TRADITIONAL HEALERS AS A FOUNDATION PILLAR OF MEDICINAL PLANT CONSERVATION IN UGANDA.

MOLLY MARIA GREGER

Norwegian University of Life Sciences
Department of ecology and natural resource management
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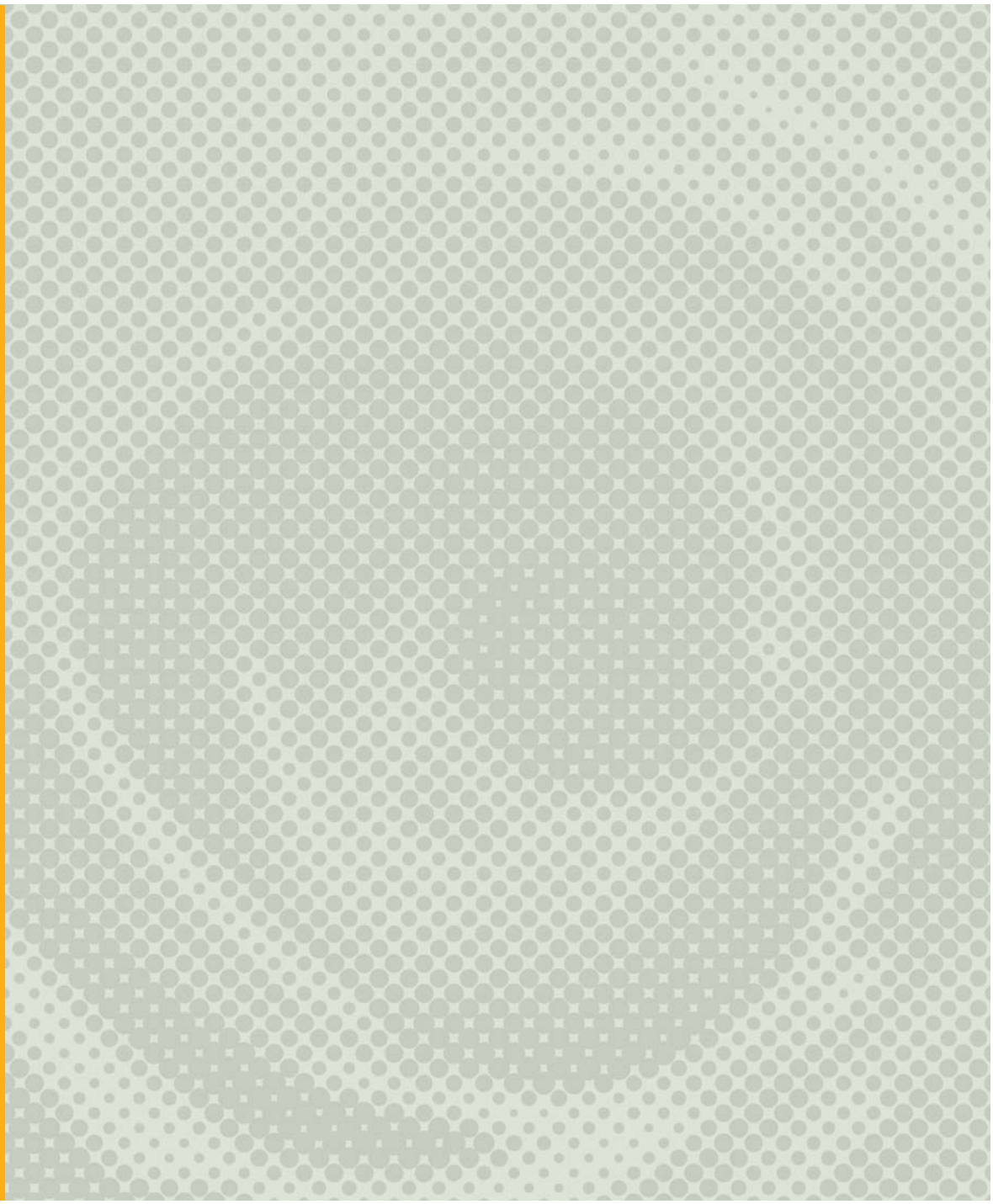

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ABSTRACT

Traditional knowledge (TK) and medicinal plants (MPs) play an important role in Uganda and in Africa in general. It has been estimated that nearly 80% of the population relies on MPs. It is also believed that traditional knowledge has a prominent position by being the base of an inexpensive health service system especially in rural areas, conservation of MPs is therefore crucial, especially for rural populations with no access to modern medicine and facilities. Information about MPs, traditional healers (THs) and TK was collected through semi-structured interviews of traditional healers in Jinja and Mpigi districts of Uganda. A total of 258 species of medicinal plants were reported, but only 28 species were the same in both districts. Leaves were the most common plant part harvested in both districts and most of the MPs were herbs. The most frequently mentioned MP was *Vernonia amygdalina* in Jinja (18 times) and *Piptadeniastrum africana* in Mpigi (20 times). Most healers (85%) conserved at least 50% of the MPs they classified as most important. Planting was the most prominent method of conservation. Traditional healers are an active group of community members trained both by family/fellow healers and NGOs and are the keepers of valuable information and knowledge about MPs. Traditional healers were aware of the global decline in biodiversity in general and expressed willingness and interest for more information and training. Facilitated courses and practical training including embedding of western terminology and methods in traditional knowledge might be the element necessary for TK to keep up and survive in a competitive globalized modern world.

1. INTRODUCTION

Ethnopharmacology is defined as the use of "plants, fungi, animals, microorganisms and minerals and their biological and pharmacological effects based on the principles established through international convention" (Soejarto et al. 2005). Medicinal plants (MPs) have been used as remedies and food since ancient times (Fabricant & Farnsworth 2001; Schippmann et al. 2006), and fossil evidence for the use of phytomedicine points back approximately 60.000 years (Fabricant & Farnsworth 2001). However western medicine and traditional medicinal methods, parted at the time when it became possible to isolate active compounds (Phillipson 2001). The plants were used to prepare consecrates, isolates and later chemical analogs of the original compound (Atta-Ur et al. 2011). Nevertheless, although MPs currently are not directly administered in western medicine, many allopathic medicines in the western world still contain plant ingredients (Okello & Ssegawa 2007).

On a global basis MPs remain extremely important (Phillipson & Anderson 1989; Okello & Ssegawa 2007). For example, nearly 80% of Africa's population relies on MPs, and traditional knowledge (TK) has a prominent position by being the base of an inexpensive health service system especially in rural areas {Farnsworth, 1991 #13;Tabuti, 2004 #102}. In Uganda the doctor to patient ratio is approximately 1:24.000 according to World Health Organization (Kyalimpa 2009). Due to their low cost and easy access the use of MPs in developing countries is therefore as important as modern primary health care systems and conventional medicine are for the rest of the world. In the WHO traditional medicine strategy 2002-2005 report (WHO 2002) it was mentioned that "traditional medicine is in a real sense carrying the burden of clinical care for the AIDS epidemic in Africa. This trend has been largely overlooked by health ministries and international agencies." MPs are not only of great importance for people, but also have a very important role in the ethnoveterinary field - both in the medication and self-medication of wild and domestic animals (Gradé et al. 2009b; Gradé et al. 2009c; Nwosu 2004).

