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Dangers for the Tropical Rain Forests

Tropical forests usually grow in places with a minimum precipitation of 100 mm each month in general, a minimum average temperature of 24°C with the temperature never falling below 0°C. Estimates of how many species of animals and plants live in these forests vary widely. Depending on which estimate is used, 24 to 95% of the 3 to 100 million extant species occur in the humid forests of the tropics. 44% of the world's endangered mammals and birds live in this habitat.

Free nutrients are rare in this ecosystem. Therefore, most trees in the rain forests have shallow roots to be able to absorb any available minerals from decomposing organic matter and rain. Apart from volcanic soils, the fertility of rain forest soils, which consist mostly of sand or latosol, is very low. Once the dense vegetation has been removed, the nutrients are quickly washed out and the thin layer of humus is eroded. After only a few years almost nothing will grow in the impoverished soil. The trees have the additional function of slowing down strong winds, and clouds are formed through the evaporation taking place above forested areas. These clouds bring rain. The quantity of precipitation decreases in large areas once the forests are removed.

Deforestation Continues

According to calculations by FAO, 154,000 km² (0.8%) of forested area was lost annually in the tropics between 1981 and 1990. According to other estimates, this number is even higher. This means that the destruction rate of the tropical forests was considerably greater in the 1980s, compared to the late 1970s. In 1980, 37% of primary forest had already disappeared in South America, 42% in Asia and 52% in Africa. In the next decade, the annual deforestation still increased by 68%. The speed of forest destruction was highest in West Africa, South East Asia and Central America. By the turn of the millennium, probably all forests will have disappeared from Thailand, Myanmar, East Africa, West Africa, Madagascar and the Philippines.

Causes of Forest Destruction

According to David Pearce and Katrina Brown (*The Causes of Tropical Deforestation*), one of the main causes for the destruction of forest is the fact that this ecosystem's actual value for the economy is being dangerously underestimated. The governments of many countries even promote logging of forests with subsidies and tax benefits. In South America, settlers often are forced to clear the forest to keep their land deeds.

More and more arable land is needed due to the high population growth rates. Fallow cycles have already been reduced, and the soil fertility cannot recover. According to various estimates, agriculture, especially slash-and-burn cultivation, is responsible for 61% to 94% of forest loss. It is the main cause of forest destruction in Africa. As the human population continues to grow in the tropics - in Africa at the highest rate - deforestation by smallholders will increase even further.

In Brazil, authorities often regard forested areas as useless land that has to be cleared and made economically profitable. Much of the deforested land is replaced by cattle pasture: in 1980 cattle ranching accounted for 72% of forest destruction in this country. According to Norman Myers, 15,000 km² of tropical rain forest were transformed into pastures in 1989, mainly in Central America and Amazonia.

An estimated 400,000 km² of forest will be lost by the year 2000 in Indonesia. Since 1985, some of the strain has been taken off the most densely populated islands by transmigration of people to islands with low population densities that are still covered with rain forest. There they are given a piece of land to clear and farm. It is planned to move more than 1 million families in this project, which is funded by the World Bank and developmental aid agencies from various countries.

In South America and Africa, mining of mineral resources is another danger for the forest. In 1989, 10,000 km² of tropical rain forest had to give way to cash-crop plantations, road construction, mining and other activities. Deforestation is advanced considerably by the building of roads, because they make it much easier for the human population to move in and to start clearing the land. According to one estimate, 4 to 20 km² of rain forest disappear with each kilometer of road in South America. Logging companies are among the most important builders of roads.

Commercial Logging

A company that wants to extract timber in the tropics is given concessions from the government of the respective country. These are clearly defined areas of forest where the company is permitted to work for a certain time. The forestry law regulates which species of trees may be felled, how many and in what way. In 1989, 45,000 km² of rain forest were affected by commercial logging, two thirds of which in Southeast Asia, where it amounted to destruction. Although logging is mainly selective these days (only big logs of certain tree species), the forests are often still considerably damaged in the process.

