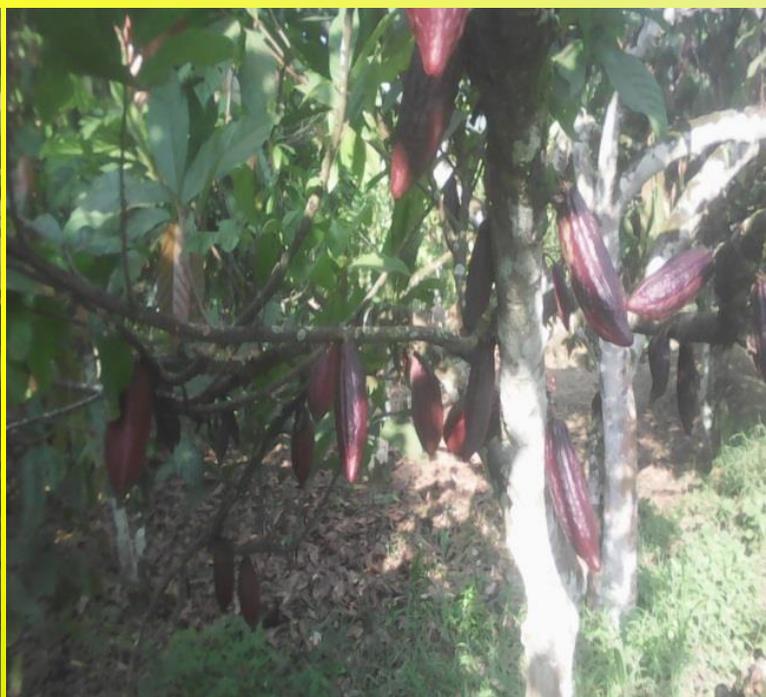
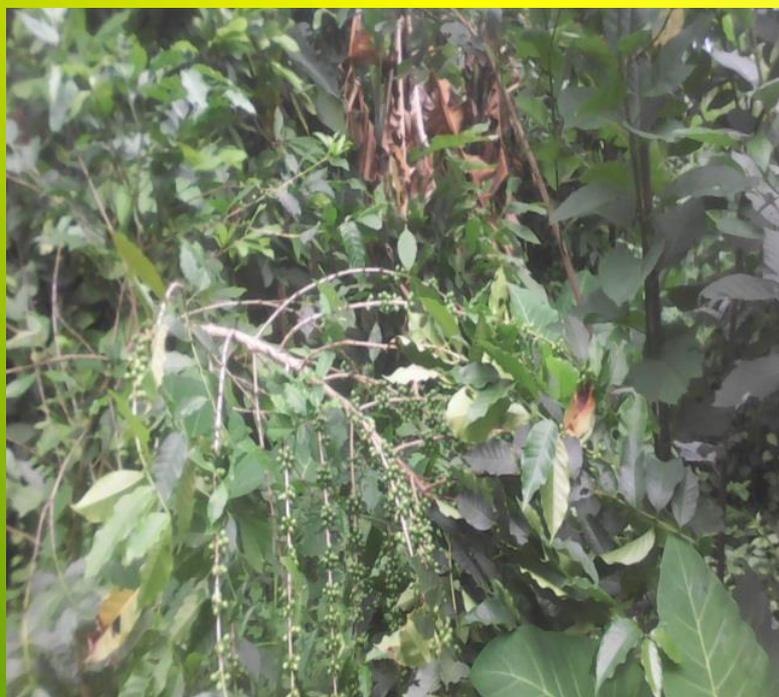


DIVERSIFYING LIVELIHOODS THROUGH
ACCESS TO PREMIUM MARKETS, ECO-
TOURISM AND ECO-TECHNOLOGY IN
BUNDIBUGYO, UGANDA

A FEASIBILITY STUDY



August 2018

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REPORT TITLE: Diversifying Livelihoods through Access to Premium Markets, Eco-Tourism and Eco-Technology in Bundibugyo, Uganda, A Feasibility Study

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EXECUTIVE SUMMARY

The Rwenzori Sustainable Trade Centre Limited (RSTC) was set up in Western Uganda to represent the people and the products available in twelve communities across the Rwenzori mountains by establishing their full product specifications, quantities and developing the value-added qualities and opportunities for adaptation for international market. The RSTC does this through formal representation agreements with each producer group, contracting specialized marketing professionals, a local and internationally experienced trading team, and supporting the acquisition and retention of international certifications like Fairtrade and Organic.

The RSTC secured funding to undertake a feasibility study into defining alternative livelihood options and securing Bird Friendly certification for two cooperatives in Bundibugyo district, one active in cocoa and the other in coffee. RSTC invited the Mountains of the Moon University to submit a proposal and budget to contribute technical and agro-ecological components of the study.

The feasibility study is a precursor to a larger project that will work dedicatedly with two cooperatives of farmers in Bundibugyo to obtain Fairtrade and Organic Certification, and also develop and promote Bird Friendly (BF) certification in order to access niche export markets for coffee and cocoa, particularly in the USA. It includes an integrated set of activities to support diversification into Eco-Tourism and Eco-Technology, creating increased income for farmers, increased employment opportunities for women and youth, greater gender equality in all aspects of daily work and commercial activities and a reduction in girls' vulnerability to early marriage and abuse.

The feasibility study was conducted in the months of June and July 2018 aimed at assessing the social, economic and ecological feasibility of selected sites in Bundibugyo for Bird Friendly certification. The study was guided by four major objectives:

- 1) To assess the current socio-economic profile of the members of the cooperatives/community required to set and run viable eco-tourism and eco-technology subsidiary enterprises in Bundibugyo,
- 2) To examine the role of the surrounding natural resources in promoting inclusive eco-tourism as a pathway out of poverty for the local population,
- 3) To establish the technical and agro-ecological components of the community in Bundibugyo District which are key for Bird Friendly certification, agro-eco-tourism and eco-technology, and
- 4) To identify the fauna and flora potentials in Bundibugyo for sustaining an eco-tourism subsidiary enterprise.

The study involved a total of 1,016 respondents comprising 500 cooperative members of Buka Bughendera Farmers' Cooperative Society Limited and Bundikakemba Growers' Cooperative Society who were purposively sampled. The remaining 516 respondents were randomly selected from non-cooperative

members. There were key methods used during the survey to achieve the above objectives. These were: Focus Group Discussions, Transect Walks, Individual Questionnaire Based Interviews and Documentary Study.

The study confirmed that both coffee and cocoa businesses will be technically and financially viable as demonstrated by the net present value (NPV) of UGX 4,447,730 and UGX 5,612,230 respectively. The business will be viable so long as the community do not invest above the NPV.

Cash Flow projections for coffee				
Period	Year 0	Year 1	Year 2	Year 3
Net cash flow		2,030,000	2,273,000	2,540,300
Discounting factor		0.8065	0.6504	0.5245
Discounted values		1,637,097	1,478,278	1,332,355
Net present value (NPV)	4,447,730			

Cash Flow projections for cocoa				
Period	Year 0	Year 1	Year 2	Year 3
Net cash flow		2,570,000	2,867,000	3,193,700
Discounting factor		0.8065	0.6504	0.5245
Discounted values		2,072,581	1,864,594	1,675,055
Net present value (NPV)	5,612,230			

Access to the national electricity grid is very low with over 86% of the households not accessing the national electricity grid in the area and even worse in Harugali and Bukonzo sub-counties with over 93% non-access. This presents a market size of 6,537 households for solar energy products. With increased income from coffee and cocoa as a result of BF certification coupled with eco-tourism, the population will be able to access solar energy, making the solar franchise business viable. The access to grid electricity gap for the entire Budibugyo district is 89% of households representing a market of 39,829 households.

Description	Harugali sub-county	Bukonzo sub-county	Nyahuka Town Council	Overall
Total no. of households	2,125	1,835	3,622	7,582
No. of households with electricity	134	132	779	1,045
No. of households without electricity	1,991	1,703	2,843	6,537
Households without electricity (%)	94%	93%	78%	86%

Source: UBOS: National Population and Housing Census 2014 –Sub-county Report – Central Region

Overall, the community will be able to benefit from eco-tourism revenue generated through a share from the Uganda Wildlife Authority (UWA), tour guide income and eco-lodging, amounting to over UGX 286 million per year. On average, the facilities will be receiving 44 visitors per day comprising of 19 foreigners and 25 from Uganda and East African neighbouring countries.

Revenue	Year 1	Year 2	Year 3
Growth rate		10%	10%
Total entry fee	929,269,350	1,022,196,285	1,124,415,914
Day nature walk	252,663,220	277,929,542	305,722,496
Share of community	185,853,870	204,439,257	224,883,183
Tour guide income	25,266,322	27,792,954	30,572,250
Eco-lodge	75,704,660	83,275,126	91,602,639
Total revenue to the community	286,824,852	315,507,337	347,058,071

The community is surrounded by a number of natural resources. Bird Friendly eco-tourism will certainly be a viable alternative source of income and act as an incentive for the community to use the natural resources sustainably. However, there is limited input from the community insofar as conservation of these natural resources is concerned. Therefore, institutional, financial, cultural and technological support will also be needed in the management of natural resources surrounding the communities if they are to sustainably act as pathways out of poverty.

Generally, the farming systems for coffee and cocoa practiced by the farmers in Bundibugyo have a high potential for certification and creating a Bird Friendly Certification procedure especially given the by-laws which prohibit the use of chemical inputs. Bundibugyo district is recorded to have as many as 450 different bird species among which 216 species are forest specialists. With a good tree cover on the farms, even some true forest birds can comfortably live in and around cocoa/coffee farms. This, however, can be achieved only if farmers are sensitized, convinced and supported to meet the minimum requirements of Bird Friendly Certification. Such requirements include improving on tree shade in their coffee/cocoa gardens and stratifying the canopy to have an upper canopy of native trees whose canopy is at least 15 meters above ground and a lower stratum of diverse other Bird Friendly trees whose canopy is at least 12 meters above ground. The total shade should not be less than 40%. The support can be by empowering the farmers to plant trees such as *Maesopsis eminii*, *Funtumia elastica* and *Spathodea campanulata* as the upper stratum back bone trees; and *Ficus natalensis*, *Prunus africana*, *Halea stipulosa*, *Warbughia ugandensis*, Palm oil tree, Native Pawpaw, Native Mango, Jackfruit, *Eriobotrya japonica*, and *Bridelia myrcantha* as the trees to make the lower stratum.

The current situation shows that the alternative energy such as solar could be a good business venture in the community as the majority expressed interest to have solar power but do not have it currently. There is also room for introducing regulations governing ecosystems management that will support Bird Friendly certification. The social aspects underlying Eco/agro/ community tourism in Bundibugyo district show that the communities are willing to adapt Bird Friendly certification as this will trigger the exploitation of this immense potential.

There are various areas that have potential for the establishment of an eco-lodge but to start with, the Karangisyo trail could be established as a demonstration for other sites as a community based agro-tourism venture product and service. The

eco-lodge with its associated services will create employment for many youth plus attracting income on a daily basis. People practicing community tourism in the Rwenzori region show that their lodges can raise an income of at least 10 dollars per tourist per day on only accommodation, while a guided tour and meals can fetch as much respectively. Given the huge numbers of birders and coffee drinkers in the World, (USA alone has about 4 million) who might get attracted to Bundibugyo after the Cocoa/Coffee Bird Friendly certification, the eco-lodge in Bundibugyo is likely to attract an average of not less 40 tourists per day. It is also clear that Bundibugyo environmental and weather conditions are conducive for tourism all year round. This indicates that this enterprise will greatly improve the income of the community.

Based on the findings of the study the following recommendations were made:

- BF certification with all the integrated activities including eco-tourism and eco-technology should be implemented in Bundibugyo and the community are supportive of the initiative and aware of the benefits and their role in the intervention.
- Development interventions for communities in Bundibugyo District should be gender-inclusive. All gender structures such as women, youth, men and the disabled have a development synergy. When one group is left out, it antagonizes the achievements of the other. For the success of RSTC's business, there is a need to define roles for each age and gender groups. There is a need to clearly define roles for youth, women and men to ensure easy follow-up and inclusiveness.
- For a balanced and sustainable development in Bundibugyo, there is a need to ensure income diversity. In addition to coffee and cocoa, there is a need to explore other non-seasonal income sources such as Agro-Tourism and Eco-Technology subsidiaries and backyard/kitchen gardening to solve the problem of food security and income that is skewed to male population.
- It was observed that farmers in Bundibugyo own smaller land parcels. Even the small land is already under perennial crops of coffee and cocoa. Women and Youth's income and participation in formal employment institutions are still low. Subsidiary options such as premium prices from BF Certification and establishing Eco-Tourist and Eco-Technology facilities thus offer diversification of income options.
- Low credit and extension services from government institutions suggests the dire need for trade cooperatives operating in Bundibugyo to consider extending efforts beyond marketing to offering on-farm credit and extension facilities.
- Knowledge of eco-tourism which is lacking and has to be imparted to the community so that they are able to use their own resources especially in cocoa and coffee farms to diversify their income. A component of community eco-tourism has to be incorporated within the community and they are urged to complement on the incomes from the natural resources.
- Fair prices have to be given for coffee or cocoa grown in areas that implement strategies to meet the standards for Bird Friendly Certification.

- A detailed inventory of flora and fauna, particularly avifauna, should be carried out and the list generated used as a tool to market the area as a birding hotspot. Sustainable ecosystem management to conserve flora and fauna should be emphasized by all stakeholders in the Bird Friendly cocoa/coffee certification enterprise of Bundibugyo.

ACRONYMS

BF	Bird Friendly
FGDs	Focus Group Discussions
GTZ	German Technical Cooperation Agency
LC	Local Council
NGO	Non-Governmental Organization
RSTC	Rwenzori Sustainable Trade Centre
UBOS	Uganda Bureau of Statistics
UGX	Uganda Shillings
USA	United States of America
UWA	Uganda Wildlife Authority
VSLA	Village Savings and Loans Associations

1.0 BACKGROUND TO THE FEASIBILITY STUDY

1.1 Introduction

The Rwenzori Sustainable Trade Centre (RSTC) was set up in Western Uganda to represent the people and the products available in twelve communities across the Rwenzori mountains by establishing their full product specifications, quantities, and developing the value-added qualities and opportunities for adaptation for the international market. The RSTC does this through formal representation agreements with each producer group, contracting specialized marketing professionals, a local and internationally experienced trading team, and supporting the acquisition and retention of international certifications like Fairtrade and Organic.

The RSTC's day-to-day work is to communicate products' strengths and values to national and international buyers and to build the good name and reputation of all associated groups in global markets. RSTC is building up a client base for each product area, negotiates and gets confirmed orders for the coops/groups. The RSTC supervises and facilitates pre-finance for trading, production and delivery to clients through two lines of credit: for trade finance and income generating projects and diversification (for specifically women's groups).

RSTC is neither an NGO, nor a commercial company. As a company limited by guarantee all profits are reinvested in its mission. Operating on a commercial basis, it has a fully hands-on and innovative approach to making trade benefit these specific people in need, directly and measurably. RSTC's heart is in the Rwenzori region. It is committed to finding an integrated strategy creating value, jobs, income predictability, good practice and community empowerment in these areas. The RSTC's specific vision is: *creating viable local businesses and social development over time, for a long time to come.*

The RSTC secured funding to undertake a feasibility study into defining and securing diversified livelihood options through Bird Friendly certification for two cooperatives in Bundibugyo district, one active in cocoa and the other in coffee. RSTC invited the Mountains of the Moon University to submit a proposal and budget to contribute technical and agro-ecological components of the study.

1.2 Focus of the feasibility study

The feasibility study is a precursor to a larger project that will work dedicatedly with two cooperatives of farmers in Bundibugyo to diversify livelihood options through obtaining Fairtrade, organic, develop, and promoting Bird Friendly (BF) certifications in order to access niche export markets for coffee and cocoa, particularly in the USA. It includes an integrated set of activities to support diversification into Eco-Tourism and Eco-Technology, creating increased income for farmers, increased employment opportunities for women and youth, greater gender equality in all aspects of daily work and commercial activities and a reduction in girls' vulnerability to early marriage and abuse.

The business partners at the heart of the proposal are two cooperatives:

Buka (meaning “waking up”) Bughendera Farmers’ Cooperative Society Limited is a social enterprise made up of 303 members (currently 162 males and 141 females) from three communities, Bupomboli, Busamba and Karangitso. It was formed in 2016 and achieved its registration as a cooperative in March 2017. It is located adjacent to the Semuliki National Park, and will be the partner in pursuing Fairtrade, Organic and Bird Friendly (BF) certification in coffee.

The second partner will be the Bundikakemba Cocoa Growers’ Cooperative Society Limited made up of 300 cocoa farmers (currently 135 males and 165 females)

The diversification strategy is to reduce dependency on the cash crops and provide employment opportunities for women and youth. Two components of this feasibility study will look at following:

1. How youth from the communities covered by the two cooperatives could be mobilized to set up and run a viable Eco-Tourism subsidiary of the cooperative, and be trained as eco-tourism and birder guides and for the management of the eco-lodge. The cooperative members using locally available materials and solar panels for lighting and rainwater harvesting would build the Eco-Lodge.
2. How members of both cooperatives could be mobilized to set up Eco-Technology subsidiaries - for the sales and distribution, servicing and parts businesses associated with marketing environmentally friendly and fuel-saving stoves, briquettes from crop by-products and solar energy products. One route that will be explored and the economics review would be through developing franchise arrangements with solar energy import companies.

Technical assistance was provided from RSTC Associates with specializations in enterprise and business development, marketing and financial management, Village Savings and Loans Associations, (VSLA) gender, community development and child protection.

1.3 Aim and objectives of the feasibility study

1.3.1 Aim

The aim of the study was to assess the social, economic and ecological feasibility of selected sites in Bundibugyo for Bird Friendly certification and the market potential for eco-tourism and eco-technology in the form of solar panels and fuel-saving stoves.

1.3.2 Specific objectives

The study was guided by four major objectives:

1. To assess the current socio-economic profile of the members of the cooperatives/community required to set and run a viable eco-tourism subsidiary enterprise in Bundibugyo.
2. To examine the role of the surrounding natural resources in promoting an inclusive eco-tourism as a pathway out of poverty for the local population.

3. To establish the technical and agro-ecological components of the community in Bundibugyo District which are key for a Bird Friendly certification, agro-eco-tourism and eco-technology.
4. To identify the Fauna and Flora potentials in Bundibugyo for sustaining an eco-tourism subsidiary enterprise.

2.0 METHODS USED IN CONDUCTING THE FEASIBILITY STUDY

A total of 1,016 respondents were surveyed comprising of 500 cooperative members of Buka Bughendera Farmers' Cooperative Limited and Bundikakemba Growers' Cooperative Society who were purposively sampled. The remaining 516 respondents were randomly selected from non-cooperative members.

There were key methods used during the survey to achieve the above objectives. These were Focus Group Discussions, Transect Walks and Individual Questionnaire Based Interviews (Appendix 1).

Four Focus Group Discussions (FGDs) were conducted, of which two were conducted with the two cooperatives and the other two with non-cooperative member counterparts. Each FGD comprised of 12 respondents; 3 local leaders (including secretary for production, cultural leader the LC1 chairperson); 3 Opinion leaders, including Uganda Wildlife Authority (UWA); 2 Teachers; 3 ordinary members; and 1 tour operator. The FGDs had a representation of women, men and the youth.

Transect walks were conducted in Bundikakemba Growers' Cooperative Society and Buka Bughendera Farmers' Cooperative Limited which was a 1-km transect through cocoa and/or coffee and food crop farms (photos in Appendix 2).

Individual questionnaires were administered to 1,016 respondents with the help of 20 well-trained and oriented enumerators. The respondents comprised members and non-members of Buka Bughendera Farmers' Cooperative Limited and Bundikakemba Growers' Cooperative Society.

Documentary study was another method used in this study. Existing literature on BF Certification, alternative sources of energy and Eco-Technology were reviewed.

3.0 FINDINGS AND DISCUSSION

This section presents the findings and discussions of the study, across all the cross-cutting themes in line with the objectives of the study. There will be a short introduction, followed by presentation and discussion of the findings and finally conclusions and recommendations.

3.1 Socio-economic Profile of Cooperatives/ Community Members

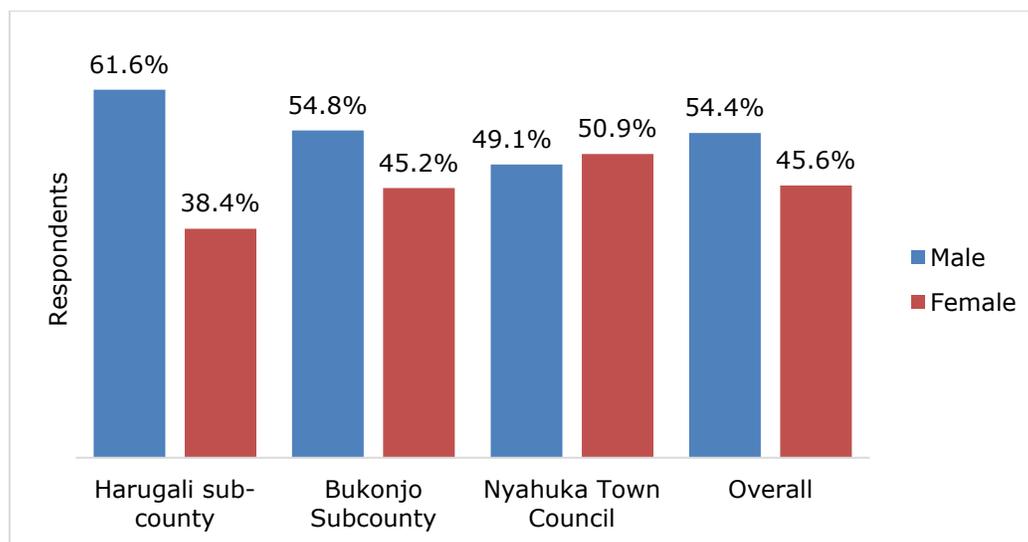
This section presents the current socio-economic profile of the members of the cooperatives/community required to set up and run a viable Bird Friendly, Eco-Tourism and Eco-Technology subsidiary enterprise in Bundibugyo.

For the success of a community Eco-Tourism subsidiary enterprise development that includes Bird Friendly (BF) certification, one must consider the current socio-economic status of the community members who are direct contributors and beneficiaries of the enterprise. A number of farmer-specific factors such as age, gender, education, farmers' experience, institutional factors such as credit, market, extension services, membership to organization and economic factors such as income and prices must be considered. The first specific objective of the study covered these socio-economic attributes of coffee and cocoa farmers in the sub-counties of Harugali, Bukonzo and Nyahuka in Bundibugyo.

3.1.1 Heads of household

The study revealed that majority households are male headed except in Nyahuka town council. Figure 1 shows that the gap between male and female is not big (less than 10%) with the exception of Harugali sub-county with a 23.2% gap. This indicates women's participation in the BF Certification project will be high and this will create employment opportunities for women thereby enhancing women's empowerment because they will be contributing to the household income.

Figure 1: Heads of household by gender

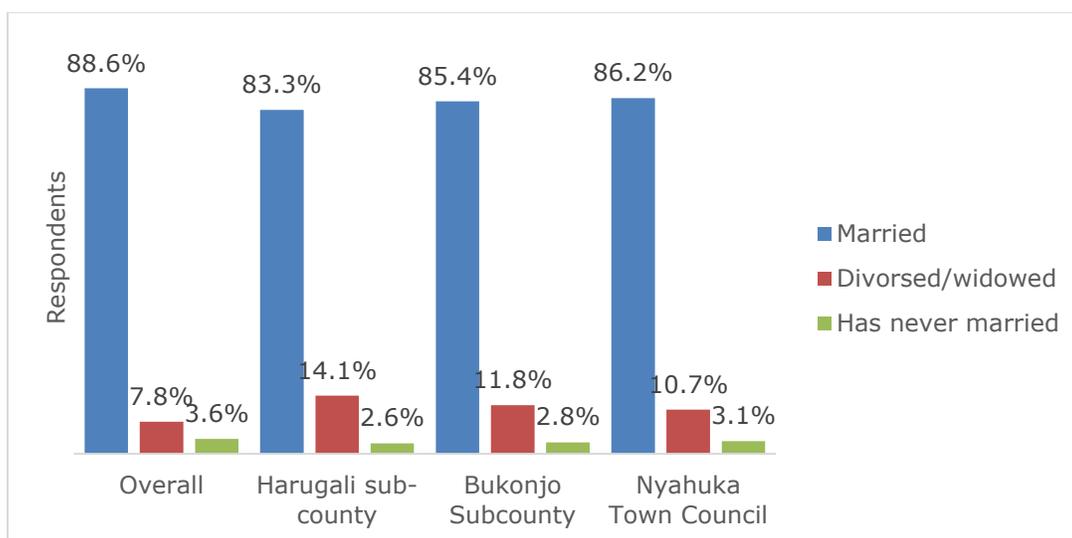


3.1.2 Marital status of respondents and household size and age

Most, (over 80%) of the respondents are married. Figure 2 below shows that there were few cases of divorced/ widowed and those who had not yet married were negligible.