Of all the plant species worldwide, about 30% have been used as medicine by traditional healers (THs) and households (HHs) (Farnsworth & Soejarto 1991). However in recent times, plant diversity has been facing a decline due to an increasing human population (Srivastava et al. 1996) and an increased market and export value (van Andel & Havinga 2008). MP collection by THs has been thought to be sustainable, in contrast to their collection when done by traders (Wiersum et al. 2006). Plants are mainly collected in the wild which makes

conservation essential (Kamatenesi-Mugisha & Oryem-Origa 2005; Schippmann et al. 2006). Rural populations with no access to modern medicine are those who are most affected by forest degradation and loss of biodiversity (Okwi 2005).

Thirty of the 234 biodiversity centers in the world are in Africa, and Uganda with its montane ecosystems and endemic forest trees (Davis 1986; Kayanja & Byarugaba 2001). TK has a leading role for both the species biodiversity (because of the magnitude of medicinal plants) and the health and wellbeing of the human communities and their animals (Kamatenesi-Mugisha & Oryem-Origa 2005). By being familiar with the plants ecology, habits, habitats, and requirements THs and TK play an vital role in their conservation and cultivation (Akerele & Heywood 1991).

Figure 1: Myself with a traditional healer in Jinja, explaining to me the properties of a medicinal plant.

Religions, customs and traditions often have a protective function in conservation and restoration during different periods of time (Hamilton 2004; Hongmao et al. 2002). An example from Uganda is a clan of women called Ngiyepan (Gradé et al. 2009a; Shifts & Paradoxes 2009), in the region of Karamoja, who managed to protect specific tree species by using their songs, dances, and storytelling, and in their efforts to persuade they became even physical when words did not have the desired effect (Gradé et al. 2009a).

Traditional healers are in many cases the only people who continue to protect traditional knowledge, serving as "reservoirs" and living libraries (Figure 1; Okello & Ssegawa 2007). The THs assemblage into organizations and associations has lifted TK from being seen as just a superstitious belief system to a system which is gaining respect by both scientists and governments (Fissel & McKay 2006). A good example is PROMETRA Uganda an organization affiliated to PROMETRA International with 26 national chapters worldwide and over 10 branch offices in Africa. This organization is training THs through a 3 year course and spreading information about species declines, preservation, conservation, sustainable

harvesting and raising awareness. The renewed interest for MPs and information about threatened species is a key feature to conserving MPs in the wild (Born et al. 2009), as "people will not act to preserve the environment if they perceive no threats to it "(Kottak & Costa 1993).

This thesis is an attempt to a) document the most important MP species in the two districts, b) examine the THs level of knowledge about the MPs cultivation, protection and conservation, c) investigate how the THs work and perceive conservation of MPs and their degree of awareness and finally d) examine the role of NGOs in the conservation work.

2. STUDY SITES AND METHODS

2.1 STUDY SITES

Jinja District (Figure 2.2) is located in the eastern region of Uganda. Jinja town in Jinja District is the second urban area in Uganda (Heyen-Perschon & Europe 2004) after Kampala (Clinard & Abbott 1976). It is located between $0^0 30^0$N - $33^0 12^0$E, the altitude ranges between 1143 – 1376 meters above sea level (masl), and is approx. 87 km east of Kampala (Wikipedia 2010), bordering with Lake Victoria in the south. Jinja district covers an area of 7349 km^2 (Fonteh et al. 2005). The vegetation of Jinja is a mixture of plantation and tropical savannah and large areas with forest ecosystems (Baranga 2007). Jinja is a place where agriculture booms due to fertile soils and enough water supply (Balirwa 1992; Explore Jinja 2012), although many soils in Uganda are over 500 million years old, poor and very weathered (Baltenweck et al. 2007).

The people living in Jinja district are primarily Basoga tribal people (J. Tabuti pers. com.) and the district has a population of approx. 560,000 (Bukenya-Ziraba & Kamoga 2007). Jinja is ecologically interesting due its close proximity to one of the three main forests in Uganda, Mabira forest (Welnformers 2010) a tropical natural reserve rainforest covering about 306 km^2 and home to approximately 47% of Uganda's tree species (Baranga 2007).

Mpigi Distrcit (Figure 2.3) is located in central Uganda ($0^0$28'N, 32^0 30' E, 1180 masl) (Wortmann & Kaizzi 1998) and is approx. 37 km west of Kampala (Wikipedia 2011) and covers an area of 3,714 km^2 (Fonteh et al. 2005). The vegetation in Mpigi is medium altitude vegetation (Turyahabwe & Tweheyo 2010), mainly tropical savannah and evergreen trees around lake Victoria (Banana et al. 2007; Mpigi.go.ug 2011) and Mpigi's forests are mainly characterized as close canopy tropical evergreen forests with a mean annual rainfall of 320 mm. (Turyahabwe & Tweheyo 2010). Mpigi district has a population of about 415,000 (Namubiru 2006) with a population density of 203 persons /km^2 (Omeja et al. 2005), who are mainly Baganda tribe people encompassing approximately 86% of the population (Namubiru 2006). Human disturbances are a increasing factor for the biodiversity and a study about the effects of forests tenure (Turyahabwe & Tweheyo 2010). It was pointed out that regulation of human activity (logging, agriculture) leads to higher diversity.