Moreover, even selective logging opens the forests up to continuing exploitation. Between 1981 and 1985, 88% of forests where logging companies had previously worked were destroyed in the Ivory Coast. The figure for Cameroon is 28%, 36% for the Congo, 10% for Gabon, and 42% for Liberia.

In 1990, Malaysia, Indonesia and Brazil were the most important exporting countries for tropical timber. Most kinds of this timber could easily be replaced by others, but they sell well because they are considerably cheaper than timber from the temperate zones.

The *International Tropical Timber Organization* (ITTO) emphasizes in its guidelines that the exploitation of tropical forests is only justified if various rules are followed, one of them being sustainability. In forestry terms, this usually means that some kind of forest will be kept after logging, and a change in species composition (generally a loss of diversity) is accepted as a consequence. However, in ecological terms, sustainability requires that the removed species of trees should regenerate in this area.

There is hardly any evidence for any area, in tropical Africa or elsewhere, that the ecologically sustainable use of common tropical timber tree species is possible with selective logging as it is employed today. Most evidence suggests that the respective tree species do not grow back to harvestable size over the envisaged logging cycles. ITTO itself reports that currently less than 1% of tropical timber on the world market originates in sustainable use areas. It is doubtful whether the organization's goal of marketing only such timber by the year 2000 is realistic.

Rain Forests in Africa

Compared to Asian and American rain forests, the biodiversity of those in tropical Africa is rather low. During the Ice Ages, these forests were reduced to small areas in western and eastern equatorial Africa by a decrease in temperature and humidity. About 10,000 years ago, these forest remnants expanded again and formed a continuous area which decreased again in the last 8,000 years. According to estimates by FAO, in 1990 168,630 km² of tropical Africa was covered by a closed forest; this is equivalent to 22.6% of tropical Africa's total area.

The West African forests have suffered the worst damage, because they were ruthlessly logged in the past. Logging companies have been playing an important role in this since the 1950s. In 1980, when only an estimated 26.5% of the original forested area still existed in West Africa, 4.8 million m³ of timber were extracted in the Ivory Coast and 5.1 million m³ in Nigeria, compared to less than 2 million m³ in Cameroon and Gabon. In 1980, 5.2% of remaining rain forest was destroyed in the Ivory Coast (20% by commercial logging); by 1990 the forest cover was so badly reduced that only 2.1 million m³ of timber could be extracted. In Nigeria, the annual harvest stayed consistently at 5.6 million m³ during the 1980s.

In 1989, the Ivory Coast and Nigeria had the highest rate of deforestation of all tropical countries with 15.6% and 14.3%, respectively. Thailand and Madagascar were next with 8.1% and 8.3%, respectively. By now, probably 80% of rain forests have been destroyed in the Ivory Coast and about 90% in Nigeria.

The Value of Rain Forests to Humanity

The most sought after product of tropical rain forests is timber, but numerous alternative forest products are also exploited. These include rubber, rattan, bamboo, camphor, resins, tannins, essential oils, dyes, plant fibres, fruit, nuts, spices, medicinal plants, insects and bush meat. Many people living in the forests and their surroundings earn a living from these forest products. The industrialized countries are also becoming increasingly aware of the value of these resources.

To many groups, there is only one argument in favour of the conservation of rain forests: the economic value of these ecosystems. In order to provide arguments for their conservation, many attempts have been made to calculate this economic value and to compare it with the profit that can be gained by logging and deforestation. According to such a study in Korup National Park, Cameroon, the direct value of the forest (sustainable use, tourism, water resources) is 3.6 times higher than the value of the timber. In Peru, another author found that the market value of sustainably-used alternative forest products was more than twice the profit from timber plantations or cattle ranching on a comparable area, and more than six times the value of the timber that could have been harvested if the area had been cleared. In several studies in other South American countries, the same was found: the use of alternative forest products yields a higher profit than logging, agriculture or cattle ranching.