On average, each household had three people above the age of 18 and 4 people below 18 years. The composition of family sizes indicates that majority members are still school-going hence high demand for fees and less farm labour especially at farm peak seasons.

Figure 2: Marital status of the respondents



3.1.3 Level of Education of the Head of the Household

The study shows that majority (58.2%) of the farmers have attended primary school with 12.9% of the respondents completing primary and 24.6% completing senior 4 (o-level). At least primary school level is enough for one to obtain literacy and numeracy skills. This implies that at least 89.8% of the community will be able to understand instructions and adopt new knowledge and improved technology.

Table 1: Education of the household head

Education level	Harugali sub-county	Bukonjo sub-county	Nyahuka town council	Overall
No education	7.0%	14.1%	11.4%	10.2%
Some primary education	47.6%	56.4%	40.1%	45.3%
Completed primary	15.0%	14.7%	10.8%	12.9%
O level	27.9%	13.5%	25.7%	24.6%
A level	1.9%	.6%	7.0%	4.2%
Tertiary/University	.6%	.6%	5.0%	2.8%
No. of respondents	n=359	n=156	n=501	n=1016

3.1.4 Ownership of land

Ownership of land is very important in agriculture production. The study revealed that most (90.5%) of the people in the area own land while only 3.2% of the 1,016 respondents were renting land for agricultural production and 6.3% were using communal land. The table indicates that there are fewer women owning land than male counterparts with only 14% of the 935 respondents compared to 52.3%. However, it is important to note that many respondents owned land jointly at 33.4%.

Table 2: Land ownership

Ownership of land	Harugali Sub-county	Bukonjo Sub-county	Nyahuka Town Council	Overall
Husband	39.9%	66.4%	57.0%	52.3%
Wife	8.5%	11.2%	19.4%	14.3%
Mixed	51.7%	22.4%	23.6%	33.4%

On average, each household owns 2.4 acres of land. Table 3 shows that a third (33.9%) of the respondents own less than 2 acres and this is very common in Nyahuka Town Council with 48.7% owning less than 2 acres. Over 87% and 79% of respondents in Bokonjo sub-county and Harugali sub-county respectively own more than 2 acres, enabling framers to grow coffee/cocoa in addition to food crops. This implies that many people will be able to benefit from improved income from coffee and cocoa as a result of BF certification and people with small parcels will take advantage of the new alternative sources of income through eco-tourism and eco-technology.

Table 3: Size of land owned

Size (in acres)	Harugali Sub-county	Bukonjo Sub-county	Nyahuka Town Council	Overall
Less than 2 acres	20.2%	12.9%	48.7%	33.9%
2 to 5 acres	73.0%	75.7%	49.3%	61.1%
Above 5 acres	6.8%	11.4%	2.1%	5.0%
Mean (in acres)	2.8	3.1	1.9	2.4
	n=307	n=140	n=485	n=932

3.1.5 Ownership of land and playing biggest role in the economic activity by gender

Similar to land ownership, the majority of the respondents indicated that coffee and cocoa garden/plantations are owned by males. Table 4 shows that 56.7% and 54.2% of the coffee and cocoa were owned by males compared to 10.1% and 23.4% owned by female counterparts. It is worth noting that more women (with 40.9%) were owning food gardens compared to men (with 19.7%). The person playing the biggest role in the economic activity followed a relatively similar trend as ownership with the exception of higher proportion of females playing the biggest role in cocoa production

at 31.2% compared to ownership at 23.4%. The results of the study explains the women’s assumed role of producing food for the household. Because of limited economic gains from subsistence food production, most men distance themselves from such investments. Women are in dire need for bailout. Eco- and community tourism enterprises will enhance employment for women. BF Certification of coffee and cocoa enhances access to niche export markets and premium prices hence increased income for the household.

The joint ownership of land at 22% plays the biggest role in all economic activities under study. This is a good indicator of women’s access to productive activities and this can partially indicate that women will also benefit from BF Certification of coffee and cocoa and other associated income generating activities like eco-tourism.

Table 4: Ownership of and playing the biggest role in the economic activity by gender

Economic activity	Harugali Sub-county (in %)			Bukonjo sub-county (in %)			Nyahuka Town council (in %)			Overall (in %)		
	Husband	Wife	Both	Husband	Wife	Both	Husband	Wife	Both	Husband	Wife	Both
Ownership of the economic activity												
Food gardens	15.6	31.5	52.9	7.5	36.1	56.4	28.4	51.7	19.9	19.7	40.9	39.5
Coffee	49.8	9.6	40.6	71.2	11.4	17.4	100.0	0.0	0.0	56.7	10.1	33.3
Cocoa	66.7	33.3	0.0	66.7	16.7	16.7	51.8	24.6	23.6	54.2	23.4	22.4
Livestock	51.3	9.6	39.0	10.3	6.9	82.8	34.2	38.5	27.3	36.7	20.8	42.5
Playing a biggest role in the economic activity												
Coffee	60.3	10.2	29.4	73.2	10.1	16.7	75.0	25.0	0.0	64.2	10.4	25.4
Cocoa	19.3	50.9	29.8	47.5	23.3	29.2	45.9	30.8	23.3	43.9	31.2	25.0
Food	8.8	53.6	37.6	6.5	48.4	45.2	25.1	57.2	17.7	17.4	54.8	27.7

3.1.6 Monthly Income

The results reveal that the community is earning more from cocoa than coffee with an average monthly income of UGX 306,298 compared to UGX 214,101 from coffee. Table 5 below also show that 77.3% of the respondents growing cocoa earn between UGX 50,000 and UGX 500,000 compared to 54.1% for coffee. Overall 75% of the 993 respondents earn between UGX 50,000 and UGX 500,000. Though distributed monthly for the sake of this research, Bundibugyo’s farm income is seasonal coming only in the 2 harvesting seasons. This leaves a lot of daily and monthly household needs such as food, utilities and fees unmet. BF Certification, Eco- and Community Tourism and Eco-Technology will provide employment and additional income throughout the year. The table presents the distribution of respondents by monthly income and sources of income.

Table 5: Distribution of respondents by monthly income and sources of income

Range (in UGX)	Coffee	Cocoa	Total for Farm	Off-farm	Overall household
0-50,000	38.5%	9.7%	15.9%	39.5%	6.0%
50,001-200,000	37.6%	53.5%	49.4%	44.7%	34.9%
200,001-500,000	16.5%	23.8%	23.9%	13.5%	40.1%
500,001-1,000,000	4.3%	8.1%	6.8%	1.9%	12.6%
Above 1,000,000	3.2%	4.9%	4.0%	0.4%	6.3%
Mean	241,101	306,298	276,857	135,215	395,349
No. of respondents	n=442	n=568	n=936	n=539	n=993

3.1.7 Main Occupation of the head of Household

The residents in the area are predominantly farmers with 94.2% of the respondents indicating that they were farmers with only 4.3% in government and 1.2% working with NGOs. Those working in government are mainly from Nyahuka town council. BF Certification, Eco- and Community tourism and Eco-Technology will present an opportunity to provide wider markets and better prices for coffee and cocoa, the project will provide alternative employment to generate income during off season as well as minimize risks associated with agricultural production including fluctuation in prices and unpredictable yields due to climate change. The Table 6 below presents the main occupation of the head of households.

Table 6: Main occupation of the head of households

Occupation	Harugali sub-county	Bukonjo sub-county	Nyahuka town council	Overall
Farmers	97.5%	97.4%	90.8%	94.2%
Government	1.4%	1.9%	7.2%	4.3%
NGO	0.6%	0.6%	1.8%	1.2%
Private sector	0.6%	0.0%	0.0%	0.2%

3.1.8 Membership in cooperative society

Out of the 1,016 respondents, 47.5% (483 members) were cooperative society members. These members belonged to the two cooperative societies in the area namely Buka Bughendera Farmers' Cooperative Limited and Bundikakemba Growers' Cooperative Society Limited. It should be noted that the two cooperatives do not have the same age: Bundikakemba Growers' Cooperative Society started earlier, (the year 2012) as a farmers' association and registered as a cooperative in the year 2014 while Buka Bughendera Farmers' Cooperative Limited started as an association in 2014 and registered as a cooperative in 2017. Table 7 below shows that over 90% of the cooperative members interviewed had experience in cooperative of at least two years. This implies that the project will be able to mobilize the community through the two cooperative societies.

Table 7: Number of years in the cooperative society

Range	Harugali sub-county	Bukonjo sub-county	Nyahuka town council	Overall
Less than 2 years	13.7%	16.7%	2.4%	9.1%
2 - 5 years	85.8%	83.3%	89.5%	87.2%
Above 5 years	0.4%	0.0%	8.1%	3.7%
	n=226	n=48	n=209	n=483

3.1.9 Access and use of credit

Access to credit and using it for agricultural production are two separate issues. Most farmers in Bundibugyo obtain credit but use it for non-farm activities such as trade, school fees and consumption expenditure instead of coffee or cocoa production. The study revealed that, on average only 21.9% access credit and of those 48% use it for coffee/cocoa production. Nyahuka town had the lowest access to credit compared to other places and this can partially be attributed to lack of assets (land and plantation) to pledge as collateral to access credit. The results show that with availability of credit people in the community are willing to utilize credit for coffee and cocoa production.

Table 8: Access and use of credit

Details	Harugali sub-county	Bukonjo sub-county	Nyahuka Town Council	Overall
Accessed Credit				
Yes	27.0%	31.4%	15.4%	21.9%
No	73.0%	68.6%	84.6%	78.1%
	n=359	n=156	n=501	n=1016
Use of credit				
Coffee/Cocoa	33.0%	59.2%	59.7%	48.0%
Not coffee/cocoa	67.0%	40.8%	40.3%	52.0%
No. of respondents	n=97	n=49	n=77	n=223

3.2 Coffee and Cocoa Production and Marketing

This section presents analysis of coffee and cocoa production with respect to experience in production, yield and value addition activities performed as well as marketing of these crops in terms of the prices being offered on the market in which the products are sold and distance travelled to access buyers.

3.2.1 Experience in coffee and cocoa growing

The community in the area have the required experience in growing coffee. Table 9 below shows that on average the respondents have 9 years of experience and 67% of the respondents have 5 and above years of experience. The cocoa farmers are even more experienced than coffee farmers with an average of 15.3 years, with 91.6% having 5 and above years of experience. This suggests that the community has the potential to produce good quality coffee and cocoa to meet the international market.

However, the government's mandated extension service to farmers has not trickled to coffee and cocoa sub-sectors in Bundibugyo. On average, a coffee/cocoa farmer has only been visited less than twice/ year. This suggests that there may be an on-going need for training/agricultural extension services.

Table 9: Experience in growing coffee and cocoa

Crop	Year	Harugali Sub-county	Bukonjo Sub-county	Nyahuka town council	Overall
Coffee	Less than 5 years	35.5%	26.7%	0.0%	33.0%
	5-10 years	35.5%	50.9%	50.0%	39.6%
	11-15 years	18.7%	11.2%	0.0%	16.6%
	More than 15 years	10.3%	11.2%	50.0%	10.7%
	Mean (in years)	9.0	8.8	12.5	9.0
		n=321	n=116	n=2	n=439
Cocoa	Less than 5 years	0.0%	23.5%	6.0%	8.4%
	5-10 years	50.0%	37.0%	31.3%	32.2%
	11-15 years	0.0%	18.5%	16.5%	16.7%
	More than 15 years	50.0%	21.0%	46.3%	42.7%
	Mean (in years)	11.5	11.0	16.0	15.3
		n=2	n=81	n=486	n=569

3.2.2 Coffee and cocoa yields

Table 10 shows that the average yield from coffee is 1.7 bags/ person/ season with Harugali sub-county having the highest mean of 2.2 bags and Nyahuka the lowest 1.0 bag/ person/season. The average yield for cocoa was 2.2 bags/ season. Bukonjo recorded the highest yield of 3.8 bags/person/ season compared to Nyahuka's 1.4 bags/ person/ season. Each bag weighs 100kg. Table 10 presents coffee and cocoa yield by areas (sub-county and town council).

Table 10: Coffee and cocoa yields

	Bags (100kg)	Harugali sub-county	Bukonjo sub-county	Nyahuka town council	Overall
Coffee	0 - 2 bags	69.4%	79.5%	100.0%	72.4%
	2.1 - 5 bags	22.1%	15.7%	0.0%	20.2%
	Above 5 bags	8.5%	4.7%	0.0%	7.4%
	Mean (in bags)	2.2	1.9	1.0	1.7
	No. of respondents	n=317	n=127	n=2	n=446
Cocoa	0 - 2 bags	100.0%	57.3%	88.5%	83.8%
	2.1 - 5 bags	0.0%	29.2%	9.9%	12.8%
	Above 5 bags	0.0%	13.5%	1.6%	3.4%
	Mean (in bags)	1.5	3.8	1.4	2.2
	No. of respondents	n=2	n=89	n=496	n=587

3.2.3 Value addition of coffee and cocoa practiced

Few people are involved in value addition in coffee with only 265 out of the 1,016 respondents representing 26% and of those 64.5% are merely involved in packaging. On the other hand, many people are involved in value addition of cocoa with 518 out of 1016 respondents representing 51% and of those 69.1% are involved in fermenting. Table 11 below presents the proportions of the community value addition practiced. It is evident that the community is mainly involved in just coffee growing while for cocoa majority are involved in fermenting as well as growing. This is because the fermenting is undertaken collectively by the cooperative.

Table 11: Value addition of coffee and cocoa practiced by the community

Product	Value addition	Harugali sub-county	Bukonjo sub-county	Nyahuka town council	Overall
Coffee	Packaging	50.0%	82.1%	100.0%	64.5%
	Grading	4.1%	7.7%	0.0%	5.7%
	Hulling	44.5%	8.5%	0.0%	28.3%
	Roasting	1.4%	1.7%	0.0%	1.5%
	No. of respondents	n=146	n=117	n=2	n=265
Cocoa	Packaging	0.0%	82.9%	10.8%	31.2%
	Grading	0.0%	15.9%	7.4%	7.8%
	Hulling	0.0%	0.0%	0.0%	0.0%
	Fermenting	100.0%	1.2%	81.8%	61.0%
	No. of respondents	n=1	n=82	n=435	n=518

3.2.4 Form in which coffee and cocoa are sold

The study revealed that coffee is mainly sold after drying. Table 12 shows that out of 441 respondents that produced coffee, 86.5% sold dried coffee. On the other hand the majority (60.8%) of the cocoa Growers' sold fresh cocoa. Buka Bughendera Farmers' Cooperative Limited and Bundikakemba Growers' Cooperative Society Growers' Cooperative Society Limited will need to play a big role helping farmer improve on value addition activities to attract improved income.

Table 12: Form in which coffee and cocoa are sold

Product	Form	Harugali sub-county	Bukonjo sub-county	Nyahuka Town Council	Overall
Coffee	Fresh	10.7%	20.0%	50.0%	13.5%
	Dry	89.3%	80.0%	50.0%	86.5%
	No. of respondents	n=318	n=125	n=2	n=445
Cocoa	Fresh	50.0%	14.8%	69.2%	60.8%
	Dry	50.0%	85.2%	30.8%	39.2%
	No. of respondents	n=2	n=88	n=487	n=577

3.2.5 Coffee and Cocoa prices

The community is experiencing volatile price fluctuation with the minimum price for coffee and cocoa going as far as UGX 4000 and UGX 5000 respectively and the maximum reaching UGX 8,000 for both coffee and cocoa. Table 13 below shows that 25.4% of the respondents sold coffee at UGX 2,500 and below while 33.3% (30.4% plus 2.9%) above UGX 4,000. Similar trends were observed in cocoa with 55.4% between UGX 2500 and UGX 4,000 while 22.2% sold at above UGX 5,000. These fluctuations are adversely affecting the income of the community. This problem may partially be addressed by taking advantage of the BF Certification that can help access markets with relatively improved and stable prices.

Table 13: Price of coffee and cocoa per kilogram

Products	Price per kilogram (in UGX)	Harugali sub-county	Bukonjo sub-county	Nyahuka town council	Overall
Coffee	0 – 2500	31.4%	10.9%	0.0%	25.4%
	2501 – 4000	29.8%	68.8%	100.0%	41.3%
	4001 – 5000	34.9%	19.5%	0.0%	30.4%
	Above 5000	3.8%	0.8%	0.0%	2.9%
	Mean (in UGX)	3590	3804	4000	3653
	No. of respondents)	n=312	n=128	n=1	n=441
Cocoa	0 – 2500	0.0%	8.0%	7.2%	7.4%
	2501 – 4000	100.0%	5.7%	64.0%	55.4%
	4001 – 5000	0.0%	66.7%	6.0%	15.0%
	Above 5000	0.0%	19.5%	22.7%	22.2%
	Mean (in UGX)	2900	4822	3876	4015
	No. of respondents)	n=1	n=87	n=497	n=585

3.2.6 Buyers of Coffee and Cocoa

Coffee and cocoa farmers do not trek long distances in search of markets. The buyers are so close to farms. They have farm-gate markets where no farmer moves beyond 2kms to look for coffee/cocoa market. Most farmers sell to cooperatives and local stores. Compared to non-members of cooperatives, members were closer to markets and were sure of a ready market near their farm. Table 14 shows that 95.9% of respondents were selling coffee within 5 kms with mean of 2.6kms. Similarly, 94.8% of respondents were selling cocoa within 5 kms with mean of 1.8kms.

Table 14: Distance to buyers of coffee and cocoa

Products	Kilometers (Kms)	Harugali sub-county	Bukonjo sub-county	Nyahuka town council	Overall
Coffee	Less than 5 Kms	94.9%	98.4%	100.0%	95.9%
	5 - 10 Kms	4.8%	1.6%	0.0%	3.8%
	Above 10 kms	0.3%	0.0%	0.0%	0.2%
	Mean (in kms)	3.8	1.6	0	2.6
	No. of respondents	n=315	n=127	n=1	n=443
Cocoa	Less than 5 Kms	100.0%	95.5%	94.7%	94.8%
	5 - 10 Kms	0.0%	4.5%	3.1%	3.3%
	Above 10 kms	0.0%	0.0%	2.2%	1.9%
	Mean (in kms)	1.0	1.8	1.8	1.8
	No. of respondents	n=1	n=88	n=491	n=580

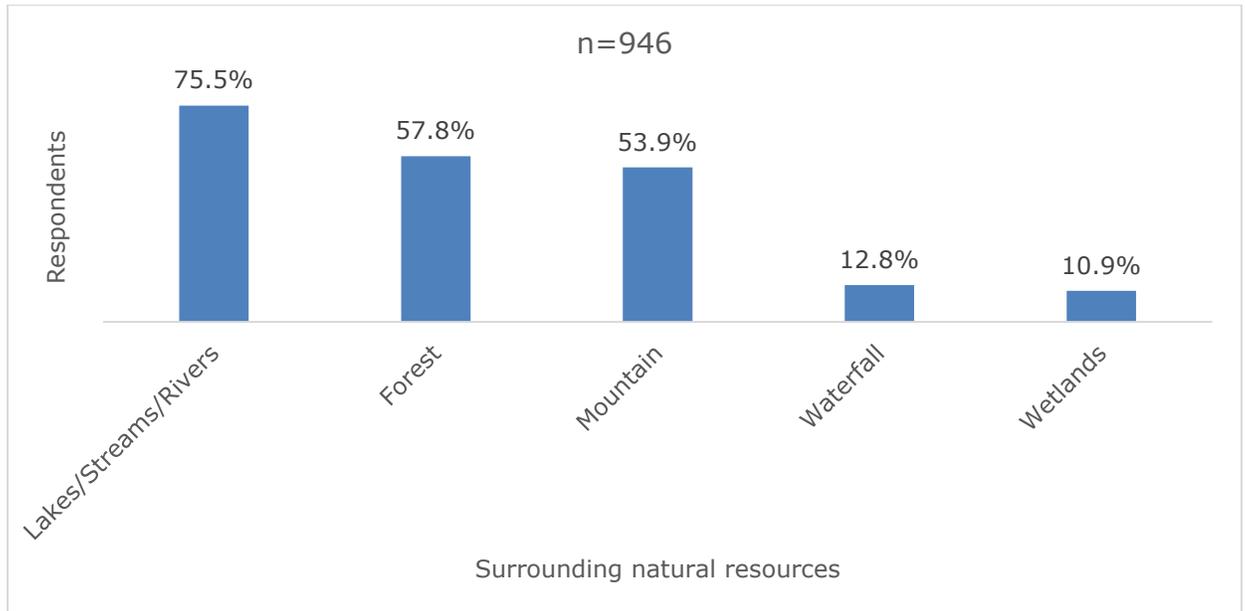
3.3 Role of the Surrounding Natural Resources

This section presents the role of the surrounding natural resources in promoting an inclusive eco-tourism as a pathway out of poverty for the local population.

This objective examines the role the surrounding natural resources can play as a pathway out of poverty for the local population surrounding Buka Bughendera Farmers' Cooperative Limited and Bundikakemba Growers' Cooperative Society in Bundibugyo and the whole district as a whole. For a natural resource to act as a pathway out of poverty for the local population, it must be accessible to the community. The community must obtain materials from it and they should be able to obtain an income from the materials obtained from the surrounding natural resources. Here the natural resources considered are forests, streams (including streams and rivers), wetlands, mountains and waterfalls.

The study revealed that the majority of the communities are surrounded by natural resources with 75.5% of the 946 respondents being surrounded by lakes/stream/rivers followed by forests with 57.8%. Figure 3 below shows that few (10.9%) people were surrounded by wetlands and this can partially be attributed to government efforts to protect wetlands, Bundibugyo being a mountainous area. Overall, the communities have access to surrounding natural resources, from which they obtain products which eventually translate into a monetary income to diversify household incomes from their farms.

Figure 3: Surrounding natural resources



The community is mainly accessing products from the forests and lake/streams/rivers as indicated at over 55%. The table shows that few people (8.3%) are obtaining products from the wetlands and this can partially be attributed to government effort to prevent encroaching on wetlands.

Table 15: Respondents accessing products from the natural resources

Natural resources	No. of respondents	Proportion of respondents
Forests	562	55.3%
Lake/Streams/Rivers	567	55.8%
Wetlands	84	8.3%
Mountain	434	42.7%
Water falls	122	12.0%
Total no. of respondents	1016	

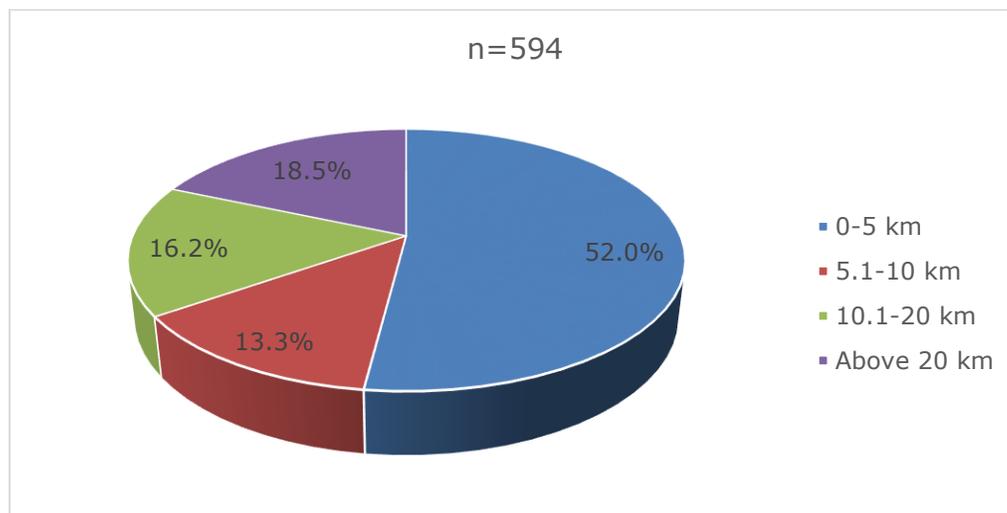
The parameters examined in this objective for the respective natural resources are distance from the natural resource, product obtained from the natural resource and the monthly monetary value of the products obtained from the surrounding natural resources.

3.3.1 Forests

3.3.1.1 Distance of the community to the forest

Up to 65.3% (52% plus 13.3%) of the respondents are within a distance of 10km from the forest and are able to access the forest easily. These are mostly residents of Harugali and Bukojo sub-counties that are within Buka Bughendera Farmers' Cooperative Limited catchment areas. Figure 4 below shows that 34.7% are staying beyond 10kms and are mainly from Nyahuka town council targeted by Bundikakemba Growers' Cooperative Society. This implies that the majority of the population in the community will be able to benefit from the eco-tourism because of the proximity to the forest.

