

**A Rapid Assessment and Evaluation of Attitudes, Motivations and
Impacts of HUGO members in the Mitigation of Human Wildlife
Conflict around Bwindi Impenetrable National Park, S.W. Uganda**

By:

Emmanuel Akampurira and Robert Bitariho

Institute of Tropical Forest Conservation



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II. Table of Contents

I. Acknowledgement	i
II. Table of Contents	ii
iii. List of tables	iv
iv. List of figures	v
V. Executive summary	vi
1.0 Introduction	1
1.1 Justification of the study (rationale)	2
2. Study Objectives	4
3.0. Methods.....	5
3.1 Study site	5
3.2 Sampling Technique	6
3.3. Documentary Review.....	6
3.4 Household Interviews	7
3.5 Focus Group Discussions (FGDs).....	7
3.6 GIS Mapping	8
3.7. Data analysis	8
4.0 RESULTS	9
4.1 Location of respondents households around BINP	9
4.2 Demographic Characteristics:	10
4.2.1 Gender representation	10
4.2.2 Age groups of respondents	11
4.2.3 Education levels of respondents.....	12
4.2.4 Land use patterns by respondents.....	13
4.2.5 Positions of responsibilities	14
4.2.6 Sources of income of respondents.....	15
4.2.7 Availability and use of hand washing facilities.....	16
4.3 Experience and frequency of crop raiding by gorillas to the respondents.....	18
4.4 Motivations for joining of HUGO	19
4.5 Number of respondents joining HUGO between 1998 and 2017	20
4.6 Benefits associated with the HUGO program	21
4.7 Response time by HUGO to gorilla crop raids.....	22
4.8 Methods used by HUGO to chase gorillas out of gardens	24
4.9 Effectiveness of HUGO in reducing gorilla raids.....	25
4.10 Understanding the regulations for interacting with gorillas and record taking	26
4.11 Recommendations suggested by HUGO members to improve their work.....	27
4.12 Perceptions, attitudes and effectiveness of non-HUGO members.	28
4.13 Motivations of Non-HUGO members to join the HUGO program.....	28
4.14 Problems by faced Non HUGO members.....	29
4.15 Constraints of HUGO members in addressing HWC	30
4.16 Weakness/failure of the HUGO Program.....	31

5.0 Discussion	32
5.1 Gender of respondents	32
5.2 Age of respondents.....	33
5.3 Education levels of respondents	33
5.4 Hygiene and Sanitation among respondents' households	34
5.5 Perceptions, attitudes and effectiveness of HUGO members	34
5.6 Recruitment of HUGO members and motivations of Non HUGO members to join	36
5.7 Effectiveness of the HUGO program.....	37
5.8 Ease of use of mobile technology devices by HUGO members.....	38
6.0 Conclusions	40
7.0 Recommendations.....	42
8.0 References	46
9.0 . APPENDICES	50
9.1 Household interviews questionnaire guide	50
9.2 Focused group discussion guide.....	58

iii. List of tables

Table 1 Recommendations suggested by HUGO respondents to improve on their effectiveness and efficiency..... 27

Table 2 Weaknesses of HUGO program as mentioned by respondents..... 32

iv. List of figures

Figure 1 Respondents' households for HUGO and non-HUGO members	10
Figure 2 Overall respondents' gender	11
Figure 3 Overall age categories of respondents (N= 100)	12
Figure 4 Overall education levels of respondents (N=100).....	13
Figure 5 Overall land use patterns of respondents	14
Figure 6 Overall positions of responsibility for sampled households	15
Figure 7 Overall sources of income for sampled households (N= 100)	16
Figure 8 overall possessions of hand washing facilities at respondents' households	17
Figure 9 Use of hand washing facilities at latrines by respondents.....	18
Figure 10 Experience of gorilla crop raids by respondents.....	19
Figure 11 Frequency of gorilla raids in different parishes as mentioned by respondents.....	19
Figure 12 Reasons for joining HUGO by respondents (N= 100).....	20
Figure 13 Rate of recruitment of HUGO members over the years.....	21
Figure 14 Mentioned benefits associated by being a HUGO member.....	22
Figure 15 overall times taken by HUGO members to respond to gorilla crop raids....	23
Figure 18 Effectiveness of the HUGO methods in reducing gorilla crop raids.....	26
Figure 20 Reasons that would motivate non-HUGO members to join HUGO	29
Figure 21 Challenges/problems encountered by non-HUGO members	30
Figure 22 Overall constraints of HUGO members in addressing HWC.....	31
Figure 23 Parish based constraints of HUGO members on addressing HWC.....	31

V. Executive summary

The major cause of human-wildlife conflict (HWC) worldwide is the competition between the ever-increasing human populations and wildlife competing for the same declining living spaces and resources. In Bwindi Impenetrable National Park (BINP) one of the most critical aspects of HWC is the human-gorilla conflict. The increase of gorilla tourism increased the habituation of wild gorillas and this has consequently increased the movement of habituated gorillas into local community fields. In the quest to reduce this conflict, "HUGO" was initiated and born in the late 1990s. HUGO is, a team of local volunteers (about 10 chosen from communities) with a ranger that help in a coordinated way to chase away gorillas from local community gardens back into the park.

In order to understand the attitude, motivations and impacts of the HUGO team members in mitigating HWC around BINP, one hundred (100) semi-structured household interviews were carried out around BINP and this involved randomly selecting households of HUGO (n=50) and non-HUGO (n=50) members from the study parishes of Nteko (n=30), Mukono (n=30), Rubuguri (n=20) and Bujengwe (n=20).

Ninety-six percent of respondents (n=100) experienced crop raids by gorillas. Fifty percent of HUGO respondents said they joined HUGO voluntarily, 25% joined because they thought it would give them status and 20% joined because they thought it put them in a better position to protect their crops from gorillas. The number of people joining HUGO since its inception in 1998 has been gradually

reducing for all the parishes in the study area. Most people who joined HUGO had higher expectations than what they encountered in reality. The communities too expected a lot more from HUGO because they believed the HUGO members were facilitated in their activities to reduce gorilla crop raids. During the FGDs we also established that the HUGO members abandoning the program were not being replaced. This result is perhaps an indication of the reduced motivation and morale to joining the HUGO program by local people. Nevertheless during our interaction with Non HUGO members they showed a willingness to join the program if the working conditions and incentives of HUGO could be improved

Twenty four percent of the HUGO respondents attributed the monthly food rations given to them by UWA as the most important incentive for joining HUGO while 21% associated the livestock projects funded by IGCP as the most important incentive to joining HUGO. Other associated benefits mentioned by the HUGO members included; equipment (rain gear, uniform, torches, etc.) got from UWA and IGCP and the support to their saving and financial schemes (VSLA). During incidences of crop raiding incidences only 14% respondents mentioned that they reached a gorilla crop raiding sites within 15 minutes. Majority of respondents (34%) mentioned that they reached the gorilla crop raiding sites between 30 minutes to 1 hour. Both HUGO and Non HUGO members however look at the current incentives for HUGO as being insufficient. Choosing the appropriate incentive requires a conditionality and balance so that any incentive chosen does not attract any member of community but rather draws interest of the very people at the frontline of the conflict, those with vested interest in reducing crop raiding in their gardens

Eighty eight percent of HUGO respondents mentioned that the HUGO program was an effective intervention while 78% of non-HUGO respondents mentioned that the HUGO program was an effective intervention. This is in agreement with several other studies carried out before (e.g. Byamukama and Asuma 2006; Babaasa *et al.* 2013 and Akampurira *et al.*, 2015). This therefore shows that HUGO remains one of the most effective interventions against crop raids by gorillas and other large animals such as elephants. It is therefore important that all stakeholders working in and around BINP on conservation and livelihood projects work together towards supporting this program. As much as there are other conservation challenges, human-wildlife conflict is one of the biggest challenges BINP and other national parks in Uganda face. Reducing this conflict opens up opportunities for engaging communities on other conservation and livelihood challenges. We recommend that UWA as the major stakeholder and custodian of wildlife take the lead to engage other stakeholders to support the HUGO program.

IGCP initiated a training program for all HUGO members and UWA staff on the use of automated devices for HUGO data collection in June 2018. During the training, we noted that only very few HUGO members were adept and quick at learning the working procedures of the automated devices. This perhaps is a result of the education levels of most HUGO members. This study shows that majority of HUGO respondents (79%) had only attained primary level education and most stopped in primary 5. We noted that during the training, most HUGO members being trained had no clue of how the automated tool works and what were expected from them even

after the training ended. For example the HUGO members over 60 years had a difficulty in reading texts on the devices. This however does not mean that HUGO cannot use the technology rather it emphasizes the need of regular refresher trainings and recruitment of HUGO members based on a criteria that matches the skills needed by the HUGO program. We recommend that the process of data collection on the mobile devices be made shorter and simpler. It would be better if the use of texts in the automated device was eliminated all together and replaced with the use of pictures/photos and symbols/icons that are more known and make sense to the illiterate HUGO members.

1.0 Introduction

Human-Wildlife conflict (HWC) is probably as old as mankind when humans hunted animals for meat, medicines, hides and skins for clothing. The early humans often faced harm and sometimes death from wild animals while hunting, cultivating fields and travelling. The trend in HWC has been on the rise with increase in human populations. The past four decades have seen an increase in HWCs exacerbated by high human populations and changing land use practices. The main cause of human-wildlife conflict worldwide is the competition between growing human populations and wildlife competing for the same declining living spaces and resources (FAO, 2009). The transformation of forests, savannahs and other ecosystems into agrarian areas or urban agglomerates as a consequence of the increasing demand for land, food production, energy and raw materials, has led to a dramatic decrease in wildlife habitats hence resulting in the HWC.

In Africa, increased agricultural practices have spread to more marginal rangelands leading to encroachment into wildlife habitats resulting into human-wildlife conflicts (FAO, 2009). This phenomenon is a major characteristic in most of the landscapes of Southwestern Uganda. When some of the forest areas located in Southwestern Uganda were gazetted National parks in the early 1990s, the human wildlife conflicts trends were exacerbated. The park adjacent local people increasingly continued to suffer direct costs from the creation of the national parks through displacements, loss of rights, hazards from crop raiding by wild animals (elephants, buffaloes and primates), labor and opportunity costs of crop defense (from wild animals) and death (Naughton-Treves, 1997; Sekhar, 1998; Woodroffe *et al.*, 2005, Adams & Hutton, 2007; MacKenzie, 2012). This inadvertently led to an increase in negative attitudes of

local communities towards park management especially those around Bwindi Impenetrable National park. The past two decades has witnessed attempts by park managers and stakeholders in the mitigation of the human-wildlife conflict around most national parks. Such attempts included programs of involving local communities in park management and decision-making processes. Programs such as collaborative forest management, tourism development, revenue sharing and problem animal management were introduced in Bwindi Impenetrable National Park (BINP) in the early and late 1990s. The problem animal management in particular was to address the issue of mitigating the human wildlife conflicts.

One of the most frequently mentioned “thorny issue” in and around BINP, is the issue of wild animals such as gorillas, elephants, baboons and bush pigs occasionally coming out of the park and into human settlements and farms resulting into human wildlife conflicts. As such between 1994 and 1999, various interventions to reduce crop raiding by the wild animals were introduced in Bwindi park management. Some of these interventions included; HUGO teams to chase away gorillas from fields, Mauritius thorn hedges, tea plantation growing adjacent the park, guarding and baboon traps. However, even after the introduced interventions, local communities continue to experience crop losses attributed to wildlife from the park.

1.1 Justification of the study (rationale)

Protected area managers have often overlooked local community involvement in park management and decision-making yet such involvement contributes significantly to improved park management. Local communities are important stakeholders if fully engaged and involved in park management. The present thinking of most conservationists is in favor of involving local people in the management of natural

resources within protected areas (Castro & Nielsen, 2001; Dietz, Ostrom & Stern, 2003; Sheil and Lawrence, 2004; Garcia and Lescuyer, 2008). Many tropical countries have thus developed mechanisms of integrating the participation of rural people in park management systems such as problem animal management and the mitigation of Human wildlife Conflicts (Sheil and Lawrence, 2004; Garcia and Lescuyer, 2008).

In Bwindi in particular, the issue of addressing the human wildlife conflict may have started in the late 1980s when the Impenetrable Forest Conservation Project (IFCP) then provided relief (compensations) for victims of gorilla crop damage by paying them a token financial appreciation. This gesture by IFCP was later taken over by IGCP in 1992 when the IFCP project closed (Madden, 1999). The system of financial compensation however was later found not to be sustainable since it had many weaknesses such as farmers amplifying damages of crops loss by the gorillas, corruption among the rangers/wardens and delays in the farmers getting paid. As such, in 1998 at a workshop held in BINP, a new approach of Human gorillas response team (HUGO) was proposed and born.

The HUGO is a team of local volunteers (about 10 chosen from communities) with a ranger that help in a coordinated way to chase away gorillas from local community gardens back into the park. The HUGO team is coordinated by the park management and facilitated by IGCP (Gum boots and field wear, etc.). The HUGO groups were initially formed around Nteko (Nkuringo) and Mukono (Buhoma) areas where habituated tourist gorilla groups occasionally got out of the park and into local people's gardens. The HUGO groups were later on expanded to other areas of Bwindi such as Mpungu and Bujengwe that were affected by the crop raiding gorillas.

It is now twenty (20) years since when HUGO was formed to mitigate crop raiding incidences and the issue of human Wildlife conflict around Bwindi. There is lack of information/data on the attitudes, motivations and actions of the HUGO team members that help in mitigating human wildlife conflicts around Bwindi.

This study was carried out to assess the attitudes, impacts and motivations of HUGO team members a pertinent issue in mitigating human wildlife conflicts around Bwindi.