It becomes increasingly apparent that the indirect value of rain forests has to be taken into consideration in addition to their direct value to arrive at a proper estimate of their importance. This is especially true for the ecological and climatic consequences of the clearing of large areas. Thus, the economist David Pearce estimates the increase in the greenhouse effect caused by the quantity of carbon dioxide that is produced by the burning of 1 ha of rain forest will create costs the equivalent of \$ 1,300 per year.

In the 1980s, 22% to 26% of the greenhouse gas emissions was produced through the destruction of tropical forests. As global climate changes concern the industrialized countries as well, it is in their own interest to contribute to the conservation of rain forests.

The World Bank

One of the international organizations that have the most influence on the future of the rain forests is the World Bank. In many cases, it pushed ahead the destruction of large areas of rain forest through grants for projects that were ecologically questionable, such as dams. The introduction of Structural Adjustment Programs in 1979 has also been dangerous for rain forests in some cases. Within these programs, grants are only awarded if the recipient countries reorientate their economies. This also

means the improvement of the economic climate and the capacity to attract foreign investors, reduction of government deficits through spending cuts (for example for education and medical care) as well as an increase in foreign exchange earnings by the promotion of exports. In order to increase exports, forests often have to be cleared or exploited more heavily.

As a reaction to increasing criticism, the World Bank set up the Global Environmental Facility (GEF) in 1991, which is intended to fund measures towards the conservation of the environment and of natural resources as well as the introduction of environmentally friendly technologies. UN organizations support GEF, too. GEF gives grants which do not have to be redeemed by the recipient countries. For example, GEF funds support rain forest biodiversity projects in Zaire, Uganda (Bwindi), the Congo, the Central African Republic and Cameroon.

Tropical Forest Action Program

UNDP and FAO, both UN organizations, developed the Tropical Forest Action Program (TFAP) in 1985 as an international effort to conserve tropical rain forests. Within this program, the countries that have tropical rain forests are to develop national action plans as to how these forests can be used in a sustainable way. To implement these programs, they are supported technically and financially. The main aim is the development of forestry. In Cameroon, for example, the considerable expansion of logging was identified as a means to increase foreign exchange earnings through the export of timber products. Even areas inhabited by pygmies were to be exploited, although the consideration of indigenous peoples' needs was one of TFPA's expressed aims. In 1990, evidence was published to prove that TFAP promoted deforestation rather than prevented it. Subsequently, FAO ordered an investigation. Today, the TFAP emphasizes the following goals: education of the population about the dangers of forest destruction, planning of more effective strategies and activities and raising of national and international funds to put these plans into practice. National programs have already been implemented in numerous African countries. In most cases, they are supported by UNDP, FAO and the World Bank; in Zaire, Canadian developmental aid supports the TFAP.

There has been a national action plan in the Congo since 1994. However, the local population and the responsible authorities were not involved in the planning stage. Other points of criticism are that the TFAP represents the interests of foreign investors more than the interests of the Congo and that it does not offer a solution for the threats to the Congolese forests.

The TFAP still has many weaknesses and will have to be improved considerably before it can make an effective contribution to the conservation of rain forests. In any case, the cooperation of all organizations working towards this goal is necessary.

Angela Meder

Dzanga-Sangha Nature Reserve

The last primary forests of the Central African Republic are situated in the southernmost tip of this country. Between 1987 and 1989, a group of scientists found that lowland gorillas live in this area. To conserve the endangered forests, a reserve was set up in 1990. It covers a total area of 4,569 km² and consists of a national park that is divided into two separate parts, Dzanga (495 km²) and Ndoki (725 km²), and a special reserve which will be divided into various zones that are exploited in various ways - for safari tourism, traditional hunting of the local population, forestry, agricultural development and game farming. 98% of the total area is covered by forest, mostly primary forest.

