Original Article

Greed or Grievance? Linking Revenue Sharing Implementation to Unauthorised Resource Use and Conservation Support at Bwindi Impenetrable National Park

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ABSTRACT

Revenue sharing is considered a major incentive to promote Community Based Approaches to conservation of protected areas. The sharing of revenue from Protected Area resources is supported by conservationists to promote strong partnerships between protected area management and local communities to address unauthorised resource use for better conservation outcomes. This is premised on the ability of the shared revenue to translate into people's livelihood improvement and minimize their dependency on resources from protected areas. However, empirical realities indicate that the practice of the Revenue Sharing policy barely addresses the initial objectives of human livelihood improvement to gain support for conservation. This study examined the Revenue Sharing Implementation, Data was collected from 715 respondents who included Local community members (including the unauthorised resource users), staff from conservation organisations in Bwindi and local council leaders. Data was collected using household survey questionnaires, key informant interviews and Focus Group Discussion (FGD). Results showed that most beneficiaries of the Revenue Sharing policy were random community households not the unauthorized resource users. The revenue sharing projects allocated to community members were majorly livelihood projects compared to common good projects. Projects included; livestock, passion fruit growing, poultry, provision of land and water projects. Unauthorised resource use was largely motivated by the need for bush meat, minor timber forest products especially firewood, collection of basketry materials and medicinal plants. Protected area managers ought to consider greater involvement of poachers in Revenue Sharing activities. Reducing unauthorized resource use requires systematic but also a combination of factors to mitigate the most driving forces that compel community members to engage in unauthorized forest resource use.

INTRODUCTION

The generation and sharing of revenue from Protected Area (PA) resources is promoted by policymakers and implementers to ensure a strong partnership between protected area management and local communities for better conservation outcomes (Pauline & Rusoke, 2023). This is premised on the ability of the shared revenue to translate into people's livelihood improvement and minimize their dependency on resources from protected areas (Vedeld et al., 2012). Sharing conservation revenues with community members surrounding protected areas dates way back to the 1940s in the colonial era in various nations in the world (Newmark & Hough, 2000). As early as 1940's there was increasing recognition that conservation would provide revenue-generating opportunities to contribute to local livelihood development most especially in poor communities (Roe & Elliott, 2010 as cited in Adam, 2004). The policy of revenue sharing has the potential to create a linkage between conservation and development (Snyman et al., 2023). If well implemented using an equitable framework, it can be a conduit for enhancing people's livelihood and influencing their support for conservation of Protected Areas. This approach can be more rewarding if the unauthorized resources are+ targeted.

Community members who live around protected areas continue to agitate for conservation benefits in order to embrace conservation since they bear more costs of conservation (Fougères et al., 020).

Twinamatsiko et al. (2014) noted that there is a strong linkage between inadequate community livelihoods and unauthorised resource use which has curtailed conservation efforts. Yet, there are often contestations between conservationists and local communities premised on inadequate benefits from Protected Areas (PAs) to address their livelihood needs due to the costs borne by community members adjacent to PAs (Walters & Wardell, 2023). Nonetheless, conservationists support revenue sharing with the objective of improving people's livelihoods in order to gain their support for conservation (Imanishimwe, 2022).

In developed and developing countries, revenue sharing is considered a major incentive to promote Community-Based Approaches (CBAs) to conservation of protected areas (Dhakal et al., 2022). The formalization of a CBA to conservation hereafter referred to as Integrated Conservation and Development (ICD) which houses Revenue Sharing policy is a recent paradigm of 1980s. Integrated Conservation and Development (ICD) as a community-based approach officially began in 1982 as a conventional approach to conservation following the 3rd World Parks Congress (Mugisha, 2002). It recognised the importance of local participation, sharing benefits with people neighbouring protected areas, sustainable resource use and collaborative park management (Lindsey et al., 2021). The policy began in Latin America in countries such as Indonesia and some African countries like Zambia, Zimbabwe, South Africa

and Tanzania (Roe & Elliott, 2010). The issue of how to deliver benefits from Protected Areas to local people was further deliberated about as the fifth objective of Bali Action Plan, a product of the 3rd World Parks Congress in 1982 which aimed at promoting the linkage between protected area management and sustainable development (McNeely & Miller, 1984). The Congress realized that people needed to appropriately share benefits flowing from Protected Areas, be compensated appropriately for any lost rights and be taken into account in planning and operations (Baker et al., 2013; Twinamatsiko et al., 2014).

