PROGRAMME PERFORMANCE REPORT

WILDLIFE CLUBS OF UGANDA YOUTH IN FOREST-BASED ENTERPRISE DEVELOPMENT PROGRAMME (YFBEDP)

Cover Photo: *A cross-section of YFBEDP participants, at KAFRED, Bigodi Kamwenge District, Western Uganda*

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PLATES

ACRONYMS

BWS:	Bigodi Wetland Sanctuary
CREST:	Centre for Responsible Travel
GAP:	Good Agricultural Practices
GMP:	Good Management Practices
HDPE:	High-Density Polyethylene
ITK:	Indigenous Technical Knowledge
KAFRED:	Kibale Association for Rural and Environment Development
LC:	Local Council
PET:	Polyethylene Terephthalate
QMS:	Quality Management System
RSTC:	Rwenzori Sustainable Trade Center
SOPs:	Standard Operating Procedures
TBG:	Tooro Botanical Gardens
TCA:	Town Council Administration
TIES:	The International Ecotourism Society
The US. FS:	The United States Forest Service
USA:	United States of America
USAGA:	Uganda Safari Guides Association
UWA:	Uganda Wildlife Authority
WCU:	Wildlife Clubs of Uganda
WES:	World Ecotourism Summit
YFBEDP:	Youth in Forest-Based Enterprize Development Program

EXECUTIVE SUMMARY

YFBEDP a program of Wildlife Clubs of Uganda is supported by the United States Forest Service and implemented by the Wildlife Clubs of Uganda to empower youth around Kibale National Park with knowledge and skills in ecotourism, basketry, and sustainable harvesting of medicinal plants.

The program goal is to train youths in forest education & ecotourism enterprise development, sustainable basketry practices, and ensure sustainable harvesting of medicinal plant parts and products.

The program objectives were i) to train youths aged 18 and 35 years in forest education & ecotourism enterprise development, ii) To train women in the sustainable development of basketry and other products using locally available raw materials within the community, and iii) to train and equip youths with skills in sustainable harvesting of medicinal plants from Kibale National Park.

Training on ecotourism involved 50 site guides who were involved in community and swamp walks within the Bigodi Wetland Sanctuary (BWS) a community forest extension of Kibale National Park (KNP). These were trained among others on issues of visitor handling, etiquette, and forest interpretation.

The training on baskets and other products was attended by 30 youths from communities around Kibale National and after the training, each participant was given a certificate of attendance and a Card for Wildlife Clubs of Uganda that can allow them access to Uganda's National Parks at a subsidized cost. The training mainly focused on making natural dyes to process locally available raw materials for sustainable basketry and other forest-related products. Sustainable craft making and use of locally available materials, making and operating craft shops in groups as opposed to individuals was emphasized. YFBEDP participants participated in practical weaving and making dyes.

The training on ethnobotany initially planned was to train youths aged between 18 and 30 years of age, this was not possible since most herbalists and ethnobotanists young and older than 35 years of age were considered due to the special occurrence that it was mostly the old women around KNP who were involved in medicinal plant harvesting and processing as a result of Indigenous Technical Knowledge (ITK). The training activities described were about capacity building of the youth and women involved in medicinal plant harvesting and processing around Kibale National

Park (KNP). The training was held at KAFRED offices in Bigodi, Kamwenge District, bringing together women with a diversity of backgrounds in herbal medicine extraction and utilization.

The ethnobotanical training aimed to encourage sustainable use of medicinal plants to promote conservation efforts by reducing the pressure on wild plant populations within KNP; contribute to the economic empowerment of the youth and women enabling them to acquire skills for sustainable livelihoods; Skill youth and women around Kibale National Park in sustainable practices to improve their standard of living while preserving natural resources, and provide knowledge on cultural and scientific preservation and scaling the cultural significance of diversity of traditional medicinal plants as well as re-echoing best practices and techniques of medicinal plant harvesting, processing, and packaging.

The need to conduct more extensive training in ecotourism enterprise development, sustainable harvesting of medicinal plants, and basketry practices with support from the United States Forest Service, develop and distribute ecotourist site guides with forest interpretation manuals/guidebooks dependent on resources found with Bigodi Wetland Sanctuary, work with the Rwenzori Sustainable Trade Centre to train more women under YFBEDP on how to produce quality baskets and forest-related products and help YFBEDP recipients find markets for their products, collaborate with TBG on capacity-building visits is imperative for all ethnobotanists. The training could focus on value addition and processing of medicinal plant parts for viability and marketing.

As part of building best practices, WCU with support from USFS can empower youth and all relevant stakeholders with sustainable utilization models, and innovative knowledge and skills for medicinal plant processing. In the long run, WCU could sign MoUs with TBG, RSTC, and UNITE for Environment to initiate a regulatory framework for skilling women in handcrafts, and herbalists with value additional knowledge and increasing youth engagement in ecotourism enterprise development. Setting up a centre where YFBEDP recipients can sell their handcrafts would be the most preferred sustainability option.

1. TRAINING OF YOUTHS IN FOREST EDUCATION AND ECOTOURISM ENTERPRISE DEVELOPMENT

The training course "Youth in Forest-Based Enterprise Development Program around Kibale Forest National Park" was organized by Wildlife Clubs of Uganda with support from the United States Forestry Service (USFS). The YFBEDP was implemented during April 2024 and May 2024 at Kibale Eco-Home, KAFRED Resource Center, and UNITE for Environment offices within Bigodi Town Council at the boundary of Kibale Forest National Park in Kamwenge District, western Uganda. Key among the support and implementing partners were the Uganda Wildlife Authority (UWA), UNITE for Environment, Kibale Association for Rural and Environment Development (KAFRED), Rwenzori Center for Sustainable Trade (RCST), KIBALE Eco Home, Katwe Tourism Information Centre, 105.6FM Jubilee Radio in Fort Portal, Nkumba University, and Tooro Botanical Gardens.

Recruitment of YFBEDP into ecotourism training was by presentation of a national ID and passport photographs to the onsite program coordinator from UNITE for Environment. The ID was used to verify age and location, whereas the passport photograph was used to process the WCU membership card.

The training focused on the youth that is in the area of ecotourism guiding activities and all the related aspects of tourism within the Kibale Forest National Park. Skilling and re-tooling them in many areas including but not limited to; concepts of ecotourism, standards of the tourism industry, Etiquette and ethics, customer care as the bedrock of the industry, and the different Ecotourism industry-based enterprises, that can be developed to enhance the sustenance of the youth in the area and the conservation of resources that support the tourism industry in the area. This in all helps to conserve the biodiversity in and around the park.

1.1 Focus Area of the Training

- Concept of Ecotourism
- Standards in Ecotourism
- Ethics, Etiquette, and ethical considerations and practices
- Ecotourism and Nature-based enterprises

1.1.1 Concept of Ecotourism

There is no universally accepted definition of ecotourism. The definition depends on whom you talk to: tour group operators, government officials, business owners, and conservationists have spent a great deal of time trying to agree on one common definition, but have failed to do so. However, we adopted the definition provided by The International Ecotourism Society, which has been revised several times and assumed its final form in January 2015.

Ecotourism is now defined as:

> ***"Responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education"***.

1.1.2 History of Ecotourism

Ecotourism was established through the growth of mass tourism and the rise of environmental awareness. The phenomenon itself existed long before the term was introduced.

- ***17th and 18th century*** - Age of the Grand Tour, a traditional trip of Europe undertaken by mainly upper-class young European men visiting places of natural and cultural interest (mostly France and Italy).
- ***1797*** - The naturalist Alexander von Humboldt and the botanist Aime Bonpland had a five-year journey through Mexico, Colombia, the Orinoco, and the Amazon basins.
- ***1835*** - Darwin's expedition on Beagle. His visit to the Galapagos islands is of crucial importance for the composition of On the Origin of Species (1859).
- ***1848*** - Alfred Russel Wallace and Henry Bates expedition to Amazon rainforests.
- ***19th century*** - Yellowstone National Park (1872, US), Royal Park (1879, Australia) and Banff Park (1885, Canada) are established as "natural areas for protection and recreation in the form of natural parks" 1950s – The Golden Age of Capitalism: postwar economic boom and beginning of the mass tourism.
- ***the Late 1960s - Early 1970s*** - First steps of the environmental movement. Recognition of the potentially devastating effects of mass tourism.

- ***1965*** - Ecotourism was coined as a term by Dr. Nicolas Hetzer, who identified four pillars: minimizing environmental impact, respecting lost cultures, maximizing the benefits of local people, and tourist satisfaction.
- ***1983*** - The term is used again by the Mexican environmental architect Hector Ceballos-Lascurain, who defined it as "the tourism that involves travelling to relatively undisturbed natural areas with the specific object of studying, admiring and enjoying the scenery and its wild plants and animals, as well as any existing cultural aspects found in these areas".
- **1990** - Foundation of TIES - The International Ecotourism Society in Florida (USA).
- **1996** - Publication of "Tourism, Ecotourism, and Protected Areas: The State of Nature-Based Tourism Around the World and Guidelines for Its Development" by Ceballos-Lascurain.
- ***2002*** - The United Nations celebrated the International Year of Ecotourism.
- ***19-22 May 2002*** - World Ecotourism Summit (WES) in Quebec, Canada where the 8 basic principles of Ecotourism were identified.
- ***2003*** - Foundation of The Center for Responsible Travel (CREST) by Dr. William Durham and Dr. Martha Honey.
- **2004 till now** - Ecotourism is unanimously recognized as the fastest-growing sector of the tourism industry (+10% - 30% per year).
- **2015** - The definition of ecotourism is now interpreted as "***responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education***".
- ***2017*** - The United Nations' International Year of Sustainable Tourism for Development.

1.2.3 The concept of ecotourism is based on three main pillars:

- **Environmental pillar**

Through market-linked long-term solutions and effective economic support, ecotourism promotes the conservation and enhancement of local natural and cultural heritage and biological diversity.

- **Social pillar**

Ecotourism represents a great opportunity for capacity building, empowerment of communities, and increase of employment opportunities while respecting sustainable development principles.

- **Cultural/Educational Pillar**

Ecotourism promotes the interpretation of natural and cultural heritage, which is the process of understanding and appreciating local nature and society. Additionally, ecotourism provides a unique opportunity for mutual cultural exchanges between local communities and guests.

It means that those who implement, participate in, and run ecotourism activities should adopt the following:

1.2.4 Ecotourism Principles

- ✓ Minimise physical, social, behavioural, and psychological impacts.
- ✓ Build environmental and cultural awareness and respect.
- ✓ Provide positive experiences for both visitors and hosts.
- ✓ Provide direct financial benefits for conservation.
- ✓ Generate financial benefits for both local people and private businesses.
- ✓ Deliver memorable interpretative experiences to visitors that help to raise sensitivity to host countries' political, environmental, and social climates.
- ✓ Design, construct, and operate low-impact facilities.
- ✓ Recognise the rights and spiritual beliefs of the local people in the community and work in partnership with them to create empowerment.

Ecotourism can provide an alternative way for economically sustainable development for local communities and other income-generating options that we will look at later. At the same time, ecotourism is an opportunity to increase the level of education and create awareness among travellers, making them eco-friendly travellers in the future.

1.2.4 Standards of Ecotourism

Ecotourism standards aim at the following elements and these are the ones our guides ought to exemplify when operationalizing and operating ecotourism-based enterprises:

- Sustainability Management Systems
- Legal Compliance

- Employee Training
- Customer satisfaction
- Responsible Marketing
- Design and Construction elements
- Interpretation of natural surroundings, local culture, and heritage

Major focus areas in the standards are:

- ❖ Maximizing Social and Economic benefits to the Local communities, through;
    - Community development
    - Local employment
    - Fair trade policies
    - Local entrepreneurship
    - Policy against exploitation
    - Equitable hiring
- ❖ Maximise benefits to cultural heritage
    - Cultural code of conduct
    - Protection of historical artefacts
    - Local art incorporation
- ❖ Maximise benefits to the environment and minimize the negative impacts
    - Fair goods and resources consumption
    - Waste disposal
    - Protecting wildlife and biodiversity

1.2.5 Ethics, Etiquette, and ethical considerations and practices;

Ecotourism service providers and future enterprise developers in the industry, have to adhere to the following ethical behaviour and or principles of service;

- Transparency
- Conservation practices (sustainable practices)
- Cultural sensitivity
- Education and Interpretation
- Compliance with regulation
- Continuous improvement

- Communication abilities (speaking in public)
- Accountability
- Inventory and stock-taking
- Physicality of the service provider
- Specialisation and Niche development

1.2.6 Ecotourism Based Enterprises

- Development of community ecotourism trails.
- Enhancement and value addition to the coffee experience.
- Local brewing technology and its enhancement.
- Community biking activities.
- Traditional Dance, Music, and Drama, performed at themed events.
- Home stays and traditional foods experience.
- Basketry, weaving, and pottery with traditional themes.
- Community camp and glamping grounds, operated entirely by the community.

