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Lecture

Wildlife Conservation – Prospects and Challenges in East Africa

Opportunities for Wealth creation and improved livelihoods through enhanced natural heritage conservation, conflict resolution and integration of traditional practices in natural resources management in Uganda – A case study for Bwindi Impenetrable and Lake Mburo National Parks

Introduction

Biodiversity conservation in Uganda started informally at the end of the 19th century at the time when most of the current wildlife protected areas were being used as traditional hunting grounds for the traditional kings. Wildlife was abundant and widely spread all over Uganda. The government identified areas of high concentration of wildlife and set them aside as conservation areas. With the various expanses of wildlife habitats and wildlife outside the protected areas, there was inevitable heightened human-wildlife conflict that called for interventions geared towards reducing the conflict. Uganda Wildlife Authority (UWA) commenced programs that are designed to enhance protection of such wildlife on both private land and inside the protected areas. This paper focuses on how these programs have positively contributed to the livelihood of the communities living next to Bwindi Impenetrable and Lake Mburo national parks

Bwindi Impenetrable National Park (BINP) was gazetted in 1991 and inscribed a World Heritage Site in 1994 after the realization that their critical biodiversity was at the verge of extinction as a result of unsustainable resource harvest. Lake Mbura National Park (LMNP) area was initially part of the Nshara rangelands. During the nineteenth century, the Nshara rangelands were a traditional grazing and hunting area for the kings of

Ankole region. An area of 650sq. km was later gazetted as Lake Mbuho Game Reserve by Statutory Instrument No. 224. In 1966 almost 78sq. km was excised for the Government-owned Nshara ranch. In 1983, the government upgraded the Lake Mbuho Game Reserve to a national park status.

The two parks are critical for the conservation of biodiversity and provide other ecosystem services. More than half (400 of the 650 gorillas) of the world's entire population of the critically endangered mountain gorilla (*Gorilla gorilla beringei*), is found in Bwindi Impenetrable National Park (BINP). Bwindi is one of the few areas with the Afromontane forest type, one of the rarest vegetation types in Africa. BINP is also an important water catchment area. It hosts an extremely high biodiversity, possibly one of the most diverse forest ecosystems in Africa containing threatened and endemic species. The park has outstanding aesthetic values with stunning scenic beauty.

The Lake Mbuho- Nakivale ecosystem is a Ramsar site which is an Important Bird Area, particularly important as a breeding area for the regionally endemic shoebill (vulnerable) and hosts the African finfoot which is endemic to Lake Mbuho. Lake Mbuho National Park is the only park with significant populations of the Impala, eland, topi and zebras in Uganda. The lake is a critical water body within the River Rwizi catchment area that drains into Lake Victoria, providing direct and indirect values such as modification of climate to the surrounding environment and communities. Lake Mbuho is associated with a rich cultural heritage that is built on the keeping of the unique long horned Ankole cow. The long horned Ankole cow is a trademark for the pastoral communities around the park.

The change from community forest and rangeland respectively to the reserve and national parks status came along with community hostility as communities perceived it as loss of benefits for their livelihoods. The communities of around Bwindi used Bwindi forest as a source of timber, minerals, non-timber products, game meat and agricultural land. As for Lake Mbuho, the gazettement of the area as a National Park did not go well with the community members who thought had rights of land within the area. The wildlife, therefore, was seen as a nuisance and the landowners started killing them.

Uganda Wildlife Authority (UWA) instituted programs that promoted the parks' and wildlife protection through enhanced awareness, revenue sharing, tourism, livelihood enhancement of the local communities, and enhanced benefits through sustainable nature-based tourism. These programs changed community attitude and improved community involvement in park management.

Initiatives such as revenue sharing schemes have increased the financial resources for the parks neighboring communities. The areas around the parks have been transformed into development centres and community way of life improved. The benefit programs have contributed to community attitude change and enhanced wildlife conservation. The wildlife population trends at both sites, especially the mountain gorillas, are very positive. Despite these improvements, key challenges that still impact wildlife conservation include inadequate political support, the growing human population around the parks, problem animals, Climate change impacts, poaching and illegal trafficking of wildlife products. Various interventions are being implemented to mitigate these challenges as explained later in the text.

Natural resources have continued to be one of the main sources of income and development for most of the rural communities that live next to natural sites whose tourism industries have been well established. It's also clear that the income from nature-based resource management is more sustainable and environmentally friendly to mankind. With the right interventions in place, conflicts between humans and wildlife can be mitigated and community livelihoods improved. This paper will first explore the context of the two case studies, and the improvements that have occurred due to the interventions instigated by UWA. It will then discuss the aforementioned challenges still facing wildlife conservation in these areas and how these challenges might be met with further interventions.

History of Wildlife Conservation in Uganda

Biodiversity conservation in Uganda started informally at the end of the 19th century at the time when most of the current wildlife protected areas were being used as traditional hunting grounds for the cultural kings. The wildlife was abundant and widely spread all over Uganda. The kings' hunting expeditions were mainly for relaxation and sport. This was done alongside traditional hunting for household purposes with the use of traditional implements. The period 1902-1923 was characterized by the introduction of sport hunting, banning the use of traditional hunting practices and tools, creating limitations for local communities to continued use of wildlife resources.

In 1923, the government established a Game Elephant Control Unit that was later transformed into the Game Department in 1925/26 under the Game Ordinance of 1926 to mitigate the potential depletion of large game species including elephants, rhinos, lions and hippos.

The government identified areas of great concentration and healthy community condition as wildlife sanctuaries, some of which were later gazetted as Game Reserves under the Game (Preservation and Control) Ordinance of July 1926.

The process of identifying areas important for wildlife resources based on population numbers and habitat conditions continued, culminating in the creation of two National Parks, Queen Elizabeth National Park and Murchison Falls National Park, under the National Parks Ordinance No. 3 of 1952.

The National Parks Ordinance created a new dispensation in wildlife conservation where the management of the new national parks (the highest category of wildlife conservation area in Uganda) was put under a separate fully autonomous institution called the Uganda National Parks. The process and the new development therefore put a stop to any form of extractive utilization of wildlife resources by the local communities.