The nature reserve has been directed by the WWF Dzanga-Sangha project since 1988. It receives additional funding from USAID, the World Bank, GTZ and other organizations. In the first phase, the WWF concentrated on the protection of the park, but in the future measures towards rural development, environmental education, support of self-help and the development of tourism will be increased with financial aid of GTZ, USAID and the World Bank. Regional authorities and the local population are demanding the establishment of schools, hospitals and wells as well as a general improvement of living conditions. This is one of the tasks of GTZ. In addition, GTZ wants to create alternative opportunities for work and sources of income. One of the activities in which GTZ plays a major role is the establishment of tree nurseries in the village of Bayanga and various developmental projects in the surroundings of the park.

Locally produced food can not fulfill the nutritional demands of the population adequately, and the fields are often damaged by elephants. GTZ is, therefore, trying to improve agricultural methods.

Just as in the Nouabalé-Ndoki National Park, there are clearings in the forest in the Dzanga-Sangha Nature Reserve, where animals can be observed especially well. A study of elephants has already been conducted there. In cooperation with the research project in the Congo, identified animals' migrations within the cross-border reserve will be documented. In addition, gorillas have been studied on a clearing for 2 years.

Hunting and Poaching

Pygmies (Bayaka) also inhabit the region. They hunt in the nature reserve in their traditional way, i.e. with nets, crossbows and spears, and sell about a third of their prey. These methods hardly damage the animal populations. However, this is illegal: a high fee per kill has to be paid according to the hunting law. This fee is much higher than the value of the meat.

Much more dangerous for animal populations is hunting with snares and firearms, as it is practised by the rest of the population. Dealers buy the animals that have been killed and take them to the markets. Even elephants, bongos and gorillas are hunted although they are completely protected by law. Elephant poachers use large-calibre guns. They are united in an organization similar to the Mafia. The tusks are taken from the CAR via Cameroon to Douala, Kinshasa and South East Asia, where they are processed. About 10 to 30 elephants a year fall prey to this type of poaching in the nature reserve.

Logging

There are hardly any opportunities to earn money in the region. Only a few workers find jobs in the mining of diamonds (outside the reserve) and in the timber industry. People are willing to move to where the jobs are, and different ethnic groups settle in these places.

The logging industry causes the biggest problems for nature conservation. For 25 years, a Slovenian company has been

extracting timber in the Bayanga region. Sipo and sapelli trees account for 90% of that timber. Currently, Sylvicole Bayanga (as the company is called today) extracts 1,500 to 1,700 m³ a week. The remaining harvestable volume of these two tree species is estimated at 1.8 million m³ in the nature reserve. In addition, 0.7 million m³ of other commercially exploitable timber trees exist there; however, the exploitation of these species is more expensive. As the fixed costs of the company have decreased considerably since the CFA (Franc de la Communauté Financière Africaine) was devalued in 1994, it is to be feared that the company will extend logging to these species and thereby damage the forest more severely in the long term.

Most of the 3,076 km² which Sylvicole Bayanga may currently exploit (70% of which is in the reserve) has already been exploited, and the remainder should keep them going for another 9 years. Sustainable use of the natural resources is not possible with the methods currently employed.

As the operators of Sylvicole Bayanga feared that their work could be threatened by the WWF project, they tried to prevent the establishment of a reserve. Although they were not successful, the two organizations are fighting a legal battle.

A French logging company, SESAM, has been operating in the region since 1991. This company has agreed to cooperate with the conservation project.

Alternative Exploitation

Promising sources of income are ecotourism and safari hunting, which take advantage of the high population densities of animals in the Dzanga-Sangha Nature Reserve. Due to the high hunting pressure and the dense vegetation, it is very difficult to habituate gorillas. Gorilla tourism will, therefore, not be established in the foreseeable future.

Up to now, about 1,000 tourists a year visit the area, still well below the capacity. Improvement of the infrastructure and coordination as well as advertising could promote tourism. WWF has already developed detailed proposals for the exploitation of the park through tourism.

