An Assessment of the Traditional Botanical Usage of the Indigenous People of the Bugungu Sub-Region of Western Uganda

Elena Kilber
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An Assessment of the Traditional Botanical Usage of the Indigenous People of the Bugungu Sub-Region of Western Uganda

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Major: Biology

This report is submitted in partial fulfillment of the requirements for Tanzania: Wildlife Conservation and Political Ecology.
Acknowledgments:

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Abstract

The questions that this study aimed to answer were: how are indigenous plants used for medicine, and spiritual practices by the indigenous Bagungu communities? What effect has colonization and globalization had on the knowledge of plants held by indigenous Bagungu communities? And how is the knowledge the Bagungu people hold of traditional plant use preserved through the generations? The methods used to answer these questions were key informant interviews with five herbalists and seven clan custodians from the Bagungu community, and questionnaires administered to 31 Bagungu community members between the ages of 27 and 83. Data were analyzed using qualitative content analysis and descriptive analysis. The findings were that all respondents had knowledge of medicinal plants and used them personally and that some clans have sacred plants that are used from shrines and rituals. It was also found that globalization has had a significant effect on the Bagungu culture. There appears to be a concerted effort to preserve the knowledge of medicinal plants, but not the traditional religious beliefs and practices. Based on these findings, the recommendations are that more of an effort should be placed on teaching and conserving Bagungu culture, and more research should be done in documenting the medicinal plant knowledge of the Bagungu.

Key words: Bagungu, herbal medicine, sacred plants, globalization, indigenous knowledge
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Chapter I: Introduction

1.1 Background

Beginning in the 16th century, European imperial interests began expanding their empire further south into sub-Saharan Africa (Raschke & Cheema, 2007). The colonization of Africa continued for centuries, leading to the progressive decline in ancient indigenous knowledge. Knowledge about traditional medicines, as well as conservation strategies and sustainable living, to name a few, have been lost (Mawere, 2015). Although colonization methods have changed over the centuries from overt colonization in the form of slavery, religious conversion, and appropriation of land and food supply, to neocolonialism inherently designed to make developing nations reliant on the western world, knowledge continues to be lost (Raschke & Cheema, 2007). It was not until recently that the significance and the importance of traditional indigenous knowledge had been recognized (Mawere, 2015). Specifically, botanical knowledge regarding medicine and indigenous plants can provide a framework for further study.

Many plants have historically and continue to carry cultural significance within ethnic groups. One example of culturally significant plants is the widespread use of medicinal plants across the world. According to the World Health Organization, 60% of the world uses herbal medicine, and 80% of people in developing countries rely on herbs as their primary source of healthcare (2019). This is largely due to limited access to western medicine because of the high costs, limited availability, and limited access to healthcare facilities (Abdullahi, 2011). Even though there are still many people who rely on traditional medicine, through colonization and subjugation of traditional medicine, knowledge of the healing powers of plants has been lost (Abdullahi, 2011).

In Africa, many plants have been used in ceremonies, as totems, and are associated with traditional religion (Kakudidi, 2004). Through the introduction of western religion, traditions and rituals involving indigenous plants have been forsaken. Globalization has also led to a change in cultivation practices. Indigenous plants are disappearing as forests are being cut down for the expansion of agriculture.
(Musinguzi et al., 2006). As the plants are disappearing, knowledge and traditions associated with those plants also disappear. However, there are still some tribes in Africa working to decolonize and preserve the knowledge and customs of their ancestors (Rhoades, 2020).

Literature shas documented that the Bugungu tribe found in Western Uganda, in recent years, have set out on a journey to decolonize their community as a way of protecting sacred natural sites from exploitation. This tribe still holds precolonial knowledge of medicinal herbs and indigenous seeds used in sacred rituals at the sacred natural site (Rhoades, 2020). However, the tribe is one of the least studied tribes in Uganda. The purpose of this study is to create documentation of the indigenous botanical uses of the Bugungu tribe, as a means of preserving indigenous traditional knowledge.

1.2 Problem Statement
Indigenous people across the globe have unique knowledge of plant resources that they depend on for food, medicine, and that carry spiritual significance within their community. It is reported that there are over 75,000 species of plants used for ethnomedical purposes worldwide (Temam & Dillo, 2016). Within Africa, 87% of the World Health Organization Member States use herbal medicine (WHO, 2019). Moreover, many plants have been used in ceremonies, as totems, and are associated with traditional religion (Kakudidi, 2004).

Despite the continued diverse botanical usage, especially in developing countries such as Uganda, traditional medicine, and knowledge of the healing powers of plants, as well as their spiritual significance has been subjugated to the edge of extinction (Abdullahi, 2011). This is highly attributed to colonization, the introduction of western culture and religion, globalization, education, and changing agricultural practices (Raschke & Cheema, 2007).

Despite the efforts of colonization and globalization, indigenous knowledge of medicinal plants has gained recognition across continents because of its support in the discovery of new medicines and its importance for the proper conservation of biodiversity (Acharya, 2009). Therefore, efforts to preserve and conserve indigenous
knowledge in various countries have been initiated. In Uganda, the indigenous Bagungu people are an example of an ethnic group that is trying to preserve tradition and knowledge from before colonization (Rhoades, 2020). In a conversation with the founder of the Bugungu Heritage and Information Center, it was pointed out that the Bagungu ethnic group is one of the least studied and documented ethnic groups in Uganda (K. Wilson, personal communication, 25 October 2021). Indigenous knowledge has dwindled as a result of colonialism and globalization (Raschke & Cheema, 2007). Much of the botanical knowledge of the Bagungu people is yet to be documented and if globalization continues to push people away from their traditional ways and towards modernization, much more of the knowledge could soon be lost. To effectively preserve the knowledge that is held by these traditional communities, this study aims to document the indigenous botanical usages by the Bagungu people of Buliisa and Hoima Districts in the mid-Western region of Uganda.

1.3 Objectives
1.3.1 General Objective:
To assess the knowledge of traditional botanical uses and preservation methods among the indigenous Bagungu communities in the Bugungu Sub-region, of Western Uganda.

1.3.2. Specific Objectives:
i. To examine the use of indigenous plants for medicine and spiritual practices by the Bagungu people.
ii. To assess the effects that colonization and globalization have had on the knowledge of plants held by indigenous communities.
iii. To examine how the knowledge of traditional plant use is preserved through the generations.

1.4 Research Questions
i. How are indigenous plants used for medicine, and spiritual practices by the indigenous Bagungu communities?
ii. What effect has colonization and globalization had on the knowledge of plants held by indigenous Bagungu communities?
iii. How is the knowledge the Bagungu people hold of traditional plant use preserved through the generations?

1.5 Study Scope
This study was conducted over the course of two weeks. The study covered botanical uses categorized by medicine and spiritual practices. Data was collected on the medicinal plants used by the community members and by herbalists, as well as what they were used to treat. The part of the plant used and how they are prepared was documented. Community members were asked about their clan’s sacred plants and whether they perform rituals. Clan custodians were asked about the specific rituals they perform that involve plants. Data was also collected on the effects of globalization on indigenous knowledge and how the knowledge is preserved. The study was being conducted in the Hoima District with respondents from Hoima and Buliisa Districts. Five herbalists and seven custodians were interviewed, and questionnaires were administered to 31 community members.

1.6 Significance and Justification
The significance of this study was that it provided a record of the botanical usage of the indigenous Bagungu people, as an effort to preserve indigenous traditional knowledge. This study could provide a reference for medical uses of plants in the mid-western region of Uganda. The Bugungu people are working towards decolonizing and preserving their traditions (Rhoades, 2020). By collecting data on their strategies of preserving traditional botanical knowledge, this study can contribute examples of these strategies that could be used by other indigenous communities.
Chapter II: Literature review

2.1 Indigenous Knowledge

Just as indigenous traditional knowledge varies around the world, the definition of indigenous traditional knowledge also varies. The definition in the Encyclopedia of Global Archaeology is “… a network of knowledge, beliefs, and traditions intended to preserve, communicate, and contextualize Indigenous relationships with culture and landscape over time” (Bruchac, 2014, p. 3814). Indigenous knowledge is passed on from one generation to the next and includes insight into methods of communication, tool manufacturing and use, ritual practices, agricultural techniques, and very importantly a deep understanding of the local ecology and ecosystem (Bruchac, 2014). In many African countries including Uganda, people still carry traditional knowledge of agricultural practices, traditional medicine, and rituals that have been part of their cultures since before colonizations (Akullo, et al., 2007, Kyazike, E., 2021). However, the effects of colonization have led to a decrease in such knowledge.

