

RWANDA OFFICE OF TOURISM AND NATIONAL PARKS

Volcanoes National Park

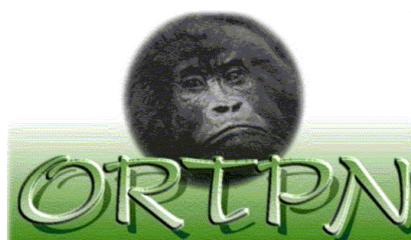
Park Management Plan

2005-2009

MARCH 2005

VOLCANOES NATIONAL PARK

Management Plan 2005-2009



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Foreword

The production of this 5 years Management Plan (PAG) of PNV (2005-2009) should be perceived within the framework of the implementation of ORTPN strategic plan. The production of this 5-years Management Plan meets one of the main objectives of ORTPN, which is to provide the institution with planning tools to serve as guide and reference both at the central and the Parks levels. For PNV, this Management Plan is the second in kind. It comes after the first one that expired in 1985. After this period, the planning of activities carried out in PNV was based on Operational Action Plans, which lacked coherence and long-term vision.

Created in 1925, the PNV is one of the first parks in Africa. It was then part of the Congo's Albert National Park, which became after the independence in 1960 the Virunga National Park. With its ecological, tourist, scientific, social and cultural values, the park is very much renown both at regional and international levels. PNV is especially world famous on being home of remaining hundreds of the endangered mountain gorillas "Gorilla gorilla beringei", which are endemic to the Virunga Massif, as well as numerous of other characteristic species endemic to the Arbertine Rift Region. In this regard, the Coordination Bureau of the International Council for the Programme of Man and Biosphere certified in 1983 that PNV be part of the International Network of Biosphere Reserves. Furthermore, the process of making PNV as a World Heritage Site is under way.

Through a participatory approach, this Management Plan was produced. This process has involved all the stakeholders living around PNV including local community, the leaders at sector, district and province level, NGOs representatives, higher learning and research institutions. Their active involvement was a result of broad consultations through direct communication on specific matters and workshops on specific themes. Some of these specific themes resulted into specific action plans. We will not hesitate to express our great satisfaction, as this document is the result of the joint efforts of all the stakeholders dedicated to the great cause of conservation of PNV.

We now call upon all the stakeholders in order to renew their commitment and we encourage them to implement possible actions identified during the consultations. May this document serve as a guide to all the stakeholders dedicated to the great cause of conservation within PNV, to enable them to work out their operational action plans of all the partners working for the conservation of PNV, especially the PNV chief park warden and his team.

We would like to express here our deep gratitude to all the stakeholders who have contributed financially and technically to the production of this PNV Management Plan.

ORTPN Director General
Rosette Chantal RUGAMBA

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We are very grateful to the local communities, the authorities of the sectors, districts and province that are adjacent to PNV for their good will and collaboration during the consultations and dialogue carried out while preparing this management plan. ORTPN acknowledges also the technical contributions and collaboration of all partners including DFGFI/CRK, DFGF-E, MGVP, CARE INTERNATIONAL for the completion of this work.

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Introduction

Volcanoes National Park: a natural site of exceptional value with multiple threats

The Volcanoes National Park (PNV) is surely the most important park in Rwanda. Despite the fact that it is the smallest park of the three national parks in the country, PNV has a series of characteristics which makes it exceptional as such. Originally created in 1925 at the occasion of establishment of Parc National Albert on the territory of Congo and Rwanda, it is the oldest park on the African Continent. Endowed with mountain golliras, PNV not only attracts attention from scientific community, but also hundreds of visitors



Figure 1 : The Volcanoes National Park extends along Ruhengeri and Gisenyi provinces on the distance of about 60 km (Photo : J.Kalpers)

from the world of eco-tourism sector visit Rwanda and the sub region every year. Situated in the center of Albertine Rift, PNV is

part a trans-boundary network of protected areas unique in the world, stretching out on the territory of Uganda, the Democratic Republic of Congo, Rwanda and Tanzania. The region harbors an extraordinary biological diversity with a large number of endemic species of fauna and flora. The Virunga Massif forest bloc, which PNV is a part constitutes a unique case of regional collaboration between the authorities of the three National parks of the Massif.

Despite its exceptional assets in terms of bio-diversity, PNV is confronted with a big number of threats which originate from human pressure on the whole park. PNV is situated in the region which is most densely populated in Rwanda and that is exactly because of the presence of volcanoes and forest environment. Volcanic soils around the park are fertile and therefore important to the population which principally practices agriculture and afro-mountains forest enable climatic regulation as far as precipitation is concerned. These structural threats which have existed for several tens of years or more were made worse between 1991 - 1999 as a result of repeated armed conflicts and insecurity which have plunged the whole sub-region in crisis. This situation has not only seriously affected the surrounding population, but it

equally is a supplementary source of threats to ecosystem which is already delicate.

The latest PNV management plan was in 1985. Since then the management is done in a disorderly manner with no long-term vision or the will to develop strategic conservation activities. In 2003, ORTPN (Rwanda Office for Tourism and National Parks), which has official mandate to manage PNV, has gone forward in restructuring its departments. This process of restructuring has pointed out the weaknesses of the institution as well as the numerous challenges to overcome in terms of conservation of nature and the promotion of tourism, the two missions having been entrusted to ORTPN by the Government of Rwanda. One of the weaknesses of ORTPN was the absence of long-term planning of its activities at national level as well as at protected areas level under its authorities. Among the recommendations made on the occasion of this redress exercise was the necessity to develop management plans for each national park. This document is an implementation of that recommendation and should guide the management of PNV in the next five years.

Structure of the management plan

The Management Plan of PNV would be a reference tool for programmes and activities which will be developed in five years. For that matter, PAG will serve as a common base for stakeholders and actors involved or interested in the management of the park. In order to facilitate the reading and assimilation of this document, the authors preferred to use a simple format which presents the synthesis of key aspects related to the management and conservation of the site. The reader who wishes to know about precise subjects could refer to different thematic documents produced in the framework of the process of management plan preparation. These documents are available at ORTPN office in Kigali and at PNV. The principal document of the management plan is therefore subdivided in several parts:

Descriptive part: Describe the context of the PNV, giving the list of physical, ecological and socio-ecological characteristics, presenting legal framework and analyzing different problems which PNV face.

Zoning plan: this presents geographical framework in which management programmes take place. Zoning enables definition of different categories of zones and orients activities to be carried out within a period of five years to come.

Management programmes: for each management theme, this section describes objectives and strategies to develop during the period covered by this plan. This descriptive part represents the heart of the management plan and proposes principal orientations which enable the achievement of global objectives described in this plan.

Methodology

The core team on Management Plan of PNV was established in March 2004. This group is composed by the park chief warden (PNV), the research, monitoring and planning warden (PNV), the research, monitoring and planning manager (ORTPN head quarters) and the technical adviser of ORTPN-IGCP. The role of this core team was to coordinate the production of the management plan and pilot the whole process.

On the 2nd April 2004 PICG and ORTPN organized an official meeting for information and start-off of management plan/PNV in which 27 people participated. Participants included representatives of Ruhengeri and Gisenyi Provinces, Mayors and sectors coordinators, ORTPN and its partners. The meeting was started by three presentations of ORTPN Kigali and the managers of PNV.



Figure 2 : The process of elaboration of PNV management plan involved a big number of stakeholders (Photo : J.Kalpers)

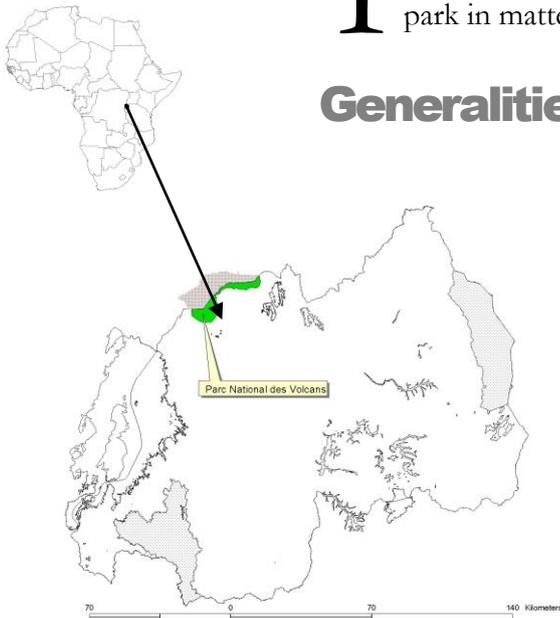
Principles of the work

- The core team lead the whole process
- The management plan format was adopted between the three parks managed by ORTPN and served as a guide for the preparation of PNV management plan.
- Among the themes taken in the management plan structure, three areas required an external expert: Community conservation, zoning plan and tourism development plan.
- Other themes were treated by specific sub-groups during thematic workshops regrouping stakeholders' teams.
- All along the process of the plan development, participative approach was preferred in order to arrive at a larger platform possible.

The situation of Volcanoes National Park

Description and context of PNV

This chapter gives a certain number of generalities on PNV which enable the reader to have the context describing the general framework of the park in matters of physical conditions and biotic factors.



Generalities

General situation

The PNV (1°30'5, 29O'E) is situated in the North of Rwanda bordering DRC and Uganda and covers medium and high altitudes towards the south of Virunga Chain.

Its length is around 40km and its width varies from 8km to 1km. The interface of PNV with its local population is around 60km; the surface area of the parks is about 160km². The altitude varies from 2400m to 4500m, the highest point being the top of Karisimbi (4,507m).

Administration

The park is the property of the State and the managing organ is the Office Rwandais du Tourisme et des Parcs Nationaux (ORTPN). 85% of the park depends on Ruhengeri Province administratively while the rest 15% depends on Gisenyi. The nearest town to the park is Ruhengeri, Neighbouring districts to the park are five, and each divided into sectors and cells.

The situation in comparison with other protect areas in the region

PNV covers Rwandan sector of the "Virunga Massif" and is contiguous to the Parc National Virunga-South in DRC and Mgahinga Gorilla National Park in Uganda, thus forming a trans-boundary bloc of protected area covering almost 450 km². The nearest forests are Gishwati and Bwindi Impenetrable National Park, in Uganda.

Physical Characteristics

Topography

The Virunga Massif comprises 6 volcanoes: five of them (from East to West: Muhabura, Gahinga, Sabyinyo, Bisoke and Karisimbi) are at the Rwanda border with either Uganda or DRC. Mikeno, which is close to Karisimbi, is entirely found in DRC.

PNV is found below the neighbouring lava areas. The volcanoes found in the park are steep and eroded in different forms with deep gullies, especially Sabyinyo. The volcano range is divided in two groups: Karisimbi, Bisoke and Mikeno in the west, and Sabyinyo, Gahinga and Muhabura in the East.

Each volcano is separated from the other by a valley, the two groups being separated by a series of smaller volcanoes. The steep slopes are slippery, especially after raining. There are a number of caves in the park and also in the neighbouring environment.

Geology

PNV volcanoes are considered inactive although eruption which took place in 1975 on a mini-volcano in DRC could indicate some minor eruption activity inside Bisoke volcano. Additionally, some little flowing lava has been observed on the slopes of Muhabura. Two volcanoes at the extreme West of the volcano range, which are Nyamulagira and Nyiragongo are still active, and some minor earthquakes do take place in the park. Virunga range is situated in the Rift Albertin of the Great African Rift Valley. Its geological and geomorphologic structure is very complex.

Climate

The climate is generally fresh and humid. The rainfall is between 2000 mm per year between 2000 m and 3000 m but decreases with altitude. It reaches 900 mm at the top of Karisimbi. It rains throughout the year but there are two heavy rain seasons, the longest being from February to June while the shortest is from September to December. Average temperature is 09°C at 2600 m. Night frosts are often present below 3000 m and snow is plenty above 4000 m of altitude, although it is not permanent. The climate is drier in the eastern part of the ranges (Lebrun 1960).

Hydrology

The park is endowed with a good number of permanent lakes: Bisoke, Ngezi, Mararo etc., but there are no permanent rivers, although there are seasonal flows of water in form of rivers (Susa, Rwebeya), except in the dry season.

There are some wetlands between volcanoes. Vegetation, litter and porous sub-soil are very important in water control especially for surface than underground water.

The water principally flows underground and some small sources of water gush out within the park and its surroundings, especially along the lava which is located at 15 km from the park toward the mountains.

Soils

There was no specific study done on the nature of the soil, drainage is generally regular. The sub-soil is composed of brown clay covered with black fine layer of soil, This layer of soil may be covered by a fine layer of humus on top and simple creeping flat roots on the steep slopes of the mountains. There is also a formation of fine alluvial peat in the wetlands and on the steep slopes at high altitude.

Biotic Factors

Vegetation

The vegetation of the park is typical of central African altitude formation and East African Mountains in general. Pasture for domestic animals, which was particularly rich in 1960's and 1970's could have influenced the current structure of vegetation which constitute different characteristics and regeneration. Different species of trees have been introduced, examples are Cyprus and Eucalyptus.

Zonation

Zoning is the succession of different zones of vegetation determined by the altitude, although there is certain difference between two sub-groups of volcanoes, East and West, which is certainly a result of micro-climates.

The structure of vegetation is as follows:

- *Neoboutonia* forest: The zone is found in eastern group of volcanoes only, reaching an altitude of 2500 m. Dominating species is *neoboutonia, macrocalyx* which makes a dense forest with an average height of 20 m. Liana and epiphytes are abundant and a carpet of grass often reaches 2 m high.
- Bamboo forest (*Arundinaria alpina*): the eastern group of volcanoes with an altitude between 2500 - 3200m, the western group of volcanoes with an altitude between 2500 and 2800. The bamboo forest dominates the area with other scattered species, forming a dense forest. The average height of bamboo is about 8m. Undergrowth vegetation is scarce, but on the stiffest

slopes, bamboo is less dense, forming groves around which develop abundant vegetation of trees, bush and liana.

- *Hagenia* forest: eastern set of volcanoes with only an altitude between 2600 m and 3200 m . *Hagenia* forest is generally less dense and the dominating species is *Hagenia abyssinica*, although *Dombeya goetzinii* is also found, reaching the altitude of 2800. The average height of trees is 20 m. Undergrowth vegetation is very dense and epiphytes are abundant although lichen is less spread from the altitude of 2800 m.
- *Hypericum* zone: from 3100 m to 3500m. In the eastern group of volcanoes, *Hypericum revolutum* forest increases progressively as the altitude increases. So does undergrowth in *Hagenia* forest. At higher levels where *Hagenia* forest becomes less dense and then diminishes, *Hypericum* forms an average height 8m.
- Given that *Hagenia* and *Hypericum* zones are mingled, the term usually often used is *Hagenia-Hypericum* domination zone. Separation of Bamboo and *Hypericum* zones is clear in the group of eastern volcanoes where even the structure of *Hypericum* is itself different. In fact there are many *Senecio mariettae* which make a thicket of 3 m high that dominate *Hypericum*.

Senecio-Lobelia zone: this is between 3500 m and 4200 m. This zone constitutes a high limit of shrub vegetation. *Senecio Johnstoni* and *Lobelia wollastonii* which form bushes, are separated by *Alchemilla Johnston* prairies. Arborescent heathers are mostly found between 3500m and 3700 m of altitude.

Alpine prairie: This area is situated between 4200 m and 4500 m of altitude. It is a fine cover of grass, sedges and mosses creeping towards the top of volcanoes. The mosses are predominantly at the immediate proximity of Karisimbi summit.

Sub- types of vegetation

Different sub-types of vegetation are distinguished and superposed on the basic zones sketch.

Diversity of flora

Virunga Massif comprises a total of 878 known species of plants, 81 of them being trees, 124 endemic plants of the Rift Valley and 5 listed on the UICN list (Plumptre et al. 2003). Concerning PNV specifically, a recent study drew up a list of 301 species of herbaceous plants, 40 species of liana and 36 species of woody plants, Plumptre *et al.*

Fauna

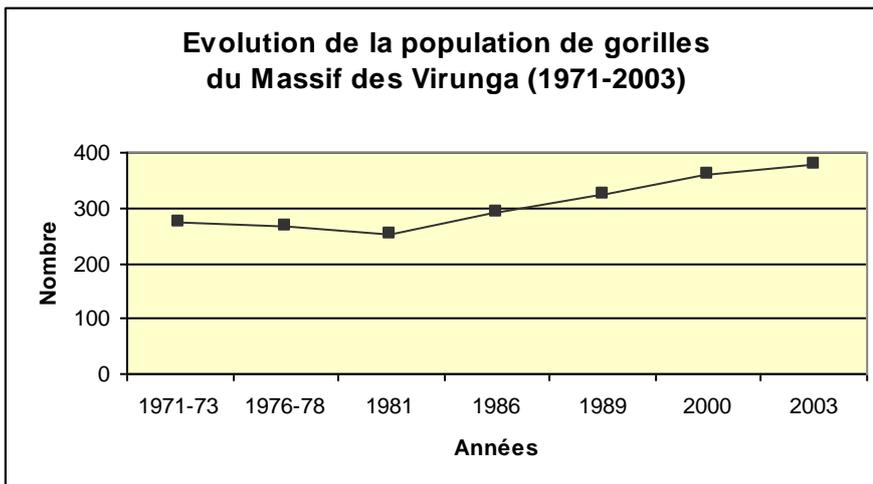
GENERALITIES

PNV fauna is poor in species. This is explained by reduced park dimension and by very high altitude in general. However, there is a fraction of endemic species and sub-species. Some of these species have reduced and their conservation requires standard protection measures within the whole of Virunga range, and not only within the PNV limits. Feral dogs are found in the PNV and these are the most regularly observed predators at the moment. They are capable of attacking antelopes, and although they are essentially nocturnal, they are shot on sight by rangers, even though it seems that their number is increasing. Stray cats have also been seen.

MOUNTAIN GORILLAS

Mountain Gorillas (*Gorilla beringei beringei*) are only found in the Virunga Massif and Bwindi Impenetrable National Park of Uganda. Mountain Gorillas are

endemic sub-species considered to be in "critical danger" by UICN. The population of gorillas in 2004 was estimated at around 700, 380 of them being in Virunga Massif. The graph below indicates their evolution between 1971 and 2003. It can be observed that their population declined during 1970 and then rose significantly at the rate of 3% in 1980. This increase was a result of combined effort initiated by



national agencies in charge of National Parks and conservation projects which had been started during this period.

During the decade of 1900-2000, the number slowed down following armed conflicts which engulfed the whole region. The latest estimation of 380 gorillas was obtained after a census which was carried out throughout the whole Virunga Massif in 2003.

OTHER MAMMALS

The whole of Virunga forest has a total of 86 known species of mammals, 34 of them being big mammals, 18 endemic species of the western Rift Valley, six species are endangered and 18 have been indicated by UICN (Plumptre et al., 2003).

OTHER PRIMATES

Golden monkeys (*cercopithecus mitis kandti*) which are endemic in Virunga Massif are often found in bamboo forest. Blue monkeys (*cercopithecus mitis stuhmani*) have also been sighted there. Coexistence between the two sub-species in the same forest is a recommendable fact which merits further research on the subject. According to Struhsaker (1981), Cercopithecus l'Hoest was seen at one time in the area between Gahinga and Muhabura, but from then this species has not been seen in PNV again.

HERBIVORES

In 1977, the elephant (*Loxodonta africana*) population was between 67 and 70, including those which regularly criss-crossed Rwanda -DRC border (Huart et al. 1985). Today the number is about 40 elephants which move within Virunga Massif in the three countries. These elephants normally follow seasonal migrations within the Massif and the area between the Massif and Nyamulagira sector of PNV in DRC. The passage corridor situated at Mwaro , crossed by Goma-Rutshuru road (DRC) which was severely damaged by successive deforestation events which took place during the past years, presents significant consequences on the natural movements of the elephants in the sub-region. This situation seems to have provoked impromptu exit of elephants in 1998, with serious damage to the crops in the three neighbouring countries.

Buffalo (*syncerus caffer*) is common and is found in the park. It is found at the attitude reaching 4000 m on Karisimbi, but it seems to avoid steep gullies.

Black-fronted duiker (*cephalophus nigrifrons*) and “*Tragelaphus scriptus*” are also found all over the park. These are main targets of poachers. *Cephalophus* with yellow back (*cephalophus sylvicator*) was sighted but it has not appeared again for a long time.

The bush pig (*Potamochoerus porcus*) and giant forest hog (*Hylochoenus meinertzi hageni*) have both been sighted and they are always traced on Muside hillside, although none of them has been seen in the past years.

The tree hyrax (*Dendrohyrax arboreus*) is common all over the forest; it is the most regularly seen animal, by visitors in PNV. Porcupine (*Hystrix africa-auralis*) is rare in PNV, but its pines are often found at an altitude reaching 2800 m.

CARNIVORES

The leopard (*Panthera pardus*) was common in Virunga in the years 1920 (*Gyldenstolpe*, 1924), some individuals with dark fur were observed (*Baumgartel* 1976). However, no observation and no tracks of live specimens have been effected from 1971.

There are tracks of Hyena (*Crocuta crocuta*), especially between Bisoke and Sabyinyo and their cries have been heard at a high altitude of Sabyinyo.

Jackal (*canis adustus*) is sporadically observed on cultivated land around the park. We think that they frequent a big range of PNV, probably in small numbers.

The African civet (*Viverra civetta*) and the African wild cat (*Felis silvestris*) were observed in Gahinga and the serval (*Leptailurus serval*) was seen in Mikeno during the census of gorillas which was done in 1973 and probably the animal frequents the park. The golden cat (*Profelis aurata*) was captured on Karisimbi and Gahinga mountains. The small-spotted genet (*genetta servalina*) and red mongoose (*Herpestes sanguineus*) are the most frequently observed carnivorous animals in the park and are well known by the population living within the environment of the park.

BIRDS

Virunga Massif has a total of 294 species of known birds in the three countries of Virunga Massif. Among them are 20 endemic species of Albertine Rift and 4 others appearing on the list of endangered species of UICN (Plumptre et al. 2004). The park constitutes an important site for species typical of high altitude forest and *senecio-Lobelia* zone. However, *Neoboutonia*, bamboo and *Hqagenia-Hypericum* vegetation zones are richer in terms of bird wildlife diversity. This diversity reaches a maximum of about 3000m in altitude, and then starts to decline at a high altitude (Plumtre et al., 2004). Among the endemic birds of Albertin Rift, the following species are relatively easy to observe in the PNV: Rwenzori Turaco (*Musophaga johnstoni*), Rwenzori double collared Sunbird (*Cinnyris stublmani*), Archer's Ground Robin (*Cassypha archeri*) and Red-faced Woodland warbler (*Phylloscopus lactus*) (Plumtre et al. 2004)

Two species merit special mention: *crytospiza shelli* and *Bradypterus graneri* which are endemic and endangered species.

Other animals

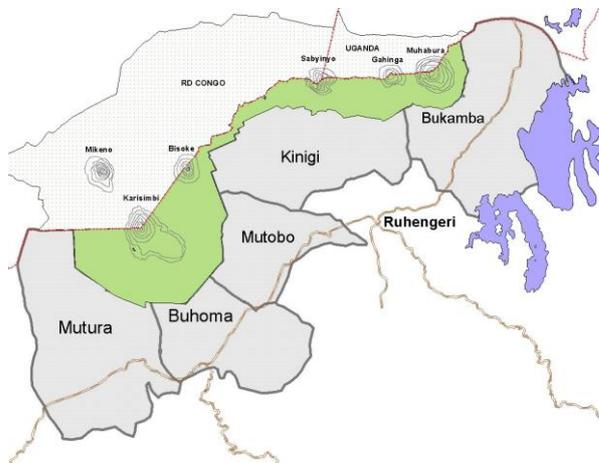
Other classes of animals are relatively less known although there are a number of the most recent and historic publications which have basic information. Thus, a collection of compiled work by Plumtre et al. (2003) demonstrates 43 species of reptiles in the whole of Virunga Massif, 7 of which are endemic species of Albertine Rift.

Concerning amphibians, the same report shows a total of 43 species, 16 of which are endemic species of Albertine Rift, 9 endangered species and 16 species which appear on the list of UICN (Plumtre et al., 2003)

Socio economic characteristics of PNV neighbouring communities

PNV human environment

The management and conservation of Volcano National Park can not be well understood without the knowledge and detailed analysis of human context which surrounds the Park. Demographic and socio-economic parameters of the population surrounding the park are in most cases the root cause of threat and interference on ecosystems. Understanding these parameters is absolutely inevitable if management programmes such as surveillance and community conservation have to be addressed in the right direction.



Demographic parameters

PNV region, like the rest of the country, is densely populated. This high density is demonstrated by high pressure of human

activities in the park.

Increase of the population

After the National Census for population and Habitat (RPGH) of 16-30 August 2002, Ruhengeri and Gisenyi, the two most populated provinces in the country, had a population of 885,309 and 853,985 people respectively.

As for the evolution of the population in the district neighbouring PNV, the following table gives the situation of the latest two censuses of 1991 and 2002 respectively.

District/Town	Population (RGPH, 1991)	Population (RGPH, 2002)
BUHOMA	80,169	89,210
BUKAMBA	88,177	118,466
KINIGI	55,244	62,798
MUTOBO	81,621	95,922
RUHENGERI VILLE	53,467	71,511
MUTURA	-	112,934
TOTAL		550,841

Table 1: Evolution of the population neighbouring PNV

Density and structure of the population

From 1991 to 2002, the year of the latest census, population density in the neighbouring PNV has shot up despite the consequences in connection with 1994 genocide.

District / Town	Total population 30/08/2002	Total surface area (Km ²)	Habitable area km ²	Physical density	Physiological density
Buhoma	89 210	154.5	144.1	577.4	619.1
Bukamba	118 466	185.1	145.8	640	812.6
Kinigi	62 798	162	110.1	387.7	570.2
Mutobo	97 180	189.3	141.8	513.3	685.2
Ruhengeri Ville	71 511	63.2	63.2	1 131.3	1 131.3
Mutura	122 934	201.7	167.3	609.3	734.9
Average total	550 841	955.8	772,3	643.1	758.8

Table : Population density according total surface and habited area

If we look at the structure of the population by age, one discovers that PNV registers that the youth in the PNV periphery is as big as it is in the whole country. In fact the age between 0 and 24 years constitutes almost 62,2% of the population in Buhoma District and 60,6% in Mutobo district. In Kinigi district, the youth below 30 years of age represent 69,8% while those between 0 and 18 represent 56% of the population in Mutura population.

According to a socio-economic study jointly carried out by CARE International, PICG and WCS (2003) on the population living near the mountains forests of Uganda, Rwanda and DRC, the majority of the people living here are very young. This study discovered that between 59% and 66% of the population interviewed are less than 20. These figures confirm that the percentages show an increase in youth population around PNV.

As for the structure of the population per sex, all the available statistics show that there are more women than men living in the area.

District	Men	Women	Total
Buhoma	48.8	51.2	100
Bukamba	46.3	53.4	100
Kinigi	45.2	54.8	100
Mutobo	45.1	54.9	100
Ruhengeri Town	47.6	52.4	100
Mutura	48	52	100
Average	46.8	53.2	100

Table 3: Percentage of the population on gender basis

Level of education and instruction

In the area of education, the rates of children in full time education and illiteracy, which are two principal indicators of young population, show that the Rwandan population is among the least educated on the African continent. In fact, in 2002 the rate of illiteracy of the population aged 6 and above was 38.2% at the national level and 40.6% in Ruhengeri Province.

According to the recent socio-economic study carried out on principal mountain forests (Mai 2004) only 54.07% of the households leaving around PNV completed primary school, 6.75% secondary school and only 0.19% reached university. Concerning the distance covered going to primary or secondary school, the same study indicated 1,43km, being 46 minutes of walking on average. Walking to primary school took 46 minutes (1.43 km) and for secondary school, it took 1 hour 16 minutes to cover 3.41 km.

Rural economy and employment

The economy of the districts neighbouring PNV, just like the national economy of Rwanda, essentially relies on agriculture. However, agriculture does not occupy the whole time because of scarcity of cultivable land.

Agriculture, livestock and forest

Agriculture therefore constitutes the main activity of the population of the whole area neighbouring the park, which figures 91.8%. On the whole, agriculture is the source of subsistence and income for the population. Almost all the region is fertile, except in some rocky areas. It is also important to note that the area is cold enough to enable traditional cultivation of Irish potatoes, sorghum, beans, wheat etc..., Nevertheless, annual income remains weak, partly because of proliferation of diseases and agricultural malpractice, poor peasants and lack of credit which would facilitate access to agricultural equipment and fertilizer. On the other hand, poor income is connected with land demarcation, following population explosion. In fact, average land per person has become very small during the past years. It is estimated at 0.25 to 0.8 hectares per person (NKURUNZIZA, 2003).

Additionally, this poor harvest can be attributed to the lack of training in agricultural improvement, knowing well that there are no agricultural extension officers. Another reason given by peasant farmers is that wild animals continue to destroy crops in areas close to the park, despite the protection wall that is being constructed along the boundaries of the PNV in order to keep the wild animals away from invading the farms.

Apart from growing food crops, the population zone under study also grows cash crops such as coffee, tea, tobacco and pyrethrum. Pyrethrum requires special attention because of destructive effects which developed after its introduction. Introduced in 1936, it was developed on lava where massive deforestation was done (Jost, 1987) so as to settle pyrethrum peasants. As for livestock, it is important to know that a good number of animals reduced seriously as a result of the events which hit the region in 1994 and 1997-1999. This reduction was worsened by diseases, lack of veterinary services, insufficient pasture and water. Livestock sector is not advanced despite the intervention of some NGOs operating in the region, which distribute some animals such as goats to the population. Animal farming encounters many problems such as lack of pasture, difficulties of selling animal products and the type of farming which remains traditional in the whole region. There are no more areas reserved for pasture such that farmers have to graze at a distance and around the park with a risk of conflicting either with cultivators or PNV officials.

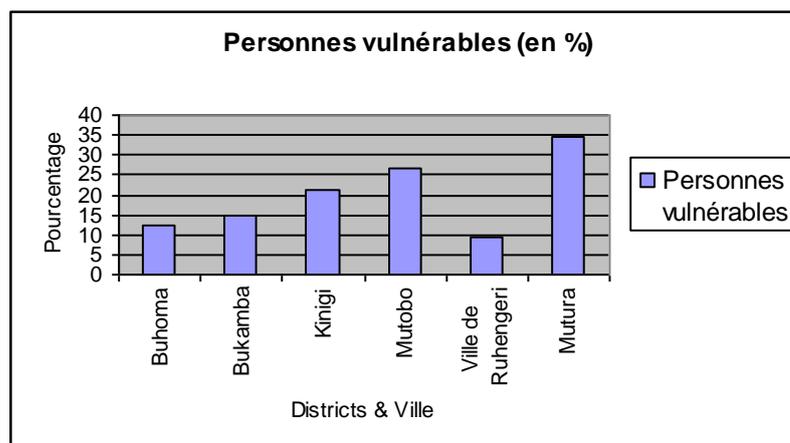
As far as the forest and tree plantations are concerned, most of these plantations were cleared during genocide and during the period of insecurity in the whole of the North West region. However, a tree planting campaign was launched some years ago, with the aim of combating erosion which is doing a lot of damage in the region. Available sources indicate that 835 hectares have been replanted in the area neighbouring PNV.

Employment

The rate of unemployment is high and it poses a serious handicap to the development of the population. In fact this is a result of scarcity of cultivable land according to NKURUNZIZA (2003). The promotion of non-agricultural activities is connected with obtaining financial assistance which is difficult because the local population fear to approach the banks operating in the region for credit. Another aspect is that in this area, it is the women who are responsible for daily work at home. In fact, a recent study indicates that women work more hours than men as far as domestic work is concerned.

Standard of living

The population of the zone under study mainly practise agriculture which has influence on annual income, which income is more limited in the rural areas close to the park than in the areas around Ruhengeri Town and /or Ruhengeri-Gisenyi and Ruhengeri-Cyanika roads.



Figures on average annual income are a good indicator of the standard of living of the following population. The districts of Kinigi (104,196 Frw), Mutobo (113 190 Frw) and the Town of Ruhengeri (191 384 Frw) have higher domestic income than the districts of Buhoma (75,064 Frw) and Bukamba (68,302 Frw). This is because of pyrethrum and potato growing in Mutobo and Kinigi districts on one hand, and a high number of salary earners and traders who live in Ruhengeri Town on the other.

However, the figures are just estimates and don't show reality on the ground, as there are also a number of uncounted vulnerable and unproductive persons in the study zone such as orphans, widows and widowers, indigenous people, the handicapped and the aged persons. According to reports done by census officials in the study zone, the real number is higher compared to the total population as indicated in the chart below.

Community Infrastructures

Social infrastructure

Education

As far as kindergarten education is concerned, only Ruhengeri town has nursery schools. Otherwise the system of pre-school education is not known because there are no schools for young children. However, some residents in the study zone have expressed their wishes to have at least one such school in their respective districts. According to them, these schools would reduce the number of pupils repeating in primary schools. At the level of primary education, the study zone possesses several schools, the majority of which are managed by religions denominations. Others are managed by the government. Most of these schools were damaged during the period of insecurity (1997-1998) and require rehabilitation. In fact, there are some densely populated

areas where there are 90 pupils in a class, or where lessons are given in a residential house, or in inappropriate places (NKURUNZIZA 2003).

There also cases of desertion as a result of different reasons. Meanwhile, it is interesting to note that the level of qualification of the teachers is very advanced compared with the rest of the country.

As for secondary education, the study zone has a number of moderate secondary schools (at least two in each district), but some of them are in bad conditions and /or lack necessary equipment such as books, laboratories /maps etc. Furthermore the qualification of teachers needs improvement.

For higher education, the study zone had four institutions of higher learning before 1994. There are Université Adventiste d'Afrique Central (UAAC) located at Mudende in Mutura district, University National du Rwanda/Campus de Ruhengeri at Nyakinama in Mutobo district, Institut d'Agriculture et d'Elevage (ISAE) also in Mutobo District and Institut Supérieur Catholique de Pedagogie Appliquée (ISCAPA) in Bukamba district.

