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Original Article

Is Fair Benefit Sharing a Reality or A Fallacy? Implications for Effective Collaborative Forest Management at Echuya Central Forest Reserve, S. W. Uganda

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*Forest Resources,
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Transparency,
Forest Conservation.*

It is generally accepted that equitable benefits sharing from protected areas (PAs) is a probable technique for both sustainable management and PA conservation. Evidence however, suggests that this might not be entirely true since such benefits might not be equitably shared among local communities as they would have wished. This research compares benefits received by Collaborative Forest Management (CFM) community members with those of non-CFM community members adjacent to Echuya Central Forest Reserve (ECFR). The study further assesses the most preferred benefits by local community members around ECFR and the perceived barriers to equitable benefit sharing. It provides insight into how benefit sharing under CFM influences the conservation of protected areas. We conducted 458 household interviews, 26 key informant interviews and 4 focus group discussions to obtain data from CFM and non-CFM community members, government institutions, conservation organisations and local community leaders around ECFR. Benefits received by community members include access to firewood, grass, medicinal plants, materials to make ropes, honey and bamboo rhizomes, livelihood project support, cash benefits and training. The preferred benefits in their descending order include agricultural support, financial support, ecotourism, and livestock farming. The failure to monitor the implementation of CFM activities and corruption hinder equitable benefit sharing and promote overexploitation of forest resources. This study recommends that the National Forestry Authority (NFA) should include forest-adjacent communities in budget frameworks in order to provide financial support for CFM activities. The NFA and conservation organisations working around ECFR need to enhance the monitoring of CFM activities to ensure transparency and equitable sharing of forest resources.

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INTRODUCTION

Forests make up part of the world's important natural resources critical for the sustainability of ecosystems. Conservation of such forests is therefore essential because they contribute to socioeconomic development and environmental protection (Kearney et al., 2020). Yet, in the last three decades, demand for food, fuelwood, timber, crafts materials, and other environmental services by people living near Protected Areas (PAs) has intensified and contributed to deforestation (Shackleton, 2021). In most tropical countries, over one-third of forestland has been converted to farmlands for agricultural activities as the human population increases (Trigueiro et al., 2020). As a proportion of total land area, the forested area in sub-Saharan Africa decreased from 31% in 2010 to 27% in 2015 (FAO, 2018). In Uganda, forest cover declined from 24% in 1990 to 11% in 2015 and to 9% currently, representing a 3% drop in just two years (Ministry of Water and Environment, 2017; Kazoora et al., 2020). Such an increasing trend of forest decline has necessitated paradigm shifts in the conservation of PAs. Such paradigm shifts include the implementation of Collaborative Forest Management (CFM) as a good governance

approach to protected area conservation and expediting equitable benefits sharing, sustainable collaborations and conservation outcomes (Snyman & Briker, 2019).

It is now generally accepted that equitable benefits sharing from protected areas (PAs) is a probable technique for both sustainable management and PA conservation (Tumusiime et al., 2013; Kegamba et al., 2022). The concept of fair benefit-sharing is reflected in international frameworks such as the Convention on Biological Diversity (CBD) of 1992, the 5th International Union for the Conservation of Nature (IUCN) World Parks Congress held in 2003, and the Nagoya Protocol in 2010 (UNCED, 1992; Springer 2016; Kegamba et al., 2022). In Uganda, benefit sharing is enshrined in the 2001 Forest Policy, Uganda Wildlife Act of 2019, Collaborative Forest Guidelines 2003 and the National Forestry and Tree Planting Act, 2003 of Uganda (GoU, 2001, 2003).

Benefit sharing is defined as a commitment to channel monetary and or non-monetary returns to a range of stakeholders such as affected communities, the Government, and other participants in the conservation of a protected area (Ghislaine, 2017;

Shreyas, 2019; Snyman & Bricker, 2019). Collaborative Forest Management is looked at as a working arrangement where stakeholders such as forest user groups and a responsible body enter into an agreement that is mutually enforceable and defines their responsibilities, roles, returns and rights (4Rs) for sustainable management of given forest resources of a PA resource (Borrini-Feyerabend et al., 2007; MWE, 2017; Kazoora et al., 2020). CFM has been recognised as a conduit for the flow of benefits to local people to gain their support for the conservation of protected areas.

Benefit sharing is extensively practised in various countries across the world through a variety of participatory approaches to promote the conservation of protected areas. The common participatory approaches include Participatory Natural Resource Management, Community Based Forest Management, Joint Forest Management and Collaborative Forest Management (CFM) which has been widely implemented in African countries such as Namibia, Ghana, Cameroon, Gambia, and Uganda (Charlene et al., 2017; Boton et al., 2021). CFM focuses on promoting community participation in conservation in order to address biodiversity loss and prevent the destruction of threatened species as recognised in the Sustainable Development Goals (SDG 15).

One of the key requirements of CFM is the establishment of robust community institutions that ensure equitable sharing of forest benefits. However, benefits are not shared among local communities as they should be (Michiels et al., 2022). In Indonesia, fair benefit sharing is marred by poor accountability and inadequate systematic monitoring (Ota et al., 2020). A study by Charlene, Nortey, Amoakoh and Assumadu (2017) in Nimba County, Namibia revealed that community members were not receiving any benefit from participating in forest management as promised. A similar view was held by Wekesa (2017) who found out that benefit sharing in Kenya's Kimothon forest faced challenges such as insignificant benefits, lack

of transparency and lack of equitable sharing among community members. In Tanzania, benefit-sharing approaches are weakened by more powerful actors who take advantage of weaker ones, exacerbate inequalities, and make sustainable outcomes difficult to achieve (Nantongo et al., 2019). In Uganda, the actual benefits accruing from CFM to local communities are largely debatable as it is not clear whether CFM offers tangible benefits to the local communities or whether there is a clear balance of power between the local people and PA managers (Turyahabwe et al., 2012; Kazoora et al., 2020).

In Uganda, the concept of benefit sharing came to the limelight when CFM was first piloted in Bwindi Impenetrable National Park in 1994 (Cunningham, 2001; Bitariho et al., 2016). Later, in 1996, CFM was also piloted in selected Ugandan forests such as Butto-Buvuma, Budongo and Namatale (Gombya-Ssembajjwe & Banana, 2000). Currently, CFM is concentrated in Central Forest Reserves (CFRs), which conserve 25% of the country's standing forest (Kazoora et al., 2020). In Southwestern Uganda, benefit sharing in ECFR started in 2007 (Mugisha et al., 2012). It is important to note that Echuya was first gazetted in 1939 with its original boundary description as an undemarcated crown forest of 16 square miles by Legal Notice 257 of 1939. Later on, the gazetted area was amended by Legal Notice 245 of 1947 to 15.21 square miles. Thereafter, all Crown Forests in Uganda were re-gazetted as Central Forest Reserves in Legal Notice 41 Notice 324 of 1948. Echuya was re-gazetted by Statutory Instrument No.11 of 1963 and amended by Statutory 206 of 1964 (Bitariho *et al.* 2015). After it was gazetted, local community members were prohibited from accessing the forest reserve and deprived of their opportunity to benefit from forest resources (Banana et al., 2014). Coupled with high poverty and the limited alternative sources of livelihood, community members began to engage in illegal activities and encroachment thus exerting pressure on forest resources, which in turn resulted

in extensive biodiversity loss (Bitariho et al., 2015). In an attempt to mitigate this state of affairs, the NFA in partnership with *Nature Uganda* and the District Local Governments of Kisoro and Kabale, started a CFM program in ECFR in 2007. This was aimed at facilitating communities neighbouring ECFR to obtain benefits by exercising their rights to manage the natural resources in and around the forest (Mugisha et al., 2012). Although enrolment and participation in CFM are voluntary and open to all communities adjacent to ECFR, several local people did not enrol and did not participate in the CFM activities. This situation led to two categories of local community members that is; CFM group members and non-CFM community members.