Between 1959 and 1962, the national programme on wildlife conservation, now under the two institutions (Game Department and Uganda National Parks), led by the Game Department, embarked on consolidating gains including identification of additional important areas for (a) protection of wildlife and (b) human-wildlife conflict resolution with special reference to problem elephants. As a result, more conservation areas were created including Controlled Hunting Areas (seasonal) and Wildlife Sanctuaries, leading to the National Wildlife Conservation Programme that was adopted by Uganda Government in 1962 under the Game (Preservation and Control) Act of 1962. The subsequent process involved the creation of more protected areas including Kidepo Valley National Park, Game Reserves and the establishment of permanent Controlled Hunting Areas (Olupot et al, 2010) under Uganda National Parks Act of 1964 and Game (Preservation and Control) Act of 1964 respectively. Nevertheless, these gazettelements left a lot of wildlife resources outside designated protected areas.

Conservation approaches historically promoted preservation rather than utilization and community participation. It was not until 1994 that the Wildlife Policy for Uganda gave recognition to community participation in wildlife management. The paradigm shift to involvement of local people in conservation has created opportunities for communities to directly engage and benefit from wildlife conservation. This came along with the creation of the Uganda Wildlife Authority (UWA) under the Uganda Wildlife Statute No. 14 of 1996 (UPPC, 1996). To date, UWA manages 22 wildlife protected areas that include 10 national parks and 12 wildlife reserves.

With the various expanses of wildlife habitats and wildlife outside the protected areas, there was inevitable heightened human-wildlife conflict that called for interventions geared towards reducing the conflict. Uganda Wildlife Authority (UWA) commenced programs that are designed to enhance protection of such wildlife on both private land and inside the protected areas. This justified the beginning of wildlife collaborative management programs in Uganda that are provided for under section 6 and 14, and are being implemented by way of section 29 of the Uganda Wildlife Act Cap 200 of 2000. The following sections will particularly focus on Bwindi Impenetrable and Lake Mburo national parks as case studies in this regard.

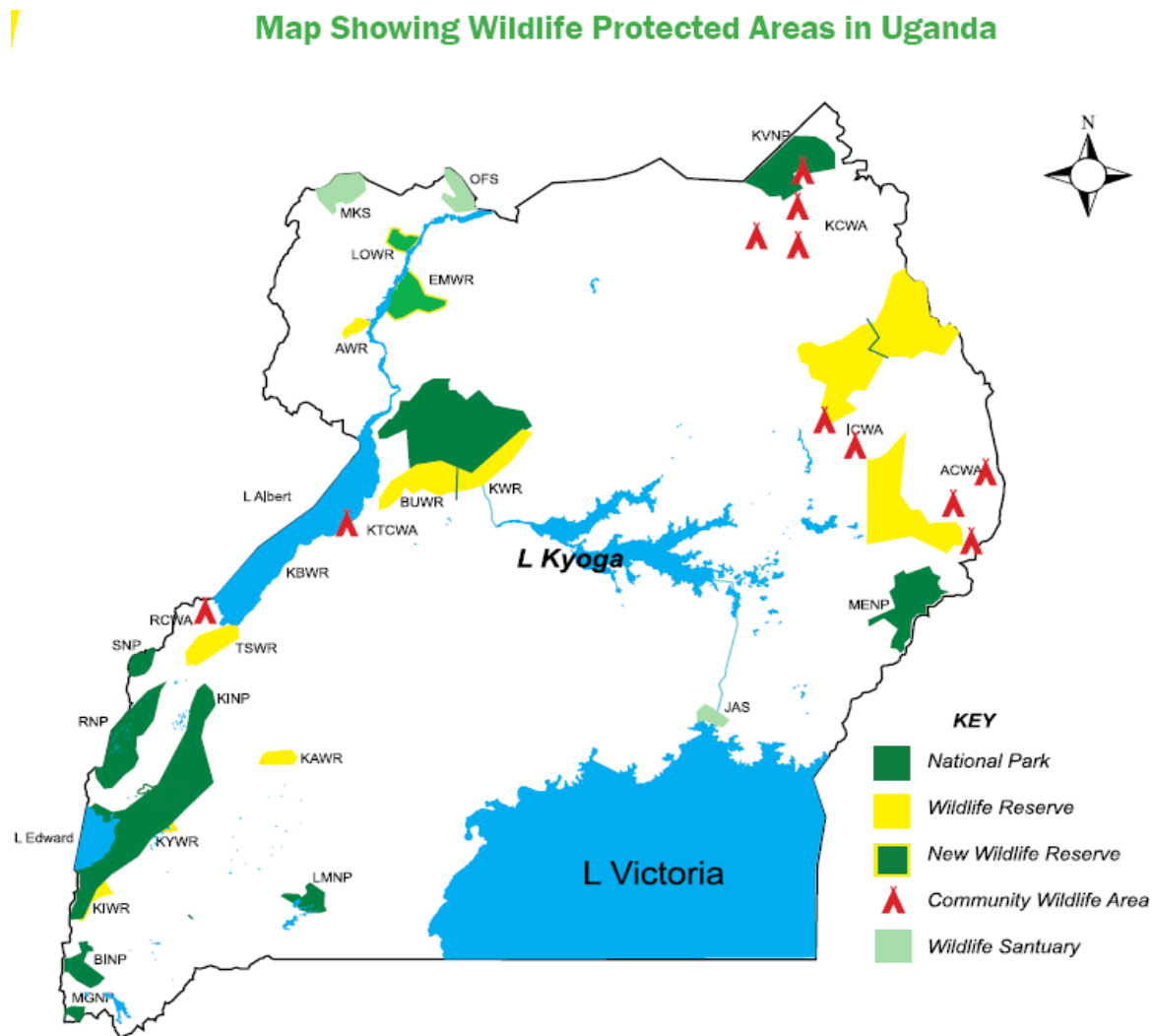
Background to Conservation Of Bwindi Impenetrable And Lake Mburo National Parks

Bwindi Impenetrable National Park (BINP) was gazetted in 1991 and inscribed as World Heritage in 1994 after the realization that its critical biodiversity was on the verge of extinction as a result of unsustainable resource harvest (UWA, 2014). Poaching was prevalent as wild animals provide a food source for the impoverished communities. BINP is located in Uganda's rift valley that hosts the highest biodiversity hot spots. BINP is a forest national park that hosts key biodiversity resources like the critically endangered mountain gorilla and the chimpanzees (BINP) and is a key source of water for millions of people that live next to it in Uganda and the Democratic Republic of Congo. BINP forest ecosystem contributes water that supports the fisheries resources in lake Edward and the Kazinga Channel and indirectly contributes water for the sustenance of agricultural systems in countries far from it, for example Egypt.