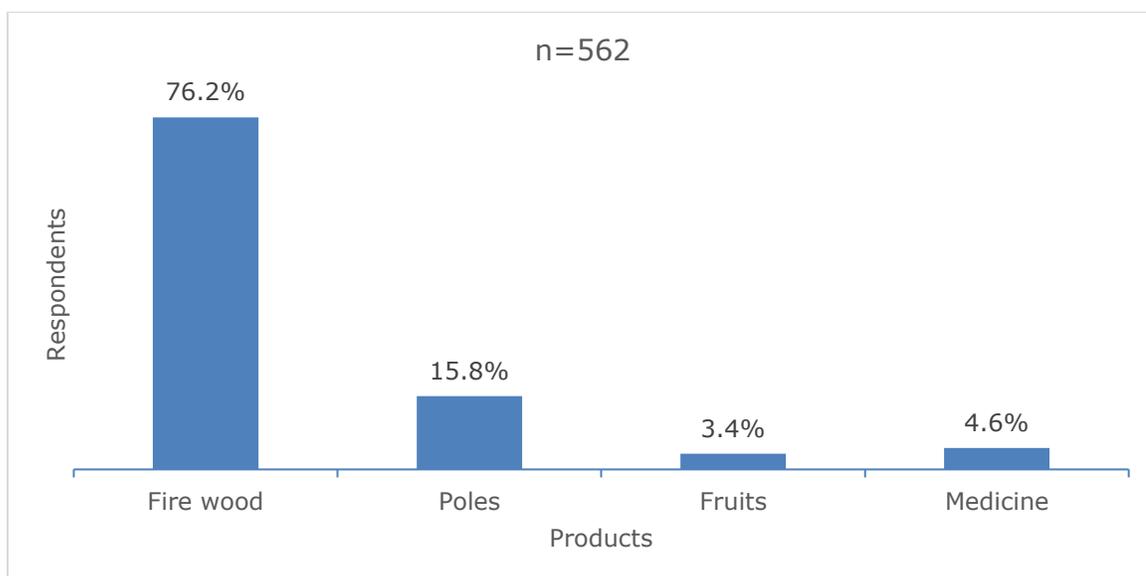
Figure 4: Distance from the community to the forest



3.3.1.2 Product obtained from the forest

Most of the population in the community are obtaining firewood from the forest for cooking and selling as indicted by 76.2% of the respondents in the figure below. The firewood was followed by timber with 15.8% of respondents and both of them have adverse effect on the environment. Introduction and promotion of solar energy and eco-tourism as an alternative source of energy and income presents not only improved household income but also protecting the environment. The figure below shows that some people are also obtaining medicine and fruits which are very important for the health of the community though at a lower scale. Eco-tourism and solar energy will conserve the environment by preventing people from taking firewood and timber from the forest that normally leads to trampling of other vegetation and deprives organisms (including some bird species) of habitat. The community must be encouraged to plant trees and minimize the use of firewood as a source of energy.

Figure 5: Products obtained from the forest



3.3.1.3 Monthly monetary value from the forest

The study revealed majority (55.6%) of the respondents receive low monetary value from the forest of less than UGX 50,000 per month and this includes firewood and timber that is affecting the environment adversely. Table 16 shows that average monthly monetary value received was UGX 60,171 and 89% of the respondents received products from the forest worth less than UGX 100,000.

This situation can improve if markets are obtained for environmentally friendly products and the community is sensitized on how to use the forest as a pathway to generate income. The monetary value from non-timber forest products like fruits and herbal medicine supplemented with Bird Friendly eco-tourism will be more than what the community is currently receiving. Bird Friendly eco-tourism will certainly offer a better alternative source of income and act as an incentive for the community to use the forest sustainably.

Table 16: Monthly monetary value from the forest

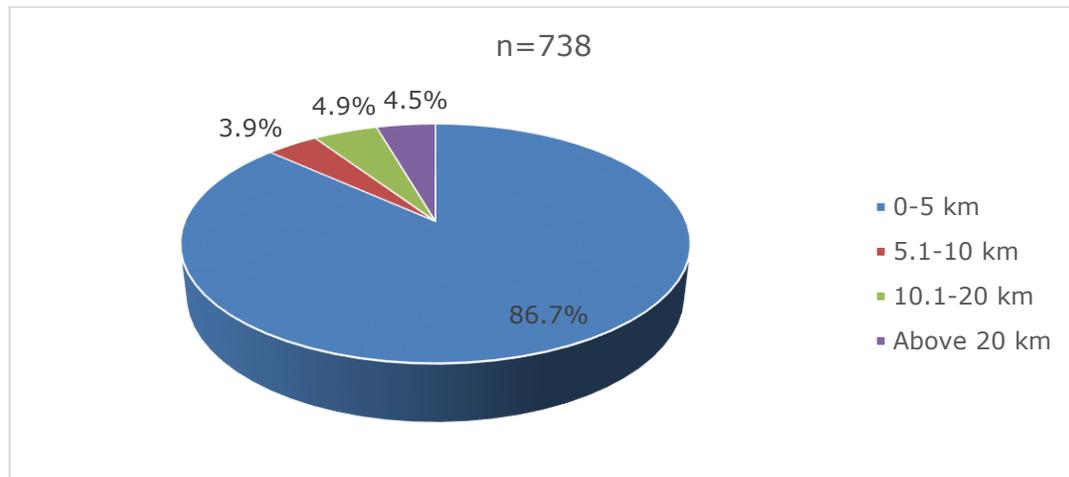
Monthly monetary (in UGX)	Harugali sub-county	Bukonjo sub-county	Nyahuka town council	Overall
Less than 20,000	25.0%	76.7%	13.6%	24.0%
20,000 – 49,999	27.3%	6.7%	42.0%	31.6%
50,000 – 99,999	32.0%	3.3%	19.3%	25.3%
100,000 and above	15.6%	13.3%	25.0%	19.0%
Mean (in UGX)	66,750	32,267	55,358	60,171
Respondents	n=256	n=30	n=176	n=462

3.3.2 Lakes/streams/rivers

3.3.2.1 Distance to the nearest stream or river

Up to 86.7% of the respondents live within a distance of 5km from the nearest lake or streams/river. This implies that most of population in the community have easy access to water resources. The figure 6 presents the proportion of respondents by distance from residents to nearest lake/stream/river. The water bodies in the area can contribute to the eco-tourism.

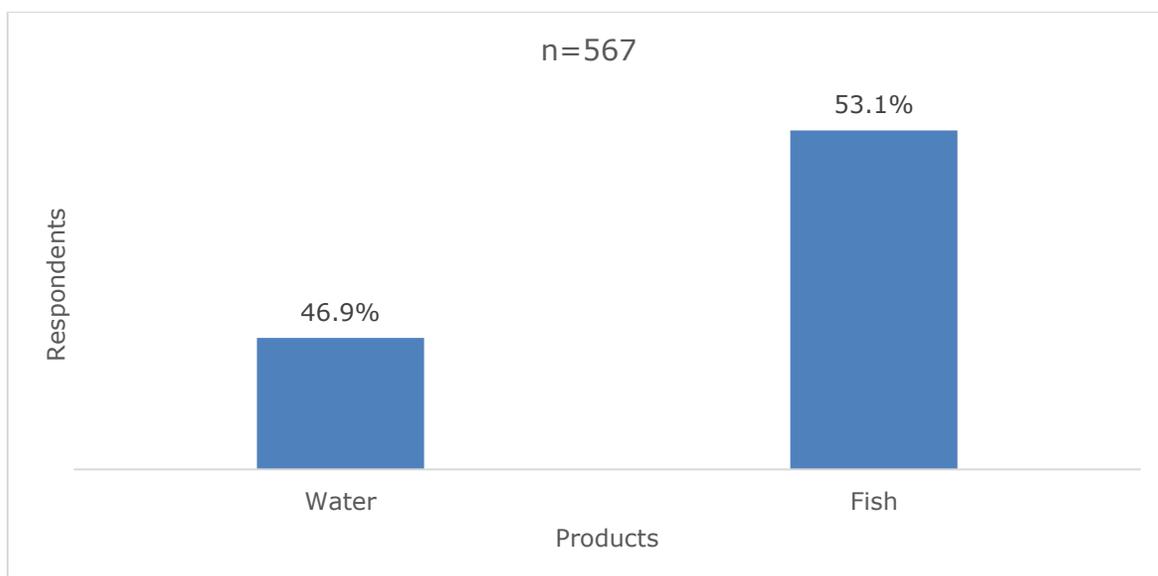
Figure 6: Distance to the nearest lake/stream/river



3.3.2.2 Products obtained from the lakes or streams or rivers

The survey revealed that 46.9% and 53.1% of the respondents obtained water and fish from nearby lake/river/stream respectively. This implies that the lakes, streams, or rivers can act as a pathway out of poverty if the fishing is done on a commercial basis and lake/streams/rivers are treated as tourist attraction spots. This will particularly benefit women and youth who should be encouraged and empowered to get involved in smoking, storing and selling of fish obtained from the streams and rivers. The fish could also act as food for tourists and a tourist attraction for those who would like to fish for sport hence providing potential for Bird Friendly eco-tourism. The figure below presents the product obtained from the lakes or streams or rivers respondents that accessed them.

Figure 7: Products obtained from the lakes, streams, or rivers



3.3.2.3 Monthly monetary value from lake/streams/rivers

As was the case for monetary value received from forests, the majority (66.5%) of the population are receiving products valued at less than UGX 50,000 per month. Table 17 below shows that, on average, each member of the community received products from lake/streams/rivers worth UGX 88,336 per month. The products are mainly for domestic use or consumption. As mentioned in the sub section, lakes, streams, or rivers can act as a pathway out of poverty if the fishing is done on a commercial basis and lake/streams/rivers are treated as tourist attraction spots.

Table 17: Monthly monetary value from Lake/streams/rivers

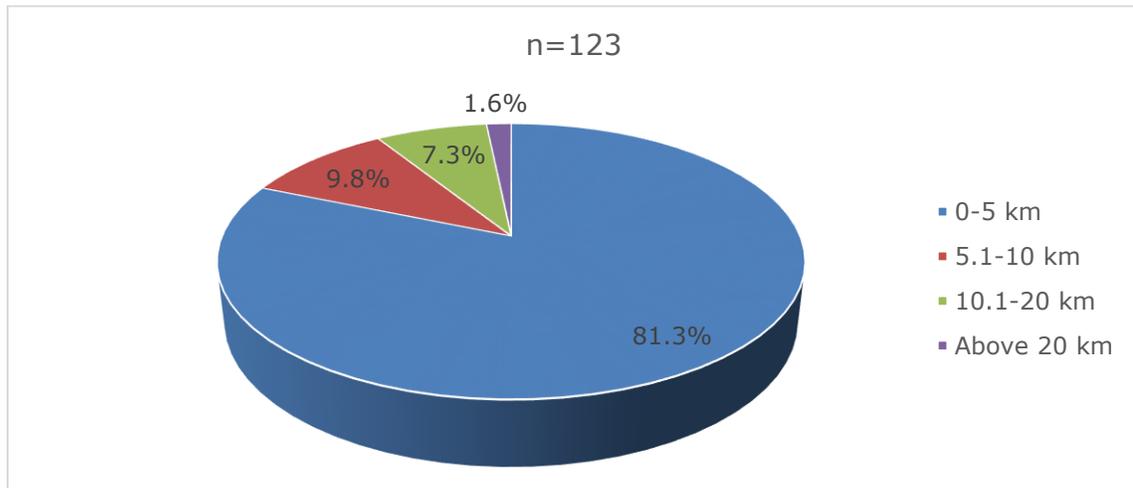
Monthly monetary (in UGX)	Harugali sub-county	Bukonjo sub-county	Nyahuka town council	Overall
Less than 20,000	29.7%	85.7%	28.1%	29.7%
20,000 - 49,999	43.7%	14.3%	33.2%	36.8%
50,000 - 99,999	16.5%	.0%	9.5%	12.0%
100,000 and above	10.1%	.0%	29.2%	21.5%
Mean (in UGX)	39,016	13,857	121,197	88,336
Respondents	n=158	n=7	n=253	n=418

3.3.3 Wetlands

3.3.3.1 Distance to the wetland

Up to 81.3% of the respondents live within a distance of 5km meaning that wetlands are easily accessible for the community. This includes both members and non-members of the cooperative. Communities near Bundikakemba Growers’ Cooperative Society are, however, closer to wetlands compared to those of Buka Bughendera Farmers’ Cooperative Limited. It worth noting that few people are near wetlands as shown in the figure below only 123 people of the 1016 representing 12% were able to respond to distance to the wetlands. The sample of 123 respondents is relatively small (well below 384 respondents at 95% confidence level) to facilitate making reliable conclusions.

Figure 8: Distance to the nearest wetlands

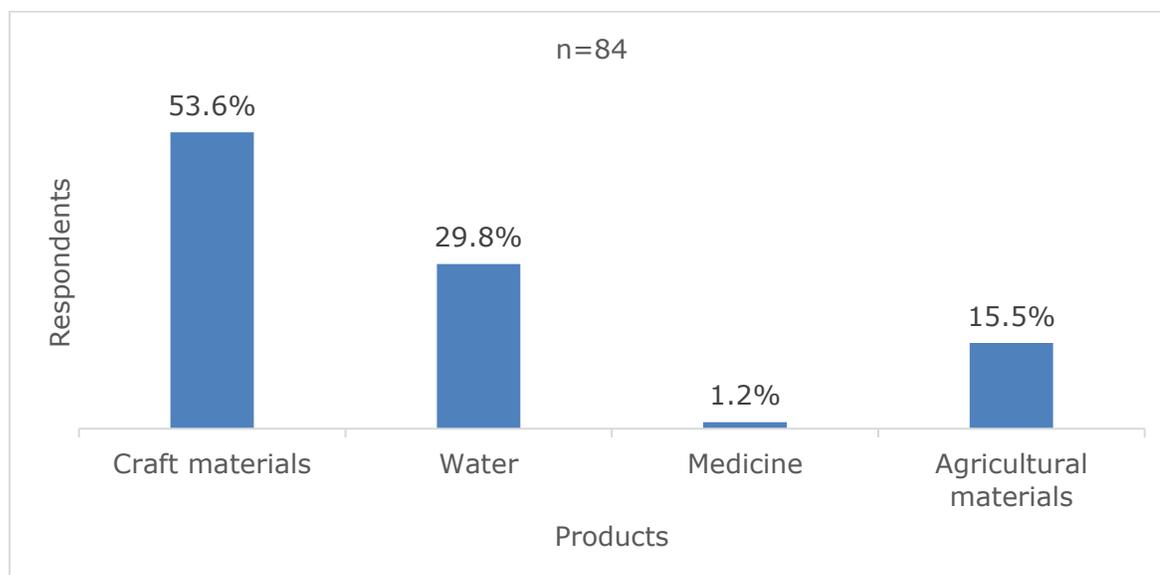


3.3.3.2 Products obtained from the wetland

Only 84 respondents out of the 1016 representing 8.3% were obtaining products from the wetlands. The survey revealed that the majority (53.6%) followed by water with, 29.8% of the respondents as indicated in the figure 9 below. The figure below shows that 15.5% of respondents were obtaining agricultural materials (fiber for construction of storage facilities, mulch etc.) from the wetland. Craft materials can especially be used for income generation making wetlands a pathway out of poverty for the community. Medicine and agricultural materials that are obtained from the wetlands can also act as a pathway out of poverty if a market is obtained. If the extraction of these products is abused, the wetlands will be destroyed since they are very vulnerable. This calls for sustainable management that can partially be achieved

through Bird Friendly eco-tourism. The sample of 84 respondents is relatively small to facilitate making reliable conclusions

Figure 9: Products obtained from the wetland



3.2.3.3 Monthly monetary value from wetland

In the survey 43.6% of the 94 respondents were receiving UGX 100,000 or more monetary value from the wetlands and on average the people near the wetlands were receiving UGX 100,489. However, the sample of 94 respondents is relatively small to facilitate making reliable conclusions. Again, the wetlands require clear well communicated wetland management policies to minimize negative environmental impact, and hence has many restrictions for use. So, the focus should mainly be only alternative sources of income and wetlands be utilized for eco-tourism and other environmental requirements.

Table 18: Monthly monetary value from wetland

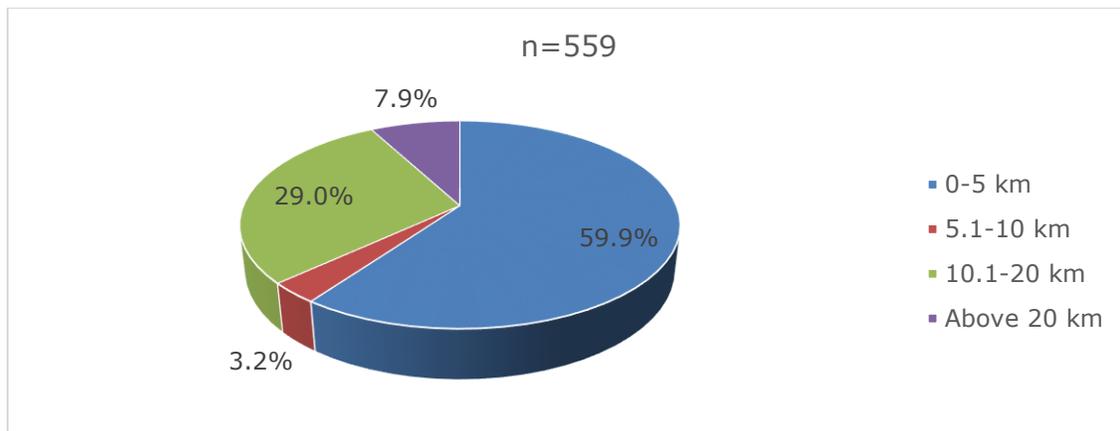
Monthly monetary (in UGX)	Harugali sub-county	Bukonjo sub-county	Nyahuka town council	Overall
Less than 20,000	12.5%	0.0%	14.0%	13.8%
20,000 – 49,999	50.0%	0.0%	25.6%	27.7%
50,000 – 99,999	37.5%	0.0%	12.8%	14.9%
100,000 and above	.0%	0.0%	47.7%	43.6%
Mean (in UGX)	34,375	0	106,640	100,489
	n=8	n=0	n=86	n=94

3.3.4 Mountain

3.3.4.1 Distance to the Mountain

Up to 59.9% of the respondents live within 5km with 63.1% living within 10km of the mountain, which means more than half of the population have easy access to the mountain.

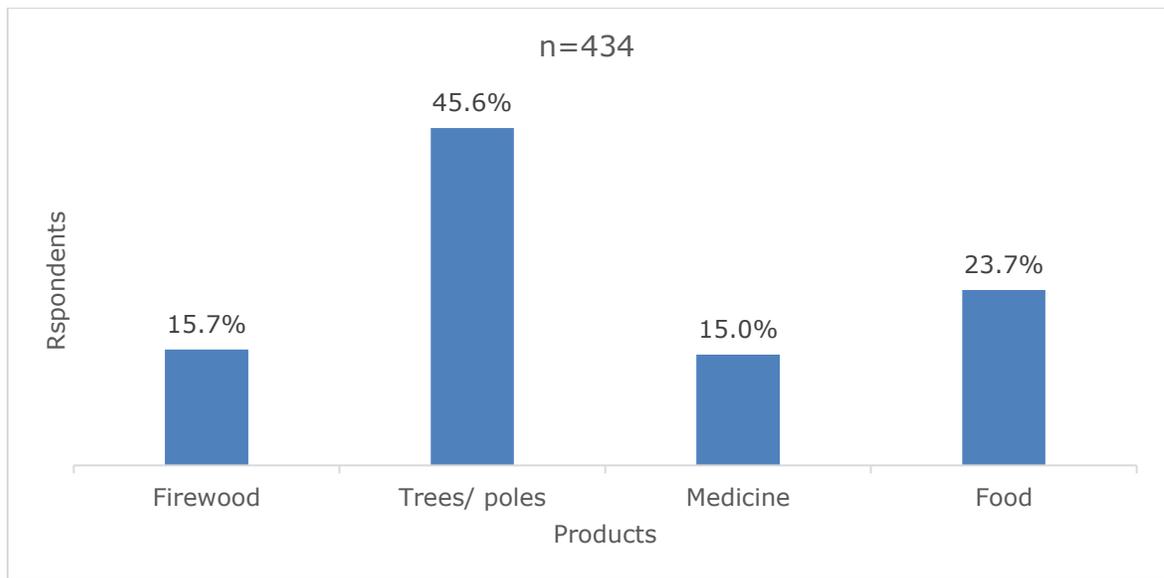
Figure 10: Distance to the Mountain



3.3.4.2 Products from the mountain

In the survey, 45.5% and 23.7% of the respondents obtain trees/ poles and food respectively from the mountain. Sale of trees and poles could be a threat to the environment, if not well managed. The population needs to be sensitized about the dangers of cutting trees. Therefore, alternative means of generating income through BF certification and eco-tourism are timely. From the figure below, the study indicates that 15% of the respondents are getting medicine from the mountain that can improve health of the community and supplement income of the community. The figure below presents the products obtained from the mountains by respondents accessing them.

Figure 11: Products from the mountain



3.3.4.3 Monthly monetary value from the mountain

The study revealed that majority (58%) of the population are receiving less that UGX 50,000 monetary value per month from the mountains. The figure below indicates that on average people receive UGX 79,569 monetary value per month with 75.4% receiving below UGX 100,000. This implies that the most of community members are not harnessing enough resources from the mountains to meet their household needs. The BF certification and eco-tourism initiative will enhance income from the mountains.

Table 19: Monthly monetary value from the mountain

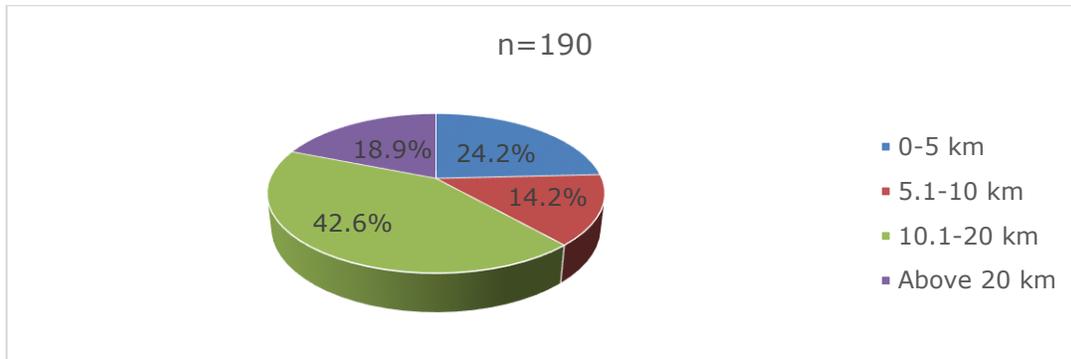
Monthly monetary (in UGX)	Harugali sub-county	Bukonjo sub-county	Nyahuka town council	Overall
Less than 20,000	24.6%	37.5%	25.7%	25.4%
20,000 – 49,999	32.6%	62.5%	31.3%	32.6%
50,000 – 99,999	23.5%	.0%	11.7%	17.4%
100,000 and above	19.3%	.0%	31.3%	24.6%
Mean (in UGX)	72,778	19,001	89,370	79,569
No. of respondents	n=187	n=8	n=179	n=374

3.3.5 Waterfalls

3.3.5.1 Distance to the waterfalls

Up to 24.2% of the respondents live within 5 km of the waterfalls with 38.4% within 10 km of the waterfalls. This means that less than half of the population can easily access the waterfalls.

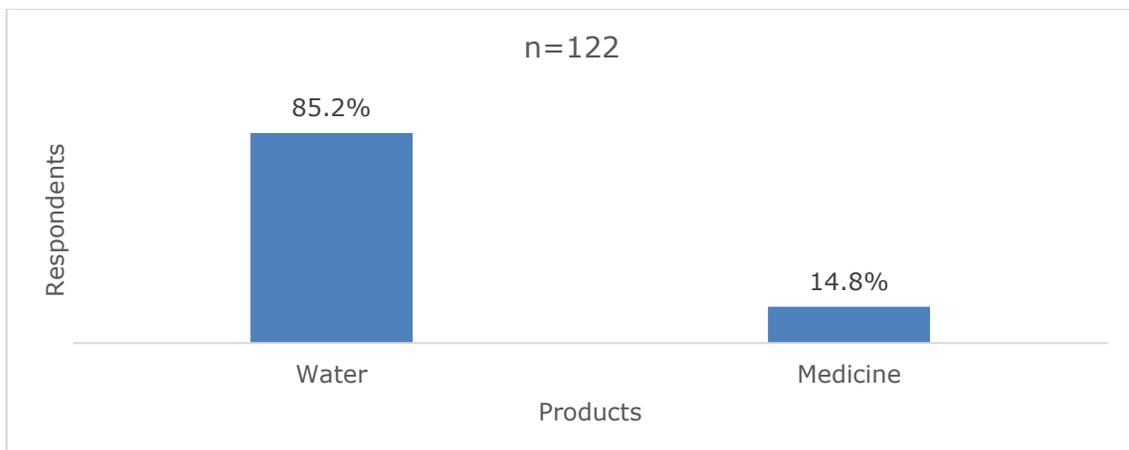
Figure 12: Distance to the waterfall



3.3.5.2 Product from the waterfalls

In the survey 85.2% and 14.8% of the respondents obtain water and medicine (herbs) respectively from the waterfalls. Once a market is established, a small part of the community can earn an income from herbal medicine and cultural healing obtained from the waterfalls. Cultural medicine can also act as a tourist attraction hence contributing to the feasibility of Bird Friendly Eco-tourism.