1.3 The need for ecotourism and enterprise development

Through a brainstorming session, participants defined eco-tourism and from their definition, the facilitator wrapped up the definition as Responsible travel, to natural and cultural sites, improves the welfare of local people, and aims at conserving the environment.

Through working with the participants, the facilitators discussed the eco-tourism activities and opportunities in the area and these were

- Community walks
- Wetland walks
- Craft making
- Traditional dance
- Coffee processing
- Local alcohol brewing
- Traditional healing and medicine

Given the fact that there were several ecotourism entities; each of these was given a few minutes to explain what they offer and how it fits in the definition, how they support communities, and how they support the conservation of the environment

After that, we assessed from the participants what the key eco-tourism challenges are in communities around Kibale National Park.

The following were identified as key challenges to eco-tourism in communities around Kibale National Park

Figure 1: Challenges affecting ecotourism around KNP (Bigodi), Kamwenge District

After identifying challenges, participants were put in seven groups, each group was given a challenge, and their task was to identify the solution to the given challenge. From the discussions, some solutions to ecotourism challenges were suggested in Figure 2.

Plate 1: Some YFBEDP during group discussions at KAFRED, Bigodi KNP

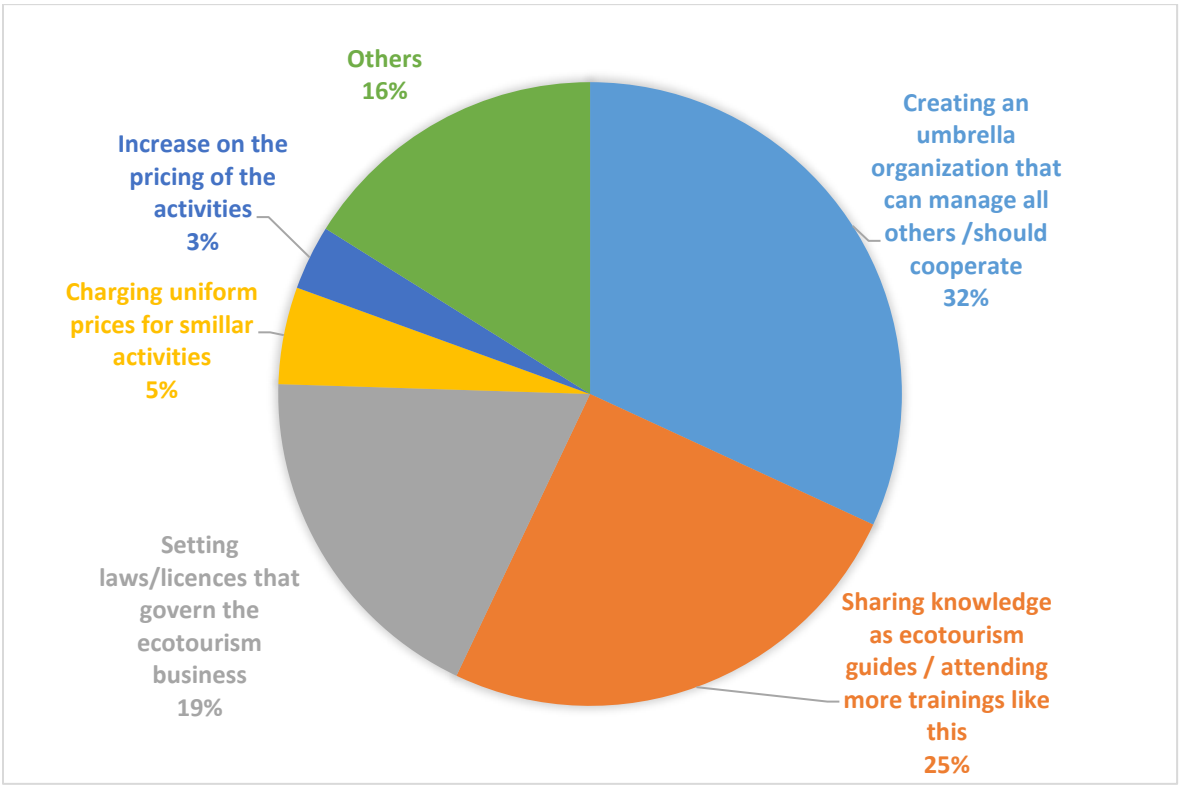

Figure 2: Suggested solutions to address ecotourism challenges in Bigodi around KNP

1.4 Lessons learned from Ecotourism training

After the discussion and after the suggestions, the facilitators told participants that they need to be passionate about eco-tourism if they want to make it. She took a few minutes to share her journey to success in ecotourism and advised that different ecotourism groups should come together for a common cause if they are to learn from each other and benefit from Eco-tourism. Facilitators thanked WCU for this initiative but challenged local players in attendance to take this on the need for cooperation.

The representative from the Community Conservation Department of Uganda Wildlife Authority also advised that if the groups come together, they can have a banner at their tourism office showing the prices for different activities but this is not possible if they are not united. A facilitator from Katwe Eco-tourism Center, shared his own experience whereby in Katwe, there were mushrooming eco-tourism operators between 2015 and 2020. This resulted in low income earned by the community and poor services offered.

The Katwe community during year 2021 came together while working with the local Town Council Administration and since then, the ecotourism operations in Katwe have been harmonized under one umbrella organization, their earnings have since more than doubled, and from these earnings, have extended services to local communities such as building water fetching cages to prevent crocodile attacks. They have also continued to pay tax to the town council, which is used to extend other services to local people. He, therefore, urged communities around Kibale National Park to take advantage of this opportunity offered by WCU to follow suit if they are to benefit from ecotourism.

Plate 2: A facilitator from KAFRED leads a group session during ecotourism training in Bigodi Town Council

1.4.1 Handling Ecotourists

This session was handled by a Freelance Safari Guide, registered under Uganda Safari Guides (USAGA). He shared how he started his guiding profession in communities around Kibale National Park and encouraged ecotourism site guides to become professional and up to the task. Through a brainstorming session, he worked with the participants to first identify the qualities of a good eco-tourism guide. This was one of the exciting parts of the training, and through a brainstorming session, the guides came up with some of the qualities and the facilitator made simple explanations, gave examples, and used role models to demonstrate some of the qualities. The following qualities were discussed:

- Always wear a sincere smile
- Be skilled and know your job
- Be clear by speaking slowly but loud enough, avoid using complicated words
- Being approachable and welcoming
- Being realistic and telling the truth

• Keeping time and being there on schedule
• Being well disciplined
• Being smart at all times and wearing a uniform or clothes that blend in well with your environment
• Being confident and in charge of the tour
• Being dynamic: “changing with change” and creative
• Being knowledgeable about your site, your country, and the whole world
• Cleanliness and hygiene, washing, bathing, brushing, cutting nails etc
• Having empathy and being considerate
• Having enthusiasm and love for the job
• Being patient and perseverance
• Being physically fit and healthy
• Integrity and trustworthiness
• Knowing many languages (polyglot)
• Skills to learn and know your audience
• Good and quick decision making
• Being respectful
• Socially and environmentally responsible

It was noted that occasionally, guests will complain, and the following hints were shared with participants as ways how they can handle guest complaints

• Listen with concern and empathy
• If possible, isolate the guest, so that other guests may not hear his/ her complaints.
• Stay calm, don’t argue with the guest (even when they front external complaints)
• Teamwork is important, don’t blame your colleagues or management
• Show interest in the complaint (I understand) and use the guest’s name
• If possible, take notes and write down the key facts
• Tell the guest what can be done, offer choices but don’t promise the impossible that exceed your authority

Set an approximate time for the completion of corrective actions. Be specific but do not underestimate the amount of time it will take to resolve the problem

• Follow up even if the problem was solved by someone else; contact the guest to ensure that the problem was solved satisfactorily.

Finally, Participants were given hints that it is important to prevent complaints before they happen through proper briefing; communicating safety protocols, understanding expectations, and for the staff to behave and act professionally.

1.4.2 How to organize a successful Walking Safari

The facilitators took participants through the main stages of a tour.

Starting point – Be at the starting point ahead of time to get organized. At this point identify your guests (may need to know them by name etc), warmly welcome the guests introduce yourself, and give precautions, the time you will take, and the expectations. In brief summarize the walk in less than 5 minutes, toilets, etc.

Interest of the clients. A few minutes into the walk, you should identify the interests of the clients and be more inclined to this. You may share information about other fields but once you identify their interests, that's where more effort should be put.

Respect the walking pace of your guests, especially if they want to move slowly. Make sure you keep the group together but if they want to move very fast, slow down their pace technically because it becomes difficult to see a lot when you are moving too fast. This may even scare wild animals.

Use the right technique to show the attractions. This can include working with one of the guests who has seen the attraction to help guide others or even using the clock sign or angles.

Understand the Community's attitude towards tourists and politely communicate this to your guests. Share with them the DOs and the DONTs in the community. On the flip side carry out some awareness in your community.

Stopover: If the walk is too long, find a suitable place under the shade preferably halfway through the journey where visitors can rest.

Debriefing; This should be brief, if you take more than 3 minutes, guests will start to switch off. Don't use the time to beg for tips, directly or indirectly.

Plate 3: A facilitator from BEARC leads an ecotourism training session

1.4.3 Nature/Species Identification

YFBEDP participants were encouraged to have an inventory of what they have to offer in terms of wildlife, other attractions, and activities. They were given simple skills on how to use guidebooks to identify birds and plants/trees in the field.

The facilitators emphasized that nature identification needs more time, and in most cases, guides learn more on the job.

The other aspect that was emphasized was the need to know the local names and traditional uses stories and myths about the different species of plants, animals, and other attractions. Telling most tourists the scientific names is not enough. You can say you do not know the name but tell stories. Some good examples were shared with the participants.

1.4.4 Organizing a Successful Birding Session

Using a field guide/bird book was discussed e.g. for males, females, sub-adults, and adults. How most birds are named according to their colors and body parts; setting examples like Great blue turaco, White-capped robin chart, splendid glossy starling, etc. Discussed how birds can change color or shape during breeding season. One example that surprised many guides was the Long-tailed whydah which loses the long tail outside the breeding season (non-breeding plumage). Participants also discussed how birds make different sounds and that sometimes males and females of the same species can make different calls.

Plate 4: A YFBEDP participant (standing) to ask a question during a birding session training

1.4.5 Trees Identification as habitats for birds

For trees /plants, the facilitator used drawings and a few samples of the different types of leaves and discussed how plants are named according to; order – genera – family, variety, etc. He also discussed how the different leaf formations and arrangements are used to identify a plant; such as:

- Simple
- Compound
- Pinnate, Bi-pinnate and tri-pinnate

• Palmate
• Ovate
• Alternate
• Oblong
• Opposite

Other tips for plant identification include looking at the bark (rough, smooth, thorny, the size of the plant and where it has grown, and looking at the flowers, size, shape, and color.

1.4.6 Ethical behavior in ecotourism (Service provider)

1.4.6.1 Transparency and Sustainability

Ecotourism enterprises should be premised on transparency. They should not just aim at making money to meet individuals' needs for today but should be sustainable in nature.

Education and interpretation; Ecotourism enterprises should have a component of education and interpretation for both guests and local communities

1.4.6.2 Compliance with Regulation

Eco-tourism should operate according to local laws. This will help them garner community support which is a key component in the eco-tourism business.

1.4.6.3 Cultural Sensitivity

Should respect the culture of guests while not compromising on the culture of the locals. Should not emphasize things such as religion when you are not sure if the group you are handling is a religious group. Interpreted local culture rather than promoting your own culture for instance because certain things are done a certain way.

Continuous improvement: There is always room for improvement

1.4.6.3 Inventory/Stock-Taking

Understand the products you have, and the biodiversity in your area to make communication with tourists easy and simple.