In 2008, at the 9th Conference of Parties, the participating member states were encouraged to make sure that development activities in the context of protected areas and conservation support contribute to sustainable development and poverty eradication (Twinamatsiko et al., 2014). Poverty eradication and livelihood improvement is also echoed in the 2011-2020 Strategic Plan for CBD under decision X31. The document puts in place the guidelines for biodiversity conservation in order to contribute towards poverty eradication. In spite of the importance of community participation in conservation and poverty eradication, Uganda in the post-colonial era continued to implement conservation policies that excluded local communities as an approach to managing PAs in Africa (Twinamatsiko et al., 2014). This is witnessed with the top-bottom approach mostly used in implementing conservation policies. Local communities that used to have access to wildlife resources were excluded from the established protected area management, which has continued to cause much tension and conflicts between PA managers and the local people bordering such PAs (Mugisha, 2002). For instance, in Indonesia, tourism revenues have not so far lived up to expectations, although they could become significant for a few PAs on Java with attractive coral reefs (Wahyudi & Santoso, 2022). Entry fees remain low with a higher percentage passing to local government and central government (White et al., 2022). In Cameroon there is a system of distributing half of its annual forestry fee revenues to decentralized public authorities and villages that live adjacent to exploited forests (Tamasang, 2019). In Rwanda, communities neighboring PAs share 5% of the annual revenues from tourism (Snyman et al., 2023).

In Uganda, in response to the international demand for benefit sharing, a revenue-sharing programme for PAs began at Bwindi in 1994 as a pilot study for other Protected Areas (Bitariho et al., 2022). In 1995, the Uganda National Park (UNP) formally adopted the Revenue Sharing programme as a wildlife management policy which outlined the goals and guidelines of sharing revenue with communities bordering Protected Areas in Uganda. In 1996, a wildlife statute was put in place that incorporates the Revenue Sharing policy. Section 70 (4) of the Uganda Wildlife Statute (1996) is to enhance communities' benefits from the Protected Areas to demonstrate partnership in management and conservation of PA resources (UWA, 2000). The three main objectives of Revenue revenue-sharing policy include; the provision of an enabling environment for establishing good relations between the protected areas and the bordering local communities; demonstration of the economic value of the protected areas and conservation in general to the local communities and lastly to strengthen support and acceptance of protected areas and conservation activities from the adjacent local communities. The empirical realities however show that the practice of the Revenue Sharing policy around Bwindi does not address the initial objectives of the policy which looks at human livelihood improvement to gain support for conservation. Failure to achieve this pathway has resulted in negative attitudes by the communities towards conservation (Twinamatsiko et al., 2014). This study therefore examined the linkage between Revenue Sharing Implementation, Unauthorised Resource Use and Conservation Support at Bwindi Impenetrable National Park. Specifically, the study established profiles and motivations of Unauthorised Resource Users in BINP, the most needed resources from Bwindi and the relationship

between unauthorised resource use and livelihood improvement for conservation support.

MATERIALS AND METHODS

Study Area

The study was conducted in Bwindi Impenetrable National Park, located in South Western Uganda. The area was considered for the study because, despite the revenue-sharing implementation, unauthorised resource use has persisted in the National Park, with minimal conservation support from frontline community members. In 2020, over 45 people were arrested for poaching with some being convicted and sentenced and serving jail time. Between 2019 and 2021, a total of 6 elephants, 12 lions, 8 buffaloes and 12 zebras were found dead within the different national parks (UWA, 2019; Kyosiimire, 2023). The park is bordered by 27 densely populated parishes, and 96 villages (Twinamatsiko, 2015). The study was conducted in 19 parishes that make 57 villages adjacent to Bwindi and 51 unauthorised resource users.

Figure 1. A map showing location of respondents in Bwindi Impenetrable National Park

Location of respondents relative to BINP

Source: Twinamatsiko (2015)

Study Design

This study employed explanatory and cross sectional designs. The two designs were employed because the researcher was interested in understanding the entire population and subset of that population to understand the differences that

existed. Bwindi is among the 3 top income-generating destinations in Uganda.

Figure 2. Map of Uganda showing Bwindi and other Protected Areas

Source: Harison (2013)

Bwindi Impenetrable National Park is an Afromontane forest situated in South Western Uganda in the Albertine Rift Valley, with rich biodiversity and several endemic species (McNeilage et al., 2006). It is 330 Sq Km^2 in size, and was gazetted in 1932 as the Kasatoro and Kayonza Forests, majorly to preserve and protect mountain Gorillas (UWA, 2001). The two Crown Forests were unified as Bwindi Central Crown Forest. In 1961, Bwindi was gazetted s a Gorilla sanctuary. In 1991, BINP was put under the management of the then Uganda National Parks, currently known as Uganda Wildlife Authority (Tumusiime & Svarstad, 2011).