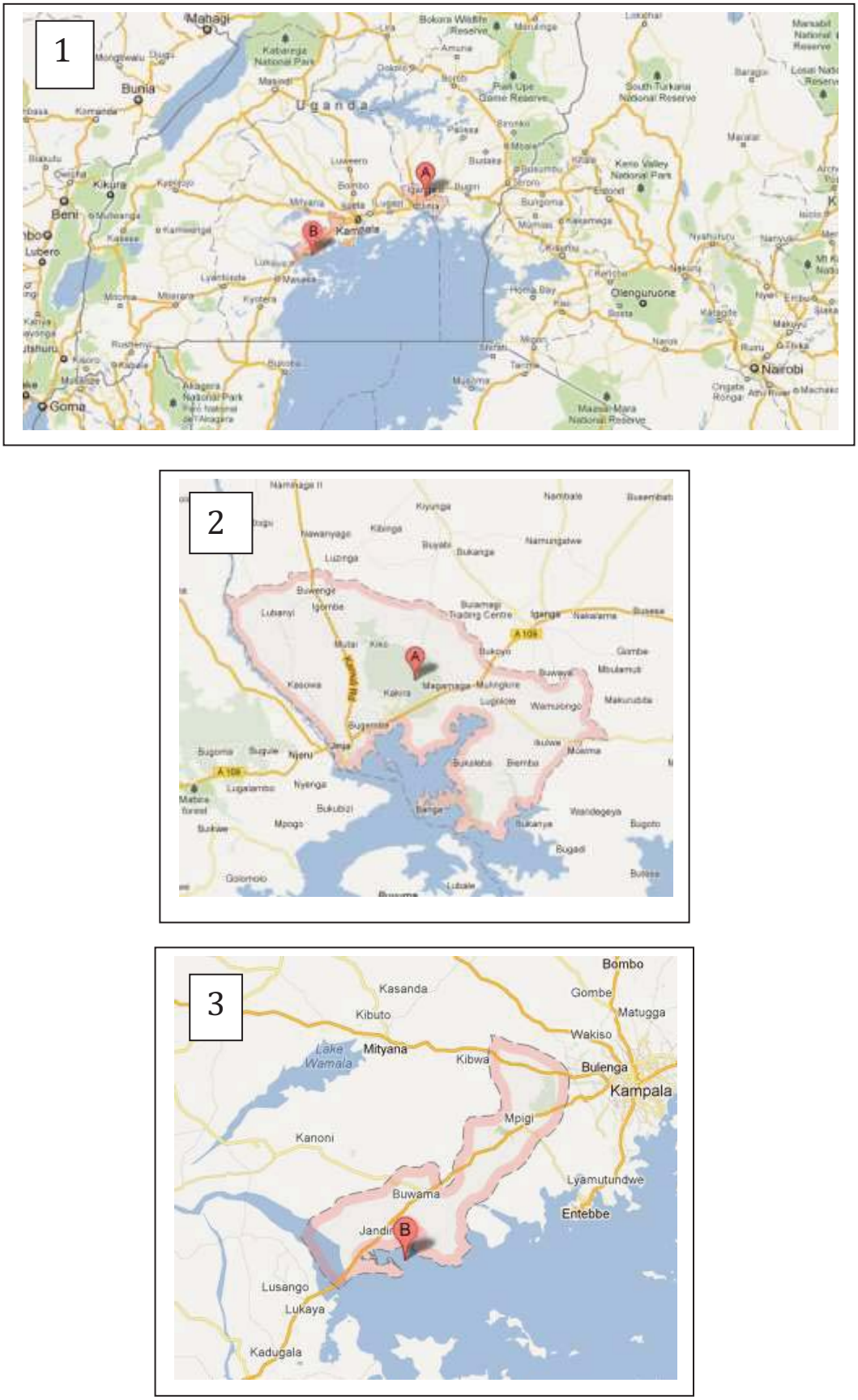

Figure 2: Map of Uganda (1) and neighboring countries and the location of the districts of Jinja (2A) and Mpigi (3B)

Both districts are primarily rural. The two districts where chosen due to their close proximity to the capital city and their difference because of the presence of an NGO which promotes traditional medicine located in Mpigi. The districts are also different in terms of the people's culture which is quite dissimilar.

2.2 DATA COLLECTION

Data was collected through the use of semi-structured questionnaire and a table (Appendix1,2)using a snowball approach (Chapman et al. 2007; Ely et al. 2011; Pesut & Reimer-Kirkham 2010). Thirty two and thirty THs were interviewed in Jinja and Mpigi, respectively (Appendix 1-3). All participants were asked for permission to be interviewed and in both districts the interviews took place at the homes and gardens of the participants. The interviewed healers were specialized as herbalists (60%), traditional birth attendants (20%), spiritualists and bonesetters (20%). The interviews were carried out by me and two field assistants. A preliminary field study was done in March 2011 in order to make connections and construct a plan. No results have been included from this round since I interviewed only 3 THs in Jinja and 4 in Mpigi. Following the preliminary study, I re-adjusted the questionnaire and the table for the new round of the interviews. The second round of interviews was completed during June and July 2011. All plants where reported originally with their local names and their botanical names were subsequently acquired from existing literature and with the help of Prof. John R. S. Tabuti. Plant harvest was categorized as "Heavy" (harvesting once a day), "Moderate" (once a week), and "Low" (once a month).

2.3 DATA ANALYSIS

Data collected was entered into the Excel. Comparison between levels of knowledge (e.g. number of plants used in traditional medicine) and practice (e.g. number of plants planted/managed by traditional healers) was conducted using the paired t-test statistic using Minitab 15 ® (Minitab Inc.). Results are presented in tables and figures.

3. RESULTS

3.1 HEALERS

Only 18% of the interviewed THs were fulltime practitioners (Table 1). The vast majority had other primary sources of income, such as crop farming. Twenty-one percent of the respondents had farming and other occupations as their primary source of income, but compensated their income as practicing herbalists (Table 1). The level of education of the THs was generally low (Table 2). The majority (54%) of THs were between 40-60 years old (Table 3), and 41 were women (66%) and 21 men (34%).

3.2 DISEASES

THs treated many different conditions such as headaches, animal bites, wounds, asthma, dental problems, mental and nerve disorders. These were conditions specified by less than two of the respondents. Other important conditions treated by TH's include malaria, sexually transmitted diseases such as syphilis and HIV/AIDS, pregnancy issues, and ulcers and high blood pressure (Table 4). There were few obvious differences between the two districts, but sexually transmitted diseases and fevers appear to be more prevalent in Mpigi and stomach problems more prevalent in Jinja. Despite the ailments mentioned as most important by the healers, the healer's specialties did not match the distribution of the ailments (Table 5).

Table 1: Main occupation of the interviewed THs

Ocupation	Total	%
Herbalists + Farmers	29	47
Herbalists	11	18
Herbalists + Other	9	14
Other	6	10
Farmer	7	11

Table 2: Educational level of the participants.

Education	Total	%
Secondary 1-6	18	29
Primary 2-7	30	48
None	11	18
Diploma	3	5

Table 3: Age distribution of the interviewed THs

Agegroup	Total	%
20-30	3	5
30-40	12	19
40-50	16	26
50-60	17	28
60-70	7	11
70-80	7	11

Table 4: Most common ailments mentioned by THs in Jinja and Mpigi districts, Uganda.

DISEASES	*JINJA*	*%*	*MPIGI*	*%*	*ALL*	*%*
Other	*46*	*27*	*43*	*22*	*89*	*24 %*
Cough	*8*	*5*	*22*	*11*	*46*	*8 %*
Malaria	*20*	*11*	*7*	*4*	*42*	*8 %*
Fever	*2*	*1*	*22*	*11*	*36*	*6 %*
Bone, joint problems/fractures	*18*	*10*	*4*	*2*	*34*	*6 %*
HIV/AIDS	*8*	*5*	*13*	*7*	*33*	*6 %*
Ulcers	*12*	*7*	*9*	*5*	*33*	*6 %*
Pressure	*16*	*9*	*5*	*3*	*33*	*6 %*
Female/birth/pregnancy/genitalia problems	*6*	*4*	*12*	*6*	*28*	*5 %*
Syphilis	*3*	*2*	*13*	*7*	*25*	*5 %*
Headache	*7*	*4*	*7*	*4*	*22*	*4 %*
Stomach diseases	*8*	*5*	*6*	*3*	*22*	*4 %*
Skin diseases		*0*	*13*	*7*	*13*	*4 %*
Worms	*2*	*1*	*6*	*3*	*12*	*2 %*
Eye diseases	*7*	*4*	*1*	*1*	*13*	*2 %*
Diarrhoia	*2*	*1*	*4*	*2*	*9*	*1 %*
Diabetes	*3*	*2*	*3*	*1*	*9*	*1 %*
Asthma	*3*	*2*	*2*	*1*	*8*	*2 %*

Table 5: The percentage of healers specialized to treat different conditions in Jinja and Mpigi districts, Uganda.