This study complements Muyambi (2004) who assessed the actions of the HUGO team members on the gorilla behavior but did not assess the attitudes, motivations and impacts of the HUGO team members in helping mitigate the human wildlife conflict around Bwindi. This study therefore, addresses this information gap needed for better park management. This information will also help IGCP in its automated park management tools such as SMART and others. This report shows how HUGO team members can be motivated to improving their effectiveness against gorilla raids and their collection of quality data on gorilla crop raiding for incorporation into the automated park management tools that will give quick results to park management.

2. Study Objectives

The main objective of this study was to assess attitudes and motivations of HUGO team members for the effective mitigation of Human wildlife conflict around Bwindi Impenetrable National Park. The Specific objectives were to:

- I. Assess the perceptions, attitudes and effectiveness of HUGO in addressing the HWC around Bwindi.
- II. Assess the perceptions, attitudes and effectiveness of non-HUGO members.
- III. Compare the perceptions, attitudes and motivations of HUGO and non-HUGO team members in addressing the HWC around BINP.

- IV. Identify constraints of HUGO team members in addressing the HWC around BINP.

3.0. Methods

3.1 Study site

The study was carried out in the parishes of Mukono, Bujengwe, Rushaga and Nteko adjacent to Bwindi Impenetrable National Park (BINP) and where the HUGO volunteer teams were formed by IGCP 20 years ago. BINP is located in the extreme southwestern part of Uganda, between latitudes 0° 53' to 1° 08" S and longitudes 29° 35" to 29° 50" E bordering the Democratic Republic of Congo (DRC). BINP is 331km² in size and has been a UNESCO World Heritage site since 1994 (IUCN, 1994). The park is most well known for harboring half of the world population of mountain gorillas (*Gorilla beringei beringei*) and has many endemic and restricted range species of birds, mammals and amphibians (Plumptre *et al.*, 2007). The park has diverse vegetation that is: moist evergreen submontane and montane forest with a continuum of habitats ranging from 1,190 meters to 2,607 meters above sea level . The major crop raiding animals around Bwindi are baboons, bush pigs, and elephants, gorillas and L'hoesti Monkeys (Olupot *et al.*, 2009; Kalpers *et al.*, 2010, Babaasa, *et al.*, 2013).

Mukono is located at the extreme western part of the southern sector of BINP, Nteko and Rushaga are located further south of BINP while Bujengwe parish is located a long mid-north sector of BINP. The Bakiga are the dominant ethnic group in the three parishes. The main economic activity is farming for both cash and subsistence crops. The main cash crop in both parishes is tea and it is planted by majority of the

households. Beans, sweet potatoes, millet, bananas and groundnuts are the major food crops in the area (Masiga *et al*, 2012).

3.2 Sampling Technique

Sampling was done in all frontline villages of the three parishes of Nteko, Mukono and Bujengwe parishes. A Social impact assessment was employed to critically understand the attitudes, motivations and impacts of HUGO and non-HUGO team members on the mitigation of Human Wildlife Conflicts. This entailed a qualitative mixed method approach. Mixed tools measure magnitude of changes and provide conclusions about the types of changes that have occurred (Mallick, 2002). Social impact assessment helped us understand the consequences of the attitudes, motivations and impacts of HUGO team members in regard to the mitigation of HWC. This assessment was disaggregated and comparative in terms of HUGO and non-HUGO team members' livelihoods, wellbeing and governance aspects as well as their impacts in the mitigation of human wildlife conflicts. The Socio-ecological impact assessment used a participatory approach that includes; Documentary review, Participatory Rural Appraisal (PRAs), semi-structured household interviews and household GIS mapping of HUGO and Non-HUGO team members households.

3. 3. Documentary Review

In order to understand the contributions the HUGO team members make to the mitigations of HWC and management of BINP, relevant records/documents such as; data collections sheets used by HUGO on gorilla raids, HUGO team members constitutions, UWA Law enforcement records on the Ranger Based Monitoring Programme (SMART), and community conservation reports were reviewed. Other relevant scholarly articles and references were reviewed to build the theoretical framework for assessment of the impacts/actions of the HUGO team members

towards the conservation of BINP. We also attended a HUGO training session in the use of Automated data collection techniques that was facilitated by IGCP in June 2018. This was in order to understand the applicability and practicability of the automated tool to the illiterate HUGO team members while collecting the HWC data in the field.

3.4 Household Interviews

One hundred (100) semi-structured household interviews were carried out and this entailed randomly selected households of HUGO (n=50) and non-HUGO (n=50) team members from the study parishes of Nteko (n=30), Mukono (n=30), rubuguri (n=20) and Bujengwe (n=20) to assess their perceptions, motivations and actions on the mitigation of HWC around BINP. The household Semi-structured interviews helped identify social and economic characteristics of HUGO team members and non-HUGO team neighbors and to explore their attitudes, perceptions and motivation for Human and Gorilla (HUGO) conflict resolution programme implementation and impacts. HUGO members were randomly selected from a list of all BINP HUGO team members provided by BMCA park management. Similarly the number of non-HUGO team neighbors interviewed was randomly selected from same village as those of HUGO team members were selected from, and the list used was got from local chairpersons of the locality. The questionnaire first covered questions on: household population, livelihoods, education and wealth rankings.

3.5 Focus Group Discussions (FGDs)

Focused Group Discussions (FGDs) entailed groups of HUGO and non-HUGO team members separately being interviewed to understand their collective views on the HWC mitigations (especially gorillas) in BINP. This was an open-ended type of discussion with key guiding questions such as; perceptions of HUGO and non-HUGO

team members on their status, attitudes, motivations and impacts in the mitigations of HWC around BINP. This technique helped in identifying and prioritizing the existing problems faced by the HUGO and non-HUGO team members and also appraised the locally generated strategies for solving such problems.

3.6 GIS Mapping

We mapped households of the interviewed HUGO and non-HUGO team members using GPS and GIS techniques. During the household interviews, GPS coordinates of the interviewed households were also recorded and incorporated into the ITFC's ArcGIS software for mapping and visual display.

3.7. Data analysis

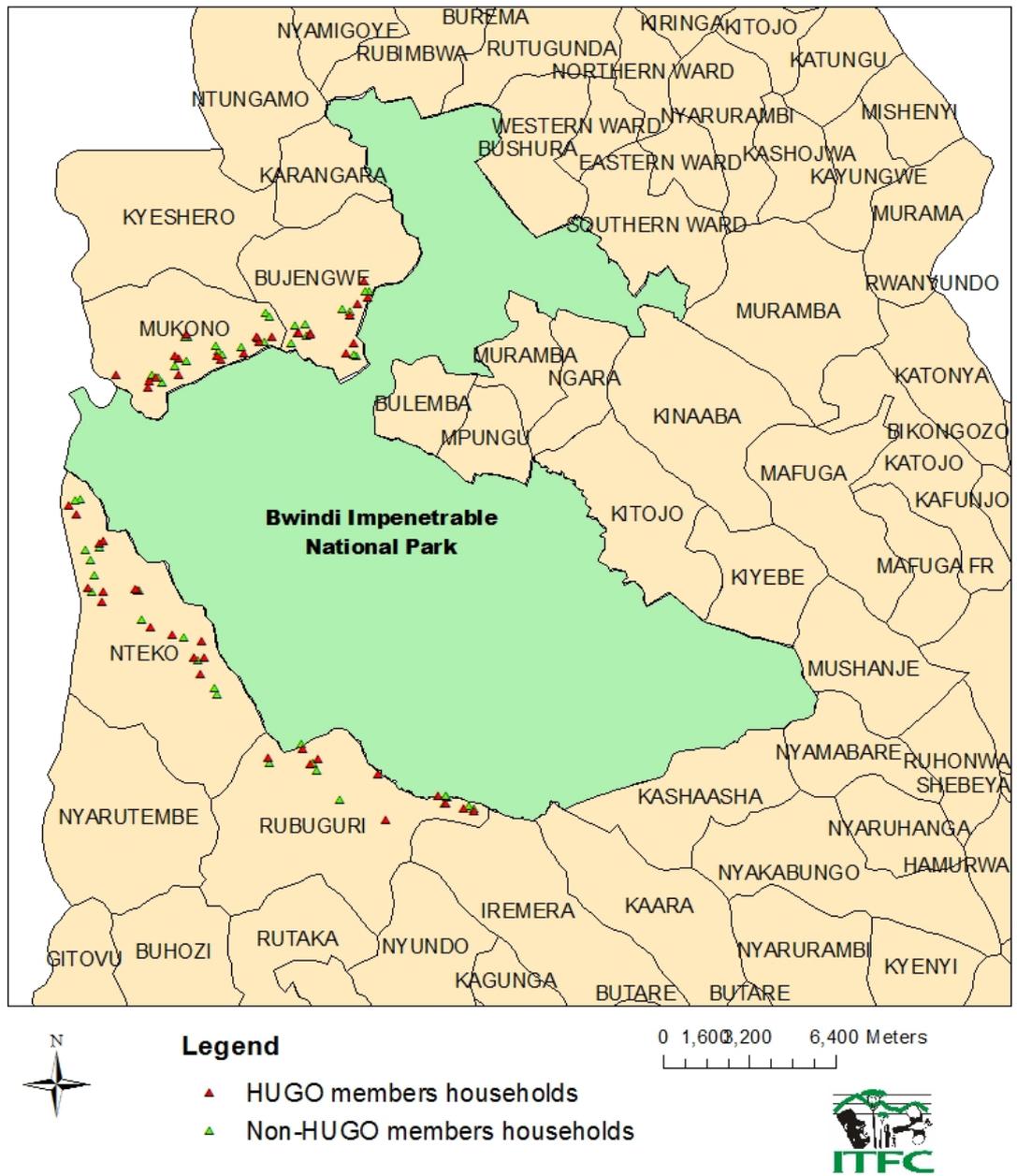
We summarized the responses to close-ended survey questions using descriptive statistics (frequencies or percentages), while those to open-ended survey questions were analyzed by reading and re-reading the text and identifying themes or patterns in the responses that re-occur in the data and then organize them into coherent or emerging categories that were summarized to bring meaning to the responses. In order to relate the interview responses to HUGO conflict resolution programme and social economic status of the respondents, cross-tabulations were done by sorting the respondents into HUGO team members and non- HUGO team neighbors and further explored by sub sorting the respondents according to wealth status and other social economic characteristics like levels of education, age, livelihoods, position of authority and others as was deemed appropriate.

4.0 RESULTS

4.1 Location of respondents households around BINP

A total of 100 respondents were interviewed and these were subdivided into 50 households for HUGO members and 50 households for non-HUGO members (Figure 1). All the interviewed households were those from the frontline villages and the first parishes around BINP as Figure 1 shows. These are the villages/parishes that experience gorilla crop raids from time to time over years. As further shown in figure 1, these households are close to the BINP forest boundary the reason the HWCs are prevalent in those frontline villages/parishes.

Sampled households for HUGO and Non-HUGO members around Bwindi



Author: Robert Bitariho, August 2018

Figure 1 Respondents' households for HUGO and non-HUGO members

4.2 Demographic Characteristics:

4.2.1 Gender representation

Interviewed respondents were divided into two gender groups - female and male, and further divided into HUGO and Non HUGO members (Figure 2). One hundred percent (100%) of all interviewed HUGO members were male while 54% of the

interviewed non-HUGO members were females and 46% male (Figure 2). The total number of interviewed HUGO members were 50 respondents and also for the non-HUGO members too (50 interviewed respondents) in all the study parishes.

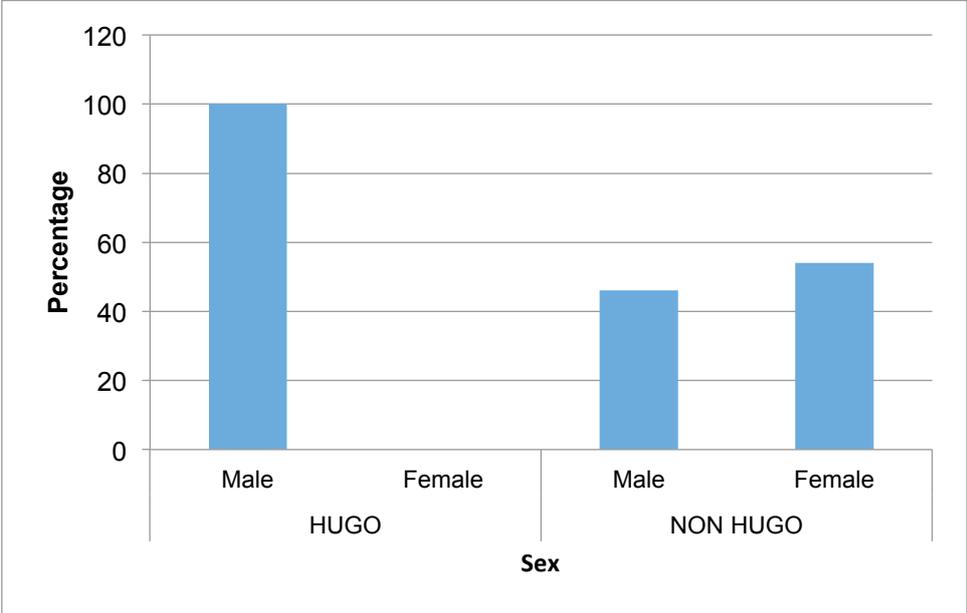


Figure 2 Overall respondents' gender

4.2.2 Age groups of respondents

Majority of interviewed HUGO members (48%) were in the age category of 41 to 60 years old and for the non-HUGO members, the majority (60%) were in the age category of 21 to 40 years old (Figure 3). Among the HUGO respondents' parishes: Mukono and Rubuguri had the highest percentage of respondents within the 41 to 60 years age category both accounting for 30%. For the non-HUGO members, Rubuguri had the highest percentage (35%) of respondents within the 21 to 40 years age category. The least age group of interviewed respondents were those below 20 years and these constituted about 5% of total respondents for the non-HUGO category.