2.2 Colonization and Globalization

Colonization of East Africa began in the 19th century. In the late 19th century Germany and Britain ruled East Africa together (Rashid, 2014). During this period of colonization both human and natural resources were exploited (Bulhan, 2015). Religion, western medicine, and education were used to undermine indigenous knowledge, beliefs, values, and identities (Bulhan, 2015). Colonialism officially ended in Africa in the 1960s and ’70s (Bulhan, 2015). This, however, left the countries open to a new form of exploitation in the form of neocolonialism, which left the countries dependent on foreign aid, mono-culture cash crops, and mineral extraction (Maekawa, 2015). The consequences of colonialism and neocolonialism are still apparent in many parts of Uganda and are contributing to the disappearance of indigenous knowledge (Bulhan, 2015).

2.4 Herbal Medicine

The history of humans using herbal medicine is virtually as long as human history itself. Even non-human primates are known to cure ailments by ingesting various herbs and other plant matter (Krief, Hladik & Haxaire, 2005). The earliest record of
the use of herbal medicine dates back to 13,000–15,000 BCE and was recorded in a
cave painting in Lascaux, in France (Mosihuzzaman, 2012). Ötzi, the “Iceman” who
was found frozen in the Tyrol region of the Alps, died approximately 3350 and 3105
BCE and appeared to have treated intestinal worms with herbal medicine (Zink et al.,
2018). Though the use of herbal and traditional medicine has changed over the years,
it is still very prevalent around the world.

In the modern area, much of the developing world still rely on herbal medicine as
their primary source of healthcare, and there is a growing trend within the western
world towards traditional healing (Mosihuzzaman, 2012). Within Africa, there are
many examples of botanical medicines. These medicines come from almost every part
of a plant, from the bark of a tree to the seeds of a shrub, and they are used to treat
everything from headache to malaria (Kyazike, 2021). In an ethnobotanical study
done in Mirab-Badwacho District, Ethiopia, Temam, and Dillo (2016) found that 56
species of medicinal plants were used by their study subjects, the majority of which
(65%) were wild. They found that there were a total of 31 ailments treated using herbs
and that around “42% of the plants were used to treat stomachache, diarrhea, and
intestinal worms” (Temam & Dillo, 2016). There have been other ethnobotanical
studies that focused on herbal medicine done across the African continent.

A study on the preference of indigenous plants for medicinal purposes was conducted
in the Buliisa district in 2021. In this study, Kyazike examined the use of indigenous
medicine and how the knowledge is passed down through the generations. The author
identified 477 medicinal plant species. Two of the most commonly used species were
the aloe vera plant and the neem tree. It was also concluded that the main transmission
of knowledge is within the family, followed by divine revelation (Kyazike, 2021).
Though the article explored a similar topic to what this study hopes to explore,
Kyazike’s study focused primarily on herbal medicine and did not expand to other
botanical uses by the indigenous people of the area for example to religious aspects
associated with indigenous plants.

2.5 Sacred Plant Use
For millennia, indigenous people have been the caretakers of the earth. They have
worshipped many aspects of nature, in turn, preserving it for generations to come
(Robson & Berkes, 2010). In Uganda, tribes held plants as totems and used them in
traditional rituals (Kakudidi, 2004). Trees played a role in their culture and beliefs,
were locations for religious activities, and were markers of sacred sites (Kakudidi, 2004). Other forest resources were used for food, costumes, and musical instruments (Kakudidi, 2004). The Bagungu tribe not only uses trees as markers of their sacred sites but also protects sacred seeds that are used in rituals (Rhoades, 2020).
Chapter III: Methodology

3.1 Study area

3.1.1 Geographic Location

The study was carried out with participants from the districts of Buliisa and Hoima, in the mid-Western region of Uganda, in the Northwestern part of the Great African Rift Valley, known as the Albertine Rift Valley (AWE, 2020). These districts are located on the shore of Lake Albert. The bordering districts to Buliisa are Nebbi District to the Northwest, Nwoya District to the Northeast, Masindi District to the East, Hoima District to the South, and the Democratic Republic of the Congo to the West (AWE, 2020). Hoima’s bordering districts are Ntoroko, Kakumiiro, and Kagadi Districts to the South, Masindi District and Kyankwazi District to the East, Buliisa District to the North, and the Democratic Republic of the Congo to the West (Hoima District Local Government, 2015).

Figure 1. Map of Buliisa District and the sub-counties. Source: Obua (2013).

3.1.2 Climate
The climate of Buliisa and Hoima District are very similar. The amount of rainfall varies depending on the elevation and proximity to Lake Albert. The shores of Lake Albert receive around 800 mm of rain a year (AWE, 2020, Hoima District Local Government, 2015). East of the lake is an escarpment that receives 1250 - 1500 mm annually, and the eastern border of the districts receives 1000 mm of rain (AWE, 2020). The peak rainy seasons are from March to May and from September to December (AWE, 2020). The average temperatures are between 18 and 30 degrees Celsius (AWE, 2020, Hoima District Local Government, 2015). The vegetation of both districts includes forest, savannah, grassland, and swamps (AWE, 2020, Hoima District Local Government, 2015).

3.1.3 Population and Demographics
According to 2014, National Population and Housing Census of Uganda, conducted by the Uganda Bureau of Statistics, the population of Buliisa district is 113,161, consisting of 57,822 men and 55,339 (2016). There are three main tribes represented in Buliisa. The most prevalent are the Bagungu indigenous to the area, next are the Alur, originally from the West Nile region in the northwest of Uganda, then the Banyoro (AWE, 2020). The primary sources of income within Buliisa District are
fishing and farming both for substance and commercial use. Other sources of income include livestock rearing and trade activities (AWE, 2020).

The population of Hoima is 572,986 according to the most recent census (Uganda Bureau of Statistics, 2016). There are 290,413 males and 282,573 that live in the Hoima district, (Uganda Bureau of Statistics, 2016). The main economic activities are agriculture, with 63% of the population farming, and fishing (Uganda Investment Authority, 2017). The most prevalent ethnic group in the district is the Banyoro, but there are also other ethnic groups including the Bugungu, Baganda, Banyankole, Bakiga, and Lugbara (Uganda Investment Authority, 2017).

The total population of Bugungu people in Uganda is 83,986 (Uganda Bureau of Statistics, 2016). They mostly reside in Buliisa District, Hoima District, and Masindi District. The population is 49% male and 51% female (Uganda Bureau of Statistics, 2016). 82% live rurally and 18% live in an urban setting.

3.2 Methods
Two data collection methods were adopted by this study to achieve the study’s objectives and respond to the research questions. The methods used were interviews with the key informants and questionnaires survey to collect primary data. All interviews were recorded with the permission of the respondents.

3.2.1 Questionnaire
Questionnaires are an effective method of gathering data in social science studies (Kabir, 2016). Questionnaires are a set of standardized questions that are administered in the same way to all the respondents (Lavrakas, 2008). This method can be used to compare answers across respondents (Lavrakas, 2008). Questionnaires were administered verbally by the researcher to community members. Questionnaires for this study consisted of a mixture of both open-ended and close-ended questions. Close-ended questions were used for demographics questions so that the respondents could easily be categorized. Open-ended questions allow the participant to expand on their answers (Lavrakas, 2008). This allowed for more detailed answers to be given by respondents. Local translators were used to translate English to local languages for
participants that did not speak English. (Full list of questions can be found in Appendix A).

3.2.2 Key informant interviews
Key informant interviews were conducted as face-to-face interviews. This technique is one of the most popular techniques for conducting surveys (Lavrakas, 2008). It allows for respondents to clarify answers and to get clarification of the question that was asked, as well as minimized nonresponse (Lavrakas, 2008). Semi-structured, face-to-face interviews were conducted with clan custodians and local herbalists of the indigenous Bagungu community from Buliisa and Hoima Districts to provide an expert voice to answers given by the community members surveyed. Semi-structured interviews allowed for questions to be drafted before the interview but also allowed for flexibility when conducting the interview (Lavrakas, 2008). For participants who did not speak English, a local translator was used. Three different translators were used for their respective communities, which could have caused discrepancies in the data. (Full list of questions can be found in Appendix B).