ISAE regained its old site in 2003 after 1997 crisis, the premises of Campus de Ruhengeri at Nyakinama was replaced by Ecole de l'Academie Militaire, UAAC is functioning but it was relocated to Kigali, while ISCAPA has not reopened its doors since the end of 1994 events despite the complaint by the residents of the area. However, the Catholic Church is going to open a new high institution at Musanze which will be called "Rwanda International University" or UNIR in abbreviation.

Health

On matters of health, the situation in the study zone is worrying today. Among the causes of its deterioration are bad drainage of the area, insufficiency of health centres as well as poverty which is a destabilizing factor in many households. The main diseases in the area are infections of digestive system, malaria, serious respiratory infections etc.... There is AIDS and some cases of malnutrition as well.

Looking at health infrastructure (health centres, dispensaries and hospitals), we find that they were damaged and looted during the crisis of 1997-1998. It is for that reason that they should be rehabilitated where the work has not yet been done so that they can serve the population better.

Settlement and equipment

The population in the study zone live in dispersed rural agricultural settlements (the most widespread), in family hamlets, and in agricultural group settlements known as "Imidugudu". The first type is the most widespread in the region, with a house or houses surrounded by an enclosure called "urugo", while the second type is found in Buhoma and Mutobo districts where people live along the road in agglomerations called "insisiro". The third one is a new national

settlement policy which recommends resembling the population in villages so that land for cultivation can be available. Many group settlements were constructed in the region from 1996, but evaluation which was done indicated that there were some cases where people abandoned their houses. In fact, it has been found out that some persons quit these villages to rejoin the land of their ancestors.

The last study which was done by PADDEP (March 2004) indicates that a good number of persons still live in precarious houses, or are housed by friends. Lack of housing in the region was caused by refugees of 1959 who returned in the country and had neither land nor shelter, and also because of genocide and insecurity which caused demolition of a considerable number of houses.

Economic infrastructure

Markets and Commercial Centres

Apart from Ruhengeri Municipality, PNV is completely located in rural area dominated by hawkers. According to the recent report on development indicators done by PADDEP (2004), this zone has four commercial centres in Ruhengeri Province. They are the big market of Ruhengeri, Mukamira in Buhoma District, Byangabo in Mutobo District and Rugarama in Bukamba District. The number of markets is equally high, even though some of them were seriously perturbed by the period of insecurity in 1997-1998. The study zone also has a good number of commercial centres, which also experienced negative aspects during the period of insecurity.

Crafts and industries

Skills and crafts are currently less developed following the consequences of genocide and infiltration. In fact this sector was seriously weakened by looting operations of the buildings and the disappearance of craftsmen, either because of death, or simply dispersal. It goes without saying that poverty is another factor of limitation for local people.

However, there are some existing craftsmen who practise different skills (carpentry, weaving, tailoring, bricklaying, tile making etc...) in all zones around PNV, especially in Ruhengeri town where working conditions are more the best as compared to the study zone. It is important to note that these craftsmen generally work in disorganized manner, with neither professional training nor financial assistance which can enable them procure modern equipment (NKURUNZIZA 2003).

If one looks at industries, it is only Ruhengeri Town which has three industries that are still operating. These are *Société des Pyrètes au Rwanda* (SOPYRWA) *Société de Transformation Industrielle de Ruhengeri* (SOTIRU) and *Projet de Valorisation de la Chaux –PVC*. These three industries employ part of the

population in Ruhengeri town and its environment, and thus contribute to the development of the region.

Banking sector

The study zone which is located in the rural area operates one bank that is a branch of the main *Union des Banque Populaire du Rwanda*. Apart from that there are small credit institutions of NGOs kind which come in Rwanda to assist the local population. These credits enable the peasants implement some income generating activities. As far as Ruhengeri town is concerned, it has the most important branches of the Banks in the country. These are *Bank de Kigali (BK)*, *Banque Continentale Africaine of Rwanda (BACAR)*, the *Banque de Commerce, de Developpement et de Industrie (BCDI)* and *Banque Populaire*. There is also *Cooperative d' Epargne and Credits (COODAF)*, *Duterimbere* and *Union des Caisses des Travailleurs (UCT)*.

The banks in the region encounter problems of not being reimbursed by creditors, either because the clients simply refuse to reimburse because their projects have failed, or they just run away before honouring their promises. This problem has made the banks more vigilant and careful in offering loans by reducing beneficiaries. Loans are mainly directed in the domain of agriculture and livestock in the districts neighbouring PNV, while they dominate in trade and housing in Ruhengeri town.

Tourism and hotels

The study area possesses tourism potentialities beyond belief. Apart from the Park National des Volcans which extends beyond the boundaries of Rwanda and endowed with mountain gorillas, the region also has other numerous attractions, some of which are found in the chapter dealing with tourism development. Despite the vast tourist potential existing in the neighbouring region of PNV, sufficient infrastructure for reception has not yet been developed. So is the level of their location, their number and especially their standards. The table below present the most important reception centres.

Distirct/Town	Name of hotel or reception centre	N° of room	Rent (us \$ or Frw)
RUHENGGERI TOWN	Muhabura	13	10,000 -15,000 Frw
	Hôtel Urumuri	7	3,500 Frw
	Centre Postoral Notre Dame de Fatima	35	10,000 - 25,000 Frw
	Centre d'Accueil Saint Pierre de l'EER	40	5,000 - 30,000 Frw
	CINFOP Hôtel	12	3,500 -10,000 Frw
	Centre d'accueil Ituze	9	3,500 - 5,000 Frw
	Hôtel d'Accueil	16	3,500 - 4,000 Frw
	Tourist Rest House	6	3,000 - 3,500 Frw
	Geust House de Kinigi	15	5,000 -15,000 Frw

	Mountain Gorilla Nest	40	\$65-120
BUKAMBA	Volcanoes Lodge	7	260,000 US\$

Transport, Communications, Water and Energy

Transports

The study zone is theoretically accessible due to the roads connecting all administrative sectors to the main national road network (Kigali-Ruhengeri-Gisenyi paved road) or the regional Ruhengeri-Cyanika road which is also paved. However, most of these roads are damaged today and require rehabilitation. This would solve the problem of isolation of some of the most remote regions within the study zone such as Kabatwa and Butaka sectors in the District of Mutura. The problem of the sectors neighbouring PNV would also be solved.

Concerning the transport of goods and persons, there are a number of different means used in Ruhengeri town and in some districts close to the paved roads of Kigali-Gisenyi and Ruhengeri-Cyanika. There are mini-bus communal taxis that belong to Association ATRACO, ONATRACOM buses, motorcycles, bicycles and traditional canoes used on lakes Burera and Ruhundo. Unfortunately, these means of transport are becoming more limited in the regions neighbouring PNV because of the above mentioned problem of damaged roads.

Communications

Telephone network is less developed in the region, except in Ruhengeri town. The equipment was looted and damaged during the war of 1994 and insecurity crisis of 1997-1998. However, the situation has been improved by the introduction of cellular telephone network which covers a good part of the zone neighbouring PNV. Anyway, this network is only accessible to people who get adequate income.

Because of RWANDATEL effort, the town of Ruhengeri currently reserves the privilege of being connected to internet in some administrative offices of the government and NGO buildings operating in the region. Moreover, there are 3 cyber-cafes accessible to the public in general.

Water supply

The study zone is considered to be the rainy area in the country with an average precipitation of 1,500 mm a year. However, following geological nature of the region mainly composed of permeable rock, there is no flowing water which can facilitate easy tapping. The problem is particularly sensitive in all sectors directly situated near PNV. Apart from the above problem of lack of permanent flowing water, the study zone is now feeling the consequences of 1994 war and insecurity of 1997-1998, two events in which hydraulic infrastructure was damaged (water pipes, public water points, water tanks). As

a matter of fact, lack of water remains pertinent despite the effort deployed by the authorities of the region in rehabilitating some sources of water.

Only 41.3% of households have access to clean water which proves that a big part of the population, especially those who live near PNV, have a lot of difficulties in getting water. A peasant has to walk an average distance of 3,9 km to reach a source of water in the whole of the study zone, which shows us the effort the peasant must put in to transport this water, bearing in mind that it is carried on the head.

Energy.

Firewood remains to be the main source of energy for the population living in the study zone. Firewood is used to cook food and provide light. Apart from Kinigi District which has been currently provided with an electric line and electricity, other Districts are fairly connected. However, some electric infrastructure of the region has suffered negative aspects following the events of the past decade and therefore need rehabilitation. Additionally, extension of electric lines to supply the main trading centres and /or secondary schools with power would be a great advantage.

Perceptions of the communities towards PNV

Consultations that were carried out in the framework of the preparation of this management plan have provided information concerning the problems mentioned below:

- Present and future benefits of the park
- Problems caused by the current management approach towards PAs which preoccupy the local communities
- Problems which occur as a result of interaction between the local community and the park and which hamper good management of PAs
- Problems which involve PAs management
- Problems of coordination between park authorities, local administration and NGOs operation in the field of conservation around the park
- Training for park authorities within ORTPN and PNV in particular in the domain of community conservation.

The following table recapitulates the problems, in priority order, as reported by delegates from sectors and local communities in each district.

PNV : MANAGEMENT PLAN

	Bukamba distirct	Kinigi district	Mutobo district
Problems identified by sector delegates			
Identified problems	<ul style="list-style-type: none"> • Destruction caused by animals • Restrictions on the use of resources (water, trees, bamboo) and what causes illegal access to them • Without PAs, the Batwa have no means of survival • There is no feedback from the PA authorities concerning reports of wild animal's problems. • Bushfires in PAs • Prohibition of killing animals which damage crops • Poaching • Collection of wild honey • The members of the community did not have the chance to visit the park • Keeping animal in the park 	<ul style="list-style-type: none"> • Destruction of crops • Access to water • Compensation for the destruction caused by wild animals • Sharing incomes • PAs does not employ members of the local community • Rain water in Pas and erosion • Use of resources is prohibited • The population has lost part of land which belonged to them and now allocated to the buffer zone • People don't control PAs buffer zone • There is no control of wild animals which infiltrate in peasants settlements • The members of the community have no chance to visit the park 	<ul style="list-style-type: none"> • Employment of the local population • Supply of water to the local community • Sharing income • Compensation for the destruction caused by wild animals • Necessity to fence the park (in order to avoid destruction) • Supply of bamboo plants which should be planted • Promotion of income generating activities with the aim of reducing illegal activities • Severe punitive measures such as shooting on the spot
Prioritised needs of park resources	Priority needs among the park resources <ul style="list-style-type: none"> • Water • Bamboo • Poles and firewood • Medicinal herbs • Beekeeping • Livestock 	This point was not exhausted because of shortage of time.	PAs offers the following benefits <ul style="list-style-type: none"> • Fight erosion • Fight against mudslides and flooding • Foreign currency obtained from tourism • Regulation of rains and climate • Fresh air • Rwanda is known for her gorillas, volcanoes and good landscape • Rich Biodiversity, eg medicinal herbs • Quality pollen for beekeeping • Interaction with foreign tourists • Temporary employment • water
Problem identified by delegates of the local communities			

PNV : MANAGEMENT PLAN

<p>Problems identified by the members of local community</p>	<ul style="list-style-type: none"> • The local population living near the parks need to share benefits obtained from social infrastructure • Members of local community should be considered when new park recruitment takes place • Income generating activities should be promoted • Members of local community need water 	<p>The local population have no access to the benefits of tourism. The members of the community living near PAs do not control the buffer zone</p> <ul style="list-style-type: none"> • Fines are very high • Crops are destroyed with no compensation • No reaction when plants are destroyed • The soil is unproductive and this aggravates poverty • Transmission of diseases between man and wild animal • Grazing the animals in the park • Poaching • Bush fires in the park • Extraction of wild honey • People who enter the park illegally destroy the wall of stone • Several organisations have not honoured their promises to assist Batwa 	<ul style="list-style-type: none"> • Poverty • Lack of land • Bamboo cutting • Poaching • Illiteracy • Fetching water from the park illegally • Bee-keeping in the park • Rudimentary cultural methods and erosion • Destruction of crops • Cutting grass in the park • Fetching firewood from the park
<p>At the moment the local community enjoy the benefits of the park</p>	<p>The advantages are as follows:</p> <ul style="list-style-type: none"> • Water • Poles • Firewood • Bee-keeping • Herbs • Grass for grazing and thatching, material for wearing • Meat • Wood and hoe handles • Good climate and fresh air 	<ul style="list-style-type: none"> • Benefits offered by the park • Fresh air and rain • Business with tourists • Fighting erosion • Honey (Batwa) • Food from hides and skins (Batwa) • Bamboo sales (Batwa) 	<p>Benefits offered by the park</p> <ul style="list-style-type: none"> • The park produces rain • Tourism brings income • Fresh air • Access to medicinal herbs • Fight against erosion • Meat • Rwanda is well-known for its gorillas

PNV : MANAGEMENT PLAN

	Buhoma district	Mutura district
Problems identified by sector coordinators		
<i>Identified problem</i>	<ul style="list-style-type: none"> • Water for members of the community • Promotion of activities related to tourism • Rehabilitation of the road which connect the district to the PNV • Sharing incomes • Training in business management • Authorising the members of the local community to visit the park and understand much about conservation. • Necessity of having bamboo plants so that people can plant them in their premises • Priority in employment should be given to the local members of the community leaving near AP • There is no compensation for the destruction of crops caused by wild animals • Local authorities are not involved in the resolution of conflicts 	<ul style="list-style-type: none"> • Outside the park water is not sufficient • Poverty • Lack of collaboration between the local community and the park authorities • Illiteracy • Prohibition of firewood collection in the park • Lack of domestic animals - poverty • Lack of land for grazing • Chances of getting employment in the park are not the same • Members of the local community don't visit the park • Necessity of developing tourism in the district at the slopes of Karisimbi • PAs should promote activities which favour tourism • Contribution of revenue for the construction of a school • Illegal activities: drawing water, fetching firewood, cutting bamboo trees, poaching, honey hunting, grass cutting
<i>Today the members of the local community are enjoying the benefits of the park</i>	Benefits offered by the park <ul style="list-style-type: none"> • Rain • Water • Firewood • Meat • Honey • Bamboo • Income obtained from tourists 	Benefits offered by the park <ul style="list-style-type: none"> • Rain • Fresh air • Fight against erosion • Income obtained from tourists • Temporary employment • Market for crafts men
Problems raised by representatives of members of local community		
<i>Identified problems</i>	<ul style="list-style-type: none"> • Fetching water in the park is prohibited • Destruction of crops • Gutting down bamboo trees is prohibited • Fetching grass is prohibited • Restriction on cutting firewood • Hunting • Cutting trees is prohibited • The method of soil conservation is not appropriate 	There was no meeting for the community in this district

Legal and institutional framework of PNV

Laws and policies governing PNV management.

UCN defines the protected area as a special territorial or aquatic site dedicated to the protection and maintenance of biological diversity and associated natural and cultural resources. This site is managed by legal framework and other adequate principles (UICN 1994). Any country which wishes to develop a network for protected areas has to enact and implement legal texts and other mechanisms which officially approve the creation and maintenance of national parks or national reserves. Rwanda has a series of these mechanisms, particularly those which cover a period of almost 70 years, which is from the period of colonialism to this day. Rwanda also has legal mechanisms which guide institutions in charge of conservation of wildlife. This chapter draws up a list of pertinent instruments for the management and conservation of the volcanoes national park.

At national level

In general, the conservation of protected areas in Rwanda is guided by the following legal provisions:

- In article 49, the constitution of the Republic of Rwanda of 4th June 2003 requires the protection of environment by law.
- The draft of organic law concerning the protection and the management of the environment of Rwanda, which was submitted to the parliament, foresees a certain number of provisions in matters of protection and conservation of protected areas. These provisions are considered by organic law as components of biological diversity.
- The agreement between the government of the Republic of Rwanda and Rwanda Patriotic Front on the repatriation of Rwandan refugees and the resettlement of displaced people signed in Arusha on 09/10/1993.
- The law concerning hunting, fishing and bush fires
- Law n°04/2001 of 13/01/2001 concerning organisation and functioning of the district. Among its responsibilities, the district has specific mission of "Supporting the promoting tourism and the environment.

- The draft law concerning land ownership in Rwanda. Article 12 of this law draft classes protected area within the heritage of the State, which confirms the status conferred by forestry law n° 47/1988.
- Decree of 26 April 1974 concerning the confirmation and modification or order /law of 18 June 1973 concerning the creation of Rwandan Office for Tourism and National Parks, and revised by law n° 32/2003 of 06/09/2003, modifying and completing decree-law of 26 April 1974. According to the terms of article 30 of decree of 26 April 1974 on the confirmation and the modification of order /law of 18 June 1973 concerning the creation of Rwanda Office for Tourism and National Parks, The National Park points out “an exclusive area destined for protection, conservation and management of vegetation and population of wild animals as well as the protection of sites, landscape and geographic formations of scientific and aesthetic value”. The same text categorises Akagera National Park and Parc National des Volcans among National Parks of Rwanda as stipulated by Article 4 of the decree.

It was in 1925 when Parc National Albert (Albert National Park) was created on the territory of Rwanda and Congo. The part which extended to Rwanda automatically constituted Parc National des Volcans in 1934 by decree of 26/11/1934 (Institut des Parcs Nationaux) du Congo Belge-Institute of Belgian Congo National Parks), establishing the borders of Parc National Albert (Albert National Park). This decree carries a unique article which stipulates that “there are reserved under the title of Parc National Albert, some part of it being a territory of Rwanda, the limits of which are indicated in the appendix of this decree”.

Another legal text concerning the conservation of PNV is order n° 21/Agri of 3 February 1938 on “Prohibition of hunting on the territory occupied by indigenous people inside Albert National Park”.

In connection with legal texts concerning PNV, one can notice that the limits fixed by the Decree of 1934 have now become obsolete because the original Parc National Albert is now composed of PNV_i in RDC and PNV on Rwanda side. Additionally, since the creation of Parc Albert, there has been some expropriation of the Park land which has been given out to the population for cultivation by the authorities between 1958 and 1973: in 1958, 700 ha were appropriated to the population for resettlement. Between 1969 and 1973, 1050 ha were converted into agricultural farmland for pyrethrum development. This practice of minimising the Park land by the method of appropriating some of it to the population, even if it was imposed by the authorities of the day, was not legalised by any legislation, so that PNV authorities can intervene in the shortest time to actualise the new boundaries.

At international level

Rwanda has for long manifested her willingness to collaborate with the international community in the area of conservation of nature. It is then the reason why Rwanda ratified some conventions concerning environment in general, and particularly the areas protected by the convention on biological diversity: UN convention on climatic changes, the convention on international trade of wildlife species in danger (CITES), UN convention on combat against desertification, African phyto-sanitary convention; the African convention on the conservation of nature and natural resources (Alger's Convention); the convention on world property (UNESCO ; RAMSAR convention on humid zones of International importance like the habitat of birds; the convention of migratory birds (CMS or Bonn convention) and the Agreement of Cartagena on bio-security in relation to convention on biological diversity.

The PNV is part of UNESCO Programme "Man and the Biosphere" (MAB) and has had the status of Biosphere reserve since 30 June 1983. Launched in 1971, MAB programme is the basis of sustainable use and protection of biological diversity and improvement of relations between man and his environment in general. A biosphere reserve must accomplish three complementary functions: protection (protection of landscapes, ecosystems, species and genetic variations; promotion of sustainable human and economic development and logistics (support for education, training and research). Otherwise, considering the importance of PNV at international level, the council of ministers took decision in its session of 10 April 2002 to propose PNV as world heritage. The matter is currently in the hands of UNESCO Center for World Heritage in Paris, and should be the subject of discussion between the Center and conservation agencies of 3 countries that constitute Virunga Massif, with the purpose of creating a cross-border site for World Heritage between PNV, Virunga National Parc in RDC and Mgahinga Gorilla National Park in Uganda. The main mission of the convention on World Heritage is "to identify and protect natural and cultural world heritage considered to have exceptional universal value" (UNESCO, 1974).

Political framework

Biodiversity Strategy and Action Plan for

This document represents a mechanism of implementing the convention on the Biological Diversity (Rio, 1992) which Rwanda signed and ratified in 1995. Biodiversity strategy and action plan (BSAP) handles a series of strategies and actions intended for maintaining durable conservation and utilisation of biological diversity on the Rwandan territory. In this framework, one of the measures recommended by the convention on biological diversity is the establishment and conservation of a network of protected area in countries which are party to this

convention. The three national parks of Rwanda, PNV inclusive, play a particularly important job in this context.

ORTPN strategic plan

Following the restructuring of ORTPN that took place between January 2002 and August 2003, a certain number of planning mechanisms were put in place or are in the process of development. One of the most important is the strategic plan, the preparation of which took off in November 2003 and is now in the phase of finalisation. This strategic plan defines a whole programme corresponding to different departments which compose two technical agencies of Rwanda Wildlife Agency and Rwanda Tourism Agency as well as support departments (finances, human resources and information technologies). The strategic plan proposes a series of main lines of intervention which facilitate to keep the development of activities in three national parks under the responsibility of ORTPN, from 2004 to 2008.

Tourism

PNV represents a real source of economic potentialities and the conservation of protected areas in Rwanda is therefore necessary.

It would be difficult to talk about the volcanoes national park without mentioning one of the most important aspects of its management which is tourism and specifically gorilla tourism. Even if PNV has always generated income from tourism as a national park, it is only from 1979 that this sector has expanded such that it is today considered the backbone of tourism at the national level.

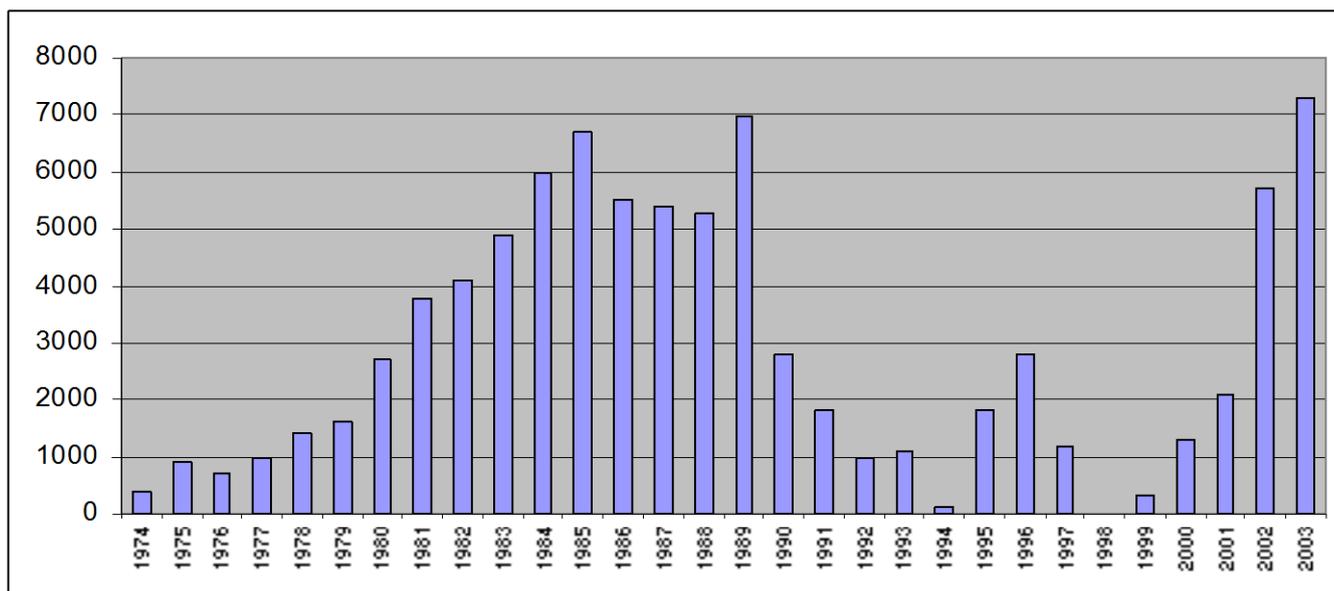
Background and trends of tourism in PNV

Tourist statistics for PNV have been rising systematically since 1974, the time of the creation of Rwanda office for Tourism and National Parks. The graph on the next page indicates the growth of tourism in PNV during the past 30 years.



Figure 3 : Tourism in PNV essentially rely on gorilla visit. Photo: Craig Sholley

Before 1979, the main tourist attraction consisted of climbing the volcanoes and random walking in PNV. Following the opening of gorilla tourism in 1979, the trend of visits has been high. The first gorilla group to be visited was group 11, then 9 and 13 in 1981, Susa group in 1983, Sabyinyo group in 1992 and group Amahoro in 1997. From 1990, visits have greatly declined as a result of the war, which culminated into genocide in 1994. After a humble recuperation, PNV was closed for a period of 18 months in 1998 and part of 1999. Since then, tourism has been growing very rapidly to the extent that the figures of 2003 overtook those of 1989.



Evolution of tourism in PNV, 1974-2003

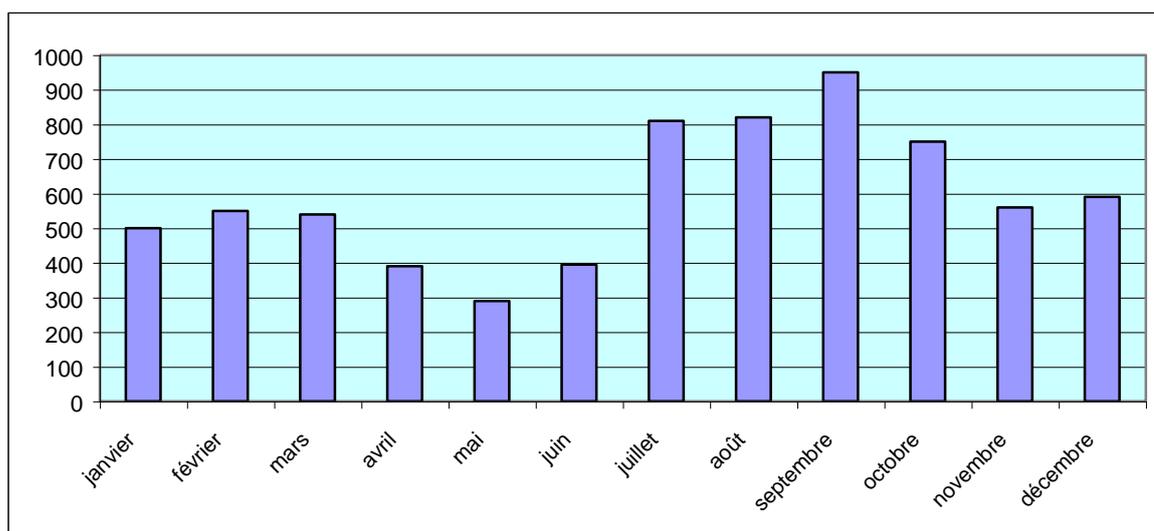
On revenue, gorilla tourism represents far more income of ORTPN than any other tourism activity in PNV, or all parks network under its responsibility. Therefore in 2003, PNV generated more than a million of American dollars, being almost 85% the total income of ORTPN in this period. Permits for gorilla visits represent far the highest amount of ORTPN income as indicated in the table below:

Attraction	Visit to gorillas	Visits to golden monkeys	Climbing volcanoes	Others (Dian Fossey and random walk)	Total
Income in USD	476,530	2,250	2,660	2,130	483,570
Percentage	98,5%	0,5%	0,6%	0,4%	100%

Table 4: Tourist income, period January-April 2004

Gorilla tourism therefore constitutes a veritable manna for ORTPN because this tourism attraction enables the office to finance a good number of its activities, not only for PNV, but also for the whole country. Economic impact and consequences is important at national level because the whole of tourist sector benefit from the presence of gorillas: Tour agencies and tour operators, hotels, restaurants, care hire companies, craftsmen etc.

Despite marketing efforts carried out at both national and international levels, the frequency of tourists visiting PNV is always determined by season. The following chart shows the development of tourism in 2003, and there are two peak seasons, one between July and September and the other less marked between December and January. These peaks correspond with two dry seasons in Rwanda which coincide with holidays in the Northern Hemisphere, hence tourist seasons.



Concerning gorilla visits, the year 2003 realised an average rate of 63%, based on a maximum capacity of 32 visitors to gorillas a day, a maximum of 8 visitors for each group of gorillas visited in 2003: Susa, sabyinyo, 13 and Amahoro. In December, PNV had groups of 81 gorillas tamed for tourism. The details of these groups are indicated in the table below:

Table 5: Composition of gorilla groups tamed to tourism

	Silverback	Black back	Adult Female	Half adults	Juveniles	Babies	Total
Susa	4	4	11	3	4	11	37
Sabyinyo	2	-	3	2	2	1	10
13	1		7	1	1	2	12
Amahoro A	1	2	5	1	3	3	15
Amahoro B	1		3		1	2	7

Other PNV attractions available in 2004 are:

- Climbing volcanoes (Karisimbi, Bisoke, Muhabura)
- Visiting golden monkeys (two groups are habituated for visits)
- Nature walk (crater lakes, bird watching)
- Visit to Karisoke and the grave of Dian Fossey

Problems and threats to PNV

What are the aspects which undermine the integrity of Volcanoes National Park?

The chapter devoted to socio-economic parameters of the neighbouring regions showed a very important demographic pressure on one hand, and a strong dependence of the population on agriculture on the other, the two factors being linked to very serious poverty. These unfavourable conditions have immediate consequences of intensifying need in PNV natural resources, and therefore cause a big number of threats to the park and its biodiversity. This section draws up a list of these problems and threats which undermine the integrity of PNV.

Direct threats to the park

Poaching (destruction of wildlife)

Poaching big mammals

The destruction of wildlife represents a permanent threat on PNV. This destruction has continued for some years and it is manifested in different manner. The most common is the poaching of big mammals; the main targeted species being in the order of importance are bushbuck (*Tragekaogys scruotys*) and black fronted duiker (*cephalophus nigrifrons*) as well as the buffalo (*syncerus caffer*). The most classic method applied by the poachers is snare trap in nylon or metal. Traps or cables are laid across the path of animals, or are laid flat on the ground using bamboo pole as a springboard.



Figure 4 : Population increase is felt along PNV periphery and is the origin of all threats towards the park.. Photo: José Kalpers

Poaching of hyrax

The snares are also used for catching the smallest species such as tree hyrax (*Dendrohyrax arboreus*). The traps are placed on ground at the immediate proximity of the trees frequented by this species.

Poaching gorillas: Trafficking in baby gorillas

A threat which was almost disappeared between 1985 and 2000 is the poaching of gorillas. However, few cases were found out recently, which ranks this activity among the threats with the most significant impact considering particularly precarious status of the mountain gorilla. The main motivation of this type of poaching is centred on capturing young gorillas for sale to foreign traffickers. In order to succeed, the poachers are obliged to at least kill the mother of the targeted baby as well as the dominating male, and at times kill all the family.

Degradation of the habitat

Cutting trees and bamboo

Degradation of the habitat represents another category of serious threats in particular. This category regroups a series of activities which directly undermine the integrity of PNV. Cutting trees, especially bamboo, is very common especially on the western side of the park where vast bamboo forests are directly adjacent to rural land inhabited by the population. Bamboo is strongly required for the construction and the perfection of different art crafts: Baskets, mats, enclosures, etc. In Mutura District, the residents even use bamboo branches for thatching their houses.

Water collection

Fetching water is equally one of the most common activities in the western side (Mutura District), but also in Bisate (Kinigi District). The problem of water is seasonal in the volcano region, where porous soil does not enable the retention of water on the surface nor does it enable permanent flow of water. The population is then forced to penetrate into the forest to get water which is necessary for survival. This activity, however illegal, is tolerated by ORTPN. The presence and the movement of a number of "water fetchers" in the park especially during dry seasons, represent a potential supplementary threat as some of these people could be tempted to lay traps or go on to cut bamboo or other trees.

Pasture

In the past, there was a crucial problem of pasture. PNV has numerous grassland areas which are sometimes large, where grass attracts farmers and their animals. This activity is relatively limited today because there are patrols

operated by ORTPN and could easily detect them. All the same, the need for pasture still exists. The presence of domestic animals has consequences on the degradation of the habitat, by trampling, potential overgrazing as well as risks of transmission of diseases.

Uncontrolled fires

Forest fires constitute a source of serious degradation of the habitat because zones which are affected take many years, sometimes decades, to recover after the fire. Although the fires are rare, their effects are devastating. The eastern side of Muhabura has developed proper characteristics of regeneration probably because of repeated burning in the region. Bush fires in PNV are caused by several incidents: Malice, natural caused (lightening), poachers and honey collection activities.

Non-indigenous plants

Other than Eucalyptus and Cyprus species which demarcate the park, there is a series of exotic plants within the park; the fact which presents big risks as far as the integrity of PNV biodiversity is concerned. During the period of insecurity in 1997-1998, several thousands of persons fled to the PNV and lived there for 18 months. Some plants like wheat, tobacco, vegetables were grown inside the park which provoked the spreading of non- indigenous species. A cleaning excise was organised in 1999, but there may be some remaining unwanted plants in the park. But even if the threat may not be very serious, it is necessary to take the problem seriously, and always follow-up the situation regularly, using the existing programme of monitoring.

Loss of habitat (deforestation)

Since the creation of Volcanoes National Park in 1925, it has lost about half of its original size by appropriating vast Neoboutonia forests to the population for settlement or cultivation of pyrethrum. Just after the events of 1996 and 1997, the population had already started to clear the forest for cultivation of several hectares in the District of Bukamba on the slopes of Gahinga and Muhabura Volcanoes before being evicted from the park. The threats connected with irreversible consequences on the habitat are regularly recorded and have been well handled, but the pressure remains very serious and potentially disastrous.

Diseases

Population increase around the park has generated a precarious balance between the health of the population, domestic and wild animals. Persons infected with bacteria or some viruses are likely to transmit it to the three mentioned entities with disastrous consequences. The risks of transmitting

diseases between domestic and some species of big size like buffaloes or antelopes are obvious, such as animal tuberculosis or anthrax. The population of gorillas is also exposed to contagious diseases, especially those which originate from human beings such as respiratory or gastro-intestinal ones. Much as the gorilla is close to man, it is susceptible to these diseases and the risks are very high.