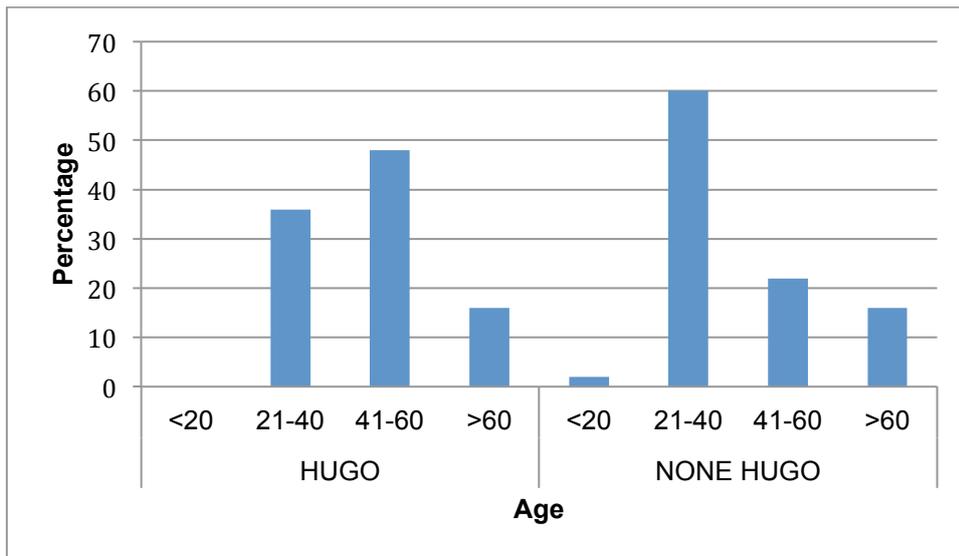


Figure 3 **Overall age categories** of respondents (N= 100)

4.2.3 Education levels of respondents

Secondary school was the highest level of education achieved by all respondents and the least being no formal education (Figure 4). Generally, the overall education level attained by the majority of respondents was primary school level and this represented 79% of all respondents (Figure 4), while the least education level was secondary that constituted 5% of all respondents. Those without any form of education in the HUGO members and non-HUGO members' category were 10% and 12% respectively. The secondary school level of education for HUGO and non-HUGO members category) accounted 12% and 8 % respectively. Within the parishes, Rubuguri had the largest percentage of respondents with secondary education that accounted for 30%.. Bujengwe parish had the largest portion of respondents without any form of formal education and this accounted for 30% and all of them were non-HUGO members.

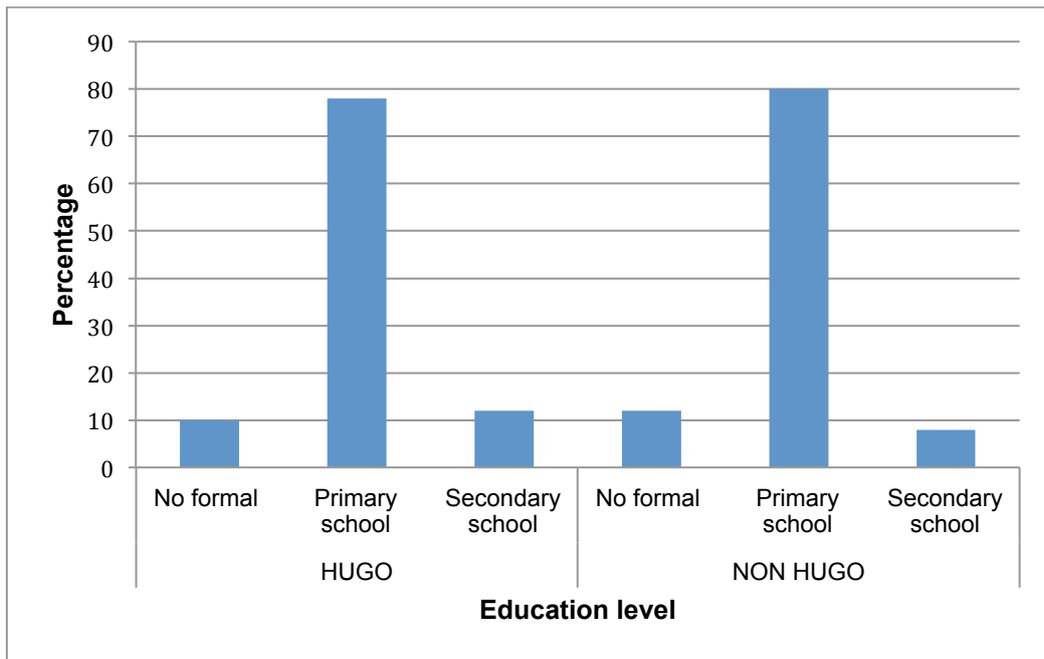


Figure 4 Overall education levels of respondents (N=100)

4.2.4 Land use patterns by respondents

Among the HUGO members, the majority of them (36%) use their land for woodlots and arable farming, followed by livestock and arable farming (34%) and plantations (tea and coffee) (24%). The least percentage of HUGO members used their land for only arable farming (6.5%). For the non-HUGO members livestock and arable farming accounted for the largest land use practice (33%) followed by plantations (tea and coffee) and woodlots (24.7% and 22.5% respectively (Figure 5). The least land use practice mentioned by non-HUGO members was other (brick making and trade-shops) by 1% of the respondents. Among the parishes, Rubuguri had the highest number of respondents (28%) undertaking arable farming, Bujengwe with 40% engaged in plantation farming, Nteko with 37% engaged in woodlots and arable farming and Nteko with 36% engaged in livestock and arable farming on their land.

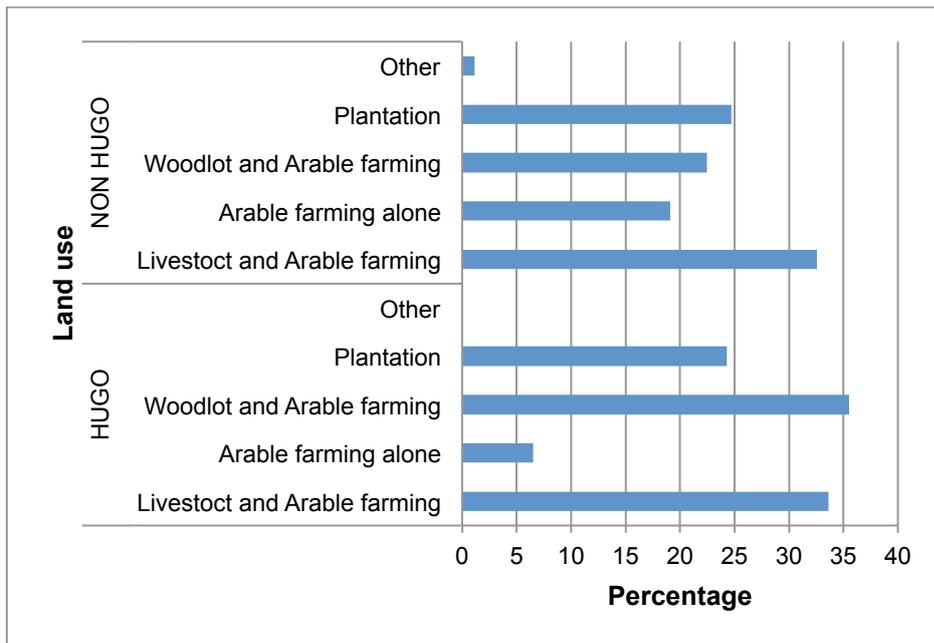


Figure 5 Overall land use patterns of respondents

4.2.5 Positions of responsibilities

Majority of the HUGO members interviewed (15.5%) mentioned that within their households they had people on the LC 3 committees and 14% had people in the other responsibility positions (rangers, UWA support staff) (Figure 6). For the non-HUGO members most of the respondents (49%) indicated that they did not have people with any positions of responsibilities in their households (Figure 6).

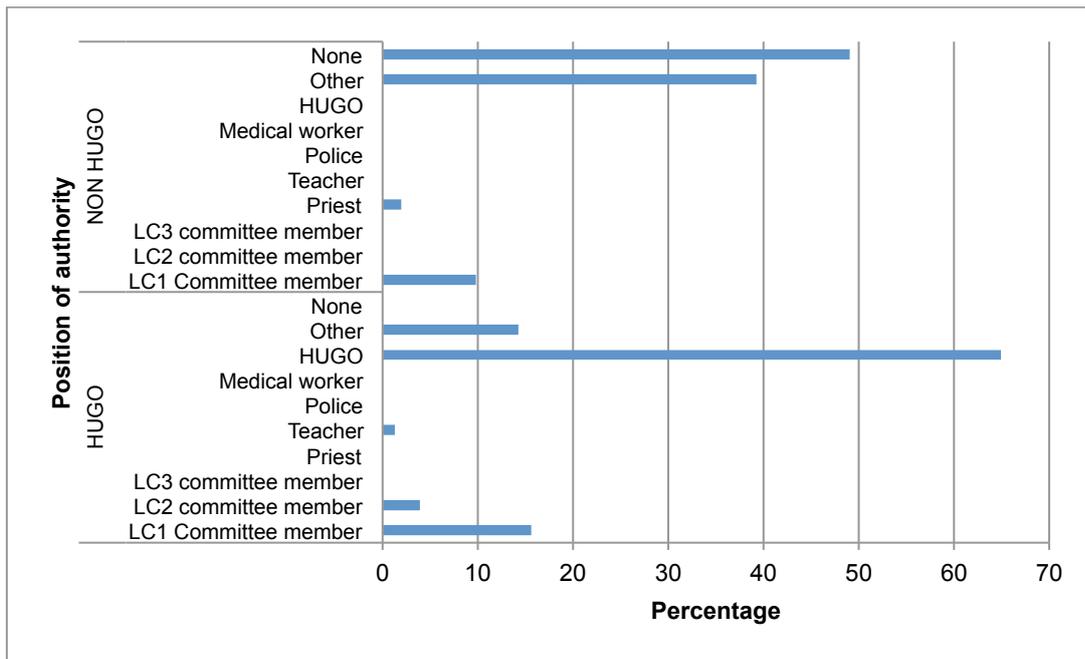


Figure 6 Overall positions of responsibility for sampled households

4.2.6 Sources of income of respondents

Fifty four percent (54%) of HUGO respondents were supported by subsistence agriculture while the least source of income was organization support (funding from donor/government project organizations) and non-agricultural enterprises both accounting for 2% each (Figure 7). Commercial farming and wage labor represented 36% and 6% were the second and third most important sources of income respectively for HUGO respondents. Majority non-HUGO respondents (44%) were supported by subsistence agriculture and their least source of income was salaried employment 2% (Figure 7). Like the HUGO respondents, commercial farming and wage labor came in second and third representing 36% and 14 % respectively for non-HUGO respondents.

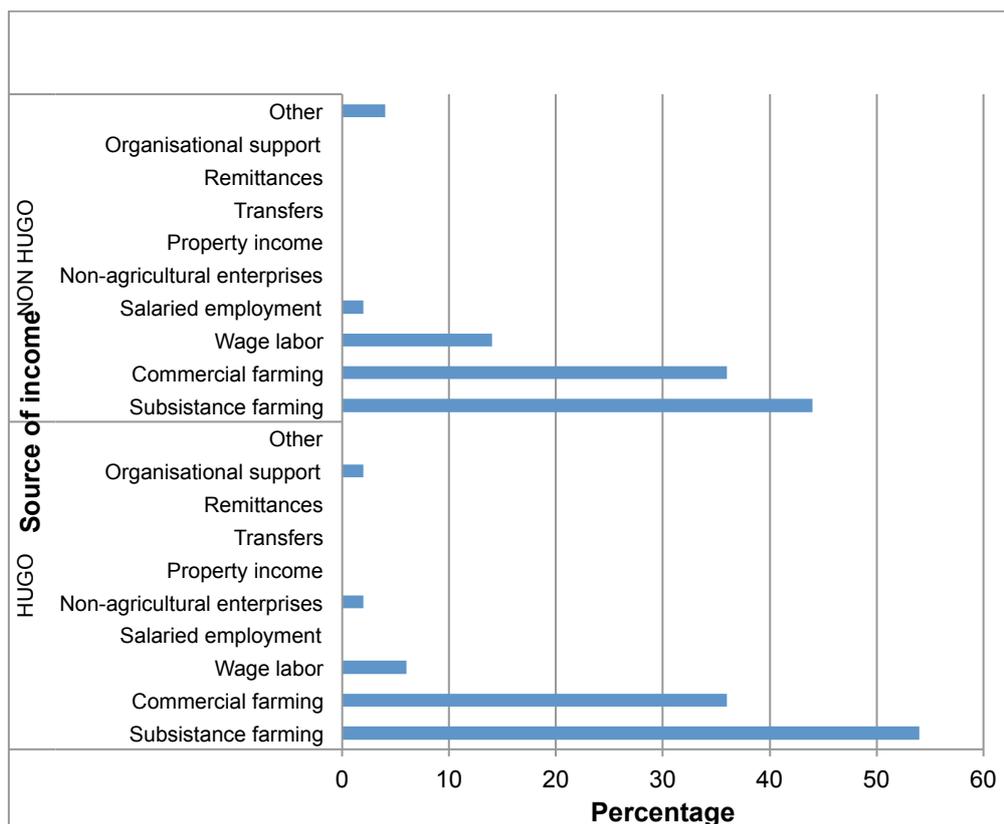


Figure 7 Overall sources of income for sampled households (N= 100)

4.2.7 Availability and use of hand washing facilities

Access to pit latrines was first accessed before assessing availability to hand-washing facilities at the latrines. Generally, overall all the interviewed HUGO and non-HUGO members had pit latrines at their homesteads. Furthermore, overall 45% of respondents had hand-washing facilities at their latrines and 55% of respondents did not have any. Fifty six percent (56%) of HUGO respondents had hand-washing facilities at their latrines while 44% did not have any. Among the non-HUGO members, 25% of respondents had hand washing facilities at their latrines while 75% did not have any (Figure 8). Among the study parishes all HUGO respondents in Rubuguri had hand-washing facilities while Bujengwe had the least (only 20%) as figure 8 shows. Among the non-HUGO respondents, Nteko parish had the highest percentage (67%) of respondents with hand washing facilities at their latrines

followed by Rubuguri parish with 65% of respondents. Bujengwe parish had the highest percentage (40%) of respondents without hand washing facilities.

