# Human-Wildlife Conflict and Its Implication for Conservation around Bwindi Impenetrable National Park

**Margaret Aharikundira and Mnason Tweheyo**

**Abstract**—This study analyzed the impact of wildlife on farmers who lived around the Bwindi Impenetrable National Park (BINP). The objectives were to assess the extent of damage exerted upon local farmers and to establish problem animal control strategies employed for park management and community members. Respondents identified crop loss as the major form of damage (40%), followed by social disruption (35%), damage to property (30%) and threats to human life (20%). The majority of the farmers (63%) reported that the park did not employ any measures to protect people's crops. Very small percentages recognized that the park management employed fencing, vermin guards, and HUGO, as preventive measures to guard against raiding of the peoples' crops. The study concludes that maize, sweet potatoes, and sorghum were the most frequently raided crops. This report recommends integrated management for conservation activities around the park, and integration of local communities into planning, management, and decision making of the Bwindi Impenetrable National Park.

**Keywords**: conflict, conservation, wildlife

## Introduction

Human-wildlife conflict (HWC) is not a new phenomenon but dates back to the pre-colonial era where wildlife depredation caused food shortages and displaced settlements in Africa (Vansina 1990). For instance, forest dwellers in pre-colonial northern Gabon lived at the "brink of starvation" because their food supply was frequently devastated by elephants (Barnes 1990). In the early 20th century, high elephant populations in parts of western Uganda prevented agricultural activity altogether (GDA 1924). While some observers blame colonialism for ruining the traditionally harmonious relations between wildlife and local people (Adams and McShane 1992), others believe HWC is as old as the beginning of agriculture in Africa (Naughton-Treves and others 1999). It is generally accepted that while conflicts between agriculturists and wildlife have always existed in Africa, the degree of conflict has escalated in the last 30 years or so with increasing amounts of land being put under cultivation (Hill 1997; Tweheyo and others 2005). Humans have lived in close relationship with wildlife and have shared resources like space, habitats, and food for a long time, which have stiffened to a nearly perfect competition (Knowledge Base Review Report 2003). Recently, HWC has intensified as a result of land use changes and the search for farmland, a situation that has been triggered by rapid population pressure. Human encroachment on wildlife habitat has thus resulted in an increase in conflicts between humans and wildlife (Madden 1999). Some progress has been made, however, to ensure that local communities benefit from wildlife through sharing of tourism revenues and establishing development programs (Knowledge Base Review Report 2003). This progress has not satisfied all the problems faced by humans due to wildlife, however. For example, threats to livelihoods from wildlife are still a constant reality, and people still face crop damage due to wild animals. The costs of destruction more often exceed the benefits to communities neighboring the park. Whatever the conflicts, livelihoods are impacted negatively. Bitter feelings among these communities has eroded local tolerance for wildlife, resulting in negative attitudes toward conservation efforts and aggression toward conservation managers and wildlife (Hill and others 2002). Consequently, the people living around protected areas in southwestern Uganda have become marginalized, and hence conservation can have a negative effect on their ability to provide for their needs. This study should help managers find solutions to these increasing occurrences.

## Problem Statement

The expansion of human settlement and development towards Bwindi Impenetrable National Park (BINP) has resulted in isolation and creation of hard edges along the human and park interface. This has essentially turned the park into an island (Bell 1984). Local people have found themselves displaced and deprived of access to resources such as pastures, water, medicines, and wild foods that are vital for their survival. Furthermore, the negative interactions between people and wildlife (such as crop loss, damage to property, social disruptions, and threats to human life

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Watson, Alan; Murrieta-Saldivar, Joaquin; McBride, Brooke, comps. 2011. Science and stewardship to protect and sustain wilderness values: Ninth World Wilderness Congress symposium; November 6-13, 2009; Meridá, Yucatán, Mexico. Proceedings RMRS-P-64. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 225 p.

by wildlife) have consistently intensified. Many of the local people around BINP consider wildlife to be a major threat to their livelihood. Most research done in BINP has not taken into account the communities' farmers' perspectives on wildlife, which is paramount to sustainable management and conservation of nature. The overall objective of this study was to assess the impact of crop-raiding animals on farmers' crops around Bwindi Impenetrable National Park. The specific objectives were:

- To assess the extent of damage exerted upon local farmers; and
- To assess the problem of animal control strategies employed by park management.