Bwindi Impenetrable National Park is inhabited by three main tribes, that is the Bakiga, who are the dominant ethnic group, Bafumbira and Batwa.

Other minority ethnic groups in the area are the Bahororo and Bahunde. The Bakiga and Bafumbira are mainly cultivators involved in agricultural projects such as Irish potato growing in parts of Kisoro and Kabale, tea growing in parts of Kanungu as well as sorghum growing. The Batwa are traditionally hunters and gatherers in wetlands and forests but currently live at the fringes of Bwindi Forest.

Study Population and Sample Size Determination

The study population constituted various sections of people in Bwindi in order to correlate and substantiate various views on revenue sharing policy. Local community members were employed as primary respondents categorised as Batwa (historical occupants of Bwindi forest

before it was gazetted), other community members (Bakiga and Bafumbira) and Unauthorised Resource Users (people who access Bwindi resources without permission from Park Management). Other categories of respondents included staff from Uganda Wildlife Authority, Bwindi-Mgahinga Conservation Trust, Cooperative for Assistance and Relief Everywhere, Institute of Tropical Forest Conservation, International Gorilla Conservation Program and United Organisation for Batwa Development in Uganda. The other respondents interviewed were Local Council (LC) leaders that is LC I, LC II, LC III and LCV.

The sample size was selected with the aid of Yamane (1967)'s formula indicated below

$$n = \frac{N}{1 + N (e)^2}$$

Where n- is the desired sample size for each category of respondents, N = the size of the population, e is the level of precision. The confidence interval of 95% (margin error of 5%) was used for respondents that were sampled for the study. The above formula was used to select a total sample size of 715 respondents comprised of 565 household survey respondents and 30 key informants and 120 Focus Group Discussion (FGD) participants. A total of 10 FGDs were conducted, each comprising 12 people. The 565 respondents included 51 evidence-based unauthorised resource users, 106 Batwa households randomly selected and 408 randomly selected non Batwa households. The classification and stratification aimed at comprehending the societal variations in terms of perceptions, views and extent of conservation support by different section of people within the same communities. The 120 FGD participants were purposively selected based on their experiences and roles in their communities concerning implementation of revenue sharing process. The 30 key informants constituted 1 staff at BMCT, 7 staff of Uganda Wildlife Authority, 6 District Local Government technocrats, 10 Local Government elected leaders, 5 opinion leaders around Bwindi

including staff from UOBDU, ITFC and elders within communities.

The sampling techniques used were stratified, simple random and purposive sampling. Stratified sampling helped in the stratification of women and men who participated in FGDs. Simple random sampling was employed to generate a representative sample. Purposive sampling was used to generate a sample with pertinent knowledge and experience in the phenomena under investigation.

Data Collection Methods, Management and Analysis

A mixed methodology was used to collect both primary and secondary data which therefore informed data analysis methods used. This mixture allowed methodological triangulation. Primary data was obtained through household surveys, Focus Group Discussions, Key Informant Interviews, Observation and monthly arrest data collection. Secondary data was obtained through project reports and UWA records.

Qualitative data was analysed using thematic content analysis based on objectives form which themes and sub-themes were derived for easy interpretation of the findings. This was aided by NVivo computer package. NVivo has proven a powerful tool that manages qualitative data (Silver & Lewins, 2014).

All quantitative data generated from the field was cleaned, coded and entered into Microsoft Access 7 and analysed using STATA 11 statistical package. Multinomial Logistic Regression (MLR) and Linear Regression (LR) formed part of the analyses of the various processes of Revenue Sharing Implementation and livelihood improvement of people around Bwindi.

The hypotheses and level of significance between revenue sharing policy implementation, livelihood improvement and conservation support were tested using the P-Value. For non-significant results, exact values are given for P-values < or > 0.05, and P values > 0.1 were reported as > 0.05.

For significance results, *P*-values are reported as < 0.05 (Sandbrook, 2006; Dytham, 1999).

RESULTS

Revenue Sharing Implementation

Results revealed that most beneficiaries of the Revenue Sharing policy were random community households who constituted 78% (310) of the total 424 beneficiaries, followed by Batwa 78 (18.4%) and unauthorised resource users 36 (8.5%). This implies that the policy does not specifically tackle those who harm the resource or the historical Batwa who claim to be ancestral occupants of Bwindi forest. During the implementation of revenue sharing, no specific projects targeted different categories of community members, implying that the contextual and cognitive dimensions of equity are not applied in revenue sharing in Bwidi. Concerning gender, most beneficiaries of revenue sharing were males 294 (69.3%) compared to 130 (30.7%) females. The revenue-sharing projects allocated to males were livelihood projects such as passion fruit growing, poultry, provision of land and measures to control crop raiding. Female beneficiaries were mostly benefiting from common good projects such as water projects but not beneficiaries of livelihood projects which are largely owned by males. Regarding ethnicities, findings from household surveys indicate that most revenue-sharing beneficiaries were Bakiga as represented by 338 (79.7%), followed by Batwa 78 (18.4%), then Bafumbira 05 (1.2%) and others as represented by 03 (0.7 %). Thus, revenue sharing is implemented among various categories of community members to gain conservation support.