Lake Mbura National Park (LMNP) area was initially part of the Nshara rangelands. During the nineteenth century, the Nshara rangelands were a traditional grazing and hunting area for the kings of Ankole. The area formed part of a cattle corridor stretching from Tanzania to Karamoja and was occupied mostly by the nomadic, cattle keeping Bahima. The nomadic life of the Bahima and the cultural practices that shunned the eating of game meat promoted the multiplication of wildlife numbers in the area. With the infestation of sleeping sickness and the depopulation of the area by the government, the wildlife thrived in the area. The Lake Mburo area was then gazetted as a controlled hunting area through General Notice No. 310 of 1958 and 355 of 1963 (UWA, 2003). An area of 650sq. km was later gazetted as Lake Mburo Game Reserve by Statutory Instrument No. 224. In 1966 almost 78sq. km was excised for the government-owned Nshara ranch. In 1983, the government upgraded the Lake Mburo Game Reserve to a national park status and this led to the eviction of both the legitimate and illegitimate occupants of the reserve. Between 1983 and 1985 when there was insecurity, communities re-occupied the area and, with this pressure on the government, the park was reduced to its present size (370sq. km) in 1986 (UWA, 2003), leaving substantial wildlife resources

outside the boundaries of the park. Figure. 1 shows the locations of Bwindi Impenetrable and Lake Mburo National Parks in Uganda.

Figure 1:



Conservation Values For BINP And LMNP (UWA, 2003 and UWA, 2014)

Bwindi Impenetrable National Park

More than half (400 of the 650 gorillas) of the world's entire population of the critically endangered subspecies of gorilla, the mountain gorilla (*Gorilla gorilla beringei*), is found in Bwindi Impenetrable National Park which is part of the wider Virunga Landscape. The mountain gorilla is a major part of Uganda's heritage, and also of high tourism value to the nation.

Bwindi is one of the few areas with the Afromontane forest type, one of the rarest vegetation types in Africa. Its lowland and montane communities are unique in Uganda. The forest has one of the highest diversity of trees, butterflies and birds in East Africa and is home to at least twelve globally threatened species. Bwindi was gazetted as a National Park in 1991 and declared a UNESCO Natural World Heritage Site in 1994. BINP is believed to have served as "Pleistocene refugia" that supported forest species in Africa during the ice age. This led to the high biodiversity, with one of the richest mountain fauna in Africa.

World Heritage Sites embody the diversity of the planet and the achievements of its peoples. They are places of beauty and wonder, mystery and grandeur, memory and meaning. In short, they represent the best Earth has to offer. Universal value is the key to the meaning of World Heritage. It means that the importance of BINP as a World Heritage site transcends local and national interests.

BINP is an important water catchment area, which is necessary for the sustenance of stream flow, prevention of soil erosion and provision for favorable climatic conditions in the area. The rivers, which flow out of the park, have abundant aquatic life and some potential for hydropower production on a few of those from Bwindi.

Bwindi lies in an altitude range of 1160metres above sea level at the northern tip to 2607metres above sea level on the eastern edge. The area is part of the rugged Kigezi highlands landscape that was formed through up-warping of the eastern blocks of the East African Western Rift valley. The lowland montane vegetation communities present an extraordinarily wide range of habitats, including low-altitude forests, mid-altitude forests, high-altitude grasslands (bamboo) and a number of wetland/ swampy areas. These qualities have enhanced Bwindi's role as an important water catchment area locally, nationally, regionally and internationally, which is necessary for the maintenance of stream flow for domestic/industrial use, fisheries and contributes waters to the Great River Nile through Lake Edward, River Semliki and Lake Albert. The rivers that flow out of the park host abundant aquatic life. The forest cover is also very important for its role in the control of soil erosion and for moderation of the local climate. Globally, Bwindi contributes to carbon sequestration.

Due to its diverse altitudinal habitats, location at the interface of the Albertine, Congo Basin and Eastern Africa ecological zones and the Pleistocene refuge characteristics, Bwindi hosts an extremely high level of biodiversity. It is possibly one of the most diverse forest ecosystems in Africa, containing threatened and endemic species. At the East African regional level, the site is the most diverse forest ecosystem for trees (over 200 species) and ferns (104 species) as well as other taxa. The trees account for 47% of the total recorded in Uganda, including 10 species not found elsewhere. In addition, it has 16 tree species that are restricted to the south western part of the country, including the globally threatened *Lovoa swynnertonii*. The site is one of the richest in faunal communities in Africa with over 214 species of forest birds, 7 species of diurnal primates and 202 species of butterflies (84% country's total). The forest is very significant as home to almost half of the population (about 340) of the critically endangered mountain gorilla, and the only spot on the globe that hosts the mountain gorillas and chimpanzees in the same habitat. Bwindi is also important as home to the Afromontane faunal life that is endemic to the Albertine Rift, with 70 out of 78 montane forest bird species including 22 of 27 Albertine endemics. Eight of the Albertine butterfly endemics are known to occur in Bwindi. Overall, Bwindi hosts 9 Globally threatened species including the mountain gorilla, chimpanzee, L'hoest monkey, African elephant, African green broadbill, Grauer's rush warbler, Chapin's flycatcher, African giant swallowtail and cream-banded swallowtail.

The park has outstanding aesthetic values with stunning scenic beauty. A walk within BINP will reveal diverse scenic beauty, mountain ranges and surroundings. It also has a diversity of butterflies, large mammals (including several primates) and birds, some of which are endemic, others rare or endangered (African

elephant, gorilla and l’Hoest’s monkey are listed in the 1996 IUCN Red List of threatened animals) and therefore of high conservation importance. BINP is most important for the conservation of montane butterflies. 3 butterflies occur only in Bwindi: the cream-banded swallowtail *Papilio leucotaenia*, *Graphium gudenusi* and *Charaxes fournierae*, It also has the threatened African giant swallowtail *Papilio antimachus*. In terms of the flora, there are two internationally threatened species, *Lovoa swynnertonii*, *Brazzeia longipedicellata* and a further 16 species have a very limited distribution in south-west Uganda. BINP is almost entirely covered with forest and plays a very important role in local climate modification and as a carbon sink.