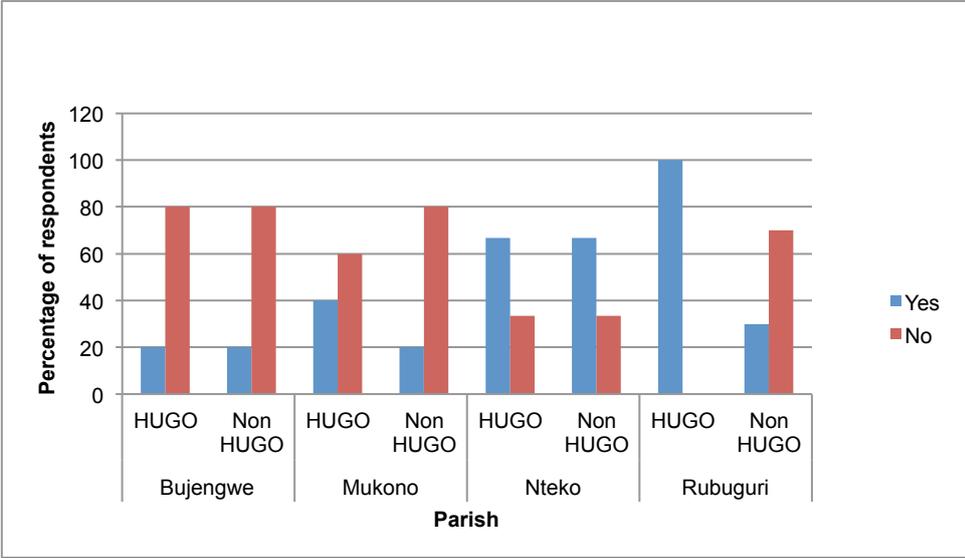


Figure 8 overall possessions of hand washing facilities at respondents' households (N=100)

We further on investigated how many of the respondents with hand washing facilities that actually used them (Figure 9). Of the 45% of respondents with handing facilities 82% of these (n=45) actually used the hand facilities and 18% did not use the hand facilities at their latrines as figure 9 shows. All (100%) respondents in Bujengwe make use of the hand washing facilities. Among the HUGO respondents, 85% used the hand washing facilities while 15% did not (Figure 9). Among the non-HUGO respondents, 75% used the handing washing facilities while 25% of Non HUGO respondents did not.

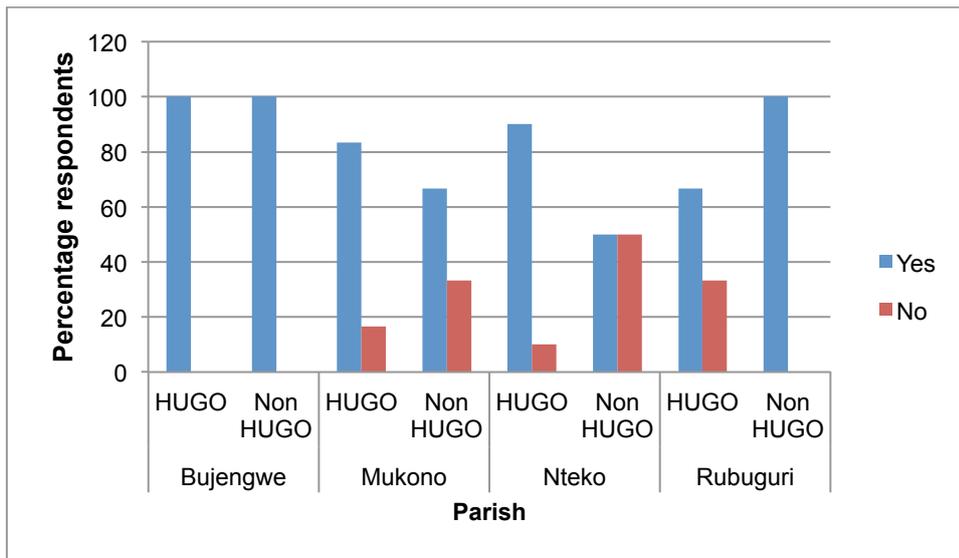


Figure 9 Use of hand washing facilities at latrines by respondents

4.3 Experience and frequency of crop raiding by gorillas to the respondents

Ninety six percent (96%) of all the respondents (n=100) noted that they experienced crop-raiding incidences by gorillas while the rest (4%) said they did not (Figure 10). The 4% of the respondents that did not experience gorilla crop raids reside in Mukono and Rubuguri parishes. Mukono parish respondents experienced the most gorilla crop raids (29%), followed by Nteko respondents (25%) and the least being those from Rubuguri parish (7%). In general there were more frequent raids annually reported in Mukono parish than the rest of the parishes (Figure 11).

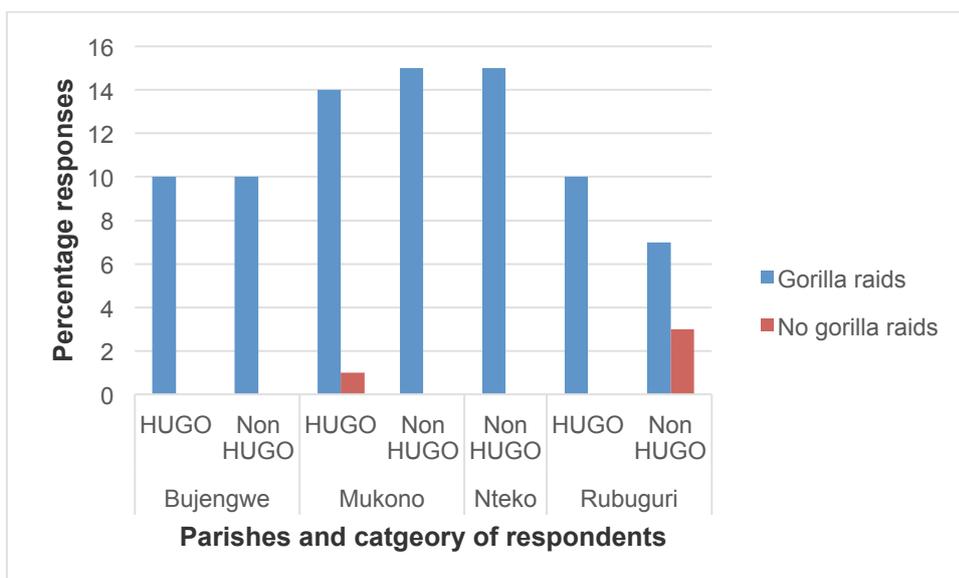


Figure 10 Experience of gorilla crop raids by respondents

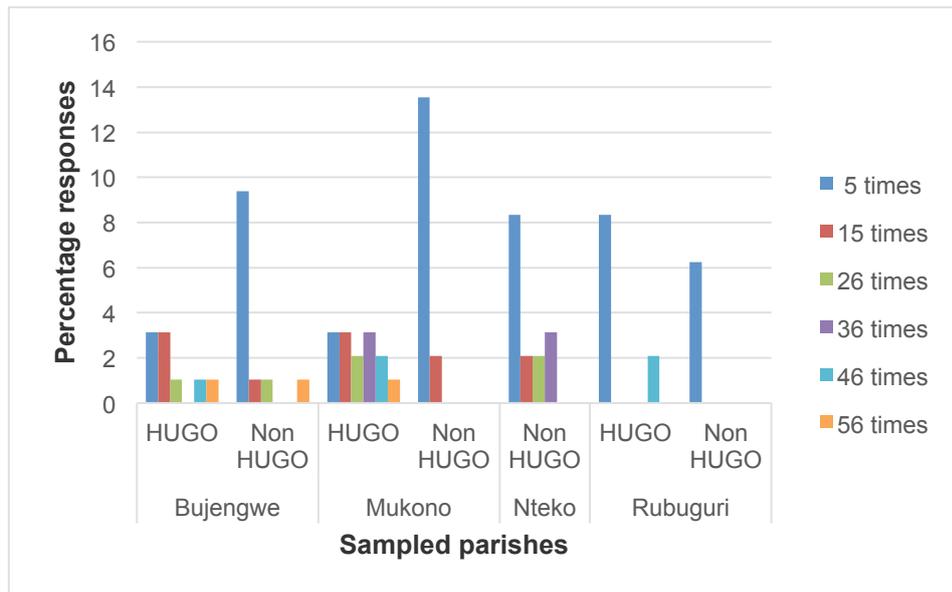


Figure 11 Frequency of gorilla raids in different parishes as mentioned by respondents

4.4 Motivations for joining of HUGO

Most respondents (50%) said they voluntarily joined the HUGO group to help the community and promote gorilla conservation. Twenty five percent (25%) of respondents mentioned that they joined HUGO because they thought it would give them status and recognition by their peers, UWA, local government and conservation organizations (Figure 12). Twenty percent (20%) joined HUGO because they thought it put them in a better position to protect their crops from gorillas. The least number of respondents hoped that by joining HUGO their would be entitled to benefits such as; Cash handouts, food, equipment (rain gear, foods, uniform, torches) and others only joined because they thought they would have access to a grant from IGCP (Figure 12).

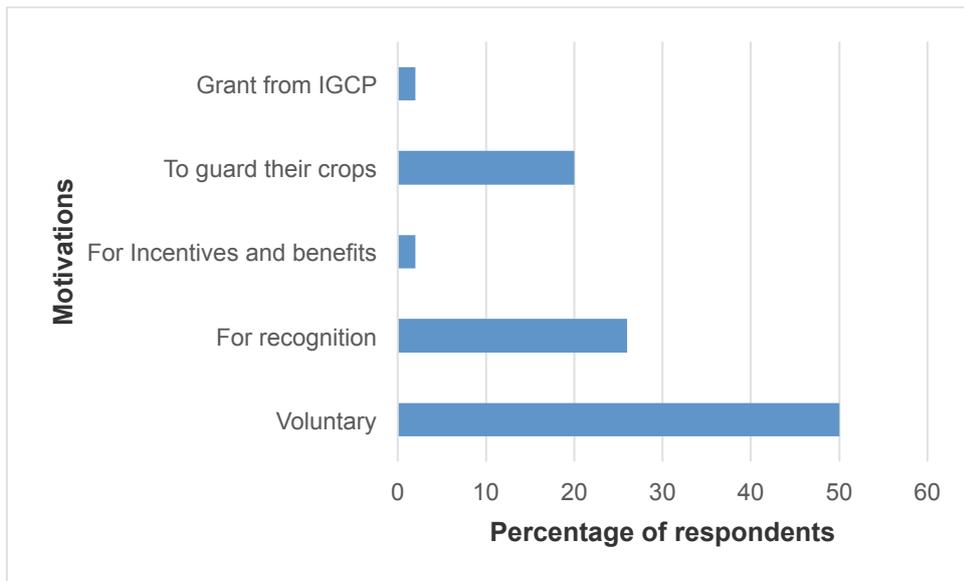


Figure 12 Reasons for joining HUGO by respondents (N= 100)

4.5 Number of respondents joining HUGO between 1998 and 2017

The number of people joining HUGO since its inception in 1998 has been gradually reducing for all the study parishes (Figure 13). The peak years for all parishes were 1998 and 1999. After 1999 the number of people wanting to join HUGO went down and rose briefly in 2004 for Nteko parish but went down again in 2006. In Nteko parish, from 2007 to 2009 was the time when the number of people joining HUGO increased but went down again in 2010. In Mukono parish, the number of people joining HUGO increased in 2012 and went down to about a half towards 2017. In Rubuguri parish the number of people joining HUGO were the fewest from the start in 1998, went down to zero and has never risen up again to date (Figure 13).