Human presence in the park

The presence of human movements inside the park constitutes another risk to the ecosystem which cannot be neglected, both at the level of associated possibilities of pollution and disturbances which can have important impact on animal behaviour, for instance of gorillas.

Tourism

Even if tourism is regarded in the framework of sustainable development, it sometimes has substantial risk. The impact of tourist activities deserves special effort in monitoring, and potential threats associated with it are the transmission of diseases particularly to mountain gorillas' population, trampling, wildlife disturbance and different pollutions.

Feral dogs

Feral dogs represent a crucial problem for some years. Domestic dogs which belong to poachers or simply the population living in the PNV environment enter in the park and chase wild animals regularly. For example they chase small mammals, the francolins and sometimes young antelopes. Other than the impact on PNV biodiversity, the presence of domestic animals presents the main risk in terms of transmission of diseases.

Bee-Keeping

Traditional beehives are regularly discovered in PNV and are destroyed. Beekeepers lay their hives in the forest and even if this activity does not presently represent a direct threat, it remains as the cause of other related threats such as risks of fire while burning the hives; the possibility of beekeepers being involved in other activities such as poaching, bamboo cutting or the fatal risk of bees stinging gorillas.

The districts most threatened by apiculture are Bukamba, Mutobo, Buhoma, Mutura.

Weaknesses

Inadequate planning

Since the beginning of the events which shaken Rwanda in 1990, the management and the conservation of PNV were carried out in emergency context, without taking care of defining long term planning objectives. Despite the fact that park has had some level of stability and security since 1999, ORTPN has not yet sought any other planning mechanisms other than annual action plan which is not very much respected in terms of allocation of financial, material and human resources. This weakness represents a significant obstacle which hinders the development of real strategies for PNV. One of the objectives of the Management Plan is precisely to correct this loophole.

Insufficient Management capacity

Other than the gaps within planning, insufficient management capacity represents another weakness which hinders smooth conservation of PNV. This insufficiency, mainly caused by instability in the region together with its institutions, is expressed at different level such as lack of vigour in the organisation and implementation of conservation and management activities, lack of coordination of different interventions from different actors and difficulties of involving grassroots authorities and local communities because of lack of vision and tools of mobilisation.

Restructuring process which took place from October 2003 has certainly helped improve the situation and to empower ORTPN in general, but what remains is institutional capacity for PNV which is still delicate and therefore necessitates particular attention in order to achieve long term development of professional and solid management.

Insufficient Human Resources (badly trained)

Despite the recruitment of new staff between 2003 and November 2004 (new officers and new field staff were recruited during the period), there are still some serious loopholes in terms of collective competences at PNV. Departments like community conservation, research or planning are completely new in all the parks under ORTPN management, and institutional capacity in these domains are practically non-existent. Human resources for implementing all the PNV management tasks necessarily need improvement, so as to establish a competent and efficient personnel at all levels of hierarchy. This improvement necessarily starts with identification of a vast programme of training that targets needs for PNV personnel, either collectively or individually.

Lack of scientific information on PNV and its environments

Although Virunga Massif in general and PNV in particular received special attention from scientific community, there is still more to be learnt on biodiversity. Many researches which were carried out in the past thirty years were concentrated on gorillas, especially their ecology, their behaviour or their genetic viability, but there were fewer studies on other domains of PNV biodiversity. Much taxonomy is hardly known these days, a fact which raises a real problem in terms of basic knowledge and intrinsic value of PNV. Initiatives were carried out in the diversification of research at the beginning of 1990 but the war and insecurity discouraged research institutions and donors who were involved in that direction, and for many years the only elementary activities in the domain of research were the monitoring of the groups studied by Karisoke Research Centre.

Conditions of the roads: Problem of access

Access to PNV from Ruhengeri or Gisenyi is still difficult and presents an obstacle to ORTPN, its partners and visitors at all levels of activity such as surveillance, community conservation, and tourism or in emergency intervention. The nature of volcanic soil, combined with thematic conditions and steep slopes, is certainly not favourable for construction of a reliable long term network of trails.

Some rehabilitated trails now are in bad condition after ten years of use and therefore necessitate a new important work. There should be lasting solutions, albeit expensive, in the shortest time possible, which will greatly enhance PNV management.

Problems of communication

Communication network present several inconveniences as follows:

- VHF antenna which enables walkie- talkie communication is now situated at the top of a hill in the district of Mutobo. This localisation is not ideal because long distance communication in the west of PNV is not possible
- There is a problem of recharging portable radio batteries in the patrol posts, a problem resulting from lack of electricity in the area
- Communication between PNV and Kigali has been a problem following a number of electric cuts which affected the country in 2004.

The management of PNV: Situation in 2004

*What are the Management and Administrative systems in place at PNV
(Situation in December 2004)*

This chapter describes the management and administrative systems existing at PNV at the time of the release of this management plan, which is in December 2004. It describes human resources (organisational structure and number), draws up lists of infrastructure and equipment as well as important elements of organisational and operational systems.

Human Resources

Before October 2003, the PNV had one simple organic structure with a warden and his Assistant, an officer in charge of communication, a guard corps as well as several categories of staff. Later on, ORTPN carried out serious restructuring which resulted into the establishment of modern conservation. The most remarkable changes constituted putting in place, both at Head Office level as well as at the national parks level, departments responsible for community conservation, planning as well as research and monitoring.

In December 2004, organic structure of PNV mostly conformed to the requirements in conservation and management of the protected areas as indicated in the organizational structure of the park.

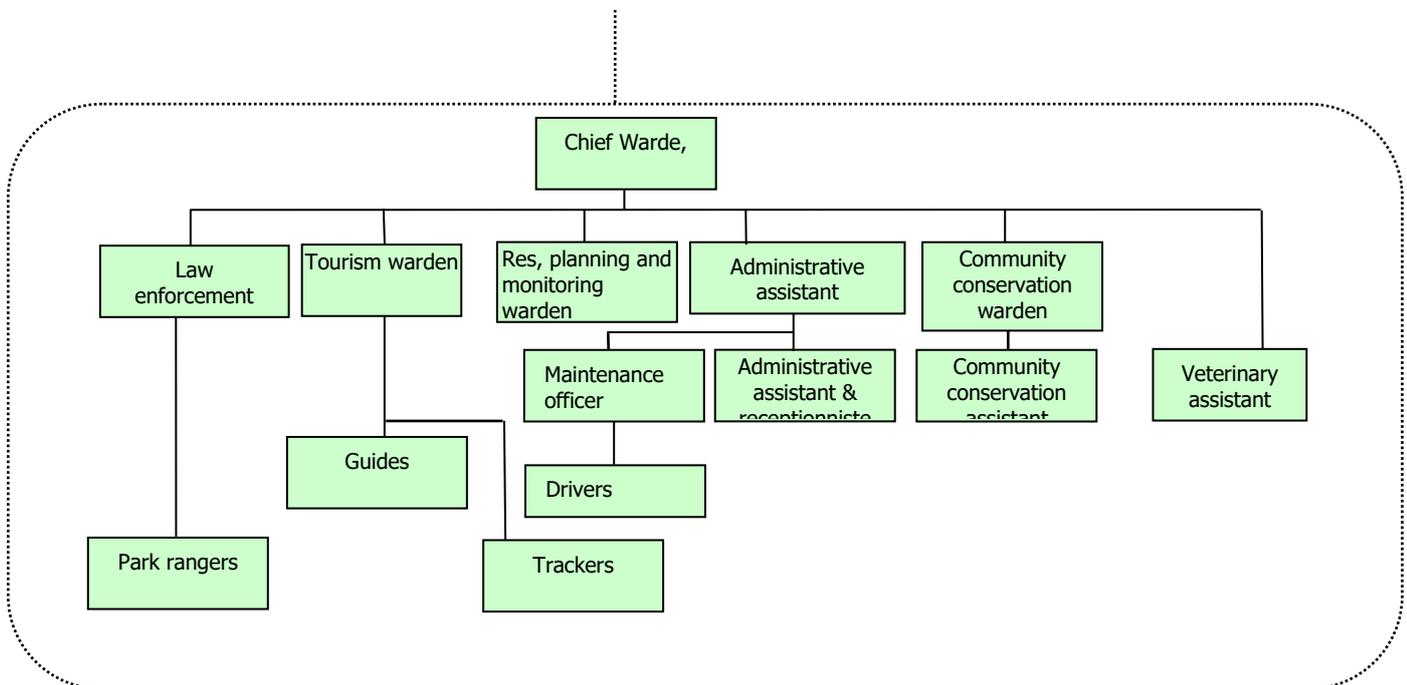
However, there are some loopholes in the structure as follows:

- Guard corps, guides as well as trackers don't have any hierarchy within their structures, which create problems of responsibilities during patrols or field work. Appointed team leaders are effectively at the same administrative level with other members of the team, and hence don't have official status which enables them to justify that higher level of responsibility and authority. On the other hand, as the guard corps and the trackers comprise a bigger number (around 30 persons each Corp),

assistant wardens in charge of these corps (tourism and protection) will necessitate having assistants at their disposal.

- During peak season there is overwork in tourist service and sometimes the number of guides and trackers don't correspond with the demand. In view of the policy of diversification of tourism attractions and the constant increase of visitors, the situation will continue worsening for months and years.
- Some staff recruited without having appropriate status (for example, assistant to the warden in charge of planning, research and monitoring, or the receptionist). This situation requires regularization on the part of human resources department in Kigali.
- The post of Administrative assistant/ receptionist is ambiguous: it means the person is under the officer in charge of Administration and Finance on one hand, and on the other, he is technically answerable to the warden in charge of tourism.
- The community conservation service only has two people, which is totally insufficient if ORTPN wishes to consolidate its new approaches towards partnership with the local population.
- Terminology utilized in organizational structure of wardens and their assistants lack coherence between English version ("chief warden" and "warden"), and French version ("warden" and "Assistant wardens").

Organizational structure (December 2004)



In December 2004, PNV personnel has a total number of 87 people, one of them having completed training in June 2004 but whose reintegration in ORTPN has not yet been regularized. The table "Human Resources" of chapter 15 gives details of these numbers, in categories and grades of personnel.

Infrastructure

The following tables indicates lists of PNV available infrastructure and commentaries on the situation

Type of building	N°	Surface	General condition	Notes
PNV office	2	7m x 7m x 2 x 2=196m ²	Good	
Chief park warden house	1	8m x 11m = 88m ²	Good	Currently occupied by commandant of 101 st Battalion
Housing for PNV staff	1	17m x 9m = 88m ²	Door and windows are damaged new paint is required	A house of six rooms. Currently H/Q of 101 Battalion Needs rehabilitation
Housing for guards and other PNV workers: Bloc I	1	9m x 25m = 225m ²	Door and windows are damaged new paint is required	A house with 7 apartments. Currently occupied by solders.
Housing for guards and other PNV workers Bloc II	1	9m x 28m = 252m ²	Idem	A house with 5 rooms, currently occupied by soldiers Need rehabilitation
Musanzu Patrol Post	1	8m x 17m = 135m ²	Still new	Occupied by sector 1 guards
Bisate Patrol post	1	8m x 17m = 135m ²	Needs rehabilitation	Occupied by sector III guards and trackers of Amahoro A and B groups
Kampande Patrol post	1	8m x 17m = 135m ²	Needs rehabilitation	Occupied sector IV guards and trackers of Susa group
Kabatwa Patrol post	1	8m x 17m = 135m ²	Its is still new	House for sector V rangers

Table 6: List of PNV Buildings (December 2004)

Equipment at the Disposal of PNV

A complete table presenting the current situation as well as the estimates of the requirements for the next 5 years is indicated in chapter 15, in section "Equipment"

Partners of ORTPN at PNV

The Volcanoes National Park, just like other national Parks in Rwanda is under the management of ORTPN. In order to complete its mission which is to protect and conserve the volcanoes national park and its bio-diversity, ORTPN works in partnership with a number of national and international institutions and organizations. PNV partners are of different categories and their domains of intervention are also diversified.

Non governmental conservation organizations

Dian Fossey Gorilla Fund International (DFGFI), through its Research Centre of Karisoke (KRC) which was created in 1967 by an American primatologist, Dian Fossey, is an old partner of PNV. KRC use around sixty persons and develops its activities in the following domains:

- Protection and monitoring: Teams of trackers and rangers carry out daily patrols, mainly in areas around Karisoke site.
- Research: Besides from doing long term follow-up of research groups (3 groups in 2004) KRC trains and coordinates a certain number of thematic researches in different domains
- Education: the center receives students every year from higher institutes of learning such as National University of Rwanda.
- Support for community development and sensitization of the population around PNV, mainly in the district of Kinigi.

International Gorilla Conservation Programme (IGCP) is a coalition of three conservation NGO's: African Wildlife Foundation, Fauna and Flora International and Worldwide Fund for Nature. PICG is the continuation at regional level, of "Projet Gorille de Montagne", founded in 1979. The main areas of activities of IGCP in PNV are:

- Institutional support and empowerment of ORTPN capacities in planning, logistical support, training etc;
- Support in Ranger Based Monitoring programme (in PNV and other parks in Virunga Massif);
- Community conservation and development of enterprises in the districts surrounding PNV (skills and crafts, apiculture etc.);

Dian Fossey Gorilla Fund Europe (DFGFE) is an NGO which now concentrates its activities outside the park. DFGFE main mission is to reduce the pressure caused by the population on PNV. Its main activities go through local NGOs such as ARASI, ARDI-beekeeping, AIMPO, VWC/R, MEA, FONCE, SATP-Imbaraga and Duterimbere. The main activities concentrate in the following areas:

- Construction and putting in place water tanks for rain water gathering

- Financial and logistic support for "Virunga Wildlife club", active in environmental education around PNV and Ruhengeri.
- Financial support for ORTPN (radios, batteries, generators for patrol posts and PNV Head office.
- Financial and logistic support for SATP - Imbaraga, active in sustainable agriculture which is integrated in the environment.
- Support for different local NGO's involved in income generating activities (bee-keeping, crafts, training, etc.), micro-credits, social integration of Batwa and for the Forum for NGOs for the conservation of environment.

Morris Animal Foundation is an American NGO which has been funding **Mountain Gorilla veterinary Project (MGVP)** activities for many years.

The main areas of intervention of this project are as follows:

- Veterinary follow-up of mountain gorilla population (interventions, regular monitoring of the health of gorillas and scientific studies)
- Medical treatment of the population living near the park and PNV staff.

Association Gorilla-France is not permanently in the field, but it regularly intervenes in PNV by supplying equipment such as work uniform, camping materials, etc.

Wildlife Conservation Society (WCS) started in 2004 the preparatory phase of a project of GEF-PNUD, which should in principle start off in 2005. This project will target development capacity in areas of biodiversity management in mountain forest of volcanoes and Nyungwe.

Non-governmental organizations for development

CARE International in Rwanda is regularly involved in the protection and sustainable management of PNV resources: plantation of trees in the districts around PNV, supplying improved equipment etc. CARE also initiated the construction of a protection wall separating the park and the land owned by the population in order to reduce damage caused by wild animals to the crops. Finally CARE RWANDA supplied goats and sheep to enable the population get income in a long term period

Since June 2002, CARE manages "Technical Support Cell of Support Programme for Decentralization and Participative Economic Development, PADDEP, an initiative funded by the government of the Netherlands. PADDEP gives IGCP and ORTPN support for the preparation of PNV management plan as well as for the development of small enterprises and the coordination of local development NGO's.

Government agencies and officials

ORTPN collaborates with a big number of official partners in PNV at both local and national levels. Among the most significant ministries are the ministry of commerce which is the mother Ministry of ORTPN, the Ministry of environment and the Ministry of Local Administration.

On local level, the privileged partners of ORTPN are the two provinces of Ruhengeri and Gisenyi, the 5 districts neighbouring PNV and the District of Ruhengeri Town. At the level of security services, PNV closely collaborates with Rwanda army, immigration and customs departments.

Concerning research and academic institutions, there is strong link with National University of Rwanda, IRST, KIST and other higher institutions of learning.

Private operators

A good number of private operators such as travel agencies and hotels enjoy good relations with ORTPN. The most regular operators bring tourists to PNV almost every day, which creates good relations. Some operators like Volcanoes Safaris (whose Headquarters is in Uganda) have established a programme for capacity development in the areas of tourism with the support of Business Linkages Challenge Fund, an initiative of British government.

Zoning of Volcanoes National Park

Geographic base of PNV management programmes

Zoning is a planning technique which enables evaluation and classing areas according to the values of resources, sensitivity and the desired conditions or objectives of the management of the protected area. PNV protected area is very interesting because of three main reasons: Firstly there is clear demarcation between the park and the population neighbouring it. Secondly, relations between the local population and the park are often characterized by conflicts. Lastly in 1983 PNV acquired the status of biosphere reserve which is based on the concept of zoning.

PNV zoning plan is also to be a permanent tool for coordinating all the activities which are done around the park so that the management of this ecosystem can be as rational as possible. It is a tool which draws up a geographic base for all management programmes which will be developed both inside and outside PNV. The demarcation of these zones and attribution of these activities are not rigid. They can be modified by judicial authorities, ORTPN and its partners particularly in case of PNV, taking into account the existing opportunities and constraints.

In the context of PNV, zoning plan is divided in two essential parts which are zoning outside the park and zoning inside the park. The first one has three categories of zones: development zone, buffer zone, and administrative zone. Concerning internal zone of the park, there are six zones: research zones, multiple uses zone, administrative and development zone, zone of high protection, the zone which was cultivated in 1996-1997 and tourist zone. After the analysis of different zones this part will deal with regional aspects which would facilitate good management of the three national parks of Virunga Massif.

PNV : MANAGEMENT PLAN

Table 7: PNV zoning plan. Categories of zone, criteria and authorized

Management zone	Criteria /Data utilized	Activities
1	<ul style="list-style-type: none"> Habitat of rare or threatened species (alpine and sub alpine zone) <p>Les senecios</p> <p>13 orchidacées mentioned by CITES: <i>Helichrysum quilelmi</i>, <i>disqa starsii</i>, <i>polystacya Kernessia</i>, <i>Arsaena mildbraana</i>, <i>calantbes sylvatica</i>, <i>Chamaengis sarcophylla</i>, <i>Cyrtorchis</i>, <i>arcuata</i>, <i>habenaria praestan</i>, <i>polystachya kermessia</i>, <i>Virectoria major</i>, <i>stolzia</i>, <i>cupugliera borsofallii</i></p> <ul style="list-style-type: none"> very delicate ecosystem at the summit of volcanoes <p>(Very uneven slopes)</p>	<p>Tourism is prohibited except in trails</p> <ul style="list-style-type: none"> Panoramic viewing Observation of nature Very limited research
2	<ul style="list-style-type: none"> Habitat of two endemic species in danger listed by UICN in albertine rift Mountain gorilla (<i>gorilla beringei beringei</i>) Grauer's rush warbler (<i>brachypterus graueri</i>) Habitat of 3 vulnerable species listed by UICN: <ul style="list-style-type: none"> African elephant (<i>Luxondata Africana</i>) Senegali de Shelley (<i>criptosyaza shelleyi</i>) Golden cat (<i>Profelis aurata</i>) 2 almost threatened species listen by UICN <ul style="list-style-type: none"> Grive de Kivu (<i>Zootheratangajicoe</i>) Black fronted duiker (<i>cephalophus nigrgriffons</i>) Small swamps at high altitude 	<p>Controlled tourism and research:</p> <ul style="list-style-type: none"> Visit to gorillas and golden monkeys Nature walk Observation of nature Camping prohibited
3	<ul style="list-style-type: none"> Habitat of endemic species in albertine rift which are not found in category 1 or 2 Habitat of heterogeneous species 	<p>Moderate tourism and research:</p> <ul style="list-style-type: none"> Some tourist and administrative infrastructure (camping for tourists, camping for patrols)
4	Zone cultivated in 1996-1997	<ul style="list-style-type: none"> To be recovered (naturally) To carry out regeneration follow-up
5 5.1 5.1.a 5.1.b 5.1 c 5.2 5.3	<ul style="list-style-type: none"> Number of illegal activities Proximity or name of the park Density of the population 	<p>Development of socio-economic activities and infrastructure so as to reduce the dependency on the resources of the park by the community living around the park:</p> <ul style="list-style-type: none"> Income generating activities (farming, small businesses, crafts, etc...) Socio-economic infrastructure (education, health, communication, water, energy etc.)
6	<ul style="list-style-type: none"> Cross-border parks Animal transition zone Source of certain illegal activities 	<ul style="list-style-type: none"> Mixed patrols (Bilateral and/or tripartite) Common management plan (same radio frequencies, permanent information exchange, etc.) Put in place a comity for coordination at three parks level

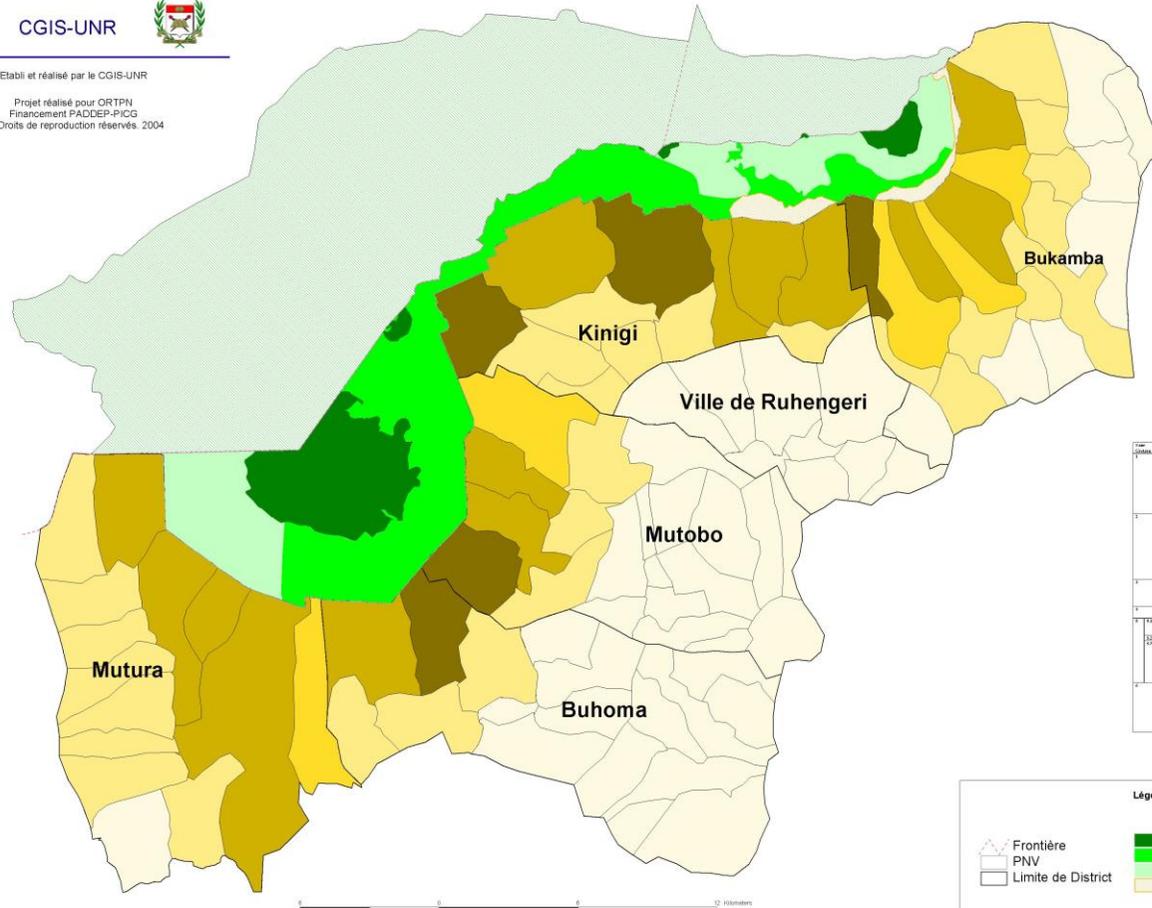
Parc National des Volcans

Plan de Zonage



Etabli et réalisé par le CGIS-UNR

Projet réalisé pour ORTPN
Financement PADDEP-PICG
(c) Droits de reproduction réservés. 2004



Zone	Description	Caractéristiques
1	Zone 1	Zone 1
2	Zone 2	Zone 2
3	Zone 3	Zone 3
4	Zone 4	Zone 4
5	Zone 5	Zone 5
6	Zone 6	Zone 6

Légende

- Frontière
- PNV
- Limite de District
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5
- Zone 5a
- Zone 5b
- Zone 5c
- Zone 2
- Zone 3
- Zone 6

Source: ORTPN/PICG, RGPH, 2002, WCS, 2003, McNeilage A., 2003

Carte réalisée par Mr Eugène Kayijamahe avec la participation de Mr Gaspard Rwanziriri et Dr Michèle A. Schilling

PNV : MANAGEMENT PLAN

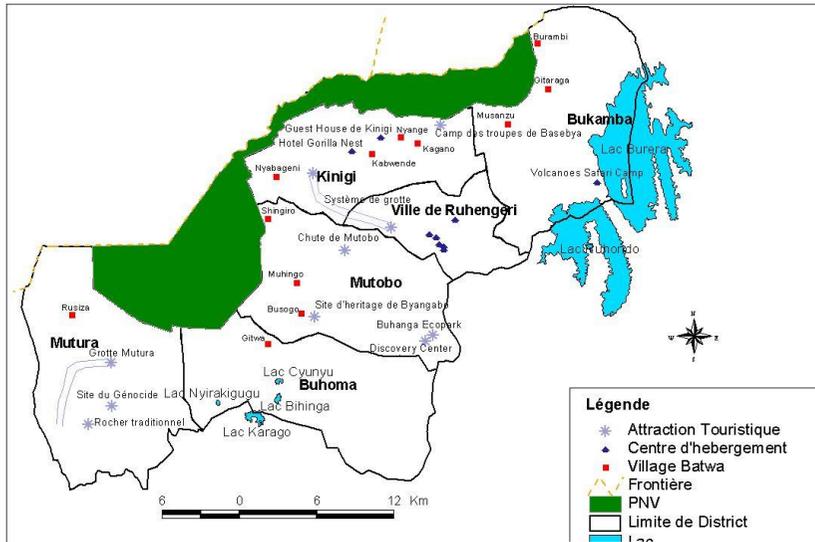


Figure 6 : Tourism zone outside the park

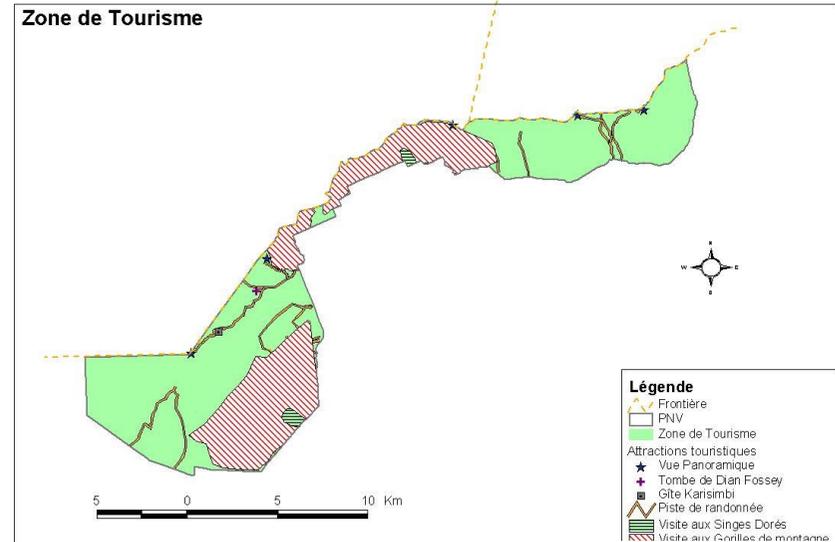


Figure 5 : Tourism zone inside the park

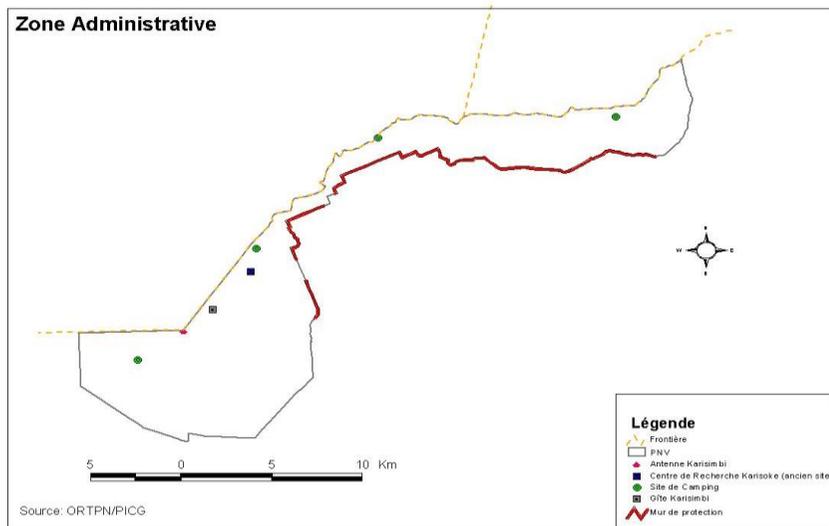


Figure 8 : Administrative and development zone inside the park

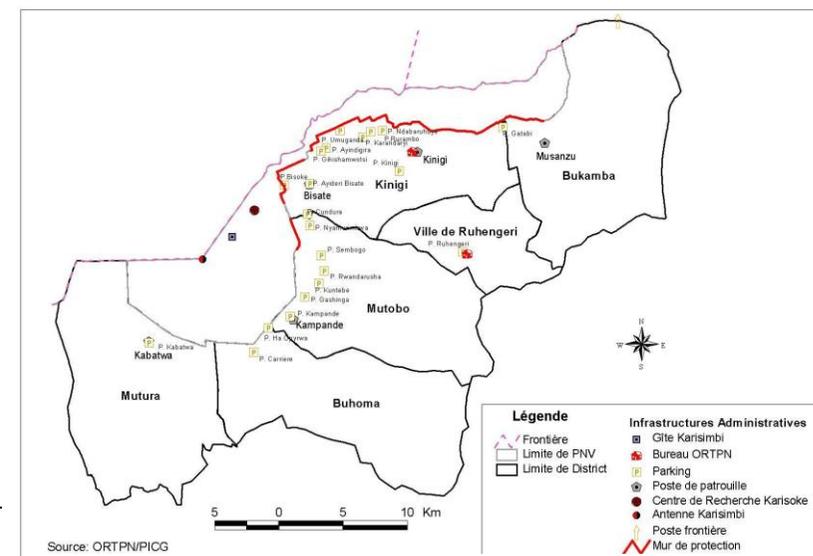


Figure 7 : Administrative zone outside the park

Values and Objectives of the PNV

Why is important to protect Volcanoes National Park?

Does the protection of Volcanoes National Park constitute a luxury in the demographic and socio economic context of PNV neighboring areas? The justification of the preservation of a protected area such as the PNV has first of all to go through the identification of objectives and values, intrinsic or otherwise, which gives to such a site a unique importance. This chapter reviews the reasons that explain this importance.

Principal Objective of PNV

The management of Volcanoes National Park has a primary objective of conserving her natural values in a sustainable way. These values represent the fundamental characteristics that will guide all operations in matters of development and management. In this context, it is essential to define the values underlying the conservation and management of PNV.

PNV represents a double interest; on one hand there is the conservation of biodiversity that it shelters, and on the other hand the economic contribution at local and national level.

Values of PNV

On international level

PNV is part of the Albertine Rift, a very important geological and ecological structure in the region of eastern and central Africa. As such, the park is a home to a bigger number of the fauna and flora species that are endemic to the sub region.

The park has the privilege of sheltering of one of the four big primate species that are found on earth. That is the Mountain Gorilla, which is endemic and an endangered sub species that lives only in two massive forests of Bwindi impenetrable National Park and the Virunga mountains of which the PNV is part. Mountain Gorillas have also become symbol of hope for Rwanda by attracting thousands of international tourists annually.

More than being a mere tourist attraction, Gorillas have become real symbol for Rwanda and plays an important role in uplifting the country's image on the international scene.

Together with her neighbours, Uganda (Mgahinga Gorilla National Park) and Congo (Parc National des Virunga) respectively, PNV forms the Virunga mountains, a unique trans-frontier in the region the world that is a subject to the first experiences of the regional collaboration for several areas. In the region that is affected by armed conflicts and insecurity since almost 15 years, Virunga Massif represents not only opportunities in matters of concerted management of biodiversity among the three countries' administrations, but it also offers the potential to contribute towards the stabilization in the sub region. Discussions on this issue are underway for quite some time to put in place a trans-frontier world heritage site (UNESCO).

Across the African continent, high altitude ecosystems have been for years invaded, destroyed or threatened. Few afro-mountain typical forests have been left intact in Africa and such areas are found in the eastern and central Africa region. The Volcanic chain represents one of the rare areas with a complete variety of vegetation zones, including the highland forest (mixed forest and forest with neoboutonia), with alpine level located at more than 4000 m of altitude, passing by bamboo zones, hagenia, arborescent heather, lobelias and giant senecios. This habitat succession present in PNV is certainly remarkable and highlights a unique ecological interest inherent to Virunga massif as far as ecology is concerned.

Formerly considered by the first historians as <the mountains of the moon>, Volcano Mountains possess an undeniable value as far as landscape and aesthetic are concerned. These mountains can even be seen at a distance of 100 km and above, and offers an extraordinary panorama that change according to perspective and season. The slogan "Rwanda nziza" derives its significance to a visitor's tour the mountain ranges on foot especially in the rainy season when the sky is clear and offers exceptional sight.

In 1925, Volcanoes National Park was part of Albert Park, the first national park ever created on the African continent. In that connection, PNV like its neighbors in the DRC, Parc national des Virunga, represents a unique symbol in conservation matters, a historical land mark second to none.