Figure 13: Product from the waterfalls



3.3.5.3 Monetary value from the waterfall

The study revealed that most (73%) of the population are receiving less than UGX 50,000 monetary value per month from the waterfalls. The figure below indicates that on average people receive UGX 37,645 monetary value per monthly with 93.6% receiving UGX 100,000.

Table 20: Monthly monetary value from the waterfall

Monthly monetary (in UGX)	Harugali sub-county	Bukonjo sub-county	Nyahuka town council	Overall
Less than 20,000	8.3%	0.0%	45.0%	41.8%
20,000 – 49,999	16.7%	0.0%	32.6%	31.2%
50,000 – 99,999	66.7%	0.0%	16.3%	20.6%
100,000 and above	8.3%	0.0%	6.2%	6.4%
Mean (in UGX)	63,750	0	35,217	37,645
No. of respondents	n=12	n=0	n=129	n=141

3.4 Technical and agro-ecological components of the community

This section presents the technical and agro-ecological components of the community, which are key for a Bird Friendly certification/ agro-eco-tourism and eco-technology

The agro-ecology components are important benchmarks for developing an agro-tourism enterprise. The partly mountainous and low land nature of the Bundibugyo district landscape provides unique agro-ecological characteristics. Understanding characteristics, especially those associated with cocoa and coffee farming, is important for Bird Friendly certification, agro-eco-tourism and eco-technology development.

3.4.1 Farming systems for coffee and cocoa practiced by the farmers

The study found that the community mainly practiced mono-crop farming systems with coffee and cocoa as the main cash crops. The attitudes of the community towards different methods of coffee/cocoa production systems indicated that they were happy with the current production and reluctant to change especially if that change involved use of agro-chemicals. The respondents indicated that they preferred organic farming. In Bundikakemba it was observed that the communities faced a limitation of low yields due to improper spacing and this is what they could change with proper advice.

The community members do not have ordinances made by the community to protect organic production of cocoa and coffee production. They only revealed that they have restriction on when to harvest cocoa, which is only harvested 15th and 30th day of the month in the harvest season. Also, they have restrictions on pruning of cocoa which is done only in March and June/July. Also, at the district in Bundibugyo, there is an ordinance against the use of agro-chemical inputs. The respondents said that they have adhered to this ordinance strictly.

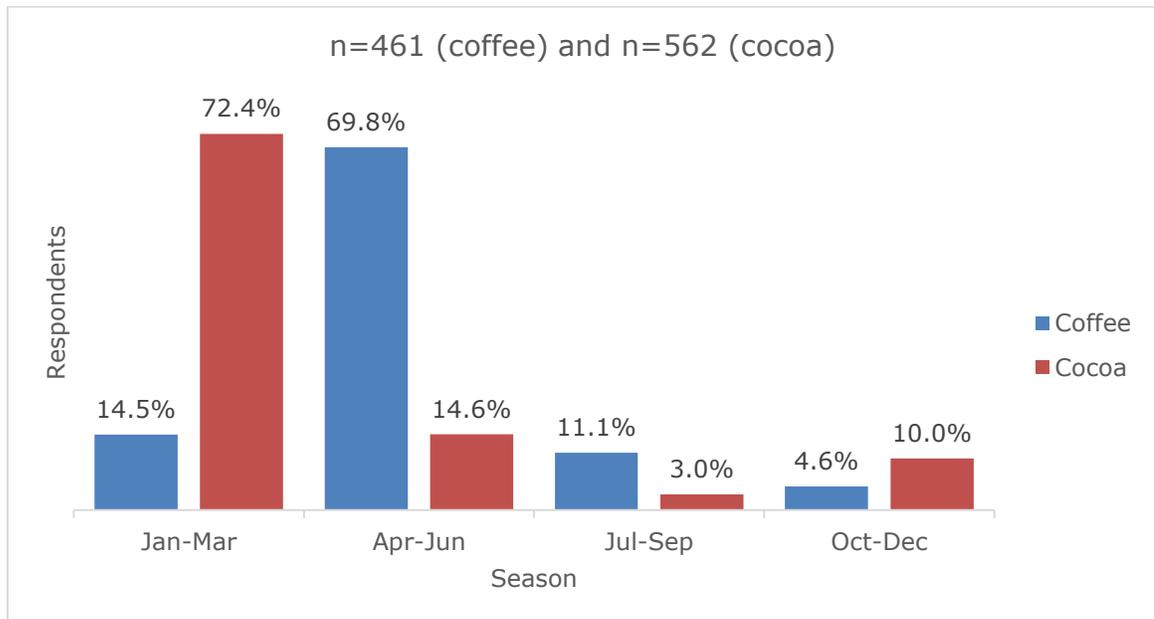
The respondents also revealed that the companies trading in coffee and cocoa in the area engage in corporate social responsibility. They cited ESCO, which provides training in cocoa farming, contributes to church activities (iron sheets, cement), has built a library and has provided rubbish bins. Other companies that engage in some social responsibility include Olam, Semuliki Union and ICAM. These companies buy cocoa especially in Bundikakemba.

About getting a premium on cocoa/coffee produced if the community meets the certification criteria, the respondents were positive provided it translates to a price commensurate to the input they make in the farming and production process. They were positive about the certification and agro-tourism aspects associated with the certification process indicating that it will be a way for them to earn income in the months Feb- September when cocoa is out of season.

3.4.1.1 Seasons for planting coffee and cocoa

The main planting months for coffee are April to June while for cocoa it is January to March. Figure 14 below shows that 69.8% and 72.4% of the respondents were planting coffee and cocoa in April to June and January to March respectively. It is important to note that both coffee and cocoa are long lasting crops, so they are not planted annually.

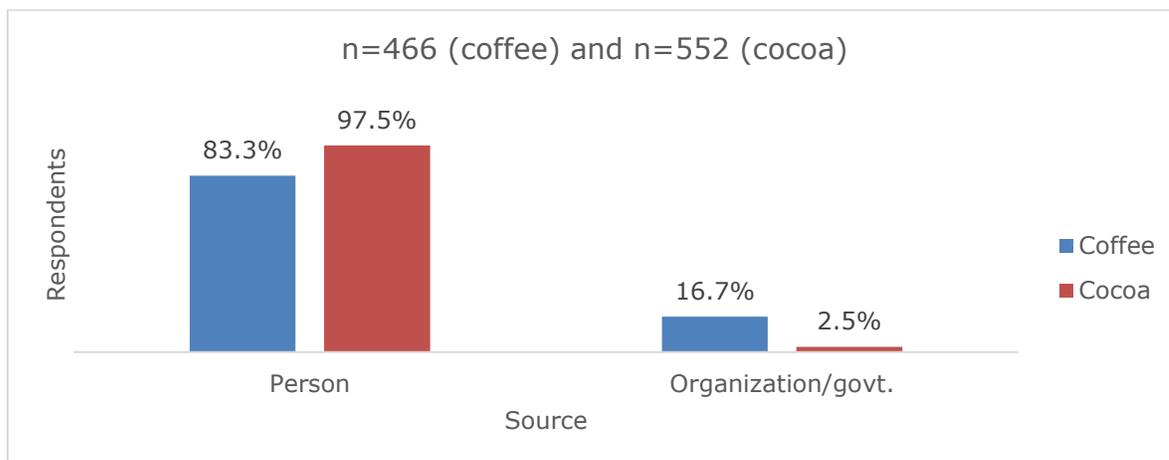
Figure 14: Seasons for planting coffee and cocoa



3.4.1.2 Source of planting material for coffee and cocoa

The sources of planting materials for both coffee and cocoa were mainly personal sources rather than organizations or corporations or government. This implies that planting material are always available and easily accessible within the community.

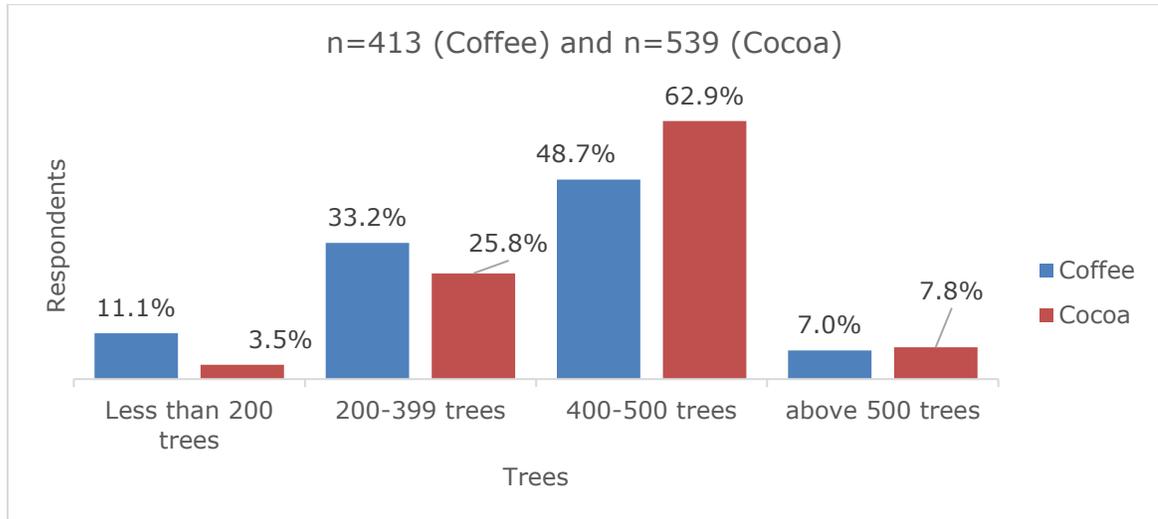
Figure 15: Source of planting material



3.4.1.3 Number of coffee and cocoa plants per hectare

Figure 16 below presents number of plants per acres. The figures can be converted to per hectare by multiplying by 2.471 because 1 hectare is equivalent 2.471 acres. The study revealed that 48.7% and 62.9% of the coffee and cocoa farmers respectively planted between 400 and 500 trees per acres (between 988 and 1236 per hectares). This is comparable to many cocoa producing countries that planting between 1,000 and 1,200 trees per hectare.

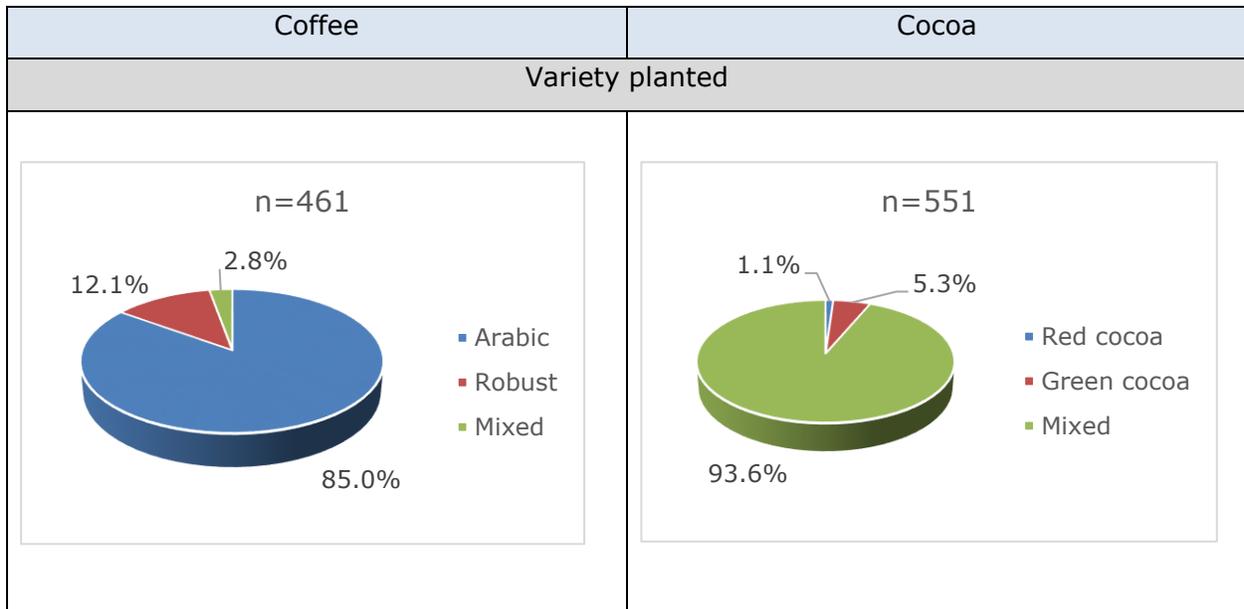
Figure 16: Number of coffee and cocoa plants per acre

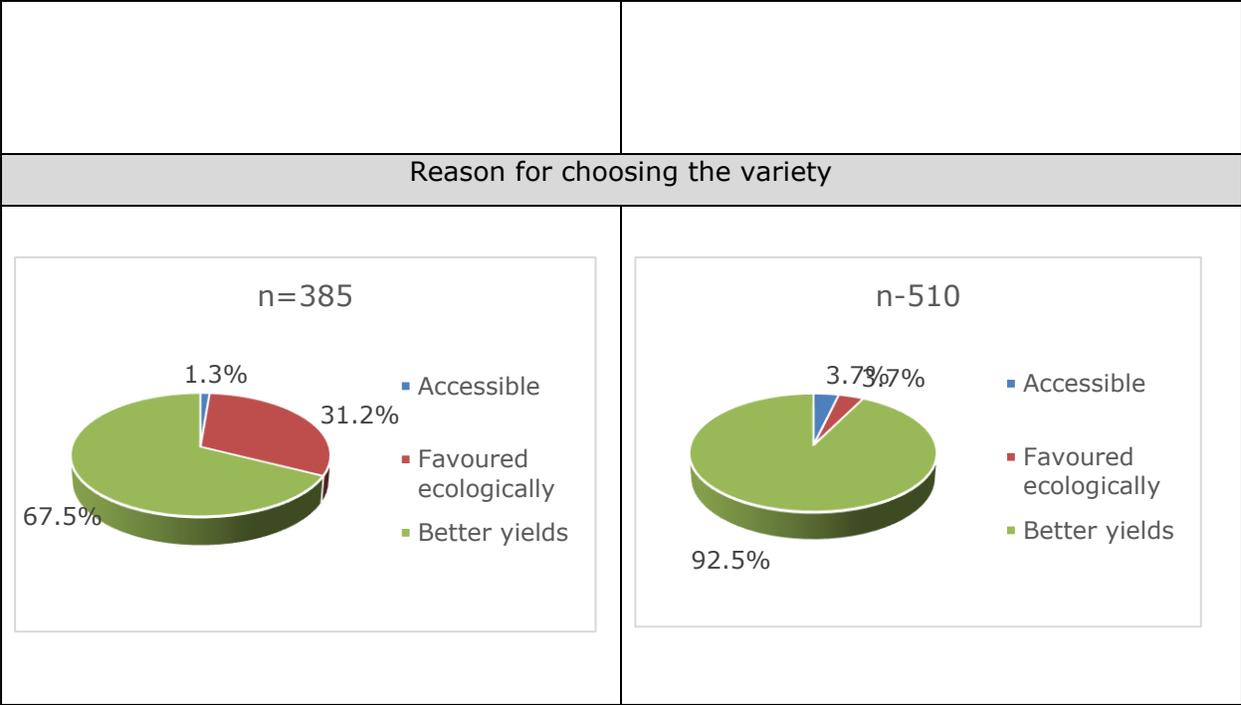


3.4.1.4 The variety of coffee and cocoa planted

The farmers further revealed that Arabica coffee was the main type of coffee planted and for cocoa farmers; they planted mainly mixed type of cocoa. On choosing the variety of coffee to plant, 67.5% indicated that the choice is based on better yield while 31.2% base on the variety that is favored ecologically. In case of cocoa, the choice of the variety is based on better yield as indicated by 92.5% of the respondents in the figure below. Figure 17 presents the variety of coffee and cocoa planted by the community and why they prefer the variety.

Figure 17: The variety of coffee and cocoa planted and why.

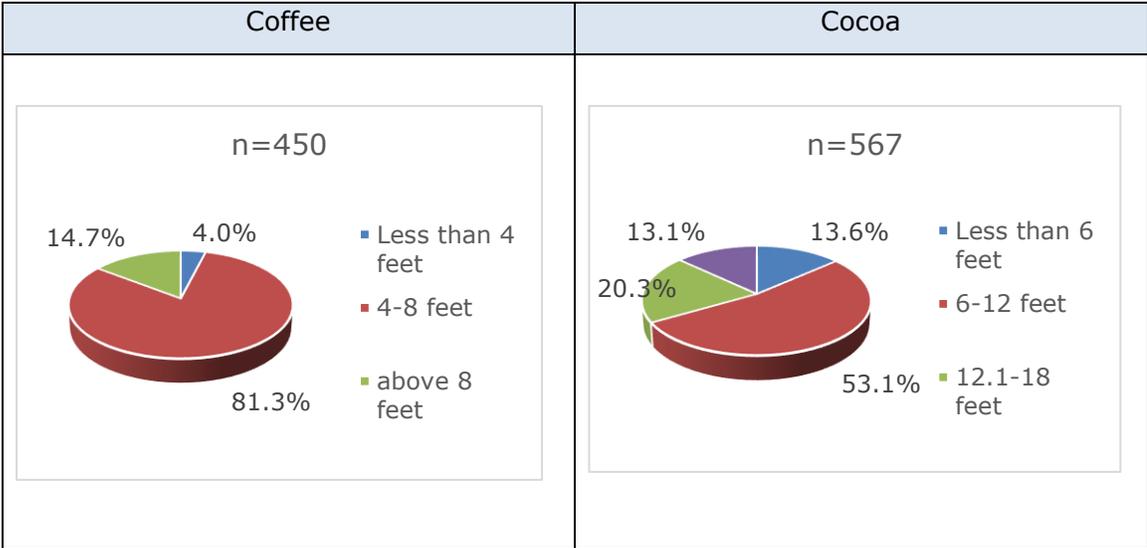




3.4.1.5 Average canopy height for coffee and cocoa

The study revealed that most (81.3%) of respondents indicated that the canopy height of coffee was between 4 and 8 feet while majority (53.1% of the cocoa farmer indicated the canopy height of cocoa was between 6 and 12 feet.

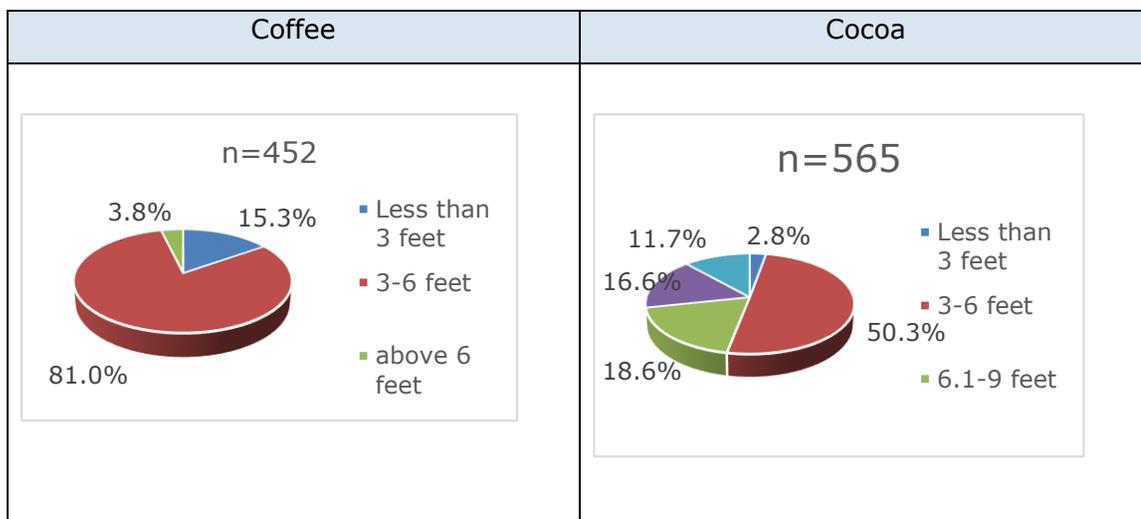
Figure 18: Average canopy height for coffee and cocoa



3.4.1.6 Average Canopy width of coffee and cocoa

The study revealed that most (81%) of respondents indicated that the canopy width of coffee was between 3 and 6 feet while majority (50.3%) of the cocoa farmer indicated the canopy width of cocoa was between 3 and 6 feet

Figure 19: Average canopy width for coffee and cocoa



3.4.1.7 Common methods of weed management in Coffee and Cocoa

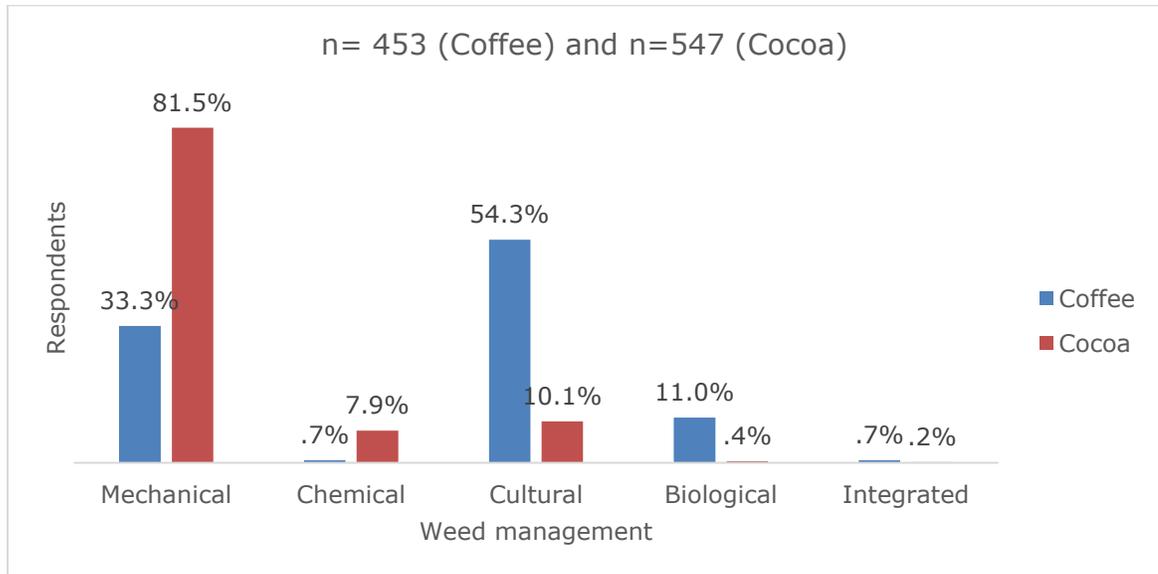
Weeds can be controlled/reduced using a number of approaches including:

- i. *Mechanical*: require application of physical human force to eliminate weed include slashing, hand uprooting, hoeing, cutting etc.,
- ii. *Chemical*: involve the use of chemicals known as herbicides,
- iii. *Biological*: involve applying living organisms such as bacteria, fungi, insects, domestic animals etc. to control weeds in the plantations,
- iv. *Cultural*: involve controlling weeds indirectly through practices such as mulching, crop rotation, fertilizer application etc.,
- v. *Integrated*: involve applying all the individual methods, step by step, to eliminate the weeds, and
- vi. *Legislative*: involve using of phytosanitary (measures for the control of plant diseases) laws and by-laws to restrict movement of planting material e.g. quarantine.

The famers practiced the first 5 methods, (except chemical), of weed management above in cocoa and coffee. The majority (54.3%) of the coffee farmers used cultural methods and most (81.5%) of cocoa farmers used mechanical methods of weed management. These methods of weeding have no harm to birds or the birds' habitats

and therefore are acceptable to Bird Friendly certification. Figure 20 below shows that chemical weeding is rarely used and when used it is at very minimal levels by especially vegetable Growers' who are non-cooperative members compared to cooperative members. This kind of weeding is not desired in BF certification and the few farmers practicing it can be discouraged from using it further by proposing better alternative income generating activities, which are environmentally friendly. Biological and integrated weed management are the other 2 methods used and both of them are Bird Friendly as it was mentioned that no chemicals are involved.