SPECIALIZATION	JINJA	%	MPIGI	%	ALL	%
General	20	32	23	29	43	30 %
Malaria	8	13	7	9	15	10 %
Syphilis	4	6	11	14	15	10 %
Ulcers	7	11	6	8	13	9 %
Pressure	7	11	2	3	9	6 %
Women's diseases	6	8	3	4	9	6 %
Fever	0	0	8	10	8	6 %
Cough	1	2	6	8	7	5 %
HIV	0	0	6	8	6	4 %
Stomach dis.	5	8	0	0	5	3 %
Bones, joints, etc	3	5	1	1	4	3 %
Skin dis.	0	0	4	5	4	3 %
senility	1	2	1	1	2	1 %
Eye diseases	1	2	0	0	1	1 %

3.3 PLANTS

Two hundred and fifty eight species of medicinal plants were reported used by the THs and 206 species were identified by their scientific names. Only 28 species were overlapping between the two districts (Table 6). A comprehensive list of species can be found in Appendix 4. The families of Leguminosae (46%), Euphorbiaceae (35%), Lamiaceae (19%), and Moraceae 16%) contributed the majority of the species.

The MPs most harvested (27%) were herbs (Figure 3). Leaves were the most common plant part harvested for treatments in both districts (Figure 4). There were few differences in plant parts harvested between districts, but bark appears to be more intensively used in Mpigi than in Jinja (53% and 10%, respectively (Figure 4). There were five species mentioned between 13-20 times, eighteen species mentioned between 6-12 times and two hundred and ten species mentioned between 1-5 times. When the healers were asked about the intensity they harvest the plants, a detailed analysis for each plant was given. Ninety one percent of the species were harvested sparingly while two percent were not harvested sparingly and I have no record for the rest. THs were aware of the worldwide decline of plant diversity but when asked to report the status of each plant in detail (of the five most important species) 56% were increasing, 22%

declining and 11% were rare. Only one of the most important species (*Prunus africana)* is vulnerable according to data from the IUCN Red List (1998).

Meanwhile 24% of the species in Jinja were sold and 83% bought and 83% species in Mpigi were sold and 16% were bought. Some plants were both sold and bought (when scarce) the rest were either harvested in the wild or cultivated.

Table 6: The number of medicinal plant species, genera and families used by THs in Jinja and Mpigi districts, Uganda. Numbers in brackets refer to unidentified species.

	JINJA	MPIGI	TOTAL	OVERLAP
SPECIES	150(48)	108(6)	258(54)	28
FAMILIES	45	39	84	27
GENERA	92	87	179	37

Table 7: The five most mentioned (used) medicinal plants used in Jinja and Mpigi districts, Uganda.

Location	Species	Times ment.
JINJA five monst mentioned species		
Jinja	*Vernonia amygdalina*	18
Jinja	*Aloe spp.*	14
Jinja	*Persea americana*	12
Jinja	*Chenopodium opulifolium*	9
Jinja	*Psidium guajava*	8
MPIGI five most mentioned species		
Mpigi	*Piptadeniastrum africana*	20
Mpigi	*Erythrina abyssinica*	18
Mpigi	*Prunus africana*	16
Mpigi	*Canarium schweinfurthii*	13
Mpigi	*Mangifera indica*	12

Figure 3: Most prevalent growth habits of the MPs harvested.

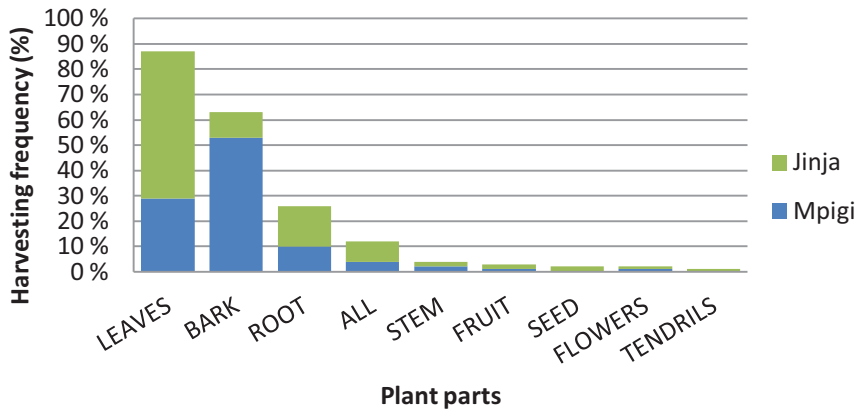

Figure 4: Medicinal plant parts harvested by THs in Jinja and Mpigi districts, Uganda.

Table 8: Plants conserved by planting.

PLACE	JINJA	MPIGI
Yard	23	0
Garden	90	72
Forest	0	9
Court-yard	90	31
Backyard	2	12
Conserved	205 | 48%	124 | 41%
All plants mentioned	424	303

Table 9: The sources of TK and conservation advice of the THs.

	NGO	Elders/Family	Fellow THs	None/Other
Where did the healer get the knowledge to plant				
J	4	10	5	13
M	26	0	0	4
Who advises the healer about conservation				
J	5	7	2	18
M	26	0	0	4

3.4 CONSERVATION

Ninety-two percent of the THs planted MPs on their lands. Seventy-six percent believed that improved access to medicinal plants through cultivation might create an opportunity for an alternative income source by selling the herbs on markets. Almost half (51%) of the THs received their knowledge about MPs from NGOs, such as PROMETRA (Table 9) and the high percentage is an indication of it's importance in passing TK. Many (16%) learned from elders and family members, from fellow THs or they had no formal advisors (28%). The role of NGOs for cultivation and conservation advices differed considerably between the two districts (Table 9). All of the THs highlighted the fact that conservation is important. In Jinja 87,5% of the THs conserved 57% of the plants they considered to be most important (Table 7). In Mpigi 83,3% conserved 44% of the most important MPs. Planting was the most prominent method of conservation among THs from the two districts; 49,5% and 46,1% in Jinja and Mpigi, respectively. Other conservation methods were watering of wild plants, harvesting sparingly and carefully, and protecting plants from thieves and animals. Most plants were planted in the THs gardens and court-yards (Table 8). Planting of MPs also occurred in yards, backyards and forests, but these places were used less. No significant difference was found in the number of plants conserved across the two regions ($t = 0,57$, $p = 0,580$).

The majority of plants underwent heavy harvest (68% and 56% in Jinja and Mpigi, respectively) when heavy harvesting was once a day, moderate once a week and low once a month. The healer's advice regarding conservation was as expected, to conserve MPs by planting (42%). Fifteen percent advised to harvest the MPs sparingly and to take care of the plants (Table 11).

Many of healers answered that conservation is challenging in various ways (Table 10). However 10 of the THs in Jinja and 3 in Mpigi could see no challenges whatsoever. All healers responded positively when asked if training, quotas, monitoring and restrictions would be useful tools in conservation.

Table 10: Challenges and hindrances to conserving MPs in Jinja and Mpigi districts.