Profiles of Unauthorised Resource Users

Results show that 24 (61.5%) out of the 39 people arrested by Uganda Wildlife Authority undertaking unauthorised resource use were residents of Bwindi communities while 15 (38.5%) were non-Ugandans. 13 out of 15 non-Ugandans were from the Democratic Republic of Congo, 01 American and 1 Israelite. Out of 24 local residents, 22 (91.7%) were Bakiga while 2 (8.3%) were Bafumbira. 25(64.1%) were from benefiting parishes while 14 (35.9%) were from non-benefiting parishes. A slightly big percentage of the arrested Ugandans 9 (36%) were because of bush meat hunting while 8 (33.3%) were arrested because of collecting minor timber forest products such as firewood and bean stakes. The other 3 (12.5%) were arrested for Non-Timber Forest Products (NTFPs), 3 (12.5%) for encroachment, 1 (4.2%) for illegal path, 1 (4.2%) for mining and 1 (4.2%) for illegal grazing.

Fourteen individuals of the 39 arrested were interviewed as part of the household survey while 25 were not. The profiles and motivations of all the 24 Unauthorised Resource Users were however documented for comparison purposes. Out of the 14 people interviewed, 13 had benefited from Revenue Sharing projects and all (100%) were residents of Revenue Sharing benefiting parishes. The parishes included; Southern Ward (23.08%), Kashasha (23.08%), Nteko (15.38%), Mpungu (7.69%), Mushanje (7.69%), Ngara (7.69%), Rubuguri (7.69%) and Bujengwe (7.6%). The idea that some of the unauthorised resource users were beneficiaries of the revenue-sharing program was reechoed during Focus Group Discussion;

> *"These people have equally got benefits from the revenue sharing program. Some of them received goats with us. However, they engage in unauthorised resource use because the resources distributed by the project are not enough to meet their household needs."* **(FGD Kanyamahene village, Rubuguri, Kisoro District)**

Likewise, another FGD participant asserted;

> *These people do not have time to attend meetings because they are always in the forest. They only come to receive goats at the time of distribution, and leave immediately after receiving what they want from the project".* **(FGD Byumba village, Bujengwe, Kanungu District).**

Figure 3: Map showing location of unauthorised resource users in Bwindi Impenetrable National Park
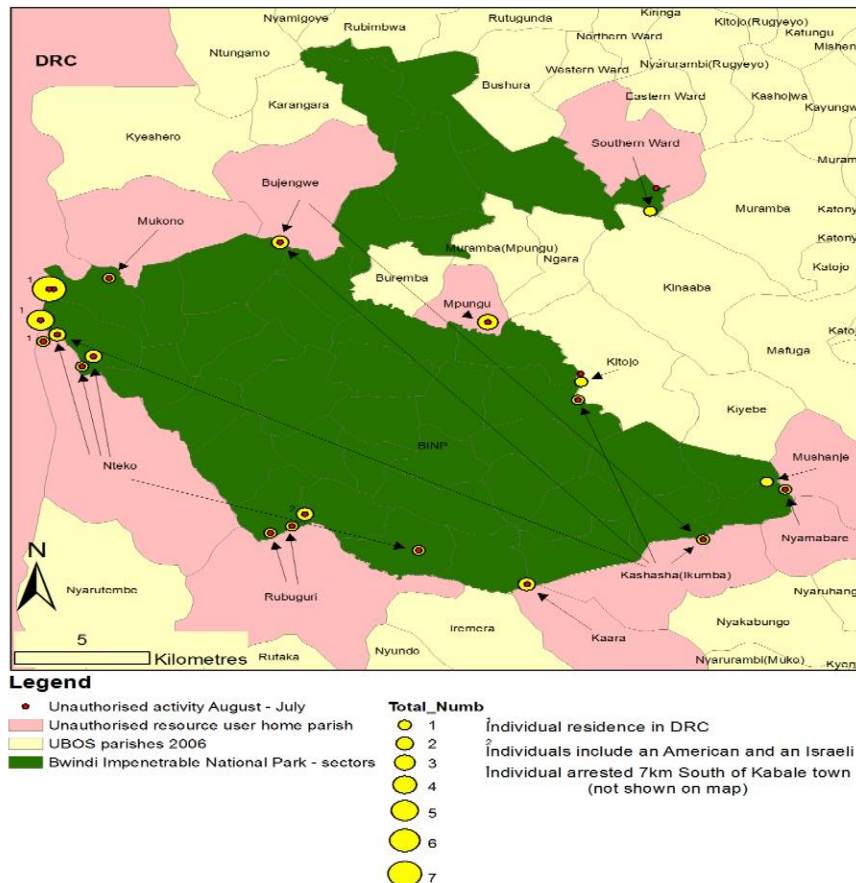
Source: Twinamatsiko (2015)