3.3 Data collection instruments
Data was collected using a questionnaire. Respondents’ answers to the questionnaire questions were recorded using a recording device and note-taking instruments. Interviews were also recorded using a recording device, and pen and paper were used for note-taking. Vehicles were utilized for transportation to and from the study sites.

3.4 Study design
This study utilized a descriptive research design and analytical research design. According to Omair (2015), the descriptive research design should be used when there is no comparison between groups, and an analytical research design should be used for comparing multiple samples. In this study, descriptive research designs were used to describe open-ended answers given by respondents. Analytical research designs were used to compare answers given by respondents and quantify the results.

3.5 Sampling techniques and procedure
The sampling technique used was non-probability convenient sampling. Convenience sampling is a sampling technique where respondents are chosen based on their
convince to the researcher and where respondents were chosen unsystematically (Lavrakas, 2008). Key informants were selected based on their knowledge and use of indigenous plants. Community members were selected based on their availability, their willingness to participate in the study, and their proximity to the study area. Local contacts were enlisted to find the respondents.

3.6 Sample size
Interviews were conducted with seven custodians and five local herbalists. These interviewees were chosen based on convenience and availability. Questionnaires were administered to 31 members of the local communities. The community members were comprised of 55 percent males and 45 percent females so that the results would not be skewed by gender difference. The population of Bagungu is 83,986. The sample of Bagungu surveyed made up less than 1% of the population, however, the total sample size is 43 was enough to be statistically significant. The sample size of community members, custodians, and herbalists was determined by what would be feasible in the allotted time.

3.3 Data analysis
The data was analyzed using quantitative content analysis and descriptive analysis. Quantitative content analysis is a method for coding survey answers into meaningful categories and applying numerical meaning to the categories (Lavrakas, 2008). Content analysis was used to categorize the answers given by the respondents so that comparisons could be drawn from the data collected. The data were presented in figures and tables. Qualitative content analysis was used to categorize and quantify the answers given by respondents to questions pertaining to medicinal and sacred plants usage. Qualitative analysis was used to determine the frequency of mentions of plant species, diseases treated, and parts of the plants used. Data was also categorized by the percentages of respondents who gave a particular answer. Qualitative content analysis was also used to categorize the answers given on the topic of globalization within the Bagungu community. Descriptive analysis was used to help explain the findings of the qualitative analysis. The same analysis methods were used to analyze the data pertaining to the preservation of knowledge.
Chapter IV: Results

4.1 Demographics of respondents

The questionnaires were administered to 31 respondents from Buliisa and Hoima Districts. Of the 31 respondents, 17 were male and 15 were female. The majority worked as peasant farmers (55% \(n=31\)) and had a primary school as their highest level of education (68% \(n=31\)). The dominant age group was between 36-50 years old (42% \(n=31\)). The dominant religion of the respondents was protestant. Demographic percentages of the community respondents are presented in Table 1.

Five herbalists were interviewed. Four were male and one was female. Their ages ranged from 35 to 83. Seven custodians were interviewed. All the custodians were male. The ages of the custodians ranged from 42-to 80.

Table 1. Demographic characteristics of respondents \(n=31\)

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<td>42%</td>
<td>23%</td>
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<thead>
<tr>
<th>Gender</th>
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<td>Percentage:</td>
<td>58%</td>
<td>19%</td>
<td>16%</td>
<td>6%</td>
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</table>
4.2 Medicinal and spiritual plants used by the indigenous Bagungu people

4.2.1 Medicinal plants

Within the group of Bugungu community members, the use of herbal medicine was very prevalent. All respondents (100% (n=31)) reported the use of herbal medicine for the treatment of diseases and other ailments. They listed a very diverse range of ailments that they treat using traditional medicine, as well as the plants used to treat these ailments (Appendix A). The most common disease that was treated using herbal medicine was malaria. The majority (58%; n=31) of respondents listed it as one of the most common diseases they treat using herbal medicine. The next two most common diseases treated by the community members were cough and syphilis (Figure 03). For both of these diseases, 32% (n=31) of the respondents listed one or both of them as their most common ailments treated using herbal medicine. Although there was some overlap of the plants used to treat these diseases, there were 10 plants that treated malaria, 9 plants that treated syphilis, and 6 plants that treated cough. Other diseases and ailments mentioned include stomach pain, diarrhea, asthma, trouble conceiving, erectile dysfunction (full list in Appendix A).

![Figure 3. Frequency of the mentions of the top three ailments treated with herbal medicine by Bagungu people, 2021 (n=108).](Image)
The most common plant used by the respondents is bitter leaf (*Vernonia amygdalina*), locally called Kibirinzi. 39% of community members and herbalists (n=36) listed this plant as a treatment for malaria. The second most common plant is locally called Rwihura (this plant was not successfully identified), it was used to treat malaria and cough. Orange bird berry (*Hoslundia opposita*), aloe vera (*Aloe barbadensis miller*), and Uganda coral (*Erythrina Abyssinica*) were all mentioned five times. All other plants were not mentioned by more than three of the respondents. 60 percent of the plants were only mentioned by one respondent.

![Bar chart showing frequency of medicinal plants](image)

*Figure 4. Frequency of medicinal plants named by Bagungu people, 2021 (n=108).*

The plants used by the herbalists varied based on the specialization of the herbalist. Three of the five herbalists interviewed had very specific specializations. One herbalist specialized in treating people affected by spirits, another herbalist was a bonesetter, and the third specialized in helping couples conceive. Because of their specialization, there was not any overlap in the plants that they mentioned using. The ailments treated by each herbalist and the most common plants they use can be found in Table 2.
Table 2. The specialty and plants used by each herbalist

<table>
<thead>
<tr>
<th>Herbalist</th>
<th>Specialty</th>
<th>Consult Spirits</th>
<th>What they treat</th>
<th>Local names of common plants used</th>
<th>Scientific name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>None</td>
<td>No</td>
<td>Malaria, treatment for poisons (both local poisons and foreign poisons), pain (both natural and supernatural), stomach pain, “male problems”</td>
<td>Mugangu</td>
<td>Solanecio mannii</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bisokiso</td>
<td>Aloe vera</td>
</tr>
<tr>
<td>2</td>
<td>Spiritual problems</td>
<td>Yes</td>
<td>Treats those affected by spirits, which manifests as not being able to conceive, not giving birth, children not speaking or not walking, or people who have trouble getting work</td>
<td>Musingabakuzi</td>
<td>Lemnae schweinfurthi</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Kibirinzi</td>
<td>Vernonia amygdalina</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mutiti</td>
<td>Acacia seval</td>
</tr>
<tr>
<td>3</td>
<td>Infertility</td>
<td>No</td>
<td>Couples who are having trouble conceiving</td>
<td>Nkoma</td>
<td>Sanseviera Trifasciata</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mulaliki</td>
<td>Harrisonia abyssinica</td>
</tr>
<tr>
<td>4</td>
<td>Bonesetter</td>
<td>No</td>
<td>Bone setting mainly, treats other ailments for example abnormal heartbeat, and female reproduction</td>
<td>Not available</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>None</td>
<td>Yes</td>
<td>Complications with birthing, epilepsy, madness, abnormal swelling (without pain), bone pain, adult bedwetting</td>
<td>Munyama</td>
<td>Khaya anthoteca</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Musku</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mbuzi</td>
<td>Warburgia ugandensis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mumara</td>
<td>Erythrophle in suaveoles</td>
</tr>
</tbody>
</table>

The parts of plants used for preparing the medicine were the leaves, roots, bark, tuber, stem, fruits, and flowers. Leaves were the most common part (49%; n=49) of the plant use (Figure 5). The next two most common parts of the plant used were the roots and the bark by 32% and 26% (n=49) respectively (Figure 5). Findings from key informant interview give a similar picture with regards to the parts of plants used.
More than one part of the plant was used from 10 of the 49 plants. Tubers, stems, fruits, flowers were all only mentioned once. There was one plant, *Euphobia tricali*, that any part of the plant could be used for treatment.