## Methods

The research used the quadrant method developed by Sukumar (1990) to assess HWC around Bwindi Impenetrable National Park. This exercise was based on park user communities. The study was focused on measurements of human wildlife conflicts at the community level, leaving out factors external to the communities (such as implementing agency effectiveness and policy environment). This research used a participatory and descriptive survey design. This research design involved field walks, direct observation, interviews administered through questionnaires and secondary data extracted from desktop reviews, secondary data books, journals, and key informant interviews (KIs).

Sixty-four households that were randomly selected from two parishes made the sample. At least two villages from each parish were selected. The sample population consisted of local community members, local leaders, and park staff as key informants. A total of 64 structured questionnaires were administered to the sample. Three different questionnaires were administered: one to local community members, one to local leaders, and one to park staff. This gave them ample time to provide relevant information. For respondents who could not write, face-to-face interviews were done to acquire the needed information.

Direct observation and field walks also provided good information. By this tool, one was able to note the wild animals in the park, housing standards of the local people, crops grown, terrain of the area, and other observable features. Twelve farms were selected at random, guided by the park rangers for each parish. Monthly visits were made to each farm, and people were asked to report any incidence of crop damage and raiding and whether they had observed the animals responsible at the time. Field visits were made to view and record incidents of crop raiding to make an independent assessment of bite size. To assess the degree of damage, five quadrants were sampled (each 2 by 10 m) from each affected crop stand. The quadrants were placed randomly within the crop stand, without further damaging the crop. The proportion of crop damage was calculated by counting the number of damaged or missing plants or parts or finding a fraction of the quadrant size when plants were not easily counted. The mean of the five quadrant values for each damaged field became a measure of the proportion of crop damage sustained. The mean percentage of crop losses for each farm was estimated taking into account the number of stands planted for each crop and the proportion of stands that sustained crop damage.

## Results

### The Extent of Damage Exerted on Local Farmers

Responses indicated that crop loss was the major form of damage, followed by social disruption, and damage to property, with threats to human life least commonly reported (fig. 1). Baboons and bush pigs were identified as the major

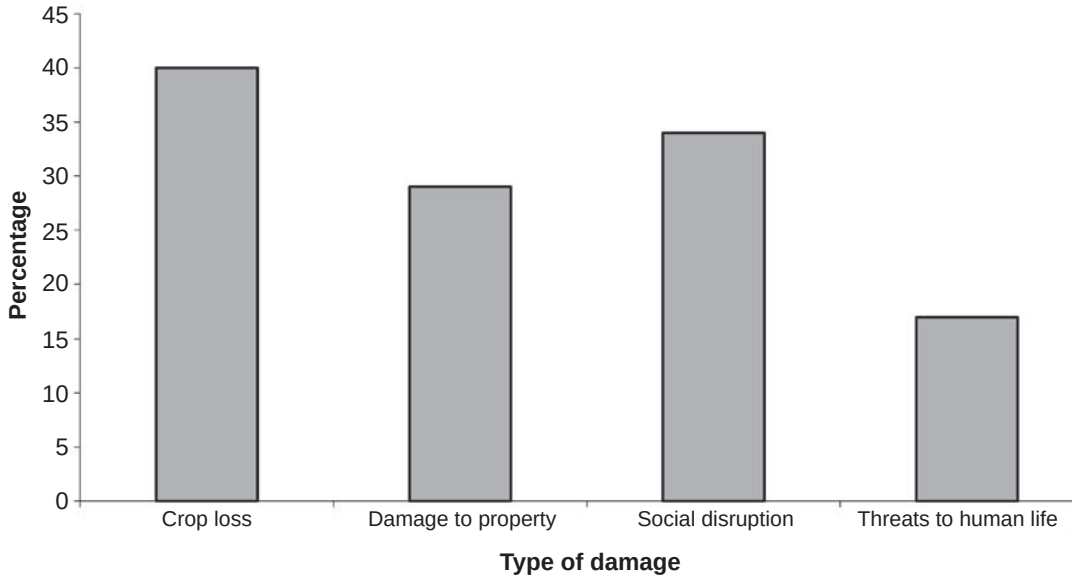


**Figure 1**—Sources of conflict between people and wildlife around the park.

crop raiding animals (fig. 2). The major crops raided included maize, sweet potatoes, and sorghum, as shown in figure 3. It must be noted that cost figures (table 1) were reported by farmers based on the estimated input to crop production. The farmers did not have exact records of input and output in crop production.