Stimulations for Unauthorised Resource Users in Bwindi Impenetrable National Park

Bush meat was identified as an important resource that people illegally collect from Bwindi. Bushmeat was mainly collected for subsistence needs as opposed to commercial needs. As shown in Table 1, results indicate that all households obtaining bush meat and the hunters arrested live within a 1 km zone from the park boundary. Therefore, closeness to the park boundary with limited alternative livelihood sources is likely to contribute to unauthorised resource use.

Results further show that, the subsistence needs of people bordering Bwindi who have no livestock or money to buy meat and those who seek bush meat to treat childhood malnutrition were among the drivers for bush meat hunting. Through FGDs, it was identified that local people bordering Bwindi sell bush meat within their communities. This trade is however on a small scale and not on a commercial scale. FGD participants further revealed that bush meat is trusted to have medicinal properties and hunting is used by the Batwa to pass on traditional knowledge to the subsequent generation as quoted;

> *"We sell bush meat within our communities and the nearby markets in order to get money to buy other household items such as salt, soap and other foodstuffs."* **(FGD Nyabwishenya village, Kisoro District).**

Yet, another FGD participant had this to say;

> *"Community members like eating bush meat because they believe that it has medicinal properties. If a person regularly eats bush meat, he or she rarely falls sick."* **(FGD**

Byumba village, Bujengwe, Kanungu District).

Collection of minor timber forest products

Minor timber forest products especially firewood were identified among the resources that people collect illegally from the park. People who collected firewood from Bwindi during the past year lived within 1km from the national park boundary compared to others. Firewood collectors were living further from village centres and vehicle roads. Minor timber collection especially firewood were collected because of limited alternatives in the communities where people live. Evidence observed from the field shows a growing scarcity of land for tree growing because of a high population. Results further established that limited land for woodlots has made it hard to get building poles outside the national park yet construction around Bwindi is mostly supported by poles. This was asserted by one of the interviewees;

> *"Due to high population, people use their land to cultivate crops. Hence, there is limited land for tree growing. As a result, people resource to get building poles from the national park." (Key informant interview, Kisoro District)*

Other resources illegally collected included medicinal plants believed to be more effective at curing illness when compared to conventional medicines. Some FGD participants across Bwindi parishes described those conventional health care services to be too far away and also expensive. This creates preferences for traditional medicine that is near them and believed to be more effective of curing infections compared to the one from such modern health facilities.

Gold Miners

Only one person was arrested for mining gold from Bwindi INP. The history of this person indicated that his family was supported by Bwindi before gazettment as a livelihood source. He narrated to the research team how his father was a gold miner and since 1991, their livelihood changed negatively. The motivation for unauthorised resource use was identified as resentment since the national park gazettment deprived their family of their livelihood resources. Miners lived far from the national park and had large families. Much as he indicated that he has received an RS project, he was quick to point out the weakness of the policy where former gold miners have not been specifically targeted for tangible benefits.

Basket Making

Study findings further revealed that collection of basketry materials from the park was another reason why local community members illegally accessed Bwindi. This was attributed to the high demand for baskets due to tea growing around Bwindi and a need for ready income. Whereas Bwindi park management implements a Multiple Use programme (MUP) where community members are allowed to legally access selected resources, those who illegally collect basketry materials indicated that not all resources are covered under MUP. FGD participants described *Smilax anceps* and *Loeseneriella apocynoides* as good forest resources for making winnowing trays and baskets needed for tea harvesting, yet they are only found in the park. When the researcher crosschecked with resources on the MUP, the two plants are among the restricted plants to be accessed by the group members.

Other causes of Unauthorised Resource Use

Other people arrested at Bwindi were those collecting Non timber forest products (NTFPs) such as medicinal plants, bean stakes and wild honey for household use. Other members of the community were arrested for grazing goats illegally in the park and walking through the park in places not gazetted as formal paths. Most of these people live closer to the park boundary and were among the poorest members compared to other community members.