1.4.6.4 The art of public speaking

1.4.6.5 Accountability and Transparency

Participants were encouraged to be accountable to their teams, to authorities, and local community

1.4.6.6 Specialization (Niche)

It was appreciated that different ecotourism players have different strengths, and each player was advised to identify their strengths and capitalize on these rather than "jumping on every eco-tourism activity.

1.4.6.7 General Practices

Some general exercises/trainings were conducted on: Basic English language, Speeches/communication, and Basic Accounting skills regarding:

- Cash at hand
- Cash received
- Cash paid out
- Debts to be collected

Community inventory

Profiling the tourists

- Purpose of the visit
- Country of origin
- Interest areas
- Length of stay

Plate 5: A facilitator from Nkumba University leads a session on ethical behavior in ecotourism

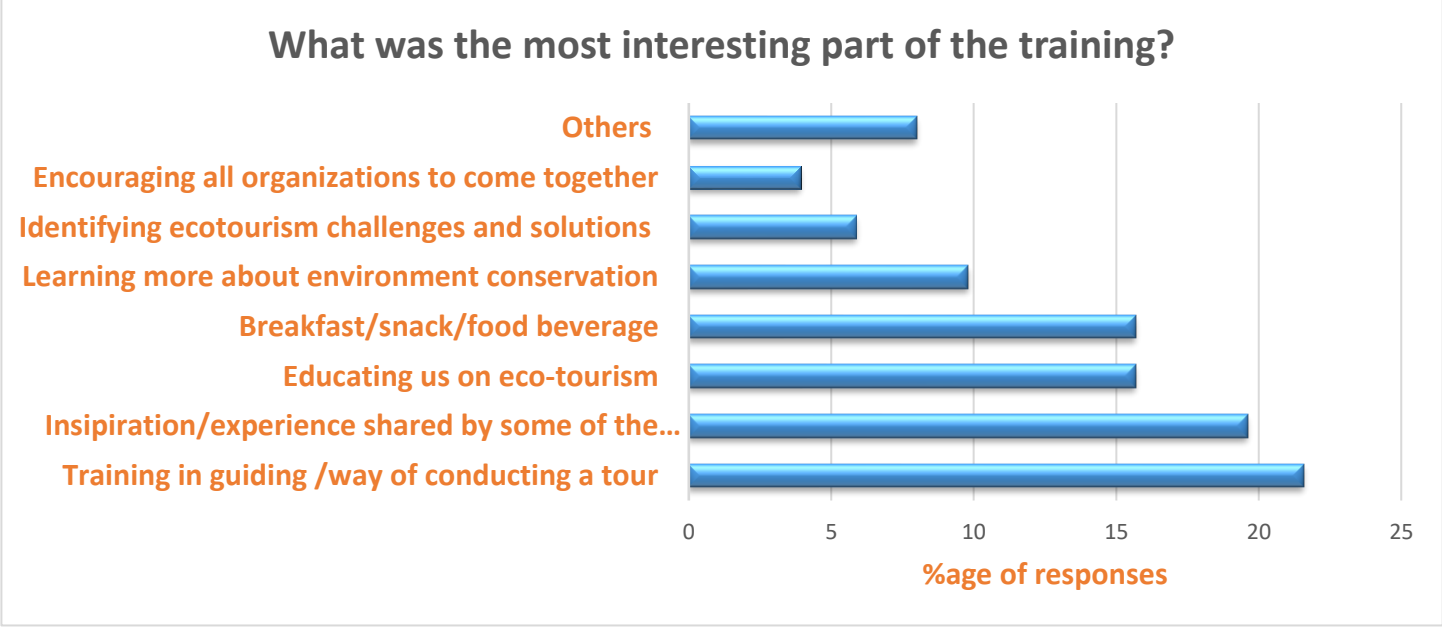

Plate 6: Experiences from ecotourism training by YFBEDP participants

2. TRAINING WOMEN IN THE SUSTAINABLE DEVELOPMENT OF BASKETRY AND OTHER PRODUCTS USING LOCALLY AVAILABLE RAW MATERIALS WITHIN THE COMMUNITY

Recruitment of YFBEDP into the sustainable basketry training was by presentation of a national ID and passport photographs to the onsite program coordinator from UNITE for Environment. The ID was used to verify age and location, whereas the passport photograph was used to process the WCU membership card.

Plate 7: A cross-section of women who were trained in sustainable basketry practices at Kibale Eco-Home, Bigodi in a group photograph with the Executive Director of Wildlife Clubs in Uganda

2.1 Sustainable Handcrafts Making

The facilitators first described the term sustainability as the process of using resources today, while ensuring that the same resources are available for future generations. To drive the point further,

they cascaded into their components of economic sustainability, environmental sustainability, and social sustainability.

2.1.1 Environmental Sustainability of Handcraft Making

On environmental sustainability, YFBEDP participants were encouraged to use regenerative/biodegradable soil-to-soil raw materials, which may not have negative impacts on the environment. They emphasized that at times non-biodegradable wastes cannot be avoided but the focus should be on biodegradable raw materials.

Ensure proper disposal of materials, especially after weaving, do not leave the waste materials all over the place but rather find a place where to dispose. They encouraged participants to compost biodegradable materials and find ways of re-using and repurposing other wastes into crafts as a tool to manage waste.

Sustainably harvest raw materials by avoiding practices such as mass harvesting and debarking of growing trees. Participants were encouraged to plant some of the raw materials even when they were available in the nearby natural areas. YFBEDP participants were encouraged to conserve resources such as water and energy in their practices. This can be through the use of energy-saving cook stoves, using little water, and re-using gray water among others.

2.1.2 Economic Sustainability of Handcraft Making

On economic sustainability, the facilitators emphasized to YFBEDP participants to use locally available raw materials because when one uses what is locally available, you are sure that it is available all through.

Use manageable resources in terms of investment. Basketry and craft making allows almost anyone, with little or no money and few tools, to create a large variety of useful products. Therefore, don’t wait for a lot of capital to get started. You can start small and grow your craft business either as a group or as an individual.

Integrate circular economy in the craft business. This involves using resources more efficiently than just disposing of them. This can be through producing products that are designed to be reused, repaired, or recycled rather than being thrown away as waste.

2.1.3 Social Sustainability of Handcraft Making

The main issue regarding social sustainability was to produce handcrafts that are acceptable in the community. Do not produce products that may end up having a bad image in the community. YFBEDP was encouraged to be open-minded to allow other members of the community to learn from you, and be open to ideas. Although you may not take all of them into consideration, listen to other people's comments.

Have diverse products that suit different demands and cultures. Much as it is important to have a niche, ensure that your niche addresses the needs of people from different backgrounds. Prioritize safety and security in your operations because these are at the base of any modern company.

Plate 8: A trainer from the Rwenzori Sustainable Trade Center leads a theoretical session on sustainable basketry practices

2.2 Making Handcrafts as a Group

The facilitator from RSTC first asked participants if they were working in groups or if they were working as individuals. In addition, many responded that they were working in groups. From this, the YFBEDP participants discussed the following as benefits of working in groups:

1) One can learn from each other
2) There is better bargaining power and market
3) If a member has a big order, it can easily be satisfied
4) Government and other institutions such as UWA and KAFRED find it easier to support groups than individuals
5) Groups can extend benefits to the community; one of the ladies shared an example of the Bigodi Women's Group that started Bigodi Progressive Nursery and Primary School
6) If there is a challenge, it is easier to get a solution when you are working as a craft group than when you are working alone.

However, some members mentioned that working in groups has the following challenges

1) Decision-making is not easy
2) Sometimes, some members benefit more from the group than others do
3) There can be competition and hatred amongst some members and this can affect the whole group

The facilitator based on this discussion to guide participants on how they can make successful craft groups. She encouraged participants to consider the following:

2.3 Cooperation in Sustainable Handcraft Production

2.3.1 Leadership

YFBEDP participants in handicrafts were encouraged to form leadership structures. Facilitators encouraged craft-making groups to elect leaders with a good vision, the leaders have to look for the market and have to know the ability and strength of every member. These leaders have to work with group members to hold meetings at least once a week or once a month for the well-being of the group. During such meetings, they can also share updates with members on whatever is happening but also guide members can set targets and goals for the craft group.

YFBEDP participants were asked to share qualities of whom they considered a good leader and these included:

1) Trustworthiness,
2) Mature in thinking,
3) Respectable in the community,
4) Team player,
5) Respect other group members, and
6) Hardworking

2.3.2 Savings to Start Handcrafts Associations

The facilitators advised YFBEDP participants to develop a savings culture. This can either be a local SACCO or even a bank account where they dedicate part of the earnings. This means from their earnings, they should be able to meet immediate needs as families but should have joint savings somewhere, which can address bigger issues or even support the community.

2.3.4 Constitution and/or Guidelines

The facilitator encouraged groups to have Dos and Don'ts to which every member must comply. This means that if a member does what is contrary, the group members can let them leave the group, especially after they have been warned against such and they go on. This can include a general code of conduct, participation, contribution to savings scheme, and quality of products.

2.3.5 Registration of a Handcraft Association

The facilitators encouraged YFBEDP participants to register their groups even if it is with the Local Council (LC) or Town Council Administration (TCA). This helps them to operate formally, can help them access markets, and also get support from partners.

2.4 Fair Trade Principle in Craft Making

- The facilitators briefly talked about the fair-trade principle as a key tool in guiding crafts business and this involves the following
- Being a blessing for those who are not well off.
- Operating on truth and responsibility

- Proper costing of the products (Do not over or underprice). The facilitators guided that the pricing should consider the type of raw materials (raffia, banana straws, needles, dye, firewood, water, etc), labor input, time, and any other costs.
- Do not force people to weave including children below 18 years
- There should be no discrimination in the crafts business (whoever is interested and meets your criteria as a group, let them join in without looking at their race, tribe, and even gender!)
- Workers should be treated well and they should be happy with what they are doing
- Train workers (learning doesn't stop)
- Be professional

Take measurements and records

Plate 9: One of the facilitators discussed cost and how to make a good basket

2.5 Weaving and Making Natural Dyes

The facilitators from the Rwenzori Sustainable Trade Center (RSTC) shared the following tips on weaving:

- It should take place only for three hours
- You should only weave during the day
- You should not weave under pressure but give time to the weaving
- Should not let any person under 18 years join your group
- Properly dispose of the materials used in weaving
- Weave in a clean environment
- Teach and learn from each other (No one knows it all and no one knows nothing).

Plate 10: Some of the crafts presented by participants at the end of the training

2.5.1 Making natural dyes from Achiote (*Bixa Orellana*)

The facilitators told participants that using natural dyes is one of the sustainable practices and discussed the following advantages of using dyes. They prevent the user from getting diseases that would otherwise be gotten through inhaling inorganic dyes. Natural dyes are from the environment; therefore, they do not affect the soil, air, and water like other dyes. They are locally available in our communities. Therefore, one does not need to go to the shops to get them. The facilitator informed participants that dyes are harvested from roots, flowers, and leaves of plants like passion fruits, raffia, Bixa Orellana, bougainvillea, hibiscus, turmeric, henna, sweet potato, aloe vera, eucalyptus leaves, to mention but a few. This is the most sustainable, eco-friendly, and organic method of preparing dyes, as opposed to using artificially processed dyes. After this introduction, the facilitator took participants through a practical session of making the dyes as shown in Plates 11 and 12.

Plate 11: Hitting and boiling of Achiote (Bixa Orellana) to make natural dyes used to decorate crafts

Plate 12: Achiote (Bixa Orellana) a plant used to make natural dyes used to decorate crafts

2.5.2 Procedure of making natural dyes

1) The dyes are harvested, and washed with cold water-room temperature.
2) They are then pounded in a locally made pestle and mortar to make a thick paste
3) Ash from local cooking stoves is then added to the thick paste.
4) The paste is mixed with water and raffia/papyrus and boiled until the raffia changes color.
5) The dyed raffia is then washed with cold water and left to dry under mild sunshine or shade as shown in Plate 13.
6) The dried raffia is then ready for use.

The facilitators trained YFBEDP participants through a session on making different colors by either doing different procedures or adding different raw materials. For example, to get an orange color, they put Achiote in warm water and put raffia, boiled it for 15-20 minutes, rinsed it in cold water, and dried it, while they added ash to get a black color as shown in Plate 11.

Plate 13: *Some of the natural dyes that were produced during training* drying under the sun

During this training, participants went through a weaving demo and were asked to continue weaving during their free time. By the end of the training, each participant produced a craft that they were working on and were awarded certificates as shown in Plate 14.