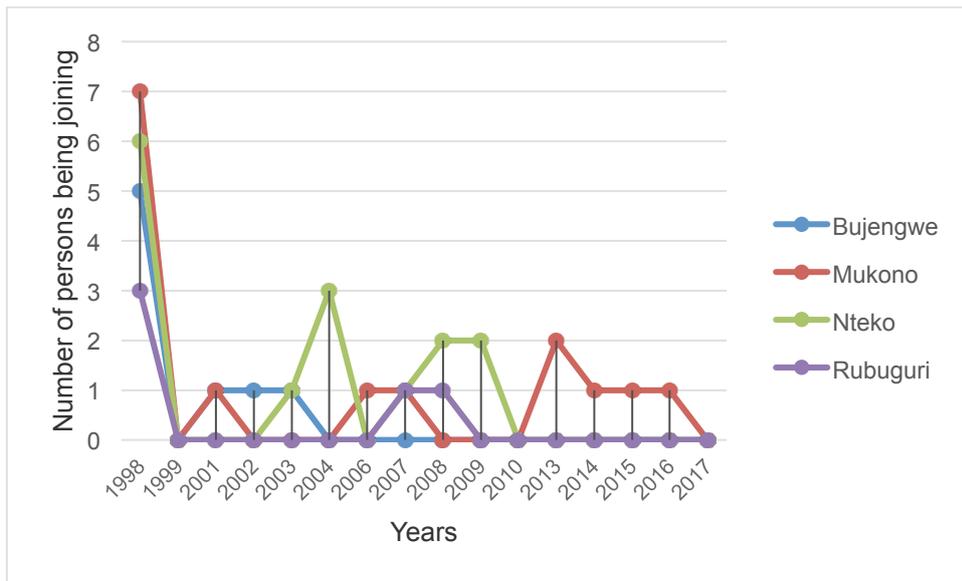


Figure 13 Rate of recruitment of HUGO members over the years

4.6 Benefits associated with the HUGO program

The largest percentage HUGO respondents (24%) attributed the associated benefits from the HUGO program such as the food items (5kg of maize flour and 2kgs of beans) given to them monthly by UWA as an incentive for being a HUGO member (Figure 14). Twenty one percent of respondents associated the HUGO benefits with funding given to their projects (e.g. in 2004 IGCP supported livestock projects in Mukono parishes and in 2009 UWA supported HUGO in Mukono with a piggery project). Eighteen percent the respondents associated benefits to the equipment (rain gear, uniform, torches) they received from UWA and IGCP that help them while interacting with gorillas. Another 17% of the respondents associated the benefits to the support they got towards their financial schemes such as the local based SACCO groups. Eleven percent of the HUGO respondents mentioned that the benefit they get from the program is the good relationship they have with UWA and in a way they have become ambassadors sensitizing other local people against illegal activities in the park and how to deal with the problem animals. The least percentage of the respondents (9%) linked their benefits to allowances they get when they attend

workshops, trainings or meetings. They confessed that they are able to save some of this allowance and use it to buy food and even support their children in schools (Figure 14).

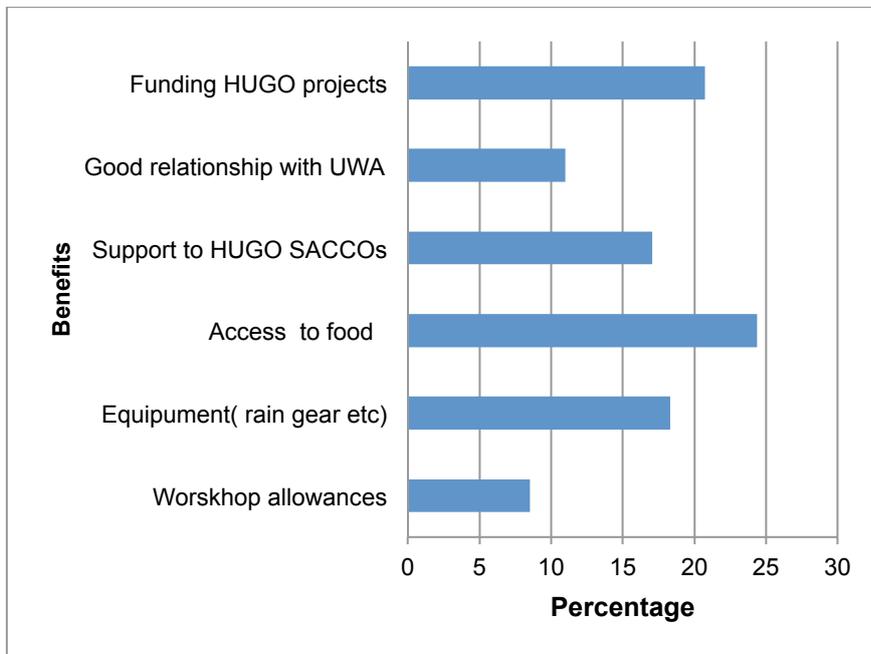


Figure 14 Mentioned benefits associated by being a HUGO member

4.7 Response time by HUGO to gorilla crop raids

Majority of the HUGO respondents (34%) said that they are usually at the site of gorilla raids within 30 minutes to 1 hour (Figure 15). Twenty-six percent of HUGO respondents mentioned that they normally arrived at the gorilla crop raiding location after 1 hour another 26% also said that they arrived within 15 to 30 minutes. The fastest group of HUGO to reach a gorilla crop raiding site got there within 15 minutes and these accounted for only 14% of HUGO respondents (Figure 15). Nteko parish had the largest percentage (47%) of respondents that got to a crop-raiding site after 1 hour followed by Rubuguri (40%) (Figure 16). Mukono parish had the largest percentage (27%) of HUGO respondents that said they got at gorilla crop raiding

sites within 15 minutes followed by Nteko and Bujengwe with 20% and 10% respectively (Figure 16).

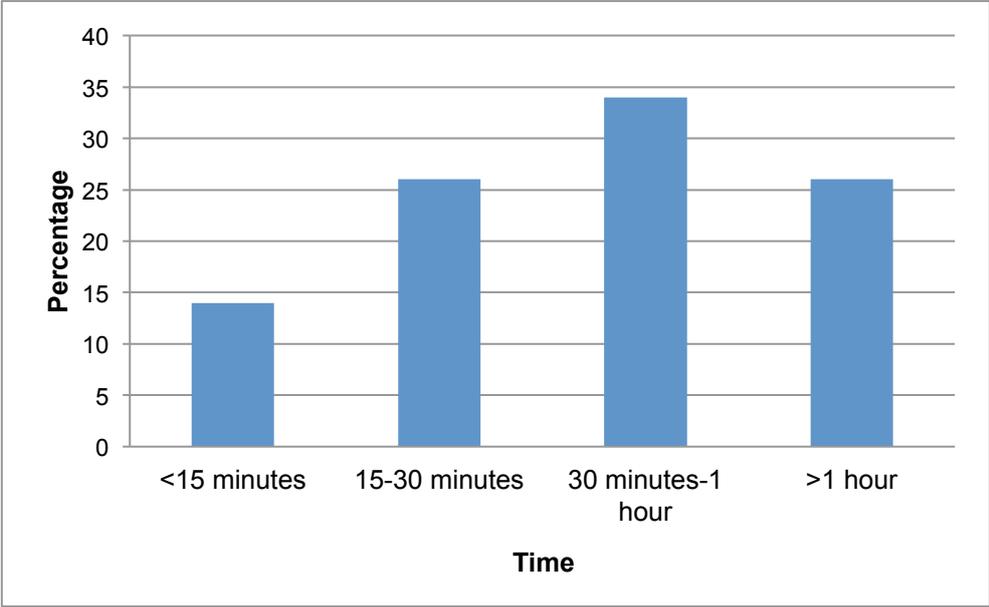


Figure 15 overall times taken by HUGO members to respond to gorilla crop raids

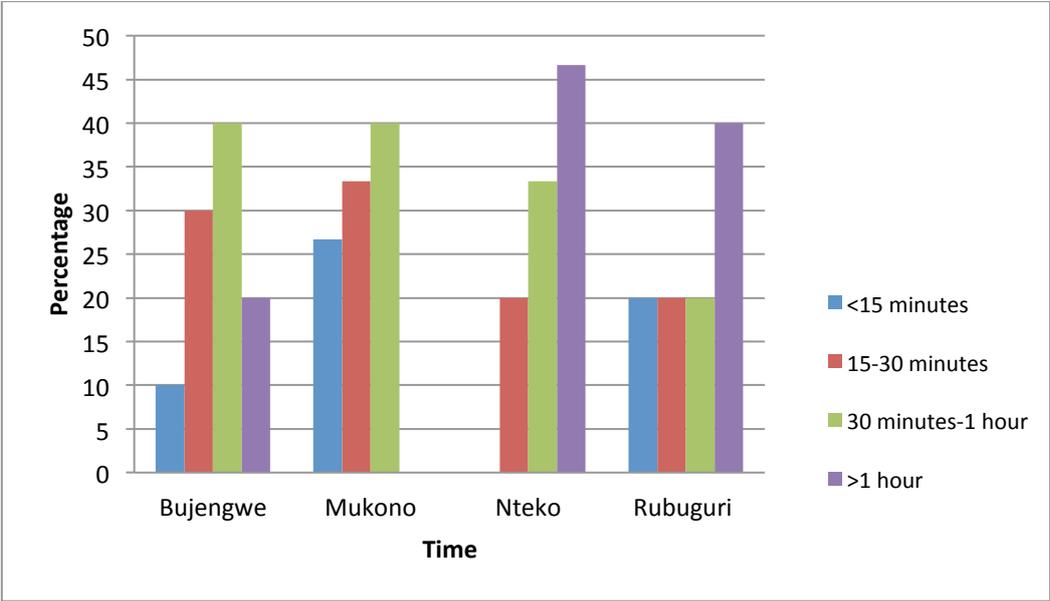


Figure 16 Time taken by HUGO members to respond to gorilla crop raids per parish

4.8 Methods used by HUGO to chase gorillas out of gardens

Shouting was the most mentioned method used by HUGO respondents with 39% of respondents mentioning that they used it, followed by hitting the ground and ringing a bell (33% and 14% of respondents respectively) as shown in figure 17. The least used methods were hitting empty tins and herding the gorilla (mentioned by 1% and 2% respondents respectively). Only respondents in Bujengwe and Mukono parishes used herding as method of chasing gorillas (figure17). Hitting empty tins was only mentioned in Bujengwe.

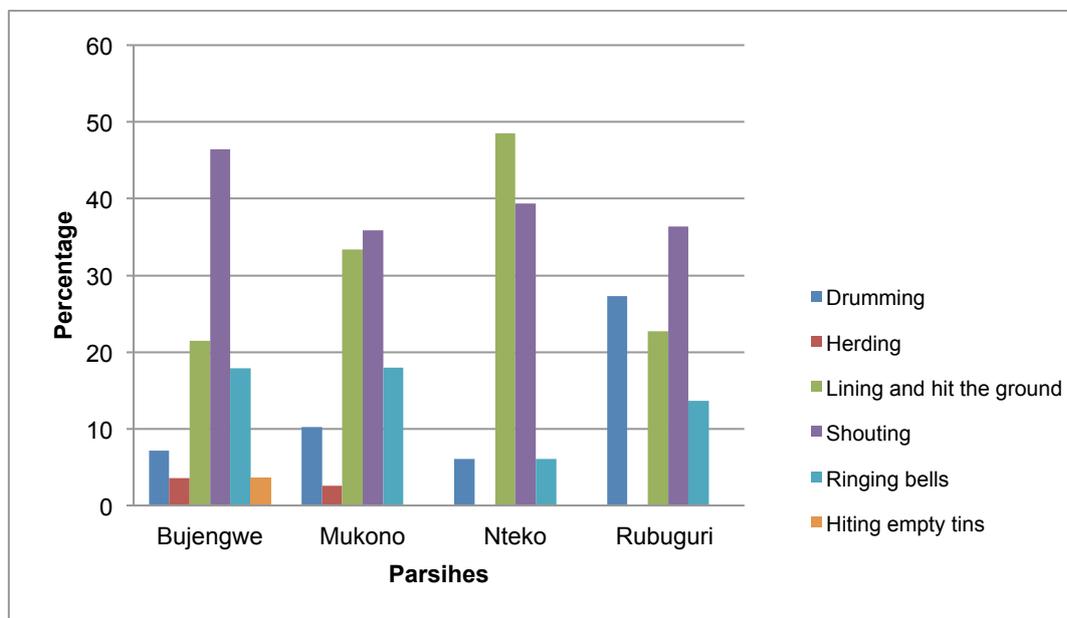


Figure 17 Methods used by HUGO to chase gorillas out of gardens

4.9 Effectiveness of HUGO in reducing gorilla raids

We used a likert scale (effective, fairly effective and not effective) to assess both the perceptions of HUGO and non-HUGO respondents on the effectiveness of HUGO (figure 18). Eighty eight percent of HUGO respondents mentioned that that the HUGO program was an effective intervention and 12% said it was a fairly effective method against crop raiding wild animals (figure 18). Seventy eight percent of non-HUGO respondents mentioned that HUGO was an effective intervention against crop raiding wild animals, 20% said it was fairly effective and only 2% said it was not effective at all (Figure18). Mukono parish had the biggest percentage respondents (47%) that mentioned that the HUGO program was effective (Figure 18). Nteko parish was the only one with respondents that said that the HUGO program was not effective.