Additionally, results show that poverty was a major factor driving unauthorised resource use with a slight majority of 227 (40.6%). This is followed by unfairness that cause resentment 201

(35.6%), immediate income 66 (11.7%), culture 37 (6.6%), peer norms 28 (5%) and lastly 'others' 4 (0.7%). 'Others' category included factors such as; social capital, looking at Bwindi INP resources as the easiest option to meet needs and idleness.

Table 1: Motivations of Unauthorised Resource Use

Motivations for URU	Freq.	Percent	Cum.
None	2	0.4	0.35
Culture	37	6.6	6.9
Poverty	227	40.2	47.08
Income	66	11.7	58.76
Unfairness	201	35.6	94.34
Peer norms	28	5.0	99.29
Others	4	0.7	100
Total	**565**	**100**	

Specific results from the 51 URUs who were part of the study (14 new arrested and 37 bush meat hunters from UWA records) show that the motivations for unauthorised resource use were the same as general views of all the 565 respondents. Out of 51 URUs, poverty was mentioned by 34 (66.7%) while 9 (17.6%) mentioned unfairness. Other 4 (7.8%) URUs mentioned culture, 3 (5.9%) mentioned income and 1 (2%) mentioned 'other factors' that were identified such as; social capital and easiest livelihood option. This implies a complicated story whether Revenue Sharing benefits contribute to poverty reduction or redress to conservation injustices that may cause resentment. In the case of Bwindi, respondents understood poverty in terms of the inability to meet subsistence needs which in this thesis is called economic poverty.

The Most Needed Resources from Bwindi

From the identified profiles of unauthorised resource users, this research identified preferences of resources during FGDs in order to establish the possibilities of integrating such resources into Revenue Sharing project selection or recommend to the park management possible ways of funding the initiatives to propagate such resources in the bordering communities. The most needed resources were identified as bush meat, firewood, medicinal plants, building poles, honey and basketry materials that are not on MUP. Bush meat was the most commonly resource obtained and needed from the forest. The second important resources that people needed were minor timber forest products. These included; firewood, bamboo shoots, bean stakes and deadwood. Firewood was mostly mentioned in FGDs. It was mentioned that Revenue Sharing policy stopped funding tree planting projects when CARE withdrew its activities from Bwindi.

Governance and Resource Use

Results from governance indicate that unauthorised resource users perceived less involvement in protected area activities much as most of them had attended park meetings. As shown in Table 3 governance of Revenue Sharing significantly influences resource use (P-value < 0.05). Compared to other households in the same community, the governance by URUs in terms of taking part in leadership such as committees of Revenue Sharing projects significantly influences their use of resources compared to other people in the same society (P-value = 0.002). The other key parameter of governance that influences resource use was accountability. Although involvement of Batwa in terms of 'accountability' as a measure of governance significantly influence their use of resources than any other resource users, the level of significance of URUs' involvement is high compared to other random community households (P-value =0.08). This implies that involvement of URUs and Batwa compared to any other members of their communities is pertinent in influencing resource use. More meaningful engagement of URUs in RS leadership committees and increased benefit impact in their lives is likely to influence

their behavior towards unauthorised resource use. Accountability and leadership compared to involvement had a positive relationship (Coeff= 0.33& 0.7) for URUs and for Batwa (Coeff= 0.33). Involvement had a negative but strong relationship (Coeff= -.0.5) for URUs. Leadership compared to accountability had a strong positive relationship (Coeff= 0.7) for URUs since it is almost close to 1.

Table 2: Relationship between Governance and Unauthorised Resource Use

Parameters	Coefficient		P-value		Z		Standard error	
	URUs	Batwa	URUs	Batwa	URUs	Batwa	URUs	Batwa
Involvement	-0.5**	0.34**	0.002	0.002	-3.1	-3.2	0.1	0.1
Accountability	0.33*	0.33*	0.08	0.015	-1.8	-2.4	0.2	0.1
Leadership on committee composition	0.7**	-	0.011	-	2.54	-	0.2	-

*** Very highly significant at 5%*
** Highly significant at 5%*
* Significant at 5%*

Relationship between Resource Users and Revenue Sharing benefits

There was no statistical significance between Revenue Sharing benefit and unauthorized resource use (P-value > 0.05). There was also no relationship between the two (Coeff=0, SE=0.05). This implies that benefiting from Revenue Sharing does not necessarily influence unauthorised resource use.