![Figure 5. Frequency of usage of the parts of the medicinal plants used by Bugungu, 2021 (n=76).](image)

The most common methods of preparation were squeezing the leaves with water and drinking the juice (16%) or boiling the plants and drinking the brew (58%). There were also some methods specific to diseases or ailments, some of these included buming the plant and using the ash. Some treatments consisted of a mixture of two or more plants, while others mixed plants with local salt mined in Kibyro (Appendix A).

Findings from key informant interview provide similar methods of preparation, the only differences were from two of the specialist. The spiritual healer relies more on ritual than on concoctions of herbs and the bonesetters had specific methods for setting bones. The bonesetter went into detail regarding her process of healing broken bones. She used herbs and ghee tied in a pouch made of banana stem. She put this in the fire. Then she smeared ghee on the affected area and put the herb mixture on it. She then removed the herbs and cleaned the area. For more severe breaks, she used
special sticks that help to bring the bone back into a proper position where it can begin healing (personal interview, 19 November 2021).

Almost all of the respondents had personal knowledge of the plants that they used and collected the plants themselves. Some of the respondents collected some of the plants themselves but relied on other people to collect plants that are either found further away or for those plants that they didn’t know. There were only three respondents that do not collect any herbs themselves (Figure 6).

![Figure 6. Methods of acquiring the herbal medicine by Bagungu community members, 2021 (n=31).](image)

### 4.2.2 Sacred plants

The types of sacred plants were identified by custodians. First, there were the trees that were at the sacred site and under which the rituals were performed, then there were the trees that were used for home shrines. Sacred seeds were another example of plants that were used in ceremonies. All seven custodians said that sacred seeds were used in their rituals. These sacred seeds include millet, sesame, cowpeas, sorghum, and local brews made from only cassava, or cassava and millet.
Only 13 of the community member respondents (n=31) said for certain that their clan had sacred plants. Seven said they did not know if their clan had any sacred plants or were unaware of any sacred plants, and 10 said that they did not have any sacred plants (Figure 7). Ugandan coral (*Cordea sinensis*) was mentioned as being sacred in their clan by four community members and two custodians (n=7). It was cited specifically for its use as a home shrine. Desert date (*Balanites aegyptiaca*) was mentioned by three of the clan members and by three custodians. Tamarind (*Tamarindus indica*) was mentioned by three custodians. Sausage tree (*Kigelia Africana*) and *Albizia coriaria* were mentioned by two custodians each (Figure 8).

One clan’s totem is the plant *Senna occidentalis*, commonly known as coffee senna, and locally called Sagala musansi. Totems are items, plants, or animals that are considered sacred by a clan.

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**Figure 7.** Percent of Bagungu community members whose clans had sacred plants, 2021 (n=31).

**Figure 8.** The number of times plant species were mentioned as sacred plants by community members and custodians by Bagungu community members and custodians, 2021.
4.3 The effects of colonization and globalization on the knowledge of plants held by indigenous Bagungu people

When asked about changes in the practices of traditional religions and rituals, 100% of community members indicated that there had been a decrease in the number of people practicing rituals. Nine of the respondents admitted to still performing rituals, three said that they used to perform rituals, one said that he did not personally perform rituals but he supports the people that do, and 19 respondents said that they did not perform rituals (Figure 9). Out of the 19 respondents who did not perform rituals, 11% said that there were not any people in their community that performed rituals, 21% said there were people in their community that still practiced but not openly, and 68% said that there were still people in their community that openly performed rituals. 68% (n=31) of the community members identified the root cause of the decline in participation in performing rituals as the influence of foreign religion. Commercialization, development, and government policies were also identified as causes of the decline in traditional beliefs.

Figure 9. Percentage of Bagungu community members who perform rituals, 2021 (n=31).
Key informant interviews with the custodians provided similar results to the community questionnaires. A decline in culture as the result of globalization was observed by all interviewees. Five of the seven custodians cited religion as one of the leading causes of the decline in culture in their community. Development was mentioned by five of the custodians, specifically the oil pipeline that is being built along Lake Albert. Along with development come outsiders who do not repeat the local traditions and practices. Three of the custodian attributed the decline in culture to government policies that restrict the practice of traditional rituals, as well as where herbs can be collected. The government had an influence on the community that resulted in people giving less care to nature.

Only one out of the five herbalists' interviews indicated a shift toward western medicine as a result of globalization, particularity with the younger generation. However, he also said that as these people get older, their attitudes shift and they begin to embrace herbal medicine more. One herbalist cited an increase in clients as evidence that his business has not been affected by globalization, he attributed this to his specialization. Another herbalist cited the availability, effectiveness, and affordability of herbal medicine as the reason that people are still very reliant on
herbal medicine, and a third herbalist said that some diseases can only be treated by traditional methods.

4.4 How the knowledge of traditional plant use is preserved through the generations by the Bagungu people

Oral tradition was the leading method used to preserve knowledge across respondent groups. Specifically, passing knowledge on to kin was mentioned by all three groups surveyed. The 84% (n=31) of community members answered that they learned about the medicinal plants from a family member. Three respondents answered that they learned from friends in addition to their parents, two respondents said they only learned from friends or other community members, one respondent said that he learned from his research, and one respondent said that she acquired her knowledge from spirits.

Four of the five herbalists learnt their skills from a parent. The other herbalist learned from the spirits, and still consults the spirits as part of his treatment process. The four herbalists who learned from their parents were passing the knowledge on to their children. Two of them specified that they were only passing the knowledge to their trusted children. The herbalist who was chosen by the spirits was not passing the knowledge on to his children because it was up to the spirits to teach the next healer.

There were many methods of preserving the knowledge of the herbal plants discussed by community members and herbalists. The most common methods mentioned were teaching children about medicinal plants, and planting trees. There were also some other specific methods mentioned, for example, using religious gatherings and religious leaders to discredit the idea of traditional medicine as devil warship, an idea that was introduced by the early missionaries. There seemed to be a near consensus among the respondents regarding the importance of protecting the medicinal plants and the knowledge of their powers. Out of the 31 community members, only 3 specifically mentioned personal efforts to preserve culture and traditions.

Five of the seven custodians interviewed received their position as custodian hereditarily. These custodians also mentioned trying to pass the knowledge to their
children, who will be appointed as the next custodians. The other two custodians were appointed by the spirits. Because of the spiritual appointment, the next custodians may not be family members. However, there were other methods of knowledge preservation mentioned by the custodians. Four of the custodians mentioned working with the local community to educate people about the rituals and the indigenous practices.
Chapter V: Summary, Discussion, Conclusions, Limitations, and Recommendations

5.1 Summary
As a way to contribute to the contemporary growing knowledge on ethnobotany, the purpose of this study was to document the botanical usage of the Bagungu people, one of the tribes thought to be extant in Western Uganda, with a particular focus on herbal medicine and sacred plant. The study included an examination of the effect of globalization on the traditional knowledge of plants and cultural practices, as well as how the communities were preserving traditional knowledge. Data was collected using questionnaires and key informant interviews. The key informants in this study were five herbalists and seven clan custodians. The questionnaires were administered to 31 members of the Bagungu community from Buliisa and Hoima Districts. The sampling technique used to find respondents was non-probability convenient sampling. Content analysis and descriptive analysis were done on the data collected. The major findings were that most of the respondents had not seen a decline in the use of medicinal plants as the result of globalization, but there had been a decline in the practice of rituals, which they attributed to a foreign religion. There was also a concerted effort to preserve the knowledge of medicinal plants, but not traditional beliefs and rituals. Malaria was a disease most commonly treated by herbal medicine, and the most common plant used for medicine was Vernonia amygdalina.

5.2 Discussion
5.2.1 Medicinal and spiritual plants used by the indigenous Bagungu people
There was a very high prevalence of knowledge of herbal medicine. As shown in Figure 6, the majority of community members collected at least some of the herbs themselves. This and the diversity of plants mentioned by the respondents speak to the amount of knowledge that is still preserved within the community.

There was less overlap of plants mentioned by the respondents than expected. There were differences in the vegetation that grow above and below the escarpment, which is likely why answers varied. There were more similarities within the answers of respondents living in the same area. However, even within the relatively isolated villages, like Kibyro, there was little overlap. This goes to show the extent of medicinal plant knowledge within these communities. One respondent even said that
she could use any green plant when making a steam bath that is a treatment for malaria (personal communication, 19 November 2021). In 2021, Elizabeth Kyazike conducted a study exploring the medicinal plants used in the Buliisa District. In this study, 56 plant species were identified. 30.4 percent of these plants overlap with the plants found in this study.