Scientific values: the diversity of ecosystems in PNV and its endemic richness gives scientific, national and international community extended opportunities on research are either fundamental or applied. Long term programs on mountain gorilla population done since the pioneer study of George Schaller and perpetuated by Dian Fossey and Karisoke Research Center are unique in the world and necessitate a continuous follow up. Numerous PNV taxonomy remains unexplored and offers wide range for scientific research in different fields.

The international community attaches a very important value to PNV: as a Biosphere Reserve (MAB program of UNESCO), PNV is privileged to have a special status and is part of protected area covering a wide range of representative ecosystems of the world biodiversity.

Volcanoes National Park through MAB program assumes the three following functions, namely: conservation, education and development.

On national Level

Climate regulation and ecological services: Regional Natural forests play an important role on the regulation plan of precipitation. It rains three times more in virunga volcanoes than in the neighborhood. In the Virunga massif, more than 300,000 persons directly depend on water supply from the forest; otherwise, precipitations generated from volcano area feed many water sources and rivers at national and regional level. While PNV represents only one percent of the total surface area of Rwanda, it is estimated to be providing around 10% of the country's rain. In the context of a national economy that strongly depends on agriculture, PNV plays a role of "water hoard" for all the neighboring regions and plays an important role in the regulation of balanced climate.

Although PNV is the smallest national Park in Rwanda, it represents a real economic resource in the real sense. Gorilla visits in PNV generate several millions of dollars every year directly or indirectly. Income gained from visit permits allows direct financing of almost half of the needs of all national park networks managed by ORTPN. Gorilla trips develop the whole sector of travel agencies, hotels, restaurants, and different tourist operators essentially contributing to the national economy. After tea and coffee, tourism represent by order of importance the third most important income earner in Rwanda, and Gorillas are the flag bearer.

Even though few Rwandans visit PNV today, the park represents the potential for attraction of future generations who will carry out research on natural sites and national destinations on a daily basis or during the weekend. Domestic tourism is not yet well developed in Rwanda but could expand in the coming years.

Natural, cultural and spiritual characteristics of PNV provide access to education and interpretation to the target audience on different levels of education such as: primary, secondary, university education, other higher institutions of learning, local communities and the whole public at large. Biosphere Reserve network, of which PNV is part, plays an essential role in matters of education and it provides a very important opportunity for exploitation in future.

On local level

Other than national importance of PNV at the level of climatic regulation, forest ecosystems and volcanic nature of soils extends to the region around the park an incomparable fertility in Rwanda. The economy of Ruhengeri and Gisenyi provinces strongly depend on agricultural activities which is very productive, due to the fertility of the soils which is directly a result of the presence of PNV.

PNV and the consequent tourist initiative significantly contribute to the local economy. Numerous jobs are created, either by ORTPN directly, or from other activities connected with tourism, such as hotels, restaurants or art crafts. Of recent, ORTPN has been involved in sharing its revenue with the local community, which will fortunately have a positive impact on the local economic plan.

Although extraction of resources from the National park is prohibited in principle, the park represents a real source of natural resources for the whole of the neighboring population. Water, bamboo, medicinal plants and weaving materials constitute resources seriously needed by some groups of users such as traditional healers or artisans. In the course of centuries, the forest has been subject to different uses: subsistence hunting, traditional dresses, beekeeping, pasture, etc...

For the population leaving around PNV, the forest represents yet a spiritual inspiration. Formidable elements like the volcanoes, caves, typical forests or animals present in the park are real sources of legend, beliefs or rituals. Interestingly, vulnerable groups like Batwa have a very spiritual approach towards the forest.

Management programme 1: Law enforcement

Rwanda is one of the most populated countries in Africa and PNV region has the highest human population density. More than 90% of the population lives in rural areas and practice agriculture. Also, as natural resources diminish, the population growth exercises sharp pressure on available natural resources. It is in that framework that PNV, like other national parks that are now under ORTPN management were created in order to safeguard their natural biodiversity that was really threatened. Legal texts that established PNV date back in the colonial era and their application was successively entrusted to different institutions before it was transferred to ORTPN after its creation in 1974. However, despite these legal frameworks, PNV continues to face threats in terms of the natural resources and ecosystems.



Figure 9 : The cable in nylon or in metal is the most used by poachers in PNV. Photo: Charles Nsabimana

Conservation of natural resources represents a national preoccupation in our times. This preoccupation is expressed through a series of legislative tools on environment, the protection of humid zones etc. Rwanda signed and ratified several international conventions which empower national efforts towards conservation of biodiversity and natural areas. Despite the difficult period that followed the 1994 genocide, collaboration with law order services (army, police and the judiciary services) facilitated in maintaining efforts to guard our protected areas.

In order to reduce the conflict with the neighboring population, strict application of law on PNV will be having an approach of community conservation. To make this application effective, emphasis must be put on improvement of infrastructure and equipment, especially those of communication, regular training of team guard and trackers, and improvement of patrol reports (ORTPN strategic plan)

Objectives of law enforcement programme

- To ensure integrity guarantee of Volcanoes National Park;
- To ensure effective management of wild fauna and flora and their products.

Main lines of interventions and actions to carry out (2005-2009)

Protection of ecosystems: forest fire

Even though fire is rare in PNV, the risk always exists. Already, Uganda and Congo side of the park have this problem regularly. Some years ago, there was fire on Ugandan side of Sabyinyo and it took several weeks to totally control it. This fire also touched a little part of Rwanda side of the volcano. Fire, especially the one that attacks arid altitude, could ravage the soil at a very big depth and destroy or damage vulnerable alpine vegetation permanently. The origin of this fire is generally human, honey collectors, and also poachers, are all often responsible. There are only three possible tactics for limiting damage caused by fire:

- Preventing fire by strengthening surveillance of illegal activities such as honey collection and poaching.
- Working out a program for controlling fire in case of break out, with help from the local authorities and the neighboring population
- Ensuring regular and efficient communication with management authorities of two neighboring parks in DRC and Uganda in order to prevent fire passage beyond borders.

Ant poaching

Ensure integration of surveillance programme with community conservation programme

These two programs cannot be developed independently because it would risk creating confusion and offset productive results. Development of a confidential atmosphere between the park and the communities constitute a difficult objective to be achieved, which would probably take several years of activity on community conservation program. The relation of confidence remains delicate and could be put to danger by applying law actions, if this is not done in conjunction with officials of community conservation department.

At the national level, develop a mechanism of fine sharing charged on park defaulters between ORTPN and local authorities.

When offenders (poachers, wood cutting or bamboo, domestic animal grazers or others) are seized and fined for their offences, the money generated should be shared with grassroots community (at sector or district levels) according to mechanisms to be discussed and defined at national level. This method is practiced in some neighboring countries like Uganda and seems to be fruitful enough in the framework of collaboration between park authorities and the neighboring population. In case of PNV, this system will enable grassroots authorities to partially invest in the task of applying the law, due to that kind of motivation based on economic proposal. Such mechanism of course necessitates putting in place clear and transparent modalities aimed at joint management and repression of illegal activities and offences

Increase of the number of patrol rangers to 54 and construct a supplementary patrol post.

When we analyze the current system of patrol posts, one realizes that the posts are far apart from each another, especially at the level of Mutura District. A supplementary post has therefore been proposed between Kabatwa and the border with DRC in order to enable the better patrol coverage of sector 5 of PNV.

It is equally necessary to strengthen the present number of rangers in each post to cater for those on leave or absent for different reason (sickness or other circumstances) and to make sure that patrol groups in the forest are strong enough. Each post should have a total of 9 people, 3 of whom would take rest or would guard the post while 6 rangers would be in the field.

Ensure adequate training for law enforcement personnel

For recruitment, patrol guards should possess primary school certificate, except in case where the person has intrinsic qualification of exceptional nature but whose level of education is short of what is required. Another important element to consider for selection of staff of the park is their geographical origin. Creation of employment represents an essential factor in a series of income, which PNV extends to the local population, and the “affirmative” action that covers all of its importance.

The current personnel have a relatively satisfactory experience in PNV and poaching problems. However, ORTPN should aim at the highest level of confidence and adopt professional approach of surveillance and anti-poaching. In that framework, basic training and refresher programs should be conceived and implemented. Training institutions or high level individual trainers will be identified in the countries that possess these resources (Kenya, South Africa, International

Ranger Federation, etc...), and each training initiative will be well evaluated and consolidated by responsible protection departments and human resources.

To revise law enforcement department structure and establish a hierarchical system

Currently there is no intermediary grade between assistant warden in charge of protection and patrol guards. This situation poses a serious problem in the sense that patrol teams do their work without real team leaders in the form of hierarchy. The function of a team leader is relatively informal without real responsibility. This system should be revised and there is a proposal of putting in place new hierarchical level for protection department: The creation of a post for assistant deputy Warden (equivalent to the old position of Chief brigadier (Brigadier en chef) on one hand, and on the others, the creation of at least 8 posts of team leaders (equivalent to the 6 proposed patrol posts + 2 reserve persons in case some of them go for leave or are sick). It is not necessary to launch supplementary recruitment for these posts but instead, identify people from within the existing force who can be promoted to these posts through a process of transparent selection.

Acquire of adequate equipment and field materials for surveillance and protection

In order to offer efficient and performing protection to the department, the following equipments were identified:

- 1 vehicle specially used in protection and surveillance activities
- 3 quality uniforms par guard and per year
- 6 rifles for each patrol post, being a total of 36 arms
- 2 VHF radios for each patrol post
- 1 VHF repeater, to be positioned on Karisimbi mast (to be negotiated with concerned authorities)
- 2 GPS 1 altimeter and a pair of binoculars for each patrol post
- Equipment to be given to each person in the protection department, and the individual would be responsible for his own equipment

The equipment items are as follows:

- Sleeping bag
- Camping mattresses
- Travelling bag
- Pullover
- Centurion
- Gum boots
- A pair of leather boots,
- Water bottle

- Socks
- Impermeable jacket and trousers.

- 20 tents for 2 persons each
- Camping mater

Modalities of acquisition of this equipment will be the subject of discussion between ORTPN Head Office in Kigali and PNV, particularly on what concerns the norms of quality, period of replacement of items such as socks and individual or collective responsibilities as far as routine duties are concerned.

Develop integrated strategies of surveillance and protection.

Different types of utilized patrol (routine, under tent, mixed, choc, ambush and gorilla tracking) should be combined in a manner of exploiting available human and materials resources at the maximum, and giving the biggest protection coverage possible in time and space.

In particular, the following should be done:

- To alternate and diversify static patrols (starting from patrol posts) with mobile ones, judged to be more efficient as far as surveillance is concerned. The patrols under tents especially, national or mixed (bi-national or tri-national) whatsoever should be multiplied.
- To put in place a system of rotation in order to increase efficiency and patrol coverage under the supervision of a warden in charge of protection in PNV,
- To ensure that there is a handover during each rotation of patrol teams, especially in handing over equipment and information concerning surveyed zones.

To continue the development of a protection wall bordering PNV

The protection wall that partially surrounds PNV fulfills a double function: first of all, it enables to a certain extent, keeping wild animals in park (especially buffaloes) away from the farms of the neighboring peasants, and secondly it physically demarcates the park. Until December 2004 a total of 35kilometers of wall was constructed in collaboration with the population in the sectors neighbouring PNV, out of a total length of 60 km of the park. ORTPN should continue to build the wall and ensure that maintenance and repair mechanisms of constructed areas remain efficient.

Intelligent and prevention

Prevention: Establish a system of sensitization targeting grassroots authorities and institutions.

This type of prevention is consisted of ensuring participation at grassroots administrative level (districts, sectors and cells) which would play a role in detecting illegal activities before they are committed. Thanks to their deep knowledge of the area and the local population, grassroots authorities who are willing to learn intrigues of their subjects and also have more gripe on the member of the community who break the law. Because of this social pressure, illegal activities should be defused before they reach serious proportions. But before arriving at such result, ORTPN should carry out sensitization campaign among these authorities so as to develop relations of collaboration and trust. PNV staff should particularly put emphasis on the following points:

- Articulation of messages concerning management by the community (PNV and its available resources): one of most frequent observation especially among the poor rural communities is lack of consideration of common property that is regarded as if it is nobody's business.
- Encouraging local authorities to make the population respect laws and regulations.

It is important to note that prevention is also concerned by the programme of sensitization intended for the neighboring community. Details on this activity are found in the chapter dealing with community conservation

Intelligence and search of information

Detection and apprehension of offenders is not only done in the forest. Just like all disciplines that are concerned with application of law, the protection of natural resources and the struggle against poaching calls for information which can be obtained by different means available. This type of activity will be developed within the period covered by this management plan, and will articulate on the following domains:

Ensure training of ORTPN staff in the areas of gathering information and intelligence

Gathering and management of information based on research network, whether in rural or urban areas, necessitates mastering a good level of competence that can only be obtained through specialized training. It is important to identify the best source of information, first at national level (e.g.

from law enforcement agents or security services) as well as regional or international levels (institutions or specialized individual trainers).

Develop a network of permanent or temporary informants

At the beginning this is intended to identify individuals who belong to the communities or not, who can provide information on the intrigues visible or potential of offenders. This information would be organized by PNV in real networks that would put in place the biggest coverage possible in the districts neighbouring the park.

Develop guidelines for utilization of informants' networks

From the beginning, it is the priority of ORTPN (even at national level) to put in place a clear framework highlighting a certain number of guidelines at the disposal of staff in charge of gathering information from informants network. The following points should be taken into consideration, without necessarily forming an exhaustive list:

- Mechanisms of grouping information: It is sometimes necessary or useful to have several sources which can allow convergence of different intelligence sources towards the same conclusion
- Motivation of informants: it is necessary to put in place a system of incentives, be in terms of remuneration or any other facility (for example increase of protection and security of informants). Informants are often in risky situations vis-à-vis their colleagues or fellow citizens, and it is necessary to guarantee their protection, or at least reduce their exposure to reprisals.
- Ethics: instead of letting each PNV person involved in gathering information on his own, it is necessary to establish possible clear limits, which should not be surpassed so that certain simple ethics can be respected.

Collaboration with authorities in charge of application and dissemination of law and follow-up of infraction

At the national level, production of exhaustive legal text integrating all aspects related to conservation.

This is a common problem in all the National Parks of Rwanda, and at institutional level. Legislation on conservation is scattered in a dozen legal texts that cover a period of about 70 years, resulting in big confusion and serious loopholes. The work will start with revising the existing texts and proposing a new law the most exhaustive possible, which will particularly indicate aspects concerning sharing incomes, clarification of park boundaries, the mandate of ORTPN, rehabilitation of damages (to persons and property)

caused by animals from the park and the role and competence of staff in charge of surveillance

Compilation of the existing legal texts and production of an improved version

The production of a new law on conservation risks taking a long time (2-3 years) Meanwhile, ORTPN managers is eager to provide agencies in charge of law and order, and law implementers the most competent and less confusing information. In order to do so, it is important to gather the most pertinent texts in matters of conservation by filtering the main elements and then translate them into clear and non-ambiguous terms. This summary will be a vulgarized version of the law and can be distributed to all involved actors in its application

To develop of systems of dissemination of legal texts to services involved in the project

Other than the distribution of summaries of the legal texts, it is also necessary to envisage other techniques of dissemination of this information such as organization of training or informal contacts with the maximum number of stakeholders and parties in matters of legal application: ministries, local government, police agents etc.

Mobilize different services involved to be equipped with legal texts

Despite the fact that ORTPN and its surveillance services possess the main mandate of surveillance and protection of the national parks and the wildlife, application of law, whatever it is, is the affair of all services involved in that domain. These services should anticipate well-founded of conservation and ultimate reasons that necessitate respect of laws in place.

Carrying out joint sensitization operations and application of law with authorities and law enforcement organs

This activity will not only enable consolidation of collaboration between ORTPN and concerned services, but will also strengthen the profile of the institution towards the neighboring population particularly by making them understand that law is an affair of everyone.

At the national level, to clarify the status of ORTPN staff as OPJ (CID)

As an agency endowed with the mandate of applying the law, ORTPN, in principal, has the right to entrust some its staff the status of officer of the Criminal Investigation Department (CID), with acceptance from the ministry of justice.

This arrangement is anticipated by the law and currently seems to cause problems or does not seem to be clear to all the stakeholders.

To encourage different services involved in law application and respect of sentences

A regular problem that was observed in applying the legal texts concerning the conservation of natures is the slight perception of the importance of respecting laws and regulations on the protection of the park and its wildlife. This bad conception generally makes the tribunals exercise a lot of forgiveness towards offenders who break these laws, or shortening their sentences in prison. It is indispensable to correct such state of affair, especially in contributing to the change of attitude in that domain.

To ensure good interpretation of law by security and judicial services.

The existing confusion on legal texts governing the conservation of national parks and wildlife often carries bad interpretation on the part of concerned parties. ORTPN should make sure that all offenders are fairly taken to justice and punished according to seriousness of the offences they committed.

Regional aspect

The strategies indicated below comprise simple recommendations which should be the subject to validation by wildlife authorities competent in matters of regional collaboration: tripartite meetings of directors of protected area agencies, committee of coordination of the wardens of 4 mountain gorilla parks, alternate references in the management plans of the neighbouring parks.

To develop communication networks

These communication networks are vital because they facilitate exchange and dissemination of information between the managers of 4 national parks particularly 3 national parks that constitute Virunga Massif. The following activities were proposed but they are not exhaustive in the domain of exchanging experience and information:

- Intensification of regular meetings between the wardens of 4 parks (“coordination committee”)
- Pursuing regional meetings organized quarterly by IGCP
- Ensuring weekly communication between the parks
- Utilization of common radio frequency or mobile telephone satellite.

To intensify joint patrols between countries that share Virunga Massif.

Whether bipartite or tripartite, these patrols are particularly important because they not only facilitate achieving spectacular results in terms of output (they receive considerable material and logistic support and involve competent and motivated personnel), but they also represent an essential tool for strengthening “morale” and regional collaboration.

To ensure existence of agreements that facilitate cross border movements of the guards

In case where guard patrols happen to pursue offenders who cross international borders, it is very important to clarify provisions that are applied in that kind of situation, specifically in legal matters concerning pursuit of offenders on the territory of neighbouring countries. If such bilateral or trilateral agreement exists for security agents, it is important to find out if they can be applied by ORTPN staff. Otherwise, there should be remedy for such loopholes and find appropriate modalities.

To evaluate legal considerations regarding cross-border movements of staff in protected areas.

When ORTPN workers participate in mixed patrol with their Ugandan or Congolese colleagues, they are made to frequent zones situated outside Rwandan territory. Such situation requires legal considerations, such as insurance in case of accidents, use of communication and security equipment.

Chapter 11

Management programme 2 : Community Conservation

The Involvement of the local population is essential for sustainable management of the protected areas. Otherwise, the local population will consider these protected areas as a source of problems or as a concept that is imposed on them by the Government or by the western world.

Since the establishment of the Rwanda Office of Tourism and National Parks (ORTPN) in 1974 and until recently, there has never actually been any establishment of any structure that allows the involvement of the local communities in the conservation, nor has there been any tangible attempts to demonstrate that conservation contributes to the development of the population.

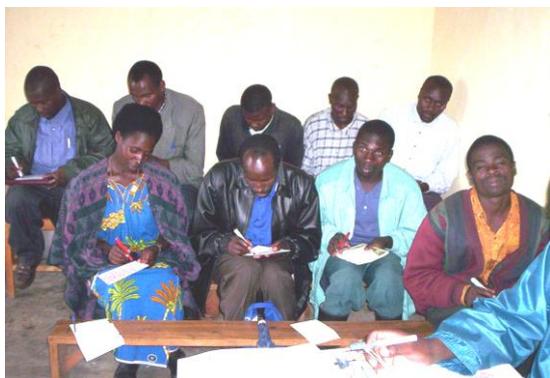


Figure 10 : The success of PNV sustainable conservation strategies rely on the involvement of neighbouring communities.
Photo: Nsabimana Charles

In the same perspective, there is no mechanism that helps to resolve conflicts such as those resulting from damages caused by wild animals. The possibility of access to resources and development of a system for sharing revenues generated from tourism has never been envisaged. In general, conservation activities were limited to repressive aspects aimed at reinforcing the law, which were often a source of tension between local communities and protected area management.

Protected areas continue to face permanent pressure from local communities and are subjected to a wide range of illegal activities. The ever-increasing population characterised by a high level of poverty exerts a considerable pressure on protected areas. Land demand constitutes a constant challenge that undermines conservation efforts in Rwanda. For instance, the three national parks managed by ORTPN have generally lost 51% of their surface area since their establishment.

In the new framework of the ORTPN structure, a department has been established in order to reinforce and co-ordinate all initiatives aimed at involving local communities in the conservation. This structure will enable the definition of orientations, mechanisms and ensure the monitoring of community-based activities as well as the success of the conservation sensitisation campaign. This structure is being created at an opportune moment and will benefit from the support of

decentralised structures which have already been established at the local level, especially the Community development Committees (CDC). Each committee is composed of members elected by the community and a member in charge of environmental problems within his community. The presence of the CDC and the emphasis put on environmental management will lead to increased participation and more responsibility in the management of protected areas.

Objective of the community-based conservation (CBC) programme

To ensure an active and effective participation of neighbouring communities in the conservation of the Volcanoes National Park (PNV).

Major areas of interventions and actions to be undertaken (2005-2009)

To improve relations between PN V and the surrounding local communities

Lack of relations and linkages between the park and members of the local communities is a result of the fact that there are no channels of communication and interaction that would enable dialogue, concerted planning and mutual consultation. As a result, members of the local communities do not appreciate the importance of the park and of the conservation in general. They reject any form of law enforcement. Eventually, local authorities and communities consider good practices of management as a mere bother. All these actions create rejection and disgust.

The habit of not involving local authorities and members of the communities in the decision making on problems that affect their lives and their welfare frustrate them and excludes them from finding solutions to problems related to the management of the park.

Imposing the manner of implementation of certain projects adopted at the national level such as tree planting along the borders of the park, creates suspicion among the populations as they do not understand the justification of the projects that are imposed on them by the State. This habit creates suspicion and lack of confidence which does not motivate members of the local communities to promote other programmes of the park. Although the tree planting initiative is in itself good, this activity was dictated from above and was not very well understood by members of the local communities.

Attitudes described above indeed create tension and conflicts in the relations between the local community and the park management. Efforts by the local authorities in fighting against illegal activities and by trying to promote conservation of the resources of the park become fruitless. Given the problems mentioned

above, the recommendations that have been conceived for the next five years are below:

- To identify existing structures within the local administration which can resolve problems of the park and park authorities (preferably to use the existing institutions).
- To develop directives for the resolution of conflicts (illegal entry, destruction caused by wild animals, interpersonal conflicts between the personnel of the park and members of the local communities), which involve local administration.
- To classify and to agree with local communities on the problem of ownership of land and trees planted along the borders of the PNV.
- To develop directives and mechanisms for future utilisation of trees planted around the limits of the park in collaboration with the local authorities.
- Regular contacts between park authorities and local administration at the lowest level possible.

To develop environmental education and communication programmes

Members of the local communities have confirmed that they understand their responsibility towards the park. However, they do not appreciate the value of the park. The local communities expressed the need for training in the field of conservation and felt that this should be a process.

The conservation facilitators (ANICOs) have been appointed in different **sectors** after they have voluntarily agreed to carry out sensitisation campaigns among the local population on various aspects of socio-economic development, including conservation. However, members of the local communities in several **sectors** indicated that the only message that they receive from conservation facilitators is related to prohibitions of the violation of the resources of the park. In some **sectors**, the conservation facilitators (This has been revealed in Bukamba District) are sometimes considered as employees responsible for the reinforcement of the law. For that reason, their role is not appreciated. In Mutura District, members of the community said that actually the conservation facilitators are appointed to report them to the park authorities. Although the idea of conservation facilitators was not bad, there is need to ensure that they actually work. This will motivate them and make them understand the role they play. The conservation facilitators are not motivated since they work on voluntary basis and due to the fact that they are seen to be collaborating with park authorities hampers communication.

Although there is lack of access to services that would help the local community to develop agriculture, animal health, bee keeping and human health services, it is not within the mandate of park authorities, it has a considerable impact on the park. Rudimentary land management methods are the causes of soil degradation and the increasing pressure on the resources of the park, low production and lack of means to improve the living conditions of the population

Gender problem needs particular attention in the training programmes in the field of conservation and other domains. The absence of women in community meetings and consultations demonstrates lack of the participation of women in public affairs and in the process of finding solutions to problems addressed at the local level. Women are the primary users of natural resources. They play an important role in population growth. For that matter, they must have access to information, be made aware of resource management problems and the impact that they have on humanity. Therefore, if messages related to conservation and to other domains do not reach them, they do not become efficient. The training programme in the field of conservation and in other domains should be better elaborated in order to involve women. This means that the tools used, the language, the venue where meetings are held, the timings, etc... should target a larger participation of women.

There is need to allow visits and access to the park by members of the local communities, the youth, pupils and students, especially those from the communities neighbouring the park. These visits can contribute to inculcate messages related to conservation and to the demystification of conservation as well as the mobilisation of the population to appreciate the existence of the park.

Actions identified for the next five years are the following:

- To develop training strategies in the field of conservation that co-ordinate various activities of involved organs.
- To identify target persons and to elaborate appropriate methods of communication.
- To create a training centre in the field of conservation in which the local community and pupils/ students can be acquainted with issues concerning environment and the park.
- To organise park visits for members of the local communities while straightening the importance of the park and environment.
- To encourage District services to approach members of the local community living within the neighbourhood and to provide them with necessary services in the field of agriculture, livestock and health.
- To identify NGO's that operate in the region and which are involved in the provision of services, strategic development and

assistance to technicians who are in contact with the largest number of the population.

To reduce conflicts related to wild animals

Damages caused by wild animals seriously affect the populations neighbouring the park and this is the major challenge the park authorities must take up. Quite often damages caused by wild animals undermine community-based conservation efforts initiated by the park authorities with the objective of improving relations between the community members and the park authorities.

Economic losses resulting from damages caused by wild animals and the risk of attacking the people provoke negative attitudes towards wild animals and the park authorities. This situation is worsened by old practices from park authorities, which used to have the tendency of excluding the neighbouring populations from conservation by considering park resources as the property of the State. The park authorities also used to dictate and impose a certain rigorous attitude in the management of the park. The fact that people are not authorised to protect themselves against wild animals, the lack of compensation and the delay or absence of response from park authorities when local communities lodge their complaints concerning damages caused by animals make them think that the State attaches more importance to wild animals.

Buffaloes are the cause of major conflicts around the PNV. However this problem was eased by the construction of a stone-wall along the limits of the park. This wall does not cover the entire perimeter of the park and other animals such as porcupines and monkeys continue to destroy crops. Other methods to stop animals from destroying crops must be applied. There is need to reinforce preventive measures and to ensure that the problems resulting from conflicts are resolved and negative attitudes abolished. The issue concerning direct compensation for damages is a policy matter that is very delicate and controversial matter for the management and administration. In the following section, we suggest other alternatives, which include the sharing of advantages accruing to the park and other solutions.

Actions to be undertaken during the next five years are as follows:

- To develop a plan of action in order to solve the problem of crop destruction while trying to suggest at the same time other alternatives (human, financial and material resources)
- To complete the construction of the stone- wall around the park.
- To identify mechanisms for the maintenance of the stone-wall, and to involve some institutions so that they are responsible for regular maintenance of the stone wall.
- Basing on a scientific and empirical research, identify other actions in the

domain of conservation that should be carried out around the park at places where there is no solid barrier.

- To identify an institution within the community that will be involved in initiatives of dialogue and resolution of conflicts rising from the damages caused by wild animals and in the training of the people.

To develop a system of sharing advantages from the PNV

The sharing of the benefits of the park constitutes an important means of supporting conservation. In some cases where resources are threatened, as it is the case for the Park, a survey must be carried out in order to determine the quantity, the nature of resources and their location. The fact that advantages are not shared does not constitute the best option.

The park management authorities and the neighbouring communities must be involved in the process of identification and demarcation of the boundaries of the park at the time of the construction of the stone-wall with the aim of reaching a consensus and resolve once and for all the issue of encroachment on the park boundaries.

Actions identified for the period of the management reform plan are as follows:

- On the ecological point of view, to assess the possibility of collecting rhizome bamboo shoots and medicinal plants, which the local communities would like to plant.
- If the assessment becomes necessary, to elaborate a programme for the collection and distribution of the rhizome bamboo shoots and medicinal plants.
- To evaluate the ecological impact of activities such as fetching water, grass and bamboo collection during specific seasons.
- If the evaluation is necessary there is need to authorise appropriate activities such as fetching water, collection of grass and bamboo shoots during drought season.
- To identify in collaboration with beekeepers in each District, places around the park where beehives can be placed and, to mobilise funds to purchase land.
- To develop a plan for the monitoring of the ecological impacts caused by the access to park resources.

To develop a programme of sharing revenue from tourism

The delicate problem of sharing incomes is pertinent if proceeds from tourism are appropriately collected. The two parties must agree on the mechanisms for the implementation of the plan. There is need to elaborate clear directives, defining the role, obligation and responsibility of each party. Otherwise, the implementation will give rise to conflicts and reduce its positive impact.

The following actions will be undertaken during the next five years:

- To decide on the approach of sharing the proceeds, to be adopted by the PNV, basing on experiences of other African countries (Examples are in the ORTPN restructuration document).
- To develop directives to pay out funds destined for the PNV proceeds sharing and to periodically modify them, depending on the lessons learnt.
- To identify in collaboration with District Mayors and Sectors Coordinators, priority project to be financed with the PNV revenue sharing funds of incomes.
- To supervise the implementation of the programme

Involvement of the communities in then development of tourism

Members of the local community can develop tourism outside the park, based on the rich bio-diversity and attractive culture. Natural sites include caves, craters, hot springs as well as the splendid landscape. The Rwandan culture, which is very attractive, includes the traditional living style, art and dance. This potential must be exploited so that it contributes to the transformation of the living conditions of the neighbouring populations with the sole objective of easing pressure and dependence on the park resources. Members of the local communities should be encouraged to get involved in tourism activities of the park. However the populations neighbouring the park do not possess sufficient means to invest in tourist hospitality services which require heavy investments in the area of capacity building.

It will therefore be necessary to develop a tourism development plan in support of the activities initiated by members of the local community with the aim of promoting tourism outside the park. The plan must identify themes that explain the sites and other aspects that can attract tourists.

The following actions have been identified for the next five years:

- In collaboration with members of the local community, to identify tourism products and services which they can initiate together with private partners.
- To identify private partners who can collaborate with members of the local community in the promotion of tourism.
- To identify communities that are capable of initiating tourism activities in collaboration with the private sector.
- To identify domains in which training is required among members of the communities that will have been identified and to train them.

- To formulate directives and procedures for collaboration and to ensure that members of the local community benefit from this collaboration.

To formulate major orientations and a legal framework in support of community-based conservation

Given that ORTPN recognises the necessity to involve members of the local communities in the management of the park for better management of natural resources within and outside the park, there is need to implement these programmes within the park in order to show the importance and the relevance of involving members of the local communities in the management of the park. Pilot programmes must therefore aim at providing data and information to decision-makers and to legislators so that they can formulate political and legislative reforms in the sector. The PNV constitutes the best opportunity where these programmes can be initiated.

A lot of pressure is exerted on the park due to low levels of living and poverty, which are highly pronounced in the area. This makes conflicts inevitable between the park and the local communities, and at the same time the cost of conservation for both the local communities and the park authorities arises. Community-based conservation programmes such as the sharing of the PNV proceeds, the access to the PNV resources as well as initiatives of local communities that aim at promoting tourism would contribute to the improvement of the lives of the local populations, while ensuring at the same time rational management of the park. However, in order to achieve this objective, it is necessary to develop directives that will facilitate the implementation of different aspects of community-based conservation and other initiatives, which require a political and a legal framework.

The following actions will be implemented during the next five years:

- To review the existing legislations in the field of conservation and elaborate a policy in the domain of conservation which supports the ongoing

restructuring process of ORT PN. The new law and policy must put an emphasis on community-based conservation.

- To develop the same community-based conservation concept which must, be adopted by all stakeholders.

To ensure co-ordination between the PNV management and the strategic partners

Co-ordination with partners, especially with the local authorities allows the intervention of political support in conservation. This proves that institutions and organs working in the conservation play an important role in priority programmes of the Districts. It is important to note that if local authorities were involved in activities planning as they do for the elaboration of development programmes, the problems of conservation will be part and parcel of the problems of the districts, and their solution would contribute to resolve the problems linked to the development of the Districts.

The mayors of the district desire to collaborate with the personnel managing the park, in the planning process. This was felt in all the districts, like in Buhoma District has started to include the park related problems in the District activity plan. Buhoma District development plan includes the control of animals that destroy crops, the construction of the stone-wall, planting trees along the limits of the park and water distribution. This is a good example that should be emulated by other districts. However, the activity planning and the allocation of the budget are two different issues. This is why the park management authorities must participate in the activity planning for the Districts so that they are able to defend the park interests, namely the determination of the budget allocated to activities that contribute to finding solutions to the problems of the park.

The following activities are planned during the period covered by the management reform plan.

- To identify major partners in community-based conservation.
- To develop a mechanism for collaboration and partnership.
- To agree with stakeholders on the co-ordination and consultation frameworks (e.g. joint planning).
- To develop a policy and directives governing the partnership between PNV and stakeholders.
- To participate in the development planning sessions of the activities of the Districts or vice-versa.

The PNV capacity building development in the field of community-based conservation

The document for the restructuring of ORTPN recommends three park wardens responsible for community-based conservation within the PNV. They would be responsible on a daily basis for community-based conservation activities around the park. Given the number of Districts that border the park and the problem of access, one of the wardens in charge of community-based conservation (CBC) would be responsible for the district of Bukamba, which is the largest and is easily accessible. The second would be in charge of Kinigi, Mutobo and Buhoma Districts (assisted by assistant park keepers in charge of CBC if it becomes necessary) while the third would be in charge of Mutura District, which is the remotest and most inaccessible.

The personnel working in the CC must possess the required skills in the domain of conservation and development of community-based conservation activities, to communicate, negotiate and resolve conflicts, community development and participatory management, competence to play the role of a moderator during meetings and consultations.