In spite of the benefits that accrue from CFM, the burden of roles and responsibilities that are transferred to communities are not commensurate with the benefits received (Mahanty et al., 2009; Kazoora et al., 2020). When it comes to benefiting from forest resources, the poor people who live near the forests get relegated to firewood, crafts materials, mushrooms, water ponds and medicinal species for domestic consumption (Turyahabwe et al., 2012; Boton et al., 2021). High-value forest resources including reserved timber species and revenue from forestry services, are maintained by the Responsible Body (NFA) (Turyahabwe et al., 2012). Moreover, benefits are specified in CFM, but in practice, community members barely receive the promised benefits. This compels community members to abandon CFM agreements and engage in illicit forest resource harvesting, which leads to the overexploitation of forest resources in protected areas.

Although equitable benefit sharing under CFM agreements has been assessed elsewhere in various case studies, an assessment of equitable benefit sharing in ECFR has largely been ignored (Bitariho et al., 2016; Singh et al., 1997; Borrini Feyerabend et al., 2007). Further, there are limited empirical studies that have comprehensively compared benefits accruing to local people under CFM and

those not. Such a knowledge gap presents a challenge to our current understanding of how forest reserves are managed and understanding why illegal resource access is increasing in those forest reserves. The objective of this paper is to assess whether fair benefit sharing is a reality or a fallacy and its implications for effective collaborative forest management. Our specific questions are: Do community members receive the benefits promised by the government in this case National Forestry Authority (NFA) as stated in the CFM agreements? What actual benefits do community members receive as incentives for the conservation of Echuya? What benefits do community members prefer under CFM? What are the perceived barriers to equitable benefit sharing under CFM? Does benefit sharing influence the conservation of Echuya CFR?

MATERIALS AND METHODS

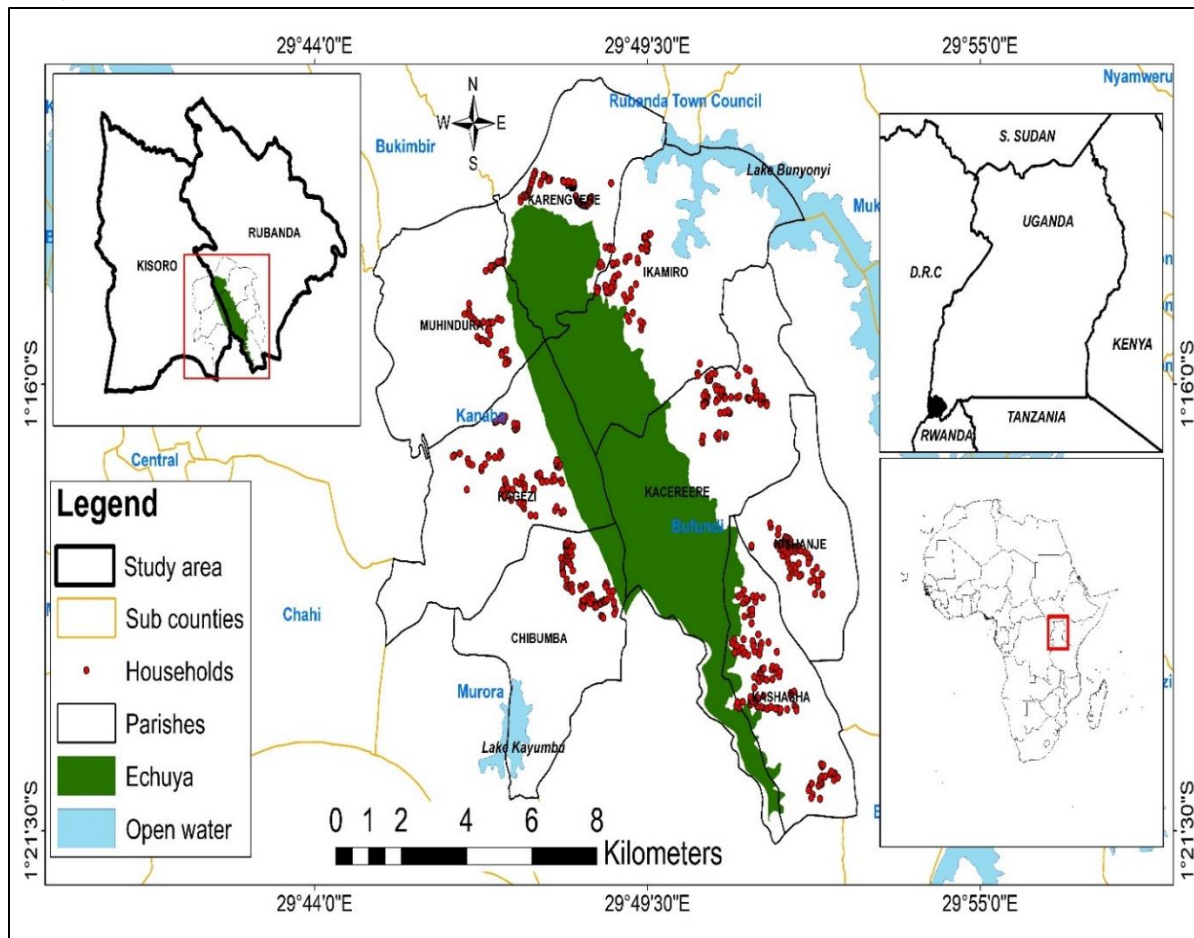
The Study Area

This study was conducted between March 2020 and February 2021 in the eight parishes of Kacherere, Kashasha, Karengyere, Ikamiro, Muhindura, Chibumba, Kashasha and Kishanje adjacent to ECFR (Figure 1). These parishes were considered for the study because they surround Echuya CFR and are part of the communities where CFM groups were formed in 2007. Echuya CFR is located in Rubanda county (80%), Rubanda district and 20% of the forest reserve is located in Bufimbira county, Kisoro district, southwestern Uganda (Figure 1). The reserve covers an area of 34 km² with an altitudinal range of 2270 – 2750 m and lies between 1°14'–1°21'S and 29°47'–29°52'E (Banana & Tweheyo, 2001; Bitariho & McNeilage, 2008). Echuya CFR is home to around 93 bird species and its forest cover is approximately 80% mature *Macaranga kilimandscharia* and *Hagenia abessinica* forest and 20% mountain bamboo alpine (Bitariho et al., 2015). Echuya CFR was considered for this study because forest resources are continually overexploited and are on a decline despite the

implementation of Collaborative Forest Management. For instance, between 2001 and 2015, bamboo in reserve drastically reduced with more than 60% of the bamboo stems being of poor quality, damaged or cut (Bitariho et al., 2015; Ssali & Bitariho, 2013). The number of bird species

reduced from 100 in 2001 to 94 species in 2015, while within the same period, tree species reduced from 35 to 20 species and the Albertine rift endemic species of small mammals declined from 5 (3 rodents and 2 shrews) in 2001 to 3 (rodents and 1 shrew) in 2015 (Bitariho et al., 2015).

Figure 1: Map showing Echuya Central Forest Reserve, adjacent parishes, and villages where the study was conducted



Data Collection

Household Interviews

We conducted face-to-face semi-structured interviews with 458 out of the initial sample size of 581 respondents. These constituted 165 out of the 195 CFM group members sampled and 293 out of the 386 non-CFM community members who were sampled for the study. The overall response rate for the study was 83.1%. This is above the

recommended two-thirds (67%) response rate (Mugenda & Mugenda, 1999). Baruch and Holton (2008) recommend that a higher response rate considered a complete rate should be more than 80%. We interviewed only household heads found at their respective homes and at the time of interviews. Using semi-structured questionnaires, household interviews were conducted in the local languages of Rufumbira and Rukiga by the first author and three research assistants who are fluent

in those languages. The semi-structured questionnaire collected information from household heads on membership/non-membership to CFM, benefits from ECFR, the preferred benefits, challenges that undermine fair benefit sharing, and how fair benefit sharing influences the conservation of ECFR. These interviews were carried out for two groups of community members, i.e., the CFM group members (registered members) and non-CFM community members (who do not belong to any CFM group). Combining the element of structured and unstructured interviews gave semi-structured interviews the advantages of comparable and reliable data, as well as the flexibility to ask follow-up questions to obtain in-depth information about the study (Tegan, 2022). The locational Global Position System (GPS) coordinates of the sampled households were also recorded after the household interviews.