The most common disease mentioned by the community members to be treated using herbal medicine was malaria. The frequency of mentions was nearly twice as high as the next leading ailments. Some respondents even had multiple ways of treating malaria. Malaria was also among the diseases that a few respondents listed as only being curable by traditional medicine. When examining medicinal plants that were used to cure common “Africa” disease in western Uganda, Gumisiriza et al. (2020), included malaria in their list of diseases that were believed to only be curable by traditional methods. It was also their finding that malaria was the condition most commonly treated by herbal medicine in their area of study.

The sacred trees were seen as totems and shrines. These trees are used in cultural performances and rituals. The leaves and bark are used for rituals. The home shrines are used to hold spirits of the family’s ancestors. Spirits rest under the trees and if a person gets too close to the tree, they can become possessed by the spirits. If somebody cuts as a tree where spirits are resting they can also go mad. The sacred trees at the sacred natural site are not to be cut or used for resources such as firewood. This ensures that the trees are protected and not exploited. The custodians still perform rituals at the sacred plants, but among the community members there was not much knowledge on the sacred plants, this is because many do not practice their traditional practices and have converted to foreign religions.

There were not many respondents that said their clan had sacred plants. Although there is not much knowledge of sacred trees, those who said their clan had sacred plants said that for the most part they were still respected. Regardless of whether their clan and sacred plants or not, many respondents mentioned the importance of plants and said that they were planting trees. The sacred plants play an important role in conservation because these trees are preserved and are not to be cut down or used for resources. So even though clans do not have specific sacred plants or community
members do not know of the sacred plants, there is knowledge about the importance of plants in conservation. A study in India found a positive correlation between traditional worship of plants and conservation efforts of those plants (Pandey & Pandey, 2016). The conservation status of the sacred plants was not investigated among the Bagungu, but by observing norms around sacred plants the community consciously also conserves nature.

Aside from the sacred trees that are used as shrined or sites of sacrifices, clans also have sacred seeds. These are seeds that are offered as sacrifices when rituals are performed. These include millet, sesame, cowpeas, sorghum, and local brews. They are sacrificed along with goats, sheep, chicken, and eggs when the custodians perform the annual rituals that help to balance their community with nature.

5.2.3 Effects of Globalization and Colonization
The belief in herbal medicine is still very strong within the Bagungu communities. The respondents attributed this to the effectiveness of herbal medicine, the availability of the plants, and the low cost. This aligns with the World Health Organization (2019) statistic that 87% of the World Health Organization Member States use traditional medicine. An article by Asiimwe et al., (2021) identifies the high rates of herbal medicine use in rural Uganda to be the result of higher levels of poverty, the lower availability of health facilities, and the proximity to the herbs. Another study by Ameh et al. (2021) also found that there is a substantial lack of health facilities in rural areas of Uganda.

When asked about the trends of herbal medicine use in their lifetimes, many said that there had not been any change in their lifetime. Agbor and Naidoo (2016) also found that religion, urbanization, and globalization have not had a substantial effect on the use of traditional medicine in African countries. They attributed this to the accessibility, affordability, availability, and dependability of traditional medicine (Agbor & Naidoo, 2016). However, some respondents did say that younger people favored the health centers, whereas the older generation still favors traditional medicine. It was added, though, that with age people return to the traditional ways. In a study on the youth’s perceptions of herbal medicine, Lawrence et al., (2014) found that only 35 percent of youths use herbal medicine. Participants were between the
ages of 15 and 24 and the study was conducted in suburban central Uganda. They cited the inhibitory factors as distrust of the healers, medicine being unhygienic, and their Christian faith. In this study conducted on the Bagungu, there were no respondents under the age of 27, so the only data collected about trends among the youth are opinions of the older people interviewed.

None of the herbalists interviewed said that they had seen the effects of globalization on their business. One herbalist, who specialized in infertility, even told a story about a white woman who can seek his services. This story appeared to be a great source of pride in his career, and this was made possible by globalization. There is a belief that there are specific African diseases that can only be treated using herbal medicine, one herbalist cited this as his reason that there has not been a decrease in people seeking his services. In their paper, Gumisiriza et al. (2020) studied the use of herbal medicine for the treatment of “African” diseases in Rukungiri District, Western Uganda. The respondents in that study went as far as to say that these diseases can pose to be fatal if they are treated in the hospital. Some of these diseases are linked to supernatural causes that western medicine had no means of treating. Malaria was also included in the list of “African” diseases only treatable by traditional medicine (Gumisiriza et al., 2020).

Colonization and globalization had the largest effect on traditional beliefs and cultural practices. Every community member interviewed said that there had been a decrease in the prevalence of traditional beliefs. Many respondents say that the members of their community that still practice the traditional religion and perform rituals do it in secret. When western religion was brought to the Bagungu community, they were told that their traditional practices and beliefs were satanic and devil warship. This effect that western religion had on culture is highlighted in Ikuenobe’s (2014) article about the colonial legacy on traditional African environmental ethics. In the article, it is described that colonial viewed African traditions as savage, uncivilized, and backward. The influence of Christianity put a huge taboo on the traditional beliefs. Only two of the community members cited their religion as a version of traditional African religion, the rest practiced western religions. In some areas of study, it was hard to find people who were willing to speak about the old traditions. Even though many of these people used to perform rituals themselves, there were only a few
people who felt comfortable speaking about them now. This proved to be a challenge when collecting data.

The development caused by globalization has also played a role in weakening people’s connection to their culture. There are multiple oil development projects taking place in Buliisa and Hoima districts (WWF & CSCO, 2017). The oil development is controlled by foreign interests and has a direct effect on the sacred natural sites (Gaia Foundation, 2021). Some of the custodians said that they will need to move their site, but as long as they perform the rituals when moving they will be able to relocate. Other custodians, however, said that they will not be able to relocate their sacred site, and they are trying to work with the oil companies and developers to preserve their sites. The destruction of the sacred site has a direct impact on the preservation of the culture because the sacred is a physical symbol of their beliefs and traditional customs. In a study done on the effects of oil development in the Niger Delta, in Nigeria, the effect of culture was included in a list of adverse impacts of the development (Opukri & Ibaba, 2008). Specifically, the study cited the damage to the culturally significant site (Opukri & Ibaba, 2008).

5.2.4 Preservation of Indigenous Knowledge

There is a lot of effort within the communities to preserve the knowledge of herbal medicine. People are not only teaching their children but they are using education, media, and even religious leaders to preserve the knowledge. There is also a concerted effort to preserve the plants themselves. People said they were planting herbs around their garden to preserve them, and they were also teaching their children that they are special plants and that they are not to be over-exploited.

There is significantly less effort to preserve the knowledge of traditional beliefs. One community member even said that there is a deliberate effort to teach young people about herbal medicine and there is an effort to preserve these plants, but there is no effort to preserve the knowledge of the sacred trees and the rituals (personal communication, 19 November 2021). The custodians were the only respondents who said that they were trying to pass the knowledge of their traditions to their children, but they also cited difficulties in passing along the knowledge because the younger generation has been indoctrinated by western religions. Foreign religion was cited as
the leading cause of the decline in cultural practices and difficulty and preserving the knowledge, by the community members. The effect that foreign religion has had on culture is supported by Ikuenobe’s (2014) article, wherein Christianity is used as an example of a tool used by colonizers to label Africans as savages, and weaken the local culture.

The difficulty in a holistic approach to the preservation of knowledge can be attributed to the preservation methods. The majority of the respondents said that they are preserving the knowledge by teaching their children about it, which means they are passing on the knowledge through oral tradition. Some challenges with preserving knowledge this way are highlighted in an article by Meyer (2009), “In addition, information flow in an oral context is controlled by attitudes, perceptions, norms, values and belief systems inherent to indigenous people” (Meyer, 2009, p. 5). This means that as values and norms shift within the community, as they did with the introduction of foreign religions, people chose what knowledge to preserve and what to leave behind. Without a written record of practices and beliefs, indigenous knowledge could be forgotten entirely.