The following activities will be undertaken during the next five years:

- To recruit the personnel and appoint the staff to the posts of assistant - park keepers in charge of community-based conservation, which posts are provided for in the restructuring document.
- To build capacity and train the personnel working with CBC in the domain of conservation, techniques and methods of sensitization, negotiation and conflicts resolution, community development, participatory management and mediators.
- To train the personnel in charge of law enforcement in the area of public relations, conflict resolution and communication.

There are mainly three options in the context of reinforcing the size of the personnel attached to community -based conservation activities:

- 1) To involve the wardens in the community-based conservation by training and specialising a certain number among them, who would be deployed to different posts of patrol; this option is the least expensive.
- 2) To avail a total number of three community-based conservation assistants under the direct supervision of the warden in charge of CBC; each assistant would be responsible for one of the following areas: Environmental education; conflict resolution, community development. This option is the most expensive.
- 3) To decentralise community-based conservation by assigning a certain

number of tasks to Districts and local NGO's in the framework of a partnership between ORTPN and grass root leaders.

These three options are not necessarily mutually exclusive and could be conceived in a complementary form. In the light of the implementation of its CBC new policy, ORTPN should be ambitious if it wishes to have impact on the ground.

To contribute to poverty reduction within the communities

Members of the local community do not consider illiteracy as the major cause of population growth. They are not aware that dropping out of school, early marriages and polygamy are the major causes of population growth.

The local population however, recognises that poverty constitutes a major problem, which is the cause of constant conflicts that put them against the park resources. However, the fundamental causes of poverty such as population increase and illiteracy are not well understood. Although the local population are predominantly agriculturists, their products are sold at very low prices on the market. We think that the park can contribute to poverty reduction but this objective has not been achieved up to now.

The following activities will be envisaged:

- To identify income-generating activities and to mobilise efforts of all stakeholders in collaboration with local NGO's, the district and members of the local community.
- To use resources obtained from partners and the PNV proceeds in order to improve school infrastructure, and to increase the number of pupils and students. This will contribute to the improvement of the living conditions when people are educated (long-term investments).
- To encourage partners to invest in developed markets for their agricultural products (for example, be able to easily access the markets, acquire storage techniques, acquire improved seeds)
- To promote improved animal breeds and grazing methods (For example agro-forestry and zero grazing methods).

Improvement of living conditions of Batwa

Given the fact that the Batwa depend mainly on the park resources for their survival, and the sale of products to meet their basic needs, Batwa's conditions of living can not improve without a deliberate affirmative action. But this action would involve a lot of investment in order to train and to involve them in productive activities, to change their attitudes towards work and their relations with

other members of the community as well as to change their attitudes towards life in general. This implies that there is need to teach members of the community on the rights of the Batwa as human beings and to fight all forms of exploitations of which the Batwa have been victims within the local community.

The following activities are planned for the next five years:

- To learn from other experiences acquired from programmes initiated for the Batwa living in the vicinity of Bwindi Forest in Uganda in order to elaborate solutions of the problems faced by Batwa in Rwanda.
- To mobilise funds for the resettlement of Batwa and to help them start a new life (agriculture and income generating activities such as services that would contribute to the development of tourism).
- To teach members of the community matters relating to the rights of the Batwa as human beings.
- If ORTPN decides to assess the resources to be allocated to members of the local communities, it must also consider the requirements of the Batwa.

To assess the impact of the community-based conservation programme

ORTPN has decided to adopt the community-based conservation in the management of the park. A lot of funds will be injected in the community-based conservation, with the hope that they will be contributing to the promotion of conservation (impact of conservation) while assisting the local communities to improve their living conditions (impact on development). This approach requires a constant monitoring in order not only to improve community-based conservation but also to evaluate the impact of the adopted strategies. This can be achieved through the monitoring carried out by the park wardens since they are the only ones who can check variables such as illegal activities, the state and changes that take place in the ecosystem resources. Besides, it is necessary to periodically carry out surveys on what people think their attitudes and their practices. The surveys will help to know the opinions of the people, while their attitudes and practices will allow having control over peoples' attitudes towards the park and at what extent their change can really influence the ways natural resources can be managed. The surveys would also enable to check if the changes are indeed influenced by community-based conservation or by other external factors.

The following activities will be undertaken during the next five years:

- To examine information at the grassroots level and to identify indicators that can be used to evaluate the success of the plan.
- To carry out regular evaluation in order to demonstrate the impact of the park community-based conservation programmes.
- To carry out research in order to know the impact of community-based conservation programmes on attitudes and practices of the members of the local community members.
- To carry out systematic monitoring of activities within and around the park using RBM in order to assess the change of practices.
- To use research data and the monitoring to ameliorate community-based conservation programmes.

Management Programme 3 : Tourism

Tourism has been identified by Rwandan authorities as one of the key sectors for national economic development. Tourism in Rwanda is mainly based on natural sites represented by the three national parks. In particular, The

Volcanoes National Park with its mountain gorillas and its other various attractions represents an essential asset for the national tourism development policy.

In order to ensure harmonious development of the tourism sector in the VNP and in the surroundings, it is especially necessary to tackle the problems linked to hospitality, road infrastructure and various services rendered to the visitors. It will be necessary to diversify tourist attractions. The

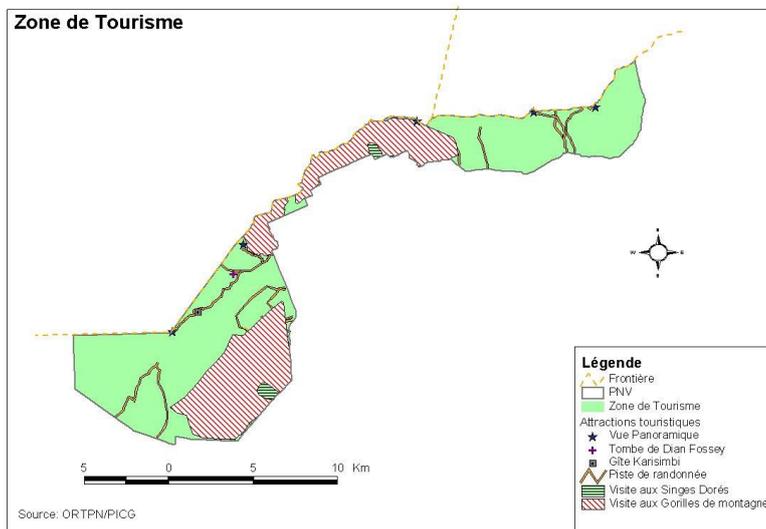


Figure 11 : Plan de zonage. Zone touristique à l'intérieur du parc

new tourism development department in charge of the protected areas that has been created at the headquarters of ORTPN will put emphasis on solving major challenges, in collaboration with tourism departments of the VNP.

For that purpose, hospitality and infrastructure, which meet the required quality and quantity norms, will be developed in partnership with the private sector. Emphasis will be put on the quality rendered to tourists by the personnel in charge of tourism. This will go hand in hand with building capacity in the domain of basic skills as well as communication and interpreting skills. Basic tourist attractions will be diversified within the park and in the surrounding areas. Co-ordination of initiatives and interventions in the field of tourism will be strengthened.

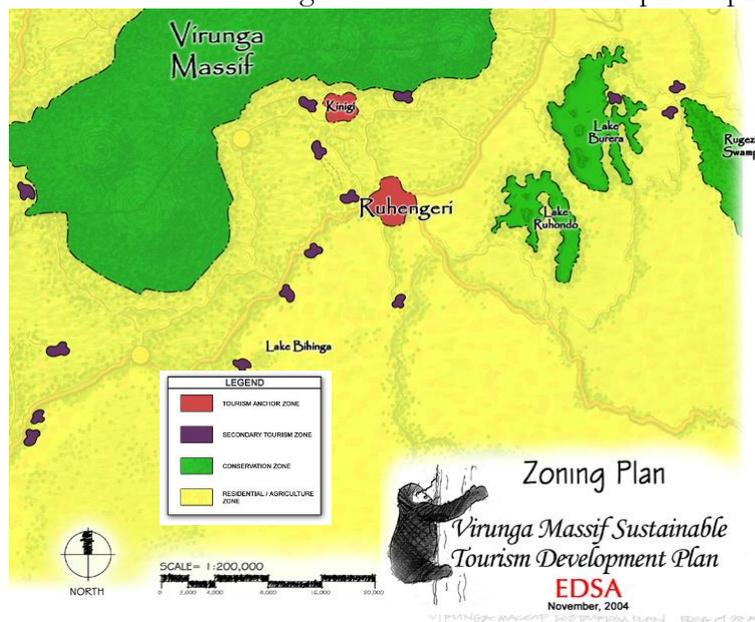
Objective of the tourism programme

To ensure the diversification, efficient and sustainable management of tourist products in the Volcanoes National Park

Major interventions and actions to be undertaken in (2005-2009)

To diversify tourist products in the VNP and in the neighbourhood

A certain number of elements mentioned below are drawn from the *<sustainable tourism development plan in the Virunga Massif>*, which was elaborated at the initiatives of the PICG and the three national conservation agencies of Rwanda, Uganda and DRC. The main philosophy behind this plan is the diversification of



tourist products (infrastructure and activities) in order to offer to tourists a wide range of experiences and accommodation facilities. The key concept is to develop tourist attractions outside protected zones of the VNP. The objective of this plan is to encourage the private sector and local communities to develop tourist initiatives outside the park in *VIT* on foot, visits to cultural and religious areas, cultural manifestations, nature walks and population tourism circuits within the communities, local markets and handicrafts exhibitions.

Taking into account the following principles will develop sustainable

tourism in the region

1. The adoption of sustainable tourism development style which is linked to strong environmental and social in the region.
2. Elaboration of appropriate major orientations in the field of planning that takes into account all aspects of tourism development.
3. The protection of bio-diversity and forests.
4. The protection and development of delicate ecological areas.

5. The establishment of buffer zones and tourism support zones.

Specific principles included in the development plan for instance are:

- To identify economic, social and environmental factors in order to offer sustainable advantages and benefits to residents, visitors and to future generations;
- No tourism development on summits and peaks;
- No tourism development on slopes with a tangent of more than 30%;
- No tourism development in the touristic critical panoramic corridors, and;
- No tourism development in conservation zones that could degrade ethical, physical and visual values of the area.

Tourism development Plan has given rise to a number of recommendations concerning attractions to be developed, and especially put emphasis on the new products situated outside the VNP: The Sabyinyo Eco-lodge in Kinigi, and The (Bulera) Experience in the lacustrine region located at the East of the VNP. These two projects are part of the products that will develop around the Virunga Massif during the first phase. The criteria, which led to the identification of the products, are mainly the following:

- Easy access
- Situation (panoramas, topography, orientation, etc.);
- Proximity in relation to local communities;
- Availability of infrastructures (electricity, water, etc.);
- Unique character of the product;
- Proximity in relation to other tourist attractions;
- Ownership of the site;
- Demand of the product on the market;

The choice of the two products identified for the Rwandan side of the Virunga Massif was carried out in a participatory manner during a workshop held in Ruhengeri in June 2004. These two projects are describe in greater details in the following paragraphs:

Sabyinyo Ecolodge

SITUATION

This site is situated a few kilometres west of Kinigi, in the proximity to the border of the VNP. Negotiations with the local communities have already taken place and the demarcation of the limits of the plot has already been effected. That site is

located in one of the most beautiful zones in the region. . The fact that the site is the highest peak offers the view of the six volcanoes when the sky is clear. The southern and the western parts of the plot are steep and covered by dense eucalyptus plantations. A seasonal stream and bamboo limit the eastern border, while the farms of the locals limit the western border.

PHYSICAL
PLANNING

Sabyinyo Ecolodge will not only be the most luxurious accommodation but especially the most delicate at environmental and social levels and at the national level. It will serve as a reference not only for Rwanda but also for the sub-region. The Ecolodge will be totally constructed using locally available building materials and by local artisans. It will also use different sources of energy, forms of water conservation and of sewage treatment.

STRUCTURES AND
BENEFITS OF LODGE
MANAGEMENT BY
THE COMMUNITIES

The community lodge, initiated by ORTPN, is the propriety of the District for the benefit of the local population. The propriety of the lodge will be owned by Kinigi District, whereas the management and marketing will be assigned to a private sector partner. Although the modalities have not yet been finalised, it will most likely be an equitable partnership. The Community Development Committee (the CDC) will represent the interests of the local population. The membership of the Committee includes a member in charge of development, women and youth representatives, members responsible for finance, social and health affairs as well as training and education. From this level, proceeds from this tourism project will go directly to the CDC for the development of local communities. The legal system assigns this management to the persons responsible for the CDC who are elected by the population.

During the development of the project, it will be essential that the management structure be well defined to recognise roles and advantages of the existing structures of the CDC. The management structure will have to be open and transparent by avoiding cumbersome bureaucracy.

Bulera Experience

SITUATION

This concerns an integral product, which at the same time includes accommodation on the eastern side of Lake Bulera. This project will have 6 tented camps at Gitare Fishing Village, in the proximity of the Musangabo Peninsula and this equipment will also enable the organisation of movements on Lakes Bulera and Ruhondo, the Rusumo falls and market as well as the Rugezi Swamp.

PHYSICAL PLANING

The tented camps will be located on small hills overlooking the lake with the view of Muhabura Volcano. The hills, for the moment are unexploited farms to be replaced by tent camps. Tracks and footpaths will be put in place from the tents to the shores of the lake where visitors can do kayaking, water skiing or boat sailing.

COMMUNITY
MANAGEMENT
STRUCTURES AND
POSITIVE EFFECTS

Bulera experience will be a locally based community project with the potential of establishing a single and unique management structure, which will have to be discussed during the development phase of the project.

The elements for discussion will have to include; ownership of the project, management and sharing of profits. The project covers several plots of land, which will need security in order to ensure the development of tourism. In that perspective, it will be necessary to start negotiations with the owners of the land and the District Mayor in order to acquire the land titles. A management structure or an association would be created to represent the interests of the local population and ensure an equitable distribution of the positive effects.

Establish and implement an effective and efficient strategy of information, interpretation and reception

To elaborate and implement an interpretation plan for the PNV

The interpretation of environment is an educational activity. One can utilise objects, observations and field experience as well as mass media equipment to show the value of environment and its components so as to encourage better understanding of the functioning and relations within the ecosystem, and also to promote conservation and appreciation of nature. Basically, interpretation is the translation of information and scientific data so as to offer explanations and provide simple and comprehensible ideas to different targeted audiences.

One of the first steps in the use of the interpretation programme is the definition of targeted groups. There exists several categories of visitors; local tourists and international tourists who have different expectations. The contents of the messages to be diffused as well as the information channels will vary from one category to another.

The interpretation is achieved using various means. Guides are among the best channels of information and ensure that messages of conservation are best transmitted. Other approaches may include: Statistical presentation such as information posters or tables, photographs, exhibitions, information centres, direct contact with objects (rocks, skeletons, fruits, etc.), Pamphlets or brochures.

The VNP will also have to elaborate a specific interpretation plan whose norms and standards will previously be developed by the Department in charge of tourism of the National Park and Tourism Board (ORTPN) in Kigali in collaboration with the three national Parks.

To ensure the conception and construction of a centre for information and interpretation.

A prestigious protected zone such as the VNP, which shelters a charismatic species like the mountain gorilla, should possess its own infrastructure for information, interpretation and education. For quite sometime establishment of such a center called « Discovery Centre » was proposed. The exact location of the centre has not yet been determined, but it is desirable to locate the centre as much as possible near the park in order to maximise its impact on the tourists and on the local populations neighbouring the park. This Information centre will have other several roles among which the major ones are the following:

- To offer constant and exact information to visitors (international and local), thanks to permanent and ad hoc exhibitions on different aspects of the VNP and its management;
- To provide an adequate framework for environmental education to target different audiences; neighbouring populations, schools, universities...
- To serve as a central element in the interpretation strategy, thanks to continuing training and refresher courses for the staff of ORTPN in charge of tourism (park wardens, trackers...) of the VNP or other parks;

To ensure that statistics of visitors are collected in an efficient and continuous manner.

Important inadequacies still exist in the collection of tourist statistics from the network of protected areas under the mandate of the ORTPN. Without reliable and precise statistical data, it becomes difficult to carry out detailed analysis or to give an orientation on the development of tourism in the VNP.

Appropriate and precise forms for data collection on tourist frequency should be elaborated, preferably in a harmonious manner in the three national parks and this information should be centralised at the headquarters in Kigali. Parameters to be collected could include among others: types of attractions visited, revenues generated by categories of visitors; duration of their stay in the VNP and in the neighbourhood, level of satisfaction (by opinion polls, etc).

To ensure that the personnel responsible for reception and information services are adequately trained

Even if ORTPN has already organised one or two training sessions for the personnel responsible for the front office and tourist information services, the training needs remain important. It is necessary to develop a genuine training strategy in the domain of front office management and the care for tourists at the VNP. This programme should conform with the following principles

- It will be necessary to ensure the organisation of training sessions of a certain category of the personnel: These training sessions are indeed very expensive. However, once the training domains have been identified (Professional training on the spot, or resident courses outside the park) they guarantee a very high quality of services and especially a more effective impact.
- The monitoring of training initiatives is fundamental since it enables the consolidation of the skills developed during the training sessions. The responsibility for monitoring the training is the responsibility of wardens, especially the one in charge of tourism development.

To support and facilitate community-based tourism in the zones neighbouring the VNP

Community-based tourism is a form of tourism in which local residents (often poor) actively participate as users or land managers, entrepreneurs, decision-makers or environmental protectors. This is not a mere question of community co-operatives that manage the camping sites. The objective is to enable residents to make decisions connected to the development of tourism linked to employment, enterprises, capacity building and other methods of improving the living conditions of the local populations.

Certain activities such as participatory planning can be undertaken in a collective manner while others such as the development of enterprises can be initiated by individuals or by families.

The conception of enterprises of community-based tourism is aimed at the following double objective: To provide concrete benefits and spillovers to the communities; to facilitate and encourage the protection of sustainable environmental integrity.

To assist and facilitate if necessary, the planning of community-based tourism infrastructures and services:

In the framework of the implementation of the national tourism development strategy, with the support of the organisation, ORTPN must see to it that a certain number of parameters are respected. These parameters must be kept with development policy of "high Level" market segment. Particular attention must therefore be paid to community-based tourism development activities around the VNP in order to make sure that that kind of tourism corresponds well with the priorities and norms required by that strategy. The ORTPN will have to support various community-based tourism initiatives, in particular not only in the planning and conception phases but also in the phase of the provision of infrastructure and monitoring services.

To provide support-advisory services to neighbouring community entrepreneurs on operation, management and maintenance of tourist products

The VNP and its partners will offer advisory and other appropriate support services in order to make sure that community -based tourism operations around the park are in conformity to required quality, standards and strategies. This support will put emphasis on the mobilisation not only of the staff responsible for tourism in the VNP but also the community-based conservation unit.

To develop the management of all services, infrastructures and tourist activities

One of the observations that is often noted about tourism in Rwanda is the generally mediocre quality of services offered to visitors, be it in hotels, restaurants or customer care and reception. The VNP represents a privileged destination on the market of ecotourism, and as such, it must endeavour to offer to its numerous visitors, high quality products that meet their expectations.

To make sure that tourist products are maintained and all services are rendered according to the appropriate standards required and acceptable by the international tourist market:

These activities complement those conceived by the community-based tourism. Its major objective is to ensure that all products and technical services developed in the VNP conform to standards that Rwanda wishes to apply in the framework of the implementation of the national tourism development strategy.

To improve, develop and maintain tourism infrastructure in the VNP and in the neighbourhood:

ORTPN is responsible for developing and maintaining tourist infrastructure located within the VNP. During the first phase, this activity will start with the inventory and assessment of the state of the existing infrastructure. Then it will be necessary on the other hand to assess the needs and possibilities in terms of the development of new infrastructure, in addition to elaborate rehabilitation and maintenance programmes. This programme will have to consider the type of the following infrastructure:

- Guest houses (For example, the guest house on Karisimbi)
- Paths (tracks towards the volcanoes, Karisoke, lakes, craters)
- Various repairs and rehabilitation works (example: picnic sites, or resting-places, panoramic viewing platforms, etc.)

To elaborate a VNP guide manual of norms and standards in the domain of tourist operations in the protected zones:

This guide must be conceived and elaborated by the ORTPN at the level of headquarters, by the department in charge of tourism in protected areas. It will serve as a reference framework for the entire network of parks, in the field of tourist operations. Once this guide manual has been elaborated, the services of the park concerned should apply it and carry out regular evaluation on the state of its evolution..

To prepare a tourist development plan for the VNP

The 2004-2008 ORTPN strategic plan provides for evaluation of the tourist development plan for each national park. The objective of this plan is to provide a strategic development framework and the restructuring of a wide range of activities and tourist products, by taking into account the demands and expectations of all the parties and stakeholders concerned and by considering a series of guiding principles. That document will also include a list of priorities on specific actions that could contribute to the attainment of the strategic objectives, according to an indicative activity implementation calendar

The document, which was prepared in the framework of the PNV Management Plan (« Virunga Massif Sustainable Tourism Development Plan »), in collaboration with the IGCP at regional level in the three countries sharing the Virunga Volcanoes, represents in reality a master plan. This plan enumerates a list of major orientations and circuit proposals both at the national and regional levels. It will be necessary for the VNP to elaborate its own development plan which takes into account the specific characteristics of the park and which translates into action in a concrete and pragmatic manner, the recommendations and orientations identified in the master plan.

To ensure a controlled gorilla tourism programme:

The PNV gorillas constitute the park's most precious resource, both at the biological and economic point of view. Gorilla tourism represents a conservation tool by generating revenues that are not only indispensable for its survival but also for the demonstration of its role in local and national development. The imperative need for conservation must however predominate in any circumstances. A particular attention will continue to be paid to the gorilla tourism programme by ensuring the strict observance of the rules and regulations in force.

The last census carried out in the Virunga Massif revealed that a proportion of about 70% of gorillas had been tamed (Gray et al., in prep.). This percentage is very high and epidemiological experts have recommended not habituating any more gorillas for tourist purpose. The ORTPN does not intend to habituate any more gorillas but it is possible that certain groups separate, as it is also possible that certain groups may disintegrate. The current number of 5 habituated groups for tourist purposes could therefore fluctuate on the basis of natural dynamics of gorilla

Management Programme 4 : Research and Monitoring

Research and monitoring enables supporting conservation at the following three levels: To respond to the immediate and long term questions in order to ensure sustainable management and provide precise and opportune information for the purposes of education, sensitisation, marketing or for publicity as well as decision making.

There exist several researches and monitoring programmes at the level of the VNP, most of which were initiated and implemented by projects or partner organisations and institutions. Concerning research, which has been done for so many years, the PNV has benefited from the presence of **Karisoke Research Centre (KRC)**, a structure of DFGF-International KRC. This centre produces huge quantities of data on the biology of gorillas (population dynamics, long-term research, eco-ethology, etc).



Figure 12 : The monitoring constitutes an indispensable tool to orient PNV management. Photo: Prosper Uwingeli

As for monitoring, the VNP has for many years utilised the «Ranger-Based Monitoring» (RBM), or monitoring of patrols. This is a system that was initiated by the IGCP in the Virunga Massif since 1997. The information that is collected in this monitoring system mainly concerns:

The identification and follow-up of gorillas: information on the group of gorillas habituated for tourist purposes, such as

their location, areas frequented, feeding, behaviour and other data related to their health.

Illegal activities: Collection of information on illegal activities as well as on patrols of the personnel in charge of surveillance (intensity and coverage of the patrols).

Observation of fauna and flora: Information on the major animal species (especially big mammals) is collected, so is certain information on the vegetation (flowering of certain species, dispersal, presence of exotic species, etc....)

Utilisation of the Geographic Information System (GIS)

On one hand, this tool is used to complete and develop basic maps, and on the other hand, to visualise all the observations and information collected in the framework of the ranger-based monitoring. These observations are then analysed and exploited in forms of distribution of maps, home range, itineraries, etc. Satellite imaging is also used to support basic maps and to assist in the spatio-temporal analysis of the soil and vegetation coverage.

Objectives of the monitoring and research programme

- To ensure coordination of research and monitoring activities in the protected areas
- To provide objective and scientific information to enable the improvement of conservation and sustainable management of natural resources in protected areas

Major interventions and actions to be undertaken (2005-2009)

Monitoring

Monitoring can be defined as a methodology of analysing and follow -up of the evolution of an element, based on the collection and management of data, preliminary analysis of these data, as well as the dissemination of information. Monitoring is a basic tool on which larger proportion actions of conservation of natural ecosystems, and in particular protected areas, are based. It deals in the detection of changes or the absence of changes within ecosystems and communities that constitute these ecosystems.

The decision making process in the management of the VNP is often based on intuition and field experience and not on objective information provided by this strategic evaluation and monitoring programmes. A workshop on research and monitoring within ORTPN identified threats that the VNP is facing and recommended a certain number of strategies, parameters, and indicators for the monitoring and reducing the impact if these threats.

PNV : MANAGEMENT PLAN

The following table presents major monitoring themes to be developed during the next five years

PNV : MANAGEMENT PLAN

Threats	Strategy to reduce the impact	Monitoring Parameters	Monitoring Indicators	Collection and Analysis of data				Submission of reports	
				Method	Frequency of collection	Who analyses	In charge	Frequency	Who receives
1. Destruction of the fauna	Patrols	# Poaching cases	# Traps /sectors/pers./ patrol/ day % Area of the field covered /sector / month	RBM	Each patrol/ day 3-5 years	WPRM IGCP KRC	WPRM	monthly	CW, RWA
		# Living animals	# signs of mammals/ sector / % of the surface abundance of mammal /secteur/ collected /3-5 years	Surveys/ Censuses					
	Sensitisation	Reduction in poaching by change in of the community attitudes	# poachers reported to the ORTPN by comm./ month #poachers arrested by the comm./month # signs of deterioration/ month	Surveys on attitudes	Monthly/ 3-5 years	WPRM IGCP	WPRM	Monthly/ 3-5 years	CW, RWA
	Intelligence	# cases reported by informants	# cases reported by informants	Coordination with intelligence services	Monthly emergency +	WLE	CW WLE WCC	when necessary	CW, RWA
	Economic development projects of the local communities	Reduction of poaching through change of the economic status of communities	# persons having benefited from development aid provided by Park Developed research projects	# and the type of development projects IGCP, DFGFI, DFGFE	Monthly Annual	WLE	WLE	Annual	CW, RWA
2. Deterioration of habitat (bamboo cutting, water fetching, medicinal plants, collection of mercury, trekking by tourists, bee keeping, penning, agriculture)	Patrols	# Incidences of human activities with impact on the habitat	#Human activities /sector/individual/day or patrol/month	RBM	Each patrol	WPRM WLE	WPRM WLE	Monthly annual	CW, RWA
	Stone wall of protection	# Livestock penetrating into the park	Frequency of destruction or repair of the stone wall by communities./ month	ANICO Reports	monthly	WCC	WCC	Monthly annual	CW, RWA
	Sensitisation	Reduction of deterioration by behavioural change of the communities	# illegal activities reported to the ORTPN par comm./ month # People arrested by comm./month # signs of threats to conservation	Surveys on attitudes	Monthly/ 3-5 years	WPRM IGCP	WPRM	Monthly/ 3-5 years	CW, RWA
	Community development projects	Reduction of deterioration though the change of the economic status of the local communities	# persons benefiting from projects arrested in the park /year	RBM Monitoring of CBC projects SEM	Annual	WLE	WLE WCC	Annual	CW, RWA

PNV : MANAGEMENT PLAN

Threats	Strategy to reduce the impact	Monitoring Parameters	Monitoring Indicators	Collection and Analysis of data				Submission of reports		
				Method	Frequency of collection	Who analyses	In charge	Frequency	Who receives	
	Water supply Systems outside the park	Reduction of the number des persons entering into the park to fetch water	# n° of persons present in the park to fetch water	RBM	Monthly	WPRM WLE	WPRM WLE	Monthly Annual	CW RWA	
	Rapid reaction Unit to fight fire (staff of the park + local communities)	Reduction of damages caused by bush fires	# n° of fires /year # persons participating the fight against fire	CBC RBM Reports	Monthly	WPRM	WPRM WLE WCC	Monthly Annual	CW RWA	
	Development Strategies to minimise impact of trails and paths.	# and the lengths of paths in delicate habitat	# and the lengths of paths in delicate habitat per year	RBM	Annual seasonal	WPRM	WPRM WLE	Seasonal	CW RWA	
3. Diseases (transmission from Man –gorillas, domestic animas - gorillas/ungulates, other key species)	Regulation of tourism	# of Times the regulations governing tourism are violated % of rules which are not explained to tourists	# of Times rules on tourism are violated /visits /year % of the rules that are not explained to tourists/visits/month	RBM Monitoring of the health of Gorillas	At least once a week or more frequent	TW	TW VA	Monthly annual	VM CW	
	Monitoring of the health of Gorillas	# of Reports the health of gorillas	# of Reports on the groups of Gorillas/day	RBM Monitoring of the health of Gorillas	At least once a week or more frequent	TW	TW VA	Monthly annual	VM CW	
	Health Programme for employees & families	Improvement of the health of families/employees # n° of Respiratory diseases and other infectious diseases	# n° of Incidents/ Diseases /year	# n° of Respiratory diseases and other infectious diseases contracted / year	EHP	Annual	WPRM MGVP	WPRM VM	Annual	VM CW
	Health Programme for soldiers (+ sensitisation)	Health Practices of soldiers improved	# of de latrines/camps/an # of times that regulations are violated visit/month	RBM	Each patrol Each visit, at least once a week	WPRM	WPRM WLE	Monthly Annual	CW VM	
	Sensitisation of the local communities on health	Improvement of the health of the communities des comm.	# of Sensitisation meetings /district/year # health-linked expenses per projects/districts/year	CBC reports	monthly	WCC MINISANTE	WCC	Monthly annual	CW VM	
	Protection of the stone wall	# of Livestock seen in the park	# of livestock identified / month	RBM CBC Reports	Each patrol	WPRM	WPRM	Monthly annual	CW VM	

PNV : MANAGEMENT PLAN

Threats	Strategy to reduce the impact	Monitoring Parameters	Monitoring Indicators	Collection and Analysis of data				Submission of reports	
				Method	Frequency of collection	Who analyses	In charge	Frequency	Who receives
4. Illegal human Presence (researchers, soldiers, Satff,...)	Zoning of the park	Level of stress and of behavioural changes by animals	Demographic Analyses Analyses of the distribution of ungulates /month/year Analyses of the distribution of legal human pop. /month or year	–	–	–	–	–	–
	Regulation of tourism								
5. Loss of habitat	Patrols	Zones affected by the loss of habitat	Monitoring cultivated zones /year	RBM	Each patrol	WPRM partners	WPRM WLE	Monthly annual	CW RWA
	Economy of the local communities	Reduction in the deterioration due to the change of the economic status of the local communities locales	# of persons benefiting from projects developed in the forest/year	RBM Monitoring of CBC projects SEM	Annual	WLE	WLE WCC	Annual	CW RWA
	Buffer zone	Reduction in the incidence of activities on the park	# of cases of cultivation by the comm. /3 month	ANICO Report	Monthly	WCC	WCC	Monthly annual	CW RWA
	Sensitisation	Reduction of the habitat loss due to the behavioural change of the local communities	# of Illegal activities reported to the ORTPN by the comm. /month # of Illegal pop arrested /month # of signs/menaces to conservation/ month	RBM CBC Reports Surveys on high attitudes	Monthly 3-5 years	WPRM IGCP	WPRM WLE WCC	Monthly 3-5 years	CW RWA
	Stone wall	Reduction of the cultivation	# of cases of damage to the stone wall /secteur	RBM ANICO Report	Monthly	WCC	WCC	Monthly annual	CW RWA
6. Trade in gorilla babies	Patrols	Reduction of incidences of the trade in gorilla babies	# of Babies killed or disappeared /year	RBM ANICO Report	Monthly	WPRM Partners	WPRM WLE	Monthly annual	CW RWA
	Education	Change of the behaviour of the communities	# of cases reported / month	RBM CBC reports	Monthly 3-5 years	WCC	CW WLE WCC	Monthly 3-5 years	CW RWA
	Intelligence	# of cases Reported by informants	# of cases reported by informants	Coordination with law enforcement agencies	When information available	WLE	CW WLE WCC	Monthly annual	CW RWA

PNV : MANAGEMENT PLAN

Threats	Strategy to reduce the impact	Monitoring Parameters	Monitoring Indicators	Collection and Analysis of data				Submission of reports	
				Method	Frequency of collection	Who analyses	In charge	Frequency	Who receives
	Collaboration with the national and international law enforcement & conservation agencies a rapid reaction.	Effective Collaboration with national and international agencies to reduce the trafficking of gorilla babies.	# of cases of monitoring and individuals arrested in collaboration with nationals & international agencies / month	RPM CBC Reports	monthly	CW	CW WLE WCC	Monthly annual	CW RWA
7. Feral dogs	Patrols	# of feral dogs	# of feral dogs/sector/ personnel/days	RBM	Each patrol/day	WPRM Partners	WPRM WLE	Monthly annual	CW RWA
		# of Monkeys, antelopes killed	# of monkeys killed /month/sector	RBM	Each patrol/day	WPRM partners	WPRM WLE	Monthly annual	CW RWA
		# of transmission of diseases		EHP RPM	annual	ORTPN MGVP	WPRM VM	annual	VM CW
	Sensitisation	Change in behaviour	# of cases reported / zone/ month	RBM CBC Reports	Monthly 3-5 years	WCC partners	CW WLE/WCC	Monthly 3-5 years	CW RWA
	Killing of feral dogs	# of feral dogs killed	# of feral dogs killed /month	RBM	Each patrol/day	WPRM partners	WPRM WLE	Monthly annual	CW RWA
	Education/ sensitisation of local communities.	Change in behaviour	# of cases of illegal presence of feral dogs reported	RBM CBC Reports	Daily/ monthly	WCC Partners	WLE WCC	Monthly annual	CW RWA
8. Deliberate fires	Patrols	Reduction of the area of the park burnt or trees burnt.	# of trees burnt / patrol/month	RBM	Each patrol/day	WPRM partners	WPRM WLE	Monthly annual	CW RWA
	Education of local communities	Change in behaviour	# of persons participating in fight against bush fires / incidents	RBM CBC Reports	Each incident	WCC partners	LEW WCC	Monthly annual	CC/M Partenaires
	Beekeeping projects outside the park	# of Beekeeping projects outside the park	# of Beehives in the park park/month # of members of beekeeping associations arrested in the park	RBM CBC Reports	Each patrol/day	WCC partners	WLE WCC	Monthly annual	CW RWA

Abbreviations:

ANICO	Conservation facilitators.	TW	Tourism warden
CBC	Community -based conservation	VM	Veterinary manager
CCM	Community conservation manager	WPRM	Warden planning, research and monitoring
CW	Chief warden	WLE	Warden law enforcement
EHP	Ecosystem health programme	WCC	Warden community conservation
RBM	Ranger-based monitoring		

Specific actions to carry out in the area of monitoring

To reinforce and harmonize RBM data collection system

A part from RBM system initiated in PNV five years ago, data has also regularly collected by the trackers of Karisoke Research Centre as well as MGVP veterinary programme. These different systems should be integrated in order to facilitate harmonized exploitation of generated information.