Several caves are found within BINP. These caves form part of rich cultural and religious values for the neighbouring communities. They are also important for tourism sites.

Lake Mbuoro National Park

The Lake Mbuoro- Nakivale ecosystem is a Ramsar site which is an Important Bird Area, particularly important as a breeding area for the regionally endemic shoebill (vulnerable) and hosts the African finfoot which is endemic to Lake Mbuoro. The park is a habitat for the papyrus yellow warbler (*Chloropeta gracilirostris*) (near threatened). The park also hosts a number of migratory birds both palaeartic and continental birds, examples of which include the Abdmn stock and the pink-backed pelicans.

Lake Mbuoro National Park is the only park with significant populations of the impala, eland, topi and zebras in Uganda. Although efforts have been made to translocate some impalas to Katonga, it will take a long time to build viable populations. The Ishasha Sector in QENP is the only other area where topi can be found though in small numbers. Elands and zebras are also found in Kidepo but the populations are equally small. Lake Mbuoro will, therefore, remain the only important stronghold as far as populations of impalas, eland, zebra and topi are concerned.

Lake Mbuoro is a critical water body within the River Rwizi catchment area that drains into Lake Victoria, providing direct and indirect values such as modification of climate to the surrounding environment and communities. It is the only source of permanent water in the area providing water for both wildlife and livestock.

The traditional and cultural relationship between the protected fauna and flora and the culture of Banyankole (a cattle keeping ethnic tribe living next to Lake Mbuoro National Park) in the surrounding

communities, e.g clans and wildlife, has positively contributed towards conservation of the park. A number of animal species including monkeys, zebra, bushbuck, have links to the culture as most of them are totems. It is traditionally abominable for someone to hunt, kill, or endanger in any way the animal that is his or her totem. Traditionally, the Bahima (sub-clan of the Banyankole) who mostly neighbor the park do not eat wild meat. This explains why large populations of wildlife have survived on private land and ranches.

Lake Mbuho is associated with a rich cultural heritage that is built on the keeping of the unique longhorned Ankole cow. The longhorned Ankole cow is a trademark for the pastoral communities around the park. Although some community groups are now switching to different breeds, the Pastoralists still have a strong attachment to the longhorned cow. There are cultural sites within LMNP which include Kigarama, Rubanga, Ruroko and Ihendamata. Rubanga site was originally used by groups of people to perform sacrifices to their gods for different reasons such as famine, drought and childbearing. Ruroko is an area where the Bacwezi used to dwell and Kigarama where the pages (servants) of the king used to stay. Although these sites are no longer active, the communities still place a lot of historical importance on them.

The park has a variety of ecosystems including lakes, wetlands, open grasslands, forests, woodlands that support a high biodiversity. Lake Mbuho with its surrounding wetland system provides a very important habitat for a number of animals. Most animals use this area for watering especially during the dry season when other parts of the park are without water. In addition, the ecosystems contain important medicinal and rare trees such as *Craibea fagara* which cures over 100 diseases, and “omuboro” tree believed to have aphrodisiac properties but a rare and threatened tree species.

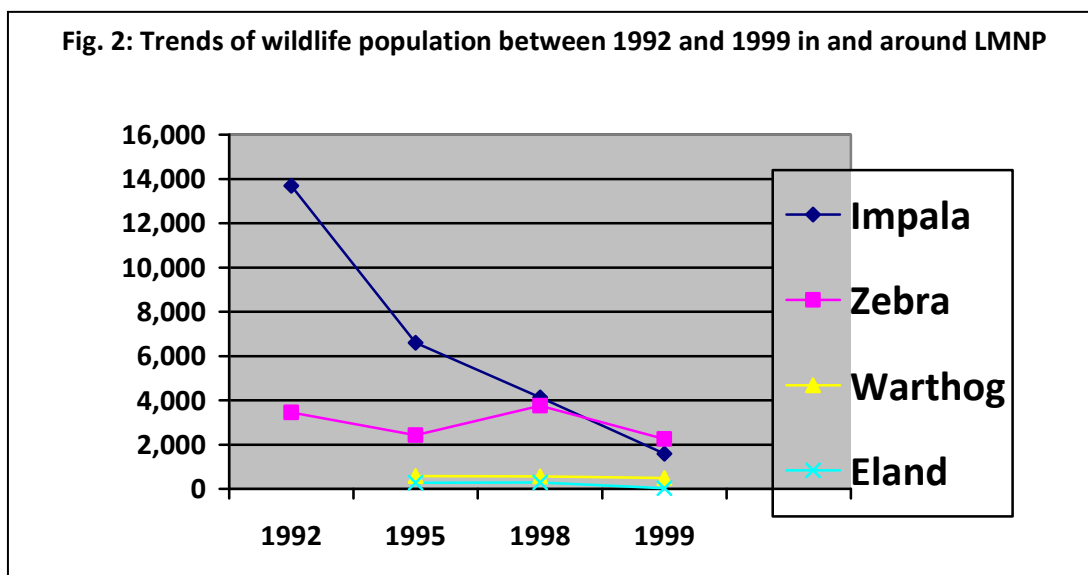
LMNP is the only national park in Ankole region that has become a base for tourism developments in the area such as hotels, cultural centers and sport hunting. The former Ankole kingdom is now partitioned into ten districts of Kiruhura, Isingiro, Mbarara, Ibanda, Ntungamo, Bushenyi, Sheema, Buhweju, Mitooma and Rubirizi. The culture of the Banyankole is closely associated with the wildlife conservation around LMNP as this used to be hunting grounds for their kings. With the current improvements and growth of the tourism sector in the country, LMNP will remain the centre for tourism in the Ankole region.