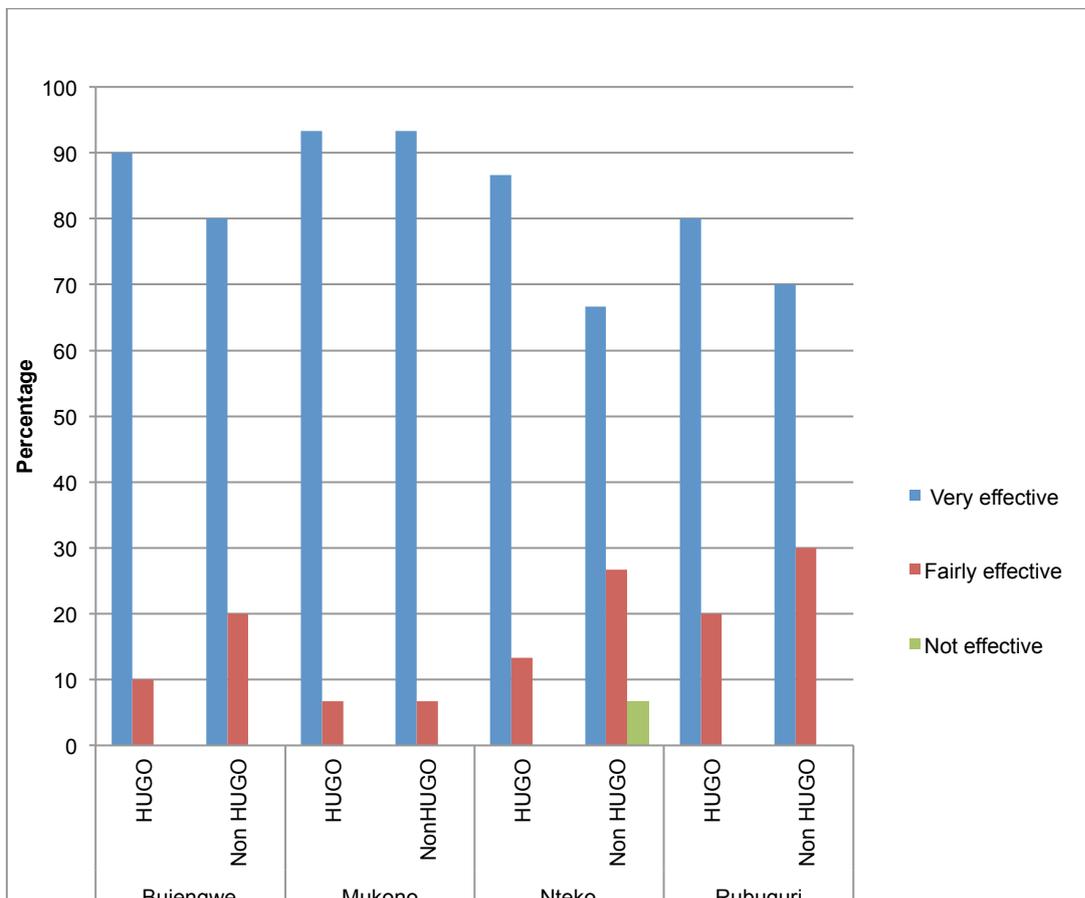


Figure 18 Effectiveness of the HUGO methods in reducing gorilla crop raids

When asked how the HUGO program could be made more effective the HUGO respondents all seemed to agree that provision of an allowance or some kind of payment especially on days they interacted with gorillas would really improve their morale and effectiveness. HUGO respondents also believe that retraining them from time to time and training of new recruits could also help improve their effectiveness. During the Focused Group Discussions (FGDs) most people seemed to rally behind the idea of increasing the benefits to HUGO by paying them, increasing the amount of funding going to their saving schemes and livestock projects. Some people in the FGDs argued that some HUGO members did not have the motivation to leave their everyday activities and chase gorillas from gardens of other people, but the increase in benefits would help them appreciate the value and importance of their work as HUGO.

4.10 Understanding the regulations for interacting with gorillas and record taking

All HUGO members mentioned that they were well conversant with all the rules and regulations for interacting with gorillas outside the national park. The information recorded by HUGO members during raids include: Date and time, Health status of the gorillas, location where the gorillas were found, method used to chase the gorillas, name of the gorilla group and age group of individuals. They mentioned that they assessed the health of gorillas by checking for any injuries, unusual fluid from ears, nose and eyes and general body strength. Ninety eight percent of HUGO respondents mentioned that the data they collected was taken to UWA and 2% were not sure where the data went. Fifty six percent of HUGO of respondents mentioned that they received feedback on the data they collected while 44% said they did not

receive any feedback on the data collected. Most of the HUGO respondents said that the feedback they received helped them to collect better data and other HUGO respondents argued that feedback was not helpful in any way because it does not address their issues and challenges.

4.11 Recommendations suggested by HUGO members to improve their work

Most of the respondents of both HUGO and Non HUGO (64%) suggested providing HUGO members with an allowance would improve their attitudes and effectiveness (table 1). Other respondents thought that the provision of more funding for their projects such as the piggery projects was the best recommendation (12% of all respondents) that would improve on their effectiveness and efficiency. The least mentioned recommendation was that of increasing on the amount of food given to HUGO members (4.2% of respondents)

Table 1 Recommendations suggested by HUGO respondents to improve on their effectiveness and efficiency

Parish	Responses	More regular trainings (%)	Allowances (%)	Funding their projects (%)	Increase food (%)	Increase on HUGO members (%)
Bujengwe	HUGO (n=16)	25	56	19	0	0
	Non HUGO (n=10)	0	80	0	0	20
Mukono	HUGO (n=20)	5	60	25	0	10
	Non HUGO (n=11)	0	64	0	9	27
Nteko	HUGO (n=29)	14	52	24	7	3
	Non HUGO (n=21)	14	57	10	5	14
Rubuguri	HUGO (n=15)	20	53	13	13	0
	Non HUGO (n=9)	0	89	11	0	0
All parishes	HUGO (n=50)	15	55	21.3	5.0	3.8
All parishes	Non HUGO (n=50)	5.9	68.6	5.9	3.9	15.7
All parishes	HUGO and Non HUGO (n=100)	9.8	63.9	12.8	4.2	9.5

4.12 Perceptions, attitudes and effectiveness of non-HUGO members.

Fifty percent of our control study population was not HUGO members and we asked them why they had never joined HUGO (figure 19). Thirty percent said they were not around at the time of the selection of HUGO members (e.g. were still in school and others were away from the village). The women believed that they were not selected because of their gender and this argument represented 25% of responses. Another 20% of respondents said that the available spots for HUGO members were full by the time they wanted to join. The least percentage of respondents (4%) said they were scared of gorillas and the other (4%) said only people staying close to the park were selected.

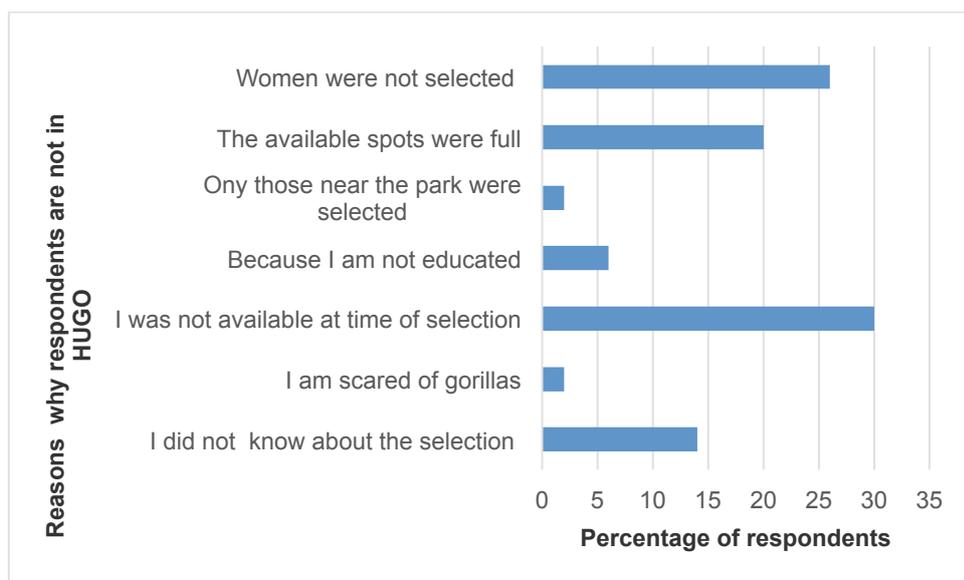


Figure 19 Reasons why respondents are not HUGO members

4.13 Motivations of Non-HUGO members to join the HUGO program

Most of the non-HUGO respondents that we talked to expressed desire to join HUGO, even the women though they thought they had been discriminated against because of their sex. Thirty percent of the respondents said that protecting their crops against gorillas would be their number one motivation to joining HUGO since as non-HUGO they lack the capacity and permission to interact with gorillas on their land (Figure 20). Twenty two percent of the respondents said there was nothing that

could motivate them to join HUGO. The least responses (7%) were from respondents that said their motivation to join HUGO would be influenced by their good will to help the community reduce gorilla raids(Figure 20).

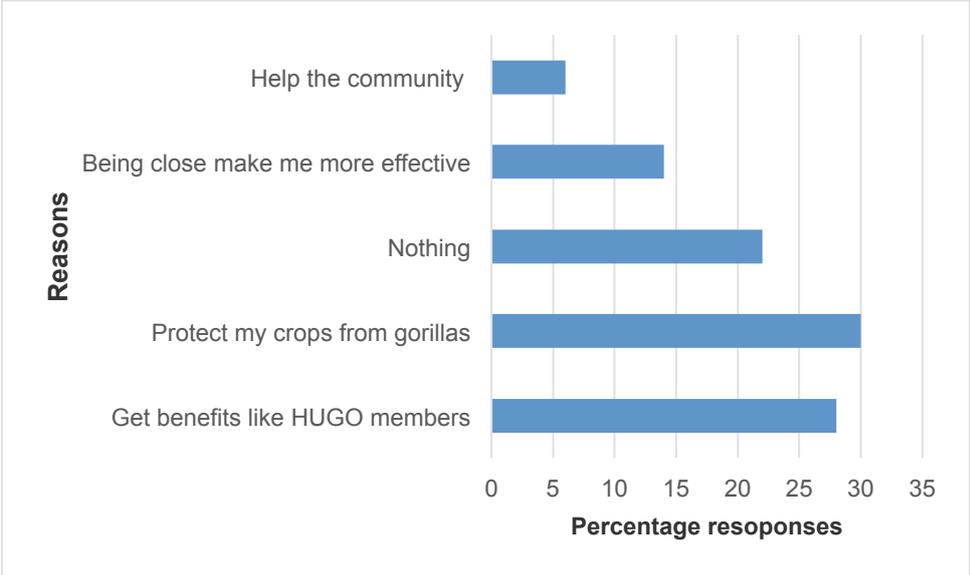


Figure 20 Reasons that would motivate non-HUGO members to join HUGO

4.14 Problems by faced Non HUGO members

We examined the problems non-HUGO members faced as a direct and indirect impact of them not being part of the HUGO program (Figure 21). Sixty five percent of the non-HUGO members said that not being part of the HUGO program impacted on how effectively they could deal with the gorillas in their gardens and the other 35% said not being part of HUGO meant they were not entitled to the benefits the HUGO program e.g. for example free food, rain gear and being considered first beneficiaries for gorilla levy and revenue sharing.

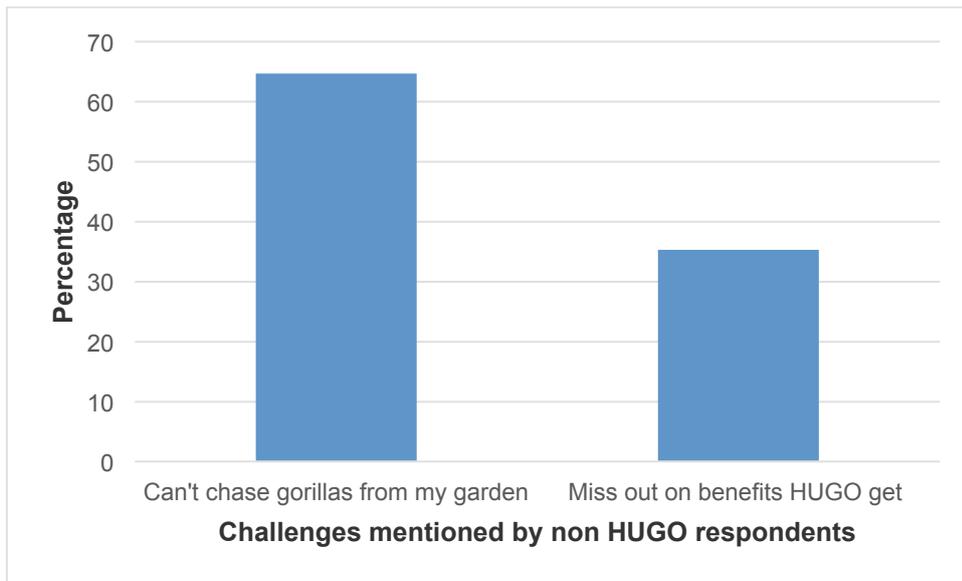


Figure 21 Challenges/problems encountered by non-HUGO members

4.15 Constraints of HUGO members in addressing HWC

The HUGO members' respondents mentioned that some of the common problems/challenges they faced during their work (Figure 22). Forty eight percent of the HUGO respondents mentioned that they spent so much time on HUGO activities that left them without enough time for their own activities (Figure 22). Thirty four percent of HUGO respondents attributed their problems to other community members blaming them whenever gorillas and other animals crop raided their gardens, while 12% and 2% of HUGO respondents attributed their problems to the risk of being attacked by gorillas and risk of diseases transmission e.g. malaria and zoonotic diseases while interacting with the gorillas (Figure 23).

