid on the map and a set of 30 random X-Y coordinates designated as locations of forest plots. Two teams of 3 people with at least one botany specialist located the plot sites in the forest using a compass and a partial grid system to guide them.

Once the centre of a plot was located, three concentric circles were marked in the forest. In the first circle (1m radius), the size of the ground covered by herbs and seedlings was estimated and the species were identified and recorded. In the next circle (3m radius), shrubs and tree saplings were identified and their heights and stem diameters measured. Saplings were defined as young trees with a maximum stem diameter greater than 2.5cm, but less than 10cm.

Trees were identified and measured both for DBH and height in the third concentric circle, which had a radius of 10 metres. (DBH refers to the diameter at breast height, usually measured at 1.3m from the ground). The DBH was measured using tree diameter calipers while the heights were estimated using a Blameless.

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Appendix 1: Forest Products Harvested by Women of Kagano/Rwaburindi

Product	Use
Dry bambo	- Firewood for domestic cooking and heating
Young/Green bamboo	- Weaving baskets
"Omunaba"	- For ropes
	- Weaving baskets and mats
Medical herbs	- Medicine
Bushes	- Weaving baskets and mats

Shortage of farm land in Echuya Community, the uncultivated hilltops is Forest reserve land

Appendix 2: Forest Products harvested by Men of Kagano/Rwaburindi

Products	Use
Mature bamboo	- Construction - Poles - Rafters - Ceiling - Fencing - Furniture - Firewood - Tools and implements - Staking beans
Young bamboo (less than 6 months old)	- Handicrafts - Baskets - Granaries - Trays - Lamp shades
Juvenile bamboo (less than 2 old)	- Bamboo sheath for thatching roofs - Mats - Baskets - Ropes - Traps
Bushes e.g. Omunaba	- Fibres for construction - Mats - Baskets - Ropes - Traps - Mats
Grasses	- Thatching - Wrapping and packing

Appendix 3:

Forest Products harvested by the Batwa

Products	**Uses**
Bamboo stems	- Fuel wood - Poles and rafters - Fibres - Thatching - Craft materials
Water	- Drinking, cooking and washing
Wild game	- Food

Batwa settlement constructed using harvested Forest Products

Appendix 4: Distribution of Bamboo within the 30 sample plots in Echuya Forest Reserve (within the 3 metre- radius plot).