The Conflicts Between Natural Heritage Conservation And Communities Around BINP And LMNP

The change from community forest and rangeland respectively to the reserve and national parks status faced community hostility as communities perceived it as a loss of benefits for their livelihoods. The communities around Bwindi used Bwindi forest as a source of timber, minerals, non-timber products, game meat and

agricultural land (UWA, 2014). These activities led to continued significant loss of forest cover and general biodiversity up to the late 1980s. The realization of the significant loss of biodiversity by the Government of Uganda resulted in the upgrading the forest to national park status, which had stricter management regulations that prohibited most of the activities outlined above, save for the non-timber resources.

As for Lake Mburo, the gazettement of the area as a national park did not go well with the community members who thought they had rights of land within the area. Indeed, as mentioned previously, between 1983 and 1985, communities re-occupied the area and the park was reduced to its present size (369sq. km) in 1986 (Olupot et al, 2010), leaving substantial wildlife resources outside the boundaries of the park. As the Bahima cattle keepers settled and started owning land, most of the community members started fencing their properties and developed infrastructure to enhance livestock husbandry. Such infrastructure included water dams, fences, salt leaks and houses. The development of farms provided a suitable environment for the grazing animals, which found the farms more suitable than the wild. The wildlife, therefore, stayed on the farms, competed for resources with the cattle and destroyed some of the farm infrastructure. The wildlife, therefore, was seen as a nuisance and the landowners started killing them. Generally, the wildlife population within and around Lake Mburo National Park (LMNP) dwindles (Fig. 2) and this raised concern from the wildlife management sector that needed to put in place strategies geared to the protection of the remaining biodiversity.



Strategic Measures And Synergies Implemented In Resolving Conflicts

Uganda Wildlife Authority (UWA) instituted programs that promoted the parks' protection through enhanced awareness, revenue sharing, tourism, livelihood enhancement of the local communities, and enhanced benefits through sustainable nature-based tourism (UWA, 2013). These programs changed community attitude and improved community involvement in park management.

UWA has mainstreamed awareness through the creation of a community conservation unit. The unit does its work through awareness campaigns on TV and other media platforms to explain to the public and promote wildlife conservation program, promotion of wildlife-based business, putting in place interventions geared towards resolution of the interfacing conflicts between wildlife and humans and promotion of livelihood-based projects.

Uganda also instituted the revenue sharing programs and incorporated them into law. This was done to ensure that the communities that suffer the costs of conservation are paid a small token as an appreciation for their role as custodians of the natural resources they live next to. The Uganda Wildlife Act (2000) provides for a 20% revenue share from the gate entry collections which is paid to the local governments that neighbour the parks. In addition, the UWA Board of Trustees has also set aside another 10% of the gorilla permit revenue to be paid to the local communities living next to Bwindi. Revenue sharing arrangements have also been instituted at Lake Mburo through the signing of sustainable harvest of wild animal resources. The details of this will be discussed at a later stage.

To de-incentivize poaching for the communities, UWA has developed tourism programs that have employed community members who would otherwise be involved in poaching. These tourism programs are usually focused on providing alternatives to park resources and enhancing community livelihood. Around Bwindi, the park has so far supported three community lodges that generate income and provide employment to the local communities. The park management has also trained a number of community members in skills enhancement areas to participate in tourism activities. Around Lake Mburo, UWA has instituted sport hunting tourism that has promoted conservation of wildlife at the same time improve community income at household level.

The next section demonstrates how community empowerment has been driven by the sustainability and biodiversity conservation of the two parks.

Conservation Synergies At BINP and LMNP, and their Contribution to Livelihood Improvement and National Development

Resource access and collaborative management

The Uganda Wildlife Authority has instituted sustainable resource harvest programs to ensure the long-term accrual of the benefits from the park. In Bwindi, communities are allowed to harvest non-timber products (*Smilax spp*, Medicinal plant products, placement of beehives for honey harvesting, harvest of old boundary trees, and yams for the indigenous community) as one of the benefits of having a good relationship with the park. In 2014, the park management had 9 MoUs with the neighboring communities for the harvest of *Smilax spp*. The communities made 1,220 baskets which they sold out and earned UG X10,872,000 (US \$3,624). This contributes directly to the household level income. The sustainable take-off of the non-timber products has created minimal injury to the park resources and yet supported the park's neighbors in their day-to-day way of life.

Revenue sharing schemes

The Uganda Government has enhanced the conservation policies and laws to get communities more involved in the management of protected areas and derive livelihood benefits. In 2000, the Wildlife Act was enacted to provide for benefit sharing between protected area management and communities living next to the protected areas. The law stipulated that 20% of the park entry fees from tourism operations should go to communities neighbouring protected areas to finance community development projects. Following parliament enactment of the law, UWA engaged communities and has already disbursed over US \$3.5 million as community share for development projects and livelihood improvement.

In a bid to increase benefits to the communities surrounding BINP, the Board of Uganda Wildlife Authority approved an additional US \$ 5 from each gorilla tracking permit to be added to the 20% entry fee and this figure has been increased to \$10 effective July 2015. *Mugenyi et al* (2015) point out that the benefits to the communities from the park have increased as tourism grew from UG X167,755,000 (US \$83,877) in 2003, UG X496,004,000 (US \$198,402) in 2009 and UG X661,774,000 (US \$264,709) in 2009. By the end of 2015, the park management had already disbursed a total of UG X2,388,255,000 (US \$796,085). This income to the community has been used in the construction of village health centres and one hospital, roads, schools and establishment of income generating projects like beekeeping, goat rearing and mushroom growing.

On the other hand, the revenue sharing scheme for LMNP has been improving with time. Since 2009, the park management has been disbursing funds to the communities to fund community development activities around the park. The revenue sharing benefits to the communities since 2009 to end of June 2015 now amounts to an equivalent of US \$437,930.

Community-based tourism

Community-based tourism in Bwindi is gaining ground and more tourists are gaining interest in visiting sites where cultural practices are being demonstrated. Currently, around BINP, the Buhoma Community walk, the indigenous Batwa Cultural trail, Nkuringo walking safaris, Batwa forest experience are all efforts to increase community benefits from the park. This income goes directly to the household level for livelihood enhancement. Bwindi has also instituted an unskilled income scheme to motivate the uneducated class who are most likely to be the biggest number of poachers. This class of people are trained to offer services to tourists who visit Bwindi for gorilla tracking expeditions. On average, each person is paid about US \$10 and this translates into US \$237,600. This kind of direct income trickles to the household level. In addition, the park has also supported the community with the construction of lodges for revenue generation. Revenues from such established enterprises are estimated at US \$216,000 annually. The incomes mentioned above are exclusive of revenues from food sales and crafts which is one of the key components of community tourism revenue in most of Africa where tourism sites have been developed. Reports from the park indicate that the community income from Buhoma community Campground tourism lodge at the park headquarters has accumulated up to US \$2.14 million since 1994. The above benefits are resulting from the sustainable utilization of Bwindi.