CHALLENGES TO CONSERVING	Times mentioned	%
Deforestation as habitat loss	15	22 %
None	13	19 %
Lack of land	13	19 %
Pests (animals, insects, etc)	6	9 %
Seed scarcity	6	9 %
Other	6	9 %
Weather	4	6 %
Soils	2	3 %
Thiefs	2	3 %
Age	1	1 %

Table11: The THs advices regarding conservation.

	To plant	Harvest ing sparingly-Taking care	Stop deforestation Dont cut	Educating	Other	Sum
JINJA	17	7	4	8	1	37
MPIGI	16	5	7	4	9	41
	42 %	15 %	14 %	15 %	13 %	100%

4. DISCUSSION

4.1 THE IMPORTANCE OF ETHNO-PHARMACOLOGY AND TRADITIONAL KNOWLDGE

Medicinal plants and traditional knowledge constitute a big proportion of the primary health care in Uganda. The assessment and conservation of medicinal plants is therefore very important (Kamatenesi-Mugisha & Oryem-Origa 2005). Medicinal plants are being used by both traditional healers and household members for self medication. TK harbors valuable information about species with active ingredients not yet identified by the pharmaceutical industry (Hamilton 2004). These plants may provide this industry with new sources of raw material. TK can also indirectly safeguard plant diversity, and loss of the knowledge and traditional healers, often leads to arbitrary harvesting or even destruction of natural areas (Ssegawa & Kasenene 2007).

Medicinal plants are generally threatened by overexploitation and deforestation (Hamilton 2004; Jeruto et al. 2008; Ssegawa & Kasenene 2007), although only one of the important species, *Prunus africana in* the current study is vulnerable on the IUCN Red List (1998), and only 22% of the mentioned MPs are decreasing according to the THs. However, Uganda has a deforestation rate of about 55.000 ha/y (Ssegawa & Kasenene (2007) and only 21% of the original forest cover is left (Banana et al. 1999). This has a direct effect on biodiversity being lost (World Wildlife Fund 2004; Hanski 2005).

Spreading information concerning sustainable harvesting combined with cultural taboos can be used as a successful tool for preventing specific MPs from extinction, because they are either thought to be home for spirits or protected by them (Tabuti 2006). On the other hand the contemporary lifestyle, when younger people are spending increasingly more of their time in schools, in addition to the strong effects of rapid urbanization and modernization, have an impact on TK, and both THs and the MPs seem to struggle with time (Evert 2008). For example, native tribes in semi-pastoral region Karamoja believe that foreign influence and external innovations in the form of monetary support (such as the UN World Food Program) and enforced schooling have weakened the communal spirit. The elders of the community claim that schools and traditions are irreconcilable (Gradé et al. 2009a).

From the results from Mpigi one can conclude that it is in fact the NGO which was passing the knowledge about the MPs and their absence from the region would probably have an effect on the continuation of TK. Traditional knowledge, plant diversity and THs are interrelated in such a way that when one goes "extinct" the other two will soon follow (Lamorde et al. 2010; Tabuti 2006).

4.2 HEALERS

Traditional knowledge is generally passed on from the older member of a community to the younger (Tabuti et al. 2003), but this practice is gradually disappearing (PROMETRA Uganda, 2012). Results from Jinja clearly showed that THs in Jinja got their knowledge primarily from elders, family and fellow healers, in contrast to Mpigi where most THs got their knowledge from PROMETRA (Table 9).

Traditional healers were not necessarily supporters of traditional beliefs. The interviewed healers were from a very diverse set of religious groups, with 36% Catholics, 29% Protestants, 27% Moslems, and 8% belonging to other religious groups. Despite the fact that the THs level of education was quite low (Table 2), they appeared well informed regarding medical and ecological terminology, the concept of biodiversity and its importance, and the concept of conservation. Some of them also knew the MPs scientific (Latin) names.

The high percentage of healers treating "general" conditions could be considered as an indication for a low level of specialization, or that THs had a high level of knowledge about many different diseases. The difference between the most common ailments (Table 4) and the specialization of the healers (Table 5) may be due to difficulties treating specific diseases because of lack of a successful remedy (recipe, mixture), or the lack of a medicinal plant. For example, cough is mentioned as the second most important ailment, but only few THs are specialized in treating coughs. This is probably because cough is a common symptom of many unrelated diseases. A treatment for cough that was successful for one patient may therefore not necessarily be successful for another. Healers may thus treat cough as a more "general" ailment. This makes the few healers which treat a common ailment even more important.

4.3 PLANTS

The districts of Mpigi and Jinja appeared to support different vegetation, since only 28 species of MPs were shared both regions. Most (91%) of the MPs were harvested sparingly despite of being used them often (once a day). For example, THs would harvest only the part they needed, not harvesting and wasting unwanted parts. In cases where there was only a small number of the MP of interest in a forest, then THs would try to harvest from sites where the abundance of the plant was enough to harvest more. This contrasts with other studies where plants were often overharvested or plant parts of no interest were damaged, subsequently affecting plant regrowth (Okello & Ssegawa 2007).

A large number of plant species were rarely mentioned (210 plants mentioned between 1-5 times). This indicates that THs have a very detailed knowledge of the properties of each plant and are able to use specific plants for specific ailments.

In general most of the MPs are harvested in a close vicinity of their homes but harvesting in the wild was preferred (pers. comm.). Due to a growing demand for MPs because of a growing population and interest from international markets, many MPs may have to be systematically cultivated in the near future (Schippmann et al. 2002).

The high percentage of bark used in Mpigi is worrying in since plants having their bark and roots harvested unsustainably, will likely have a lesser chance to heal or regenerate for future use. The reason bark and roots are often preferred and overharvested, is because of all the plant parts, bark and roots are basically available all year around (when leaves are affected by weather conditions such as drought) and are a stock for photosynthates and exudates and hence more rich in toxins/active compounds than leaves (Jeruto et al. 2008).

4.4 CONSERVATION

Almost all healers where familiar with the fact that loss of wild land due to plantation, urbanization and human expansion affects MPs (Shackleton et al. 1998; Tabuti 2007), and were also familiar with conservation as a concept . All of them were ready and willing to welcome more information and training.

Conservation of wild medicinal plant populations is "the most important conservation strategy for most wild-harvested species and their habitats" according to Schippman et. al. (2002), and there are two main reasons for this. Firstly, wild populations are an incentive for conservation of forests. If medicinal species are cultivated, people may lose their motivation to conserve plants in the wild. This may subsequently lead to a loss of other non-medicinal and/or less important species. Secondly, loss of wild populations leads to loss of genetic diversity. This is often due to the selection of a few high yielding individuals considered to be the best for propagation and cultivation (Schippman et. al. (2002). However a very critical approach to Schippmans "most important conservation strategy" is recommended and *ex situ* cultivation should be in many cases considered as a prioritized conservation plan, especially with plants which undergo mass bioprospecting. This conversion of plant derived chemicals into a commercial product can rapidly lead to wild species extinction (Soejarto et al. 2005; Ssegawa & Kasenene 2007). The healers interviewed for this study have seen the problem increasing.