Key Informant Interviews

Key informant interviews were used because they allowed the interviewer to clarify the questions asked and have the benefit of generating detailed data via probing (Cooper, 2014). Key informant interviews (KII) of 26 respondents were carried out around ECFR. They include four CFM group leaders who are involved in administering benefits to their respective CFM group members and four NFA staff who oversee the implementation of CFM on behalf of the government. Others were three staff members from *Nature Uganda*, which facilitates NFA in the implementation of CFM and advocacy for the conservation of ECFR and two staff members from the Institute of Tropical Forest Conservation (ITFC) which has extensively carried out research in ECFR. Other respondents included four local government members (Natural Resource Officers) from the districts of Kisoro and Rubanda districts since they oversee forest activities within their respective districts. We further interviewed nine Local Council One (LC1) leaders of the villages adjacent to ECFR on their roles and responsibilities in protecting ECFR at the village

level. We conducted key informant interviews in order to gain first-hand knowledge about benefit sharing from the categories of people who participate in the implementation of CFM and advocate for the conservation of Echuya. The information generated from key informant interviews included; whether community members received the benefits promised by the NFA as stated in the CFM agreements, the actual benefits community members received, community members' preferred benefits, challenges that hinder equitable benefit sharing under CFM and whether benefit sharing influence conservation of ECFR.

Focus Group Discussions

Focus group discussions (FGD) of 8-12 members in each of the four CFM groups (total of 4 FGDs) to enable triangulation of respondents' views on benefit sharing in CFM were carried out. An FGD guide with open-ended questions was administered to FGD participants. The FGDs were guided by information on the benefits obtained from ECFR, the benefits preferred, barriers to equitable benefit sharing and how benefit sharing influences the conservation of ECFR. Focus groups enabled us to discover new information about benefit sharing under CFM in ECFR because participants owned and contributed diverse viewpoints on the study subject, which improved the quality of discussions and their outcomes (Nyumba et al., 2018).

Documentary Review

Documentary review enabled identification and analysis of legal instruments and other documents that support fair benefit sharing under CFM. The documents reviewed included: the CFM guidelines 2003, the National Forestry and Tree Planting Act 2003, The 2001 Forest Policy, and the CFM agreements between the NFA and communities adjacent to Echuya signed in 2007. Document review enabled us to obtain information about the forms of benefit sharing in CFM. This information was obtained to corroborate data from FGDs, key

informant interviews and household interviews. As noted by Patton (2003), document review eases the authentication of data with other sources of information and gains detailed insights into the study area of interest rather than only relying on primary methods.

Study Design and Sample Size

We used the cross-sectional and explanatory research designs that helped triangulate quantitative data from household interviews and qualitative data obtained through key informant interviews, FGDs and document review. The use of the triangulation approach in this study was justified because it increases confidence in the findings and provides the confirmation of a proposition using two or more independent measures (Heale & Forbes, 2017).

The sample size for households interviewed was determined using Yamane's (1967) formula, as recommended by Adam (2021). Yamane's (1967) formula was as follows:

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

Where n - is the desired sample size for each category of respondents, N = the size of the study population, and e is the level of precision. We used a confidence interval of 95% (margin error of 5%) for respondents sampled for the study.

Upon determination of the sample size, we used simple random sampling to select households for interviews. The simple random technique was conducted by attaching, listing, and writing numbers of CFM group members and non-CFM households on pieces of paper, putting them in a box and thereafter randomly selecting the first 195 respondents for CFM group members and 386 respondents for non-CFM community members. Simple random sampling was used because it ensures unbiased, representative, and equal probability of the population (Noor et al., 2022). We

therefore selected a sample size of 581 household members for interviews using a semi-structured questionnaire. The household members constituted 195 respondents selected from 380 CFM group members and 386 non-CFM households selected from a total of 11 117 households based on the latest census data in Uganda (UBOS, 2014). The other respondents who were purposively selected were Local Council one leader (LCI) (15), CFM Group Chairpersons (4), CFM Committee Members (23), staff from *Nature Uganda* (4), NFA staff (4), District Local Government staff of Kisoro and Rubanda districts from the Environmental Management/Natural Resource Office (4), and staff members at the Institute of Tropical Forest Conservation (ITFC) (3). These categories were included in the study because they are CFM partners and advocate for fair benefit sharing for the conservation of ECFR.

Data Analysis

Qualitative data from FGDs and key informant interviews were analysed using thematic and content analysis. Thematic and content analysis provides the systematic element characteristics of the collected data and allows the researcher to combine analysis of the meaning behind the data collected within a particular context (Vaismoradi et al., 2013; Neuendorf, 2018). Data from the field were arranged into categories and sub-categories, sorted, and organised based on the themes of the study. Responses from FGDs and key informant interviews were transcribed, translated into English, and organised according to sub-themes based on the objective of the study. This was done progressively right from the field to allow easy data analysis and interpretation of findings. Qualitative data analysis was aided by the NVivo package, version 10 which helped to organise and manage data in a more coded and thematic manner (Silver & Lewins 2014).

All quantitative data were cleaned, coded, and entered into the SPSS statistical package Version 25, where numerical variables were used to generate

descriptive statistics in the form of frequencies and percentages for easy interpretation. Linear Regression was used for quantitative data analysis to examine the relationship between benefit sharing and forest conservation. As indicated by Sarstedt et al. (2019), regression analysis helped to determine if the independent variable benefit sharing has a significant relationship with the dependent variable forest conservation. It further indicated the relative strength that the independent variable has on the dependent variable.

Benefit sharing was conceptualised as access to resources, cash payments, livelihood support and training. Conservation was conceptualised as the quality of tree species, biodiversity species composition and control of unauthorised forest use. *P*-value was used to determine the level of significance between benefit sharing and conservation of Echuya. For significant results, *P*-values were reported as < 0.05 (Sandbrook, 2006).

RESULTS

Socioeconomic Status of Respondents

As indicated in *Table 1*, we interviewed a total of 458 household heads, 55.2% being males. The majority (50.9%) of the respondents lived between 1-2 kilometres away from the forest reserve, while the least was more than 2 kilometres away from Echuya. The main type of land surrounding households was farmland (67.5%), and the least village/centre (11.6%). All respondents were adults aged above 20 years; 70.1% attained primary education, while 2.4% attained tertiary education. Majority of the respondents (82.1%) depend on farming as their main income-generating activity, and 63.8% of them earned between 26 USD and 53 USD (Mean =1.09; Standard deviation .593) each month.

Table 1: Attributes of respondents (N=458)

Variable	Category	Freq.	%
Gender	Male	253	55.2
	Female	205	44.8
Main type of surrounding land	Farmland	309	67.5
	Forest	96	21.0
	Village/Centre	53	11.6
Age group	Below 20 years	36	7.6
	21-30 years	107	23.4
	31-40 years	143	31.2
	41-50 years	92	20.1
	51-60 years	66	14.1
Highest education level of household head	60+ years	14	3.1
	No formal education	105	22.9
	Primary education	282	61.6
	Secondary education	57	12.4
Ethnicity	Tertiary education	14	3.1
	Bakiga	251	54.8
	Bafumbira	120	26.2
Monthly income	Batwa	87	19.0
	Less than 26.6 USD	107	23.4
	26.6 – 53.3 USD	292	63.8
	Above 53.3 USD	59	12.9

Benefits Promised to CFM Group Members Adjacent to ECFR

Document review of the CFM agreements between the NFA and the CFM groups showed that the benefits for the local community members allowed under the agreements were; access to bamboo, fuelwood, medicinal plants, sand, rattan canes, water, grass, and honey (Table 2). Access to these resources is sanctioned by the NFA on designated days free of charge, except for fresh bamboo which is harvested at a fee of 0.08 USD, dry bamboo at

0.03 USD per stem, and young bamboo at 2.7 USD per person. The NFA and NGOs are responsible for livelihood project support. The NFA and NGOs were also to provide community members with capacity building and training. Specifically, the NFA was projected to train community members in modern beekeeping, handcraft making, energy-saving stoves and the basics of agroforestry practices. The NFA would also give CFM group members the job of slashing unwanted plants from the reserve.