Relationship between Unauthorised Resource Users and Livelihood Improvement

This study regressed resource user category and livelihood improvement. This was intended to find out whether unauthorised resource users perceive limited livelihood improvement compared to other people living in their communities. It was also intended to find out the relationship between unauthorised resource use and livelihood improvement. Results after linear regression indicate that resource use highly significantly influence livelihood improvement. There is however a negative relationship between resource use and livelihood improvement (Coeff=0.71, P-value=0.000, SE=0.09, df=564). The study further employed Multinomial Logistic Regression to investigate the differences in terms of relationship and significance that exists on livelihood improvement with unauthorised resource users in the face of other people in the same communities.

Using other community members as a base category, results indicate that resource users significantly influence livelihood improvement compared to other community members (Coeff=-0.28, P-value=0.04, SE=0.14, df =564). The Batwa are significantly influenced by livelihood improvement than Unauthorised Resource Users and other members in their community (Coeff=-1.13, P-value=0.000, SE=0.13, df =564). The relationship however for both Batwa and Unauthorised Resource Users and livelihood improvement was negative. This implies that at the moment, both the livelihoods of Unauthorised Resource Users and Batwa have not been affected by the current implementation of Revenue Sharing projects although resource use and livelihood improvement relate.

Relationship between Unauthorised Resource Users and Conservation Support

The relationship between resource use and conservation support was also established using linear regression. The differences among Unauthorised Resource Users, Batwa people and other community members in terms of significant influence were also established using Multinomial Logistic Regression. This was intended to determine whether resource use influenced people's support for conservation. Also determining who strongly relate with conservation support among resource users in the

same communities was also paramount for this study.

Conservation support was measured in terms of; reduced unauthorised activities, involvement in conservation activities such as stopping fire outbreak on Bwindi forest, ownership and participation of crop raiding control measures, participation in conservation education programmes and the ability to report poaching. In order to establish an index for conservation support, polychoric PCA was applied. Results indicate that resource use statistically significantly influence conservation support (P-value < 0.05). Also, there was a positive relationship between resource use and conservation support within sections of resource users. The key significant factors in conservation support were; involvement in conservation activities and ability to report poaching compared to the third indicator of reducing unauthorised activities.

Results indicate that unauthorised resource users compared to other people in their community positively relate with conservation support (Coeff=0.31, P-value=0.02, SE=0.13, df=564). Other community members were used as a base category. The level of significance between the Unauthorised Resource Users and Batwa was however low. The use of resources by Batwa highly significantly influence conservation support more than any other member of their society (Coeff=-0.36, P-value=0.000, SE=0.09, df=564). The level of relationship between Batwa and conservation support is negative compared to that of unauthorised resource users.

DISCUSSION

Revenue Sharing Implementation

Most beneficiaries of the Revenue Sharing policy were random community households with no specific target of unauthorized resource users or Batwa indigenous people. This approach compromises the equitable governance framework where recognition, procedural and distributive equity enhance more conservation benefits. During the implementation of revenue sharing, no specific projects targeted different categories of community members. This is consistent with Awung and Marchant (2020) who conducted a study in Mount Cameroon National Park and established that forest revenues were distributed to forest adjacent community members without focusing on specific categories of community members. Results from the current study revealed that most beneficiaries of revenue sharing were males who benefited passion fruit growing, poultry and provision of land and measures to control crop raiding. The findings are in agreement with Manilay et al. (2021) who asserted that vegetable gardening and fruit trees were the major benefit sharing projects in Htee Pu village, North-central Myanmar. However, females mostly benefitted from water projects, which is corroborated by Tadesse et al. (2022), who a noted that water projects minimise community members' over reliance on forests and allow the forest to provide economic needs and ecological functions, its sustainability needs to be ensured.

Profiles of Unauthorised Resource Users and motivations of Unauthorised Resource Users in BINP

Most URU arrested, were residents of Bwindi communities and few from neighboring countries such as Rwanda and Democratic Republic of Congo. This is in line with Iordăchescu and Vasile (2023) who contend that illegal logging was an everyday reality in Carpathian Mountains in Romania, mostly fueled by forest adjacent communities. From the current study, it was established that most local residents arrested for unauthorised resource use were Bakiga, the dominant ethnic group around Bwindi. Some of the reasons why local community members were arrested included bush meat hunting, collecting minor timber forest products such as firewood and bean stakes. This is in agreement with Bortolamiol et al. (2023) whose study in Kibale National Park, Uganda indicated that wild meat hunting and poaching were the dominant illegalities engaged in by community members adjacent to the Park. This therefore informs UWA

to better target communities bordering with Pas. Similarly, Bayesa and Bushara (2022) asserted that fuel wood and wood for poles and curving were illegally harvested from the Berete Gera Forest, Southwest Ethiopia. Similar to Kidane, Balke and Backéus (2023)'s study Non Timber Forest Products (NTFPs) and illegal grazing were also among the illegalities engaged in by Park adjacent community members. Study results indicated that some of the unauthorised resource users were beneficiaries of the revenue sharing program, mainly because the distributed projects are not enough to address their subsistence needs. According to Singoei (2022), inadequate access to resource benefits from protected areas compels local community members to engage in illicit activities.