There are reports that small scale community based cultivation of MPs can help local economies grow through the sale of the medicinal plants at the local markets, and providing an important source of income for the rural families (Srivastava et al. 1996). If conservation through cultivation has direct benefits like income, it is also more attractive. In addition cultivation of endangered or rare species may also lead to restoration of tainted environments, when restoration directly in the wild is not possible. However, many THs stated that a lack of land was a problem for conservation by cultivation - not the lack of will. In addition, several MPs are difficult to grow and/or are of low productivity like trees (Thokozani et al. 2011). Regular use of vulnerable plant parts such as roots and bark also illustrates the need for more protection.

Climate changes and agricultural expansion are posing a threat to wild species and their habitat (Evert 2008) along with expansion of the population in Uganda which is now up to 32 million people and expanding by 3,4% per year (Nuwaha et al. 2011). In addition, globalization will probably have a negative impact on biodiversity and MPs, as it is

encouraging people to adopt a more modern lifestyle followed by all its negative impacts and set aside their traditional knowledge (Ssegawa & Kasenene 2007; Voeks 2007).

The role of the community is often important, but underestimated, and the ecological status of a species parallels the ecological awareness of the community (Gaoue & Ticktin 2009). Studies have shown that both the will and the circumstances exist for farmers to get more involved in conservation. (Tabuti et al. 2011).

4.5 THE IMPORTANCE OF ORGANIZATIONS

Figure 5: "Classroom" and participants attending a lecture at PROMETRA's forest school.

PROMETRA Uganda is an NGO promoting traditional medicine and the use of medicinal plants, and works closely together with THs. The office is located in Kampala and the forest school on a private piece of land at Buyijja Forest School in Buwama Sub-county Mpigi District (Figure 5) and is owned by its director Dr. Sekagya Yahaya. PROMETRA guides healers during a 3 year course on how to identify MPs, harvest sustainably, cultivate and treat them hygienically, and how to preserve and conserve them. The school also provides a course in human anatomy and teaches the participants to identify diseases. The third year the school certifies the participants with a diploma. The participants also include the children of THs who want to continue the profession of their parents, people with ailments interested in self healing, conventional health care personnel and mothers who are interested in learning how to treat their own children. The school's community clinic also treats patients for free. As traditional lifestyles are increasingly abandoned in favor of a lifestyle similar to the western world, the role of the NGOs may become even more important. Given the low percentage of healers who got their knowledge from other sources than PROMETRA in Mpigi, and the fact that knowledge is often not transmitted from parents to children (Okello & Ssegawa 2007), the presence of NGOs may be a warranty for TK to be passed on and prevent this knowledge from being lost.

5. CONCLUSION

The incentive for this study was to document the most important MPs in Jinja and Mpigi, to highlight how traditional ethnobotany is a valuable source of information about relationships between plants and people and knowledge concerning plant diversity, and to examine the THs and NGOs role in conservation and cultivation of MPs.

The use of 258 MPs as reported, show that THs keep TK and the use of plants alive and active mainly because it's importance as a affordable health care system especially in rural areas. The results of this study also provided information about the most important medicinal plant species and families, the plants habits and plant parts used in Jinja and Mpigi. Of the 258 plant species only 28 are common in both districts. The most prevalent growth habit was herbs, followed by trees and the most used plant part was leaves followed by bark and roots in both districts. Flowers and tendrils were used the least.

The healer's knowledge about the MPs use, and common ways of MP protection, conservation and domestication were transmitted both from family, community members and fellow healers (mainly in Jinja), and an NGO (PROMETRA Uganda) in Mpigi. The current study demonstrated that the two districts had variations regarding MP species, diseases and THs disease specialization, and the healer's sources of both knowledge about conservation and traditional methods, but there was however no significant variation regarding conservation in general. Although there were several problems experienced by the THs regarding conservation, the percentage of healers who do in fact conserve MPs is high. This shows that they overcome the challenges in one way or another. Despite their low level of education, traditional healers have both a positive attitude towards conservation and a good insight of the sustainable use of biodiversity.

While conservation of MPs in the wild is crucial since this harvesting in the wild is preferred, conservation by cultivation seems to be developing into a necessity due to increased demand for MPs both nationally and internationally in order to cover these demands. Domestication programs and training for THs, and the development of MP farms and factories where tested, labeled and authorized MPs will be produced will be a stepping stone for a good communal economy, and the way to conservation and protection of endangered species in the wild. Studying the role of THs and MPs, the importance of TK and the capacity building by NGOs, is in many ways building up a support mechanism for biodiversity conservation and

protection of natural resources (Schippmann et al. 2002; Ssegawa & Kasenene 2007). Facilitated courses and practical training, including embedding of western terminology and methods of traditional knowledge might be the element necessary for traditional healers to keep up and the for traditional knowledge to survive in a competitive globalized modern world in order to guard and conserve important medicinal plant species.

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7. TABLE OF APPENDICES

1. What are you specialized to treat?
2. Please list for me the MPs for treating human diseases.
3. Of these MPs please tell me the most important 10.
4. Please rank them for me starting from the most important to the least important.
5. Which are the most common human diseases? (enter in table)
6. Do you think that it is important to conserve MPs?
7. Which you have you conserved?
8. How have you conserved them?
9. Have you planted any MPs on your land?
10. Where?
11. Do you think that small scale cultivation would help you with extra income?
12. What are the challenges to conserving MPs?
13. How do you overcome the challenges?
14. Do you have anyone to advising you how to plant MPs?
15. If yes, then who is this person/organization?
16. Do you have any person/organization to advising you to conserve plants?
17. If yes then who is this person/organization?
18. What is your advice to conserving MPs?
19. Do you think that cultivation might be a conservation option?
20. Do you think that selective harvesting (recovery plots)/ sustainable (non destructive) harvesting might be one?
21. Do you think that information and/or training would help you to conserve MPs?
22. Do you think that quota, restrictions and monitoring will be a useful tool in conservation?

APPENDIX 2: TABLE

Note start time:

Note end time:

Recorder		Date	
Checked by			

District		Parish	
County		Village	
Sub county			

A. Biodata

Name		Religion	
Age		Tribe	
Sex		Main occupation of Respondent	
Education of Respondent			