## What Farmers Saw as Weaknesses by the Park Management

The community members and park management authorities did not have a good relationship. They had conflicting ideas about how they could live comfortably together. The community members looked at the park and its authorities as potential enemies to their well-being. Some of the errors by the park management as seen by the farmers are in table 2.

The majority of the people reported that the big mistake by park management was that they had failed to put vermin guards in place. The park management authorities did not bother to prevent the animals from raiding people's crops. Although local people sympathized with the conservation issues, park management failed to put control measures in place to ensure food security for the households. Even if the farmers reported raids to crops, there was no response from park management. The farmers expected response in terms of compensation for their losses (both in crops and life) but park managers did not inspect losses incurred by the farmers from wildlife. Park management was not willing to give compensation saying that it was difficult to quantify losses, since some losses were not significant. For example, young sorghum could always do well after an attack from the animals, whereas loss of human life would truly deserve compensation.

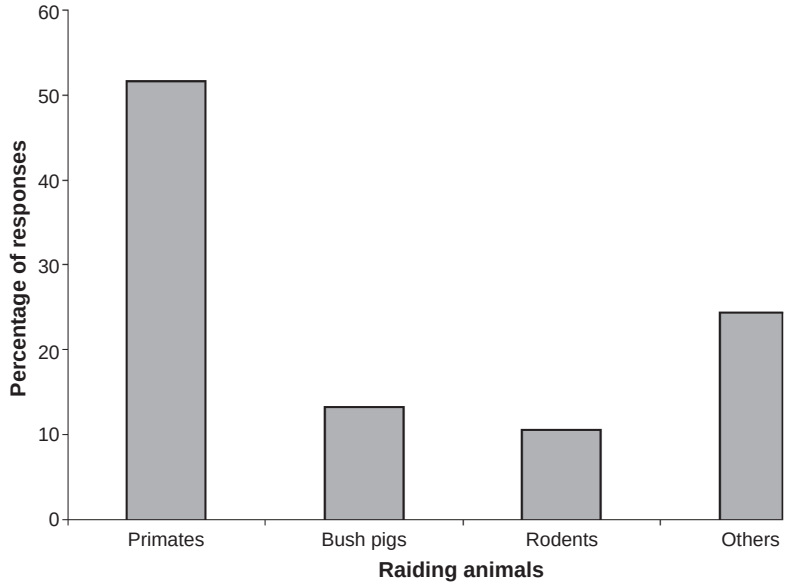


**Figure 2**—Major crop-raiding animals identified by farmers.

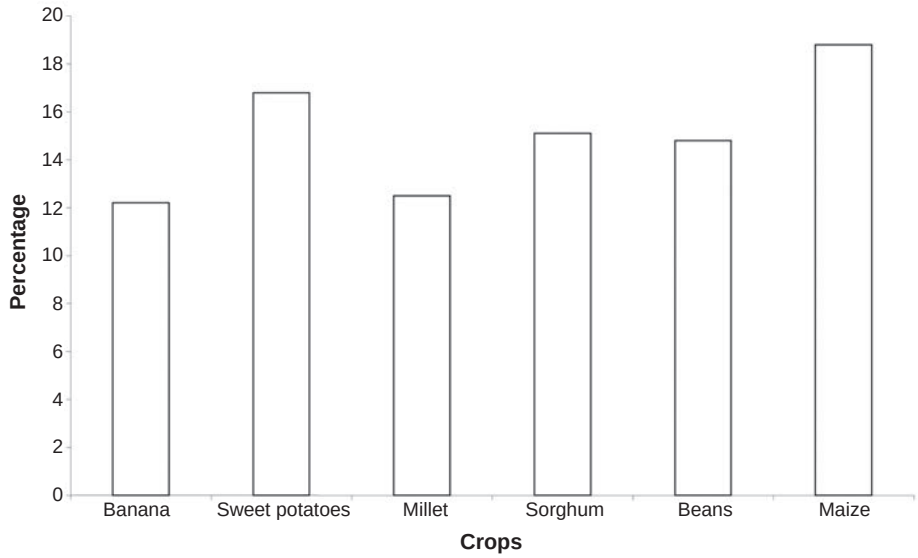


**Figure 3**—Percentage of crops raided as identified by farmers.

**Table 1**—Cost of damage in shillings as estimated by the farmers.

| Cost (shillings) | Percentage |
|---|---|
| < or = 10000 | 33 |
| 10000–25000 | 42 |
| 25000–50000 | 20 |
| 50000 + | 5 |