Plate 14: One of the participants posing with a local leader with her training certificate

Plate 15: WCU cards and certificates awarded to YFBEDP Participants

3. TRAINING ON SUSTAINABLE MEDICINAL PLANT CONSERVATION AND UTILISATION UNDER YFBEDP

Recruitment of YFBEDP recipients into sustainable harvesting of medicinal plants from Kibale National Park was by presentation of a National Identification card and passport photographs to the onsite program coordinator from UNITE for Environment. Whereas the National Identification card was meant to be used to verify age and location, this was not the case for herbalists since most of them were above the youthful age of 35. The passport photograph was used to process the WCU membership card.

Plate 16: Unprocessed medicinal plant parts exhibited by women during the training

Training Content: The module outline was developed to suit the objectives of the Wildlife Clubs of Uganda training of the youth and women around Kibale Forest National Park. It was also developed to suit the participants' academic level and structured for ease of understanding and to be used as a training guide for the forest adjacent communities. This was basic training to help improve the community's approach to sustainable medicinal plant conservation. The training content and modules delivered are highlighted in the general training overview and description and were all delivered in Runyoro-Rutooro and Runyankole-Rukiga languages.

Training methodology: The training integrated several approaches both interactive inhouse discussions, guided by descriptive presentations and field practical sessions with examples of the medicinal plants in utilization by the communities. The facilitators asked questions and welcomed

the sharing of experience and some situational analysis approaches giving several relevant examples and demonstration of focus group discussion (FGD) management for detailed sharing and learning outcomes.

Training sessions: The training was 50% theory and 50% practical. It used illustrations and case studies. Important issues and questions followed as feedback after each session. Participants interacted freely and shared their experiences with the facilitator. Emphasizing the importance of considering, culture, age, gender, religion, income disparity, and work or group dynamics where applicable to derive comprehensive aspects of the traditional medicinal plant utilization.

Trainee support needs: The trainees highlighted key concerns about their support needs and post-training follow-up sessions:

- Access to resources: Communities highlighted the urgency of access to resources such as seeds, saplings, or propagation materials to contribute to their domestication and conservation
- Technical assistance: Providing continued technical assistance and guidance such as correct identification of plant species, sustainable harvesting techniques, cultivation practices, and processing methods
- Value additional on their locally processed herbs, continuous training on value addition, packaging, marketing, and connecting communities with buyers or distributors.
- Infrastructure development: Investing in infrastructure such as drying facilities, processing centers, or storage facilities can improve the efficiency and quality of medicinal plant processing and storage, enhancing the value chain from harvest to market.
- Capacity building: Ongoing capacity-building initiatives, including workshops, exchange and visitation programs, refresher training, and knowledge-sharing sessions.
- Networking and Collaboration: Facilitating networking opportunities and fostering collaboration among communities, NGOs, government agencies, research institutions, and private sector stakeholders can create synergies, share resources, and amplify the impact of conservation efforts.

3.1 Training Overview/ Module

3.1.1 Sustainable utilization of Medicinal plants

Key concepts of Understanding Medicinal Plants:

- **Bioactive Compounds:** Medicinal plants contain various bioactive compounds such as alkaloids, flavonoids, terpenoids, and phenolics, which contribute to their therapeutic properties. These compounds interact with the human body to produce physiological effects.
- **Traditional Knowledge:** Traditional knowledge refers to the wisdom, practices, and beliefs regarding the use of medicinal plants passed down through generations within indigenous communities. This knowledge is often based on observation, experimentation, and cultural practices.
- **Phytochemistry:** Phytochemistry is the branch of chemistry that deals with the study of plant-derived compounds, including their isolation, identification, and characterization. Understanding the phytochemical composition of medicinal plants is crucial for elucidating their therapeutic properties.
- **Pharmacology:** Pharmacology is the study of the interactions between drugs and biological systems. In the context of medicinal plants, pharmacological studies investigate the mechanisms of action, efficacy, and safety profiles of plant-derived compounds.
- **Ethnobotany:** Ethnobotany is the interdisciplinary field that explores the relationships between plants and people, particularly in terms of traditional knowledge, cultural practices, and societal uses of plants, including medicinal plants
- **Sustainable harvesting:** Sustainable harvesting refers to the practice of harvesting medicinal plants in a manner that maintains or enhances their populations and ecosystems' health. This involves implementing techniques such as selective harvesting, rotation, and habitat conservation to prevent overexploitation.
- **Conservation:** Conservation involves the protection, management, and sustainable use of biodiversity, including medicinal plant species. Conservation efforts aim to preserve plant populations, maintain ecosystem integrity, and safeguard cultural heritage.
- **Cultivation and Domestication:** Cultivation and domestication involve the intentional cultivation of medicinal plants in controlled environments such as gardens, farms, or

agroforestry systems. This practice can help alleviate pressure on wild populations and ensure a sustainable supply of medicinal plants.

- **Regulatory Frameworks:** Regulatory frameworks encompass laws, policies, and regulations governing the collection, trade, and use of medicinal plants. These frameworks aim to ensure ethical sourcing, quality control, and safety standards in the herbal medicine industry.
- **Integration with Conventional Medicine:** Integrating traditional herbal medicine with conventional healthcare practices involves recognizing the complementary nature of both systems and promoting collaboration between traditional healers, healthcare professionals, and researchers for improved patient care and health outcomes

3.2 Cultivation of Medicinal Plants/Good Agricultural Practices

Implementing Good Agricultural Practices (GAP) is crucial for the sustainable cultivation of medicinal plants, ensuring their quality, safety, and environmental sustainability. Here's a comprehensive guide to GAP for cultivating medicinal plants:

3.2.1 Site Selection

1. Choose sites with suitable soil characteristics, sunlight exposure, and water availability for the specific medicinal plants being cultivated.
2. Consider factors such as elevation, slope, and drainage to minimize risks of soil erosion and waterlogging.

3.2.2 Seed Selection and Propagation

1. Source high-quality seeds or plant materials from reputable suppliers or certified germplasm banks.
2. Use appropriate propagation methods such as seeds, cuttings, or tissue culture to maintain genetic diversity and ensure uniformity in plant growth.

3.2.3 Soil Preparation and Management

1. Conduct soil tests to determine nutrient levels and pH, and amend soil as needed to optimize plant growth.
2. Implement soil conservation practices such as mulching, cover cropping, and terracing to prevent erosion and maintain soil fertility.

3.2.4 Water Management

1. Develop efficient irrigation systems to provide adequate moisture to plants while minimizing water wastage.
2. Monitor soil moisture levels regularly and adjust irrigation schedules based on plant requirements and weather conditions.

3.2.5 Crop Rotation and Intercropping:

1. Practice crop rotation to minimize disease buildup and nutrient depletion in the soil.
2. Intercrop medicinal plants with compatible crops to maximize land use efficiency and diversify income streams.

3.2.6 Weed Control

1. Implement integrated weed management strategies, including mechanical, cultural, and chemical control methods.
2. Avoid using herbicides that may contaminate medicinal plants or harm beneficial organisms.

3.2.7 Pest and Disease Management

1. Monitor crops regularly for signs of pest infestation or disease outbreak.
2. Employ cultural practices such as crop sanitation, companion planting, and biological control to minimize reliance on chemical pesticides.

3.2.8 Harvesting and Post-Harvest Handling

1. Harvest medicinal plants at the appropriate stage of growth, taking into account factors such as plant phenology and bioactive compound content.
2. Use sharp and clean tools to minimize damage to plants during harvesting.
3. Handle harvested materials carefully to prevent bruising or contamination, and process them promptly to preserve their quality.

3.2.9 Quality Control and Documentation

1. Establish quality control measures to ensure the identity, purity, and potency of medicinal plants.
2. Keep detailed records of cultivation practices, including inputs used, pest and disease management activities, and harvest yields.

3.2.10 Environmental Sustainability

1. Implement sustainable farming practices that minimize environmental impact, such as agroforestry, organic farming, and biodiversity conservation.
2. Promote the use of renewable energy sources and eco-friendly technologies in cultivation operations.

3.3 Harvesting of Medicinal Plants

Harvesting medicinal plants is a critical step in their cultivation process and requires careful planning and execution to ensure optimal yield, quality, and sustainability. Here are key considerations for harvesting medicinal plants:

1. Timing: Harvest plants at the appropriate stage of growth when their medicinal properties are most potent. This timing varies depending on the plant species and the specific plant part being harvested (leaves, flowers, roots, etc.). Consultation with experts or reference to traditional knowledge can help determine the ideal harvest time.

2. Identification: Accurately identify the target medicinal plant species and ensure that no toxic or non-medicinal plants are harvested inadvertently. Familiarize yourself with the plant's morphology, growth habits, and habitat to avoid misidentification.

3.3.1 Harvesting Methods

- ❖ Hand Harvesting: Use hand tools such as knives, shears, or sickles to carefully harvest plant parts without causing damage.

- ❖ Sustainable Harvesting: Practice selective harvesting to minimize impact on plant populations and ecosystems. Leave enough plants behind to ensure natural regeneration and maintain biodiversity.

- ❖ Ethical Considerations: Respect cultural and ecological sensitivities associated with the harvesting of medicinal plants, especially those harvested from wild habitats or sacred sites.

3.3.2 Harvesting Techniques

- ❖ Leaves and Flowers: Harvest leaves and flowers early in the day when their moisture content is highest and their essential oils are most concentrated.

- Roots and Rhizomes: Harvest roots and rhizomes during the plant's dormant season or when their medicinal compounds are at their peak. Carefully dig around the plant to avoid damaging the roots.
- Bark and Stem: Harvest bark and stem materials using sustainable methods that minimize damage to the plant and promote its regrowth.

3.3.3 Post-Harvest Handling

- Cleaning: Remove any soil, debris, or foreign matter from harvested plant materials to ensure cleanliness and prevent contamination.
- Drying: Dry plant materials promptly after harvest to prevent spoilage and preserve their medicinal properties. Use well-ventilated drying facilities with controlled temperature and humidity levels.
- Storage: Store dried medicinal plants in airtight containers, away from sunlight and moisture, to maintain their potency and quality. Label containers with the plant species, harvest date, and other relevant information.

3.3.4 Quality Control

- Conduct quality assessments of harvested materials to ensure they meet established standards for purity, potency, and safety.
- Implement quality control measures throughout the harvesting and post-harvest processing stages to maintain product integrity.

3.3.5 Documentation

- Keep detailed records of harvesting activities, including harvest dates, quantities, locations, and any relevant observations.
- Maintain documentation of compliance with regulations, certifications, and ethical guidelines related to the harvesting of medicinal plants.

3.4 What to avoid while harvesting medicinal plants

3.4.1 Overharvesting

Harvesting more plants than can be sustainably replenished can deplete wild populations and threaten the survival of species. Avoid harvesting medicinal plants indiscriminately or excessively from natural habitats.

3.4.2 Habitat destruction

Be mindful of the surrounding habitat when harvesting medicinal plants to avoid damaging ecosystems. Avoid trampling on other vegetation, disturbing wildlife habitats, or causing soil erosion during harvesting activities.

3.4.3 Harvesting Endangered Species

Refrain from harvesting medicinal plants that are endangered, threatened, or protected by law. Consult local conservation authorities or red lists to identify species that should be conserved and protected from exploitation.

3.4.4 Harvesting Immature Plants

Harvest medicinal plants at the appropriate stage of growth to ensure optimal potency and quality of the harvested materials. Avoid harvesting immature plants or parts, as they may lack the full complement of bioactive compounds.

3.4.5 Using Harmful Harvesting Practices

Avoid using harmful harvesting practices such as uprooting entire plants, excessive pruning, or damaging surrounding vegetation. These practices can disrupt ecosystems, reduce biodiversity, and compromise the sustainability of medicinal plant populations.

3.4.6 Harvesting Contaminated Plants

Avoid harvesting medicinal plants from polluted or contaminated environments, such as areas with industrial pollution, pesticide runoff, or heavy metals. Contaminated plants may contain harmful substances that can pose risks to human health.

3.4.7 Ignoring Ethical Considerations

Respect cultural, spiritual, and ethical considerations associated with the harvesting of medicinal plants, especially those harvested from sacred sites or culturally significant areas. Seek permission from local communities or indigenous groups before harvesting plants on their lands.