APPENDIX 3: NAME OF THE PARTICIPANTS

Name	Age	Sex	Education	Occupation	District	Village
Zalika Kappa	82	f	None	Herbalist/Farmer	JINJA	Kivubuka
Robinah Kyabayiga	65	f	P3	Herbalist/Farmer	JINJA	Kivubuka
Sarah Maaka	43	f	None	Farmer	JINJA	Kivubuka
Isiko Abasa	48	m	P2	Herbalist	JINJA	Ivunamba
Charles Kigere Salongo	24	m	S3	Herbalist/Farmer	JINJA	Bujagaazi
Koyile Elwaniya	77	m	NR	Herbalist/Farmer	JINJA	Bujagaazi
Sulaiman Luyomeya	60	m	None	Bucher/Herbalist	JINJA	Bujagaazi
Jamila Namusuubo	55	f	P2	Herbalist/Farmer	JINJA	Kivubuka
Mariam Mbabazi	40	f	S3	Herbalist/House wife	JINJA	Ivunamba
Sam Muvawa	37	m	Diploma	Herbalist	JINJA	Bujagazi
Simon Bayide	60	m	P7	Herbalist	JINJA	Bujagazi
Moses Isabirye Mugabi	32	m	P7	Herbalist	JINJA	Bujagazi
Betty Muwonge	43	f	S4	Community worker	JINJA	Kivubuka
Florence Bazanya	53	f	None	Herbalist/Farmer	JINJA	Kivubuka
Rose Mugide	50	f	P5	Herbalist	JINJA	Kivubuka
Ephraim Mitango	75	m	P3	Herbalist/Farmer	JINJA	Kivubuka
Dorothy Tugoloze	40	f	P7	Farmer	JINJA	Kivubuka
Selesta Lukwaaya Namwandu	70	f	None	Farmer	JINJA	Kivubuka
Aziida Nabirye	76	f	None	Herbalist/Farmer	JINJA	Kivubuka
Magrete Nabirye	51	f	P4	Birth attendant	JINJA	Kivubuka
Aida Jafaari Gubwika	65	f	P4	Herbalist/Farmer	JINJA	Kivubuka
Margarete Nyamwenge	44	f	None	Herbalist	JINJA	Namizzi
Margarete Biryeri	50	f	P7	Herbalist/Farmer	JINJA	Namizzi
Kamila Aisha	45	f	P4	Herbalist/Farmer	JINJA	Namizzi
Fatuma Aveko	46	f	None	Herbalist	JINJA	Namizzi west
Margaret Nakayima	44	f	None	Herbalist	JINJA	Kivubuka
Suleiman Tenywa	52	m	S3	Herbalist/administrator	JINJA	Namizzi west

Stella Okwi	46	f	S4	Herbalist	JINJA	Namizzi west
Jeniffer Kakaire	36	f	None	Herbalist	JINJA	Namizzi west
Kagoya Hasamanti	46	f	P5	Herbalist/Farmer	JINJA	Kivubuka
Margret Nakayima	65	f	P7	Farmer	JINJA	Kivubuka
James Dhikusodka	50	m	S2	Painter	JINJA	Kivubuka
Sylvia Nabakiesi	35	f	S2	Herbalist/Farmer	MPIGI	Kayanja
Veronica Nakakakia	36	f	P7	Herbalist/Farmer	MPIGI	Bussebwe
Justine Naiga	36	f	P3	Herbalist/Farmer	MPIGI	Katebu
Jemba Nalongo	38	f	S3	Herbalist/Business	MPIGI	Buwejja
Semwogerere Nalongo	36	f	P7	Birth attendant	MPIGI	Mbzinnya
Sylvester Siryegana	37	m	P7	Fisher/Herbalist/Farmer	MPIGI	Katebu
Phoebe Nakakakia	32	f	P7	Hobby herbalist	MPIGI	Buwama
Beatrice Mwanje	46	f	P7	Herbalist/Farmer	MPIGI	Buseebwee
Justine Natume	37	f	P7	Herbalist/Farmer	MPIGI	Buwele A
Dorothy Navuga	40	f	S3	Herbalist/Business	MPIGI	Bumbo
Mathias Nakedde	29	m	S6	Herbalist	MPIGI	Buwama
Leo Nkinjja	50	m	P4	Farmer	MPIGI	Jaramba
Joyce Muwike	53	f	P7	Herbalist/Farmer	MPIGI	Bussebwe
Christine Nanteza	59	f	S2	Herbalist/Farmer	MPIGI	Kanaani
Robinah Muleke Namussisi	48	f	P7	Herbalist/Business	MPIGI	Nvule
Adam Kintu	65	m	Diploma	Farmer	MPIGI	Kikunyu
Bernadeth Nasos	52	f	S4	Farmer	MPIGI	Bbongole
Jackson Katumba	45	m	S3	Herbalist/Spiritualist	MPIGI	Kanoni
Mustafa Byarugaba	59	m	P5	Herbalist/Farmer	MPIGI	Bulugu
Deo Salongo Sekabira	54	m	S3	Herbalist/Farmer	MPIGI	Kigongo
Wilson Senkezi	67	m	P7	Herbalist/Farmer	MPIGI	Kalamba
Sofia Musanje Lunkuse	55	f	P7	Herbalist/Farmer	MPIGI	Ssenge
Winnie Nandaula	52	f	S2	Herbalist/Farmer	MPIGI	Mitala Maria
Charles Semanda Katayira	57	m	S3	Herbalist/Farmer	MPIGI	Kibanga
Franklin Nsubuga Buyoga	75	m	Diploma	Herbalist/Farmer	MPIGI	Magejjo

Peter Lubega	74	m	P2	Herbalist/Farmer	MPIGI	Kalamba
Christine Namakula	52	f	P6	Herbalist/Farmer	MPIGI	Nsangwa
Jalia Nakate	37	f	S1	Farmer/Birth attendant	MPIGI	Kamengo
Sarah Nalugya	45	f	S1	Herbalist/Farmer	MPIGI	Kalamba
Ndiwalana Umar	27	f	M	Community worker	MPIGI	Kigato

APPENDIX 4: MEDICINAL PLANTS (Plant names in bold are plant species unique for the district.)

LOCATION	LOCAL NAME	BN CORRECTED (w.Authority)	FAMILY	GROWTH HABIT
Jinja	Kasota	----------	----------	----------
Jinja	Omuwo	----------	----------	----------
Jinja	Omuiirema	----------	----------	----------
Jinja	Ebisimbisimbi	----------	----------	----------
Jinja	Omuwungansowela	----------	----------	----------
Jinja	Bakitya	----------	----------	----------
Jinja	Kimera	----------	----------	----------
Jinja	Omuselu	----------	----------	----------
Jinja	Akatangalaala	----------	----------	----------
Jinja	Murizi	----------	----------	----------
Jinja	Ensaasira	----------	----------	----------
Jinja	Mufungeeda	----------	----------	----------
Jinja	Kasandosando	----------	----------	----------
Jinja	Entokotonko	----------	----------	----------
Jinja	Olweeyo	----------	----------	----------
Jinja	Ekiyitawagulu	----------	----------	----------
Jinja	Iseja	----------	----------	----------
Jinja	Bikuffa (Ekitegore)	----------	----------	----------
Jinja	Kengabalogo	----------	----------	----------
Jinja	Mufulanya	----------	----------	----------
Jinja	Mutaasa	----------	----------	----------
Jinja	Kikira	----------	----------	----------
Jinja	Omusanso	----------	----------	----------
Jinja	Kyerunga	----------	----------	----------
Jinja	Empununuko	----------	----------	----------
Jinja	Namattu	----------	----------	----------