Revenue from sustainable harvest of faunal wildlife resources

Fig. 2 shows declining wildlife numbers in Lake Mburo as wildlife was being seen as a nuisance by the pastoral community. This attitude changed when Uganda Wildlife Authority (UWA) introduced sport hunting as one way of sustainable resource harvest. This form of tourism removes the very old males in an ecosystem which no longer contributes to the gene pool. Such old bulls usually live in isolation, are insecure and easily threatened. They are the main cause of injuries or death and therefore conflicts. In a bid to solve this human-wildlife conflict that contributed to the decimating of the wildlife resources within and around Lake Mburo, UWA signed MoUs between the community, district local governments and the private sector in regard to protection of wildlife on their land and earning revenue accruing from wildlife the same way pastoralists

would earn income from their cattle sales. Over the time, the community started realizing the benefit and have since changed attitude towards wildlife on their land. To date, the community and the local government together have earned US \$2,153,222 with US \$482,375 going directly to the landowners. Table 1 has the details of the distribution of the funds from sport hunting tourism over the years.

Table 1: Sport hunting Revenues generated and shared amongst the stakeholders within the Lake Mbuo Livestock Ranches

LG – Local Government, Comm. Ass – Community Association, CPI – Community Administration, UWA – Uganda Wildlife Authority

Year	Local Govt (US \$)	Comm Ass. (US \$)	CPI (US \$)	UWA (US \$)	Land Owners (US \$)
2001	547	7,105	547	2,733	-
2002	1,118	14,528	1,118	5,588	-
2003	1,824	23,706	1,824	8,808	310
2004	1,589	20,657	1,589	4,767	9,534
2005	2,287	29,731	2,287	6,861	4,574
2006	3,072	39,930	3,072	9,215	6,143
2007	3,525	45,825	3,525	10,575	7,050
2008	5,721	51,489	5,721	17,163	18,567
2009	5,288.5	47,596.5	5,288.5	15,865.5	22,956
2010	4,033	36,293	4,033	11,993	32,260
2011	1,180	10,076		2,224	11,120
2012	22,785	89,208		22,788	61,072
2013	47,835	159,299		47,835	109,057
2014	74,590	294,285		74,590	199,732
Total	312,461	1,338,705	19,681	388,440	482,375
	Total Income to Communities & District			2,153,222	

Employment

UWA's policy on recruitment prioritizes the employment of local communities within the establishment of the parks. In Bwindi and Rwenzori, about 80% of the staff are local communities living next to the protected areas. The reason this was done is to enhance community ownership of the resources. Lake Mburo has a total number of 112 and Bwindi 156 staff who are from the neighbouring villages. With a total of 268 individuals, each taking home a monthly wage of US \$192, the two parks inject an equivalent of US \$51,456 monthly that translates into a total of US \$617,472 annually. This figure excludes medical care for an employee, spouse and 4 dependants and annual leave benefits.

Namara (2015) documented the Bwindi community tourism employment at the tourism lodges to be 76.2% of the local people, with the protected area adjacent communities taking 80% of the lower level jobs, 65% of the mid-range jobs and 44% of senior-level jobs. She went ahead to look at the annual income to the frontline village community employees of 40 lodge facilities that totalled to US \$151,651, and US \$211,609 for the local administrative parishes.

Generally, through enhanced economic and social benefits, tourism is currently generating over US \$5.3 million annually for the government (UWA, 2014). At Bwindi, US \$796,085 has so far been received by neighboring communities from the parks' revenue sharing schemes, and an average of US \$13.3 million generated from hotels and lodges (both around the park and in the neighbouring towns) that have relationships with the existence of the park. Local community employment has reached US \$333,333 per annum (at district level). The areas around the parks have been transformed into development centres and community way of life has been improved.

Water resources

The General Management Plans for both Lake Mburo (UWA, 2003) and Bwindi (UWA, 2014) recognize the parks as key water catchment areas. Indeed, one of the elements of the outstanding universal value for Bwindi as a World heritage Site is the role it plays as a water catchment centre. The stream flow from the park is constant and never dries up through the year. Lake Mburo is, on the other hand, the only source of water during all the dry seasons for livestock, humans and wildlife. The parks are, therefore, the key source of water for agricultural, domestic and urban use.

Though the water has not been metered, elsewhere, in a comparable case, around the Rwenzori Mountains National Park (WHS), millions of metered water litres are being harvested from the park through the gravity water schemes every day. During the 2013/ 2014, UBOS (2015) documented over 1.124 million cubic meters

of piped water as having been sold to the urban residents that total to over 300,000 people in Bundibugyo, Kasese, Bwera and other towns surrounding the Rwenzoris. This is translated into over US \$936,667, generated as revenue to the government in the local area of the Rwenzori region. It should be noted that the water being used by the rural communities is not metered. The Rwenzoris being a similar mountainous area like Bwindi, the demonstration of the water income to government around Bwindi is a manifestation that Bwindi is likely contributing similar benefit to the government through the supply of water to the surrounding communities and urban areas.

Agriculture support

Agriculture support comes through the local climate modification role played by the two protected forests. Over 1,000mm of annual relief rainfall is received at Bwindi and about 700mm at Lake Mburo. This facilitates agriculture in the districts where the two parks are located. It must be noted that these are benefits that accrue to the communities but are not documented as contributions to the livelihood of the people from the parks.