3.4.8 Neglecting Legal Regulations

Familiarize yourself with local, national, and international regulations governing the harvesting of medicinal plants. Obtain necessary permits, licenses, or permissions from relevant authorities to ensure compliance with legal requirements.

3.4.9 Disrupting ecosystem services

Be mindful of the ecological roles that medicinal plants play within their ecosystems, such as providing habitat and food for wildlife, regulating water flow, and maintaining soil fertility. Avoid disrupting these ecosystem services through unsustainable harvesting practices.

3.4.10 Ignoring Sustainable Harvesting Guidelines

Adhere to established sustainable harvesting guidelines and best practices developed by experts, conservation organizations, or regulatory agencies. These guidelines help ensure the long-term viability of medicinal plant populations and promote responsible harvesting practices.

3.5 Primary Processing of Medicinal Plants

3.5.1 Cleaning and Sorting

1. Remove any soil, debris, or foreign matter from the harvested plant materials.
2. Sort the materials to separate leaves, stems, roots, flowers, or other plant parts, depending on the specific requirements of the desired end product.

3.5.2 Washing

1. Rinse the plant materials with clean water to remove surface contaminants, dust, or residues.
2. Use gentle agitation or brushing to clean delicate plant parts without causing damage.

3.5.3 Drying

1. Dry the cleaned plant materials promptly to prevent spoilage and preserve their medicinal properties.
2. Choose appropriate drying methods such as air drying, solar drying, or mechanical drying based on the plant species, climate conditions, and processing facilities available.
3. Ensure proper ventilation and airflow during drying to facilitate moisture removal and prevent mold growth.

3.5.4 Size Reduction

1. If necessary, reduce the size of dried plant materials to facilitate further processing or extraction of bioactive compounds.
2. Use equipment such as grinders, crushers, or milling machines to achieve the desired particle size or consistency.

3.5.5 Storage

1. Store dried and processed plant materials in clean, dry, and well-ventilated containers to maintain their quality and potency.
2. Protect stored materials from exposure to sunlight, moisture, pests, and contaminants.
3. Label containers with the plant species, harvest date, processing date, and any other relevant information for traceability and quality control purposes.

3.5.6 Quality Control

1. Conduct quality assessments of processed plant materials to ensure they meet established standards for purity, potency, and safety.
2. Monitor factors such as moisture content, particle size, color, odor, and microbial contamination to identify any deviations from quality specifications.
3. Implement corrective actions or adjustments to processing techniques as needed to maintain product integrity.
4. Specimen identification /species identification
5. Wild-harvested or wild-crafted material details

3.5.7 Documentation

1. Keep detailed records of primary processing activities, including cleaning, washing, drying, size reduction, and storage.
2. Document processing parameters, such as time, temperature, humidity, and equipment used, for quality control and regulatory compliance purposes.
3. Maintain documentation of adherence to Good Manufacturing Practices (GMP) or other relevant quality management systems.

3.6 Prevention Measures Recommended for Control of Infestation in Harvested Medicinal Plants (*Bacteria, Mould & Yeasts*)

3.6.1 Hygienic Harvesting Practices

1. Ensure that harvesting tools, containers, and equipment are clean and sanitized to prevent contamination of harvested plant materials with microorganisms.

3.6.2 Proper Handling and Storage

1. Handle harvested plant materials with care to avoid bruising or damage that could provide entry points for microorganisms.

2. Store harvested plants in clean, dry, and well-ventilated containers or facilities to minimize moisture accumulation and microbial growth.

3.6.3 Drying Techniques

1. Dry harvested plant materials promptly and thoroughly to reduce moisture content and inhibit the growth of bacteria, molds, and yeasts.

2. Choose appropriate drying methods such as air drying, solar drying, or mechanical drying based on the plant species and environmental conditions.

3.6.4 Temperature and Humidity Control

1. Maintain optimal temperature and humidity levels during drying and storage to discourage microbial proliferation.

2. Monitor environmental conditions regularly and implement measures to control temperature and humidity as needed, such as using dehumidifiers or air conditioning.

3.6.5 Air Quality Management

1. Ensure good ventilation in drying and storage facilities to promote airflow and prevent the buildup of moisture and microbial contamination.

2. Install screens or filters to prevent the entry of insects, pests, and airborne contaminants that could introduce microbial pathogens.

3.6.6 Use of Natural Preservatives

1. Consider using natural preservatives or antimicrobial agents such as essential oils, herbs, or spices to inhibit microbial growth in harvested plant materials.

2. Incorporate preservative herbs or spices into storage containers or packaging materials to provide additional protection against infestation.

3.6.7 Quality Control Checks

1. Conduct regular inspections and quality assessments of harvested plant materials to detect signs of microbial contamination, such as discoloration, foul odors, or visible mold growth.

2. Implement sampling and testing protocols to monitor microbial load and ensure compliance with quality standards and regulatory requirements.

3.6.8 Integrated Pest Management

1. Implement integrated pest management (IPM) practices to control insect pests and rodents that can spread microbial contaminants in storage facilities.

2. Use non-chemical control methods such as traps, barriers, and sanitation measures to minimize pest infestations.

3.6.9 Training and Education

1. Train harvesters, handlers, and processing personnel in proper hygiene practices, sanitation procedures, and pest management techniques to prevent microbial contamination.

2. Provide education and awareness programs on the importance of hygiene and sanitation in maintaining the quality and safety of medicinal plant products.

3.7 Good Manufacturing Practice (GMP)

Good Manufacturing Practice (GMP) refers to a set of guidelines and standards that ensure the quality, safety, and consistency of pharmaceutical, food, and herbal products throughout their manufacturing process.

GMP regulations are designed to minimize risks associated with product contamination, adulteration, and errors, thereby safeguarding public health and consumer welfare.

3.7.1 Quality Management System (QMS)

1. Establish and maintain a comprehensive quality management system that encompasses all aspects of manufacturing, including facilities, personnel, processes, and documentation.
2. Implement quality control measures to monitor and verify the quality of raw materials, intermediate products, and finished goods at various stages of production.

3.7.2 Personnel Training and Qualification

1. Provide adequate training and education to manufacturing personnel to ensure they possess the necessary knowledge, skills, and competencies to perform their duties effectively and in compliance with GMP standards.
2. Maintain records of personnel qualifications, training activities, and competency assessments to demonstrate compliance with regulatory requirements.

3.7.3 Facility Design and Maintenance

1. Design manufacturing facilities under GMP guidelines to facilitate proper sanitation, workflow, and contamination control.
2. Implement routine maintenance, cleaning, and calibration procedures to ensure the functionality and cleanliness of equipment, utilities, and infrastructure.

3.7.4 Control of Raw Materials

1. Establish procedures for the receipt, storage, handling, and testing of raw materials to ensure their identity, purity, and quality.
2. Verify the authenticity and integrity of raw materials through appropriate testing, documentation, and supplier qualification processes.

3.7.5 Process Validation and Control

1. Validate manufacturing processes to demonstrate their capability to consistently produce products that meet predetermined quality specifications.
2. Implement process controls, monitoring systems, and in-process testing protocols to ensure adherence to established manufacturing parameters and product quality attributes.

3.7.6 Documentation and Record Keeping

1. Maintain accurate and comprehensive documentation of all manufacturing activities, including standard operating procedures (SOPs), batch records, quality control tests, and deviations.

2. Establish procedures for the review, approval, retention, and retrieval of records to facilitate traceability, accountability, and regulatory compliance.

3.7.7 Quality Assurance and Quality Control

1. Assign responsibility for quality assurance and quality control functions to designated personnel or departments with the authority and resources to enforce GMP requirements.

2. Conduct internal audits, inspections, and quality reviews to identify and address non-compliance issues, deviations, and opportunities for improvement.

3.7.8 Product Packaging and Labeling

1. Ensure that product packaging and labeling comply with regulatory requirements and accurately convey essential information such as product identity, dosage, usage instructions, expiration date, and warning statements.

2. Implement controls to prevent mix-ups, cross-contamination, or mislabeling errors during packaging and labeling operations.

3.7.9 Complaint Handling and Product Recall

1. Establish procedures for the timely and effective handling of customer complaints, adverse events, and product recalls.

2. Investigate complaints and adverse events thoroughly, take appropriate corrective and preventive actions, and maintain records of all complaint-related activities.

3.7.10 Continuous Improvement

1. Foster a culture of continuous improvement by encouraging feedback, employee involvement, and innovation in manufacturing processes, quality systems, and product development initiatives.

2. Monitor industry trends, technological advancements, and regulatory updates to stay abreast of best practices and emerging requirements in GMP compliance.

3.8 Gaps and Barriers to Sustainable Utilization of Medicinal Plants

3.8.1 Overharvesting and Habitat Destruction

The demand for medicinal plants often exceeds sustainable supply levels, leading to overharvesting and habitat destruction. Lack of regulation and enforcement of harvesting practices contributes to the depletion of wild populations and loss of biodiversity.

3.8.2 Lack of Legal Frameworks and Regulations

Inadequate or ineffective legal frameworks and regulations for the sustainable management and trade of medicinal plants hinder efforts to control harvesting, ensure fair trade practices, and protect endangered species

3.8.3 Limited Access to Resources and Technology

Small-scale farmers and local communities often lack access to resources, technology, and infrastructure needed to cultivate medicinal plants sustainably. This includes access to land, capital, training, and market information

3.8.4 Limited Awareness and Capacity

There is often a lack of awareness and capacity among stakeholders regarding the importance of sustainable utilization practices and the potential impacts of overharvesting. Education, training, and outreach efforts are needed to promote understanding and adoption of sustainable practices.

3.8.5 Market Demand and Commercialization Pressure

High market demand for medicinal plants, driven by pharmaceutical, cosmetic, and herbal industries, can lead to unsustainable harvesting practices and exploitation of wild populations. Commercialization pressure may prioritize profit over sustainability

3.8.9 Lack of Collaboration and Stakeholder Engagement

Inadequate collaboration and coordination among stakeholders, including governments, local communities, researchers, and industry players, impede efforts to develop and implement sustainable management strategies for medicinal plants.

3.8.10 Climate Change and Environmental Degradation

Climate change and environmental degradation pose significant threats to the sustainability of medicinal plant ecosystems. Shifts in temperature, precipitation patterns, and habitat loss can impact plant growth, distribution, and resilience.

3.8.11 Weak Monitoring and Enforcement Mechanisms

Inadequate monitoring, enforcement, and compliance mechanisms limit the effectiveness of regulations and management measures aimed at promoting sustainable utilization of medicinal plants. Strengthening monitoring and enforcement capacity is essential for ensuring compliance with sustainability standards and regulations.

3.9 MP-Particle Size Reduction

Importance of particle size reduction:

- Particle size reduction of medicinal plants is often necessary to increase their surface area,
- Enhance dissolution rates,
- Improve bioavailability,
- Facilitate extraction of bioactive compounds

Grinding/Milling: This is one of the most common methods where the plant material is ground using mechanical forces. Techniques include:

- **Mortar and Pestle**: Manual grinding using a mortar and pestle.
- **Ball Milling**: Plant material is ground using balls in a rotating cylinder.
- **Hammer Milling**: Plant material is crushed by the impact of hammers.
- **Jet Milling**: Material is pulverized by high-speed jets of compressed air or steam.

3.10 Extraction of Medicinal Plants

3.10. 1 Preparation

- The herb/root/bark must be properly dried
- Particle size reduction is key for faster extractions
- Put MP material in the mill facility/mortar
- Fill a weighed amount of milled herb into temporary storage materials

3.10.2 Solvent Extraction Method

- **Maceration:** Plant material is soaked in a solvent (e.g., water, ethanol, methanol) for a period to allow the solubilization of desired compounds.
- **Percolation:** Similar to maceration but involves continuous solvent flow through the plant material.
- **Soxhlet Extraction:** Plant material is placed in a thimble, and a solvent is repeatedly cycled through the material via heating and condensation, allowing for efficient extraction.

3.10.3 Water Extraction Method

1. **Infusion**: This is one of the simplest methods where plant material is steeped in hot water for a certain period to allow the solubilization of compounds. It's similar to making tea. The temperature and duration of infusion can vary depending on the plant material and desired compounds.
2. **Decoction**: In this method, plant material is boiled in water for a longer period compared to infusion. Boiling helps to extract a broader range of compounds, including both water-soluble and some heat-stable compounds. Decoctions are commonly used for tougher plant parts like roots, bark, and seeds.
3. **Cold Water Extraction**: While not as efficient as hot water extraction, cold water can still be used to extract certain compounds from medicinal plants, especially heat-sensitive ones. Plant material is soaked in cold water for an extended period, sometimes with occasional stirring or agitation.
4. **Maceration**: In this method, plant material is soaked in cold or hot water for an extended period at room temperature. The extraction process can take hours to days, depending on the plant material and desired compounds.
5. **Hydro distillation**: Though primarily used for extracting essential oils, hydro distillation also allows for the extraction of water-soluble compounds. In this method, steam is passed through the plant material, vaporizing both essential oils and water-soluble compounds, which are then condensed and collected.