Table 2: CFM benefits for community members

	Category of benefit for community members	Responsible body
Access to forest resources	Bamboo, fuelwood, medicinal plants, sand, rattan canes, water, grass, honey.	NFA
Livelihood project support	Not specified	NFA & Nature Uganda
Training/ Capacity building	Nursery establishment and management, Modern beekeeping, handcraft making and value addition, Energy saving stoves, basics in agroforestry practices.	NFA & Nature Uganda

Actual Benefits Community Members Receive for Participating in CFM

Access to forest resources was the benefit most shared by CFM group members (100%) and non-CFM community members (91.5%) (Figure 2). The forest resources accessed by community members were firewood, bamboo, grass, medicinal plants, ropes, and honey (Figure 3). From household interviews, it was revealed that the NFA also distributed bamboo shoots and tree seedlings to both CFM and non-CFM members to plant on private land for domestication. Household and key informant interviews also revealed a ban on bamboo harvesting to allow regeneration. However, key informant interviews with NFA officials revealed that community members harvest bamboo without official authorisation from the NFA. Household and key informant interviews also revealed that some community members and traders harvest bamboo under the patronage of NFA officials.

All (100%) of the CFM group members benefited from training facilitated by *Nature Uganda* (Figure 2). The training was in various enterprises including modern beekeeping, handcraft making, organic and inorganic farming practices, livestock farming, ecotourism, winemaking, and making craft items like baskets, mats, granaries, bee hives, beads and winnowing trays supported by *Nature Uganda*, and bamboo and tree planting from the NFA. Only 11.3% of non-CFM members received training in bamboo and tree planting facilitated by the NFA (Figure 2). Livelihood project support was received by 100% of CFM group members by *Nature Uganda* (Figure 2). The livelihood support received included seedlings for growing vegetables, Irish potatoes, wheat, passion fruits and equipment to use for honey harvesting. non-CFM community members did not receive livelihood project support. Key informant interviews with NFA officials revealed that the NFA was unable to support the implementation of livelihood projects and to train

community members in livelihood improvement because the government does not have a separate budget committed to the implementation of the CFM activities. As shown in Figure 2, financial support was received by 59.4% of the respondents, all of whom were CFM group members. Results from key informant interviews revealed that *Nature Uganda* gave each CFM group SACCO financial

support of 1,600 USD from *Nature Uganda* as seed money to strengthen the SACCOs. Members can borrow money from the SACCOs in the form of agriculture loans, school fees loans and business loans at an interest rate of 5%. Non-CFM community members did not benefit from the SACCOs because credit is given to only members registered with CFM groups.

Figure 2: Comparison of benefits received by CFM and non-CFM community members around Echuya

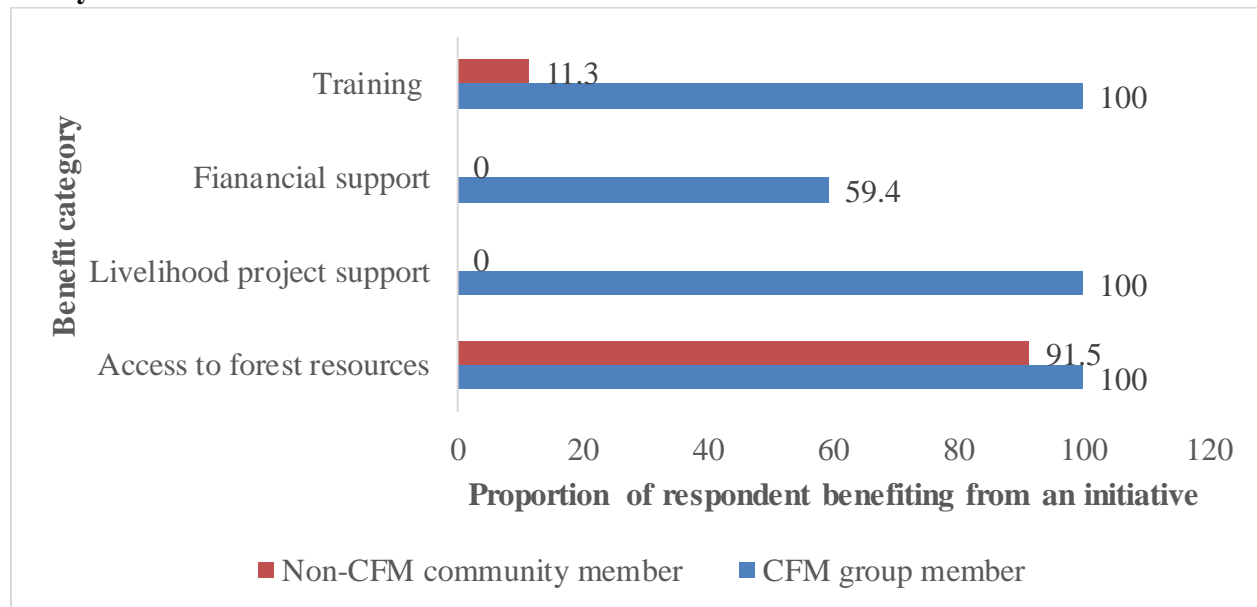
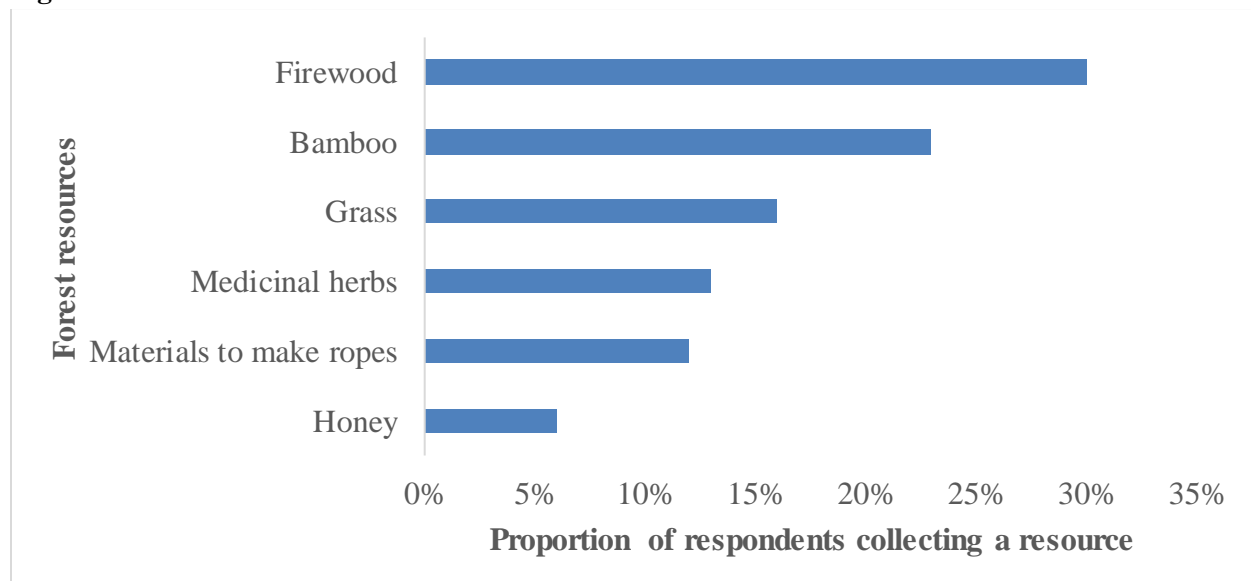