Two organizations are permitted to offer hunting safaris in certain areas of the nature reserve. About 30 hunters a year visit these areas with the sole purpose of hunting bongos. According to estimates, only 20 to 25 animals a year should be killed to avoid placing the population at risk. Most of the income from safari hunting goes straight to the treasury; certain political circles even demand that the region should not receive any part of it.

Angela Meder

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Gorilla Census on Mt. Tshiaberimu: Preliminary Report

Mt. Tshiaberimu (1,850 to ca. 3,100 m high) is located off the northwest corner of Lake Edward in eastern Zaire (see map on page 12). This roughly 60 km² of montane forest is all that remains of what were more than 450 km² of forest earlier this century. Mt. Tshiaberimu, which once held a large population of gorillas, is part of the Parc National des Virunga but the corridor connecting it to the main portion of the park has been encroached upon and destroyed. Conrad Aveling undertook a survey of Mt. Tshiaberimu in 1986 and concluded that no more than 20 gorillas remained.

From 30 May through 7 June 1995 we undertook a census of the gorillas there, examined their habitat, and assessed the threats to the area. This work was undertaken with considerable cooperation and assistance from the park wardens and rangers, and other personnel of the IZCN (*Institut Zairois pour la Conservation de la Nature*). Funding was provided by the *Berggorilla & Regenwald Direkthilfe* and Zoo Atlanta.

Three teams of guides and researchers searched suitable habitat for gorillas for seven consecutive days. Groups of 4 and 11 gorillas, plus one lone adult male, were located during this intensive search. We believe that the total number of gorillas remaining on Mt. Tshiaberimu is 16 to 18 and that only two groups occur. They use an area of approximately 18 km² at 2,800 to 2,900 m in the southwest corner of Mt. Tshiaberimu. This is an area dominated by high bamboo (*Arundinaria alpina*) and large *Podocarpus latifolius*, intermixed in some places with *Galiniera saxifraga*, *Ilex mitis*, *Rapanea melanophloeos*, *Xymalos monospora*, *Mimulopsis* spp. and *Sericostachys scandens*.

For as far as one can see from the high points on Mt. Tshiaberimu, there is no natural forest remaining in the region except for a few square kilometres of forest on some of the higher, distant ridges. Even these are, however, being felled and will probably be completely destroyed within the next few years. There is extensive agricultural encroachment around the entire boundary of Mt. Tshiaberimu and this is, undoubtedly, the greatest single threat to the area and its gorillas. In some places, the forest has been completely removed for a distance of more than 1 km inside the boundary. Pit-sawing is another serious problem. We estimate that more than 500 large *Podocarpus* have been pit-sawn during the last few years. There is ample evidence that gold mining along the rivers was at a high level in the recent past as there is much damage to the river bed, river banks and bordering forest. This activity appears to have declined considerably in recent years.

Poaching is at a very low level at this time but was probably much more prevalent in the past. Only one active trap was found although several old traps set for blue monkey (*Cercopithecus mitis stuhlmanni*) and L'Hoest's monkey (*Cercopithecus lhoesti*) were located. Black-fronted duiker (*Cephalophus nigrifrons*) and yellow-backed duiker (*Cephalophus sylvicultor*) are still present but at extremely low densities. It may be that poaching is not a worthwhile activity given the low densities of prey. There was no evidence that gorillas are hunted on Mt. Tshiaberimu and the park rangers with whom we worked claimed to have never heard of gorilla hunting in the area.

Signs of elephant were abundant throughout the area between 2,600 and 3,100 m. The rangers estimate that about 30 elephants remain on Mt. Tshiaberimu. There is almost certainly no movement of elephants between this area and other parts of the park as the former corridor is densely populated by people.