3.11 Powder Mixing in MP Processing

1. **Homogeneity**: Powder mixing ensures that all ingredients in the formulation are uniformly distributed throughout the mixture. This is crucial for ensuring consistent dosage and effectiveness of the final product.

2. **Ingredient Compatibility**: Mixing allows for the combination of different plant materials, extracts, excipients, and additives to create formulations with desired therapeutic effects and properties. It also ensures that all ingredients are compatible and do not react unfavorably with each other.

3. **Enhanced Bioavailability**: Mixing certain plant materials or extracts with other ingredients can enhance the bioavailability of bioactive compounds, improving their absorption and efficacy in the body.

4. **Improved Palatability**: Mixing medicinal plant powders with flavoring agents, sweeteners, or other additives can improve the taste and palatability of herbal formulations, making them more appealing to consumers.

5. **Uniform Dispersion of Active Ingredients**: Powder mixing ensures that active ingredients present in medicinal plants or their extracts are evenly dispersed throughout the formulation, maximizing their therapeutic effects.

6. **Formulation Development**: Powder mixing is an integral part of formulation development, where various ingredients are combined in different ratios to optimize the desired characteristics of the final product, such as stability, solubility, and shelf-life.

7. **Quality Control**: Proper mixing techniques and equipment are essential for maintaining quality control and ensuring consistency in the production of medicinal plant formulations. Uniform mixing minimizes the risk of ingredient segregation or uneven distribution of active compounds.

3.12 Tincture Manufacturing

3.12. 1 Raw material for tincture processing

1 **Medicinal Plant Material**: This is the primary ingredient used to prepare the tincture. It can include various parts of the plant such as leaves, flowers, stems, roots, bark, or berries, depending on the specific medicinal properties being targeted. The choice of plant material

depends on the desired therapeutic effects and the active constituents present in different plant parts.

2 **Alcohol**: Alcohol serves as the solvent for extracting the bioactive compounds from the medicinal plant material. Ethanol (commonly known as alcohol or grain alcohol) is the most commonly used solvent due to its ability to efficiently extract a wide range of compounds, including both hydrophilic and lipophilic substances. The concentration of alcohol used in tincture manufacturing typically ranges from 25% to 90%, depending on the solubility of the target compounds and the desired potency of the final tincture.

3 **Water**: In some cases, water may be added to the alcohol during the tincture manufacturing process to facilitate the extraction of water-soluble compounds from the plant material. The addition of water can help improve the extraction efficiency and yield of certain bioactive constituents.

3.12.2 Optional Additives

Depending on the specific formulation and desired properties of the tincture, various additives may be incorporated into the manufacturing process. These can include:

- Flavoring Agents: Herbs, spices, or essential oils may be added to enhance the taste or aroma of the tincture.
- Preservatives: Natural preservatives such as vitamin E or rosemary extract may be added to extend the shelf life of the tincture.

Equipment and Packaging Materials: Equipment used in tincture manufacturing may include stainless steel tanks or containers for maceration, filtration equipment, and storage vessels. Packaging materials such as amber glass bottles or dropper bottles are commonly used to store and dispense the finished tincture.

3.12. 3 Appropriate container materials for tincture manufacturing

1. **Glass Bottles**: Amber glass bottles are the most popular choice for storing tinctures. They offer excellent chemical resistance, preventing interactions between the tincture and the container that could compromise its potency or purity. Amber glass also protects against

light, which can degrade certain bioactive compounds in the tincture. Glass bottles are reusable, recyclable, and generally considered inert, making them suitable for a wide range of medicinal products.

2. **High-Density Polyethylene (HDPE) Bottles**: HDPE bottles are lightweight, durable, and resistant to chemical corrosion, making them suitable for storing tinctures. While not as chemically inert as glass, HDPE is compatible with alcohol and provides a cost-effective alternative for large-scale production or when breakage is a concern. However, HDPE bottles may not provide as much protection against light as amber glass.

3. **Polyethylene Terephthalate (PET) Bottles**: PET bottles are lightweight, transparent, and shatterproof, making them convenient for storing and dispensing tinctures. However, PET is less chemically resistant than glass or HDPE and may not be suitable for long-term storage of tinctures containing high concentrations of alcohol or sensitive bioactive compounds.

4. **Aluminum Bottles**: Aluminum bottles offer excellent barrier properties against light, oxygen, and moisture, making them suitable for protecting the potency and stability of tinctures. They are lightweight, recyclable, and resistant to corrosion. However, aluminum containers may react with acidic or alkaline solutions, so they are typically lined with a protective coating to prevent interactions with the tincture.

5. **Glass Dropper Bottles**: These are small glass bottles equipped with a dropper or pipette for convenient and precise dispensing of tinctures. They are commonly used for liquid herbal extracts and tinctures intended for oral or topical administration. Glass dropper bottles provide excellent chemical resistance and are available in amber glass to protect against light exposure.

3.12.4 Process of Making a Tincture

Selecting Plant Material: Choose high-quality medicinal plant material, such as leaves, flowers, stems, roots, or berries, depending on the desired therapeutic properties of the tincture. Ensure that the plant material is clean, free from contaminants, and properly identified.

Preparation of Plant Material: If necessary, clean and dry the plant material to remove dirt, debris, and excess moisture. Depending on the plant part used, you may need to chop, grind, or crush the material to increase its surface area and facilitate extraction.

Choosing Solvent: Select an appropriate solvent for extraction. Ethanol (alcohol) is commonly used due to its ability to efficiently extract a wide range of bioactive compounds from plant material. The concentration of alcohol used in the tincture can vary depending on the solubility of the target compounds and the desired potency of the final product.

Maceration: Place the prepared plant material in a clean, dry glass jar or container. Cover the plant material with the chosen solvent (alcohol) to ensure complete immersion. Seal the container tightly with a lid.

Extraction Period: Allow the plant material to macerate in the solvent for a certain period, typically ranging from several days to several weeks. During this time, the alcohol extracts the bioactive compounds from the plant material, resulting in a concentrated liquid extract known as a tincture.

Agitation: Shake or stir the tincture mixture regularly during the extraction period to ensure thorough mixing and extraction of bioactive compounds from the plant material.

Filtration: After the extraction period is complete, filter the tincture mixture to remove solid plant particles and debris. Use a fine mesh strainer, cheesecloth, or coffee filter to achieve a clear, particle-free tincture.

Storage: Transfer the filtered tincture into clean, dark-colored glass bottles or containers for storage. Amber glass bottles are preferred as they protect against light, which can degrade certain bioactive compounds in the tincture. Seal the bottles tightly with caps or lids.

Labeling: Label each tincture bottle with the name of the plant material, the solvent used, the concentration or strength of the tincture, the extraction date, and any relevant instructions or precautions for use.

Storage and Aging: Store the tincture bottles in a cool, dark place away from direct sunlight and heat to preserve the potency and stability of the tincture. Some tinctures may benefit from aging for a certain period to enhance their flavor, aroma, and therapeutic properties.

3.13 Dosage Prescriptions in Medicinal Plants-Herbs

1. **Dosage Forms**:
    - **Tinctures**: Dosage is typically measured in drops or milliliters (ml). Standard dosages for tinctures often range from 10 to 60 drops per dose, depending on the strength of the tincture and the specific herb being used.
    - **Teas/Infusions**: Dosage is measured in cups or ounces (oz) of tea. A typical dosage is 1 to 3 cups of herbal tea per day, depending on the potency and intended use of the herbs.
    - **Capsules/Tablets**: Dosage is determined by the manufacturer and usually listed on the product label. It's essential to follow the recommended dosage instructions provided by the manufacturer.
2. **Dosage Guidelines**:
    - Start with a low dose and gradually increase if needed, especially for individuals who are new to herbal medicine or have sensitive constitutions.
    - Consult reliable sources, such as herbalists, pharmacists, or reputable herbal medicine books, for dosage recommendations specific to each herb.
    - Consider individual factors such as age, weight, health status, and any pre-existing medical conditions or medications that may interact with the herbal preparation.

3.14 Dosage Administration in Medicinal Plants-Herbs

3.14.1 Administration

1. **Oral Administration**: Most herbal preparations are administered orally, either in the form of tinctures, teas, capsules, or tablets. They can be taken with water, juice, or food to enhance absorption and minimize gastrointestinal irritation.

2. **Topical Application**: Some herbal preparations are applied externally to the skin as ointments, creams, poultices, or compresses. Follow specific instructions for the application provided with the product or consult a healthcare professional for guidance.

3. **Inhalation**: Inhalation of herbal steam or vapor is another method of administration for certain respiratory conditions. This can be achieved by inhaling the steam from hot herbal infusions or using herbal essential oils in a diffuser or steam inhalation device.

4. **Rectal or Vaginal Administration**: In some cases, herbal preparations may be administered rectally or vaginally for localized effects or to avoid gastrointestinal irritation. This should only be done under the guidance of a qualified healthcare provider.

3.14.2 Dosage Monitoring, Adjustments-Precautions

Monitoring and Adjustments:

- Monitor the patient's response to the herbal preparation, including any changes in symptoms, side effects, or adverse reactions.

- Adjust the dosage as needed based on the individual's response, with guidance from a qualified healthcare professional.

Safety Precautions:

- Always use medicinal plants and herbal preparations with caution, as they can have potent effects and may interact with medications or underlying health conditions.
- Follow recommended dosage guidelines and avoid exceeding the maximum recommended dose unless under the supervision of a healthcare professional.
- Discontinue use and seek medical attention if any adverse reactions or side effects occur.

3.14.3 Call to Action for Medicinal Plant Conservation Efforts

- Empower youth and all relevant stakeholders with sustainable utilization models, innovative knowledge, and facilities
- Support indigenous communities in the documentation of their indigenous medicinal knowledge
- Facilitate knowledge sharing about Finance mechanisms
- Policy regulation, governance
- Initiate collaboration and partnership
- Research and monitoring
- Technology transfer
- Youth involvement
- Indigenous knowledge enhancement

3.15 Participants/Trainee/Feedback

The training approach used, diversity of knowledge sharing was considered throughout the training approach; The training context enhanced, traditional, scientific, social, and indigenous technical knowledge considerations in implementing sustainable medicinal plant conservation approaches. At the end of the training, Trainees were given a platform to share experiences on their mode of harvesting and common medicinal plants in the area, and the following correspondences were documented.

Table 1: YFBEDP herbalist correspondences on the common medicinal plant utilization in the area

FAMILY	Scientific name	Local name (Rutooro)	Type	Parts used	MOP	Diseases treated
Myrsinaceae	*Maesa lanceolata* G. Don	Omuhangabagenzi	S	s	P	Scars, skin rashes
Acanthaceae	*Justicia fluva* Kurz.	Mufooka	H	L	HT	Fever
Aloaceae	*Aloe wallostoni (L.) Burn.F*	Enkoko rutanga	H	L	AE HT	Wounds Malaria
Anarcadiaceae	*Mangifera indica* L.	Muyembe	T	L	HT	Cough
Asparagaceae	*Dracaena fragrans (*L) KerGawl	Omuramura	T	S	AE	Cleaning ears
Asteraceae	*Vernonia amygdalina* Del.	Mubirizi	S	L	P	Fresh wounds
Asteraceae	*Aspilia pluriseta* Sch.	Ekarwa	S	L	CL	Dental problems
Asteraceae	*Crassocephalum vittelinum* (Benth) S.moore	Mbiribiri	S	F	AE	Fresh wounds
Asteraceae	*Bothriocline longipes N.E.Br*.	Kitokotoko	T	L	HT	Cough and flue
Asteraceae	*Guizotia scabra* Chiov.	Kiterankuba	T	F	HT	Fever and malaria
Bignoniaceae	*Markhamia lutea* K.schum	Musambya	T	B & L	HT	Fever
Bignoniaceae	*Spathodea campanulata*	Munyara	T	B	HT	Vaginal dryness
Bromediaceae	*Ananas cosmosus* (L.) Merr.	Enanansi	S	F	J	Cough
Canellaceae	*Warbugia ugandensis* Sprague.	Muharrumi	T	L	HT	Stomach pain

3.16 Trainee Learning Outcomes

- ❖ Increased knowledge and a deeper understanding of local medicinal plants, including their properties, uses, and sustainable harvesting techniques.
- ❖ Skill development through practical training sessions, participants acquired skills in plant identification, sustainable harvesting, processing, and extraction methods.
- ❖ Environmental stewardship and development of a sense of responsibility towards the environment and the importance of sustainable practices.
- ❖ Cultural preservation through understanding traditional medicinal plant usage helps preserve cultural heritage and indigenous knowledge systems. It ensures that valuable ancestral wisdom is passed down to future generations.