5.3 Conclusion
The Bagungu community has extensive knowledge of herbs and plants that can be used in treating a variety of ailments. Not a single respondent in this study said that they did not use herbal medicine, or had no knowledge of herbal medicine. Traditional medicine is still an invaluable aspect of the Bagungu community. It is very clear that Bagungu community is very connected to nature. This is seen in their vast knowledge of medicinal plants, the use of sacred trees when performing the rituals, and in the rituals that they perform that aim to balance human activity and nature. The wide variety and little overlap in medicinal plants named by respondents speak to the vast knowledge of medicinal plants within this community. Although many people did not mention specific sacred plants honored by their clans, many people spoke of the importance of trees and plants and mentioned a culture of not over exploiting those resources. Even without the incentive of spirituality to protect trees and nature, there is a deep understanding of the significance of plants when it comes to the environment.
Although globalization has affected many aspects of culture in Uganda, the practice of using herbal medicine is still extremely prevalent. Overcoming the effects of globalization speaks to the effectiveness of herbal medicine, but also the lack of other resources within rural communities. The use of herbal medicine still persists when other cultural practices have not, in large part due to the collective belief in the effectiveness of the herbs and the availability. Foreign religion as a consequence of globalization has had the largest impact on culture within the Bagungu community. Many aspects of the culture are at risk of extinction, especially as the older generation who used to practice more rituals pass away. It will take a concerted effort of the communities to preserve the knowledge before too much is lost.

Efforts are being made to preserve the knowledge of the medical plants. Not only are parents teaching their children about them, but people are actively planting the rarer species to ensure their preservation. This however can not be said about other religions’ practice. Although there are members in most communities that still practice rituals, many do so in secret. It is up to the custodians, who still practice rituals to preserve the culture and preserve the indigenous knowledge.

5.4 Limitations
A major limitation in this study was that the study could only be conducted in Hoima District because of bureaucratic reasons. Visiting the sites where some of the respondents were coming from, would have provided more insight into the environment and available vegetation in their community. Another limitation was the use of translators. This likely limited the amount of information being recorded compared to the amount of information shared. As multiple translators were used, it is likely that there were inconsistencies in the translated questions and the interpretation of the answers. For some of the herbalists and some of the community members, multiple people were contributing to the answers of one person’s interview or questionnaire. This resulted in more general answers than specific answers, or answers that were skewed by the other people responding.
5.5 Recommendations

Research should be done to analyze the medicinal plants and possibly isolate specific chemicals that treat the diseases. It would also be interesting to assess the success rate that herbal medicine has compared to health facilities in rural areas that do not have access to state-of-the-art facilities. It should be investigated how herbal medicine can be used in conjunction with western medicine to provide safe and affordable care to areas that lack access to adequate health services. Further research could also be done on the dosages of the medicine.

Research should also be done on how the relationship the Bagungu have with nature affects the environment. This includes the effect that the preservation of plants and the effect of performing rituals. Research could also be done on how population increase in the Bugungu area has affected the availability of medicinal plants, and how sustainable the practices of herb extraction are.

Strategies should be explored that allow for globalization, while also preserving traditions and culture. The government should promote culture, and policies should be created that protect nature and sacred sites from development. While development is important particularly in Uganda’s rural communities, it should not come at the cost of culture. Further research should be done in the future, after the extent of the effect of the oil development is felt, to determine what its effect has been on the practice of rituals and on the effects to preserve medical plants.

Although there is a concerted effort to preserve the knowledge of medicinal plants and the plants themselves, a more comprehensive list should be made of all the medicinal plants as documentation of the knowledge. Further research should also be done to create a more robust record of the cultural beliefs and practices of the Bagungu people. There should be more formal education on the importance of preserving culture and knowledge. Culture is not taught in schools, and for the most part, it is the parent’s responsibility to pass on knowledge to their children. It is unlikely that foreign religion will go away, so finding a way of religion coexisting with traditional beliefs could help preserve the indigenous knowledge. Educating children on the importance of their heritage can help with that as well.
References


Appendix A:

Sample Questionnaire:

Section A: Demographics Profile
1. Interview Code (Just for Survey use):
2. Date of Interview:
3. Village:
4. Clan Name/totem:
5. Age:
   a. 18-35 (youth)
   b. 36-50 (young adult)
   c. 51-64 (mid-age)
   d. 65+ (elders)
6. Gender:
   a. Male
   b. Female
7. Marital Status:
   a. Married
   b. Single
   c. Other (widowed or divorced)
8. Highest Level of Education:
   a. No School
   b. Primary School
   c. Secondary School
   d. Vocational School
   e. Tertiary Education (Bachelor’s Degree)
   f. Tertiary Education (Master or Above)
9. Economic Activity:
10. What is your religion?
   a. Protestant
   b. Catholic
   c. Muslim
   d. Other

Section B: Herbal Medicine
1. Do you use traditional remedies for curing pain and disease?
2. For what ailments do you use traditional remedies?
3. Do you collect and administer the herbs yourself or do you go to an herbalist?
4. Where do you collect the herbs you use for medicinal purposes?
5. What parts of the plants do you use?
   a. Leaves
   b. Stem
   c. Bark
   d. Roots
   e. Flowers
   f. Other
6. How did you learn about herbal medicine?
   a. From personal study
   b. From family
c. From formal education
   d. Other
7. How common, would you say, it is for members of your community to use herbal medicine?
8. How common, would you say, it is for members of your community to use visit health clinics?

Section C: Plants used in Rituals
1. Does your clan have any sacred plants? If so, what are they?
2. Are there people in your community who still practice traditional beliefs and rituals?
3. Do you perform rituals? If so, what kind of rituals?
4. How have the traditional practices changed in your lifetime?
5. What are specific effects that the influence of wester culture has had on your community?
6. How is traditional knowledge preserved?
Appendix B:

Sample Interview Questions for the Custodians:

1. How long have you been a custodian?
2. How did you get the position of a custodian?
3. What are your responsibilities as a custodian?
4. What measures have to be taken to preserve your culture?
5. What are the challenges associated with preserving your indigenous knowledge?
6. How have you or how do you plan on passing your knowledge to the next generation?
7. What are the biggest effects globalization has had on your community?
8. What are the traditional ways your clan uses plants?
9. Do you have plants that are sacred or held as totems?
10. Are there certain parts of plants that are more sacred than others?
11. Is there a way to embrace progress, while also preserving your traditions?

Sample Interview Questions for the Herbalist:

1. How long have you been an herbalist?
2. Where did you learn your skills?
3. How many people come to see you?
4. What are the demographics of the people that come to see you?
   a. Are there more women or men?
   b. Is there an age group that uses your service more than others?
   c. Are the people that come to see you mainly from your community or do people travel to see you?
5. What services do you offer people?
6. What are the most common plants you use?
7. What parts of the plants do you use?
   a. Leaves
   b. Stem
   c. Bark
   d. Roots
   e. Flowers
   f. Other
8. In what form do you use the plants?
9. Have you noticed any shift towards western medicine as a result of globalization?
10. What is the best way western medicine and traditional medicine can coexist?
### Appendix C:

*Medicinal Plants*

**Table 3. Medicinal plants mentioned by the community members**

<table>
<thead>
<tr>
<th>Local Name</th>
<th>Common name English</th>
<th>Scientific name</th>
<th>Treats</th>
<th>Part used</th>
<th>Preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artemesin</td>
<td>NA*</td>
<td>NA*</td>
<td>Malaria</td>
<td>leaves</td>
<td>boiled and drank</td>
</tr>
<tr>
<td>Bidontino/Mu tumali</td>
<td>Uganda Coral</td>
<td><em>Erythrina abyssinica</em></td>
<td>Diarhea</td>
<td>Roots</td>
<td>Roots pounded and mixed with water or boiled and drunken</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Syphilis</td>
<td>Bark boiled</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Malaria</td>
<td>Leaves squeezed and drank</td>
</tr>
<tr>
<td>Bisookiso</td>
<td>Aloe vera</td>
<td><em>Aloe barbadensis miller</em></td>
<td>Malaria</td>
<td>leaves</td>
<td>Cut and drink juice, applied to the skin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Skin rash</td>
<td>Applied to skin</td>
</tr>
<tr>
<td>Bukulumbe ru</td>
<td>NA*</td>
<td><em>Asparagus africamus</em></td>
<td>Measles</td>
<td>Leaves</td>
<td>boiled and drank</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Syphilis</td>
<td>Roots boiled and drank</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Malaria</td>
<td>Roots boiled and drank</td>
</tr>
<tr>
<td>Buuroi</td>
<td>Millet</td>
<td><em>Pennisetum glaucum</em></td>
<td>Burns</td>
<td>Seeds</td>
<td>fried until black, then pounded into powder and applied to the burn</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butute</td>
<td>Rosary pea</td>
<td><em>Abrus Precatorius</em></td>
<td>Stomach pain</td>
<td>leaves</td>
<td>squeezed and drank</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Byata</td>
<td>Sweet potato</td>
<td><em>Ipomoea batatas</em></td>
<td>stomach pain</td>
<td>leaves, tubers</td>
<td>boiled and drank</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Treating wounds</td>
<td>Tubers burned in the fire, then pounded into powered and applied</td>
</tr>
<tr>
<td>Dodo</td>
<td>Pigweed</td>
<td><em>Amaranthus spp.</em></td>
<td>rashes</td>
<td>Flower</td>
<td>squeezed and smeared</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ijiri</td>
<td>Spiderwisp</td>
<td><em>Cleome gymandra</em></td>
<td>worms</td>
<td>Roots</td>
<td>boiled together and given to the patient to drink if a person is cursed they will release stool</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>lifting curses</td>
<td>Roots boiled together and given to the patient to drink if a person is cursed they will release stool</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>gonorrhea</td>
<td>Bark boiled and drank</td>
</tr>
<tr>
<td>Lubingo</td>
<td>Elephant grass</td>
<td><em>Pennisetum purpureum</em></td>
<td>Cough</td>
<td>Stem</td>
<td>boiled and drank or chewed and the juices are swallowed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Measles</td>
<td>Stem boiled and drank</td>
</tr>
<tr>
<td>Mapeera</td>
<td>Guava</td>
<td><em>Psidium guajava</em></td>
<td>Toothache</td>
<td>Leaves</td>
<td>squeezed and liquid is dripped onto the gums</td>
</tr>
<tr>
<td>Mutungutunguu</td>
<td>Capers</td>
<td>Capparis erythrocarpos lloquent</td>
<td>Back pain</td>
<td>Roots</td>
<td>poured with hot water and applied to the back, tied with a cloth for 30 minutes</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------</td>
<td>---------------------------------</td>
<td>-----------</td>
<td>-------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Mbumbuula</td>
<td>NA**</td>
<td>Hoslandia opposita</td>
<td>stomach pain</td>
<td>Leaves</td>
<td>juiced or boiled</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>fever of head</td>
<td>Leaves</td>
<td>squeeze and bathe</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>eye pain</td>
<td>Leaves</td>
<td>juice dropped into the eye</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>headache</td>
<td>Leaves</td>
<td>boiled and drank</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ulcers</td>
<td>Leaves</td>
<td>Squeezed and drank</td>
</tr>
<tr>
<td>Ngenge</td>
<td>NA**</td>
<td>Oxycyonum spinatum</td>
<td>Syphilis</td>
<td>Roots</td>
<td>boiled and drank</td>
</tr>
<tr>
<td>Mpeere</td>
<td>Hibiscus</td>
<td>Kosteletzya adowenäe</td>
<td>Fever of head</td>
<td>Leaves</td>
<td>squeeze and bathe</td>
</tr>
<tr>
<td>Ntobbotobbo</td>
<td>NA*</td>
<td>NA*</td>
<td>Root</td>
<td>boiled together and given to the patient to drink, if a person is cursed they will release stool</td>
<td></td>
</tr>
<tr>
<td>Kibienzi</td>
<td>Bitterleaf</td>
<td>Vernonia amygdalina</td>
<td>malaria</td>
<td>Leaves</td>
<td>juiced or boiled</td>
</tr>
<tr>
<td>Mugorogoro</td>
<td>NA*</td>
<td>NA*</td>
<td>STIs</td>
<td>Bark</td>
<td>boiled and liquid drunk</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Asthma</td>
<td>Bark</td>
<td>porridge is made from millet that was left to germinate and the bark water, burned and ash is mixed with Kibyro salt and licked</td>
</tr>
<tr>
<td>Mahoko</td>
<td>African soapberry</td>
<td>Phytolacca dodecandra</td>
<td>Asthma</td>
<td>Bark</td>
<td>boiled and drank</td>
</tr>
<tr>
<td>Mukungu</td>
<td>Forest newtonia</td>
<td>Newtonia buchananii</td>
<td>Stomach pain</td>
<td>Bark</td>
<td>boiled and drank</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Barren woman (only works on naturally barren women, not women that have been cursed to be barren)</td>
<td>Bark</td>
<td>boiled and drank</td>
</tr>
<tr>
<td>Mukunkulu</td>
<td>Capertree</td>
<td>Crateva adansoni</td>
<td>fever of head</td>
<td>leaves</td>
<td>squeeze and bathe</td>
</tr>
<tr>
<td>Muluolo</td>
<td>Sausage tree</td>
<td>Kigelia africana</td>
<td>joint pain, STIs</td>
<td>Fruit</td>
<td>Pounded and dried to make a powder, eat powder or mix with water</td>
</tr>
<tr>
<td>Name</td>
<td>Common Name</td>
<td>Scientific Name</td>
<td>Condition</td>
<td>Part Used</td>
<td>Treatment</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------------------------</td>
<td>-----------------------------------</td>
<td>--------------------------------</td>
<td>--------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Muraana Nyama</td>
<td>Creeping foxglove</td>
<td>Asystasia gangetica</td>
<td>High blood pressure</td>
<td>Bark</td>
<td>Boiled and drank</td>
</tr>
<tr>
<td>Murauma</td>
<td>Dragon tree</td>
<td>Dracaena draco</td>
<td>Back pain</td>
<td>Leaves</td>
<td>Squeezed and massaged on pain</td>
</tr>
<tr>
<td>Musambya</td>
<td>Níke tulip</td>
<td>Markhamia lutea</td>
<td>STIs</td>
<td>Bark</td>
<td>Boiled and drank</td>
</tr>
<tr>
<td>Musinga bakazi</td>
<td>Aastard marula</td>
<td>Lannea schweinfurthii</td>
<td>Syphilis, malaria</td>
<td>Bark</td>
<td>Boiled and drank</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Leaves</td>
<td>Squeezed and drank</td>
</tr>
<tr>
<td>Musisye</td>
<td>Albizia</td>
<td>Albizia coriaria</td>
<td>Syphilis</td>
<td>Bark</td>
<td>Boiled and drank</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cough</td>
<td>Leaves</td>
<td>Boiled and drank</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Erectile dysfunction</td>
<td>Leaves</td>
<td>Boiled and drank</td>
</tr>
<tr>
<td>Musamvu</td>
<td>Tallow wood</td>
<td>Ximenia americana</td>
<td>Syphilis, malaria</td>
<td>Bark</td>
<td>Boiled and drank</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Leaves</td>
<td>Squeezed and drank</td>
</tr>
<tr>
<td>Musororo</td>
<td>Indigo</td>
<td>Indigofera arrecta</td>
<td>Stomach pain</td>
<td>Roots</td>
<td>Put in fire the outer coating of the roots</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>in removed and chewed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diarrhea</td>
<td>Roots</td>
<td>Chew</td>
</tr>
<tr>
<td>Mususa</td>
<td>NA*</td>
<td>NA*</td>
<td>Malaria</td>
<td>Leaves</td>
<td>Squeezed and drank</td>
</tr>
<tr>
<td>Muteete</td>
<td>Desert date</td>
<td>Balanites aegyptiaca</td>
<td>Syphilis</td>
<td>Root</td>
<td>Boiled and drank</td>
</tr>
<tr>
<td>Mutiti (specifically</td>
<td>White galled acacia</td>
<td>Acacia seval</td>
<td>Heavy menstrualation</td>
<td>Roots</td>
<td>Clean them and remove the cover, pound them</td>
</tr>
<tr>
<td>those that don’t</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>with water and drink, the residue is put in</td>
</tr>
<tr>
<td>grow to full size)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a clay pot and cooked over the fire, the</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>woman then squats over on it</td>
</tr>
<tr>
<td>Mutotohama</td>
<td>NA*</td>
<td>NA*</td>
<td>Typhoid</td>
<td>Roots</td>
<td>Boiled and drank</td>
</tr>
<tr>
<td>Mutuura</td>
<td>Manula</td>
<td>Sclerocarya birrea</td>
<td>Abnormal heartbeat</td>
<td>Bark</td>
<td>Boiled and drank</td>
</tr>
<tr>
<td>Mayora</td>
<td>Splinter bean</td>
<td>Entada abyssinica</td>
<td>Asthma</td>
<td>Leaf and bark</td>
<td>Squeezed and drank</td>
</tr>
<tr>
<td>Mazinga</td>
<td>NA**</td>
<td>Sesamum angustifolium</td>
<td>Knee pain</td>
<td>Leaves</td>
<td>Boil and eat</td>
</tr>
<tr>
<td>Mwani</td>
<td>Coffee</td>
<td>Coffea arabica</td>
<td>Stomach pain</td>
<td>Leaves</td>
<td>Boiled and drank</td>
</tr>
<tr>
<td>Mwetangu</td>
<td>Seaport goosefoot</td>
<td>Chenopodium apalligolium</td>
<td>Malaria</td>
<td>Leaves</td>
<td>In water and bathe children</td>
</tr>
<tr>
<td>Mwitanjonka</td>
<td>NA*</td>
<td>NA*</td>
<td>Ringworm</td>
<td>Roots</td>
<td>Pounded, mixed with kerosene and applied</td>
</tr>
<tr>
<td>Nkoma</td>
<td>Snake plant</td>
<td>Sanseviera trifasciata</td>
<td>Syphilis</td>
<td>Root</td>
<td>Boiled and drank</td>
</tr>
<tr>
<td>Common name</td>
<td>Latin name</td>
<td>Condition</td>
<td>Part</td>
<td>Preparation</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>------------</td>
<td>-----------</td>
<td>------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>Bikoni</td>
<td>Pencil tree</td>
<td>Euphorbia tirucalli</td>
<td>Ear infection</td>
<td>Any part broken and milk comes out and is dripped into the ear then aloe is dried and burned and the power is applied to the boil</td>
<td></td>
</tr>
<tr>
<td>Ntobbotobbo</td>
<td>Sodom Apple</td>
<td>Solanum incanum</td>
<td>Boils, gonorrhea</td>
<td>Fruit cut and milk comes out and is dripped into the ear</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Gonorrhea Bark boiled and drank</td>
<td></td>
</tr>
<tr>
<td>Rwihura</td>
<td>NA*</td>
<td>NA*</td>
<td>Breached baby</td>
<td>Leaves squeezed with water and bathe in water</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Malaria</td>
<td>Leaves Juice of boiled</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cough</td>
<td>Leaves Juiced or boiled</td>
<td></td>
</tr>
<tr>
<td>Sagala musansi</td>
<td>Coffee senna</td>
<td>Senna occidentalis</td>
<td>Lifting curses</td>
<td>Roots, bark boiled together and given to the patient to drink, if a person is cursed they will release stool</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cough</td>
<td>Leaves Juice of boiled</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gonorrhea Bark boiled and drank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kipaapaali</td>
<td>Papaya</td>
<td>Carica papaya</td>
<td>Bloody stool</td>
<td>Roots Pounded and boiled with milk and drank</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cough</td>
<td>Leave Iron sheet used to turn the leaves above the fire the ash is mixed with the Kibyro salt and it’s eaten</td>
<td></td>
</tr>
<tr>
<td>Vacado</td>
<td>Avocado</td>
<td>Persea americana</td>
<td>Not have enough blood</td>
<td>Seeds Pounded and boiled then drank</td>
<td></td>
</tr>
<tr>
<td>Neemu</td>
<td>Neem Tree</td>
<td>Azadirachta indica</td>
<td>Malara, cough</td>
<td>Leaves Chewed</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cough</td>
<td>Leaves Boiled and drank</td>
<td></td>
</tr>
<tr>
<td>Mukalutunsi</td>
<td>Eucalyptus</td>
<td>Eucalyptus globulus</td>
<td>Cough</td>
<td>Leaves boiled and drank</td>
<td></td>
</tr>
</tbody>
</table>