Figure 3: Forest resource benefits from ECFR

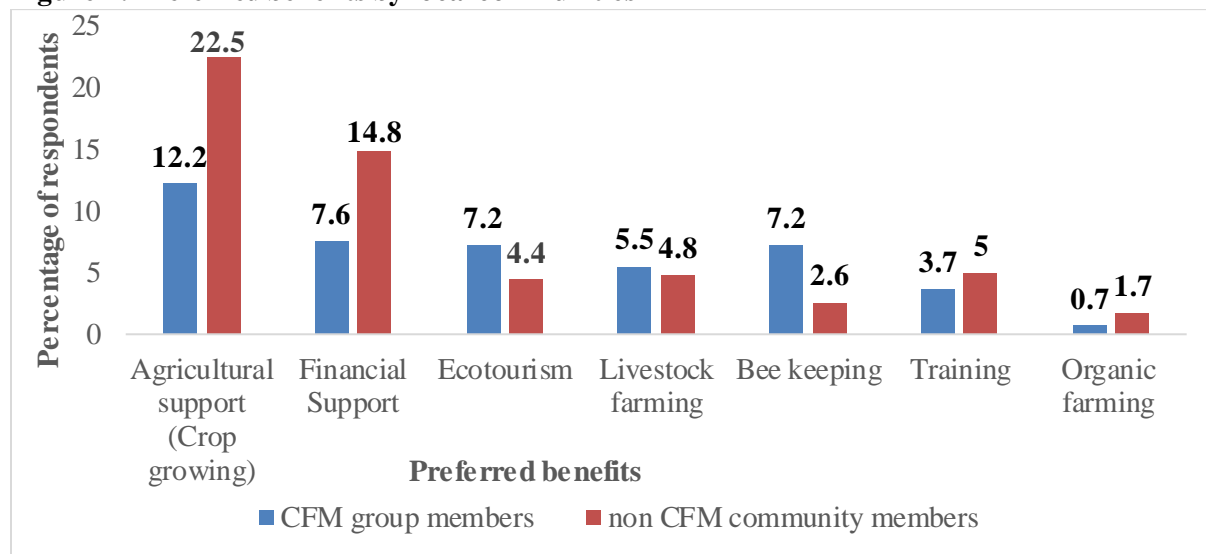


Preferred Benefits by Local Communities

The most preferred forest benefits in descending order were; agricultural support, financial support, ecotourism projects, livestock farming, beekeeping, training and organic farming (Figure 4). Results from focus group discussions reveal that agricultural support is the most preferred benefit because it ensures food security and increases household income through the sale of surplus agricultural produce. Financial support encourages

a saving culture, and local community members can access credit to support livelihood enterprises and meet other household needs. Ecotourism attracts tourists for revenue generation and it provides a market for crafts made by local people. Livestock farming (specifically piggery projects and poultry keeping) was ranked fourth because pigs and chickens have a shorter gestation period, and their products are sold for income. Beekeeping, training and organic farming were the least preferred benefits in their ascending order.

Figure 4: Preferred benefits by local communities



Challenges that Undermine Fair Benefit Sharing in CFM

Key informant interviewees reported that there is no clear policy regarding benefit sharing at Echuya. Community members rely on some elements highlighted in the CFM agreements showing the categories of benefits which community members can access. Community members consider the benefits they receive for participation in CFM inadequate because of CFM restrictions on the resources accessed and the lack of a revenue-sharing policy in Echuya. The NFA does not share with community members revenue from the sale of bamboo or fines from the apprehended unauthorised forest resource users. All revenue collected goes to the consolidated government fund.

Community members who lack land for collateral do not benefit from credit from the CFM SACCOs because it is a prerequisite for community members to mortgage collateral, especially land, yet poorer community members such as the Batwa do not own land. This was echoed by one of the FGD participants who said:

“They ask for land as security (mortgage) in order to give money. Me, I do not have land. So, what can I mortgage? Many of us have not been able to access money (credit) because we do not have land for collateral” (KADECA FGD participant 3).

Respondents also reported that CFM SACCOs do not have adequate capital for all interested

community members to borrow at their preferred time.

In some instances, the NFA fails to deliver the benefits promised to community members. The NFA promised CFM groups the job of slashing unwanted plants from the forest but sometimes gave it to non-CFM community members. On other occasions, the NFA and *Nature Uganda* failed to deliver the promised benefits in time. For instance, the NFA gave bamboo seedlings to community members late during the dry season and they dried up shortly after planting. Another CFM group member reiterated that *Nature Uganda* promised them piglets, but the NGO had taken more than one year to deliver on the promise. Respondents also cited lack of transparency and corruption as factors which hinder the smooth implementation of livelihood projects. Due to the lack of close monitoring of CFM activities, some CFM group leaders misuse money meant for CFM group activities. The misuse of CFM group financial resources was confirmed by a CFM group leader as quoted:

“There is no proper monitoring of CFM activities. For instance, a CFM group leader sold wine that belonged to his group and embezzled the money. Another CFM group Chairperson disappeared with money from the sale of Irish potatoes that belonged to the CFM group” [KII01].

The Influence of Benefit Sharing Under CFM on Forest Conservation

Results from household interviews, focus group discussions and key informant interviews revealed that benefit sharing provides alternative livelihoods and reduces local people’s dependency on forest resources, thereby minimising the over-exploitation of the resources. CFM group members who are supported to grow food crops for home consumption and the surplus sold for income

generation do not entirely depend on forest resources. Livelihood projects inspire community members to participate in forest protection through patrols and locally-based monitoring. Ecotourism encourages CFM group members to preserve and protect forest resources to maintain the attraction of tourists. In addition, ecotourism and beekeeping instigate CFM group members to regularly monitor the forest reserve as they check on the ecotourism sites and bee hives, thereby controlling unauthorised forest resource users. Craftworks provide alternative sources of income and minimise community members’ dependence on forest resources.

Through key informant interviews, respondents revealed that the bamboo shoots and tree seedlings which the NFA distributed to CFM and non-CFM community members for domestication had promoted conservation outside the forest reserve and subsequently reduced the pressure on the forest reserve as illustrated by one of the respondents:

“In the past, all community members depended on bamboo from Echuya. But currently, their eyes are not entirely fixed on the forest because of planting their own bamboo. NFA gave us bamboo shoots to plant on our private land and this has enabled local community members to plant their own bamboo” [KII01].

Relationship between Benefit Sharing and Forest Conservation

Multiple regression results show that the coefficient of determination (Adjusted R Square) value is .418 (Table 3), which implies that benefit sharing explains 41.8% variance in the conservation of ECFR. After running linear regression, Cash benefits ($\beta = .486$. Sig. < .000), forest resource access ($\beta = .385$. Sig. < .000) and livelihood support ($\beta = .126$. Sig. < .001) were significant (P -value ≤ 0.05). Only training ($\beta = .057$. Sig. < .157) was not significant.

Table 3: Linear regression model between benefit sharing and conservation support

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std Error	Beta		
(Constant)	2.363	0.254		9.297	0.000
Cash benefits	0.496	0.042	0.486	11.78	0.000
Training	0.083	0.058	0.057	1.59	0.157
Livelihood support	0.096	0.029	0.126	3.334	0.001
Forest resource access	0.427	0.04	3.85	10.641	0.000

R = 0.650 R Square = .423 Adjusted R- square = .418 F= 82.993 Sig. = 0.000
Dependent variable = Forest conservation

DISCUSSION

Perceived Benefit Sharing by Participating CFM Members in ECFR

There is an almost unanimous consensus that community members receive both monetary and non-monetary benefits for their participation in CFM. The benefits range from forest resources to livelihood project support and financial benefits. This is corroborated by Boton et al. (2021)'s study in the Mabira forest in Uganda, that community members receive a wide range of benefits for participating in CFM. Studies conducted elsewhere in Central Asia, Nepal and Indonesia concur that community members receive both monetary and non-monetary benefits to motivate them to participate in CFM (Soliev & Theesfeld, 2020; Ghimire & Lamichhane, 2020; Christian, 2019).