Plate 17: A Facilitator from Tooro Botanical Gardens demonstrates to trainees on sustainable harvesting of bark of the medicinal tree species using a tree bark

Plate 18: Facilitator explains to trainees the diversity of collected medicinal plants during training

Plate 19: Training on Medicinal plant size reduction of *Hibiscus acetosella*

Plate 20: Women herbalists explain several medicinal plants collected during the training sessions

4. MONITORING AND EVALUATION

4.1 Training of youths in forest education and ecotourism enterprise development.

Out of the 50 youths that benefited from this training, we randomly evaluated/interviewed 26 of them representing 52%.

Age ranges of respondents.

24 respondents representing 92.31% were of the age range 18 to 35 years of age while the other 2 respondents were from the extreme age ranges of less than 18 years and more than 35 years of age representing 3.85% for each. This means the training benefited a targeted age group of youths aged 18 to 35 years.

Gender of respondents

16 (61.54%) of the respondents were male and 10 (38.46%) were females meaning both genders benefited from this particular training.

Occupation

21 (80.77%) were tourist guides, 3 (11.54%) were students and 2 (7.69%) were traders. The students and traders attending the training could show a growing interest in joining the ecotourism business among young people and other community members around Kibale National Park.

In what topics were you trained in?

Table 2: Evaluation Topics for training during ecotourism

Topics of Ecotourism that the respondents remembered during the evaluation	Freq.	%
Concept of Ecotourism Ethics, Etiquette, and ethical considerations and practices; Ecotourism and Nature-based enterprises	4	15.38
Concept of Ecotourism Ethics, Etiquette, and ethical considerations and practices; Ecotourism and Nature-based enterprises Standards in Ecotourism	1	3.85
Concept of Ecotourism; Standards in Ecotourism	1	3.85
Concept of Ecotourism; Standards in Ecotourism; Ecotourism and Nature-based enterprises	5	19.23
Concept of Ecotourism; Standards in Ecotourism Ethics, Etiquette, and ethical considerations and practices; Ecotourism and Nature-based enterprises	14	53.85
Ethics, Etiquette, and ethical considerations and practices; Standards in Ecotourism	1	3.85
Total	**26**	**100.00**

The table representation above indicates that each respondent remembered at least two topics of ecotourism that were discussed during the training.

The concept of Ecotourism is based on the following three pillars?

Table 3: Evaluation on pillars of ecotourism

Responses for Ecotourism pillars	Freq.	%
Environmental, Economic and Cultural or Educational	13	50.00%
Environmental, Economic and Social	2	7.69%
Environmental, Social and Cultural or Educational pillar	11	42.31%
Total	**26**	**100.00%**

Some 11 representing 42.31% of the respondents got it right. The 50% (13) probably went for the "Environmental, Economic and Cultural or Educational" option because of the existence of "Economic" which could be thought of as one of the major outcomes of ecotourism and a major

reason most of them join ecotourism. This indicates a good number of training participants gained knowledge on the pillars of ecotourism.

Good ecotourism practices should minimize physical, social, behavioural, and psychological impacts.

Table 4: Evaluation on practices of ecotourism

Responses	Freq.	%
Strongly Agree	9	34.62%
Agree	11	42.31%
Neutral	4	15.38%
Disagree	2	7.69%
Total	**26**	**100.00%**

Some 34.62% (9) agreed and 42.31% (11) strongly agreed showing that respondents agree to sustainable ecotourism practices. This indicates positive attitudes towards good ecotourism practices.

What Ethics, Etiquette, and ethical considerations and practices for Ecotourism do you know?

Table 5: Knowledge on Ecotourism etiquette

Responses	Freq.
Conservation practices (sustainable practices); Cultural sensitivity; Communication abilities (speaking in public); Physicality of the service provider; Specialization and Niche development	1
Conservation practices (sustainable practices); Cultural sensitivity; Compliance with regulation; Communication abilities (speaking in public); Inventory and stock-taking; Physicality of the service provider	1
Conservation practices (sustainable practices); Cultural sensitivity; Education and Interpretation; Continuous improvement; Communication abilities (speaking in public); Accountability; Inventory and stock-taking; Physicality of the service provider; Specialization and Niche development	1

Conservation practices (sustainable practices); Cultural sensitivity; Education and Interpretation; Continuous improvement; Communication abilities (speaking in public); Physicality of the service provider; Specialization and Niche development	1
Cultural sensitivity; Education and Interpretation; Communication abilities (speaking in public)	1
Transparency Conservation practices (sustainable practices); Accountability Education and Interpretation; Cultural sensitivity; Communication abilities (speaking in public); Continuous improvement; Compliance with regulation; Inventory and stock-taking	1
Transparency; Conservation practices (sustainable practices); Cultural sensitivity; Education and Interpretation; Communication abilities (speaking in public); Accountability; Inventory and stock-taking; Physicality of the service provider; Specialization and Niche development	1
Transparency Conservation practices (sustainable practices); Cultural sensitivity; Education and Interpretation; Communication abilities (speaking in public); Accountability; Physicality of the service provider; Specialization and Niche development	1
Transparency Conservation practices (sustainable practices); Cultural sensitivity; Education and Interpretation; Compliance with regulation; Continuous improvement; Communication abilities (speaking in public); Accountability; Inventory and stock-taking; Physicality of the service provider	2
Transparency; Conservation practices (sustainable practices); Cultural sensitivity; Education and Interpretation; Compliance with regulation; Continuous improvement; Communication abilities (speaking in public); Accountability; Inventory and stock-taking; Physicality of the service provider; Specialization and Niche development	7
Transparency; Conservation practices (sustainable practices); Cultural sensitivity; Education and Interpretation; Compliance with regulation; Continuous improvement; Communication abilities (speaking in public); Accountability; Inventory and stock-taking; Physicality of the service provider; Specialization and Niche development; Others	3
Transparency; Conservation practices (sustainable practices); Cultural sensitivity; Education and Interpretation; Compliance with regulation; Continuous improvement; Communication abilities (speaking in public); Inventory and stock-taking; Physicality of the service provider	1

Transparency; Conservation practices (sustainable practices); Cultural sensitivity; Education and Interpretation; Compliance with regulation; Continuous improvement; Communication abilities (speaking in public); Inventory and stock-taking; Specialization and Niche development	1
Transparency; Conservation practices (sustainable practices); Cultural sensitivity Education and Interpretation; Compliance with regulation; Continuous improvement; Communication abilities (speaking in public); Physicality of the service provider; Specialization and Niche development	1
Transparency; Conservation practices (sustainable practices); Cultural sensitivity; Education and Interpretation; Continuous improvement; Communication abilities (speaking in public); Accountability; Inventory and stock-taking; Physicality of the service provider	1
Transparency; Conservation practices (sustainable practices); Cultural sensitivity; Education and Interpretation; Continuous improvement; Communication abilities (speaking in public); Physicality of the service provider; Specialization and Niche development	1
Transparency; Education and Interpretation; Communication abilities (speaking in public); Physicality of the service provider; Continuous improvement; Cultural sensitivity; Conservation practices (sustainable practices)	1
Total	**26**

Each respondent mentioned at least three (3) of the Ethics, Etiquette, and ethical considerations and practices for Ecotourism that were discussed during the training with majority mentioning almost all. Among others that the respondents suggested were; tolerance, flexibility, gender sensitivity, marketing and career guidance. This indicates that the training participants gained knowledge on the Ethics, Etiquette, and ethical considerations and practices for ecotourism.

The following are eco-tourism activities and opportunities in your community except?

Table 6: Ecotourism activities around Bigodi TC

Response	Freq.	%
Film shows	26	100
Community walks	0	0
Wetland walks	0	0
Craft making	0	0
Traditional dance	0	0
Coffee processing	0	0
Local alcohol brewing	0	0
Traditional healing and medicine	0	0
Total	**26**	**100**

Some 100% chose film shows as an exemption of the ecotourism activities and opportunities in their community showing that the training participants gained knowledge on the ecotourism activities and opportunities.

What part of the training did you like most?

Table 7: Rating training delivery

Responses	%
Group discussions	19.23
Facilitators were good	15.38
Everything	11.54
Inspiration by the facilitators	11.54
Nature conservation sensitization	11.54
Practical sessions	11.54
Learning Ethics, etiquette, ethical considerations and practices topic	7.69
Others	11.54
Total	**100.00**

Others include; Ecotourism sustainability training, networking and teamwork.

What did you not like about the training?

Table 8: Likes and dislikes about the YFBEDP training

Responses	%
Nothing	26.92
Poor time management	26.92
Limited time for the training	23.08
Others	15.38
The training allowance was small	7.69
Total	**100.00**

Others include; the lack of a projector, lack of team among trainees, a suggestion to put all ecotourism enterprises under one umbrella and some facilitators were harsh.

What activities would you suggest for WCU to include in their future projects/programs?

Table 9: Areas for further support to enhance YFBEDP

Responses	%
More training	23.08
Organize field trips for guides	19.23
Creating and connecting youths to ecotourism and green jobs	11.54
Community conservation initiatives to promote alternative livelihoods	7.69
Community sensitization on conservation	7.69
Funding youth tourist guides to purchase guiding equipment	3.85
Include Park activity fees under the WCU card membership benefits	3.85
Indigenous tree planting	3.85
More practical sessions	3.85
Music, dance and drama	3.85
Nature-related film showing	3.85
Tour guide assessments	3.85
Training on field safety measures, Partnership building in Ecotourism	3.85
Total	**100.00**

4.2 Evaluation on women participation in sustainable development of basketry and other products using locally available raw materials

Out of the 30 youths that benefited from this training, we randomly evaluated/interviewed 17 of them representing 56.67%.

Age ranges

Some 94.1% (16) of the respondents were of 18 to 35 years of age while 5.9% (1) of the respondents were of more than 35 years of age. This indicates the target age group dominated the training.

Gender

Some 94.1% (16) of the respondents were female while 5.9% (1) of the respondent's male. This indicates the target gender dominated the training.

Occupation.

Some 82.25% (14) of the respondents are craft makers while 17.65% (3) are farmers. The 17.65% of the farmers attending the training show interest among other youths in joining craft making.

How did you hear about this training opportunity by WCU?

Table 10: Mobolisation to participate in the project

Responses	%
Through a local association	62.07
Mobolisation by KAFRED	37.93
Total	**100.00**

Some 62.07% having heard through a local association shows that craft makers have existing local associations.

Was it your first time attending a training for handcraft making?

Table 11: Participation in training on sustainable basketry practices

Responses	%
Yes	88.24%
No	11.76%
Total	**100.00%**

If yes, would you like to continue receiving training on sustainable basketry?

Table 12: Gauging interest for continuous training in sustainable basketry by WCU

Responses	%
Yes	88.24%
No	11.76%
Total	**100.00%**

This indicates that the youths are interested in having more of these training and making crafts. Those that indicated no, were interested in supporting them in alternative livelihoods.

What handcraft-making skills did you learn during the training?

Table 13: Handcraft skills learnt during the training

Responses	Freq.
Applying natural dyes on the baskets; Extracting natural dyes; Mixing natural dyes.	1
Basket weaving; Mixing natural dyes;	1
Basket weaving; Mixing natural dyes; Extracting natural dyes; Applying natural dyes on the baskets.	1
Mixing natural dyes.	9
Mixing natural dyes; Basket weaving; Applying natural dyes on the baskets.	1
Mixing natural dyes; Basket weaving; Extracting natural dyes; Drying weaving materials	1
Mixing natural dyes; Basket weaving; Others	1
Mixing natural dyes; Others	1
Others	1
Total	**17**

The respondents at least learnt one skill from the training. The other skills gained include; pricing the products, not using children under the age of 18 years and how to share knowledge.