To establish strategic partnerships at both national and regional levels.

In order to develop systems of analysis and interpretation of obtained data, it is indispensable to have partnership with specialized institutions (GIS, remote sensing...). Apart from that, PNV geographic position necessitates that its sustainable protection and conservation be supported by a regional character of activities. Monitoring presents a special need for such regional integration. In fact, given cross-border character of the Virunga Massif, it is impossible to have objective monitoring information without regional collaboration.

To put in place appropriate equipment and an adequate system of data collection, data analysis and data management

Among the observed weaknesses in matters of management of our protected areas, there is lack of equipment and other necessary tools. It is indispensable to put appropriate equipment at the disposal of the park, and training should be given to the users for durable use. For each equipment delivered, the use should be appropriate to the expected objective and if possible, the responsibility should be given to individuals. This would avoid consequences connected with abusive utilization of common equipment.

To put in place database on PNV biodiversity

Putting in place database on biodiversity facilitates regular checking and updating of available information as well as the gaps from which supplementary data are needed. We shall continue the existing collaboration with Karisoke Research Centre in order to enrich the existing database.

To put in place a system of monitoring and evaluation of impacts of human activities and conservation strategies.

This exercise is particularly important given the variety of activities going on here and there within the park and the neighborhood. Moreover, the community conservation plan suggested recommendations aimed at the follow-up of the impact of protection measures established by PNV management such as the protection wall. Finally, it is important to follow-up the impact of conservation strategies carried out within and outside the park

itself as well as on the on the neighbouring population called upon to benefit from these activities.

Definitely, it is indispensable to draw up a guide of monitoring of socio-economic parameters around PNV and the matrices of monitoring and evaluation of the impact of illegal and “legal” activities in case they are permitted as suggested by the community conservation plan.

To collaborate with local population for the inventory of forest resources used locally and their different uses

A partnership will be promoted with the local population to inventory forest resources utilized locally and their different uses. This follow-up will facilitate the management of the park in evaluating the dependency of the population on the resources, accessibility and abundance of these resources in the park. Even if this follow-up does not necessarily seek to enable the population to reap these resources, this exercise will enable drawing up a new strategy of collaboration which will facilitate other mechanisms of partnership with the population in the domains of the protection and community conservation.

To ensure continuous and adequate training of staff in charge of monitoring

Training at all levels is proved to be an important element to ensure collection, integration and analysis of data. Guards who currently participate in monitoring have acquired good experience in data collection. Refreshment courses have been organized every year in order to discuss RBM functioning and evaluate the expected results. Given the fact that all the guards are interested in actively participating in RBM system, it is hoped that more specific training will be organized for interested persons with more intellectual level. On the other hand, analysis and integration systems of data in the park management necessitate more developed knowledge which surpasses personal experience in the field or self-training by manipulating computer programmes.

Ensure follow-up of regeneration of PNV degraded zones

Certain PNV zones were degraded during the past 15 to 20 years: forest fires, deforestation of a bamboo corridor between Sabyinyo and Gahinga Volcanoes (1991-1992), encroachment into several tens of hectares at the foot of Gahinga (1996-1997). Although it is not necessarily realistic to establish an active restoration programme of these zones, it does not remain less indispensable to realize a regular follow-up of these zones. Natural regeneration of these zones should be subject of an ecological monitoring programme, whether by utilization of remote sensing techniques (satellite images), field control or other information element. Aspects like evolution of gorilla movements or the frequentation by different species ungulates are susceptible to finding their origin in the dynamics of PNV vegetation, where natural regeneration of degraded zones represents an important aspect.

To ensure the monitoring of exotic species

The situation of exotic plants in PNV is relatively bad known, perhaps because the threat is not taken seriously. Nevertheless, there are zones which were more seriously affected than others, especially during the period of infiltration in (1997-1998), because people who fled into the forest practiced all sorts of agriculture in the forest. Priority action which should be recommended for such threat will first of all be the inventory of these species and then draw up a statement report on the presence of these exotic plants: type of plants, distribution, risks on indigenous biodiversity, and proposals of measures to take as well as an indicative plan of action.

Research

The research devotes in data collection which aim at responding to the question or problem which is well defined, generally by giving out several hypotheses. Research in protected areas contributes to the knowledge and understanding of ecological processes which are indispensable in the planning of the management and conservation activities. In fact, the exact and scientifically collected data on species (inventories, census...), their habitats, their ecological relations, their needs and their dynamic changes can precisely facilitate the preparation of a complete long term management and conservation plan for protected areas. Besides biological research, data collection on the effects of protected areas on the economy and the local community will be necessary in order to evaluate the role of protected areas on the neighboring population. These two methodologies are therefore complementary and their planning should be effected in the same framework.

A regional seminar/ meeting on research and monitoring which was held in Ruhengeri (7-9 September 2004) has identified a certain number of subjects of priority research in Virunga Massif indicated below.

Themes of priority researches for Virunga Massif and Bwindi

- The relation between wild animals/humans and domestic health (including plants if necessary)
- Monitoring of key species (the population and their health if necessary): indicators of good health in the forest (example: species that are only found in primary forest, the amphibians)
- Economic valorization of ecosystems (How to use them in fundraising)
- Impact of tourism on key species
- Factors of gorilla movements, habitat use, quality and requirements of the habitat, carrying capacity of the habitat
- Research on poaching
- Causes of gorilla exit from the park and possible solutions
- Research on crop raiding: impact on human and economic loss.

- Sustainable funding of conservation
- Sustainability of natural resources use: (resources, water, etc...) including the distribution, abundance and ecology of targeted resources
- Impact of government policies on conservation (e.g. decentralization, liberalization, regional collaboration)
- Efficiency of conservation strategies: development programmes integrated in conservation.
 - Economic appreciation of ecosystems
 - Efficiency and impacts of conservation strategies : community institutions (community involvement in the management of the park)
 - Efficiency of strategies to control animals causing problems (including education and change of attitude)
 - Evaluation of changes in demand of non timber forest products (NTFPs)
 - Bamboo : income, utilization and alternative, quantity of bamboo outside the park
 - Bamboo and other plants: the number of people in need of resources, the rate of success (tree nursery/plantation-), the quantity of bamboo shoots and species.
 - Charcoal: preferred species
 - Values and cultural practices in favor of conservation
 - Interventions which promote the development of alternatives of agriculture
 - Traditional use of the forest
 - Appropriate crops in the buffer zone (income-generating)
 - Location of pastures outside the park, availability of water, distance traveled by domestic animals in the park
 - Causes of agriculture in the park/fertility of the soil outside the park

Among the themes of research, the following domains were identified as the most important at the most specific level of PNV (each theme of research is indicated in relation with the causing threat)

Priority themes	Subjects of research for PNV (expressed in question form)
Poaching	Does the improvement of economic and social conditions of the local community reduce illegal activities and poaching of animals in the park?
Deterioration of the habitat	How can sustainable management of water resources be ensured around PNV? In quality and quantity Does the habitat change and what are the causes? (Human intervention, climatic changes...) + consequences

Diseases transmission	What are the impacts of the actual emergency plan on the gorillas and their population?
Bushfires	What are the causes and the impact of fire on Hagenia species?
Restoration of ecosystems	What are the species which play an ecological role in the park habitat (distribution and abundance) What is the carrying capacity of the park for the key species in economic and ecological terms?
Buffer zone	What are the possibilities of extension of PNV (Buffer zone, renting of land...)
Conflicts with the local community	What are the strategies to involve the local community in the management of the park and conflicts reduction?

Specific actions to take in the domain of research

To develop strategic partnerships with research institutions in order to carry out applied research in PNV management

Experience shows that the park is not itself able to implement a complete programme of research, given the limited human and material resources. PNV should therefore be strategic and attract research institutions and independent researchers in order to develop research programme which can be applied in the park management and its priorities.

To identify and update regularly research priorities in PNV and publish them

Up-dating and publishing research priorities are seen as a strategy to attract institutions and independent researchers. On one hand, it will enable us avoid overlapping of research subjects, and on the other, it will ensure accessibility to information. Here we should promote utilization of information technology.

To implement recommendations of useful research in the conservation of PNV biodiversity

It has often been blamed on the leaders for not applying research results in order to improve their management and conservation strategies. In this connection, PNV envisages promoting applied researches in PNV, identified together by researchers and managers, the responsibility then going to the managers to apply the recommendations in question.

In the first place, PNV is going to collaborate with Karisoke Research Centre and its partners of the region in analyzing the applicability of the commendations of the study on the impact of tourism.

To conduct necessary inventories of PNV biodiversity for increased knowledge.

Despite the fact that PNV possesses protection status for years and that many researches have been conducted, still there are some domains of biodiversity where the knowledge is yet insufficient. The management of the park will encourage initiatives to conduct inventory of PNV reptiles and amphibians, contacts will be made for scientific partnership with specialists in the respective domains.

To develop and update useful databases for the management of PNV

As a responsible department of collection and management of information, the research and PNV monitoring unit should also ensure that all this information is available and at the disposal of other departments. It is therefore necessary to develop appropriate databases, particularly in the domain of basic documentation. A library, both physical and electronic will be established, and references will be managed by bibliographic treatment software such as Reference Manager™ or End Note™

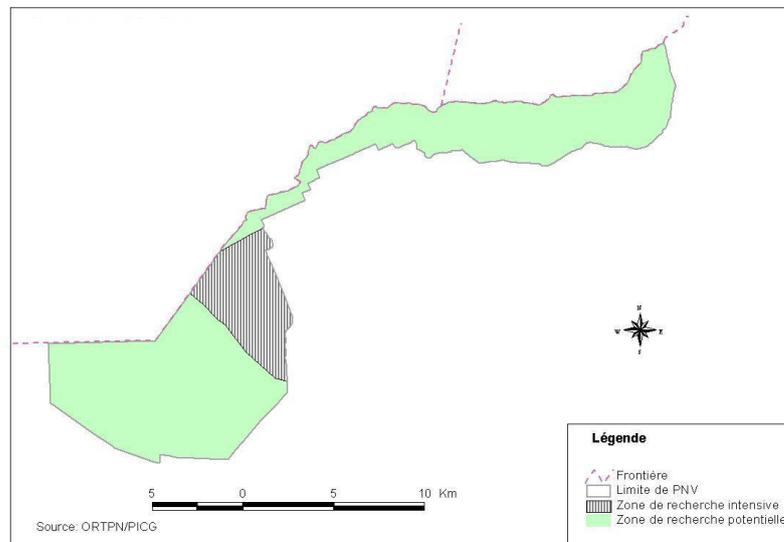


Figure 13 : Plan de zonage. Zone de recherche

Management programme 5: Veterinary Monitoring

The conservation used to be conceived as a simple activity of conservation of wildlife. Currently, conservation is rather considered as a multidisciplinary domain which is not only pen for biologists, but also for other domains such as veterinary sciences, socio-economy, public health etc. ORTPN did not have a veterinary unit before restructuring. Species in danger of extinction such as mountain gorilla or chimpanzees constitute a big preoccupation of veterinary treatment.



Figure 14 : Veterinary intervention on a gorilla taken in snare. Photo : Maryke Gray

However, veterinary intervention was only extended to mountain gorillas by Mountain Gorilla Veterinary Programme “MGVP” in volcanoes national park. Almost 380 mountain gorillas were recently counted up in Virunga Massif, one of the two habitats of mountain gorillas in the world. The most current veterinary problems are represented by animals which are regularly found in traps, which necessitate immobilization and veterinary treatment so as to avoid consequent complications of infections, amputations and often death.

Another sanitary preoccupation concerns surveillance of contagious diseases susceptible of provoking epidemic situations causing death.

Respiratory infections are currently observed in mountain gorillas and veterinary follow-up requires great importance in order to avoid serious and wide inter-group contamination. In case of necessary interventions in other parks, ORTPN called upon MGVP expertise.

Veterinary unit now in place within ORTPN will thus enable to relieve serious challenges encountered in the conservation in the three national parks, and also in the surveillance and the management of animals illegally kept in captivity. The challenges which should be addressed are in the following order:

- The conservation of live biological materials of animals or their products. Faced with a growing phenomenon of disappearance and extinction of species, it is time for the institution responsible for conservation to ensure the conservation of biological materials of its genetic heritage and ensure follow-up of biological materials conserved elsewhere. This would facilitate orientation of potential re-introduction decisions by establishing phylo-genetic relations with the same species from other ecosystems
- The monitoring of anthroozoomic or zoonotic diseases. In fact, demographic pressure around the national parks as well as the development of ecotourism gradually cause close contact with man, domestic animals, wild animals and consequently, risks of disease exchanges become more and more inevitable. For sustainable conservation, this imposes veterinary service at the level of every park so as monitoring can be effective and interventions be done at time

Impact of eco-tourism on conservation, especially on the wildlife biodiversity species threatened of extinction. Veterinary monitoring of changes with time among the wildlife population habituated to human visitors is important for anticipating or alleviating negative impact in time. This follow-up therefore facilitates to develop indicators and norms so as to ensure regulation of ecotourism. Regular taking and analyzing urine sample, blood and faeces play an important role here.

Objectives of veterinary monitoring programme

- To ensure veterinary follow-up of wildlife, particularly PNV mountain gorillas so as to reduce and control the risk of diseases.
- To ensure the follow-up of wild animals kept illegally and their transfer to safe sanctuary.

Main lines of intervention and actions to take (2005-2009)

To ensure collection of specimens destined to biological resources centre (CRB)

With the loss of biodiversity in our protected areas, it is imperative to envisage and get a collection of biological materials. This will empower us with a genetic diversity which we have no access because the stock was outside Rwanda. The available material would increase our knowledge on the biology of species which will contribute to the access of vital information for the monitoring and the management of animal population. On the other hand as investigation of diseases was under-estimated/ neglected, it was inevitable because these resources were limited.

Furthermore, this structure will give researchers, research institutions and students opportunity to access this material. It is at the same time an opportunity for the training of national capacities and will be a motivation to be associated in sustainable conservation.

Actions to consider

- To organize a manual of procedures and protocols of preservation of samples and for maintenance of equipment.
- To ensure training of personnel used by CRB
- To develop a protocol and a committee for evaluating requests to have access to the specimens and samples.

To develop and realize a programme of health monitoring

Health monitoring conducted by PNV staff, MGVP and KRC/DFGF-I has been in place for some years. However, with progress in information technology, concerned with the collection of data so as to construct database which can assist in better understanding of mountain gorilla epidemiology, a programme called IMPACT (Internet –supported Program to Assist Conservation Technologies) was developed and utilized in PNV for health follow-up

Action to consider: there is MGVP project ensuring gorilla health monitoring with veterinary assistance under the supervision and coordination of ORTPN veterinary unit. The project has the duty to recycle and update the veterinary assistant and procure/install/update health data within IMPACT programme.

To establish a contingency plan of intervention for mountain gorillas

The mountain gorilla population is small and very delicate and therefore its genetic diversity must be preserved with particular attention. In order to do that, it is urgent to work out a programme of contingency intervention at regional level in coordination with two other adjacent parks (because of the same ecosystem: Virunga Massif) so that a process of decision making can be conceived, and establish different responsibilities.

Action to be undertaken: It is necessary in the nearest future to organize a seminar at the regional level to work out a strategy on the required logistics of this plan in case of epizooty.

To develop guidelines so as to reduce or control risks of disease transmission between humans, domestic animals and the wildlife.

The new vision of conservation demonstrates more emphasis in pluridisciplinary approach. From now on we can no more limit ourselves by considering risk of diseases in wildlife because it is now clear that there exists a circulation of pathogens between humans, domestic animals and the wildlife in the ecosystem.

Health and problems of diseases are considered in the interface of ecosystem. In order to have a good ecosystem it is important to develop directive lines guided by trans-disciplinary considerations which take into consideration knowledge of socio-economic factors, public health, etc.

Action to consider

- To multiply partners for studies on incidence of domestic animal diseases, wildlife, and human population in collaboration with MINAGRI and regional health services.
- To identify priority diseases
- To establish critical points of control reference
- To improve communication systems between PNV and health services for animals and humans.

To establish strategic partnerships with national and international institutions

In order to develop a performing veterinary unit, it is indispensable to create a partnership which would at the same time contribute to continuous training, update the level of expertise and collaborate with institutions that have recognized expertise. On the other hand, with concern to maintain training and improvement

of local capacities intended to contribute to the conservation on long term, the promotion of partnership with national institutions is to be considered.

Action to consider

- To multiply contacts and partnerships for joint studies
- To attract and involve national universities in research in applied conservation domain
- To develop training courses programme for veterinaries

Confiscated animals

PNV authorities and their partners are regularly confronted with the problems of confiscated animals. Whether it is gorillas (lowland or mountain), or other primates, the problem raises both logistic and judicial difficulties. In order to enable ORTPN and its partners to adopt a pro-active approach, a certain number of activities were proposed:

- To train a rapid intervention team for treatment and follow-up
- To establish an identification and control plan for illegally detained animals.

Animals with problems

Some animals like buffaloes, porcupines and even gorillas regularly come out of the park and create damages in the plantations of the neighbouring population and threaten humans. Different management programmes (community conservation, protection) have reviewed measures principally preventive and palliative, for addressing this problem. In extreme cases, it is necessary to call upon veterinary services, especially for dangerous animals which threaten the lives of the population. In that framework, the establishment of a precise protocol is to be reviewed so that the problems of animals can be solved.

Chapter 15

Management programme 6 : Systems of management

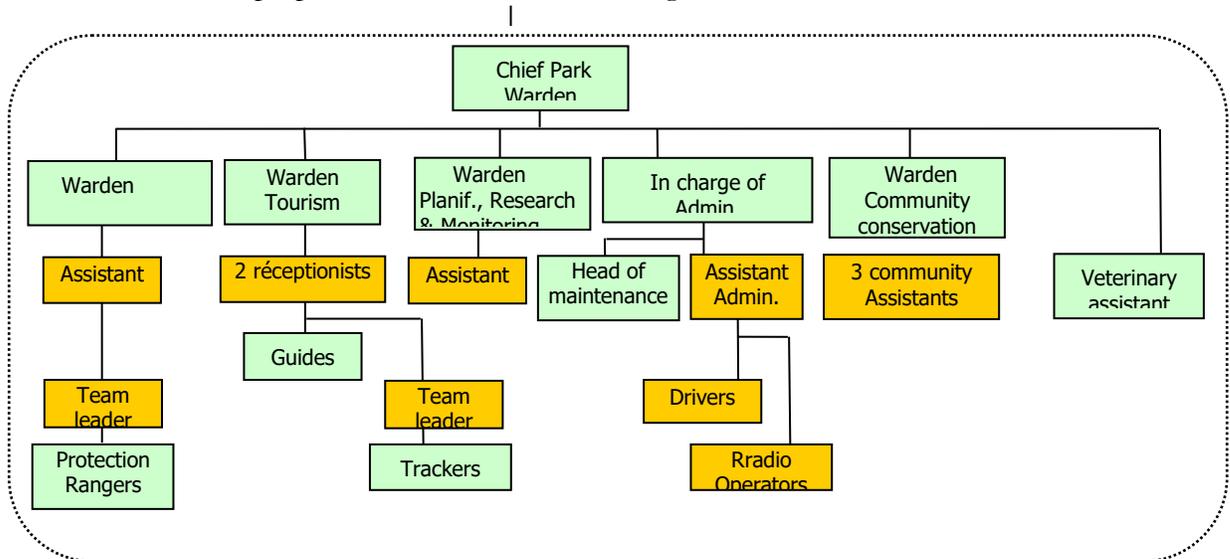
The first five programs of management introduced in the previous chapters described areas of intervention and actions to be taken in PNV in various technical domains : protection and supervision, community conservation, tourism, research and monitoring as well as veterinary follow up. In order to carry them out effectively, these programs request the mobilization of appropriate, human, material and financial resources. This chapter draws up a list of such resources, also called « management systems ».

Objectives of System of management

To put in place an effective and efficient system of management supporting ORTPN mission and objectives in the Parc National des Volcans

Human Resources

It is advised to design the PNV organizational chart by creating or modifying several posts. These modifications should allow finding solutions to problems expressed in chapter no 7 during assessment of systems of management in place in December 2004. The proposed modifications are in orange color in the chart below:



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To strengthen the community based conservation unit, through the recruitment of two additional assistants. Each of the three assistants will be in charge of a specific theme: education, management and conflicts resolution, and community development.

To separate the two posts of receptionist and administration assistant which are currently combined into one.

To combine the post of administration assistant (which acts as the deputy of the in charge of administration and finance) with that of the cashier.

To create a second post of receptionist, and transfer the two posts to tourism unit.

To create a position of assistant to the warden in charge of planning, research and monitoring (already effective since December 2004 but not yet confirmed officially).

To create a position of assistant to the warden in charge of protection and surveillance.

To put in place positions of team leaders for rangers and trackers.

To reinforce the number of guides, trackers and rangers.

As far as the number is concerned, the chart below gives a summary of the current situation, as well as proposed ideal situations to be put in place during the next years.

Department	Posts	Grade	Current size	Minimum Size number	Ideal size number
	Chief Park Warden	7	1	1	1
Administration	In charge of finance and administration	6	1	1	1
Administration	In charge of maintenance	4	1	1	1
Administration	Receptionist	4	1	2	2
Administration	Administration assistant	4	0	1	1
Administration	Driver	2	3	3	5
Protection	Protection Warden	6	1	1	1
Protection	Protection assistant	4	0	1	1
Protection	Ranger's team leader	2	0	5	6
Protection	Rangers	1	31	31	48
Tourism	Tourism Warden	6	1	1	1
Tourism	Guide	3	12	16	16
Tourism	Tracker's team leader	2	0	5	5
Tourism	Tracker	1	30	34	34
Community based conservation	Community based conservation Warden	6	1	1	1
Community based conservation	Community based conservation assistant	4	1	3	3
Planning, Research and Monitoring	Planning, reseach and monitoring Warden	6	1	1	1

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Planning, Research and Monitoring	Research and monitoring assistant	4	0	1	1
Veterinary	Veterinary assistant	4	1	1	1
Total			86	110	130

The column on « minimum number » gives the list of proposed number in order to ensure an effective management of the PNV. The « ideal number » column presents the number that would correspond to the maximum functioning of the PNV, reinforced protection services that allow a permanent presence of workers in the six patrol posts (five current posts + one new post) surrounding the park.

Infrastructure

Concerning infrastructure issue, the following tables give details on the situation as of December 2004, as well as proposed improvement and renovation to be carried out in the next five years.

Buildings

Type of building	Number	Surface area	General status	Observation	Refurbishment / Action to be taken
PNV office buildings	2	7m x 7m x 2x2=196 m ²	Good		-Office airing through windows -New bloc or extension of existing offices -Sanitary block extension
Chief Park Warden residence	1	8mx11m= 88 m ²	Good	° Currently accommodating the 101 battalion commandant	-To be recovered and rehabilitated
PNV staff residence	1	17mx9m= 88 m ²	Doors and windows damaged, requires a new painting	° Residential house with 6 rooms currently serving as the 101 battalion headquarter. Requires refurbishment	-To be recovered and rehabilitated -Accommodation policy
PNV rangers other staff members residence: Bloc I	1	9mx25m= 225 m ²	Doors and windows damaged, requires a new painting	° Residential house with 7 rooms currently accommodating soldiers. Requires refurbishment	-To be recovered and rehabilitated -Accommodation policy
PNV rangers and other staff members residence: Bloc II	1	9mx28m= 252 m ²	Idem	° Residential house with 5 rooms currently accommodating soldiers. Requires refurbishment.	-To be recovered and refurbished -Accommodation policy
Musanzu Patrol post	1	8mx17m= 135 m ²	Still new	Accommodates rangers of sector I	
Bisate Patrol post	1	8mx17m= 135 m ²	Needs to be refurbished with semi-durable materiel, Built on a mass grave	Accommodates rangers of sector III, and trackers of AMAHORO groups A and B	-Rehabilitate or construct a new building
Kampande Patrol post	1	8mx17m= 135 m ²	Needs to be refurbished with semi-durable materiel,	Accommodates gangers of sector IV and trackers of SUSA group	-Rehabilitation
Kabatwa Patrol post	1	8mx17m= 135 m ²	Still new	Accommodates rangers of sector V	
KARISIMBI lodge	1	-	Old	To be rehabilitated	- Rehabilitation and extension

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KARISOKE Bungalow	1	-	new		
Unipots	6		damaged	Currently unused	-Think of what to do with unipots
Toilets/Parking	9	-	Good		-Regular maintenance
Toilets/Office	1	-	Good	Not enough in comparison with the number of visitors	-Sanitary block extension
Bungalow	1	50m ²	new	Not yet used	-2 small blocks, shop and reception annexed to the bungalow
KARISOKE Ruins and Dian Fossey's grave	1			Tourists attraction	- To be maintained

Roads

Name of the road	Distance	Utilization	Level of priority	Road repair	Observations
Kidaho-Nyagahinga	6 Km	-Protection rangers -Community Conservation	3	- Regular maintenance	
Kurukiko-P.P Musanzu	3 Km	- Protection rangers -Conservation Communautaire	2	- Regular maintenance - Canalization of rain waters	
Gasiza-Chez Député-Gatabi	4,7 Km	- Tourism: Muhubura climbing - community Conservation - Protection rangers	2	- Regular maintenance -Rebuild parts destroyed by the population in order to reach PNV edge	From the residence of the member of parliament towards Gatabi, the road was in good state up to 1994. As of now, the population has partly destroyed it. This road' importance was to facilitate tourists to reach the park's edge.
Kagano-Bwambuba	1,8 Km	- Protection rangers -sometimes trackers.	3	- Regular maintenance	At times, KWITONDA group from Congo goes around the randan side of the park also used by our trackers.
Kagano-chez Mgr (à Horezo)	2,8 Km	- Protection rangers - community Conservation	2	- Regular maintenance	
Pont Kampanga-H.Q Kinigi-PNAP (towards Kagano)	2,3 Km	- Tourism - Protection ranger patrols -CC -Administration	1	- Regular maintenance	-Very much frequented
H.Q Kinigi-Diversion to Bisoke(passing by Rurambo,Ndabaruhuye,Karandaryi,Ayindigira, Semusatsi, Sopyrwa.)	13,8 Km	- Tourism - Protection rangers - Community Conservation -Administration	2	- Regular maintenance - Great effort because it's very near the parc	-Not often frequented because of its current state (too much damaged)
Diversion Karandaryi	0,5 Km	- Tourism	1	- Regular maintenance	
Déviation Umuganda	0,8 Km	- Tourism	1	- Regular maintenance	
Diversion Ayindigira	1 Km	- Tourism - Protection rangers - Community Conservation -Administration -C R Karisoke	1	- Regular maintenance	
Diversion chez Mukecuru	1 Km	-C R Karisoke - Tourism - Protection rangers - Community Conservation -Administration	1	- Regular maintenance - Regular maintenance - Great effort because it's too much damaged	-Very much frequented despite its critical state
Diversion EP Rwinzovu	1km	-All PNV departments	3	- Regular maintenance	
Diversion Gashinga	1.7km	- All PNV departments	1	- Regular maintenance -Canalization of rain waters -Great effort because some parts have been damaged	

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Diversion Musumba	1.8km	- Tourism - Protection rangers patrols	2	- Regular maintenance - Great effort because it's currently too much damaged	Damaged due to lack of maintenance and it is being used as a path track for cows.
Diversion Rubare –Séchoir Kabatwa	6.8km	-Tourism - Protection rangers - community Conservation	3	- Regular maintenance - Great effort because it's too much damaged	Will serve mainly as traking for SUSA group which often change its vital space
PP KABATWA-KIYIRA	1.4km	- Protection rangers	3	- Regular maintenance	
TOTAL	50.4km				

Paths

N°	Name of the path	Distance	Frequence of utilization	Type of maintenance	Observation
1	Muhabura	4.5km	3	-Regular maintenance -Winding form of Construction - Ladder form of Construction - Benches for resting -Toilets	-Recently constructed -Hardly utilizable
2	Nyirambubu	2.6km	3	- Regular maintenance	
3	Mararo-Gasindikira	4km	2	- Regular maintenance -Ladder form of Construction - Benches for resting - Toilets	
4	Kibumbu	0.3km	2	- Regular maintenance - Benches for resting	
5	Ngezi	1.5km	2	- Regular maintenance - Benches for resting	
6	Bisoke	3.4km	1	- Regular maintenance -Ladder form of Construction - Benches for resting - Toilets	
7	Karisoke	3.5km	1	- Regular maintenance - Benches for resting	
8	Karisimbi	10km	2	- Regular maintenance -Winding form of Construction -Toilets	
	TOTAL	25.3km			

N.B : Frequency of utilization: -1 : very utilizable ; -2 : utilizable ; -3 : fairly utilizable

New paths to be created

N°	name	Distance
1	GAHINGA	4km
2	VON BERINGE	0.5km
3	KABATWA-NTANGO-KARISIMBI	8.5km
4	BISOKE-KARISOKE	6.8km
	TOTAL	19.8km

Parkings

N°	Name	Access	Space	Toilet	Poubelle	Straw hut	Priority
1	KINIGI Office	easy	Not sufficient	extension	ok	ok	
2	KUTANKI	easy	Not sufficient	Not necessary	Not necessary	Not necessary	3
3	RURAMBO	easy	Not sufficient	Necessary	Necessary	Necessary	2
4	NDABARUHUYE	easy	Not sufficient	ok	Pas nécessaire	Not necessary	2
5	KARANDARYI	easy	Not sufficient	ok	Necessary	Necessary	1
6	UMUGANDA	easy	sufficient	ok	Necessary	Necessary	1
7	BINGALOW	easy	sufficient	ok	Necessary	Necessary	1
8	GIHISHAMWOTSI	easy	Not sufficient	Not necessary	Not necessary	Not necessary	2
9	SEMUSATSI	easy	Not sufficient	Not necessary	Not necessary	Not necessary	3
10	MUKECURU	easy	Not sufficient	ok	Necessary	Necessary	1
11	SUSA	easy	Not sufficient	Necessary	Necessary	Necessary	2
12	NYAMURIRWA	easy	Not sufficient	Not necessary	Not necessary	Not necessary	3
13	SEMBOGO		Not sufficient	Not necessary	Not necessary	Not necessary	3
14	RWANDARUSHYA	easy	Not sufficient	Not necessary	Not necessary	Not necessary	3
15	NTEBEYINGWE	easy	Not sufficient	Not necessary	Not necessary	Not necessary	3
16	RWINZOVU	easy	Not sufficient	ok	Not necessary	Not necessary	2
17	GASHINGA	easy	Not sufficient	ok	Necessary	Necessary	1
18	KAMPANDE	easy	sufficient	ok	Pas nécessaire	Not necessary	1
19	MUSUMBA	easy	Not sufficient	Necessary	Pas nécessaire	Not necessary	2
20	CARRIERE	easy	sufficient	ok	Necessary	Necessary	2
21	KAREBA	easy	sufficient	Necessary	Not necessary	Pas nécessaire	3
22	KAJAGARI	easy	Not sufficient	Necessary	Necessary	Necessary	3
23	KABATWA	easy	sufficient	ok	Not necessary	Not necessary	3

Equipments

Item	Quantity	General situation	Observation	Acquisition
Radio relay station	1	Good		-To install it at KARISIMBI when its antenna starts functioning.
Radiotelephone	1	Good		-3 bases -installing radio HFat KINIGI
Radio motorola GP300	2	Good		
Radio motorola GP340	20	Good		-12 radios
Radio motorola GP300	5	damaged		
Radio motorola GP340	2	damaged		
Radio set	2	One is damaged	Needs repair	
Telephone	1	Good	Found in Ruhengeri office	
Telephone	1	new	Will be installed at Kinigi	

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Fax	1	new	Ruhengeri office	
Television+magneto	1	bon	KINIGI office	
Television+magneto	1	new	Communaity conservation	
Charger	3	old	insuffient	-multiple charger at à Kinigi -multiple charger at Ruhengeri -multiple charger
Chargers	1	Out of use		
GPS	11	Good	Used by guards and trackers	
binoculars	17	14 in good position and 3 damaged		
Vehicles	2	In good position		
Vehicles	1	It was damaged by accident	Used by soldiers To be replaced	
Vehicles	1	old	Will soon be sold through auction	
Motocycles	3	new		
Motocycles	2	good		
Motocycles	1	It had an accident and only spareparts remain	Will soon be sold through auction	
Offive desk	22	Mre or less good		
Reception desk réception	1	new		
Sofa set	5	new	Don PICG	
chairs	17	More or less good		
counter	1	More or less good		
shelves	8	More or less good		
safe	1			
Office computer	2	new	insufficient	
Office computer	1	damaged		
printer	1	new		
printer	1	Good		
generator	4	Good	insufficient	
generator	4	damaged	To purchase another one	
Fire arm	38	Good	Rifle of 101 ^{ème} bataillon	
firearm	2	damaged	To be replaced	
Tents	10	Good	Insufficient	
Gourds	47	Good	Insufficient	
Sleeping bags	44	Good	Insufficient	

The following equipments will be purchased in the next five tears:

Type	2005	2006	2007	2008	2009
Vehicles	3	1	1	1	1
Motocycles	2	0	2	0	2
Computers/desktops	3	0	0	0	0
Computers /laptops	3	0	0	0	0
Printers	2	0	0	0	0

Administration

As far as administration and organization of the PNV are concerned, a number of actions is envisaged in order to improve the functioning of the park and professionalize its management.