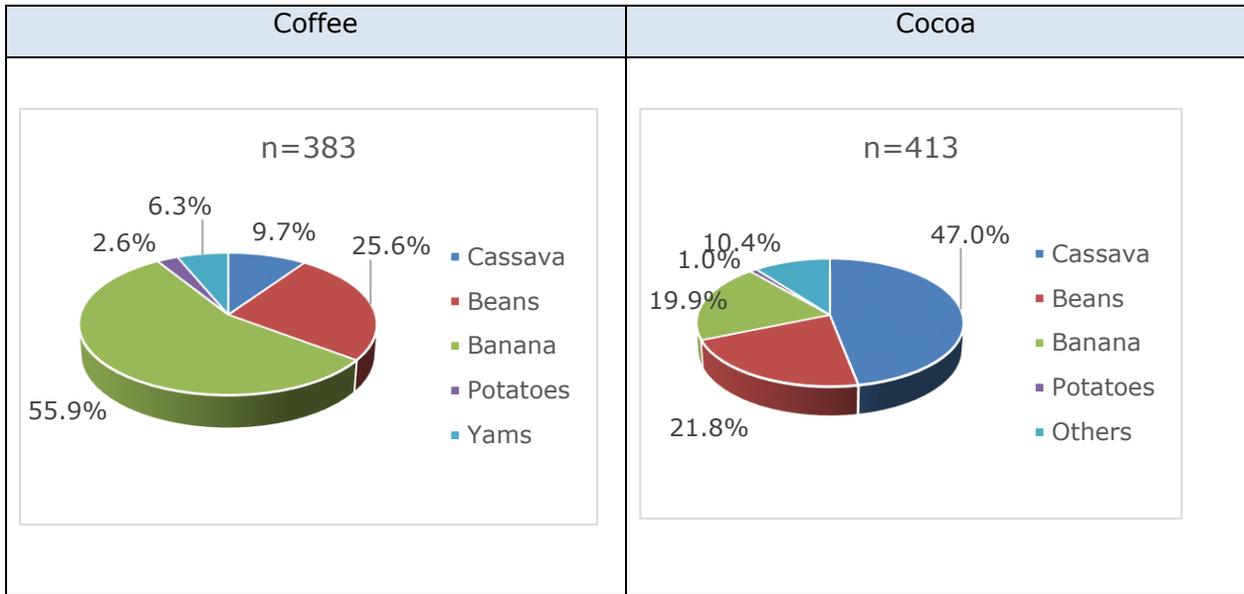
Figure 20: Common methods of weed management in Coffee and Cocoa



3.4.1.8 Crops intercropped with Coffee

In both coffee and cocoa plantations there was inter cropping. In coffee the majority (55.9%) of the farmers intercropped with banana while cocoa was mainly intercropped with cassava as indicated by 47% of the respondents in the figure below. Figure 21 shows that 25.6% and 21.8% of the respondents intercropped coffee and cocoa respectively with beans.

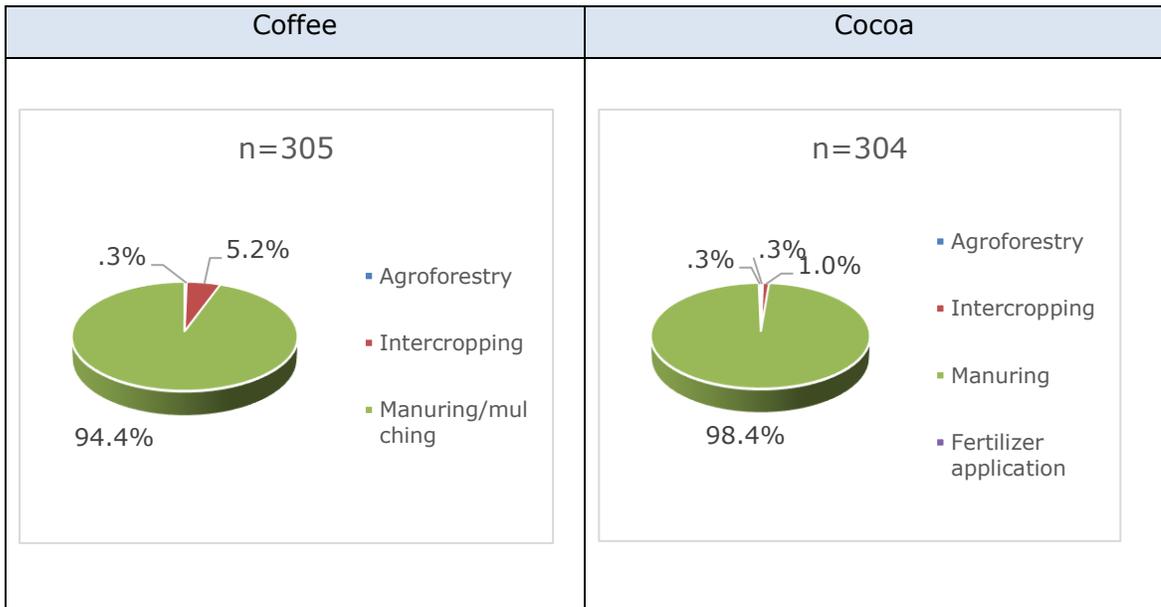
Figure 21: Crops intercropped with Coffee



3.4.1.9 Methods used in improving soil fertility in Coffee and cocoa

Concerning the management of soil fertility, most of coffee and cocoa farmers used manure. Figure 22 shows that 94.4% and 98.4% of the coffee and cocoa farmer respectively use manure to improve soil fertility. It is important to note that coffee farmers are using mulching which complies with FB certification requirements.

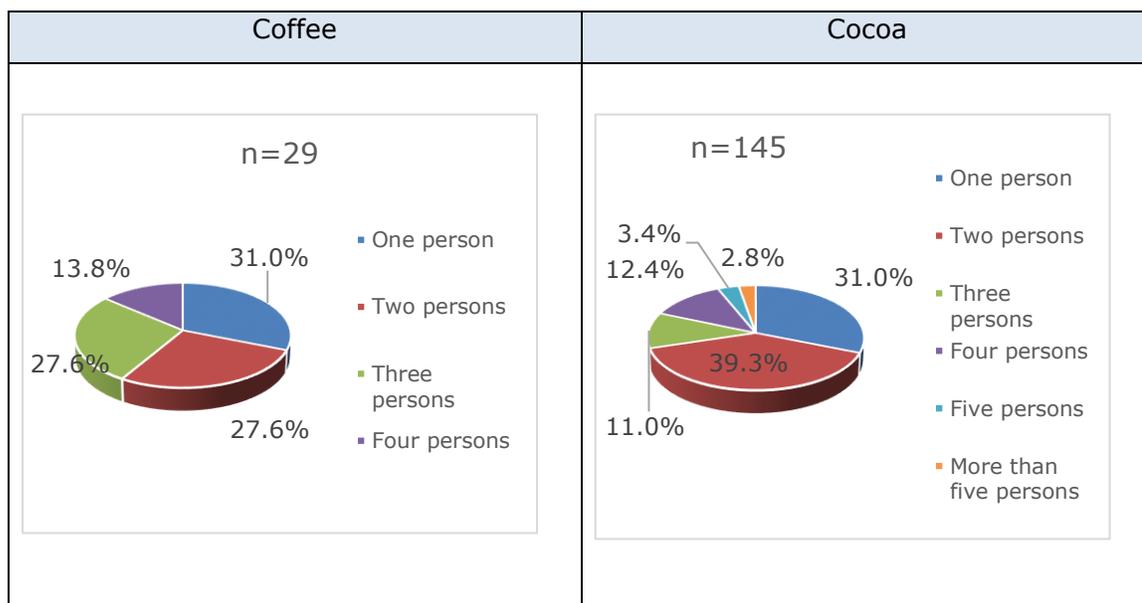
Figure 22: Methods used in improving soil fertility in Coffee and cocoa



3.4.1.10 Number of persons hired for Coffee per season

In both coffee and cocoa, few farmers were hiring labor. Figure 23 shows that only 29 and 145 respondents hired labor compared to 466 and 552 respondents who indicated source of planting materials for coffee and cocoa (proxy for coffee and cocoa farmers) respectively. This translates in 6.5% and 26.3% of farmers for coffee and cocoa respectively. Again, most of them were not hiring more than 2 persons. Figure 23 shows that 58.6% and 70.3% of respondents were not hiring more than two people per season for coffee and cocoa respectively. The low level of hired labour may partially be attributed to the fact that most of the community members are small holder farmers

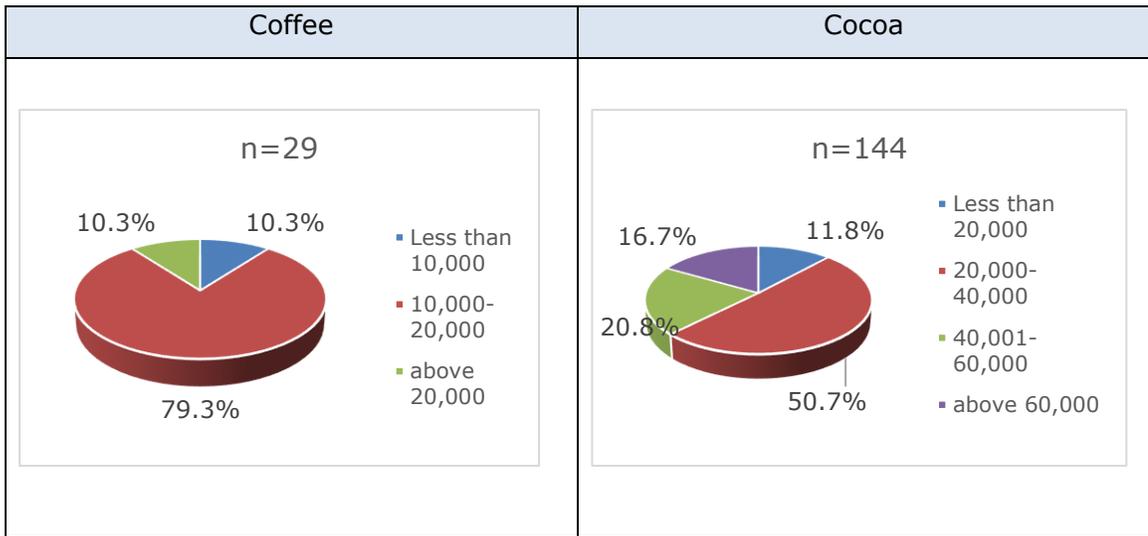
Figure 23: Number of persons hired for Coffee per season



3.4.1.11 Cost of hired labor per person per day for coffee

The hired labor cost was more expensive for cocoa farmers than coffee farmers. Most (79.1%) of the coffee farmers paid between UGX 10,000 and UGX 20,000 per day while the majority (50.1%) of the cocoa farmers paid between UGX 20,000 and UGX 40,000 per day and 20.8% paid between 40,000 and 60,000 per day. The respondents who were willing to provide hired labour costs were few as shown the figure only 29 and 144 for coffee and cocoa respectively. However, the information is reliable because those who were not willing to provide were not forced into giving unreliable information.

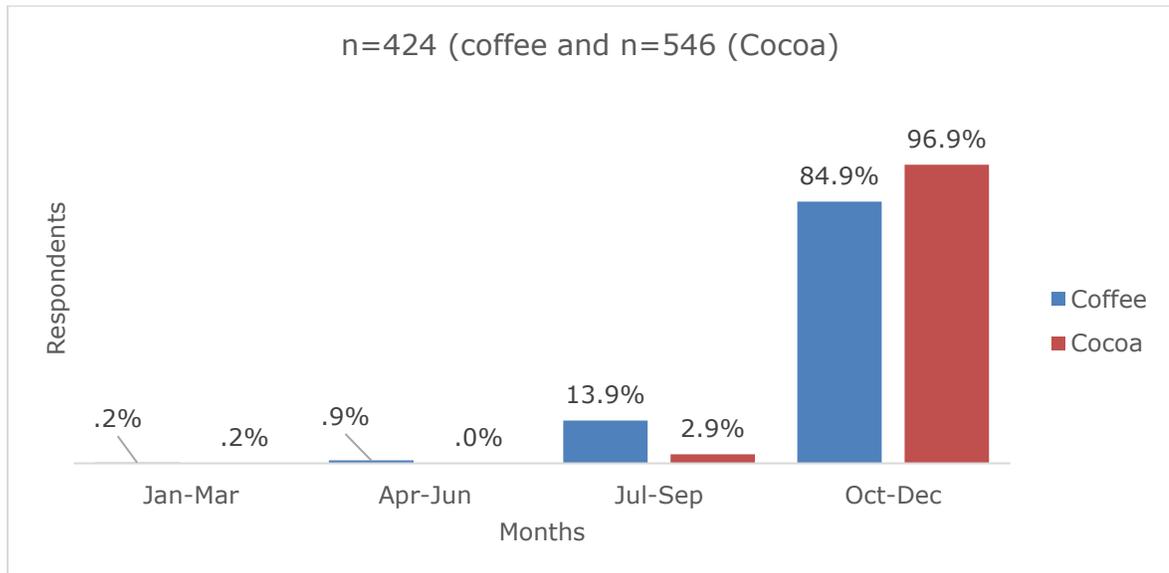
Figure 24: Cost of hired labor per person per day for coffee



3.4.1.12 Peak months for harvesting coffee and cocoa

The peak of the harvesting season for most of the coffee and cocoa farmers was between October and December. Figure 25 below shows that 84.9% and 96.9% of respondents for coffee and cocoa harvest between October and December. This implies that much as the FB certification promises to offer stable and improved prices for coffee and cocoa, the community will need to embrace alternative sources of income like eco-tourism to cater for the long period when they are not harvesting coffee and cocoa.

Figure 25: Peak months for harvesting coffee and cocoa



3.4.2 Use of alternative energy

The respondents revealed that they mostly do not use cooking stoves. Their main source of energy is firewood and charcoal. Table 21 shows that only 21.9% were using energy saving stove. On asking respondents not using energy saving stoves whether they would like to use these stoves, 94.1% answered in affirmative. Community members said they were willing to change due to limitations of getting dry wood and due to smoke produced using firewood in cooking. In Bundikakemba a few members used Lorena stoves (2 pot), 1 pot stove.

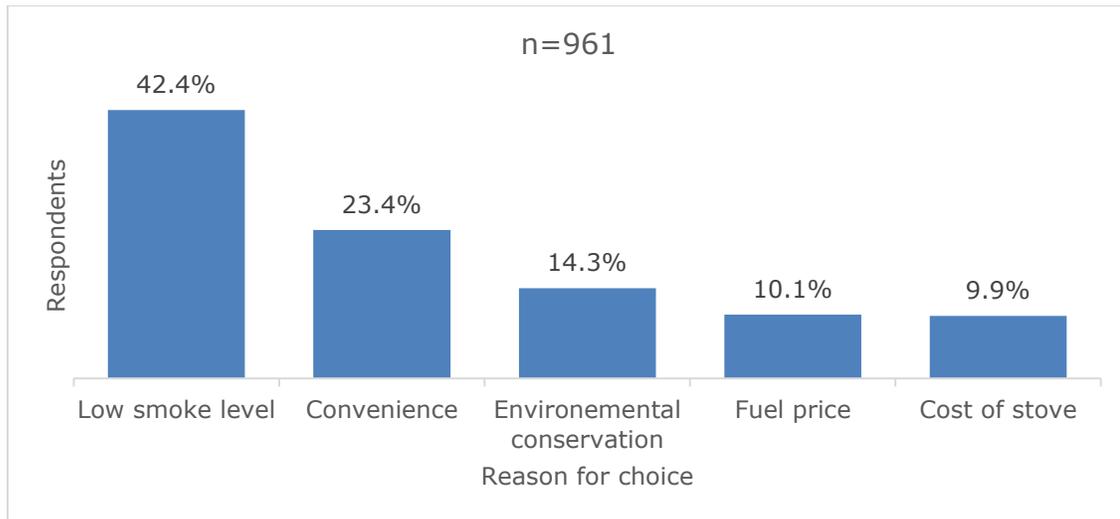
Table 21: Use of energy saving stoves

Using saving	Harugali sub-county	Bukonjo sub-county	Nyahuka town council	Overall
Yes	15.0%	11.5%	30.1%	21.9%
No	85.0%	88.5%	69.9%	78.1%
	n=359	n=156	n=501	n=1016

3.4.2.1 Type of energy stove preferred

The study revealed 53.7% of the respondents preferred charcoal briquettes stoves to firewood stoves and on asking the reason for the choice, 42.4% indicated low smoke level followed by convenience with 23.4%. The cost had the least number of respondents with 9.9%.

Figure 26: Reasons for choosing to use stoves

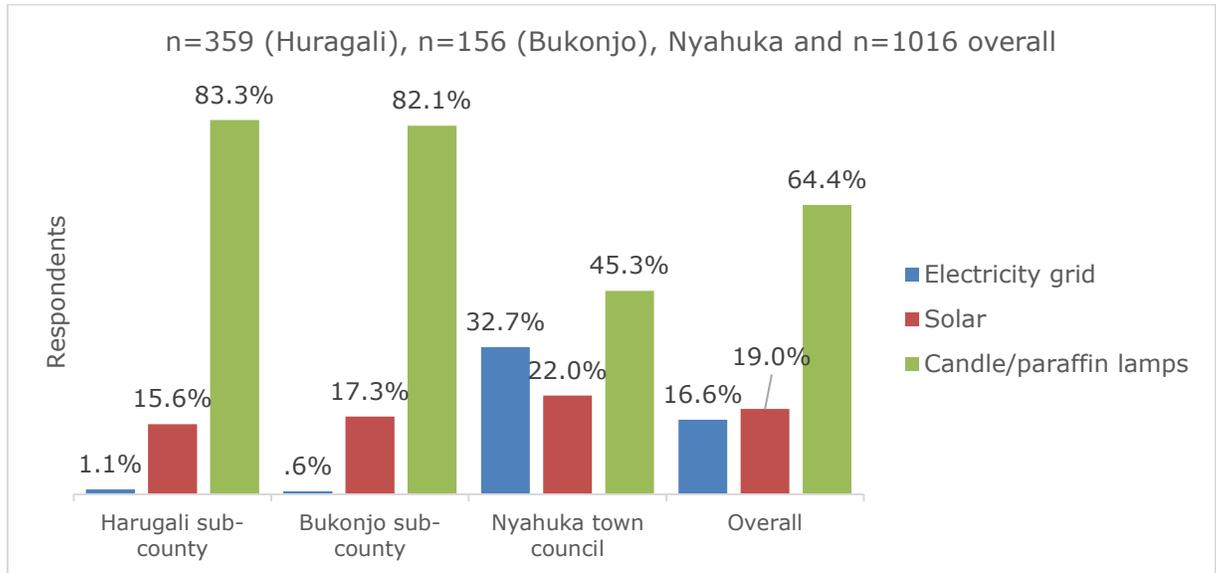


3.4.2.2 Source of light in the house

The study has further found that candle and paraffin lamps are a main source of light at the households. Figure 27 below shows that electricity grid is used in Nyakahuka town council with the rest of the study area resorting to candles, paraffin lamps and solar. On average, those community members who had access to the grid were paying UGX 22,700 per month for electricity.

People in the area have started embracing solar as a source of energy for light with the proportion ranging from 15.8% to 22% of the respondents in the different study areas. This is a good development for the area in terms of protection of the environment. The majority (66.8%) of the respondents decided to use solar because it is cheaper than other sources while 33.2% indicated that electricity was not available.

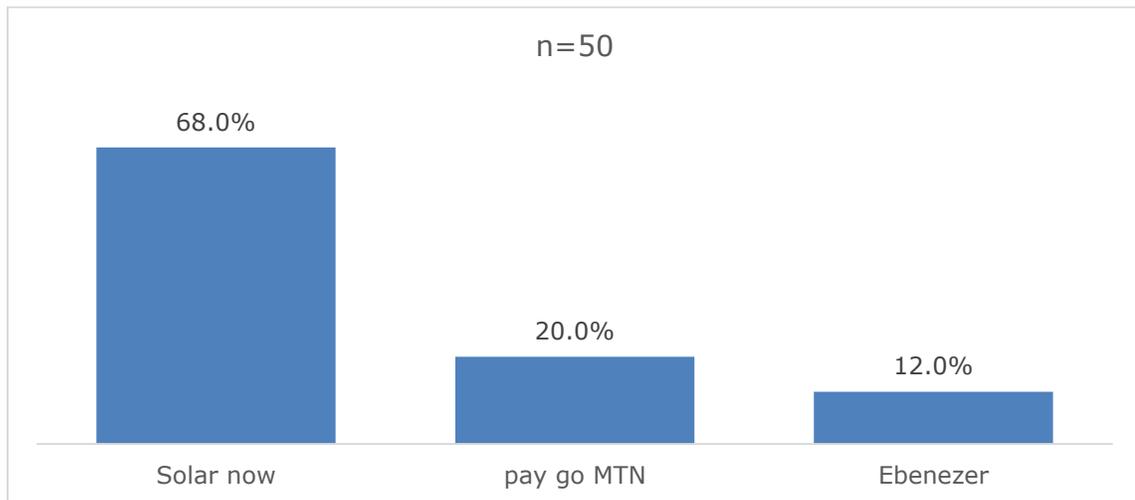
Figure 27: Source of light in the house



3.4.2.3 Solar brands used in Bundibugyo

The common solar brands in Bundibugyo are Ebenezer, Solar Now and Pay Go MTN. The majority (68%) use Solar Now followed by Pay Go MTN used by 20% while the remaining 12% use Ebenezer.

Figure 28: Solar brands used

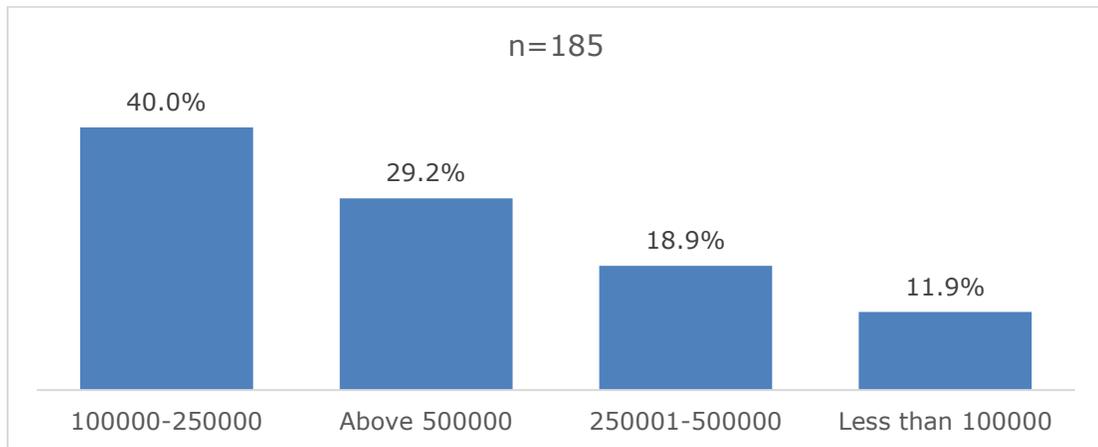


3.4.2.4 Cost of solar including installation fee

The study revealed that, on average, the cost of the solar gadget and installation fee is UGX 434,000. However, most respondents revealed that the cost of the gadget plus

installation is in the region of 100,000-250,000 (40%) followed by those respondents who said that the cost is above 500,000 29.2%.

Figure 29: Cost of solar and installation fee



3.4.3 Regulations underlying ecosystems

The respondents revealed by-laws such as laws associated with the Rwenzori Mountains National Park, illegal charcoal burning planting, 5 to 10 trees for every 1 tree cut. No cutting timber using a power saw, no bush burning, all people with land to plant *Prunus Africana*, water management- recycle, reduce, reuse and terraces on hilly areas to reduce soil erosion.

The respondents did not state any by-laws that they expect to have in the community in regard to ecosystem management. They indicated that they are currently comfortable with the current system but added that the existing laws need proper sensitization and enforcement.

3.4.4 Social aspects underlying agro-tourism in Bundibugyo District

The community's attitude towards Eco-tourism (in their context this includes agro-tourism and community tourism) was generally positive. The respondents expect that through eco-tourism, they will benefit from advice/feedback given by tourists to improve service delivery, exposure/cross learning from tourists, employment, income and foreign exchange

The eco-tourism enterprises that exist in the study sites are associated with cocoa, coffee, forest (in the park), birds, wildlife (such as monkeys), scenery, mountains, crafts and culture.

The existing Eco-tourism business currently in Bundibugyo is that which is run by the Uganda Wildlife Authority under the Semuliki National Park. The community members

also pointed out that most tourists come from Europe, universities and they do not pay to the community. They revealed that foreign tourists pay one week per tourist UGX 1.7 million to Uganda Wildlife Authority and that EAC tourists pay UGX 20,000 per day to UWA.

The activities offered in Semuliki are bird watching, cultural encounters with the Batwa, Game drives and hiking. For instance, the park entrance fees are 35 dollars for foreign tourists and 10,000/= for an East African citizen.

Within the local community there are no eco-tourism businesses run by the locals in Bundibugyo. However, there are tour companies such as Fort Green Tours, Rwenzori Mountaineering Services, Kabarole Tours and the Far Tours that take tourists to communities in Bundibugyo. These charge 250,000 per person per day. This amount is exclusive of park fees but includes food, visits to the sites such as cocoa, coffee, palm oil extraction and beer making. Based on the information from one of the tour operators that takes tourists to Bundibugyo, the tourist stays for 1 to 2 nights.

The number of tourists that visit the area monthly varied. Among the Buka group, the respondents said averagely 4-5 per 2 months and no tourists that come over to Bundikakemba. This was observed as very irregular partly due to lack of dedicated community tourism.

The few tourists that come to the community request to see coffee and cocoa gardens, cultural values, crafts, trees, birds, livestock, food crops, hills, Kayima forest reserve, and Kasulenge hill.

The tourists that arrive in the community spend nights in UWA established hotels and hotels in Bundibugyo Town. The community do not have accommodation facilities. The hotels in Bundibugyo that appear on Semuliki National website are Hotel Vanilla, Picfare Guesthouse, and Semliki Guest House which charge an average of 50,000/= per night per person.