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Sustainable handcraft making may not have negative impacts on the environment

Table 14: Rating knowledge on sustainable handcraft making

Responses	%
True	100
False	0
Total	**100**

Some 100% positive attitudes towards environmental sustainability were registered.

Using locally available raw materials for handcraft-making business increases economic gains.

Table 15: Rating knowledge on economic gains from handcrafts while using locally available raw materials

Responses	%
True	100
False	0
Total	**100**

The respondents were 100% aware of the local availability of raw materials for craft making.

What part of the training about baskets did you like most?

Table 16: Rating training on sustainable baskets

Responses	%
Mixing natural dyes	45.0%
Weaving baskets	25.0%
Marketing the baskets	15.0%
Sustainable harvesting of materials	10.0%
Applying natural dyes on the baskets	5.0%
Total	**100.0%**

What did you not like about the training?

Table 17: Evaluation of the training about baskets

Responses	%
None	88.2
Pricing of products	11.8
Total	**100.0**

What activities would you suggest for WCU to include in their future projects/programs?

Table 18: Suggestions to improve YFBEDP programme

Responses	%
No suggestion	58.82
Marketing our products	17.65
More training	11.76
Training on new weaving designs	11.76
Total	**100.00**

4.3 Evaluation on sustainable medicinal plant extraction, conservation and utilization under YFBEDP

Out of the 20 youths that participated in this training, we randomly evaluated/interviewed 11 of them representing 55%.

Age ranges

Some 81.8% (9) of the respondents were aged more than 35 years old, while 18.2% (2) of the respondents were of ages 18 to 35 years of age. This indicates that ethnobotanists are mainly older persons with extensive indigenous technical knowledge.

Gender

Some 100% (11) of the respondents were female. This is simply attributed to the 100% female gender attendance during the training. No male ethnobotanists attended the training.

Occupation.

Some 90.9% (10) of the respondents were Ethnobotanists while 9.1% (1) were farmers. The 9.1% of the farmers show interest among other community members in becoming Ethnobotanists.

How did you hear about this training opportunity from WCU?

100% (11) of the respondents heard about the training opportunity through a friend. This could indicate the nonexistence of a local association that brings together Ethnobotanists.

The training equipped you with the following skills.

Responses	**%**
Medicinal plant identification; processing; sustainable harvesting	27.27%
Medicinal plant identification; sustainable harvesting; processing	45.45%
sustainable harvesting	9.09%
sustainable harvesting; Medicinal plant identification; processing; extraction methods	18.18%
Total	**100.00%**

For every respondent interviewed, the training equipped each with at least one skill on sustainable medicinal plant conservation and utilization.

Sustainable harvesting of medicinal plants conserves the environment and enables future generations to also benefit from the same medicinal plants.

Some 11 of 20 participants trained in sustainable medicinal plant extraction agreed with the statement saying "True". This indicates the training impacted the positive attitudes of the trainees towards sustainable harvesting of medicinal plants for environmental conservation.

Where do you get your medicinal plants from?

Responses	**%**
Own garden	38.89
Wetland fragments and forest patches	61.11
Main Kibale forest	0.00
Total	**100.00**

Some 61.11% get their medicinal plants from the wetland fragments and forest patches indicating a greater role played by these fragments and patches in absorbing the shocks and pressure from resource harvesting in the main Kibale forest. None getting from the main Kibale forest could

indicate two possibilities, either due to restricted access by the park management or due to a better opportunity cost offered by the wetland fragments and forest patches, and Ethnobotanist's gardens.

Some 38.89% of the respondents getting these medicinal plants from their gardens is a great indicator of the cultivation and domestication of medicinal plants.

It is possible to cultivate and domesticate medicinal plants?

100% (11) of the respondents agreed with the statement saying “True”. This indicates the training impacted the positive attitudes of the trainees towards the cultivation and domestication of medicinal plants.

What part of the training did you like most?

Responses	**%**
Harvesting techniques	45.45
Dosage	18.18
Medicinal plant identification	18.18
Processing of herbs	18.18
Total	**100.00**

What activities would you suggest for WCU to include in their future projects/ programs?

Responses	**%**
More training	46.15
Marketing for our products	30.77
Distribute packaging materials for our products	15.38
Organize herbalist exchange programme for ethnobotanists	7.69
Total	**100.00**

Plate 21: Principal evaluator interviewing with one of the local ecotourism site guides in KAFRED premises, Bigodi Town Council.

Plate 22: *Left:* Extracts (from a tree bark) from medicinal plants being dried.
Right: Medicinal extracts from a plant being processed by boiled in one of the households in Bigodi Parish.

5. CHALLENGES ELICITED DURING THE TRAINING

Limited training schedule/time, the project only focused on communities in Kamwenge District (Bigodi). In the next phase of the project, the focus could be on the time allocated for training schedules regarding ecotourism, ethnobotany, and basketry.

Limited information on where to access raw materials for making quality baskets and other crafts, their markets, and uniform pricing impedes the development of sustainable basketry among YFBEDP recipients.

All ethnobotanists lacked the equipment to dry their medicinal plants and extracts. Lack of equipment such as solar dryers makes the process of value addition difficult for most women involved in harvesting, extracting, processing, and use of medicinal plants.

6. CONCLUSION

The program trained fifty ecotourism site guides around Kibale National Park (KNP). There is an opportunity to train youths aged 18 and 35 years in forest education & ecotourism enterprise development as change agents for Bigodi Wetland Sanctuary as a viable ecotourism destination in Uganda.

The program trained thirty women in sustainable basketry practices. Training women in the sustainable development of basketry and other products using locally available raw materials within the community provides an opportunity for community transformation especially when women are organized in groups.

Some twenty youths and elderly women were trained and equipped youths with skills in sustainable harvesting of medicinal plants from Kibale National Park.

6. RECOMMENDATIONS

1. Wildlife Clubs of Uganda (WCU) can conduct more extensive training in ecotourism enterprise development, sustainable harvesting of medicinal plants, and basketry practices with support from the United States Forest Service.

2. In the next phase of the program, there is a need for WCU to develop and distribute ecotourist site guides with forest interpretation manuals/guidebooks dependent on resources found with Bigodi Wetland Sanctuary.

3. WCU should continue working with the Rwenzori Sustainable Trade Centre to train more women under YFBEDP on how to produce quality baskets and forest-related products and help YFBEDP recipients find markets for their products.

4. The need for WCU to work with TBG on capacity-building visits is imperative for all ethnobotanists. The training could focus on value addition and processing of medicinal plant parts for viability and market analysis.

5. As part of building best practices, WCU with support from USFS can empower youth and all relevant stakeholders with sustainable utilization models, and innovative knowledge and skills for medicinal plant processing.

6. In the long-term, WCU could sign MoUs with TBG, RSTC, and UNITE for Environment to initiate a regulatory framework for skilling women in handcrafts, and herbalists with value additional knowledge and increasing youth engagement in ecotourism enterprise development.

APPENDIX I: MONITORING AND EVALUATION TOOL

Introduction

Hello good morning/afternoon/evening, my name is Oreret Erasmus Tukei, a private Conservation project evaluations specialist contracted by Wildlife Clubs of Uganda (WCU) to evaluate their project, WCU - Youth in Forest-based Enterprise Development Program around Kibale National Park supported by the United States Forest Service. I was given your name/contact/address by WCU as one of the beneficiaries of the project training sessions.

I am therefore inviting you to take part in an evaluation exercise, and your participation in this study is voluntary. You can choose to be part of this exercise, to stop participating at any time, or not to participate at all.

The reason for this evaluation is to get a better understanding of how the beneficiaries/participants of the WCU-YFBEDP benefited from the training sessions that were conducted. You are not guaranteed any personal benefits from participating in this exercise but your opinions are important for us to understand what WCU has done in this area, and the information you provide us might help them to strengthen their programs.

This exercise will take some of your time (between 20 to 30 minutes) to answer the questions but we will try as much as possible to be brief. I will keep the information you tell me private. This information will be shared with WCU but it will be modified so that it is not obvious from the data who you are; I will keep your information on file separately so I know who is who, but that won't be shared. We will store the information for future research and interventions and WCU may share this information with other people without asking you. If you have questions at any time about the exercise, you can ask the interviewer or contact WCU and partners (UNITE for the Environment, KAFRED or UWA).

Do you accept to be part of this exercise/interview? Yes No (If yes, proceed to the interview questions).

SECTION A: Demographic information

1. What is your name?
2. How old are you? (Less than 17, 18 to 35, More than 36)
3. What is your gender? (Male or Female)
4. In what parish do you live in?
5. What is your Occupation? (Tourist guide/ Farmer/ Craft maker/ Herbalist or Ethnobotanist/ Student/ Other, mention)
6. What training were you part of? (Training of youths in forest education and ecotourism enterprise development/training of women in the sustainable development of basketry and other products using locally available raw materials within the community/Training and equipping of youths with skills in sustainable harvesting of medicinal plants from Kibale National Park)

SECTION B: Training of youths in forest education and ecotourism enterprise development

7. How did you hear about this training opportunity by WCU? (Word of mouth/social media/A friend/ A colleague at work/ Through a local association/ Special invite/ Radio/ Others, if others mention)
8. In what topics were you trained in? (Concept of Ecotourism/Standards in Ecotourism/Ethics, Etiquette, and ethical considerations and practices/Ecotourism and Nature-based enterprises)
9. The concept of Ecotourism is based on the following three pillars? (Environmental, Social and Cultural or Educational pillar / Environmental, Economic and Social / Social, Cultural or educational and Economic / Environmental, Economic and Cultural or Educational)
10. Good Ecotourism practices should minimize physical, social, behavioural, and psychological impacts. (Strongly agree/ Agree/ Neutral/Disagree/ Strongly disagree)
11. What Ethics, Etiquette, and ethical considerations and practices for Ecotourism do you know? (Transparency/ Conservation practices (sustainable practices) / Cultural sensitivity / Education and Interpretation / Compliance with regulation / Continuous improvement 5 / Communication abilities (speaking in public) / Accountability / Inventory and stock-taking / Physicality of the service provider / Specialisation and Niche development / Others, mention)

12. The following are eco-tourism activities and opportunities in your community except? (Community walks / Wetland walks / Craft making / Film showing / Traditional dance / Coffee processing / Local alcohol brewing / Traditional healing and medicine)
13. What part of the training did you like most?
14. What did you not like about the training?
15. What activities would you suggest for WCU to include in their future projects/programs?

SECTION C: Training of women in the sustainable development of basketry and other products using locally available raw materials within the community

16. How did you hear about this training opportunity by WCU? (Word of mouth/social media/A friend/ A colleague at work/ Through a local association/ Special invite/ Radio/ Others, if others mention)
17. Was it your first time attending a training for handcraft making? (Yes / No)
18. If yes, what handcraft did you learn how to make? (Basket /…. /….)
19. What special idea/skill did you learn from the training?
20. The environmental sustainability of handcraft making may not have negative impacts on the environment. (True / False)
21. Using locally available raw materials for hand craft-making business increases economic gains. (True / False)
22. What part of the training did you like most?
23. What did you not like about the training?
24. What activities would you suggest for WCU to include in their future projects/programs?

SECTION D: Training on sustainable medicinal plant conservation and utilization under YFBEDP

25. How did you hear about this training opportunity by WCU? (Word of mouth/social media/A friend/ A colleague at work/ Through a local association/ Special invite/ Radio/ Others, if others mention)
26. The training equipped you with the following skills. (Plant identification/ sustainable harvesting/ processing/ extraction methods/ Others, mention).

27. Sustainable harvesting of medicinal plants conserves the environment and enables future generations to also benefit from the same medicinal plants. (True/ False)
28. What practices do we need to avoid while harvesting medicinal plants? (Overharvesting/ Habitat destruction/ Harvesting endangered species/ Harvesting immature plants/ Harvesting contaminated plants/ Using harmful harvesting practices/ Ignoring ethical considerations/ Neglecting legal considerations/ Ignoring sustainable harvesting practices/ Disrupting ecosystem services)
29. Where do you get your medicinal plants from? (KNP/ Wetland fragments and forest patches/ Own Garden/ Others, mention)
30. It is possible to cultivate and domesticate medicinal plants? (True/ False)
31. What part of the training did you like most?
32. What did you not like about the training?
33. What activities would you suggest for WCU to include in their future projects/programs?