Results from the current study show that the benefits received by CFM group members were firewood, grass, medicinal plants, materials for ropes and craft work, honey and tree seedlings provided by the NFA. The NFA does not authorise community members to harvest dry and fresh bamboo as indicated in the CFM agreements because a ban was imposed on bamboo harvesting to allow regeneration. However, some community members and traders harvest bamboo from Echuya with the patronage of the NFA authorities, albeit the ban imposed, an aspect which CFM members consider unjust and elicit unauthorised bamboo harvesting. This is consistent with Kyere-Boateng, Marek,

Huba and Kluvankova (2021) who found that in Ghana, perceived injustices in the access and distribution of forest resources culminated in illegal harvesting of forest resources and degradation. Results from the current study revealed that community members consider the resources they are permitted to harvest as inadequate. As a result, both CFM and non-CFM community members engage in unauthorised resource harvesting. This finding is consistent with Boton et al. (2021) who found that the quantities CFM members were permitted to access in Mabira Central Forest Reserve in Uganda were so insufficient which made them continue harvesting forest resources illegally.

The NFA does not train community members in nursery establishment and management, modern beekeeping, handcraft making and value addition, energy-saving stoves and basics in agroforestry practices as indicated in the CFM agreements. This was attributed to the fact that government does not have a separate budget for implementing CFM activities. This is in line with Kazoola et al. (2020) who asserted that the failure of NFA to fulfil its commitment to the CFM arrangement had been attributed to a lack of funds from the government. A similar finding was reported by Medina and Pokorny (2022) in a study carried out in the Brazilian Amazon, where four out of five communities engaged in CFM relied on external support by NGOs with limited financial support from the government.

Although the NFA has not sufficiently delivered the benefits promised to community members, results show that *Nature Uganda* has provided CFM group members with agricultural inputs for livelihood project support. *Nature Uganda* has also supported community members with capacity building in modern beekeeping, organic and inorganic farming practices, livestock farming, ecotourism, winemaking, and making craftworks, and financial support for CFM group SACCOs. However, poorer community members barely share in cash benefits from CFM SACCOs because they lack land for collateral.

Contrary to a recent study by Boton et al. (2021) in the Mabira forest in Uganda which shows that non-CFM sites benefit more from forest products, the current study reveals that CFM group members benefit more from forest products. This is consistent with what scholars Turyahabwe et al. (2012) stated that CFM members benefit from forest resources such as firewood, medicinal plants, bamboo, ropes, and craft materials used to meet various household needs. Results further indicate that the cash benefits which some CFM group members receive from SACCOs provide the capital which is used to boost income-generating activities for better economic returns. This is in agreement with Chinangwa et al. (2016) who stated that in Malawi, CFM had enhanced financial capital through the introduction of externally subsidised income-generating activities. Likewise, in Indonesia, CFM has helped to provide economic benefits to the surrounding population (Waridin et al., 2019).

Benefits Most Preferred by CFM and Non-CFM Community Members

Agricultural support, financial support and ecotourism were reported as the benefits most CFM and non-CFM community members prefer, an indication that community members prefer benefits that enhance food security and those that ensure economic gains. Results from the current study are in agreement with the findings by Pawlak and

Kołodziejczak (2020) and Chan et al. (2021) that agricultural support is preferred because it ensures food security while sustainable ecotourism can generate economic benefits for local communities. Likewise, Rahut, Ali and Behera (2015) found that in Bhutan, South-Central Asia, most community members adjacent to protected areas preferred agricultural support as well as ecotourism and other forest-based activities that accrue financial returns for improved livelihoods. Results from the current study agree with Börner et al. (2017) and Ssemanda et al. (2020) that financial support through CFM SACCOs is preferred because it encourages a saving culture among the local community members and also provides capital for other livelihood activities.

The Influence of Benefit Sharing Under CFM on Forest Conservation

Results from the current study are in agreement with findings by Kegamba et al. (2022) and Syallow and Prasanna (2022) that in Tanzania and Kenya, sharing benefits from conservation with local people living next to protected areas offers a key instrument in gaining local conservation support. Likewise, Chinangwa et al. (2016) concur that in Malawi, benefit sharing under CFM reduced the overexploitation of forest resources for livelihoods by introducing profitable income-generating activities.

The livelihood project support which CFM group members receive in the form of agricultural inputs facilitates the enhancement of agricultural production and promotes food security thereby reducing dependency on forest resources for livelihood. This is consistent with Lestari, Kotani and Kakinaka (2015) who found that in Indonesia, benefit sharing enhances livelihood support and food security among communities that live adjacent to protected areas. The current study reveals that enterprises such as apiary and ecotourism not only reduce the over-exploitation of forest resources but also promote the conservation of natural and

cultural heritage with ecological integrity through low-impact activities. The enterprises also compel local community members to regularly visit the forest reserve to check on their projects while at the same time monitoring the forest to curb unauthorised forest users. This finding is consistent with Chan, Marzuki, and Mohtar (2021) who contend that through ecotourism, CFM group members preserve forest species deemed to be unique in order to attract tourists for income generation, thereby conserving the forest reserve.

Results from the current study reveal that CFM group members receive financial support through CFM SACCOs which can be used for diversification and scaling up of enterprises as alternative sources of income. This is corroborated by Ssemmanda et al. (2020) who assert that access to financial support enables CFM group members to engage in alternative livelihood activities and reduce dependence on forest resources. Likewise, Börner et al. (2017) established that financial support reduces deforestation rates and improves forest conservation. Community members who borrow cash from the SACCOs use it as capital to boost business enterprises and minimise dependency on forest resources. This is similar to studies conducted elsewhere in South-West Ethiopia and South Korea which found that access to capital boosts community members' income to cater for household needs and reduces over-exploitation of forest resources, hence promoting conservation (Wood et al., 2019; Park & Yeo-Chang, 2021).

Challenges that Undermine Fair Benefit Sharing in CFM

The lack of a clear policy regarding benefit sharing in Echuya inhibits fair benefit sharing in CFM. Due to the absence of a revenue-sharing policy, the NFA does not share with community members revenue from the sale of forest resources and fines from unauthorised forest resource users who are apprehended by the locally based monitors. This

result is consistent with that of Amumpaire (2014) and Ssemmanda et al. (2020), who found that inequitable benefit-sharing has been aggravated by the lack of a clear benefit-sharing policy for CFM programs in Uganda. Likewise, Kyere-Boateng et al. (2021)'s study in Ghana revealed that the forest policy interventions have not adequately addressed the co-benefits issues of forest resources leading to several forest illegalities that drive forest resources degradation and loss. Snyman and Bricker (2019) concur that a significant obstacle undermining the notion of benefit-sharing from a global to local scale is the lack of benefit-sharing policy and inadequate understanding of the types of benefits required from protected areas by CFM members.

Results from the current study are in agreement with the findings by Wekesa (2017) that in Kenya, benefit sharing has been marred by lack of transparency and inadequate monitoring of CFM activities. The current study shows that some CFM group leaders misappropriate money from the sale of CFM group products. This is in line with Mahanty et al. (2009) and Kazoora et al. (2020) who stated that benefit sharing in CFM is retarded by lack of transparency, poor accountability, and lack of systematic monitoring. Likewise, Morrison et al. (2021) found that inequities in benefit sharing under CFM were experienced in the Philippines. As a result, benefits are not shared among local communities as they could be (Michiels et al., 2022).