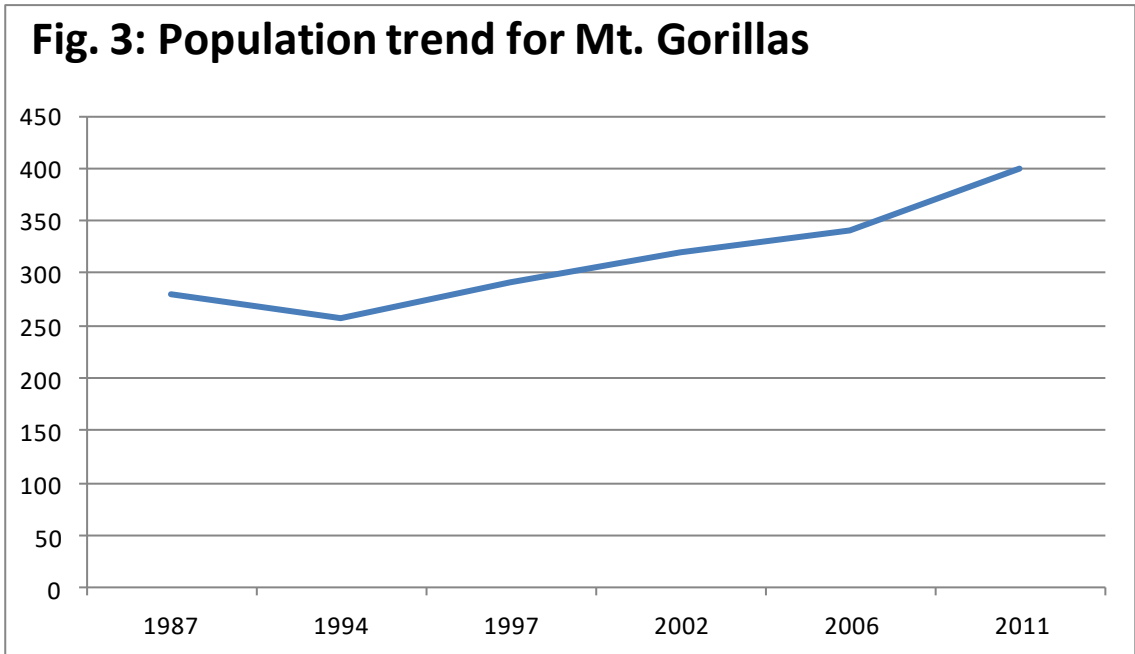
Fisheries resources

The sustainability of the fisheries resources on Lakes Edward and Mburo have a greater bearing on the existence of the Bwindi forest and the Lake Mburo Wetland ecosystem that provide the water through their river flow systems. The fisheries resources are a major food source for the communities neighbouring the park and an alternative to meat which would otherwise be sourced from the park by communities.

Outcomes Of The Various Interventions

Positive trend in population of Mountain Gorilla

The change in the attitude of the communities, resulting from the various interventions, has led to a positive trend in the population of the mountain gorillas. Periodic Censuses are conducted every 5 years and the most recent reports indicate that the parks Outstanding Universal Values in regard to the mountain gorilla population (Fig. 3) is adequately protected and enhanced.



Change of community attitude

The change in community attitude at Bwindi has been indicated through their response and participation in park-related management programs. In 2003, community members reported a team of their own people which was planning to traffick a baby gorilla. Three other reports related to poaching were received at the park headquarters in the same year. On the other hand, communities in one of the parishes neighboring Bwindi (Mpungu Parish) have established a local court to apprehend their own who are involved in poaching.

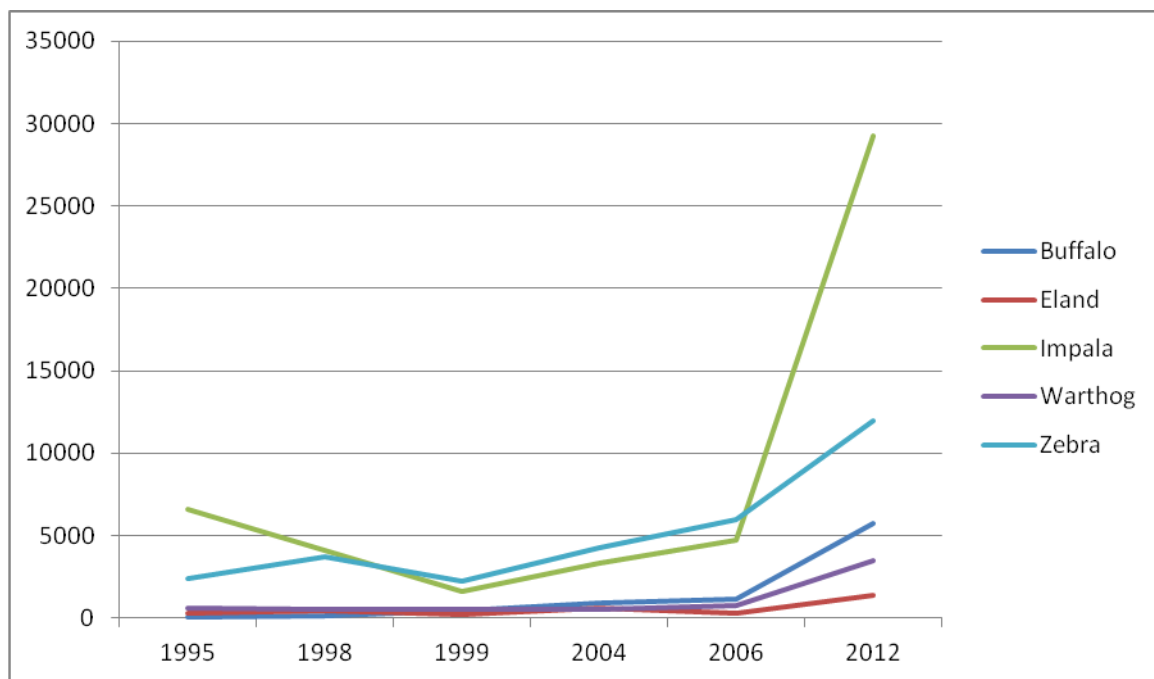
Attitude change has also been seen in the voluntary participation in villages clean-up activities to protect the gorillas from accessing old rags and other rubbish that could cause disease. The same voluntary services are involved in the control of crop raiding by gorillas who often stray on to community property and destroy crops.

This change in attitude is thought to be a result of the realization that the park is more beneficial to them than it was before the forest was gazetted as a park.