The community do not largely benefit from the tourist visits but get incidental benefit like tips or buying something from a local shop, create friendships, support their children to pay school fees and buy crafts from local people. The study revealed that out of the 744 respondents, only 45 (6%) benefited from tourism and those that received monetary benefit were just 4 people. This confirms that the community have not tapped into the tourism industry.

On a scale of 1 to 10 the respondents ranked the viability of using crafts as an income generating activity in the community at 6.

3.4.5 Appropriate areas for an eco-lodge and local resource availability

There were various areas proposed by the respondents on the appropriate location of establishing an Eco-Lodge. Others proposed in the mountains Kihoko, Kitisimba, Kamente, Bundikakemba 4, Busunga village, Kajunga, Simbya. However, experience

from the transect walk shows that the most appropriate place for an eco-lodge would be on a trail along the Karangitsyo trail. The eco-lodge should be developed along the community based tourism enterprise starting from Bumate to Tweyambe village, Karangitsyo 2 to Karangitsyo 1. A detailed map of the route and the tourism product and services can be developed.

The local community showed willingness to provide resources that are needed to establish an Eco-Lodge, and some of these included banana fibres, grasses and fibres from the park, trees, bamboo, grass, climbers, human resource to provide labour for the construction.

With respect to availability of labour and offering employment opportunities to girls/women as tour guides, some community members had mixed reactions about involvement of housewives in the employment. They supported young girls who are not yet married to be given the employment opportunity. They said that this will enable exposure for more knowledge, enable self-sustaining, better understand their natural resources, and enhance social capital through interaction.

3.5 Fauna and Flora potentials in Bundibugyo

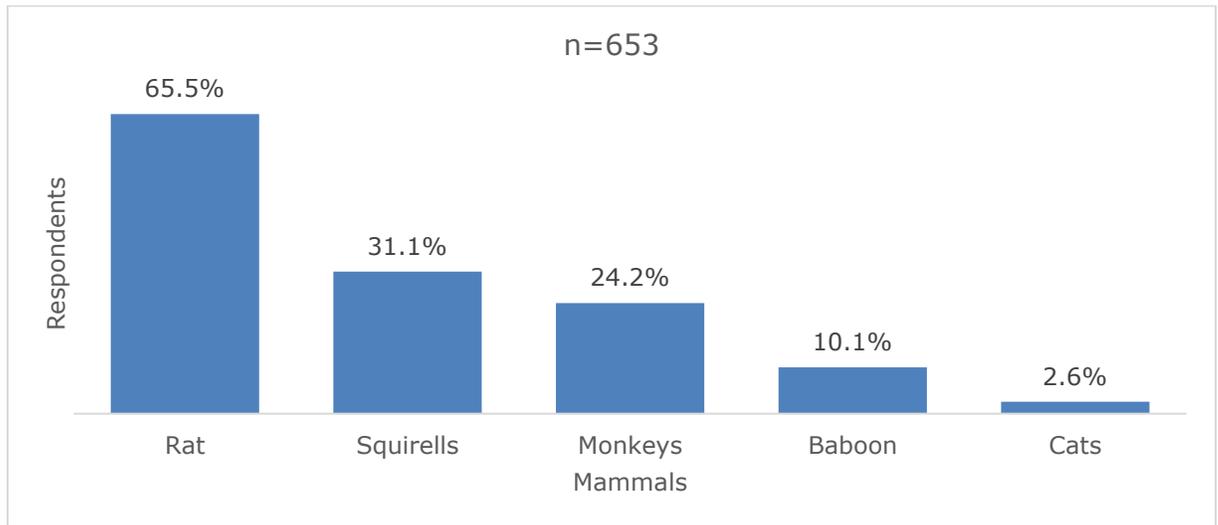
This section presents the fauna and flora potentials in Bundibugyo for sustaining an eco-tourism subsidiary enterprise. The Rwenzori region is endowed with various natural resources. Some of these natural resources are plant and animal species that are rare, endemic, and threatened. These species are of both conservation and tourism importance. The protected areas such as the Rwenzori Mountains National Park and Semuliki reserve have offered a haven for these species.

The various species, which were found, include insects, reptiles, birds, mammals as well as plant species. The actual species in each of the categories are outlined in the following sub-sections.

3.5.1 Mammal species

Bundibugyo district has different species of mammals which are of ecological and tourism value. They, however, sometimes create some challenges to agricultural production. Respondents in this study named some species especially the ones that pose challenges to their farming systems. These include small mammals such as rats and large mammals such as primates. Their abundance differs from village to village depending on their proximity to protected forest and cropland where they are harassed. Figure 28 shows that 65.5% of the respondents indicated that rats are common in the area while 24.2% and 10.1% indicated that monkeys and baboons respectively are common in the area.

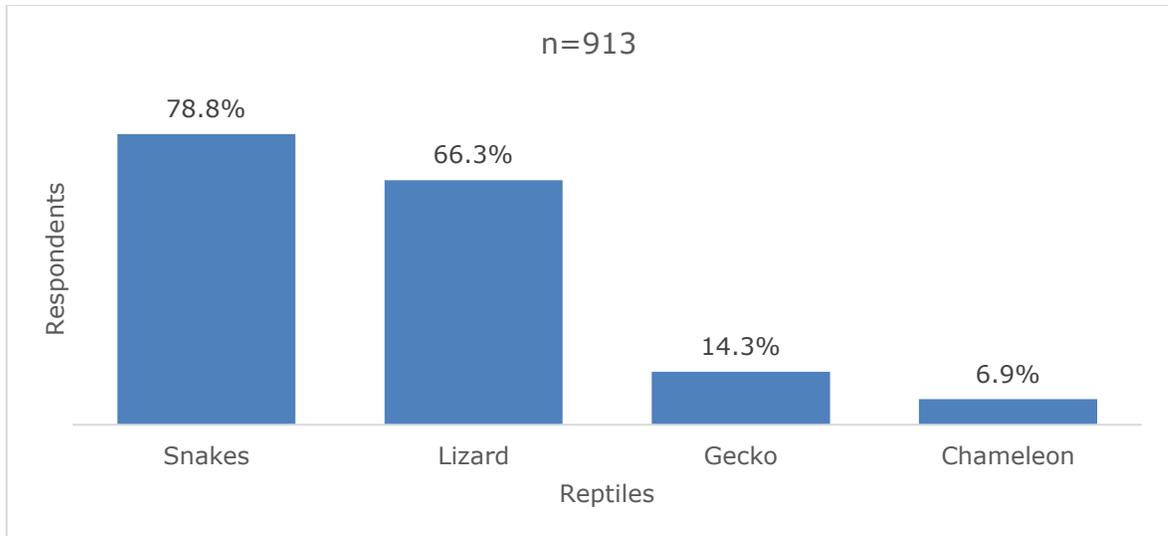
Figure 30: Common mammal species found in the area



3.5.2 Reptile species

Reptiles are common creatures in Bundibugyo District. Snakes and lizards are seen more than the geckho and cammeleon. The Three Horned Cammeleon particularly is endemic to Rwenzori Mountain National park and is of high conservation and tourism value. Snakes and lizards, although sometimes scary to people, are very good for ecosystem health as they serve as good food to many species of birds of prey such as the Grey Sparrow Hawk, Little Falcon, Long Crested Eagle, Grey Heron etc. The existence of such birds of prey in cocoa and coffee farms certainly decreases the incidence of some reptiles to harm humans as they work on their farms. Figure 31 shows that 78.8% of the respondents indicated that snakes are common in the area while few (6.9%) indicated chameleons are common in the area.

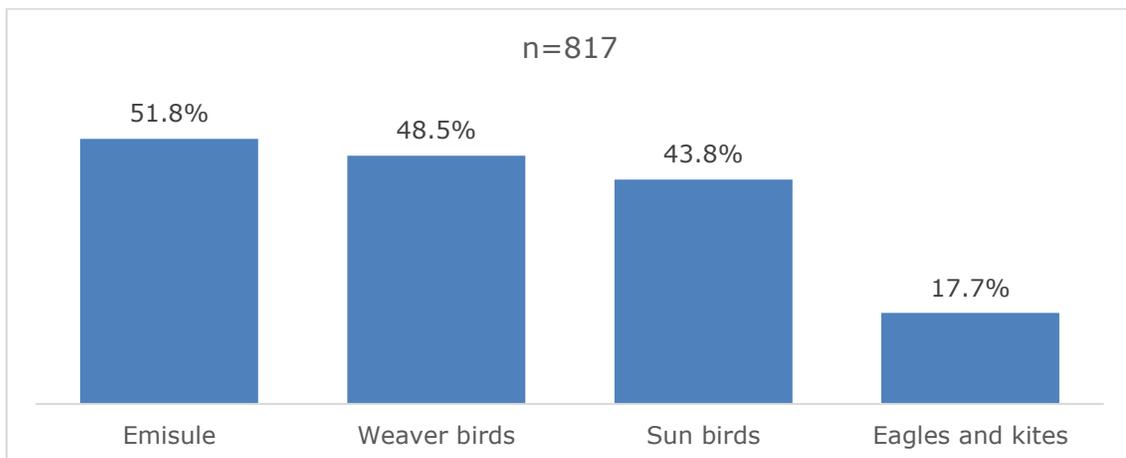
Figure 31: Common reptiles found in the study area



3.5.3 Bird species

Bird species abundance and diversity are some of the unique qualities of Bundibugyo District in terms of tourism and conservation. In the areas of this study a rapid assessment was done and birds of prey, weaverbirds, sunbirds, and bulbuls were some of the prominent types which could be named by respondents. However, a bird expert on the team managed to register many more including different types of Hornbills, Doves, Pigeons, Thrushes, Wagtails, Swallows, Storks, Turacos, Woodpeckers, Coucals, Bee-eaters, Cuckoos, Mouse birds, waxbills, warblers, herons, etc. Figure 32 shows that Majority (51.8%) of the respondents indicated that Emisule are common in the area while few (17.7%) indicated eagle and kites are common in the area. According to respondents of this study, the birds are common in the months of April to June. This is an early season as the peak for tourists in Uganda is June-July.

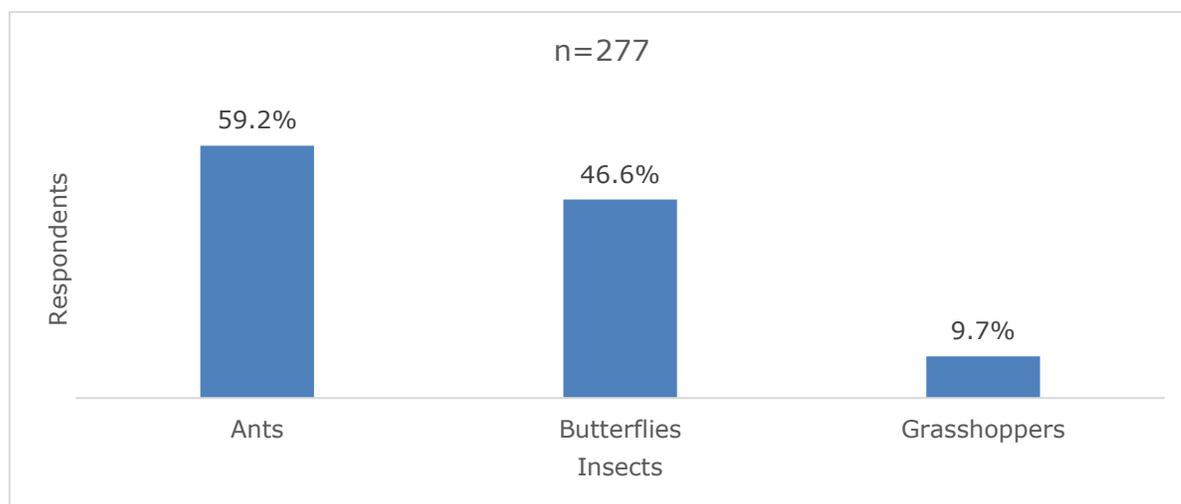
Figure 32: Birds common in the study area



3.5.4 Insects common in the area

The insects common in the area are ants, grasshoppers and butterflies. Ants which include termites are sometimes destructive to crops and farm infrastructure. They however, like grasshoppers and butterflies, attract some insectivorous bird species such as Fly catchers, Bee eaters, Thrushes, Francolins etc. because they serve as food to the birds. The ants also play another big role in the breakdown of organic matter to produce manure in the cocoa and coffee fields. Figure 33 shows that Majority (59.2%) of the respondents indicated that ants are common in the area followed by butterflies indicated by 46.6% of the respondents.

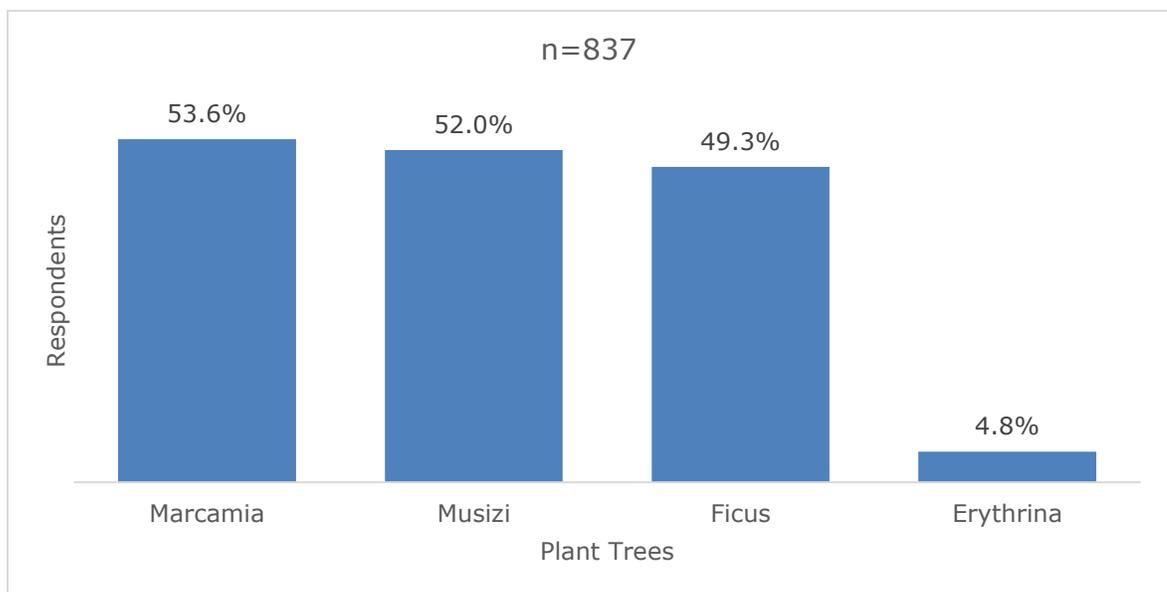
Figure 33: Insects common in the area



3.5.5 Plant species

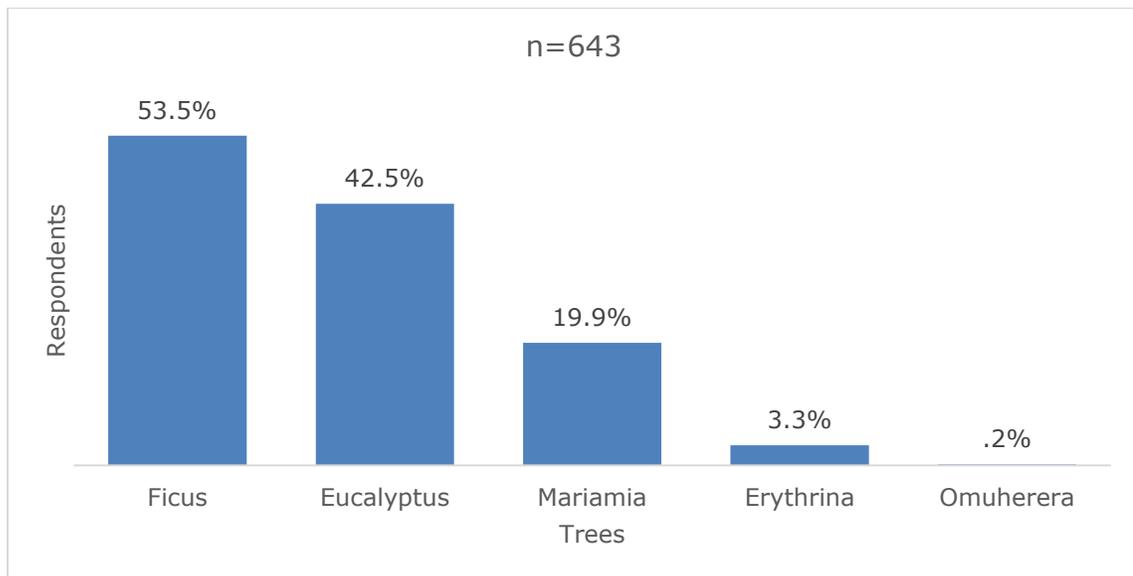
Many parts of Bundibugyo District were one-time natural forests but were deforested to do crop cultivation especially cocoa and coffee for cash and a few food crops such as cassava, banana and beans. Nevertheless, some trees can be seen within the cultivated areas and the common ones named by respondents include *Maesopsis eminii*, *Ficus natalensis*, *Markhamia lutea*, *Eucalyptus spp*, *Erythrina abyssinca*, and *Maesa lanceolata*. Figure 34 shows that 53.6% and 52% of the respondents indicated that marcamia and musizi trees respectively are common in the area.

Figure 34: Plant trees commonly found in the study area



It is usually known that ficuses are trees that are liked by birds because of their fruit and the study confirms it as demonstrated in the figure below by 53.5% indicating that the species preferred by birds. However, eucalyptus usually has less benefit to birds apart from perching there. The figure below shows that eucalyptus as one of the most liked trees by birds with 42.5% respondents indicated that it preferred. This could partially be attributed to limited range of choice for the birds. Figure 35 shows that indigenous trees like *Markhamia* and *Erythrina* are preferred by birds with 19.9% and 3.3% of the respondents indicating that they are preferred by birds.

Figure 35: Tree species preferred by the birds in the area



3.5.6 Agro-ecological tree species

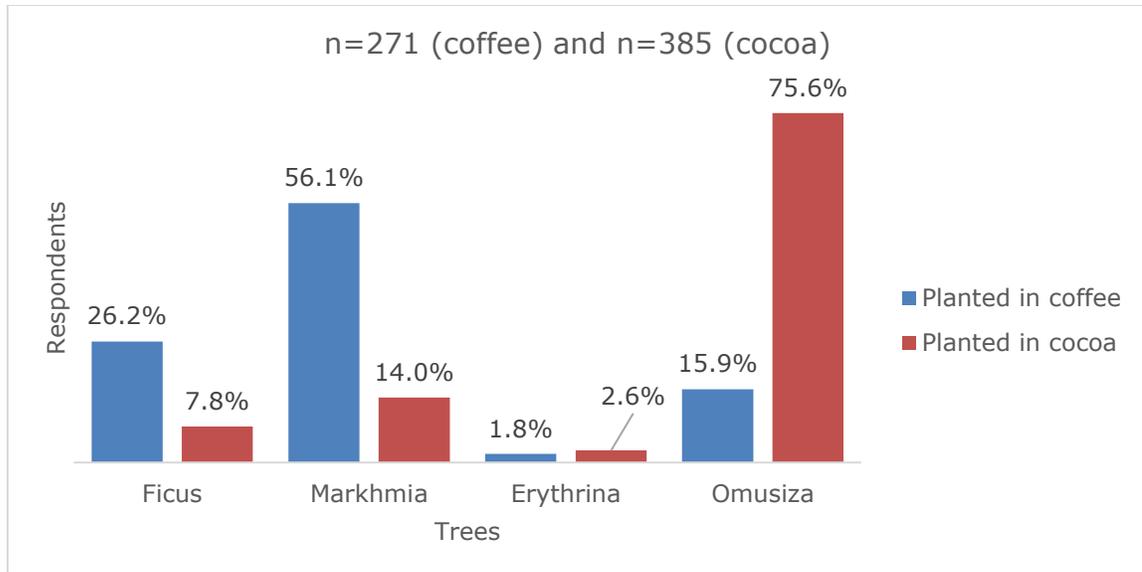
The community members indicated that there were some tree nurseries available owned by individuals and majority of them owned by membership associations and are usually for sale. The Buka members mentioned that there is a tree nursery at the sub-county mentioned. In Bundikakemba there were no nurseries except for *Maesopsis eminii* (Musizi) and for cocoa crop. The trees species found in the nursery include cocoa, coffee, *Prunus africana*, *Maesopsis eminii*, and *Eucalyptus*. Musizi is especially planted to provide shade for cocoa and farmers are willing to plant more of this species. Farmers also expressed willingness to plant more Bird Friendly tree species like *ficuses*, *Spathodea*, *Markhmia*, *Prunus* etc. to meet the minimum requirements in terms of tree canopy and shade required for Bird Friendly certification.

The respondents mentioned that other tree species most visited by birds in the community include Palm trees, Musizi, Mangoes, jack fruit, Pawpaw (generally fruit trees), *Ficus Nantalensis*, *Maesa lanceolata*, Wild banana (*Ensete spp*), *Halea stipulosa* (omunywamaizi), *Cordia africana* (Omutumba), omuti gwengazi, *Ficus exasperata*.

On average respondents said that there were 10 trees per acre existing on farmland.

There were various trees planted in cocoa and coffee gardens. Omusizi tree was the highly mentioned as planted in cocoa gardens and Markhmia in coffee gardens.

Figure 36: Trees planted in coffee and cocoa gardens



Generally, the findings show that there is a diversity of fauna and flora, which provide an opportunity and potential in Bundibugyo for sustaining an eco-tourism subsidiary enterprise. The eco-tourism subsidiary enterprise could stem from mammal and bird species identified, coupled with the crops and other flora that constitute their habitats.

4.0 ASSESSMENT OF THE FEASIBILITY OF BIRD FRIENDLY CERTIFICATION

In this section, we assess the feasibility of Bird Friendly Certification and the economics of the businesses associated with Bird Friendly Certification in Bundibugyo including coffee and cocoa production, solar franchise, fuel-saving stoves and eco-tourism. The assessment is based on the findings of the feasibility study.

4.1 Feasibility of the BF certification

Comparing the findings with the criteria for BF certification, it is found that the area can be Bird Friendly Certified as illustrated in the table below.