Stocks management

The PNV is asked to manage a number of supplies and articles in order to ensure the running of the park and the supply of the shop located at the reception. Without an adequate system, these supplies and articles cannot be managed in a transparent way. Stock management is carried by the way of establishing a stock form per article, on which the movement of articles (in and out) is registered.

The person in charge of maintenance who is at the same time in charge of stock management keeps these forms. Registering in articles is done after the purchase while the registering out articles is done when a worker expresses the need of a given item.

From December 2004, the purchase will be carried out at the beginning of each month basing on the situation of monthly requirements.

Such purchases will constitute the stock. The person needing a given item will have to fill a requisition form that is submitted to stock manager, who in turn checks whether the person has provided such expense while establishing the monthly requirements.

Car fleet management

Motorcycles and vehicles belonging to PNV car fleet constitute a set of valuable equipments that are particularly important for the park. These vehicles facilitate the management and development of the park on a daily basis, by making sure that the field staff and material are deployed on time in their adequate position. The volcanic nature of most roads surrounding the park makes the vehicles movements quite difficult and is the major cause of constraints of vehicles maintenance, break down and repair that affect severely their life span.

With such a situation, a precise and rigorous management of vehicles will allow not only to ensure the maximum longevity of PNV car fleet, but also to rationalize the staff movement, thus ensuring better management of the park staff timetable. A sane policy of the car fleet management and a rational rotation of vehicles must take the following parameters into condition: authorized drivers; condition of vehicles utilization (speed, loading, authorized hours of driving...); frequency of maintenance; purchase of fuel on time; grouping together and rationalization of movements.

Documents filling and archives

An institution like ORTPN or PNV manages and receives a lot of information that is in most cases quite difficult to manage efficiently. Such information include among

others the correspondance received or dispatched, reports received or prepared by the PNV, ORTPN head office, visiting partners or consultants, all kinds of documents that submerge the technical and administration departments. In such conditions, a system of filling and archives is of the most importance because it allows not only to save time but also to ensure a system of management based on reliable information. It is important to stress the difference between electronic filling and archives, and the physical filling and archives.

The physical filling is a very classic system that arranges the files according to their themes, or by chronological order or again by geographic order. Files that are utilized can be file-dossiers with rings or hanged files kept in drawers.

Electronic filling is in most cases ignored: electronic files (text files or spreadsheet, pictures, various documents) are often grouped in an uncertain and non-organized manner. For such electronic documents, it is important to apply a very rigorous discipline in order to find at any time the desired informations. A filling by hierarchical order is absolutely indispensable for the perfect functioning of the technical and administration departments.

Coordination of the departments and partners activities

This activity is particularly important because it allows efficiency of collaboration between departments in charge of PNV management, and between ORTPN and its partners in the conservation issues as well as in development.

Proposed mechanisms for such coordination are as follows:

- To plan communal operations, mainly based on ORTPN priorities in the matter of the PNV conservation and management;
- To hold regular meetings for activities coordination, based on a pre established timetable that must be strictly followed from a meeting to another;
- To disseminate compile reports among departments and between partners;
- To evaluate jointly assessment of activities on a regular basis ;
- To plan collective field visits in conjunction with ORTPN head office in Kigali.

Implementation of Park Management Plan, follow up and evaluation

This chapter presents important lines and major principles which will facilitate the implementation of PNV Management Plan during the period from 2005 to 2009. The following sections give an indicative list of resources to mobilize in order to achieve the targeted objectives within the plan and carry out the necessary activities. Appendix 4 shows in tables the activities that have been planned for 2005-2009

Operational Planning

Areas of intervention and actions to carry out, as it is indicated in the management plan, constitute the principal recommended orientations in the course of the next 5 years. In fact, the management plan corresponds to the strategic planning for PNV. In order to implement this plan, it is necessary to convey the big areas of intervention into a series of activities which will enable the plan to operate. It is in this context where operational planning comes in, a type of planning which is extremely important and which concentrates on much shorter periods, between one year and one month, and even one week. Ideally, a good manager may even be able to plan each one of his days so that it can contribute to the achievement of the objectives of the week, the month, the year and the definite period of 5 years as it is indicated in the management plan. ORTPN has already drawn up an annual operational plan format (AOP) which is applied by managers based at the Head Office and the wardens situated in the National Parks. These AOP will be developed every year towards the month of December in order to use them from the month of January the following year. The AOP should clearly be a reference to actions and to set out areas of intervention in the management plan. They will certainly be evaluated and updated every year so as to ensure that there is effective follow-up of orientations of the management plan.

Resources to allocate for implementation of the management plan.

These resources are mainly of three levels: financial resources, material resources which are closely connected to financial resources, and then human resources. Financial resources are the subject of detailed analysis in chapter 17 which deals with PNV Business Plan. Material and human resources are described in chapter 15, which deals with the management systems in place, and which aims at the development of the volcanoes national park.

Strategic partnerships

The management and conservation of PNV embrace ambitious operations which necessitate important means, both at financial and material levels as well as in expertise and competence. Effective implementation of this management plan involves participation of a certain number of stakeholders and partners, many of them already being engaged in supporting ORTPN within PNV. Based on their level and the domain of intervention, partners involved in the implementation of the management plan are divided in 5 categories:

- Key ministerial institutions and parastatal companies play an essential role in the definition and implementation of policies in the framework of legislature and regulations, norms and standards related with their respective ambitions and domains.
- Decentralized administrative structures will contribute in the implementation of the objectives and strategies specifically identified in each protected area. This collaboration will start by integration of defined activities by different services of each park within the development plans of the neighboring districts of the respective parks
- National and international non-government organization and the private sector will intervene in general in the sensitization of the population, in technical support and in the mobilization of additional funds for implementing different objectives and strategies according to their areas of interest.
- Through different channels, written and audiovisual, national and international media will be solicited to regularly inform the public on the events and initiatives aimed at accomplishing the mission and the objectives of ORTPN.
- Bilateral and multilateral cooperation agencies will contribute to the technical and financial support in different objectives according to their domains of collaboration.

Regional Collaboration

A certain number of actions and interventions at regional level have already been written in the previous chapters. This section indicates some suggestions of regional collaboration as they appear in the management plan produced for Bwindi-Mgahinga conservation area (BMCA) in 2001. For coherence sake, the objectives and activities have been adopted as in the document (Uganda Wildlife Authority 2001). As mentioned earlier, regional actions mentioned in the management plan are indicative because they should necessarily be the subject of preliminary consensus with conservation agencies of Uganda and DRC.

The purpose of regional collaboration is to strengthen the bond with our gorilla parks partners in Uganda and RDC. The main areas of collaboration to be developed are as follows: conservation and management of resources, regional tourism circuits and regional security.

Conservation and management of resources

PNV is contiguous to the two other protected areas situated in Uganda and RDC, and the activities taking place on the other side of the border can have a considerable impact on the PNV. However, it is obvious that there is no sufficient regional collaboration for the protection of resources. It is therefore important for the three countries to strengthen their cooperation so as to avoid or limit negative impact and improve conservation practices. Collaboration uses strategic approach which ensures that the management of Virunga Massif on one or the other side of the border works in a complementary manner. The information sharing but also the organization of joint activities should be developed within the next years. Eventually, it is also desirable that the planning of the activities related to the management and the conservation of Virunga Massif should be done jointly and regionally.

There are some portions of land along the borders with Uganda and DRC which are not clear. This situation generates potential risks for field staff that are sent to patrol these zones. These people fear to cross borders as they could possibly suffer the consequences. Unfortunately, this question does not regard ORTPN because it is the responsibility of the Ministry of Foreign Affairs. ORTPN could however, through MINICOM, address the question to the competent authorities.

Proposed actions are as follows:

- To establish protocols of regional cooperation
- To start off joint programmes of community conservation at the level of borders.

- To carry out joint programmes of health monitoring of human population and gorillas
- To carry out joint patrols
- To carry out joint monitoring programmes
- To enforce necessary mechanisms for ensuring border demarcation and maintenance.
- To identify priority themes and researches with partner organizations
- To harmonize different databases among partner countries
- To share results and recommendations produced from research and monitoring in order to improve the management of resources
- To implement recommendations produced by research and monitoring in order to improve the management of resources.
- Implementation of recommendations given by the research
- To plan and participate regularly in bilateral and trilateral meetings

Regional tourism circuits

Although the possibilities of exploiting tourism at the regional level exist, cross-border tourism has not yet become developed. Information on the possibilities of tourism on the other side of the border is not always possibly available, and it is often costly and complicated for tourists to visit areas of attraction situated at the other side of the border. There is also a certain competition between different countries. Development of regional tourism, with information from standardized and available services for all, could greatly improve the satisfaction of visitors and their experiences in the three countries, and equally increase tourist leisure in the region.

The following are activities which were proposed:

- To work with ICCN and UWA so as to identify regional tours and packages
- To prepare guidelines dealing with prices, visas, etc. between partner countries
- To develop joint regional leaflets and guides
- To ensure joint training for guides and organizing exchange visits in order to improve performance
- To develop activities and products which are mutually beneficial.

Regional security

Even if regional tourism circuits were available, the current prevailing security situation in the region would not certainly enable establishment of very active tourism. Chronic insecurity observed in DRC had consequence of a certain

negative publicity for tourism in the region. The death of several tourists and a warden in Bwindi in 1999 and the hijacking of several other visitors in Jomba in 1998 are yet present in the minds of many people. The three countries should from then get down to work in restoring the confidence on the security of persons and their property in the region. With the aim of accelerating the process, conservation agencies in the three countries should intensify bonds with the institutions in charge of security in their respective domains and competence. This should be done together with security cooperation initiatives which are already in place.

The following actions should be reviewed:

- To ensure liaison with partner organizations (ICCN and UWA) and security agencies and prepare a security strategy.
- To develop an agreement of collaboration for security related domains
- To organize joint patrols with neighboring parks

Follow up and evaluation of the management plan

A plan remains a useless document so long as it is not implemented in depth, or if it is not followed by all the actors involved in its implementation. A certain number of mechanisms were proposed for ensuring follow-up and evaluation of the management plan of PNV:

- Putting in place a cell in charge of planning and evaluation, composed of the warden in chief, the warden in charge of planning and the manager responsible for planning, research and monitoring
- Annual operation plans (AOP) should include, every year, a list of objectively verifiable indicators for each identified PNV management programme. These indicators will be identified and selected in a way that they would be realized in a year concerning AOP in question.
- During the editing of every PNV annual report, a separate chapter will deal with the degree of management plan implementation, in reference to AOP and its operational indicators. This will facilitate defining the rate of AOP/management plan achievement by giving each indicator an accomplishment percentage. In case of non-realised or partially realized indicators, clear explanation will be given and corrective measures will be proposed.

PNV international status

PNV has a very important reputation on the international scene, much as a site endowed with mountain gorillas, an impressive range of landscape, and endemic species. Certain legislative tools and international programmes would facilitate to highlight unique assets of such protected areas.

To stimulate the status of Biosphere Reserve of PNV

Although PNV possesses the status of Biosphere Reserve since 1983, ORTPN has contributed little to the MAB programme. This protected area network, covering prestigious specimens of natural sites in the whole world, emphasizes on the three following angles: education, conservation and development. ORTPN should re-launch contacts with the UNESCO programme and ensure that PNV participates dynamically in the network activities.

Active follow-up of the issue of nominating PNV as a world heritage site

Rwanda signed a convention on World Heritage (UNESCO) in 2001, but has not yet had any site which can be included on the list of World Heritage (WH). In 2002, the Rwanda government proposed that PNV be included on the list but the dossier has not since taken up. According to the previous information received by the World Heritage Centre, the nomination of PNV should be accepted if all the three countries (Rwanda RDC and Uganda) presented the complex composed of Parc National des Virunga (already WH site) Mgahinga Gorilla National Park and Volcanoes National Park in order to create a World Heritage cross- border site. It therefore concerns ORTPN in having adequate contacts with Congolese and Uganda partners in supporting this very important issue.

Chapter
17

Business Plan

A business plan can be perceived as a detailed presentation of the Management Plan: it allows people to identify the resources needed to achieve the goals presented in the Management Plan. Such "business" approach encourages the protected areas managers to perceive their work, more or less as that of the head of a company. However, in this case of a protected area such as PNV, the aim is not to make more profits, but rather to improve management of the park, to ensure the sustainable development of the park on the ecological, social and financial point of views. To generate income is just a means to reach an end, which is nothing else than a better management of the park.

This chapter presents the summary of the whole business plan which can be found in the appendix of this Management Plan. The reader will find all the details for a better understanding of the plan. The following section presents the main points relating to the Management Plan budget, income and expenditure estimates between 2005 and 2009.

Methodology

The Business Plan was developed with the active participation of the senior staff of PNV, the Finance and Administration Department of ORTPN, the Technical Advisor to ORTPN, officers of MINITERE and key stakeholders.

The Business Plan is based on activities specified in the draft Management Plan 2005-2009. Expense estimates were derived from the activities specified under various programmes, and complemented with the Strategic Plan of ORTPN and annual budget of PNV to represent the ideal work for the protected area (PA). Activities implemented by the international non-governmental organisations (NGOs) are considered separate expense items although they are also an integral part of the Management Plan 2005-2009 of PNV. First, expenses directly related to PNV operations were estimated in both local and foreign currency covering the plan period. For currency conversion, 1 United States Dollar was considered equivalent to 570 Rwandan Francs (1US\$ = 570 RWF). Next, estimates of costs of activities supported by the international NGOs were determined based on their indicative budgets. They were grouped under project expenses. Third, both the re-current and capital budgets of ORTPN were introduced based on estimates in the organisation's strategic plan. These

estimates excluded costs attributable to PNV so as to avoid double counting. Then a summary of the expenses was prepared covering the entire period.

On the revenue side, estimates were first made of government contributions, fundraising efforts, and eco-tourism revenues. Thereafter, estimates were made for possible revenues from consumers' willingness to pay and ecological services.

For purposes of further analysis, expenses and revenues were classified as shown below.

Expenses

1. Direct expenses

- (a) programme expenses
- (b) projects expenses

2. Other expenses

- (a) ORTPN re-current expenses
- (b) ORTPN capital expenses

3. Total expenses

Direct plus Other expenses

Revenues

1. Direct park revenues

- (a) Tourism revenue
- (b) contributions by international NGOs

2. Other revenues

- (a) Government contribution
- (b) Multilateral and bilateral sources
- (c) Willingness to pay
- (d) Ecological services
- (e) Option / existence values

3. Total revenues

Direct park revenues plus other revenues

Several levels of analysis were carried out essentially comparing revenues with expenses. The primary aim was to see if PNV generates enough revenue to meet the costs of activities specified in the Management Plan 2005-2009. The analyses also looked at the contribution of other sources of revenue towards meeting the

projected expenses. A section of the analyses deals with the feasibility of establishing an endowment or trust fund using revenues generated from the willingness to pay.

Expense Analysis

There are three categories of expenses: programmes, projects and ORTPN expenses. Details of estimates of expenses are included in *Annex 2* of this report. Programme and project expenses constitute direct expenses; while ORTPN re-current and capital expenses make the other expenses.

Direct Expenses

Programme expenses

Programme expenses are those to be incurred in the implementation of activities in the six programme areas, namely: management systems; research and monitoring; park protection; community conservation; tourism; and veterinary unit, as further elaborated below.

The Management systems programme has the largest share of programme expenses because it includes most of the infrastructure developments and additional equipment required to implement the Management Plan 2005–2009. Expenses for this programme area also include all overhead costs un-allocated to the various programmes. Over the 5-year plan period, Management systems programme is expected to require RWF 2,009 million or about \$3.5 million.

The Research and Monitoring programme is the next largest expense item amounting to RWF 306 million or about \$ 537,000 over the plan period. The Management Plan calls for the establishment of accurate baseline data, the inventorying of various fauna and flora attributes of PNV, and the establishment of strategic partnerships.

The Community Conservation programme is expected to require RWF 230 million or \$404,000 over the plan period. This indicates the realisation in the Management Plan 2005–2009 that the communities surrounding PNV are one of the key factors to the successful conservation of the protected area. The plan calls for increased community awareness, the creation of livelihood alternatives, the introduction of benefit and revenue sharing, the active involvement of the communities in planning and management, and the establishment of income generating activities.

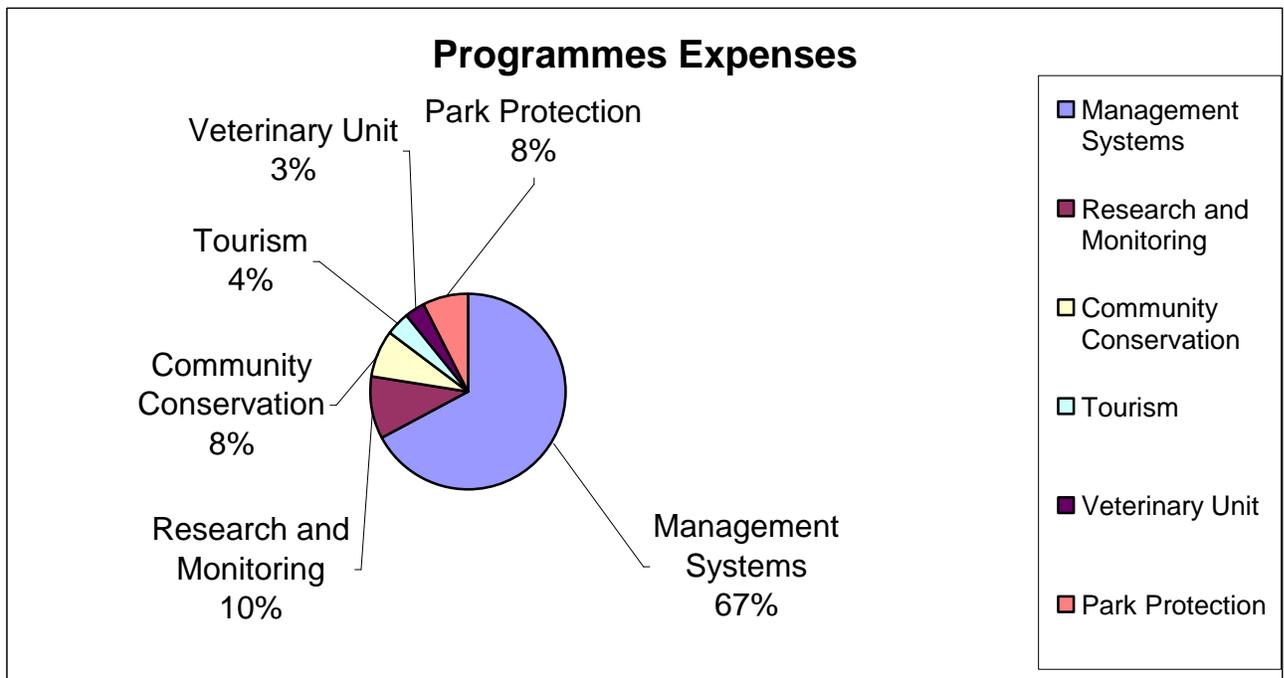
The Park Protection programme is estimated to require RWF 228 million or \$400,000 over the plan period. This is so because in spite of the significant investment recommended for community conservation, the Management Plan also calls for

increased investment in park protection. The investments are largely for equipment and increased park patrols.

The Tourism programme is expected to require RWF 121 million or \$212,000 over the plan period.

The investment calls for tourism product diversification, establishing a strategy for tourism information and interpretation, promoting community tourism, and developing a tourism master plan, infrastructure and tourist activities.

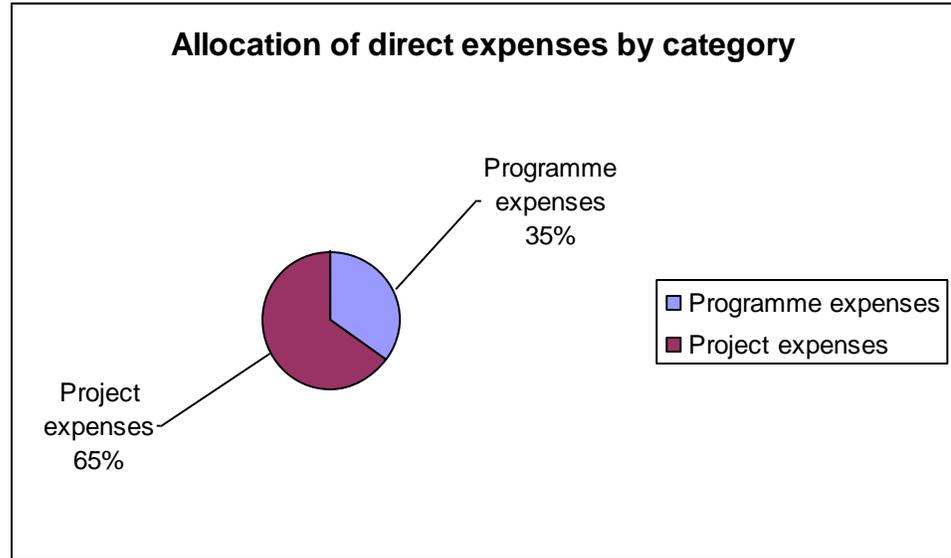
Finally, the Veterinary Unit programme is expected to require RWF 94 million or \$ 165,000 over the plan period. These investments are largely for infrastructure such as an animal orphanage building and resource centre, and for equipment. The expenditures of the Veterinary Unit may appear small but infact are significant when projects supported by the international NGOs are also considered.



Project expenses

Project expenses are those related to activities implemented by the international NGOs, both inside and outside the park.

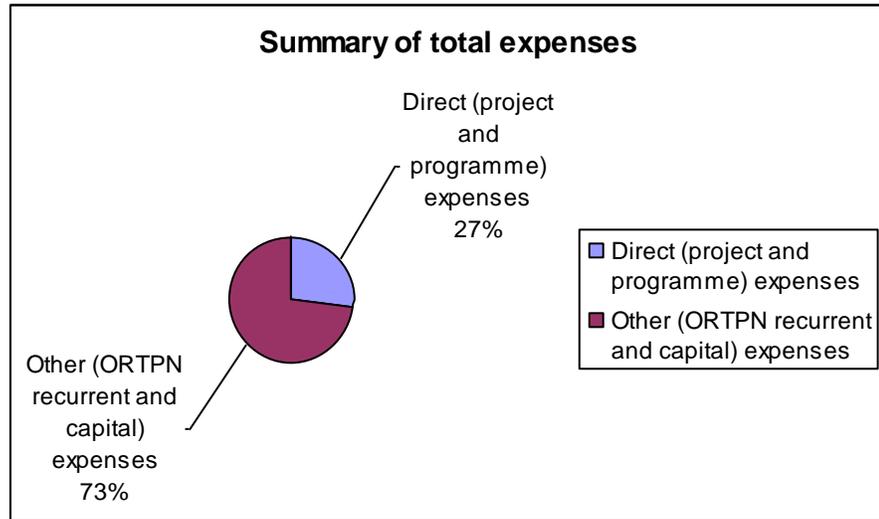
Project expenses were estimated based on indicative budgets and discussions. These amount to RWF 5,494 million or about \$9.6 million over the plan period. The amount represents 64% of direct expenses (programme and project expenses) showing the critical role of the NGO partners play in the management of PNV.



Other expenses

Other expenses relate to operating (re-current) and capital (investment) expenses of ORTPN. The ORTPN expenses exclude those of PNV. Over the plan period, re-current expenses were estimated to amount to RWF 14,589 million, or about \$26 million; while capital expenses are to be RWF 8,320 million or \$ 15 million. Total ORTPN expenses over the plan period were, therefore, estimated at RWF 22,909 million or about \$ 41 million.

When programmes, projects and ORTPN expenses are added together, the latter represents the largest share: ORTPN recurrent expenses accounting for 45%; and ORTPN capital expenses at 27%, making a total of 72%.



Expense summary

Details of the expense estimates by programme areas and including projects and ORTPN recurrent and capital budgets and the basis for their estimates are included and further elaborated in *Annex 2*. A summary of the expenses is presented below.

PNV : MANAGEMENT PLAN

Protected Areas Financial Plan - Annual Expense Summary

PNV Analysis

Jan 2005 - Dec 2009

	Total Projected Budget (RWF '000s)						Total Projected Budget (US \$ '000s)					
	2005	2006	2007	2008	2009	Total	2005	2006	2007	2008	2009	Total
Direct expenses												
<i>1. Programmes</i>												
Management Systems	654,157	404,200	415,691	268,206	266,610	2,008,864	1,148	709	729	471	468	3,524
Research and Monitoring	94,100	56,600	55,600	46,600	53,100	306,000	165	99	98	82	93	537
Community Conservation	135,300	39,200	24,300	12,400	18,900	230,100	237	69	43	22	33	404
Tourism	65,220	33,240	10,560	6,000	6,000	121,020	114	58	19	11	11	212
Veterinary Unit	78,089	3,940	3,940	3,940	3,940	93,849	137	7	7	7	7	165
Park Protection	69,782	39,486	39,486	39,486	39,486	227,726	122	69	69	69	69	400
<i>2. Projects</i>	828,000	1,049,000	1,140,000	1,189,600	1,287,000	5,493,600	1,453	1,840	2,000	2,087	2,258	9,638
Sub-total Direct Expenses	1,924,648	1,625,666	1,689,577	1,566,232	1,675,036	8,481,159	3,377	2,852	2,964	2,748	2,939	14,879
Other expenses												
<i>3. ORTPN Recurrent Expenses</i>	2,389,647	2,628,612	2,891,473	3,180,621	3,498,683	14,589,036	4,192	4,612	5,073	5,580	6,138	25,595
<i>4. ORTPN Capital expenses</i>	521,741	1,033,898	4,137,287	1,251,016	1,376,118	8,320,060	915	1,814	7,258	2,195	2,414	14,597
Sub-total Other Expenses	2,911,388	3,662,510	7,028,760	4,431,637	4,874,801	22,909,096	5,108	6,425	12,331	7,775	8,552	40,191
Grand Total (Direct + Other)	4,836,036	5,288,176	8,718,337	5,997,869	6,549,837	31,390,255	8,484	9,278	15,295	10,523	11,491	55,071

Revenue Analysis

There are several sources of revenue available to a protected area. They are: public sources, fundraising and revenue generating financial arrangements. This Business Plan places the different sources under two categories, Direct and Others (indirect) as shown below.

Funding Source	Category over Plan period	
	Direct	Others
1. Government subvention		X
2. Fundraising		
a. Bilateral and Multilateral		X
b. International NGOs	X	
3. Revenue generating financial arrangements		
a. Ecotourism receipts	X	
b. Willingness to Pay		X
c. Ecological services		X
d. Option and existence value		X

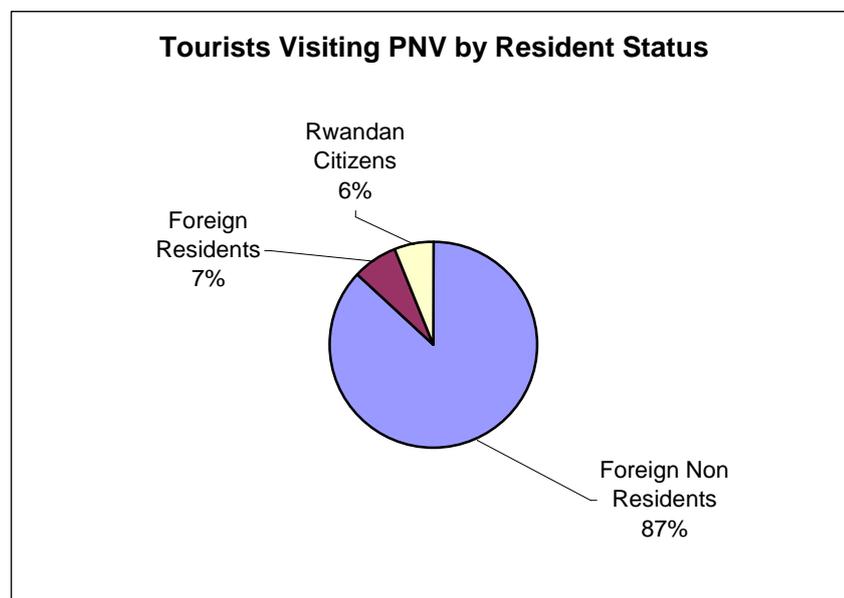
Direct revenues

The main source of direct revenues is ecotourism tied to the existence of the mountain gorilla, followed by the contributions of the international NGOs.

Ecotourism

The main source of revenue available to PNV is eco-tourism, a business enterprise. The biggest tourist attraction in PNV is the mountain gorilla followed by the golden monkey, mountain climbing, the Dian Fossey tomb, and nature walks. The majority of tourists visiting PNV are foreign non-residents (FNR), followed by foreign residents (FRs) and lastly residents (Rs) or Rwandese.

Over the plan period, the number of tourists was forecast to increase from 7,000 (or 50.5% capacity utilisation) in 2005 to 13,000 in 2009. The last figure represents 93.7% utilisation of the current capacity considering gorilla tracking only. Of the total number of tourists, 87 % are foreign non-residents (FNRs), 7% foreign residents (FRs), and Rwandan (R) citizens (6 %).



The main source of revenue, as much as 90.7 % is from gorilla tracking as shown below. Details of the revenue projection follow this summary. A key objective of the Management Plan is the diversification of sources of tourism revenue reflected by a declining proportion of revenues attributed to gorilla tracking. A number of activities have been planned for the diversification of tourism revenue sources. However, for purposes of projections over the next 5-year period, gorilla tracking is expected to remain the main source of revenue for PNV.

Summary Tourist revenues by sources over plan period, 2005-2009

Source	Revenue (x1000 RWF)	Percent
Entrance fees	702,780	5.9 %
Gorilla tracking	10,762,050	90.7 %
Golden monkey	273,484	2.3 %
Mountain	82,693	0.7 %
Dian Fossey Tombs	27,581	0.2 %
Nature walk	27,581	0.2 %
TOTAL	11,876,169	100 %

PNV : MANAGEMENT PLAN

PNV Protected Areas Financial Plan - Ecotourism Revenue Details

Jan 2005 - Dec 2009

	2005	2006	2007	2008	2009	5 Year Total
Total tourists	7,000	9,000	11,000	12,000	13,000	52,000
Origin						
FNR	6,090	7,830	9,570	10,440	11,310	45,240
FR	490	630	770	840	910	3,640
R	420	540	660	720	780	3,120
Visitors Additional activities						
FNR	1,218	1,566	1,914	2,088	2,262	9,048
FR	98	126	154	168	182	728
R	84	108	132	144	156	624
Revenue by activities (RWF '000s)						
Entrance Fees						
FNR	86,782,500	111,577,500	136,372,500	148,770,000	161,167,500	644,670,000
FR	6,982,500	8,977,500	10,972,500	11,970,000	12,967,500	51,870,000
R	840,000	1,080,000	1,320,000	1,440,000	1,560,000	6,240,000
Total	94,605,000	121,635,000	148,665,000	162,180,000	175,695,000	702,780,000
Tracking						
FNR	1,214,955,000	1,562,085,000	1,909,215,000	2,082,780,000	2,256,345,000	9,025,380,000
FR	48,877,500	62,842,500	76,807,500	83,790,000	90,772,500	363,090,000
R	3,360,000	4,320,000	5,280,000	5,760,000	6,240,000	24,960,000
Total	1,267,192,500	1,629,247,500	1,991,302,500	2,172,330,000	2,353,357,500	9,413,430,000
Golden Monkey						
FNR	260,347,500	334,732,500	409,117,500	446,310,000	483,502,500	1,934,010,000
FR	11,172,000	14,364,000	17,556,000	19,152,000	20,748,000	82,992,000
R	1,050,000	1,350,000	1,650,000	1,800,000	1,950,000	7,800,000
Total	272,569,500	350,446,500	428,323,500	467,262,000	506,200,500	2,024,802,000
Mountain Climbing						
FNR	347,130,000	446,310,000	545,490,000	595,080,000	644,670,000	2,578,680,000
FR	19,551,000	25,137,000	30,723,000	33,516,000	36,309,000	145,236,000
R	1,470,000	1,890,000	2,310,000	2,520,000	2,730,000	10,920,000
Total	368,151,000	473,337,000	578,523,000	631,116,000	683,709,000	2,734,836,000
Dian Fossey Tomb						
FNR	173,565,000	223,155,000	272,745,000	297,540,000	322,335,000	1,289,340,000
FR	11,172,000	14,364,000	17,556,000	19,152,000	20,748,000	82,992,000
R	840,000	1,080,000	1,320,000	1,440,000	1,560,000	6,240,000
Total	185,577,000	238,599,000	291,621,000	318,132,000	344,643,000	1,378,572,000
Nature Walk						
FNR	104,139,000	133,893,000	163,647,000	178,524,000	193,401,000	773,604,000
FR	5,586,000	7,182,000	8,778,000	9,576,000	10,374,000	41,496,000
R	630,000	810,000	990,000	1,080,000	1,170,000	4,680,000
Total	110,355,000	141,885,000	173,415,000	189,180,000	204,945,000	819,780,000
Sub-Totals	2,298,450,000	2,955,150,000	3,611,850,000	3,940,200,000	4,268,550,000	17,074,200,000
Estimated other						
FNR	109,345,950	140,587,650	171,829,350	187,450,200	203,071,050	812,284,200
FR	5,167,050	6,643,350	8,119,650	8,857,800	9,595,950	38,383,800
R	409,500	526,500	643,500	702,000	760,500	3,042,000
Total Other	114,922,500	147,757,500	180,592,500	197,010,000	213,427,500	853,710,000
Total Tourism Revenue	2,413,372,500	3,102,907,500	3,792,442,500	4,137,210,000	4,481,977,500	17,927,910,000

Contributions of international NGOs

Private sources of funds comprise of individual, corporate and NGO contributions. During the plan period, it is unlikely that any significant amounts of individual or corporate funding can be realised for PNV. On the other hand, there are several NGOs supporting biodiversity conservation in PNV.