During the survey, one of us (TMB) collected data on the avifauna between 2,550 m and 3,100 m. 15 of the 33 Albertine Rift Afromontane Region endemic bird species and subspecies were observed. Only a few of the regional endemics not seen would be expected to occur above 2,500 m. Two species not previously known to be present in the highlands to the west of Lake Edward were found, the Kivu ground thrush (*Zoothera tanganjicae*) and Shelley's crimson-wing (*Cryptospiza shelleyi*). It is likely that a few other regional endemics occur but were over-looked during this short survey. Mt. Tshiaberimu has a rich avifauna with several species of particular conservation concern.

It is clear that the forests of Mt. Tshiaberimu, and the important biodiversity they support, are under severe threat from the surrounding human population. Conservation inputs from outside of Zaire to IZCN are urgently needed if this area is to have any long-term future. We recommend that (1) immediate material and logistic support be provided to the twelve park rangers working to protect Mt. Tshiaberimu and (2) that a multi-faceted, long-term conservation project for this area be initiated no later than 1996.

Thomas M. Butynski
and Esteban Sarmiento

The Kahuzi-Biega National Park and the IZCN/GTZ Project

This national park is situated in the Kivu district, one of the most densely populated areas in Zaire. It is also one of the most fertile regions. The park's natural resources are under severe pressure.

Originally, one part of the present park was a forest reserve. In November 1970, it was gazetted a national park in order to protect the eastern lowland or Grauer's gorilla (*Gorilla gorilla graueri*) which was seriously threatened even at that time. In 1975, the park's size was increased from 600 to 6,000 km² to protect the transitional vegetation formation between montane and lowland rain forest.

The park was given the name of two extinct volcanoes in the original section: the Kahuzi (3,308 m) and the Biega (2,790 m). The original park section contains various types of vegetation: bamboo forest, primary and secondary montane forest and cyperus swamps. The larger new part is covered by lowland rain forest. The whole park has an exceptionally high diversity of plant and animal species characteristic of each type of vegetation.

In the old part, four groups of gorillas have been habituated to people; they are the most important tourist attraction. Eco-tourism is the principal source of income for the park. Due to its ecological importance, the Kahuzi-Biega National Park was declared a UNESCO World Heritage Site in 1980.

Conflicts with the Surrounding Population

Before we introduce the work of the IZCN/GTZ project, it is necessary to give a brief description of the conflicts between the park and the local population in its surroundings. The people consider the national park laws that prohibit any human activity in these areas to be too severe. Conflicts arise between the habitual rights of the people to use certain areas and the right of the state to protect these areas.

The people around the old part of the park live in poor conditions and at high density (ca. 300 people per km²). Although the local population knows more or less where the park borders are, they exert severe pressure on the park mainly through their need for new fields, pastures and forest products (firewood, timber for building, game, mushrooms, medicinal plants).

A corridor of 7.5 km breadth connecting the mountain forest with the lowland rain forest partly belongs to the Nindja community. 30% to 35% of this community are inside the park. Before the park was extended, the government did not negotiate with the local population about their habitual rights. Today, about 15,000 people are living within the national park, in Nindja 2,300 persons. It is hoped that compensation measures will be an incentive for them to leave the park voluntarily.

The new part of the park contained several villages before it was added. In this zone the population density is less than 10 people per km² except for some concentrations in mining areas. The people still living in the park continue to exploit the park in their traditional way by farming, keeping livestock, hunting, and mining for precious metals. The inhabitants of villages in close proximity to the park farm within its borders. As this area is so remote, the local population did not know that they were living close to a national park for a long time, and they were told about its extension only a few years ago by the authorities.

The Project and its Activities

In view of the complexity of the problems mentioned above, IZCN, the Zairean nature conservation authority, looked for a foreign partner to assist with the biodiversity conservation of the national park. To this end, IZCN together with GTZ (German Society for Technical Cooperation) initiated an integrated conservation project in 1985. Its goal is the protection of the park and, at the same time, the sustainable development of its surroundings. In February 1995, the achievements of the project were assessed and it was subsequently decided to continue it from October 1995 for another 3 years.