**Table 2**—Errors by park management.

| Mistakes by park management | Frequency | Percentage |
|---|---|---|
| Do not chase raiding animals | 15 | 18.98 |
| No vermin guards | 39 | 49.36 |
| No response | 24 | 30.37 |
| None | 1 | 1.26 |

## Responses of Farmers When Animals Were Found in Their Fields

Local farmers stayed in the fields from morning to evening (6:00 a.m. to 6:00 p.m.) guarding against crop raiding. Farmers used several methods to stop animals from raiding their crops, including guarding, chasing, and scaring. On most occasions, when farmers found raiding animals in their farms, they would chase the animals back to the forest or report the incident to park management. Seventy-four percent of respondents chased raiding animals upon finding them in their fields, while 26.5% of respondents reported the cases of crop raiding to park management or to forest guides or rangers. Farmers built small huts in their gardens to shade themselves as they watched for animals approaching their fields.

## Problem Animal Control Strategies Around BINP

In the past, women and children carried out most of the guarding activity, especially during the day, while men would guard at night. More recently, some families employed hired labor from Batwa communities to guard their crops. Chasing, shouting, and scarecrows were additional strategies used to enhance the effectiveness of guarding.

In parishes of Mukono and Nteko around BINP, management and the International Gorilla Conservation Programme (IGCP) introduced Gorilla Conflict Resolution (HUGO) groups to provide a remedy to crop raiding by mountain gorillas. The local communities were satisfied that this strategy was working. This program had brought about a significant reduction in crop loss and attacks on humans in the affected areas. Despite all the efforts to reduce damage by gorillas, there was a general perception from the local community that the park authority did not care about crop loss to other animals such as baboons and bush pigs, which caused more crop loss.

Mauritius thorn fence was planted in several areas around BINP. Mauritius thorn is a thorny shrub that forms an impenetrable barrier that hinders bush pigs and baboons from entering fields. Fence maintenance was carried out by farmers with gardens close to the park boundaries and was organized on communal working days.

In the northern parts of BINP, cultivation of tea had proved to be an unintended strategy for reducing crop raiding by baboons, monkeys, and bush pigs. Tea production was encouraged near park boundaries because fields had been abandoned due to severe crop raiding by baboons and bush pigs. Planting tea close to the park boundary reduced crop raiding because tea was not palatable to either baboons or bush pigs. Hence, tea created a buffer zone that the animals had to cross in order to reach the food crops cultivated further from the park boundary. Measures employed by the park management to guard peoples' farms are shown in figure 4.

## Summary

Crop loss was the major form of damage, and the animals causing the most damage were baboons. There were no substantive measures to mitigate the problem of crop raiding. Wild animals raided crops all year round. Bush pigs and baboons were the most destructive animals, mainly feeding on maize, sweet potatoes, and sorghum, which were the most frequently raided crops. Spatial distribution of crop fields also determined the frequency of the field raids. For example, fields nearest to the park boundary and those that did not have any crop fields separating them from the park were raided most. The raiding animals were unpredictable to farmers.