Although the contributions of NGOs do not often get reflected in PNV's budgets, they nonetheless provide significant support for activities both in- and outside- park activities. International NGOs supporting activities of PNV include:

- ❖ IGCP, which has traditionally supported in-park activities but is now also involved in outside park interventions;
- ❖ DFGFI, which supports mainly in-park activities;
- ❖ DFGFE, which supports largely outside-park activities encouraging community income generating ventures to partly relieve pressure on the PA; and
- ❖ MGVP, which supports mostly in-park activities related to animal health with some health monitoring (park employees and their families) outside the park.

Estimation of the funds each of the NGOs will make available over the plan period presents some difficulty since this will to a large extent depend on the success of their own fundraising efforts. However, indicative figures based on past experiences and future prospects are presented.

Projections of contributions of international NGOs

	(RWF '000s)				
Source	2005	2006	2007	2008	2009
IGCP (IP) ^a	114,000	142,500	178,125	222,642	278,160
IGCP (OP) ^b	114,000	162,450	162,450	162,450	162,450
DFGFI	114,000	114,000	114,000	114,000	114,000
DFGFE	57,000	57,000	57,000	57,000	57,000
MGVP	114,000	114,000	114,000	114,000	114,000
Total International NGO contributions	513,000	589,950	625,575	670,092	725,610

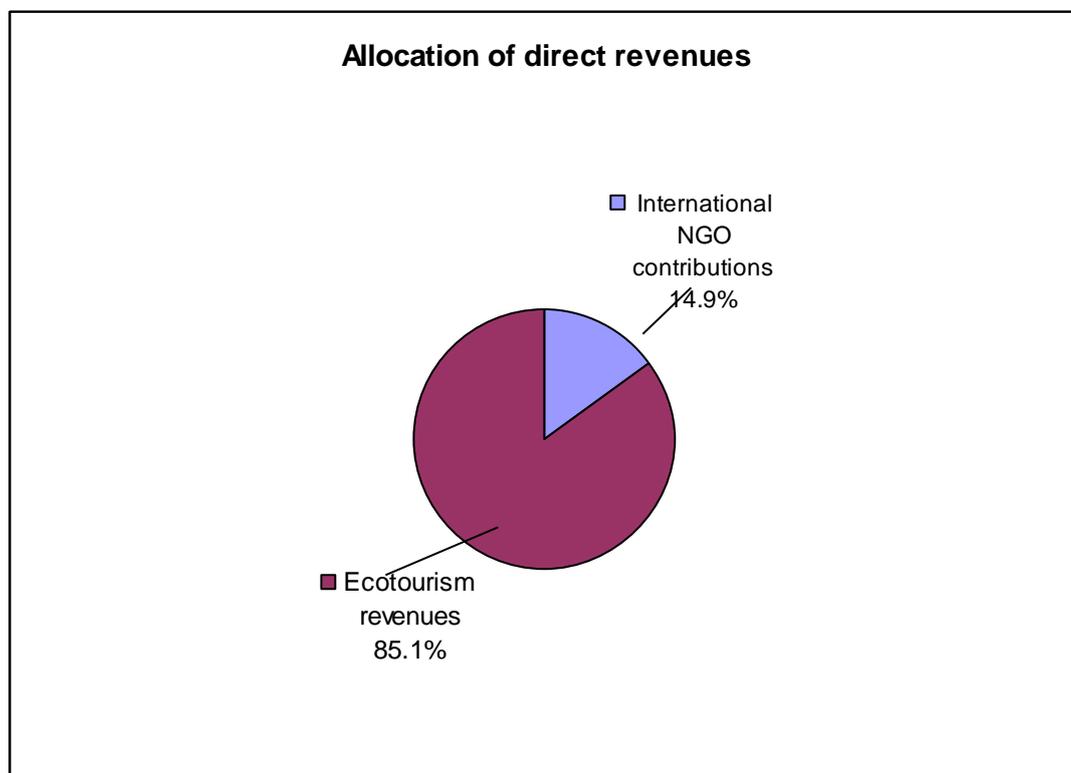
Summary Direct Revenues

The summary of direct revenues consisting of eco-tourism and contribution by international NGOs over the 5-year plan period was estimated at RWF 21,052 million or \$ 36.9 million. Of this amount, ecotourism revenues are expected to contribute 85.1% of the direct revenues and contributions from international NGOs the remaining balance of 14.9%.

Summary direct revenues (RWF '000s)

PNV : MANAGEMENT PLAN

	2005	2006	2007	2008	2009
Ecotourism	2,413,373	3,102,908	3,792,443	4,137,210	4,481,978
Contributions by international NGOs	513,000	589,950	625,575	670,092	725,610
	2,926,373	3,692,858	4,418,018	4,807,302	5,207,588



Other Revenues

Included under 'Other revenues' are: Government subventions; fundraising from bilateral/multilateral sources; and potential revenue generating financial arrangements through willingness to pay, ecological services, and option and existence values as further elaborated below.

Government subvention

The Government of Rwanda (GR) does not provide any direct funding to PNV or any of the other Pas. However, GR provides budget support to ORTPN, but not specifically to PNV. This is largely by subventions. To the extent that PNV is the major source of revenue to ORTPN it is unlikely that GR subventions can be counted as direct income to PNV.

Last year the GR subvention to ORTPN was RWF 156 million and this is expected to increase to RWF 390 million in 2005. While ORTPN expects this subvention to increase in subsequent years, issues of budgetary constraints make it impossible to estimate the actual increases. In this

business plan, the expected GR subvention to ORTPN was expected to increase by 5% per year as obtained from the Strategic Plan 2004-2008.

**Projected Government Subvention to ORTPN
(RWF '000s)**

	2005	2006	2007	2008	2009
Subvention	390,000	409,500	429,975	451,474	474,047

Fundraising

Apart from the NGOs whose contributions are catered for in Section 3.1.2, the other main sources of funds under fundraising are bilateral agencies, multilateral agencies, and individual and corporate organisations. PNV is not expected to raise any funds from bilateral agencies, and individuals or corporations over the plan period. However, there are two multilateral opportunities with high probability. These are the Global Environment Facility project under UNDP and the GRASP project under UNEP.

The project document for the GEF funds is being finalised. However, it is assumed that if approved, activities may begin in earnest in 2006. Of the GEF funds expected, 75% is to be used by ORTPN for general and not PA-specific investments. Therefore, the parks are likely to share in 25% of the \$6 million. PNV could therefore get at least one third or \$100,000/year from 2006 to the end of the plan period. PNV also has an opportunity to access funds through the GRASP programme, but will need to develop proposals and submit for approval. These proposals are expected to be typically small, at about \$50,000 each. During the plan period, it is expected that PNV will get one such proposal approved, especially in the area of community conservation. Livelihoods of communities around PAs is a major focus of GRASP.

Estimated revenues from multilateral and bilateral agencies for PNV

(RWF '000s)

	2005	2006	2007	2008	2009
UNDP/GEF	0	57,000	57,000	57,000	57,000
UNEP/GRASP	0	0	28,500	0	0
Total multilateral contributions	0	57,000	85,500	57,000	57,000

Willingness to pay

Another potential source of revenue is the consumers' willingness to pay. In many parts of the world, Rwanda included, tourist fees are usually set without proper analysis of the supply and demand for tourism services and goods (Turpie *et al*, 2004). The result is that parks tend to be under-priced. Visitors to protected areas often pay less than they otherwise are willing to pay for entry and accommodation

and guiding. The difference between what they are willing to pay and what they actually pay is the consumers' surplus. If the aim is to maximise revenues from park fees, this consumers' surplus should be 'captured' as soon as possible (Turpie *et al*, 2004). However, the 'capturing' of this consumers' surplus is not entirely straightforward, since raising prices has impacts on aggregate demand.

Willingness to pay for the use of protected areas is usually ascertained by means of Contingent Valuation and Travel Cost methods, both of which are survey-based. Studies that have been carried out in East and South Africa suggest that there are large "uncaptured" values in the form of consumers' surplus and that most of this is associated with international, rather than regional or domestic tourists (Krug *et al*, 2002; Moyini & Uwimbabazi, 2000; Brown *et al*, 1995). The latter is attributed to the large proportion of overseas relative to local tourists, as well as to foreign tourists having higher consumers' surplus due to disparities in income relative to park prices. Of relevance, studies in Bwindi, the Virungas and more specifically PNV support the existence of consumers' surplus in gorilla tourism. A recent study in PNV suggests that tourists in general are willing to pay \$400 for gorilla trekking (including entrance fees). Currently, entrance and trekking fees are \$375 per tourist, suggesting a consumers' willingness to pay per tourist of \$25. Based on previous studies elsewhere, it is safe to assume that this willingness to pay accrues largely to foreign non-residents. Furthermore, it is relatively safe to assume that the demand for gorilla trekking is relatively inelastic. This observation is supported by research in South Africa, relating to game viewing (Barnes, 1996).

Eighty seven percent of the tourists visiting PNV are foreign non-residents. These FNRs could be persuaded to spend an extra \$25 each for conservation. However, the message will have to be clear and be closely linked to the conservation of PNV and the protection of the gorilla population. Such a message would typically highlight either research and /or endowment for the management of PNV. The message could be a combination of the two.

In a question specifically aimed at assessing willingness to pay for conservation as opposed to wildlife viewing, Turpie *et al* (2004) reported that Barnes and others found 72% of surveyed visitors to wildlife-based tourism areas were willing to contribute towards conservation in the form of a *Trust Fund*. Based on assumptions of FNR tourist numbers over the plan period, a tentative probability-indexed revenue stream has been worked out as shown below. The probabilities attached are guesstimates based on expert opinion. The data show that if the decision to 'capture' the consumers' surplus for research or creation of an endowment is implemented, PNV could realise as much as RWF 161 million in 2009. For the first year of the plan, no revenue is expected to be realised since this represents a planning and piloting period. Thereafter, the likelihood of realising the income stream increases with a hope for ever-increasing tourist acceptance.

Estimates of Willingness to Pay Revenues

Year	FNR (Number)	Gross Revenue (RWF ' 000s)	Subjective Probability of Being realised	Actualised Potential (RWF ' 000s)
2005	6,090	86,783	0.00	0
2006	7,830	111,578	0.30	33,473
2007	9,570	136,373	0.50	68,187
2008	10,440	148,770	0.75	111,578
2009	11,310	161,168	1.00	161,168

- ❖ *Gross is equal to FNR number × \$25 × RWF 570/ \$.*
- ❖ *Actualised potential is gross multiplied by probability.*
- ❖ *Probability reflects expert opinion regarding the development of revenue generating opportunities and the challenges of introducing new products in the market.*

Ecological services

Obtaining funding through ecological services is another type of business enterprise. However it is treated under a separate heading due to its uniqueness. The forests of Rwanda's PAs are important watersheds and stores of carbon. The main source of revenue from ecological services provided by the forests of PNV relate to carbon sequestration. PNV's forests have limited watershed values to be commercialised, notwithstanding its contribution to local rainfall.

Forests contribute an important carbon sink, helping to reduce accumulation of greenhouse gases hence global warming, which would otherwise lead to adverse changes in climate. Afromontane forests sequester about 125 tonnes of carbon per hectare (Emerton and Muramira, 1999). Consequently, the estimated value per tonne of carbon sequestered is \$20, and annually worth \$0.20 per tonne when discounted over 25 years at a rate of 10% per annum. Therefore, the annual value of PNV with respect to carbon was estimated at \$106,250/year as shown in the table below.

Carbon offsets and credits can generate flows of funds from the international community for conservation. Unfortunately, how much the carbon is bought for is a matter of negotiation. Carbon-related sources of funds include the BioCarbon Fund of the World Bank.

One of the activities envisaged under the GEF project is the development of mechanisms for realising funds through ecological services provided by Rwanda's PAs. Since such a development is expected to take at least two years to come into fruition and since the GEF project is unlikely to become fully operational until 2006, funds from carbon sequestration are expected to be realised from 2009. A key question is, how much of the annual value of \$106,250 will be realisable? No one knows for sure at the moment. With good negotiating skills, possibly half of this value, representing 50% probability is achievable. That is about \$53,000 in year 2009.

Carbon Value of PNV

Area (ha)	4,250
Carbon rate (mt/ha)	125
Quantity of carbon sequestered (mt)	531,250
Value per mt (\$/mt)	20
Total Value (\$)	10,625,000
Annual Value/mt (\$/mt)	0.2
Total Annual NPV value (\$)	106,250

Option and existence values

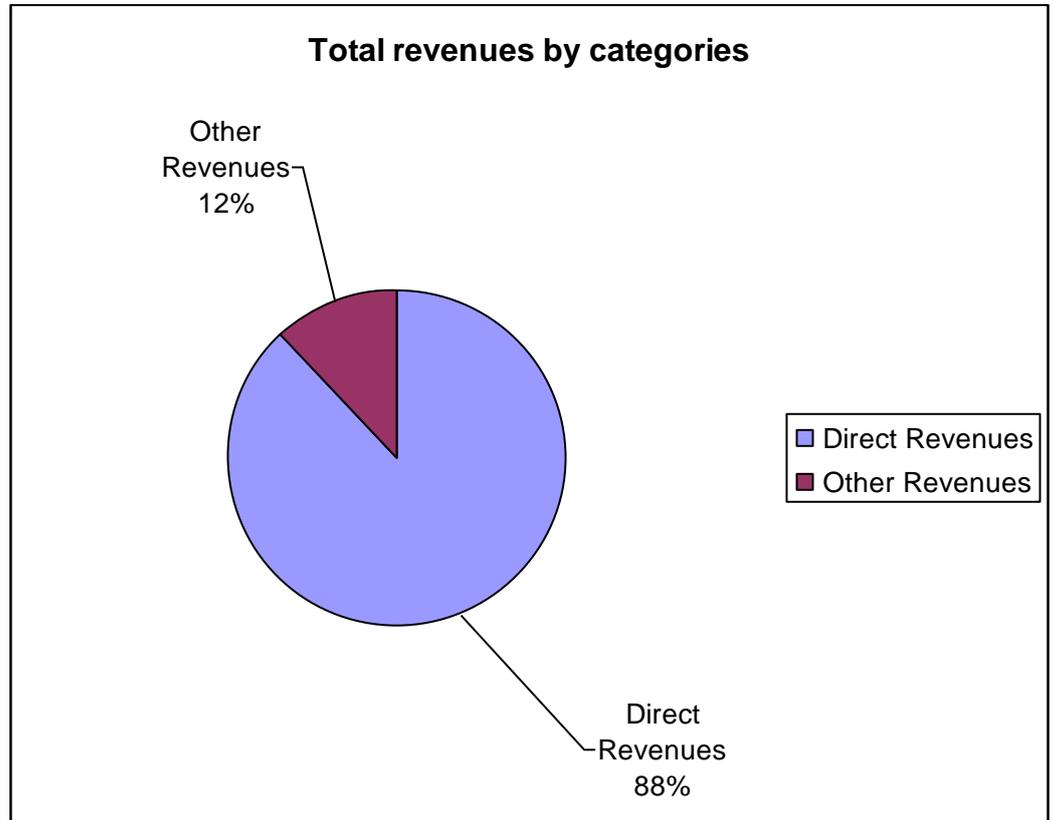
Option values are largely derived from the conservation of resources that have the potential to be valuable in future (Turpie *et al*, 2004). This value is often associated with the genetic diversity of protected areas, the future potential of which is readily acknowledged but completely unknown. Globally, examples abound of the discovery of new species or genetic material, which have turned out to have enormous value in the global pharmaceutical industry. Global loss of 50,000 species would mean the loss of 25 potential new prescription drugs with a value of \$ 25,000 million (Scott, 1993). The horticultural industry could also derive benefits from species conserved in Rwanda's PNV. Wild genetic resources are also important in the development of new agricultural crops and varieties. Option value cannot be, estimated, however. The closest measure available is quasi-option value, which is equal to the amount that society is willing to pay to retain the option of using these resources in the future.

Non-use values do not involve any current or future use of protected areas. They comprise a composite of values including existence and bequest values, and are commonly just referred to in general as existence value (Turpie *et al*, 2004). The existence value of a protected area is the satisfaction obtained from the knowledge that the resources can be enjoyed by future generations. Non-use values are far more intangible than the above values, but perhaps more measurable, in that they are theoretically reflected in society's willingness to pay to ensure the continued existence of protected areas. Individual values are often reflected in the donations they make or are willing to make to conservation agencies. Global existence value is reflected in the donations that government and non-governmental organisations around the world make towards the development and maintenance of PNV. These contributions were already reflected in the earlier part of this section on revenue. A key question remains though; that is, are these donations enough? Do they reflect the true value of this global resource? These questions suggest the need for further economics analysis.

Revenue summary

Total revenue over the 5-year period were projected to be about RWF 24,357 million or \$ 42.7 million. Of these revenues, direct revenues comprising of ecotourism and contribution by the international NGOs was estimated to account for about 88.0%; while other sources of revenue are expected to contribute the remaining 12%. Of the total 'Other revenues' amounting to RWF 3,304 million (or \$5.8 million), 75.6% is expected to be realised from Government Subventions.

The remainder, or 24.4% is expected from multilateral donations, tourists' willingness to pay, and ecological services. However, to be realised, the markets for the latter will first have to be developed.



Protected Areas Financial Plan - Revenue Summary

PNV

Jan 2005 - Dec 2009

	Projected Revenue (RWF '000s)						Projected Revenue (US \$ '000s)					
	2005	2006	2007	2008	2009	Total	2005	2006	2007	2008	2009	Total
Direct revenues												
1. Ecotourism	2,413,373	3,102,908	3,792,443	4,137,210	4,481,978	17,927,910	4,234	5,444	6,653	7,258	7,863	31,452
2. Contribution by International NGOs												
IGCP (IP)	114,000	142,500	178,125	222,642	278,160	935,427	200	250	313	391	488	1,641
IGCP (OP)	114,000	162,450	162,450	162,450	162,450	763,800	200	285	285	285	285	1,340
DFGFI	114,000	114,000	114,000	114,000	114,000	570,000	200	200	200	200	200	1,000
MGVP	114,000	114,000	114,000	114,000	114,000	570,000	200	200	200	200	200	1,000
DFGFE	57,000	57,000	57,000	57,000	57,000	285,000	100	100	100	100	100	500
Sub-total Direct Revenues	2,926,373	3,692,858	4,418,018	4,807,302	5,207,588	21,052,137	5,134	6,479	7,751	8,434	9,136	36,934
Other revenues												
3. Government subvention	390,000	409,500	429,975	451,474	474,047	2,154,996	684	718	754	792	832	3,781
4. Fundraising: Bilateral/Multilateral												
GEF	57,000	57,000	57,000	57,000	57,000	285,000	100	100	100	100	100	500
GRASP	0	0	28,500	0	0	28,500	0	0	50	0	0	50
5. Willingness to Pay	0	33,473	68,187	118,578	161,168	381,406	0	59	120	208	283	669
6. Ecological services	0	0	0	0	30,210	30,210	0	0	0	0	53	53
Existence values	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total Other Revenues	447,000	499,973	583,662	627,052	722,425	2,880,112	784	877	1,024	1,100	1,267	5,053
Total Revenue	3,373,373	4,192,831	5,001,680	5,434,354	5,930,013	23,932,249	5,918	7,356	8,775	9,534	10,404	41,986

Balance Analysis

This section of the Business Plan presents an analysis of the relationships between various categories of expenses and revenues to test the financial feasibility of implementing the Management Plan 2005-2009 for PNV. More specifically, several levels of analysis were carried out. These analyses sought to answer the following questions.

- What is the impact of tourism capacity utilisation on the different levels of expenses?
- Can PNV ecotourism revenues cover all expenses of the programmes specified under the Management Plan 2005-2009, without resorting to assistance outside the Park?
- Suppose contributions from the international NGOs active in the area were to cease, can PNV ecotourism revenue cover both projected programme and project expenses and leave some surplus for the parent ORTPN's expenses?
- How do total revenues compare with total expenses?
- What is the feasibility of establishing an endowment for PNV?

Data for the various levels of analysis are presented in *Annex 3*, presented below are the descriptions of the results coming from the various analyses.

Tourism capacity and expense levels

In the analysis of revenues in *Section 3*, ecotourism emerged as the main source of revenue. However, this dependence on tourism can be risky. Events around the world and particularly in the Great Lakes Region attest to the risky nature of tourism investments. For this reason, it is worthwhile to look at different tourism capacity utilisation levels and their abilities to support varying levels of expenses.

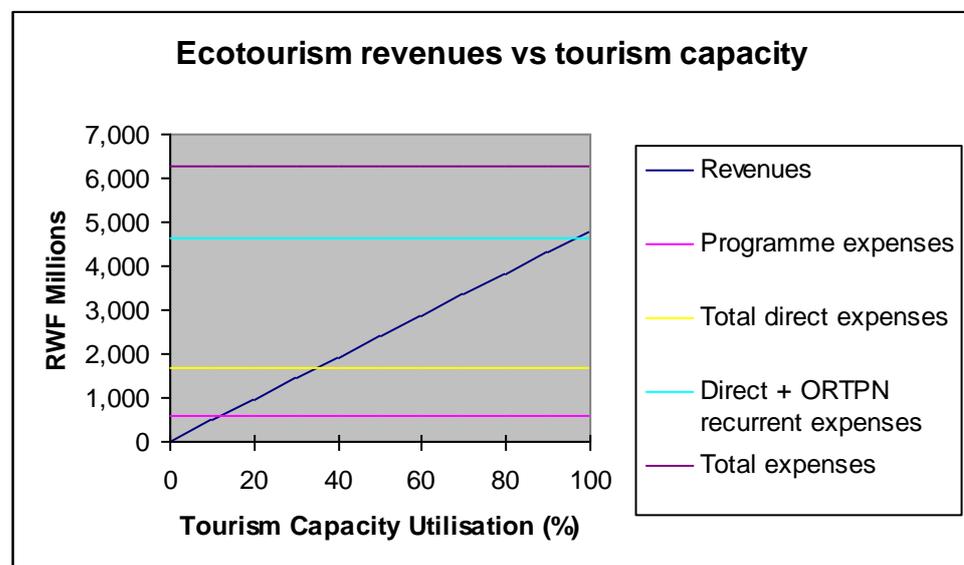
At full (100%) capacity, PNV can receive 38 tourists per day for 365 days per year (or 13,870 tourists). This is nearly the situation in the 5th year (2009) of the Plan period (about 93.7% capacity utilisation). In the first year of the Plan period (2005) capacity utilisation was estimated at 50.5%. Revenues at different capacity utilisation levels were worked out and compared with expenses.

For the expenses, annual averages were obtained from the 5-year totals presented in *Section 2*. The aim was to assess at what various capacity utilisation levels the expenses would be covered. Four expense levels were assessed, namely the average annual level of: programme expenses; direct expenses (programme plus project); ORTPN re-current expenses added to direct expenses; and finally total expenses (including ORTPN capital). The results are shown in the figure below.

The resulting analysis shows capacity utilisation and the resulting revenues and how the latter balance with the different levels of expenses. The data show that at

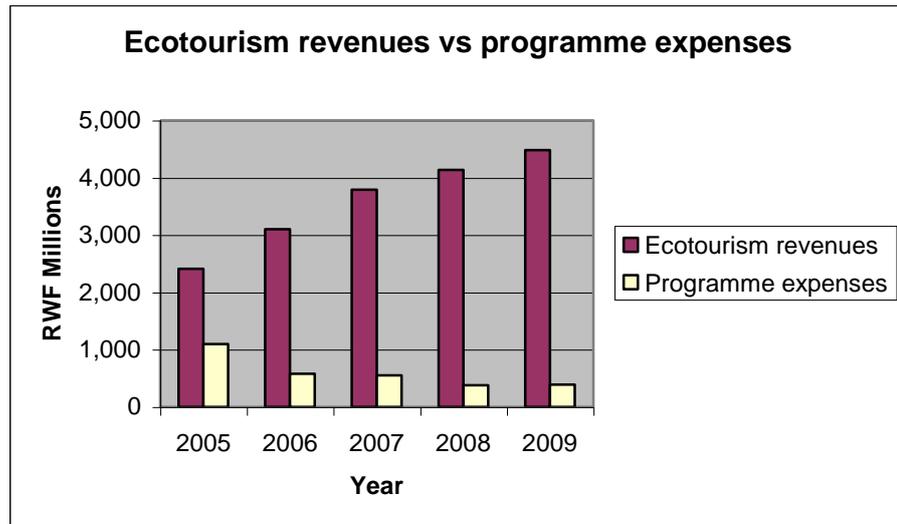
slightly more than 10% tourism capacity utilisation, PNV's ecotourism revenues would be sufficient to support programme expenses over the Plan period.

But when total direct expenses (programme and projects) were considered, close to 38% tourism capacity is needed to meet the expenses. When ORTPN recurrent expenses were added to the direct ones, close to 97% capacity utilisation would be required for a break-even situation. Finally, when all expenses including ORTPN investment (capital) were weighed against capacity utilisation, even at 100% capacity, revenues would be insufficient to meet all expenses. Some of the shortfall is met through contributions by international NGOs, fundraising from bilateral/multilateral agencies, and Government subventions. However, ORTPN will need to diversify its income sources to reduce the financial burden on PNV.



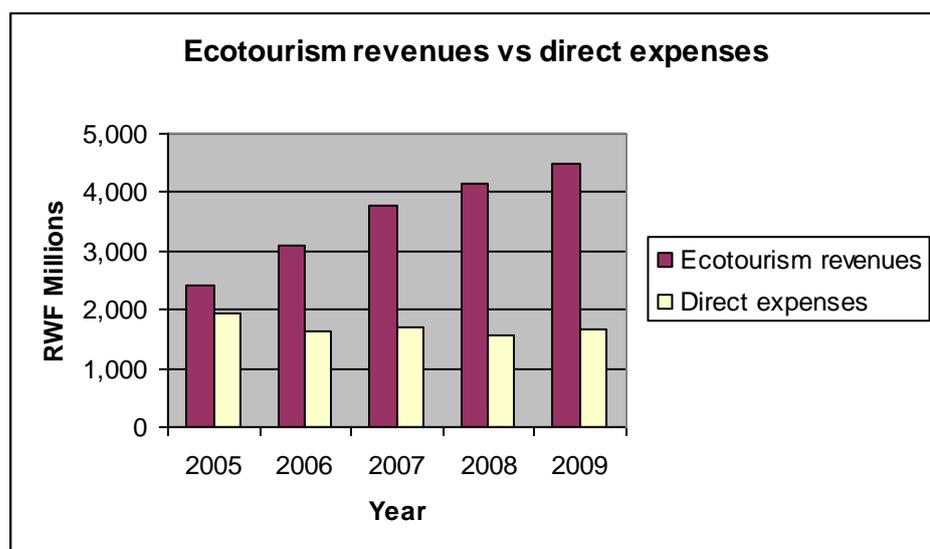
Ecotourism revenue vs. programme expenses

Based on the tourism capacity utilisation levels forecast over the Plan period, the resulting ecotourism revenues were compared with programme expenses. The data show that in each of the 5 years of the Plan, ecotourism revenues are much bigger than programme expenses. PNV ecotourism revenues can easily support the activities specified under the six programmes for each year of the plan.



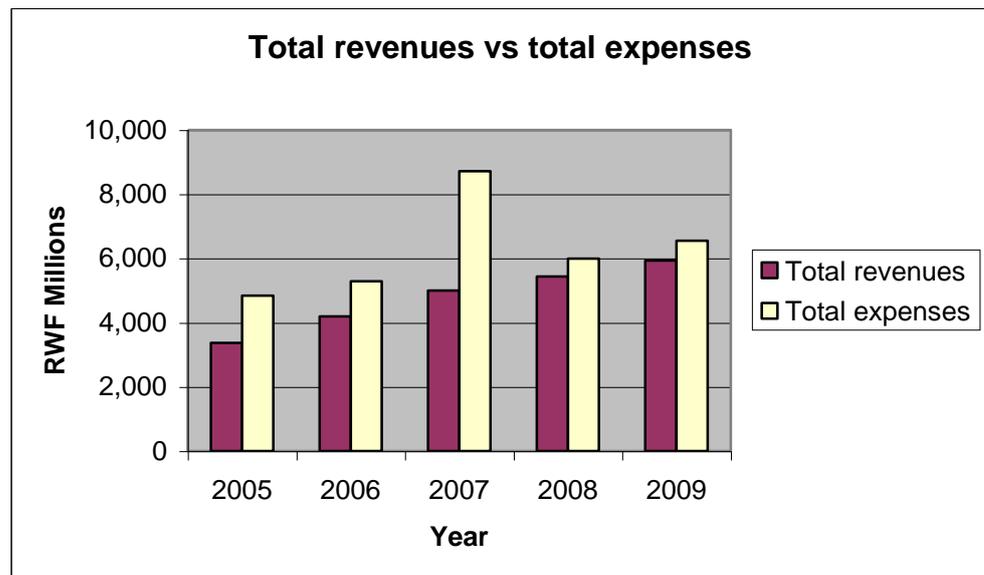
Ecotourism revenues vs. Direct expenses

Direct expenses are made up of programme and project expenses. Ecotourism revenues are based on the tourism capacity utilisation over the 5-year period. Once again, the resulting picture is that ecotourism revenues more than meet direct expenses. Such a scenario could arise if for whatever reason, international NGOs are unable to make contributions to the management of PNV. From the results of the analysis, it can be concluded that PNV ecotourism revenues are in a position to meet both programme and project expenses in the absence of NGO support. However, there is a *caveat*, namely, that ORTPN will preferentially apply the ecotourism revenues of PNV to first meet the PAs programme and project costs. A difficult choice to make when ORTPN itself has many demands to satisfy.



Total revenues vs. total expenses

Total revenues represent direct and other revenues as elaborated in *Section 3*. Similarly, total expenses stand for direct and other expenses as elaborated in *Section 2*. The data show that for each of the 5-years in the Plan period, total expenses are expected to exceed total revenues. The largest deficit is expected in the third year of the Plan (2007) when ORTPN hopes to initiate a real estate development to house its operations and to raise additional revenue for the organisation by earning rental income. In the fourth and fifth years of the Plan, revenues nearly match all of the expenses.



Feasibility of establishing a trust fund

According to Victurine (2004), various organisations in Rwanda have raised the idea of establishing an endowment fund to support conservation and conservation-related activities. The question is, should one be created, and if so for what? Since building an endowment that can effectively fund conservation nationally is challenging and requires tying up significant sums of money, Victurine (2004) advocates for a targeted endowment particularly for PNV. However, making such an endowment work is expected to require some policy changes, including the introduction and passage of a foundation law that would permit an endowment to be created (Victurine, 2004). According to the author, the possibility of creating a targeted fund for the mountain gorilla has an appeal for several reasons. These include having to deal with a manageable amount; experience from neighbouring Uganda; and PNV currently enjoying support from many NGOs in the region. While there is a general consensus on the need for an endowment for conservation activities in PNV, of key concern is where the money will come from.

PNV's average annual direct (programme + project) expenses over the Management Plan 2005-2009 period is estimated at RWF 1,696 million (or about \$3 million) per year. While PNV may not be able to entirely fund an endowment which can meet the entire annual direct expenses, it can catalyse the creation of a smaller one targeted to take care of recurrent critical or priority activities in the park.

One potential source of this seed money is the consumers' willingness to pay. In *Section 3*, it was shown that PNV could raise RWF 374.4 million (or \$657,000) by the end of the Plan period. With this amount in hand, ORTPN may be able to leverage four times or more of additional funds from other sources. Hence an endowment fund for PNV of RWF 1,710 million (or \$ 3 million) is feasible by the end of the Plan period if the regulatory reforms needed are put in place within the first year of the Plan and ORTPN Board approves the creation of the endowment.

Opportunities foregone

While considerations of agricultural production foregone as a result of setting aside PNV as a protected area are largely outside the scope of the Management Plan, nonetheless it gives recognition to this factor by recommending significant investments in community conservation activities which deal with poverty reduction, and improvements in agricultural productivity and livestock yields, making up for the need to expand the area under agriculture and livestock. International NGOs are assisting PNV through ORTPN in this area. In addition, they are committing significant funds in support of income generating activities (IGAs) including micro finance credit facilities for communities neighbouring PNV.

Conclusions and Recommendations

Conclusions

There is no doubt the mountain gorillas of PNV constitute a flagship of Rwanda's tourism industry. For the moment, the majority of foreign non-resident tourists come to Rwanda to see the mountain gorillas whose population in Rwanda is confined to PNV alone. Hence the Management Plan 2005-2009 is timely since Rwanda expects to expand its tourism business. Increased tourism brings with it other concerns, social and conservation. The plan calls for a balanced development, which includes considerations of the ecological fragility of the PNV ecosystem and the health of the animals.

From a financial standpoint, the Management plan 2005-2009 for PNV is sound. The Plan's financial requirements are reasonable and can easily be financed by the revenues the protected area generates. Through investments in infrastructure, equipment, management systems and greater community involvement, the successful implementation of the plan should lead to improved delivery of services and the attainment of conservation goals.

Recommendations

From the foregoing, the following recommendations have been made.

- ❖ ORTPN should assist PNV to establish an endowment for conservation of the mountain gorilla. Realising revenues from the willingness of consumers to pay more than fees charged currently can catalyse the funding for the endowment.
- ❖ ORTPN should also invest, in partnership with the international NGOs, in mechanisms for generating revenue from the ecological services which the forests of PNV provide
- ❖ ORTPN, in partnership with the international NGOs, should increase investments in community welfare, notably improving access to safe water sources, developing alternatives to other park resources, and encouraging income-generating activities.
- ❖ ORTPN should, give consideration to adopting the Management Plan 2005-2009 for PNV and its accompanying Long-term Business Plan.

Appendix

1. **List of Stakeholders involved in PNV Management Plan**
2. **Bibliography**
3. **Annual Operation Plans 2005**
4. **Action Plans 2005-2009**
5. **Other Management Plan supporting documents**