In the course of their work, project staff has been confronted several times by social and political problems in the area. They interfered with the work considerably in one way or another. For instance, in October 1991, the GTZ funds were frozen because of the political crisis in Kinshasa. From then until the beginning of 1995, when the ban was lifted, the project worked with considerably reduced resources. When hundreds of thousands of refugees arrived in Bukavu from Rwanda in July 1994, activities had to be reduced even further as all project staff were occupied with emergency help for the refugees in the second half of 1994.

In the first phase of the project, the most important objectives were the improvement of park protection, the expansion of the infrastructure for tourists and research. Since 1988, the project has increased its efforts to find long-term solutions for the integration of conservation with the interests of the surrounding population. This is to be achieved mainly by decreasing human pressure on the natural resources.

The following measures were taken towards this goal:

- Improvement of park boundary demarcation, increase of patrols in the park and more efficient controls on the road passing

through the park

- Initiation of small projects that increase confidence and support the development of the park's surroundings in order to decrease the population's dependency on the park resources (building of water pipes, medical support, road restoration)
- Increasing the proceeds from tourism by maintaining facilities and producing advertising material
- Education of the population regarding the necessity of nature conservation in the national park and on economic systems that decrease the dependency on the park's resources.
- Improvement of the project administration through more effective planning, employment and training of local staff and the acquisition of equipment that will facilitate the work of the technical staff.

The activities are concentrated in various areas, depending on the pressure exerted by the local population. Up to now, attention has focused in the old part of the park on the critical zones Kalonge, Nindja and Tshibati as well as the station Tshivanga. In addition, work has now also started in the surroundings of Itebero. Nzovu will be included in autumn 1995.

Conclusions and Prospects

Since 1985, the IZCN/GTZ project has consistently pursued its goals, even if progress was slowed down at times due to the circumstances. Currently, the continuation of the activities will depend very much on the improvement of the political and economic situation in Zaire and on the situation of the Rwandan refugees in the area.

We wish to take this opportunity to ask the international community to assist Zaire as far as possible to prevent the trade in animal species included in Appendix I of CITES. As a consequence of the alarming economic situation, this trade has become an important source of income. Currently, every other month a chimpanzee or a gorilla baby is confiscated from dealers by government authorities. If this continues, the establishment of an orphanage in Zaire could be considered.

Mbake Sivha

Sensitization

Mbake Sivha and the Belgian Geneviève Trépart together with their team were essentially responsible for this task. Among their activities in 1994, the following should be mentioned:

- Designing a poster for the park
- Setting up signs within the park
- Editing the magazine *Kacheche*
- Organizing the celebrations for the reforestation day
- Developing a teach-path for pupils
- Organizing a seminar for teachers
- Elaborating and conducting radio programs
- Organizing a harvest of agroforestry seeds and preparing tree-nurseries at eleven schools.

In the meantime, the sensitization activities, which were originally limited to the area around the old part of the park, were extended to the new part near Itebero and will soon include Nzovu.

This summer a study is planned that will determine how the work with the pygmies can be improved. Once this has been established, a new and highly qualified team will be selected for this task.

Mbake Sivha's Past and Future Activities

The biologist Mbake Sivha has so far carried out all the research and she led the sensitization team in Kahuzi-Biega National Park. Since 1993 she has been collecting data for a research project which she analyzed in a report completed in December 1994. The following is a summary of this report.

Maintenance of the roads in the park and its surroundings enhances the ability to control the park, provides the infrastructure for tourism and contributes to the development of the park's surroundings. However, the roads also contribute to the park's destruction.

Several studies have dealt with the impact of the Kisangani-Bukavu road which transverses a part of the park. These studies provided suggestions for reducing the destruction of the park's flora and fauna. This is also one of the aims of the present study, which investigates the long-term impact of traffic in the park.