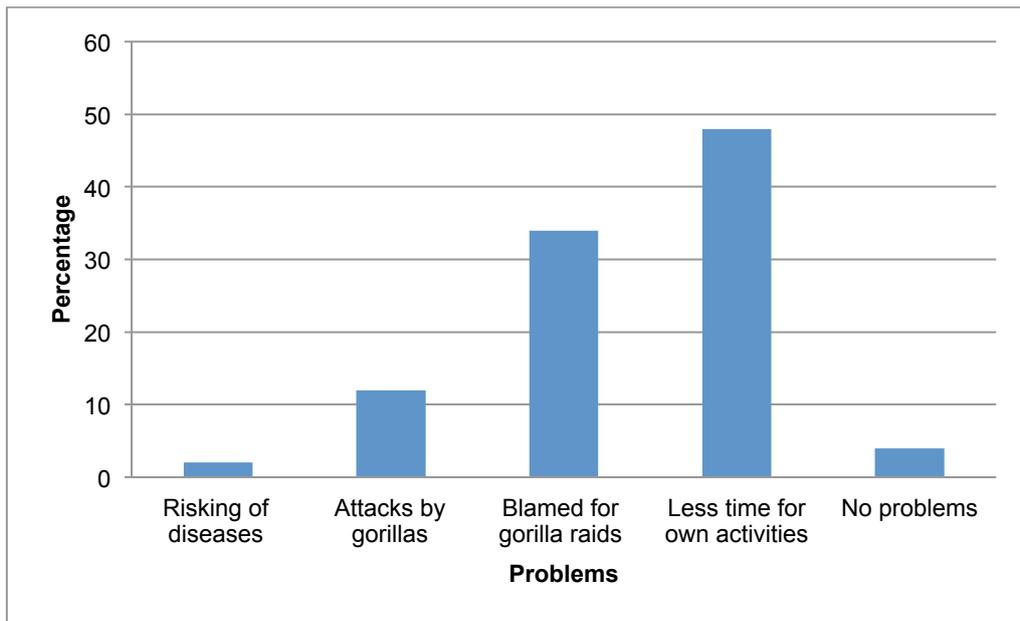


Figure 22 Overall constraints of HUGO members in addressing HWC

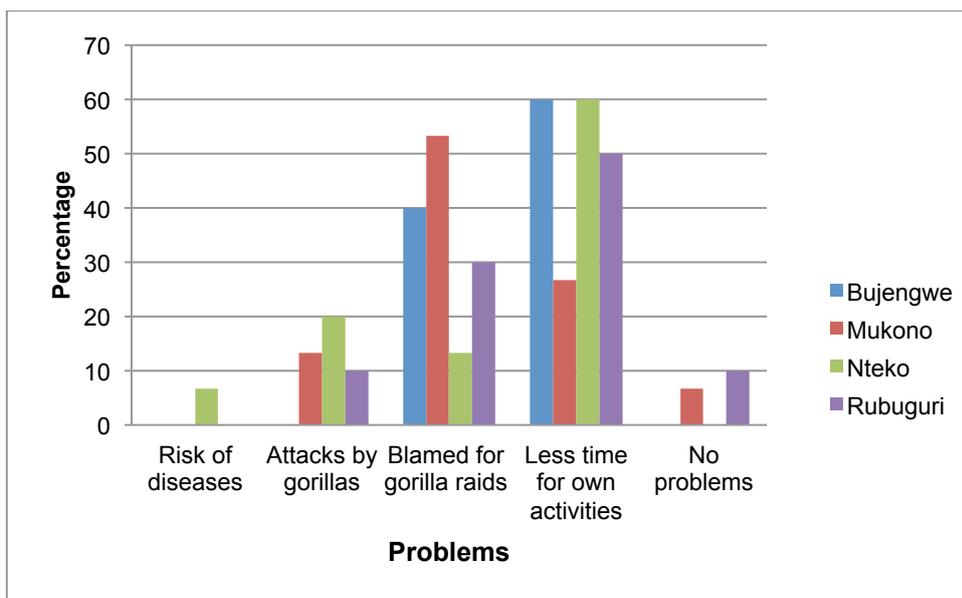


Figure 23 Parish based constraints of HUGO members on addressing HWC

4.16 Weakness/failure of the HUGO Program

Both HUGO and non-HUGO respondents listed some of the flaws of the program (Table 2). Majority of respondents (42%) attributed HUGO's weaknesses' to their lack of enough time to commit to HUGO activities, while 4% and 2 % blamed HUGO's flaws on lack of coordination among HUGO members during gorilla raids and

HUGO's fear of gorillas respectively. Fifty-three percentage of the respondents mentioned that the HUGO program had no weaknesses.

Table 2 Weaknesses of HUGO program as mentioned by respondents

Parish	Category of respondents	Do not commit enough time to HUGO (%)	Fear gorillas (%)	Little or no coordination among HUGO members (%)	No weakness (%)
Bujengwe	HUGO (n=10)	20	0	10	70
	Non HUGO (n=10)	10	0	0	90
Mukono	HUGO (n=15)	47	0	6	47
	Non HUGO (n=15)	47	0	0	53
Nteko	HUGO (n=15)	53	7	13	27
	Non HUGO (n=15)	40	0	0	60
Rubuguri	HUGO (n=10)	60	0	0	40
	Non HUGO (n=10)	50	0	0	50
All parishes	HUGO (n=50)	46	2	8	44
All parishes	Non HUGO (n=50)	38	0	0	62
All parishes	HUGO and Non (n=100)	42	1	4	53

5.0 Discussion

5.1 Gender of respondents

The result from the gender analysis showed there was no female among the HUGO respondents. Some of the Non HUGO female respondents we interacted with thought it was not fair since they felt left out to be members of HUGO. The women argued that most of the times they did more guarding of fields against problem animals than the men. Akampurira et al. (2015) also found that women and children in Nkuringo did more guarding than men. The men argued that whilst women could guard against baboons and monkeys, they could not handle gorillas and elephants because they were much more dangerous and sometimes chasing and herding those animals involved nights and entire days. This was not only a risk for women but in

addition to that, most husbands could not allow their wives to be away from the household for that long. Probably this is the reason the HUGO team memberships did not involve the women. However, for effective membership and participatory involvement, the HUGO memberships should have women.

5.2 Age of respondents

Majority of HUGO members (48%) were between the ages 41 to 60 years. This is the age that has families and is responsible for family maintenance and other household livelihoods activities (school fees, food and other family provisions). Whereas it is important to mention that most HUGO members mentioned that they were happy and willing to participate in HUGO activities, effective participation in HUGO activities by this age group (41-60 years) is limited due to their other family engagements and in order to maintain their livelihoods and that of their dependents. It should be noted that HUGO membership is voluntary and not paid for in monetary terms. According to the focused group discussions in Mukono those above 60 years lack the agility and are sometimes burdened by ill health and cannot be as active as those below 40 years. For effectiveness of HUGO, IGCP/UWA should think of recruiting more youthful members to HUGO, perhaps those between the age group of 18 to 30 years.

5.3 Education levels of respondents

Literacy is a key aspect of HUGO program especially in the collection of data. In this study we found that 78% of the HUGO members had only attained primary level qualification and most of them had not even gone above primary five. This result has important implications on the training of HUGO especially in recording the HWC data collected in the field and the automated data collection tool. Some of the HUGO members are not able to write and fill in the datasheets currently being used for the collection of the HWC data. To get the best out of them regular and vigorous training

is needed by UWA and IGCP. This level of education also signifies that any data collection protocol should be custom made to their abilities and capacity of education.

5.4 Hygiene and Sanitation among respondents' households

Humans and gorillas share 97% of their genetic makeup and this means that the risk of disease transmission between the two is potentially high. Humans with high exposure and whose exposure-related activities are in daily contact with the Mountain gorillas are potentially risk agents of human diseases to the gorillas (MGVP; 2001; Nizeyi et al., 2012). This is the case with the HUGO team members whose activities are in daily contact with the gorillas. This study shows, 46% of HUGO respondents did not have had hand-washing facilities at their latrines and that 75% of the non-HUGO members also did not have handwashing facilities at their latrines. This is a potential health risk to the gorillas by the HUGO and non-HUOH members.

Human excreta have been implicated in the transmission of many infectious diseases such as diarrhoea, cholera, typhoid, infectious hepatitis, polio, cryptosporidiosis, and ascariasis (MGVP, 2004). Gastro intestinal pathogens of humans have been detected in some gorilla populations of BINP (Nizeyi et al., 2012). Intensification of human activities coupled with insensitive sanitary behaviors within and around BINP may be responsible for this human to gorillas' transmissions of infectious diseases.

5.5 Perceptions, attitudes and effectiveness of HUGO members

HUGO members' attitudes towards their work have been evolving over time but more than anything these attitudes are influenced by motivations for joining HUGO. Some joined HUGO as volunteers, while others joined expecting some kind of benefit either monetary or non-monetary, others saw it as opportunity reduce crop raiding by gorillas in their gardens and others joined because they thought being in HUGO

would give me them some kind of status and recognition. Based on the interviews and FGDs it seemed that most people that joined HUGO had higher expectations than what they encountered in reality. The communities too expected a lot from HUGO because they believed the HUGO members were facilitated in their activities. That notwithstanding, it should also be mentioned here that persistence of people in HUGO over the years has a lot to do with some of the benefits they accrue from the HUGO program. For example Byamukama Atanzio a long serving member of HUGO from Nteko parish, mentioned that a lot has been done by UWA, local government and IGCP to improve the attitudes of the members. He further mentioned HUGO members were now among the first people considered for benefits from UWA's revenue sharing program and this has greatly motivated members and encouraged others to join.

Motivations and incentives for HUGO have been highlighted by other authors such as Akampurira et al. 2015; Babaasa et al. 2013; Hockings 2009; Kalpers et al. 2010) as one way to improve HUGO attitudes and effectiveness. This was further emphasized and presented in a different manner by HUGO members from Mukono parish that argued that their goodwill had reduced them to beggars always waiting for handouts from UWA and well-wishers. Yet if they were paid an allowances for the time they spent interacting with gorillas they would be more motivated and much prouder of their work. Although one would expect that the major reason why anyone would join HUGO would be to reduce crop loss to gorillas and other wildlife we found this only represented 20% of current HUGO members (n=50). More interesting we found that over 50% of the current HUGO members suggested that they joined voluntarily without expectation of any benefits. However from the FGDs we realized that some

of the HUGO members did not fully understand the commitment they were making when joining. They thought it would be an easy job that would raise their statuses among their peers and create easy access to UWA and other conservation institutions while not for most members.

5.6 Recruitment of HUGO members and motivations of Non HUGO members to join

It is clear from the results that the recruitment of HUGO members over the past 20 years has gradually reduced from an average of 5 people in 1998 to none in 2017. During the FGDs we also established that the HUGO members abandoning the program were not being replaced. This perhaps is an indication of the reduced motivation and morale for joining the HUGO program by the local people. Nevertheless during our interaction with Non HUGO members they showed a willingness to join the program if the working conditions and incentives of HUGO improved. In their argument the Non HUGO members described the workload of HUGO being excessive but with very little benefits. They for example explained that some HUGO members would be busy chasing gorillas from other people's gardens while baboons raided the HUGO member's gardens.

One respondent from Mukono parish had this to say: "Though most local people acknowledge that HUGO is purely a voluntary program with no monetary benefits they think it is too much to ask the HUGO to commit as much time to the gorillas as rangers who are paid a monthly salary and with other benefits such as health insurance." Even when most of the Non HUGO respondents did not show enthusiasm to join HUGO they were still a few who thought that the only way they would proactively stop gorillas from going into their gardens was by joining HUGO.

This is an important result for the success and sustainability of the HUGO program because it shows that the recruitment of HUGO members can be done based on willing and volunteering candidates with a vested interest in reducing gorilla raids. For many local community based groups especially those created to address issues like HWC, it is very important that most if not all the members in said group experience problems with wildlife and this gives them a common goal that is not only interested in how much monetary or non-monetary benefits they get but in trying to find a working solution (Hill et al. 2017; Sheil and Akampurira 2012).

5.7 Effectiveness of the HUGO program

The assessment of the effectiveness of the HUGO program is based on the perceptions of the local communities, UWA and HUGO themselves. These three entities give their assessment based on their interests; for example local communities want the gorillas out of their gardens as soon as possible, UWA want the gorillas chased carefully and gently without stressing them or causing them any harm to them. Our analysis here emphasizes the assessment of the HUGO and Non HUGO members. Our likert scale showed that majority of the HUGO and Non HUGO members (88% and 78% respectively) commended the HUGO program for being effective against gorillas with only 2% of the Non HUGO respondents saying that the HUGO program was not effective. Babaasa et al. (2013) in their study also found that HUGO was the most effective intervention against gorillas and elephants. Other interventions like Mauritius thorn hedge and tea plantation and earlier schemes of compensation have not registered as much success as HUGO around Bwindi (Akampurira et al. 2015; Babaasa et al. 2013; Byamukama and Asuma 2006).

Taking long to respond to gorilla raids was one of the reasons HUGO is considered ineffective. Secondly the failure of HUGO to chase gorillas out of people's gardens while tourists were viewing them was another reason that infuriated respondents in the FGDs. In their defense HUGO members argued that they do not make the rules of engaging gorillas and UWA does not allow them to chase the gorillas while tourists are viewing them because it becomes difficult and risky to effectively herd the gorillas back to the park in the presence of many people. However the local people think that is an excuse given by UWA because all they (UWA) care about is making the tourists happy at the cost of their livelihoods (Laudati 2010; Tumusiime and Sjaastad 2013).

5.8 Ease of use of mobile technology devices by HUGO members

IGCP and UWA in June 2018 unveiled the use of mobile technology as a data collection tool for human-wildlife conflict in Bwindi. The primary users of this technology are HUGO and UWA. It is envisaged that the mobile technology will be used simultaneously as problem animals are being chased back to the park. It is hoped that technology will help provide real time data on crop raiding incidences and also accurately provide information on circumstances surrounding the crop raiding incidences. This technology replaces paper based data collection which had a couple of challenges such as; being unusable during the rainy season, difficulties in storage of the data sheets, the extra time needed to clean and enter the data and data analysis.

During the training we assessed the visibility and usability of the technology in respect to HUGO members based on our interaction with them during the data collection of the rapid assessment.