The inability of the NFA to provide CFM group members with promised benefits demoralises CFM group members' commitment to CFM group dynamics and forces local community members to resort to forest resources. This is consistent with Tumusiime et al. (2018) who found that in Budongo Forest Reserve in Uganda, the failure of CFM to deliver benefits as promised in the signed agreements leads to dissatisfaction with the CFM arrangement and contributes to an increase in subversive activities that cause depletion of forest resources. Similarly, Paudel, Carr, and Munro

(2022) found that partial delivery of the promised benefits under CFM retarded conservation efforts in Nepal. Gash (2022) concurs that failure to live up to its promise undermines the ability of collaborative governance to ensure forest conservation.

CONCLUSION

Benefit sharing has the potential to foster collaboration and enhance forest conservation. However, community members do not receive all the benefits promised in the CFM agreements which compels them to violate the agreements and engage in unauthorised forest resource access. Inequitable benefit-sharing has been exacerbated by the lack of a clear benefit-sharing policy, yet it is critical for equitable benefit-sharing and reducing dependence on forest resources to prevent overexploitation. The government should include the CFM program in the budget framework and provide forest-adjacent communities with financial support to boost CFM activities. The NFA needs to strengthen the CFM governance by delivering on the commitment it has made in existing CFM agreements. There is a need to enhance the monitoring of CFM activities to control embezzlement and misuse of financial resources from CFM group activities.

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REFERENCES

- Amumpaire, A. (2014). Benefit sharing is key to effective forest governance in Uganda. Advocates Coalition for Development and Environment (ACODE), Kampala, Uganda
- Baruch, Y., & Holtom, B.C. (2008). Survey response rates and trends in organisational

research. *Human relations*. 61: 1139-1160. USA and UK.

- Bitariho, R., Babaasa, D., & Mugerwa, B. (2015). The status of biodiversity in Echuya central Forest reserve, SW Uganda. DOI:10.13140/RG.2.1.1021.1282
- Bitariho, R., Sheil, D., & Eilu, G. (2016). Tangible Benefits or Token Gestures: Does Bwindi Impenetrable National Park's long established Multiple Use Programme benefit the poor? *Journal of Forests, Trees and Livelihoods*, 25 (1): 16-32.
- Banana, A.Y. & Tweheyo, M. (2001) The Ecological changes of Echuya afro-montane bamboo forest, Uganda. *African Journal of Ecology*. (39), 66–372
- Bitariho, R., & McNeilage, A. (2008). Population structure of montane bamboo and causes of its decline in Echuya Central Forest Reserve, South West Uganda. *African Journal of Ecology*, 46(3), 325-332.
- Bitariho, R., Sheil, D., & Eilu, G. (2016). Tangible Benefits or Token Gestures: Does Bwindi Impenetrable National Park's long established Multiple Use Programme benefit the poor? *Journal of Forests, Trees and Livelihoods*, 25 (1), 16-32.
- Börner, J., Baylis, K., Corbera, E., Ezzine-de-Blas, D., Honey-Rosés, J., Persson, U. M., & Wunder, S. (2017). The effectiveness of payments for environmental services. *World development*, (96), 359-374. doi: 10.1016/j.worlddev.2017.03.020
- Borrini-Feyerabend, G., Pimbert, M., Farvar, M.T., Kothari, A & Renard, Y., (2007). Sharing Power: A global guide to collaborative management of natural resources. Earthscan Publications limited, London.

- Boton, D.M., Mensa, S., Egeru, A., Yamungu, A.B.B., Houedegnon, P., & Namara, B. (2021). Performance of collaborative forest management on forest status and contribution to adjacent community livelihoods in Uganda. *Makerere University Journal of Agricultural and Environmental Sciences* 10 (2), 123 – 143.
- Chan, J.K.L., Marzuki, K.M. & Mohtar. T.M. (2021). Local community participation and responsible tourism practices in ecotourism destination: A case of lower Kinabatangan, Sabah. *Sustainability*, 13(23), 13302.
- Chinangwa, L., Pullin, A. S., & Hockley, N. (2016). Livelihoods and welfare impacts of forest co-management. *International Journal of Forestry Research*. <https://doi.org/10.1155/2016/5847068>
- Christian, F. Y. (2019). Levelling up the collaborative forest management in Indonesia: a review. In *IOP Conference Series: Earth and Environmental Science* (Vol. 285, No. 1, p. 012008). IOP Publishing.
- Cooper, P. S. (2014). *Business Research Methods*. New York: The McGraw-Hill Companies.
- Cunningham, A. B., (2001). Applied ethnobotany, people, wild plant use and conservation, WWF, Earthscan Publications Ltd, London.
- FAO (Food and Agriculture Organization). (2018). The State of the World's Forests 2018-Forest Pathways to Sustainable Development. <https://www.fao.org/documents/card/en/c/CA0188EN/>
- Gash, A. (2022). Collaborative governance. In *Handbook on theories of governance*. Edward Elgar Publishing.
- Ghimire, P., & Lamichhane, U. (2020). Community Based Forest Management in Nepal: Current Status, Successes and Challenges. *Grassroots Journal of Natural Resources*, 3(2), 16-29.
- Ghislaine, Z.D. G. (2017). A Framework for Community Benefit Sharing Mechanisms Design and Implementation of CBSM for Forest Conservation in Liberia. IDH, the Sustainable Trade Initiative FDA, the Forestry Development Authority. *Palava huts Saniquelle, Nimba, Liberia*
- Gombya -Ssembajjwe, W. S., & Banana, Y. A. (2000). Collaborative Forest Management in Uganda: The Case of Butto-Buvuma Forest Reserve. In: *Community-based Forest Management in East Africa*, W.Gombya-Ssembajjwe and A.Y.Banana, eds. Makerere University Painterly.
- GoU (Government of Uganda). (2001). *The Uganda Forestry Policy, 2001*. Government of Uganda publication.
- GoU (Government of Uganda). (2003). The National Forestry and Tree Planting Act, 2003. Government of Uganda publication.
- Heale, R., & Forbes, D. (2017). Understanding triangulation in research. Evidence-based nursing 16(4) DOI: 10.1136/eb-2013-101494
- Kegamba, J. J., Sangha, K. K., Wurm, P., & Gamett S. T. (2022). A review of conservation-related benefit-sharing mechanisms in Tanzania. *Global Ecology and Conservation*, 33, e01955.
- Kazoora, C., Irumba, D. Smithand, N. & Campese. J. (2020). A review of Collaborative Forest Management in Uganda. Overview. Ministry of Water and Environment, Kampala, Uganda
- Kyere-Boateng, R., Marek, M. V., Huba, M., & Kluvankova, T. (2021). Perceived Injustices in Forest Policy Interventions are Causes of Forest Resources Degradation and Loss in Ghana: A Review. *Open Journal of Forestry*, 11(3), 171-191.