In Lake Mburo, the change in community attitude has been seen in the increasing number of wildlife. The current population trend is an indication that the members of the community within the Lake Mburo area are now tolerant and participating in conserving the wildlife which is resident on their farms. Wildlife is now

looked at as a benefit. Fig. 4 shows the current trend of wildlife populations after the introduction of sport hunting tourism within the ranches of Lake Mburo in 2001. The graphs are a clear indication that wildlife populations picked up drastically after the realization of benefits from tourism-related ventures.

Fig. 4: Wildlife Population trends for selected wildlife species within the Lake Mburo Livestock Ranches



Data Source: UWA Census reports

Challenges/ Issues In Natural Resources Management at BINP and LMNP and possible remedies

Inadequate Political support

Despite the fact that the parks have led to improved community livelihood, there are still negative sentiments from local politicians that are more focused on goals that benefit them as individuals. The demand for road infrastructure through the sensitive ecosystem of Bwindi and Lake Mburo (shorter routes) for transportation of tea (Bwindi) or connect the two communities on the two sides of the park (Lake Mburo) illustrates that the pressure from developments is yet another threat that needs to be addressed. Despite the guidance provided by the environmental impact studies in decision-making, politicians still feel that the park management is blocking development in their areas through the deliberate refusal of road infrastructure.

The construction of roads through small ecosystems will disintegrate the forest and savannah into small fragments that may fail to deliver the desired ecosystem functions.

UWA has held stakeholder meetings to avert such pressures that are coming from political and other stakeholders. Annual Site specific workshops have been instituted to discuss issues that concern conservation and communities. The workshops are aimed at delivering decisions that are reached collectively. This way, we hope that the wildlife resources will be saved from imminent threats of infrastructure developments.

The rapidly growing human population

Bwindi is located in an area with a rapidly growing population of more than 500 people per square kilometre. The rapidly growing human population is building pressure on the buffer areas, park land and park resources, and are, therefore, a threat to the existence of these ecosystems and may affect their sustainability. It is important to note that currently, Bwindi has no buffer protection except for a small area (12km x 350m strip) on the southern part of Bwindi. The hard-edge (park boundary without a buffer zone) (Fig. 5) between the community gardens and the park provides wildlife an opportunity for crop raiding and leads to intense human-wildlife conflicts. The hard edge effect also promotes isolation and creation of small conservation islands that lead to isolated gene pools. The impacts of inbreeding of the isolated wildlife populations are yet to be understood. These impacts are being experienced at both Bwindi and Lake Mburo

To mitigate this, UWA is in talks with the communities around Lake Mburo to create Wildlife Conservancies (land set aside by an individual landowner, body corporate, group of owners or a community for the primary purpose of wildlife conservation) that are anticipated to continue offering a buffer to the park. UWA is also planning to secure more benefits for the livestock farmers who may wish to forego crop production in favour of wildlife conservation.

Fig. 5: Bwindi Impenetrable National Park unbuffered from community activities



Inadequate financial resources

The two parks are still young and have very few sources of income to enhance their management. Whereas Bwindi meets all its operational requirements, its capital budget is left with many gaps that need to be patched. Lake Mburo's situation is no better. The need for decent staff accommodation is an indicator of inability to meet its financial obligations.

Problem animal management

With the loss of buffer protection around the parks, the frequency of crop raiding by wildlife from the parks is also noticeable. The loss of livelihood to wildlife continues to strain the relationship between UWA and its neighbours. Currently, the Wildlife Law does not provide for any form of compensation. Even then, the costs would be very expensive for the government to clear. The park managers have tried to put up barriers but

the boundaries of the park are too extensive to address every eventuality. UWA will continue to explore possible interventions in overcoming such conflicts.

Climate change impacts

The impacts of climate change are already manifesting in the management of the two sites. At Bwindi, it is evident that the forest is getting drier, and natural fires are more common than before. The tracking of the mountain gorillas is also getting tougher as gorillas now spend more time looking for food than eating. The distances trekked by tourists is now getting longer every day (average of 4 – 8hrs) than what it used to be in 2000 (average of 2 – 4hrs). Climate change impacts are, therefore, coming with an extra cost to the management of the parks and the tourists.

Lake Mburu ecosystem is also being heavily affected by frequent droughts which in most cases affect the water supply systems in the park and the ranches next to the park. This results into an influx of livestock into the park in search of water. Lake Mburu is the only permanent source of water during such periods.

Poaching and illegal trafficking of wildlife products

Despite the various efforts being invested in livelihood improvement and attitude change through the various benefits schemes, poaching remains the key threat to wildlife conservation. Whereas traditional poaching was done with primitive tools, today's methods are sophisticated. Poachers are sometimes better armed than the wildlife protection units and have better surveillance systems than the Wildlife Management Authorities. The poaching threat to the elephant has claimed over a half of the population of the elephants within the East African region and remains prevalent. The people fueling illegal trafficking of wildlife products (especially ivory) are not known much as the local communities have always fallen prey to them (communities are used by the traffickers to poach and obtain ivory and paid pea-nuts in return). Wildlife trafficking is currently one of the top threats to our wildlife population, and hence our tourism industry.

As for Uganda, we shall continue with sensitization and strengthen our law enforcement through any appropriate strategic measures. Currently, we are training the canine unit to be able to detect wildlife products on transit. We shall soon train canine trackers who will be deployed at field level to flush out poachers from the parks. We have also embarked on the revision of the law to make the sentences more

punitive so that poachers may earn the sentences that correspond to the crimes they commit. That way we hope that some of them may withdraw their investment in illegal wildlife trade.

Conclusion

Natural resources have continued to be one of the main sources of income and development for most of the rural communities that live next to natural sites and whose tourism industry has been well established. It is also clear that the income from nature-based resource management is more sustainable and environmentally friendly to mankind. Well developed nature-based tourism can significantly contribute to national economic development as these resources are infinite if well looked after. With the diversity of wildlife (flora and fauna), culture, history and hospitality a lot shall continue to be reaped. It is important, therefore, that these resources are wisely used for the coming generations to enjoy the benefits and realize the importance of environmental sustainability. To achieve this there is a need for strong coordination amongst the stakeholders, and appropriate engagement of government institutions, inter-governmental agencies and conservation partners. With the right interventions in place, conflicts between humans and wildlife can be mitigated and community livelihoods improved.

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