- i. Majority of the HUGO did not complete primary level of education and this is likely to affect the ease with which they operate the technology. Therefore the

information to be collected was put in the local Rukiga language to make the technology more user friendly

- ii. The information to be collected by the mobile technology includes: HUGO team members present, leader of the day, UWA team and their leader, problem wildlife (if gorillas, group name, number of silver backs, other mature ones and the young), type of crops destroyed, value, quantity, village, parish, sub county and district. Whereas this information is very important and valuable to understanding and managing the HWC better, it seems to add more work to the HUGO members to collect. For such a technology to work better with HUGO it must be very simple and basic to use and less information for them deal with. For example an ideal data set should include: HUGO members present, crop raiding species (if gorillas, group name, numbers adults and young), type of and estimated quantity of crop destroyed and stage of growth. The value of the crop destroyed can be assessed later by UWA based on the current market prices. It is important that we do not forget the primary focus of the HUGO program is to “chase crop raiding animals from gardens”. Increasing their tasks does not only decrease the efficiency for their primary purpose but also entitles them to claim for more incentives which may affect the sustainability of this program.
- iii. During the training we noted that among the HUGO members attending the training, only a few were quick and adept to learning the working procedures of the tool. Unfortunately others left the training without a clue of what was required of them. For example the HUGO members above 60 years had a difficulty in reading texts on the devices. It would be better if the use of texts in the automated is eliminated and substituted with the use of pictures/photos and symbols/icons that are more known and make sense to the HUGO members. This however does

not mean that HUGO cannot use the technology rather it emphasizes the need of regular refresher trainings and recruitment of HUGO based on a certain criteria.

- iv. The solar system that comes with the technology is brilliant idea for charging the mobile device in these areas where electric power is not an option. However we noted with concern that the solar system may also cause a problem as most of HUGO members saw an opportunity to charge their phones and those for the rest of the community for a price. This may consequently raise issues of who should keep the solar system and how effectively it is used for its intended purpose.

6.0 Conclusions

This study has shown and collaborated results of past studies (Akampurira et al. 2015; Babaasa et al. 2013; Byamukama and Asuma 2006; Kalpers et al. 2010) that HUGO remains one of the most important and effective management approach that can reduce crop raiding by gorillas and other large animals such as elephants. It also has the potential to increase and improve community-park relationships as it allows communities and UWA rangers work side by side to reduce the crop raiding issue in BINP.

The HUGO program was created on the basis that local communities would volunteer their time. However as the human-gorilla conflict evolved over the years and some gorilla groups spend nearly 80% of their time outside the park. The work load and time HUGO spend with the gorillas has also increased and most of the HUGO members now look at the non-monetary benefits they are getting as insufficient to compensate for their time. In some cases HUGO members argued that they spend much more time with gorillas than UWA rangers and are convinced that there should be given a monetary benefit especially for the days and nights they

spend with the gorillas. This perhaps has contributed to the observed and mentioned issue of HUGO ineffectiveness by respondents. The HUGO members feel that their efforts in regard to human-gorilla conflict are not adequately appreciated. The HUGO members mentioned an example that unlike the UWA rangers who have health insurance schemes in case of accidents and harm by the gorillas, the HUGO members do not have such scheme and therefore are at risk to attacks and harm by the gorillas.

This study has shown that HUGO members clearly understand the operation procedures when interacting with gorillas and try as much as possible to uphold to them. Even when facing criticism from community members, for example when gorillas enter gardens the communities would want the HUGO members to quickly and aggressively send them away. However the HUGO members hold their ground and follow the right protocols that they have been trained in. This task is not a simple one but most of them take pride in the work and are convinced they play a big role in conservation of the mountain gorilla.

Despite the fact that most of the HUGO members mentioned that the incentives given to them were not equal to the amount of work their put into HUGO activities, they were still grateful for the benefits they have been given through HUGO for example the livestock projects, food, rain gear and a cordial relationship with UWA. The good relationship they have created with UWA has put them in a place where they can act as an intermediary between UWA and the communities. On one end conveying grievances/concerns communities have with UWA and on the other end sensitizing communities on conservation, something they take great pride in.

There is a potential diseases transmission risk to the gorillas by some HUGO members especially those that do not have better sanitations at their homes. This HUGO group of people is the 44% that did not have hand-washing facilities at their latrines. Another risk for the disease transmission to gorillas is the other non-HUGO members' group (75%) that also did not have hand-washing facilities at their latrines. This group although not in regularly contact with the gorillas could potentially transmit the infectious diseases to the gorillas when the gorillas raid their gardens. IGCP and UWA should target these groups of HUGO and non-HUGO member to improve on their hygiene and sanitary measures in their homes.

7.0 Recommendations

- Both HUGO and Non HUGO members look at the current incentives for HUGO as being insufficient. Choosing the appropriate incentive requires a conditionality and balance so that any incentive chosen does not just attract any members from the community yet without interests in participating in HUGO activities for the very target people of frontline villages that are affected by the crop raiding animals. Although the HUGO program was formed as a voluntary activity of local communities to chase away wild animals from their gardens, this is not what is currently on the ground. The spirit of volunteerism has been lost among the local communities and most especially when involved in common good activities. All HUGO members and non-HUGO members have mentioned that some kind of monetary allowance should be paid to them.

- We recommend that some incentives been given to the HUGO members by UWA and its partners. For example awarding contracts of trail cutting and maintenance (including park boundary maintenance) to HUGO members would be an added incentive to the HUGO members. If the HUGO members accessed these contracts/jobs and therefore acquired funds in return, this would be a great incentive to them.
- Furthermore, where possible, some funds from revenue sharing should be channeled towards paying for a health insurance scheme for all the HUGO members. This could act as not only as an incentive for the HUGO members but also as an insurance against harm and accidents against gorilla attacks.
- The spirit of volunteerism among the HUGO members needs to be revived through sensitization meetings and workshops. Perhaps the most sustainable way of reviving the volunteerism spirit among HUGO members would be through UWA and partners involving the HUGO activities through the small local community administrative units such as the stretcher groups (*engozi groups*). These local stretcher groups are cohesive and highly respected by the local communities and institute norms and sanctions for local community administration/behavior. The stretcher groups can give sanctions to any community member who deviates away from the agreed norms of all community members. The stretcher groups have been in existence for many years most especially in S.W Uganda. If UWA and its partners use these local community institutions, the spirit of volunteerism while chasing gorillas and other wild animals from gardens could be revived among local communities.

- This study and others studies before have shown that HUGO remains one of the most effective interventions against crop raiding by gorillas and other large species like elephants. It is therefore important that all stakeholders working in Bwindi on conservation and development work together to support this program. As much as there are other conservation challenges human-wildlife conflict is one of the biggest challenges. Reducing this conflict opens up opportunities for engaging communities on other conservation and livelihood challenges. We recommend that UWA as the major stakeholder and custodian of wildlife take the lead to engage other stakeholders to support the HUGO program.
- Vaccination against the childhood communicable diseases and improved human waste disposal could be critical control points for preventing disease transmission to mountain gorillas (MGVP, 2004) This is one recommendation that IGCP and UWA should consider. All HUGO team members together with their families should be immunized against these infectious diseases and their household hygiene and sanitary measures improved.
- With the introduction of mobile data collection technology in HUGO the recruitment of HUGO members though voluntary should be selective to a certain degree. People over the age of 60 years are unlikely to adapt to the technology compared to their younger counterparts. This was clearly demonstrated during the introduction of the technology to HUGO members. We also recommend that further constant refresher training of the HUGO

members in the use of the automated devices for data collection be carried out in order for them to “get to grips: with the devices functions. Furthermore, the automated devices need to be made user friendly to the illiterate HUGO members and this could be through use of pictures/photos and symbols/icons that are more known and make sense to the HUGO members than the use of texts.

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9.0 . APPENDICES

9.1 Household interviews questionnaire guide

Date:.....

Interviewer's name:.....

Parish..... Village.....

Household ID.....

GPS Northing.....GPS Easting.....

Part 1 Demographic and Background assessments

1. Respondent's Name.....
2. Sex..... Age.....
3. Marital status.....
4. How many people currently live in your household? (Including person being interviewed-use table below)

Age (years)	Number of males in this household	Number of female in this household
+60		
41-60		
21-40		
Below 20		

5. What is your level of education? (tick)
 - (a) No formal education
 - (b) Primary school
 - (c) Secondary school
 - (d) Other(please specify)

6. How do you currently use land in this household? (*Tick more than one*)

(a) Livestock farming and Arable farming

(b) Arable farming/cultivation alone

(c) Woodlot and Arable farming

(d) Other (specify).....

7. What types of crops do you normally grow in your gardens? (*please list*)

.....
.....
.....

8. How and when do you choose the types of crops to plant in your garden? (*Soils, seasons??*)

.....
.....
.....

Part 2 Source of livelihoods for households

9. Does any member of your household hold any position of authority?

- LC1 committee member
- LC2 committee member
- LC3 committee member
- Priest
- Teacher
- Police
- Medical worker
- HuGo
- Other

- None

8 What was your household’s greatest source of income in the last 12 months?

- Subsistence farming
- Commercial farming
- Wage labor
- Salaried employment
- Non-agricultural enterprises
- Property income
- Transfers (pension, allowances, social security benefits etc.)
- Remittances
- Organizational support
- Other

Part 3 Hygiene and sanitation of HUGO members

9. As a HUGO member, do you have rules and regulations when chasing gorillas? (*E.g. no gorilla contact when sick with flu, scabies etc.*)?

(YES/NO).....

- If yes, are those rules strictly observed by members?

(YES/NO).....

- If no, how are risks of diseases transmission to gorillas mitigated?

.....

10. Do you have access to a pit latrine? (YES/NO).....

- If yes, is it shared with other households? (YES/NO).....

11. Which of the following anal cleansing methods do you use?

- Paper/Water/Leaves/Toilet paper/other?/none

.....

12. Do you have a hand washing facility at latrine? (**YES/NO**).....

- Do you often use the hand washing facility?

(**YES/NO**).....

- Any problems with the hand washing facility? (**Lack of water, etc.**)

.....

.....

13. Does your household have a bath shelter? (**YES/NO**).....

14. How often do you bathe/week?.....

15. Where do you fetch water used for home? (*River, spring, rainwater harvests tank, gravity water, pond, swamp, etc.*)

.....

16. How far do you go to fetch water for HH use? (Time and approx. distance)

.....

17. Do you have adequate water for HH use? (**YES/NO**).....

18. Do you have livestock? (**YES/NO**).....

- Where do your domestic animals stay? (*House, outside shelter, other?*)

.....

19. Do you use a fuel-efficient stoves for cooking? (**YES/NO**).....

- What is your main source of cooking fuel? (Firewood, charcoal, gas, paraffin, electricity, other)

.....

Part 4 HUGO membership and Perceptions/Attitudes & Impacts

20. Do you experience cases of Gorillas raiding your gardens or your neighbors?

- **Yes/No**

21. Are you a member of the HUGO team?

- **Yes/No**

22. If Yes, When did you become a member of HUGO?

.....

23. If No, Why aren't you a member of HUGO?

.....
.....

24. What would make you become a member of HUGO (***for the non-HUGO members***)

.....
.....

25. Do you face any problems by not being a member of HUGO (***non-HUGO members***) **YES/NO**

26. If yes, what problems do you face?

.....
.....

27. What prompted you to be a member of HUGO? (***HUGO members***)

- Voluntary
- Recognition among my village members
- Incentives (gum boots, clothing, other (mention)).....
- Need to guard crops

- Grant from IGCP
- Other (please specify).....

28. What benefits do you get being a member of HUGO? (**HUGO members**)

.....

29. What problems do you face being a HUGO member? (**HUGO members**)

.....

30. How can the problem be addressed? (**HUGO members**)

.....

31. How long does it take for HuGo members to reach site of gorilla raid after being informed of gorilla garden raids? [**HUGO members**]

.....

32. Describe the methods used to chase gorillas out of gardens (**HUGO members**).....

.....

33. Do HUGO team members effectively & successful mitigate gorilla raids out of gardens? (**YES/NO/FAIR**)-(ALL RESPONDENTS)

34. If No/Fair, how can the HUGO team members be effective? **ALL**

RESPONDENTS.....

35. What do you consider a weakness/failure by HUGO? (**ALL RESPONDENTS**).....

.....
.....

36. Are there any records taken when chasing gorillas out of gardens? (**YES/NO**) (**HUGO members**)

.....

37. What information/data is collected and recorded? (**HUGO members**)

.....

38. Where is the data taken? (UWA? IGCP? HOME?) (**HUGO members**)

.....

39. Do you get feedback from UWA/IGCP on the analyzed data that was collected by HUGO? (**YES/NO**) (**HUGO members**)

.....

40. How would/is the feedback from UWA/IGCP helping/going to help you as HUGO? (**HUGO members**)

.....

41. It has been suggested that HUGO is the best intervention against gorillas do you agree? If not please mention what intervention you think is or could be more effective (**ALL RESPONDENTS**)

.....
.....

42. Any recommendations for improving the HUGO program in Bwindi?

.....

.....

9.2 Focused group discussion guide

FGDs Group location.....

Village;.....

Parish.....

Key guiding issues/questions to consider

- Advantages of being a member of HUGO (list as mentioned)
 - Disadvantages if being a member of HUGO (list as mentioned)
 - Problems faced by HUGO members
 - How to address problems faced by HUGO members
 - Effectiveness of HUGO in mitigating Human Wildlife Conflicts
 - How to improve effectiveness of HUGO in mitigating Human Wildlife conflicts
 - Weaknesses/failures of HUGO (and how to address them)
 - Involvement of HUGO team members in the collection of data on gorilla raids
- How to improve feedback between UWA/IGCP and HUGO members
- Describe how HUGO was formed? Allow the participants to give you all the details for example what organizations were involved, which local people were involved, was it the local community's suggestion to start HUGO or not, where did the idea come from? , Were they happy with idea? You guide them through this.