The Most Needed Resources from Bwindi

It was established that bush meat was the most important resource that people desire and illegally collect from Bwindi. This finding is consistent with results from a study in four protected areas in Malawi, which revealed that hunting and consumption of bush meat is a major threat to the biodiversity PAs (Van Velden et al., 2020). From the current study, it was established that all households obtaining bush meat and arrested hunters live near the park boundary which implies that proximity from park boundary and social services without active engagement is likely to contribute to unauthorised resource use. Bush meat is trusted to have medicinal properties and hunting is used by the Batwa to pass on traditional knowledge to the subsequent generation. Likewise, Inatimi et al. (2022) noted that in countries such as Zimbabwe, South Africa and Nigeria, bush meat is on high demand because it is used in traditional rites and cultural celebrations.

Firewood was also identified among the resources illegally collected from the Park. Most people who collected firewood from the Park lived within 1 km from its boundary, and had limited alternatives to fuelwood. This is consistent with Abdu et al. (2022) whose study in Tasmania, Australia revealed that unauthorised collection of

firewood from public forests is a widespread, and a perplexing issue to control. Furthermore, limited land for woodlots has made it difficult to get building poles outside the national park yet construction around Bwindi is mostly supported by poles. As such, most semi-permanent structures across Bwindi communities are built using poles from the Park. This is similar to Lwankomezi, Kisoza and Mhache (2022)'s in Manakao Wildlife management Area which revealed that community members extracted construction poles from the protected area despite restrictions by management. The most needed resources from Bwindi are premised on subsistence needs compared to commercial needs which therefore calls for interventions that address the livelihood needs of Bwindi society.

Results further indicated that medicinal plants were harvested from the Park because they are near and considered more effective at curing illness compared to conventional medicines which were also regarded to be too far away and expensive. Incidentally, local communities in Bwindi are still traditional and the landscape in most cases limits access to modern health care facilities. These results from the current study are consistent with findings from a study by Gonfa, Tulu, Hundera and Raga (2020) which was carried out in Gera district Ethiopia, and found that indigenous community members harvested medicinal plants from protected areas because they were considered more curative compared to modern medicines.

Furthermore, findings from the current study are similar to results from a study by Velempini and Garekae (2022) that was conducted in Okavango Delta Panhandle in Botswana which revealed that collection of materials for basket weaving was another major activity that compelled community members to engage in unauthorized resource use. This was attributed to the high demand of winnowing trays and baskets due to tea growing around Bwindi and a need for ready income. Similar to Muir (2021)'s study, it was established that unauthorized resource users were arrested for accessing Park resources such as bean stakes, wild

honey for household use, illegal grazing of cattle and walking through the park in places not gazetted as formal paths. Therefore, there are multiple factors that compel community members to access resources from protected areas without authorization.

CONCLUSION

Revenue sharing implementation among communities adjacent to protected areas is essential for better conservation outcomes given that that it contributes to improved livelihoods and reduced encroachment on protected area resources. The current revenue sharing interventions are short of targeting the most critical categories of the communities – the unathorised resource users and the Batwa indigenous people. The lack of a deliberate target of these two groups creates a gap in the implementation process since it is revealed that engaging them yields to more conservation benefits. Furthermore, the motivations for unathorised resource use are premised majorly on subsistence needs which therefore creates a clear linkage with the livelihood projects distributed under the revenue sharing policy. However, there are controversies between community members and protected area managers due to inadequate benefits received to address their livelihood needs due to the costs borne by community members adjacent to PAs. The failure to target specific categories of people during the implementation of revenue sharing, indicates the contextual and cognitive dimensions of equity are not applied in revenue sharing, which compromises the effectiveness of revenue sharing as a suitable approach to improve conservation of protected areas. Protected area managers ought to consider greater involvement of poachers in Revenue Sharing activities. Alternative livelihood schemes that can engage poachers to reduce dependency on poaching ought to be thought about during Revenue Sharing project selection. Overall, reducing unauthorized resource use requires systematic but also a combination of factors to mitigate the most driving forces that compel community members to engage in unauthorized forest resource use. Economic empowerment of Park adjacent communities will highly contribute to the reduction of their dependency on protected area resources for their livelihoods.

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