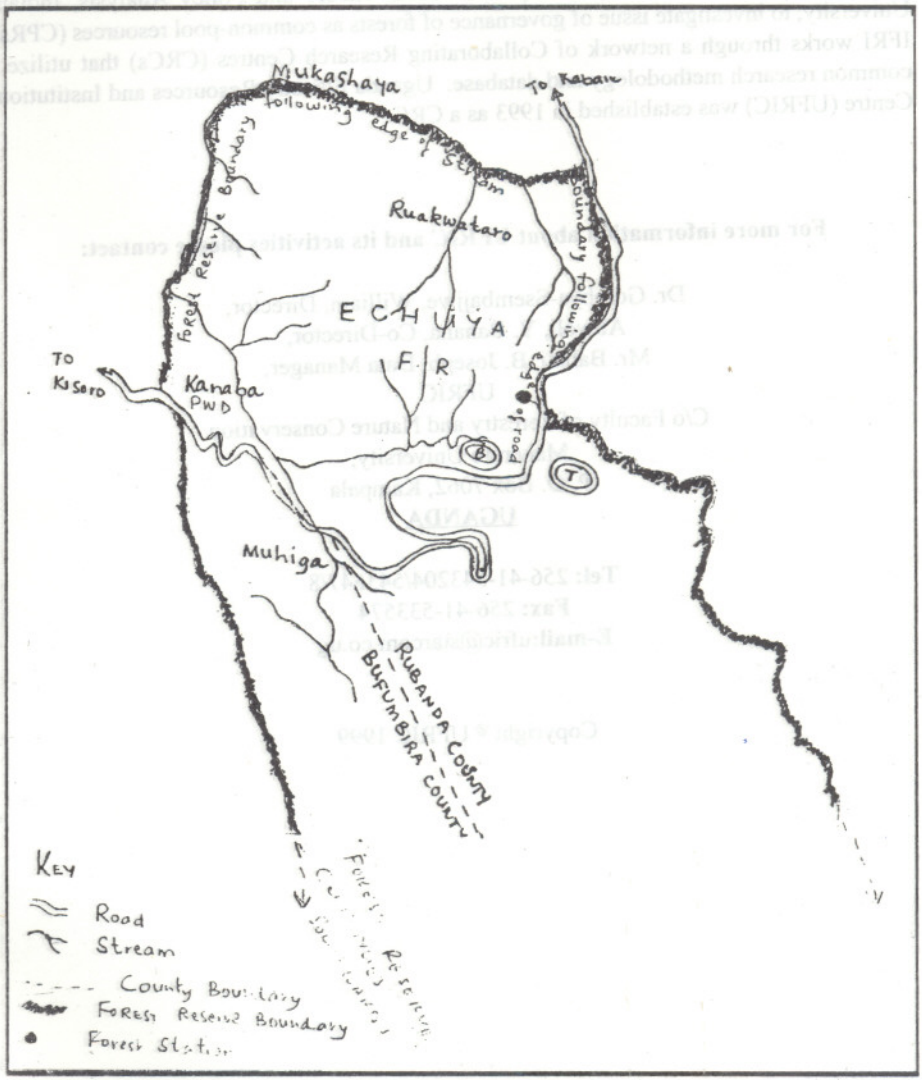
Plot Number	Mean diameter at breast height (cm)	Mean height in metres
1		
2	4.7	10.6
3	4.3	8.2
4	3.5	8.3
5	4.7	9.4
6	2.8	12.3
7	-	-
8	3.0	9.9
9	5.4	9.8
10	-	-
11	4.7	8.9
12	3.3	8.5
13	3.4	13.6
14	4.8	10.2
15	4.4	9.4
16	4.8	10.0
17	-	-
18	-	-
19	4.0	10.2
20	-	-
21	4.6	9.1
22	4.4	10.8
23	3.4	20.8
24	5.2	12.2
25	7.0	13.0
26	7.9	23.5
27	3.6	18.7
28	4.3	22.3
29	9.0	20.7
30	4.2	9.4

Appendix 5: Tree species Recorded in the 30 Sample plots within Echuya Forest Reserve, Kabale District.

Species	Local Name	Total Number	Mean Diam At Breast Height (cm)	Mean Height
Alangium chinense	Mukofe	1	26	38
Allophylus macrobotrys	Mushasha	4	13	25
Bersama absyssinica	Mukaka	4	24	15
Dombeya goetzenii	Mukole 2	17	30	19
Dombeya rotundifolia	Mukole	3	26	38
Dracaena afromontana	Kigorogoro	1	12	7
Macaranga Kilimandscharia	Murara	60	26	25
Maesa lanceolata	Muhanga	6	22	19
Neoboutonia macrocalyx	Mwanya	1	12	8
Nuxia congesta	Mubuzije	17	32	23
Parinari holstii	Mushamba	14	14	19
Pittosporum spathicaly	Mushekera	7	17	13
Polyscias fulva	Mungo	2	28	38
Rapanea pulchra	Mukoni	4	17	10
Trimeria bakeri	Mwatanshare	2	13	19
Xymalos monospora	Muhotora	16	14	12

Appendix 6

Map of Echuya Forest



The International Forestry Resource and Institutions (IFRI) Research Programme was developed in 1992, at the Workshop in Political Theory and Policy Analysis, Indiana University, to investigate issue of governance of forests as common-pool resources (CPRs). IFRI works through a network of Collaborating Research Centres (CRCs) that utilize a common research methodology and database. Uganda Forestry Resources and Institutions Centre (UFRIC) was established in 1993 as a CRC.

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