Table 22: Assessment of Bird Friendly Certification

BF criteria	Findings from the feasibility study	Remarks
<p>1. Vegetation cover</p> <p>The plantation must have at least 40 percent canopy cover, even after pruning.</p> <p>The plant coverage should include different strata: the lower stratum, that is, the one that is located under the main canopy, must constitute 20 percent of the total volume of the shade foliage. The same applies for the emergent species stratum. The shade must be composed of various tree species, including some that are useful in other ways (providing other kinds of shade and biological richness). There must be sufficient arboreal foliage cover all year round to create a microclimate that protects the coffee plantation from rain and dry winds. Species like <i>Gliricidia sepium</i>, <i>Grevillea robusta</i>, <i>Erythrina</i> spp, <i>Albizzia</i> spp. and <i>Pinus</i> spp. are unacceptable as backbone species.</p>	<p>The canopy height for both coffee and cocoa varied ranging from 1 foot to 35 feet. For coffee the most (81.3%) were 4-8 feet and for majority cocoa between 6 and 12 feet. The canopy width of both coffee and cocoa also varied. For coffee the width most (81%) were 3-6 feet and for Cocoa majority were also 3-6 feet.</p> <p>Farmers have already planted <i>Maesopsis eminii</i> (Musizi) and <i>Markhmia</i> tree among coffee and cocoa farms with 16% and 56% of coffee farmers and 77% and 14% of cocoa farmers have planted <i>Maesopsis eminii</i> (Musizi) and <i>Markhmia</i> respectively to provide shade.</p>	<p>These natural resources however are Bird Friendly and have eco-tourism potential since they have largely remained intact albeit unregulated access for instance the backbone species in forests are 12 meters high or taller, the shade have some clearly visible strata: a lower stratum occupies the space below the main canopy, and an upper stratum made of trees that are at least 15 meters high and the upper stratum composed of native trees. These forests also act as vegetation buffer zones that are maintained and protected next to rivers, streams as well as zones exposed to erosion.</p> <p>Farmers have already planted <i>Maesopsis eminii</i> (Musizi) and <i>Markhmia</i> to provideshade for coffee and cocoa. For those who have not yet planted, <i>Maesopsis eminii</i> (Musizi) and <i>Markhmia</i> trees take 5 and 3 years respectively to reach the required canopy</p> <p>Farmers expressed willingness to plant more Bird Friendly tree species like <i>ficuses</i>, <i>Spathodea</i>, <i>Markhmia</i>, <i>Prunus</i> etc. to meet the maintain requirements in terms of tree canopy and shade required for Bird Friendly certification. Farmers will just need support in forms plant seedlings and training on spacing and raising of these species</p>
<p>2. Structural diversity</p> <p>The backbone species must be a minimum of 12 meters high. Pruning should be practiced in such a way to allow the trees to attain that height.</p> <p>The shade must have some clearly visible strata: a lower stratum that occupies the space below the main canopy, and an upper stratum made of trees that are at least 15 meters high. The upper stratum must be composed of native trees.</p>	<p><i>Maesopsis eminii</i> (Musizi) , <i>Prunus africana</i>,, <i>Eucalyptus</i>, Palm trees, Musizi, Mangoes, jack fruit, Pawpaw (generally fruit trees), <i>Ficus Nantalensis</i>, <i>Maesa lanceolata</i>, Wild banana (<i>Ensete</i> spp), <i>Halea stipulosa</i> (omunywamaizi), <i>Cordia africana</i> (Omutumba), omuti gwengazi, <i>Ficus exasperata</i>. The species of tree have height above 12 meters</p>	<p>They are composed of various tree species, including some that are useful in other ways (providing other kinds of shade and biological richness). Farmers expressed willingness to plant more Bird Friendly tree species like <i>ficuses</i>, <i>Spathodea</i>, <i>Markhmia</i>, <i>Prunus</i></p>

BF criteria	Findings from the feasibility study	Remarks
<p>3. Floristic diversity</p> <p>The predominant species of the backbone species (Inga and others) must occupy no more than 60 percent of all shade trees. The remaining 40 percent of the shade trees must belong to a minimum of 10 different species, of which each species must constitute at least 1 percent of the total shade trees present. The backbone species must be a native species. The canopy's different tree species must be well distributed throughout the entire plantation.</p> <p>The growth of epiphytic plants, such as bromeliads, orchids, and ferns, as well as that of parasitic plants and some mistletoe should be encouraged.</p> <p>Some dead limbs and trunks should be left within the plantation to provide habitats for certain insects and birds. The selection of shade tree species and pruning practices must have a minimum impact on the epiphytes, mosses and lichens. Pruning in such a way as to produce a thin, laminar appearance of the canopy is not permitted.</p>	<p>Maesopsis eminii (Musizi) , Prunus africana,, Eucalyptus, Palm trees, Musizi, Mangoes, jack fruit, Pawpaw (generally fruit trees), Ficus Nantalensis, Maesa lanceolata, Wild banana (Ensete spp), Halea stipulosa (omunywamaizi), Cordia africana (Omutumba), omuti gwengazi, Ficus exasperata.</p> <p>Certain insects such as ants, grasshoppers and butterflies were also present.</p>	<p>These are native species and have the canopy's different tree species well distributed throughout the entire plantation</p>
<p>4. Soil management</p> <p>Soil must be covered year round, with either mulch or living cover. Soil conservation practices must be carried out on sloping terrains, and those broken and subject to intense rains.</p>	<p>Concerning the management of soil fertility, the majority of coffee and cocoa farmers used manure.</p> <p>Methods for soil conservation were agroforestry, intercropping, and manuring. Over 94% were using manuring.</p>	<p>There were no dangerous activities such cutting timber using a power saw, no bush burning, all people with land to plant Prunus africana, Water management- recycle, reduce, reuse and terraces on hilly areas to reduce soil erosion should be emphasized.</p>
<p>5. Vegetation buffer zones</p> <p>Vegetation buffer zones must be maintained and protected next to rivers, streams and lakes, as well as zones exposed to erosion.</p> <p>A living fence or border strip of trees and shrubs along roadways and other borders must be maintained.</p> <p>The buffer strips must be at least 5 meters wide on each side of streams and 10 meters wide along rivers, and be composed of natural vegetation in order to provide habitat to certain animal species.</p>	<p>These natural resources however are Bird Friendly and have eco-tourism potential since they have largely remained intact albeit unregulated access for instance the backbone species in forests are 12 meters high or taller, the shade have some clearly visible strata: a lower stratum occupies the space below the main canopy, and an upper stratum made of trees that are at least 15 meters high and the upper stratum composed of native trees.</p> <p>These forests also act as vegetation buffer zones that are maintained and</p>	<p>In addition to what the forests are providing, farmer should be encouraged to have buffer strips of at least 5 meters wide on each side of streams and 10 meters wide along rivers.</p>

BF criteria	Findings from the feasibility study	Remarks
	protected next to rivers, streams as well as zones exposed to erosion.	
<p>6. Processing</p> <p>The processing of Bird Friendly® coffee or cocoa - whether done as a "natural" (dry process) or as a "mild" (washed) - must be separated from all other crops, including those that are certified organic." The depulping machine must be cleaned before depulping "Bird Friendly®"</p>	The Coffee and Cocoa processed is specifically separated during processing.	The farmers should continuously be advised to strictly follow this regulation.
<p>7. Drying</p> <p>"Bird Friendly®" coffee must be dried in lots separate from those of any other kind of coffee to thus guarantee its integrity and prevent any mixing.</p>	Drying is done separately for coffee and cocoa after fermentation.	
<p>8. Packaging</p> <p>Only natural fibre packaging that has not been previously used to keep synthetic chemical products may be employed.</p>	Packaging is being done using a synthetic bag (Kadeya) but not strictly following the Bird Friendly certification process.	Farmers should be advised to adhere to the BF packaging requirement.
<p>9. Storage</p> <p>Bird Friendly® must be stored in clean bags on wooden platforms, properly separated from any kind of coffee /cocoa that is not "Bird Friendly®".</p>	This is observed for cocoa but not coffee	The Coffee farmers should be advised to follow this requirement.
<p>10. Labeling</p> <p>The bags of coffee must be marked with the acronym "BF" to be able to identify them on sight as "Bird Friendly®".</p>	Not done	The farmers should be shown how to label and with which labeling material sticker or marker.
<p>11. Transportation</p> <p>During the transport one must guarantee that the vehicle is clean and has not transported synthetic chemical products or other products that would affect physical and organoleptic integrity of the "Bird Friendly®" coffee.</p> <p>If "Bird Friendly®" coffee is transported along with any other coffee, physical separation of lots must be guaranteed.</p>	Transported by the buyer companies. These are general merchandise transporters.	Specific transport companies should be identified that are willing to adhere to the BF requirement of transportation.

BF criteria	Findings from the feasibility study	Remarks
<p>12.Records</p> <p>Registers for "Bird Friendly®" coffee must be kept separate. These must include information about the quantity of shade-grown coffee harvested and sold.</p>	<p>Records were at cooperative level not farmer level</p>	<p>The farmers should be trained to keep records following a simplified version of the record sheet.</p>
<p>13.Access</p> <p>The operator must allow the certification body sub-contracted, in order to carry out the inspection of the unit, to have access to the unit, facilities and accounting records, and provide all the information needed to carry out an inspection.</p>	<p>Records at cooperative level are accessible</p>	<p>The farmers are willing to have their units and records accessed under BF certification.</p>
<p>14.Obligation to provide information</p> <p>The operator must inform the certification body sub-contracted by the SMBC about any change made to the production unit.</p>	<p>This was not done as BF is not present.</p>	<p>The farmers are willing to provide any information required.</p>

4.2 Feasibility of the Coffee and Cocoa businesses as backbone for other proposed RSTC's businesses

The following points are indicative of the feasibility of the coffee and cocoa businesses in Bundibugyo:

1. Most members still have school-going children hence high demand for tuition and having farm labour especially at farm peak seasons with an average household size is about 4 below the age of 18 (school-going) and 4 people above 18 to provide labor.
2. The study further shows that for the adoption of new knowledge, instructions and improved technology, a given level of education of the recipient is very important. At least primary school level is enough for one to obtain literacy and numeracy skills and 89.2% have attend primary and above level of education. More youths being educated, is perhaps a potential source of skilled labour for BF Certification, Eco-Technology and Eco- and community tourism (as tour guides).
3. Most (90.5%) of the households sampled own land which is indicative that the households have secure land tenure. In terms of size, each household occupies about 2.4 acres of land on which they grow coffee, cocoa and other crops.
4. Most small land parcels owned and rented are already under perennial crops of coffee and cocoa, it is indicative that farmers' income remains static, unless other subsidiary options such as premium prices from BF certification and establishing eco-tourism and Eco-Technology are explored.
5. The study further shows that average yield from coffee is 2.2 bags per season and cocoa is 1.7 bags per season with each bag containing 100kgs.
6. Coffee and cocoa farmers do not trek long distances in search of markets. The buyers are so close to farms. They have farm-gate markets where no farmer moves beyond 2 kms to look for coffee/cocoa market. Most farmers sell to cooperatives in the area and local stores.
7. The prices of coffee and cocoa fluctuate a lot rendering computing of income from average prices not reliable. Across the three sub-counties, farmers indicated that they obtained higher income from cocoa than coffee. The BF certification and selling to the cooperative will help in stabilizing the prices.
8. Though distributed monthly for the sake of this research, Bundibugyo's farm income is seasonal coming only in the 2 harvesting seasons. This leaves a lot of daily and monthly household needs such as food, utilities and fees unmet. BF Certification, Eco- and Community Tourism and Eco-Technology would provide employment and additional income throughout the year. Women and youths generally obtain less monthly income compared to adult male-headed households.
9. Out of the 946 respondents, 75.5% and 57.8% reported that they are surrounded by a lakes/streams/rivers and forests respectively while 53.9% and

12.8% are surrounded by mountains and waterfalls respectively. This implies that the community has surrounding natural resources that it can access, obtain products from them and translate them into a monetary income to diversify household incomes from their farms.

10. There are various species which were found and they include: insects, reptiles, birds, mammals as well as plant species and these can enhance Bird Friendly certification.

Financial viability

The following are the basis for the assumptions in the Table 23 below:

- Since 30% and 22% of respondents were able to sell coffee and cocoa between UGX4000 and UGX5000 and above UGX5000 respectively and community members will be encouraged to sell through cooperatives to avoid fluctuations in prices.
- The community will increase the number of plants per acres to 500 trees. According to the study, 44.3% and 29.3% of the coffee and cocoa farmers respectively had less than 400 trees
- Most of the work will be done by the household members

Table 23 table below presents the assumptions for the financial projections. The assumptions were based on the findings from the study.

Table 23: Assumptions for financial projections

Coffee production	
Kilograms per Bag	100
No. bags per acres season	3
No. of seasons	2
Production per year (in kgs)	600
Price year 1	4,500
Annual increase in price	10%
Revenue in year 1	2,700,000
Interest rate	24%
Days worked by laborer	20
Labour cost per day	20,000
Operating cost /sales	10%
Cocoa production	
Kilograms per Bag	100
No. bags per acres season	3
No. of seasons	2
Production per year (in kgs)	600
Price in year 1	5,500
Annual increase in price	10%
Revenue in year 1	3,300,000
Interest rate	24%
Days worked by laborer	20

Labour cost per day	20,000
Operating cost /sales	10%

The financial projections confirms that both coffee and cocoa businesses are financially viable as demonstrated by the net present value (NPV) of UGX 4,447,730 and UGX 5,612,230 respectively. The business will be viable so long as the community do not invest above the NPV. Table 24 presents the financial projections for coffee and cocoa for a community member.

Table 24: Financial projections for coffee and cocoa for a community member

Revenue projections for coffee				
Period	Year 0	Year 1	Year 2	Year 3
Projected sales (in kgs)		600	600	600
Prices		4,500	4,950	5,445
Revenue projections		2,700,000	2,970,000	3,267,000
Cash Flow projections for cocoa				
Period	Year 0	Year 1	Year 2	Year 3
Sales		2,700,000	2,970,000	3,267,000
Less Labour costs		(400,000)	(400,000)	(400,000)
Less Operating costs		(270,000)	(297,000)	(326,700)
Net cash flow		2,030,000	2,273,000	2,540,300
Discounting factor		0.8065	0.6504	0.5245
Discounted values		1,637,097	1,478,278	1,332,355
Net present value (NPV)	4,447,730			

Revenue projections for cocoa				
Period	Year 0	Year 1	Year 2	Year 3
Projected sales (in kgs)		600	600	600
Prices		5,500	6,050	6,655
Revenue projections		3,300,000	3,630,000	3,993,000
Cash Flow projections for cocoa				
Period	Year 0	Year 1	Year 2	Year 3
Sales		3,300,000	3,630,000	3,993,000
Less Labour costs		(400,000)	(400,000)	(400,000)
Less Operating costs		(330,000)	(363,000)	(399,300)
Net cash flow		2,570,000	2,867,000	3,193,700
Discounting factor		0.8065	0.6504	0.5245
Discounted values		2,072,581	1,864,594	1,675,055
Net present value (NPV)	5,612,230			

4.3 Feasibility of the Solar Franchise Business

Also, the current situation shows that the alternative energy such as solar could be a good business venture in the community as the majority expressed interest to have solar power but do not have it currently.

The respondents also revealed that to a small extent, they use solar. The brands commonly used are Solar Now, Jeriko, Ebenezer, Ready Pay and Sun King. It would be good to promote the existing brands because people are comfortable with them. Respondents indicate that there are solar systems in the District with as low a cost as UGX 150,000 depending on other accessories. On average the cost of the solar gadget and installation fee is UGX 434,000

The study has further found that candles and paraffin lamps are a main source of light at the households. The respondents also showed that solar is cheaper than other sources of light. This indicates that there is still high potential for solar energy in Bundibugyo.

The Eco-Lodge would be built by the cooperative members using locally-available materials and solar panels for lighting and rainwater harvesting. These can be arranged with solar energy import companies for a franchise business.

Solar Now is the most common because the start-up pack has other accessories. Therefore, the Franchise business should not just consider provision of a panel and light system but also other accessories such as a charger, torch, and other items. The solar now Welcome Pack provides a Pack 50Wp + 50Wp Solar Panel + Phone charging + 45Ah Battery + Light Pack 3x 3w + Radio Torch. The additional upgrade includes Radio Torch, Solar Now Radio, Flat Iron, Clipper, Lightpack 3 x 3W, Lightpack 3 x 9W, Floodlight Pack 10W, TV/DVD/FTA 19", TV/DVD/FTA 24", Zuku Decoder, Small Fridge 35L, Big Fridge 112L, Solar Laptop Charger.

The predominant operator models for solar business include:

- **Product Franchising:** Suppliers identify rural based dealers to promote a product that they supply. In most cases there is direct cash exchange between the dealer and the supplier. The model developed from a loose relationship with limited trust between the dealer and the supplier, however the user will usually know the dealer as a local community member. In some cases, if the dealer is consistent and a relationship grows, they may get limited quantities of products on credit.
- **Brand Franchising:** A rural based dealer is assisted to promote the suppliers' brand. The supplier will give marketing support to the dealer to promote their product and a limited quantity of stock in form of credit. An example would be traders in electrical accessories.

- **Hire Purchase:** The supplier or system integrator creates a specific solar product and promotes it in a group of common income earners, which are usually rural based civil servants, farmers' groups or clustered communities. This model requires a high quantity of stock, a good financial resource and a network of community-based agents to assist in promotion and collections. A typical organisation that promotes this type of business model is Solar Energy Uganda Limited.
- **Microfinance institutions (MFI) and SACCOs:** This is one of the most dominant models of selling Solar PV Systems of late. In some cases the MFI simply acts a conduit of collection and benefits by charging an interest on the system without actually paying for the solar product to the supplier. This model has become very popular; the government is promoting its end-user subsidy through this approach in Post Bank and FINCA.
- **Direct off-the counter sales:** The clients include end-users, dealers and system integrators. All the solar supplier companies that have any basic stock will do a direct sale.
- **Bids and Tenders:** This is most applicable through projects. Periodically government and large donor institutions advertise project-specific procurements. There are firms that specialise in the bids and tenders to run and most firms usually participate in partnership with international suppliers.

The solar franchise business should consider the following factors:

- **Solar Panel:** A solar panel is the most important component of the solar system and should be chosen with utmost care. Its basic function is to pick the solar energy and convert it into direct current or solar energy. A malfunctioning panel, therefore, will not only fail to conduct power, but will affect the entire system. Solar panels on the Ugandan market can be divided into two; Polycrystalline and Monocrystalline which are both made from crystalline silicon. Their difference, however, lies in performance. While monocrystalline panels are created from a single continuous crystal structure, polycrystalline panels are made of segments that form a whole. Monocrystalline panels are more efficient because they have lower silicon purity. Before one go out to invest in solar energy, it is important to know what you are looking for. Which is quality, efficiency, durability and the manufacturer. The market is flooded with solar panels and recently, we have experienced a surge in inferior panels.
- **Quality:** Quality entails cell efficiency, finishing and size of the frame. Just like the panel is the mother of the solar energy system, the solar cell is the main component of a solar panel. When buying panels, emphasis should be put on efficiency and warranty. Cell efficiency relates to the amount of available energy from the sun that gets converted into electricity. The most efficient solar panels determine the photovoltaic wattage and subsequently the quality of the energy produced. Specifications should be consistent with the panel.
- **Durability:** Most manufacturers offer the 20-25-year standard solar panel warranty and require minimal maintenance over their productive lifetime. This

means that if something goes wrong, the solar energy provider would cover replacement and repair at no extra cost.

- **Country of origin:** The brand and country of origin of the panels may indicate whether you get value for money or a disappointing experience. About 99 per cent of the solar panels on the market come from China. The difference is the intended market. Grades A and B are meant for the American and European market since they are costly. Grades D, E and F are meant for the African market.
- **Manufacturer:** When buying panels, stick to the trusted brands. Since internationally recognized brands have a reputation to protect, they invest heavily in the performance and reliability of their products.
- **Watts produced:** The marketing manager at Solar Point, says a typical solar panel produces around 265 watts of power. That can vary based on the size and efficiency of the solar panel you choose. Most panels on the Ugandan market produce 2, 5, 6, 12 and 24 volts. The ones commonly installed in homes are 12 and 24 volts. The 5-6 volt panels are mainly used in lanterns. More efficient panels are a little more expensive, and are usually only needed if one has limited space on the roof.

Commercial viability

According to Target Market Analysis – Uganda’s Solar Energy Market (GTZ 2009), the household PV market in Uganda is categorized as follows:

- Up to 60% of the rural households can afford micro-solar systems of 2-20W (lanterns, phone chargers, radio systems).
- 10% of the rural population can potentially afford medium to larger SHS PV systems (50Wp – 150Wp).
- 30% of the rural households would be considered too poor to afford a solar PV system

According to the 2014 National Census, 94% and 93% of the households in Harugali and Bukonzo sub-counties respectively did not have access to electricity from the national grid. Table 25 below shows that 86% of the households in the three sub-counties did not have access to grid electricity presenting a market size of 6537 households for solar energy products. With increased income from coffee and cocoa as a result BF certification and eco-tourism the population will be able access solar energy making the solar franchise business viable. The access to grid electricity gap for the entire Budibugyo district is 89% of households representing a market of 39,829 households.

Table 25: No. of Households and access to electricity for Lighting

	Harugali sub-county	Bukonzo sub-county	Nyahuka Town Council	Overall
Total no. of households	2,125	1,835	3,622	7,582
No. of households with electricity	134	132	779	1,045
No. of households without electricity	1,991	1,703	2,843	6,537
Households without electricity (%)	94%	93%	78%	86%

Source: UBOS: National Population and Housing Census 2014 –Sub-county Report – Central Region

4.4 Availability of raw materials for briquettes

Members of both cooperatives could be mobilised to set up Eco-Technology subsidiaries - for the sales and distribution, servicing and parts businesses associated with marketing environmentally friendly and fuel-saving stoves, briquettes from crop by-products. The individual farmers at household level revealed that they would prefer charcoal briquettes to use in the energy-saving cook stoves. Crop residues, apart from providing organic matter for manure, can as well be used for making the briquettes to minimize the impact charcoal briquettes on the environment.

4.5 Feasibility of the Eco-tourism business

The study revealed that community is surrounded with a number of natural resources they have access to. Low monthly monetary value for most of the products show that much of the products accrued from the natural resources are used for domestic consumption. A lot of sensitization will be needed to help the community use these resources to obtain income in a sustainable manner. Bird Friendly eco-tourism will certainly be a better alternative source of income and act as an incentive for the community to use the natural resources sustainably.

Knowledge of eco-tourism which is lacking has to be imparted to the community so that they are able to use their own resources especially in cocoa and coffee farms to diversify their income. This must also include planting more trees and crops and also stopping the act of killing birds as was evidenced in the Transect Walk.

There is limited input from the community in as far as conservation of these natural resources is concerned. Therefore, institutional, financial, cultural and technological support will also be needed if the accessible natural resources to this community have to sustainably act as pathways out of poverty.

The fish could also act as food for tourists and a tourist attraction for those who would like to fish for sport hence providing potential for Bird Friendly eco-tourism. When the component of eco-tourism is developed for the crafts that can be made from the reeds

and other products from the wetlands then their income can rise to the thresholds of the national vision of 2040.

In the survey 85.2% and 14.8% of the respondents obtained water and medicine (herbs) respectively from the waterfalls respectively. Once a market is established, a small part of the community can earn an income from herbal medicine and cultural healing obtained from the waterfalls. Cultural medicine can also act as tourist attraction hence contributing to the feasibility of Bird Friendly Eco-tourism.

More youths being educated, is perhaps a potential source of skilled labour for BF Certification, Eco-Technology and Eco-community tourism (as tour guides). With the rest of the availability of labour and offering employment opportunities to girls/women as tour guides, some community members had mixed reactions about involvement of housewives in the employment. They supported young girls who are not yet married to be given the employment opportunity. They said that this will enable exposure for more knowledge, enable self-sustaining, better understand their natural resources, and enhance social capital through interaction

The social aspects (including attitude and perceptions that they will learn from tourists) underlying Eco/agro/ community tourism in Bundibugyo district show that the communities are likely to adapt to Bird Friendly certification as this will trigger the exploitation of this immense potential. There are various areas that are potential for establishment of an eco-lodge but to start with, the Karangisyo trail could be established as a demonstration for other sites as a community based agro-tourism venture product and service.

There were various areas proposed by the respondents on the appropriate location of establishing an Eco-Lodge. Others proposed in the mountains Kihoko, Kitisimba, Kamente, Bundikakemba 4, busunga village, Kajunga, Simbya. However, experience from the transect walk shows that the most appropriate place for an eco-lodge would be on a trail along the Karangitsyo trail. The eco-lodge should be developed along the community based tourism enterprise starting from Bumate to Tweyambe village, Karangitsyo 2 to Karangitsyo 1. A detailed map of the route and the tourism product and services can be developed.

People practicing community tourism in the Rwenzori region show that their lodges can raise an income of at least 10 dollars per tourist per day on only accommodation, while a guided tour and meals can fetch as much respectively. Given the huge numbers of birders and coffee drinkers in the World (USA alone has about 4 million) who might get attracted to Bundibugyo after the Cocoa/Coffee Bird Friendly certification, the eco-lodge in Bundibugyo is likely to attract an average of not less 40 than tourists per day. It is also clear that Bundibugyo environmental and weather conditions are conducive for tourism all year round. This indicates that this enterprise will greatly improve the income of the community.

It is also clear that Bundibugyo environmental and weather conditions are conducive for tourism all year round. This indicates that this enterprise will greatly improve the income of the community.

Knowledge of eco-tourism which is lacking has to be imparted to the community so that they are able to use their own resources especially in cocoa and coffee farms to diversify their income. A component of community eco-tourism has to be incorporated within the community and they are urged to complement on the incomes got from the natural resources. Fair prices have to be given for coffee and cocoa grown in areas that implement strategies to meet the standards for Bird Friendly eco-tourism

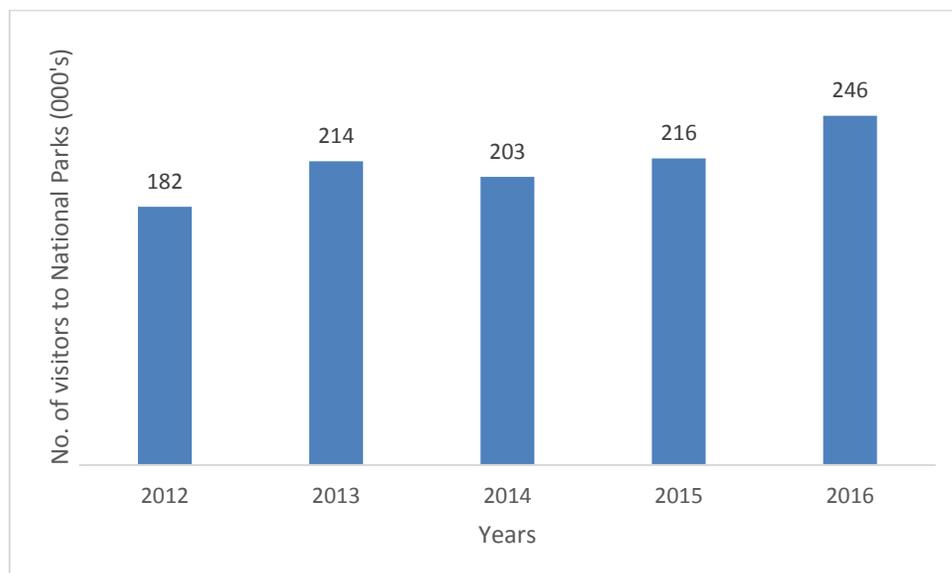
The local community showed willingness to provide resources that are needed to establish an Eco-Lodge. One of these included: banana fibres, grasses and fibres from the park, trees, bamboo, grass, climbers, human resource to provide labour for the construction.