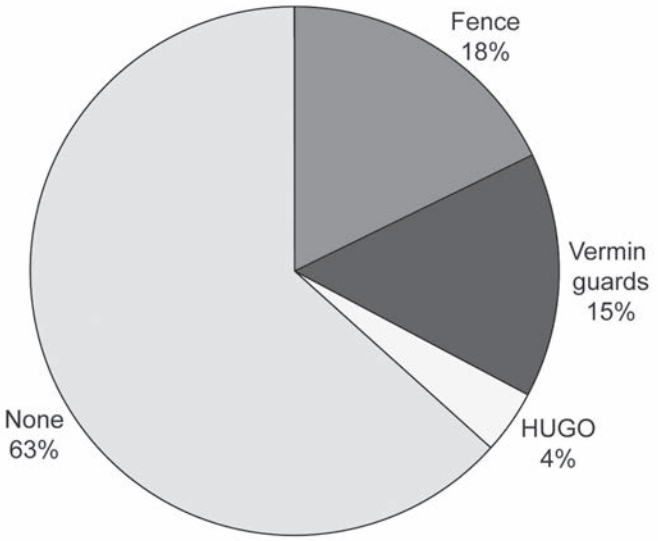


**Figure 4**—Measures employed by park management to guard peoples' farms.

## Possible Solutions

Local communities around BINP could be involved in managing and benefiting from wildlife and natural resources in and around the park (collaborative conservation management). This could be done through a participatory approach where the community and other stakeholders are involved in the conception, planning, execution, and evaluation processes of park management. This could unlock the potential of communities solving their own problems, as opposed to waiting on park management to solve problems. Figure 5 shows a proposed community action framework. Conservation organizations could consider putting considerable effort into community conservation programs so that farmers can be sensitized about wildlife conservation and allowed to give their views about wildlife; farmers could even earn some income to improve their way of living. There is a need to systematically document and compare approaches to wildlife conservation, so that there is harmony between local people and the conservation authorities. Critical issues to look at could include: traditional institutional structures, information flow networks, location, challenges that have been met, and adjustment mechanisms. Figure 6 shows the proposed Natural Resource Institutional Framework for BINP.

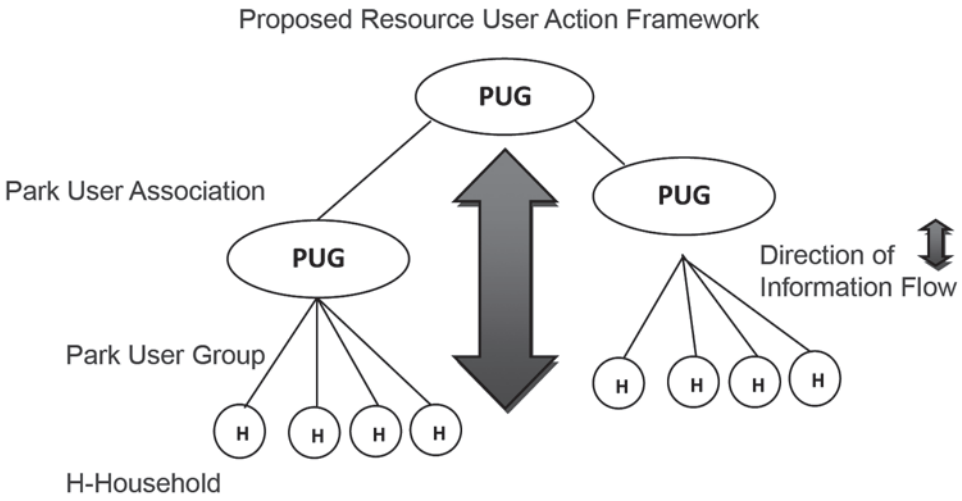


**Figure 5**—Proposed resource user action framework.

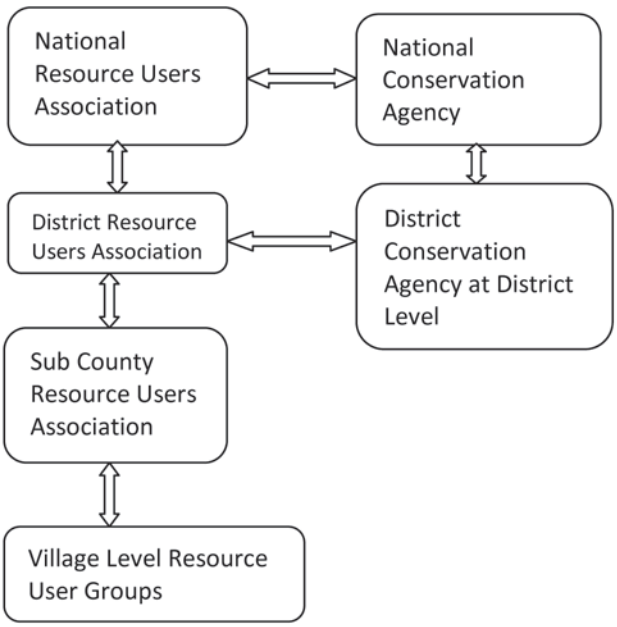


**Figure 6**—Schematic overview proposed for flow of information between national conservation Agencies and the Resource users.

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