Large Mammals Near the Kisangani-Bukavu Road

The road transverses 18.4 km of the old park section. Along this stretch the following plant communities can be seen: 10.6 km of secondary forest (*Hagenia* and *Myrianthus*), 2.8 km of bamboo forest, 2.7 km of swamp, 2.3 km of mixed forest (secondary and bamboo). Elephant and gorilla tracks as well as sightings of these animals were recorded on six transects (1 km long, with 500 m on each side of the road). Three transects were in the secondary forest, one in the mixed forest and two in the bamboo forest. From October to December 1993, the transects were patrolled by a guide and a tracker once a week, and from the end of January 1994 on a biweekly basis.

From November through May, the gorillas spent most time in the secondary forest. There they moved less than in the bamboo forest. From May to the end of August, the dry season, they primarily stayed in the secondary forest and swamp. From September to the first half of December, they preferred the bamboo forest. Gorillas frequently transverse the road, but not as often as elephants do.

Continuation of Research

In the future, Mbake Sivha will completely concentrate on her research work and continue to investigate the impact of traffic on gorilla and chimpanzee reproduction, mortality and ranging. She is employed by the IZCN and receives some additional

financial support from the GTZ. Her two co-workers are also supported by the GTZ.

In agreement with Georg Dörken, director of the GTZ project, the *Berggorilla & Regenwald Direkthilfe* will support Mbake Sivha's research. We will fund the equipment as well as the salaries of local scientific assistants. We intend to support the work for 3 years.

Report from Chantal Shalukoma

Sensitizing the pygmies for the importance of the Kahuzi-Biega National Park has proven to be a difficult and tedious endeavor. We are therefore still in the experimental phase of the project, continuously increasing our knowledge. Our efforts to alleviate the hardships of the pygmies are primarily focused on two aspects: opportunities for earning money (maintenance of roads and other projects in the park) and support in agriculture. For road maintenance, a total of 62 pygmies were employed in 1994 for more or less extended periods of time. The seeds for agriculture (beans, corn and potatoes) were provided by the project. However, due to various reasons, the yield was fairly meager.

Another task has been sensitizing womens' organizations in the surroundings of the park. In 1994, the organization *Ama-jambere* in Tshivanga was visited. For 2 years, the wives of the park employees have been meeting there to discuss subjects like opportunities for earning money (retail business etc.), knitting, embroidery, establishing a nursery school and hygiene. In the beginning of 1995, the women were also informed about the methods of birth control.

644 persons were guided through the Kahuzi-Biega National Park in 1994, of which 488 were Zaireans and 116 Germans. An analysis of questionnaires shows that they were generally content with their visit.

Four Gorillas Killed in Bwindi

In mid-March 1995, poachers killed four gorillas in the Bwindi Impenetrable National Park, near Ruhizha, with spears. The gorillas killed were an adult female, a blackback male and two juveniles. The first carcass was found on 19 March, the others later. Some of them were partially mauled by dogs that probably had accompanied the poachers.

The gorillas belonged to a group of 18 animals, called the Kyaguliro group, that had been under habituation for some time for scientific research. Therefore, every group member was individually known. As two gorilla babies were missing after the incident, it is assumed that the poachers wanted to capture the babies for smuggling them. To do that, they had to kill the older animals who defended their young.

Reports on the discovery of the carnage are contradictory. On the one hand, the animals were reported to have died on 15 or 16 March. According to other sources, field assistants of the ITFC (Institute of Tropical Forest Conservation) sighted poachers with spears and dogs on 18 March and passed on this information, but the rangers did not show any concern because poachers were regularly in the area. (Already in November 1994, Jaap Schoorl, the technical advisor of CARE in Bwindi and the responsible person for anti-poaching measures, had shown us a map of the national park with multiple-use zones and areas of increased poaching; they overlapped nearly completely.)

Three suspects were arrested on 24 March; five others were still at large. President Yoweri Museveni ordered that top criminal investigators should be sent to Kabale. The arrested persons are probably not the ones who had planned the crime. Employees of the national park may have been involved in leading the poachers to the gorilla group, which was not easy to locate.

From articles by Ndyakira Amooti in New Vision