*Species not identified
**Common name not available
Appendix D:

Ethical Considerations

There were minimal ethical considerations in this study as the purpose was only to gain knowledge from the community. No sensitive topics were broached and no vulnerable populations were interviewed. That being said, the researcher did go into the community as a white person and there are some inherent power dynamics associated with that, with she tried to handle mindfully. The researcher also did not contribute anything significant, besides a small compensation to the participants, to the communities participating in the study. Providing compensation could also create the exception of monetary compensation for all further participation in research studies. No respondent was interviewed without giving prior consent and was be recorded without consent.
Appendix D:

Consent form:

Hello, my name is Elena Kilber. I am a student from the United States of America. I am currently studying about conservation here, in Uganda.

As part of my studies in Uganda, I am conducting a study on the botanical usage of the Bagangu people. I am learning about herbal medicine and your clan’s traditional knowledge of plants. The purpose of this study is for me to learn about your culture and to create a written record of your culture’s knowledge.

I will be interviewing you/ administering a questionnaire as part of my study. I will be recording this interview using my phone.

The information you provide will be confidential, and none of your personal information will be shared.

You are not required to answer any questions that you do not feel comfortable answering.

Do you consent to be interviewed for my study?

Do you consent to be recorded?

Would you mind giving me your contact information, in case I have any further questions?
Appendix E:

Work plan and Budget

Table 4. Budget plan for 20 days of ISP work.

<table>
<thead>
<tr>
<th></th>
<th>Quantity</th>
<th>Unit Cost (UGX)</th>
<th>Total Cost (UGX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accomodations (Hoima)</td>
<td>17</td>
<td>12,500</td>
<td>212500</td>
</tr>
<tr>
<td>Accommodations (Kigorobya)</td>
<td>3</td>
<td>7,500</td>
<td>37500</td>
</tr>
<tr>
<td>Food</td>
<td>20</td>
<td>30,000</td>
<td>600000</td>
</tr>
<tr>
<td>Transportation</td>
<td>5</td>
<td>15,000</td>
<td>75000</td>
</tr>
<tr>
<td>Data &amp; minutes</td>
<td>1</td>
<td>55,000</td>
<td>55,000</td>
</tr>
<tr>
<td>Custodians and Herbalists</td>
<td>10</td>
<td>10,000</td>
<td>100000</td>
</tr>
<tr>
<td>Community members</td>
<td>30</td>
<td>10,000</td>
<td>300000</td>
</tr>
<tr>
<td>Translator</td>
<td>10</td>
<td>30,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Advisor</td>
<td>1</td>
<td>200,000</td>
<td>200,000</td>
</tr>
<tr>
<td>Sum</td>
<td></td>
<td></td>
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<tr>
<td>Total per diem</td>
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</table>

Table 5. The time frame from arrival at ISP site on 15/11 to ISP submission on 16/12.

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Activity</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15/11–20/11</td>
<td>Try to receive permission to conduct the study in Buliisa</td>
<td>Hoima</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Interview local herbalists and custodians</td>
<td>Around Kigorobya</td>
</tr>
<tr>
<td>2</td>
<td>22/11–27/11</td>
<td>Administer questionnaires to local community members</td>
<td>Around Kigorobya</td>
</tr>
<tr>
<td>3</td>
<td>29/11–4/12</td>
<td>Interview local custodians</td>
<td>Around Kigorobya</td>
</tr>
<tr>
<td>4</td>
<td>6/12–11/12</td>
<td>Analyze data from questionnaires</td>
<td>Hoima</td>
</tr>
<tr>
<td>5</td>
<td>13/12-14/12</td>
<td>Work of finalizing ISP write-up</td>
<td>Entebbe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ISP presentation</td>
<td>Entebbe/Kampala</td>
</tr>
<tr>
<td>16/12</td>
<td>Submit final ISP write-up</td>
<td>Entebbe/Kampala</td>
<td></td>
</tr>
</tbody>
</table>
Appendix F:

Nuts and Bolts:

Location: Hoima

Data collection location:
- Kigorobya
- Kibyro
- Kapapi

Transportation:
Bus from Kampala to Hoima: 40,000 UGX
Link Bus Terminal phone number: 0782 099992
Public Taxi from Buliisa to Hoima: 15,000 UGX

Accommodation
Alesco Guest House: 25,000 UGX per night
Contact: Edward Kibuka 039 2175184

Meals:
Trudy’s Dinner
Food Court

Translator/ Contact person:
Kiiza Wilson: 075 7725763