- Lestari, S. Kotani, K., & Kakinaka, M. (2015). Enhancing voluntary participation in community collaborative forest management: A case of Central Java, Indonesia. *Journal of environmental management*, (150), 299-309.
- Mahanty, S., Guernier, J., & Yasmi, Y. (2009). A fair share? Sharing the benefits and costs of collaborative forest management. *International Forestry Review*, 11(2), 268-280.
- Morrison, C., Humphries, F & Lawson, C. (2021). A Regional Review of Genetic Resource Access and Benefit Sharing—Key Issues and Research Gaps. *Environmental Policy and Law*, (Preprint), 1-24.
- Mugisha, A., Byaruhanga, A. & Opige, M. (2012). Enhancing the livelihoods of local communities dependent on a montane tropical forest: a case of Echuya forest, Uganda. *Nature Uganda*, Kampala.
- MWLE (Ministry of Water Lands and Environment). (2001). *The Uganda Forest Policy*. Government of Uganda Publication
- MWLE (Ministry of Water Lands and Environment). (2002). *The National Forest Plan*. Government of Uganda Publication.
- MWLE (Ministry of Water Lands and Environment). 2003. *Guidelines for Implementing Collaborative Forest Management in Uganda*. Produced under the EU's Forestry Programme (FRMCP). Government of Uganda Publication
- MWLE (Ministry of Water Land and Environment). (2003). *National Guide for Implementing Collaborative Forest Management in Uganda*. Government of Uganda publication.
- MWLE (Ministry of Water and Environment). (2017). *State of Uganda's forestry*. Government of Uganda Publication
- MWLE (Ministry of Water Lands and Environment). (2013). *The National Forest Plan*. Government of Uganda Publication.
- Nantongo, M., Vatn, A., & Vedeld. P. (2019). All that glitters is not gold; Power and participation in processes and structures of implementing REDD+ in Kondoa, Tanzania. *Forest Policy and Economics*, (100), 44-54.
- Nature Uganda* (2011). Implementing Collaborative Forest Management in Uganda; Lessons Learnt from Kasyoha Kitomi and Echuya Central Forest Reserve. *Nature Uganda*, Kampala, Uganda.
- Medina, G., & Pokorny, B. (2022). Financial assessment of community forest management: Lessons from a cross-sectional study of timber management systems in the Brazilian Amazon. *International Forestry Review*, 24(2), 197-207.
- Michiels, F., Feiter, U., Paquin-Jaloux, S., Jungmann, D., Braun, A., Sayoc, M. A. P., & David, B. (2021). Facing the Harsh Reality of Access and Benefit Sharing (ABS) Legislation: An Industry Perspective. *Sustainability*, 14(1), 277.
- Mugenda, O. M., & Mugenda, A. G. (1999). *Research Methods: Quantitative and Qualitative Approaches*. Nairobi: Acts Press.
- Neuendorf, K. A. (2018). Content analysis and thematic analysis. In *Advanced research methods for applied psychology* (pp. 211-223). Routledge.
- Noor, S., Tajik, O., Golzar, J. (2022) Simple random sampling. *International Journal of Education and Language Studies*. 1 (2)
- Nyumba, O. T., Wilson, K., Derrick, C. J., & Mukherjee, N. (2018). The use of focus group discussion methodology: Insights from two

- decades of application in conservation. *Methods in Ecology and evolution*, 9(1), 20-32.
- Park, S. H., & Yeo-Chang, Y. (2021). Impact of collaborative forest management on rural livelihood: A case study of maple sap collecting households in South Korea. *Sustainability* 13(4), 1594.
- Patton, M. Q. (2003). Qualitative evaluation checklist. *Evaluation checklists project*, 21, 1-13.
- Pawlak, K. & Kołodziejczak, M. (2020). The role of agriculture in ensuring food security in developing countries: Considerations in the context of the problem of sustainable food production. *Sustainability*, 12(13), 5488.
- Paudel, G., Carr, J., & Munro, P. G. (2022). Community forestry in Nepal: a critical review. *International Forestry Review*, 24(1), 43-58.
- Rahut, D.B., Jena, P.R., Ali, A., Behera, B., & Chhetri, N.B. (2015). Rural nonfarm employment, income, and inequality: Evidence from Bhutan. *Asian Development Review*, 32(2), 65-94.
- Sarstedt, M., Mooi, E., Sarstedt, M., & Mooi, E. (2019). Regression analysis. *A concise guide to market research: The process, data, and methods using IBM SPSS Statistics*, 209-256.
- Shackleton, C. M., Teka, O., & Sinsin, B. (2021). Ecological patterns and effectiveness of protected areas in the preservation of Mimusops species' habitats under climate change. *Global Ecology and Conservation*, (27), e01527.
- Shreyas, B. (2019). Good Practices of Access and Benefit Sharing. Indo-German Biodiversity Programme Access and Benefit Sharing Partnership Project. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. New Delhi – India
- Silver, C., & Lewins, A. (2014). *Using Software in Qualitative Research. A step-by-Step Guide*. Second A. Edition. Sage Publication.
- Snyman, S., & Bricker, K. S. (2019). Living on the edge: Benefit-sharing from protected area tourism. *Journal of Sustainable Tourism*, 27(6), 705-719.
- Springer, J. (2016). Initial Design Document for a Natural Resource Governance Framework. NRGF Working Paper No. 1. Gland, Switzerland: IUCN and CEESP.
- Soliev, I., & Theesfeld, I. (2017). Reframing for sustainability: exploring transformative power of benefit sharing. *Sustainability*, 9(8), 1486.
- Soliev, I., & Theesfeld, I. (2020). Benefit sharing for solving transboundary commons dilemma in Central Asia. *International Journal of the Commons*, 14(1), 61-77
- Ssemmanda, R., Kiyangi, G. & Opige, M. (2020). Collaborative Forest Management in Uganda—Recommendations for CSOs. Briefing paper September 2020. The Ecological Trends Alliance, Kampala, Uganda, and Tropenbos International, Wageningen, the Netherlands
- Ssali, F., & Bitariho, R. (2013). Status and Distribution of Montane Bamboo in Echuya Central Forest Reserve, S.W. Uganda. Institute of Tropical Forest Conservation, Kabale, Uganda
- Syallow, D., & Prasanna, K. (2022). Characterising Livelihood Opportunities Arising from Collaborative Forest Management-A Comparative Case of Uttara Kannada, Karnataka and Mau Forest, Kenya. *The Mysore of Agricultural Sciences*, 56(1), 349-357.

- Teagan, G. (2022). Semi-structured interview, definition, guide and examples. <https://www.scribbr.com/methodology/semi-structured-interview/> Accessed on January 23rd 2022.
- Trigueiro, W. R., Nabout, J. C., & Tessarolo, G. (2020). Uncovering the spatial variability of recent deforestation drivers in the Brazilian Cerrado. *Journal of Environmental Management*, 275, 111243.
- Tumusiime, D. M., Turyahabwe, N., Byakagaba, P., & Tumwebaze, S.B. (2013). Impact of collaborative forest management on forest status and local perceptions of contribution to livelihoods in Uganda. *Journal of Sustainable Development*, (6)10, 2013
- Tumusiime, D. M., Vedeld, P., & Gombya-Ssembajjwe, W. (2011). Breaking the law? Illegal livelihoods from a protected area in Uganda. *Forest policy and economics*, 13(4), 273-283.
- Turyahabwe, N., Agea J. G., Tweheyo, M., & Balaba, T. S. (2012). Collaborative Forest Management in Uganda: Benefits, Implementation Challenges and Future Directions, Sustainable Forest Management - Case Studies, Accessed from: <http://www.intechopen.com/books/sustainable-forest-management-case>
- Twinamatsiko, M., Rugunda, G.K., Basheka, B. & De Herdt, T. (2015). Can Governance in Revenue Sharing Be a Pathway for a Win-win Situation between People's Livelihood Improvement and Conservation? *Journal of Social Science Research* (8) 1
- UBOS. (Uganda Bureau of Statistics). (2014). The National Population and Housing Census 2014 – Main Report, Kampala, Uganda. [https://www.ubos.org/wp-](https://www.ubos.org/wp-content/uploads/publications/03_20182014_National_Census_Main_Report.pdf)
- content/uploads/publications/03_20182014_National_Census_Main_Report.pdf
- UNCED. (United Nations Conference on Environment and Development). (1992). Earth Summit-Rio Declaration and forest principles. United Nations, Department of Public Information, USA.
- Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing & health sciences*, 15(3), 398-405.
- Waridin, W., Dhea Safira, R. K. Susilowati, I. Wijajanti, K. & Purwanti, E. Y. (2019). Economic evaluation on the application of collaborative forest management (CFM). *Economics Development Analysis Journal* 8(4), 292–301.
- Wekesa, I. W. (2017). Examining the role of community participation in forest management and conservation in Kimothon forest, TransNzonia County, Kenya, University of Nairobi, Nairobi Kenya.
- Wood, A., Tolera, M., Snell, M., O'Hara, P. & Hailu. A., (2019). Community forest management (CFM) in south-west Ethiopia: Maintaining forests, biodiversity and carbon stocks to support wild coffee conservation. *Global Environmental Change*, 59, 101980.
- Yamane, T. (1967). *Elementary Sampling Theory*, New Jersey: Prentice-Hall, Inc.