A check on both Trip Adviser and AirBnB for hotels in Bundibugyo brings up the majority of hotels outside Bundibugyo but in Fort Portal town. The average of 21 hotels listed on Trip Adviser when searched for Bundibugyo revealed a fee of UGX 210,761 per night. For AIR BNB an average of the 16 listed accommodations provide an average of UGX 81,400 per night. It would be good to propose home stays and advertise homes stays in Bundibugyo in addition to an Eco-lodge which should be rated between 120,000/= and 150,000/= per night.

Financial viability

Uganda has 12 national parks and 3 active game reserves offering a wide range of products including gorilla tracking, nature guided walks, village walks, butterfly, bird watching, rare fauna and flora species. Figure 37 below shows that there was a steady increase in number of visits to the national parks registering with growth of 13.9% between 2015 and 2016 and 6.4% between 2014 and 2015 excepting 2014 when there was a rise of 5.1%.

Figure 37: Visits to national Parks (000's) 2012 - 2016



Source: Uganda Bureau of Statistics (UBOS): 2017 Statistical Abstract

Table 26: 2016 Visitors to National Parks by Category

Region	National park	Foreigner Non-Residents	Foreigner Residents	EAC Residents	Students Uganda	Others Uganda	Total
Western	Queen Elizabeth	22,020	4,130	17,629	42,126	-	85,905
	Lake Mburo	8,723	1,851	8,395	7,043	-	26,012
	Bwindi Impenetrable	18,050	372	972	126	2	19,522
	Kibaale	10,809	272	327	349	3	11,760
	Semiliki	286	153	1,612	6,148	15	8,214
	Mgahinga Gorilla	2,470	171	518	674	7	3,840
	Rwenzori Mountains	1,069	197	317	1,609	-	3,192
	Toro Semiliki SWR	204	54	91	341	71	761
	Sub Total	63,631	7,200	29,861	58,416	98	159,206
Northern	Murchison Falls	29,868	7,643	25,650	10,814	1,385	75,360
	Kidepo Valley	2,032	648	4,791	279	74	7,824
	Sub Total	31,900	8,291	30,441	11,093	1,459	83,184
Eastern	Mount Elgon	418	287	1,840	790	-	3,335
	Sub Total	418	287	1,840	790	0	3,335
	Grand	95,949	15,778	62,142	70,299	1,557	245,725

Source: Uganda Bureau of Statistics (UBOS): 2017 Statistical Abstract

The following assumptions were made to determine annual revenue and preparing financial projections:

- 10% of the visitors in western region will go to Bundibugyo park
- Dollar rate = UGX3700
- Foreigner non-residents will visit the park in groups of 3 people for purposes of computing revenue
- Foreigner residents will visit the park in groups of 4 people for purposes of computing revenue
- EAC residents will visit the park in groups of 5 people for purposes of computing revenue
- Students Uganda will visit the park in groups of 50 people for purposes of computing revenue
- Other Ugandans will visit as individuals
- Tourists visiting will increase at a rate of 10%
- Income generated by community through participating as tour guide is set at 10% of day nature walk for UWA
- Income generated by community through eco-lodge set at 10% of accommodation for UWA
- According to Section 69(4) of the Wildlife Act Cap 200 requires the Authority to pay 20% of the park entry fees to the local government of the area surrounding the wildlife protected area from which the fees were collected

Table 27: Revenue from eco-tourism in Bundibugyo per annum

No. of visitors in Bundibugyo and rates charged in UGX						
	Foreigner Non-Residents	Foreigner Residents	EAC Residents	Students Uganda	Others Uganda	Total
No. of visitors	6,363	720	2,986	5,842	10	15921
Entry fee	129,500	92,500	10,000	1,500	2,500	
Guided game drives (Private) per vehicle	74,000	74,000	20,000	2,000	20,000	
Birding	111,000	111,000	10,000	10,000	10,000	
Day nature walk	111,000	55,500	10,000	10,000	10,000	
Accommodation	82,000	82,000	52,000	3,500	52,000	
No. of visitors covered by the rate						
Entry fee	1	1	1	1	1	
Guided game drives (Private) per vehicle	3	4	5	50	1	
Birding	3	4	5	50	1	
Day nature walk	3	4	5	50	1	
Revenue (in UGX)						
Sources	Foreigner Non-Residents	Foreigner Residents	EAC Residents	Students Uganda	Others Uganda	Total
Entry fee	824,021,450	66,600,000	29,861,000	8,762,400	24,500	929,269,350
Guided game drives (Private)	156,956,467	13,320,000	11,944,400	233,664	196,000	182,650,531
Birding	235,434,700	19,980,000	5,972,200	1,168,320	98,000	262,653,220
Day nature walk	235,434,700	9,990,000	5,972,200	1,168,320	98,000	252,663,220
Accommodation	521,774,200	59,040,000	155,277,200	20,445,600	509,600	757,046,600
Total	1,973,621,517	168,930,000	209,027,000	31,778,304	926,100	2,384,282,921

The study was not able to determine the cost community will incur with respect to eco-tourism, but able to estimate revenue Uganda Wildlife Authority will square with the local government and revenue generated by participation of the community as tour guides. Overall the community will be able to benefit from eco-tourism revenue generated through share from the UWA, tour guide income and eco-lodge amounting to over UGX 286 million per year. On average it will be receiving 44 visitors per day comprising of 19 foreigners and 25 from Uganda and East African neighbouring countries. This implies overall the community will be able to benefit from eco-tourism.

Table 28: Projections for revenue going to the community

Revenue	Year 1	Year 2	Year 3
Growth rate		10%	10%
Total entry fee	929,269,350	1,022,196,285	1,124,415,914
Day nature walk	252,663,220	277,929,542	305,722,496
Share of community	185,853,870	204,439,257	224,883,183
Tour guide income	25,266,322	27,792,954	30,572,250
Eco-lodge	75,704,660	83,275,126	91,602,639
Total revenue to the community	286,824,852	315,507,337	347,058,071

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Both coffee and cocoa businesses will be technically and financially viable as demonstrated by the net present value (NPV) of UGX 4,447,730 and UGX 5,612,230 respectively. The business will be viable so long as the communities do not invest above the NPV.

Access to grid electricity is very low with over 86% of the households not accessing national grid electricity. Harugali and Bukonzo sub-counties are most affected with over 93% of the population not on the National Power Grid. This presents a market size of 6,537 households for solar energy products. With increased income from coffee and cocoa as a result BF certification and eco-tourism the population will be able access solar energy making the solar franchise business viable. The access to grid electricity gap for the entire Budibugyo district is 89% of households representing a market of 39,829 households.

Overall the community will be able to benefit from eco-tourism revenue generated through share from the UWA, tour guide income and eco-lodge amounting to over UGX 286 million per year. On average will be receiving 44 visitors per day comprising of 19 foreigners and 25 from Uganda and East African neighbouring countries.

Most families in the study area are not only male-headed, but the same men also have more accessibility to productive assets and productive resources. Women are relegated to less economically-productive assets and roles such as subsistence food production. Socio-economic incentives that augment women and youths' opportunities for a sustainable increase in income and living standards should be explored. Interestingly, the two vulnerable categories are not completely without any strengths: they participate in group/cooperative activities, own some reasonable land parcels, have adequate education, can ably offer labour and are within the innovative age brackets. They just lack sensitization and guided discovery to tap their natural potentials.

The community is surrounded by a number of natural resources, within accessible distance. Low monthly monetary value for most of the products show that much of the products accrued from the natural resources are used for domestic consumption. A lot of sensitization will be needed to help the community use these resources to obtain income in a sustainable manner. Bird Friendly eco-tourism will certainly be a better alternative source of income and act as an incentive for the community to use the

natural resources sustainably. However, there is limited input from the community insofar as conservation of these natural resources is concerned, therefore institutional, financial, cultural and technological support will also be needed if the accessible natural resources to this community have to sustainably act as pathways out of poverty.

These natural resources, however, are Bird Friendly and have eco-tourism potential since they have largely remained intact albeit unregulated access for instance the backbone species in forests are 12 meters high or taller, the shade has some clearly visible strata: a lower stratum occupies the space below the main canopy, and an upper stratum made of trees that are at least 15 meters high and the upper stratum composed of native trees. These forests also act as vegetation buffer zones that are maintained and protected next to rivers, streams as well as zones exposed to erosion. They are composed of various tree species, including some that are useful in other ways (providing other kinds of shade and biological richness). The rivers, wetlands and streams are able to provide breeding grounds for many bird species and contribute to the feasibility of Bird Friendly certification.

Generally, the farming systems for coffee and cocoa practiced by the farmers in Bundibugyo have a high potential for certification and creating a Bird Friendly certification procedure. Bundibugyo district is recorded to have as many as 450 different bird species among which 216 species are forest specialists. With a good tree cover on the farms, even some true forest birds can comfortably live in and around cocoa/coffee farms. This, however, can be achieved only if farmers are sensitized, convinced and supported to meet the minimum requirements of Bird Friendly certification. Such requirements include improving on tree shade in their coffee/cocoa gardens and stratifying the canopy to have an upper canopy of native trees whose canopy is at least 15 meters above ground and a lower stratum of diverse other Bird Friendly trees whose canopy is at least 12 meters above ground. The total shade should not be less than 40%. The support can be by empowering the farmers to plant trees such as *Maesopsis eminii*, *Funtumia elastica* and *Spathodea campanulata* as the upper stratum back bone trees; and *Ficus natalensis*, *Prunus africana*, *Halea stipulosa*, *Warbughia ugandensis*, Palm oil tree, Native Pawpaw, Native Mango, Jackfruit, *Eriobotrya japonica*, and *Bridelia mycrantha* as the trees to make the lower stratum. Some of the lower stratum trees are native fruit trees liked by birds and humans.

Also, the current situation shows that the alternative energy such as solar could be a good business venture in the community as the majority expressed interest to have solar power but do not have it currently. There is also room for introducing regulations governing ecosystems management which presents an opportunity for introduction of such regulations to support Bird Friendly certification. The social aspects underlying Eco/agro/ community tourism in Bundibugyo district show that the communities are likely to adapt Bird Friendly certification as this will trigger the exploitation of this immense potential. There are various areas that are potential for establishment of an eco-lodge but to start with, the Karangisyo trail could be established as a demonstration for other sites as a community based agro-tourism venture product and service. The eco-lodge with its associated services will create employment for many

girls and boys plus attracting a lot of income on a daily basis. People practicing community tourism in the Rwenzori region show that their lodges can raise an income of at least 10 dollars per tourist per day on only accommodation, while a guided tour and meals can fetch as much respectively. Given the huge numbers of birders and coffee drinkers in the World (USA alone has about 4 million) who might get attracted to Bundibugyo after the Cocoa/Coffee Bird Friendly certification, the eco-lodge in Bundibugyo is likely to attract an average of not less 40 tourists per day. It is also clear that Bundibugyo environmental and weather conditions are conducive for tourism all year round. This indicates that this enterprise will greatly improve the income of the community.

5.2 Recommendations

1. There is need for gender-inclusive development interventions for communities in Bundibugyo District for the diversification of livelihood options and food security. Women, youth, men, children and disabled have a development synergy. When one group is left out, it antagonizes the achievements of the other. For the success of RSTC's business, there is need to define roles for each age and gender groups. There is need to clearly define roles for youths, women and men to ensure easy follow-up and inclusiveness.
2. For a balanced and sustainable development in Bundibugyo, there is need to ensure income diversity. In addition to coffee and cocoa, there is need to explore other non-seasonal income sources such as Agro-Tourism and Eco-Technology subsidiaries and backyard/kitchen gardening to solve the problem of food security and income that is skewed to male population.
3. It was observed that farmers in Bundibugyo own smaller land parcels. Even the small land is already under perennial crops of coffee and cocoa. Women's and Youth's income and participation in formal employment institutions are low. Subsidiary options such as premium prices from BF certification and establishing an eco-tourist and Eco-Technology should be explored.
4. BF certification with all the integrated activities including eco-Tourism and eco-technology should be implemented in Bundibugyo and the community should be sensitized about the benefits and their role in the intervention.
5. It was observed that, though they had low income, accessibility and ownership of productive resources, the youths had a comparatively higher education. This suggests that they can be a potential source of skilled labour for BF Certification, Eco-Technology and Eco- and community tourism (as tour guides).
6. Low credit and extension services from government institutions suggests the dire need for trade cooperatives operating in Bundibugyo to consider extending efforts beyond marketing to offering on-farm credit and extension facilities.

7. Free but regulated access to the natural resources has to be granted to the community for them to act as a pathway out of poverty although this was not identified as a challenge.
8. Knowledge of eco-tourism which is lacking has to be imparted to the community so that they are able to use their own resources especially in cocoa and coffee farms to diversify their income. This must also include planting more tree and crops and also stopping the act of killing birds as was evidenced in the Transect Walk.
9. A component of community eco-tourism has to be incorporated within the community and they are urged to complement on the incomes got from the natural resources.
10. Fair prices have to be given for coffee or cocoa grown in areas that implement strategies to meet the standards for Bird Friendly eco-tourism.
11. Community members in Bundibugyo, especially the youth, need to be sensitized about the importance of mammals, insects, birds and plants regarding ecosystem sustainability and tourism enhancement for socio-economic development.
12. A detailed inventory of flora and fauna, particularly avifauna, should be carried out and the list generated used as a tool to market the area as a birding hotspot.
13. Sustainable ecosystem management to conserve flora and fauna should be emphasized by all stakeholders in the Bird Friendly cocoa/coffee certification enterprise of Bundibugyo.

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https://nationalzoo.si.edu/scbi/migratorybirds/coffee/quick_reference_guide.cfm

APPENDICES

Appendix 1: Research Tools

Appendix 1(a): Farmers' Questionnaire

Introduction

Mountains of the Moon University (MMU) has secured funding and support from Rwenzori Sustainable Trade Center (RSTC) to undertake a feasibility study that would eventually lead establishment of an agro-eco-tourism known as Bird Friendly (BF) Certification for Bundibugyo District. This is aimed at improving access to niche export markets for coffee and cocoa in the USA. The purpose of this survey is to establish baseline information that will help to inform planning and establishment of the BF Certification, eco-lodge and eco-technology for communities in the District. Please note that information obtained will remain confidential and will only be used by RSTC and MMU for purely research purposes and only general responses will be reported.

Sub-county	
Village	
Name of the Enumerator	
Enumerator's Tel. No	

SECTION ONE: FARMER'S SOCIO-ECONOMIC PROFILE

No	Question	Answer	
1	Name of the respondent		
2	Telephone of the respondent		
3	Sex of the respondent (1=male 2=female)		
4	Age of the respondent (years)		
5	Formal employment history (place and position) of the household head		
6	Household members (including non- biological members)	Below 18	Above 18
7	Education level of the house hold head respondent (years and level)		
8	Marital status (1=married 2=divorced/widowed 3=never married)		

9	Type of land ownership (1= Rented 2= Owned 3= Communal)				
10	If owned enter size (acres)				
11	Who owns the land? (1=husband 2=wife 3=mixed)				
12	If rented, enter size (acres)				
13	Who rents the land? (1=husband 2=wife 3=mixed)				
14	Who owns the coffee, cocoa, food crops and livestock? 1=husband 2=wife, 3=mixed	Food	Coffee	Cocoa	Livestock
				a	
15	Who plays the biggest role in each of the following activities (coffee, cocoa, food) (1=husband 2=wife 3=mixed)	Coffee		Cocoa	Food
				a	
16	Number of years in coffee/cocoa growing	Coffee		Cocoa	
17	Total yield last harvest (100 kg bags)	Coffee		Cocoa	
18	Who buys your coffee/cocoa (buyer/channel)	Coffee		Cocoa	
19	Form in which your produce is sold (1= Fresh 2= dry)	Coffee		Cocoa	
20	Other value addition practices 1=packaging 2= grading 3=hulled 4=fermented 5=others (specify)	Coffee		Cocoa	
21					
22	Distance from the market/buyer (km including zero)	Coffee		Cocoa	
23	Price (UGX) per kg at which you sold your coffee/ cocoa last/latest time	Coffee		Cocoa	
24	Monthly income (UGX) from coffee and/or cocoa				
25	Monthly total farm income (UGX)				

26	Monthly off-farm income (UGX)						
27	Total monthly household income (UGX)						
28	% Income you commit to each aspect (Food, fees, health, conservation, energy, others (specify) (1= Not at all. 2= 1%, 3= less than 5%, 4= less than 10% 5= above 10%)	Food	FS	H	C	E	Other
29	Domestic animals reared at home (include name number)						
30	Food crops grown at home (type and scale in acres)						
31	Are you a member of Buka or Bundikakemba Cooperative? 1=yes 2=no						
32	Number of years as a member of a cooperative						
33	Did you acquire any loan in the last one year? 1=yes 2=no						
34	Credit use on coffee/cocoa farm in the last one year (1= Used credit 2= no)						
35	If yes in 34, state the source						
36	Number of extension visits to the farm in the last one year						
37	Extension visits to coffee/ cocoa						

SECTION TWO: THE SURROUNDING NATURAL RESOURCES

No	Question	Answer
38	Name the surrounding Natural resources	
39	What is the distance in km to the nearest forest, wetland, water fall, Mountain or water body?	Distance to Forest Distance to Lake/stream/river Distance to wetland Distance to Mountain Distance to water fall Distance to other (specify)

40	What products do you obtain from the Forest/lake/wetland and give the quantity in a year	Products from Forest Products from lake Products from wetland Product from mountain Product from water fall Product from other (specify)
41	What is the monthly monetary value of the products above?	Value from Forest Value of lake Value of wetland Value of mountain Value of water fall Value of other (specify)

SECTION THREE: FLORA AND FAUNA POTENTIALS FOR ECO-TOURISM AND ECO-TECHNOLOGY SUBSIDIARIES

No	Question	Answer		
42	Common mammal species in your area			
43	Reptiles common in your area			
44	Birds common your land			
45	Plant trees/shrubs common in your land			
46	Tree/shrub species preferred by birds			
47	The birds' season (Month(s) of the year).			
48	Insects common in your farm			
49	Name the birds common in your plantation	Food	Coffee	Cocoa
50	Do birds cause any harm to your crop? (1=yes (specify the harm) 2=no)	Food	Coffee	Cocoa
51	List all other animals found in your place			

52	Have any members of your household benefited in tourism activities? (1=yes (specify activity) 2=no)	
53	If yes, state the monetary benefit in UGX	
54	Do you use energy saving stove? (1=yes (specify) 2=no)	
55	Would you like to use one 1=yes 2=no (why)	
56	Which type of energy saving stove would you prefer? (1=the one using charcoal briquettes 2=the one using firewood 3= other (specify))	
57	Rank the reasons for your choice of stoves above (1=fuel price 2= convenience 3=cost of stove 4=low smoke level 5=environment conservation)	
58	Name the source of light in the house (1=Electricity/UMEME 2=solar 3=candle/ paraffin lamps 4=other (specify))	
59	Cost of electricity per month (UGX)	
60	If you use solar, give the reason for the choice (1=no UMEME/electricity line around 2=solar is cheaper 3=other/specify)	
61	Name the solar providers/brands you use	
62	Give the cost of solar gadgets and installation fee (UGX)	

SECTION FOUR: COFFEE/ COCOA AGRO-ECOLOGICAL AND OTHER INFORMATION

No	Question	Answer	
63	Season of planting (Month)	Coffee	Cocoa
64	Source of planting materials (person/ organization)	Coffee	Cocoa
64	Quantity/ seedlings planted per acre	Coffee	Cocoa
65	Name of variety planted	Coffee	Cocoa

66	Reason for variety choice	Coffee	Cocoa
67	Average canopy height when fully mature (ft)	Coffee	Cocoa
68	Average canopy width (ft)	Coffee	Cocoa
69	Common method of Weed management 1=mechanical 2=chemical 3=cultural 4=Biological	Coffee	Cocoa
70	Quantity and cost per unit/kg of herbicide used last year (if any)	Coffee	Cocoa
71	Intercropping done in the plantation (name the crops)	Coffee	Cocoa
72	Species of trees and shrubs integrated/agro-forestry	Coffee	Cocoa
73	Methods of improving soil fertility	Coffee	Cocoa
74	If fertilizers were used in Q.73, state Quantity (kg) and cost (UGX) per kg of fertilizer used in a year	Coffee	Cocoa
75	Quantity and cost of hired labour used in a season (number of persons and cost per person)	Coffee	Cocoa
76	Harvesting season (peak month)	Coffee	Cocoa

END

Appendix 1(b): Focus Group Discussion guide

Four Focus Group Discussions (FGDs) will be conducted. Two FGDs will be conducted with the two cooperatives and the other two with non-cooperative member counterparts. Each FGD will comprise of 12 respondent members Broken down as follows:

- 50% women and youth overall.
- 3 local leaders (including secretary for production, cultural leader)

- 3 Opinion leaders (include UWA)
- 2 Teachers
- 3 ordinary members
- 1 tour operator

Tools:

- Markers
- Flip Charts

Questions

1. What is the community's attitude towards Eco-Tourism and why?
2. What eco-tourism enterprises exist in the area?
3. Where do most tourists come from and how much do they pay?
4. How many tourist visits does this community have on a monthly basis?
5. What do tourists demand most to see in this community?
6. Where do the tourists who visit your community spend nights?
7. What direct benefits does the community get from tourist visits?
8. Which areas are most appropriate for establishing an Eco-Lodge?
9. Which resources are available to establish an Eco-Lodge?
10. Which resources are the community members willing to offer to establish an Eco-Lodge?
11. What are the services offered by the available tourist lodges?
12. What is the opinion of the community towards offering employment opportunities to girls/women as tour guides in the community (please explain your response)?
13. Does the community have tree nurseries?
14. What tree species are in the nursery and why?
15. What are the tree species most visited by birds in this community?
16. On average how many trees per acre exist on a farmland?
17. What by-laws exist in the community in regard to ecosystem management and why?
18. What by-laws do you expect to have in the community in regard to ecosystem management and why?
19. Cooking stoves used and willingness to change them?
20. Solar brands used in the area and willingness to change them?
21. Attitudes of the community towards different methods of coffee/cocoa production systems
22. Are there ordinances made by the community to protect organic production of cocoa and coffee production?
23. If no, can they be made and how?
24. Do the companies trading in coffee and cocoa in the area engage in any corporate social responsibility (and how?)
25. On a scale of 1 to 10 rank the viability of using crafts as an income generating activity in the community (and why)
26. What is your opinion on getting a premium on cocoa/coffee produced if the community meets the certification criteria? (and why?) [tell them the criteria involved]
27. Establish any other information related to Bird Friendly Certification, Eco-Tourism and Eco-Technology including prices of the existing franchises from FGD members.

END

Appendix 1(c): Transect Walk guide

The team to do the transect walk

Rodgers Mutyebera, Clovis Kabaseke, Ronald Buwa, Moses Muhumuza, Lazarus Bwambale, Anne Manyindo, Chairperson of the cooperative, Chairperson of the area, Community Liaison Officer of UWA in the area.

- **BUNDIKAKEMBA:** A 1-km transect through cocoa and/or coffee and food crop farms.
- **BUKA:** A 1-km transect through which will include cocoa and/or coffee plus food crop farms.
- **UWA/ SEMULIKI NATIONAL PARK:** Visit the Ntandi eco-tourism station to get:-
 - i) Documentary review/ Oral and written information about bird spp and other eco-tourism related biodiversity
 - ii) Technical information relevant to mobilize the Bundibugyo communities into incorporating eco-tourism into their socio-economic activities
 - iii) A walk into the forest to observe the existing biodiversity
- **UWA/ RWENZORI MOUNTAIN NATIONAL PARK**
 - 1) Documentary review/ Oral and written information about bird spp and other eco-tourism related biodiversity
 - 2) Technical information relevant to mobilize the Bundibugyo communities into incorporating eco-tourism into their socio-economic activities
 - 3) A walk into the forest to observe the existing biodiversity

Equipment necessary

1. A GPS for taking coordinates and establishing land areas
2. At least 2 pairs of binoculars
3. A bird guide book
4. A Guide book for plants (trees)
5. Camera/smartphone to take high resolution pictures
6. Notebooks and pens
7. Clear bags to protect collected data from rain.
8. At least 2 sharp pangas
9. Strong umbrellas (1 per person) or raingear

Key aspects to observe along the transects

	Aspect to observe	What actually is observed
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1	Tree species inter planted with cocoa /coffee, their estimated average height, canopy size, and number per hectare.	
2	The bird species common and how they relate with the farming communities	
3	Existing tree nurseries and species	
4	Existing food crop gardens and their estimated acreage	
5	Determining the number of trees (depending on spp) that can create a 40% shade in the cocoa/coffee farms	
6	The common systems of production, postharvest handling, and storage	
7	Conservation efforts being used e.g. soil water conservation, clean and renewable energy technologies	
8	Abundance, diversity and distribution of key species (especially birds) for eco-tourism	
9	Possible sites for an eco-tourism lodge basing on acceptability of stakeholders, accessibility, feasibility, and sustainability as a tourism business.	
10	Possible sources of local materials for construction of eco-lodge	
11	Any other item of eco-tourism interest.	

END

Appendix 2: Field Pictures

Appendix Picture 4(a): Training of enumerators



Appendix Picture 4(b): Focus Group Discussion



Appendix Picture 4(c): Transect Walk