Jinja	Kanamaadi, Kanyamaadi	----------	----------	----------
Jinja	Kawugira	----------	----------	----------
Jinja	Binda	----------	----------	----------
Jinja	Kaluluma	----------	----------	----------
Jinja	Sekabembe	----------	----------	----------
Jinja	Omukubanduulu	----------	----------	----------
Jinja	Nantabulirwa	----------	----------	----------
Jinja	Omusogi	----------	----------	----------
Jinja	Ebitulatula	----------	----------	----------
Jinja	Kayiboyibu	----------	----------	----------
Jinja	Kkiffu	----------	----------	----------
Jinja	Enkomamawanga	----------	----------	----------
Jinja	Omulemeezi	----------	----------	----------
Jinja	Omuvuudo	----------	----------	----------
Jinja	Lulimi lummu	----------	----------	----------
Jinja	Mugomera (Tanzania)	----------	----------	----------
Jinja	Kikambantaama	----------	----------	----------
Mpigi	Ekimyula	----------	----------	----------
Mpigi	Enkunyana	----------	----------	----------
Mpigi	Omufunzo	----------	----------	----------
Mpigi	Enkomamawanga	----------	----------	----------
Mpigi	Omutilu	----------	----------	----------
Mpigi	Muzanganda	----------	----------	----------
Jinja	kalemanjovu	----------	----------	----------
Jinja	Ekilama	----------	----------	----------
Jinja	Luiwula	----------	----------	----------
Jinja	Akasiitisiiti	*Abrus precatorius* L.	Leguminosae	Herb
Mpigi	Olusaasisaasi	*Abrus precatorius* L.	Leguminosae	----------
Mpigi	Kasaana	***Acacia hockii* De Wild.**	Leguminosae	Herb/Shrub
Jinja	Muwologoma	***Acacia macrothyrsa* Harms**	Mimosaceae	Shrub/Tree

Jinja	Katasubwa	***Acacia senegal* L. Wild.**	Leguminosae	Tree
Jinja	Mperere	***Acalypha bipartita* Müll.Arg.**	Euphorbiaceae	Shrub
Jinja	Fula	***Achyranthes aspera* J.Jacq.**	Amaranthaceae	Herb
Mpigi	Lugerogero	***Adenia cissampeloides* Harms**	Passifloraceae	Herb
Mpigi	Namirembe	***Aegeratum conyzoides* L.**	Asteraceae	Herb
Mpigi	Olweza	***Aerva lanata* (L.) Juss.**	Amaranthaceae	Shrub/Tree
Jinja	Omusita	*Albizia coriaria* Welw.	Leguminosae	Tree
Mpigi	Mugavu	*Albizia coriaria* Welw.	Leguminosae	Tree
Jinja	Nalongo	*Albizia zygia* J.F.Macbr.	Leguminosae	Tree
Mpigi	Nalongo	*Albizia zygia* J.F.Macbr.	Leguminosae	Tree
Jinja	Ziila	***Albuca abyssinica* Jacq.**	Hyacinthaceae	Herb
Mpigi	Oluzimbazimba	***Alchornea cordifolia* (Schumach.) Müll.Arg.**	Euphorbiaceae	Shrub/Tree
Jinja	Garlic	***Allium sativum* L.**	Amaranthaceae	Herb
Jinja	Ekikaka	***Aloe* L.**	Aloaceae	Herb
Jinja	Mubaadangalabe	***Alstonia boonei* De Wild.**	Apocynaceae	Tree
Mpigi	Ddoodo	***Amaranthus dubius* Mart. ex Thell.**	Amaranthaceae	Herb
Mpigi	Kilundu	***Antiaris toxicaria* Lesch.**	Moraceae	Tree
Mpigi	Omukumya	***Aristolochia elegans* Mast.**	Aristolochiaceae	Herb
Jinja	Fene	***Artocarpus heterophyllus* Lam.**	Moraceae	Tree
Mpigi	Pawpaw	***Asimina triloba* Dunal**	Annonaceae	Tree
Jinja	Neem tree	***Azadirachta indica* A.Juss.**	Meliaceae	Tree
Jinja	Obukaala	*Bidens pilosa* L.	Asteraceae	Shrub
Mpigi	Sere	*Bidens pilosa* L.	Asteraceae	Herb
Mpigi	Nkuzanyana	***Blighia unijugata* Baker**	Sapindaceae	Tree
Mpigi	Enkuzanyana	***Blighia welwitschii* (Hiern) Radlk.**	Sapindaceae	Tree
Mpigi	Kaatazamitti	***Bridelia micrantha* Baill.**	Euphorbiaceae	Shrub
Jinja	Kalyandra	***Calliandra calothyrsus* Meisn.**	Leguminosae	Tree
Mpigi	Nyambala Butonya	***Callistemon citrinus* (Curtis) Skeels**	Myrtaceae	Shrub
Mpigi	Muwafu	***Canarium schweinfurthii* Engl.**	Burseraceae	Tree
Jinja	Muzingaani	***Capparis tomentosa* Lam.**	Capparaceae	Tree

Mpigi	Red pepper	***Capsicum* L.**	Sapotaceae	Shrub
Jinja	Kambula	***Cardiospermum grandiflorum* Sw.**	Sapindaceae	Herb
Mpigi	Akambula (akanene)	***Cardiospermum* L.**	Sapindaceae	Herb
Mpigi	Amapapali	***Carica papaya* L.**	Caricaceae	Tree
Mpigi	Muyonza	***Carissa spinarum* Lodd. ex A.DC.**	Apocynaceae	Tree
Jinja	Mucuula	***Cassia didymobotrya* Fresen.**	Caesalpiniaceae	Shrub
Mpigi	Sekajja	***Catharanthus roseus* G.Don**	Apocynaceae	Herb/Shrub
Mpigi	Embutami	***Centella asiatica* (L.) Urb.**	Apiaceae	Herb
Jinja	Lubowa	*Chasmanthera dependens* Hochst.	Melastomataceae	Herb
Mpigi	Lubowa	*Chasmanthera dependens* Hochst.	Melastomataceae	Herb
Jinja	Kawunawuna	***Chenopodium ambrosioides* L.**	Chenopodiaceae	----------
Jinja	Namuvu	***Chenopodium opulifolium* Schrad. ex DC.**	Chenopodiaceae	Herb
Jinja	Kavamagombe	***Cissampelos mucronata* A.Rich.**	Melastomataceae	Herb
Jinja	Kayungamagumba	***Cissus quadrangularis* L.**	Vitaceae	Herb
Jinja	Niimu	***Citrus limon* (L.) Burm.f.**	Rutaceae	Tree
Jinja	Omucungwa	***Citrus sinensis* Pers.**	----------	----------
Jinja	Emicungwa	**Citrus sp**	Rutaceae	Tree
Jinja	Empangula	***Clematis hirsuta* Guill. & Perr.**	Ranunculaceae	Herb
Jinja	Yobyo	***Cleome gynandra* L.**	Capparaceae	Herb
Jinja	Kakonge	*Clerodendrum myricoides* (Hochst.) R.Br. ex Vatke	Lamiaceae	Herb
Mpigi	Enkuzannyana	*Clerodendrum myricoides* (Hochst.) R.Br. ex Vatke	Lamiaceae	Herb
Jinja	Emwanyi	Coffea sp.	Rubiaceae	Shrub/Tree
Mpigi	Emwanyi	Coffea sp.	Rubiaceae	Shrub/Tree
Mpigi	Omugoboola	***Combretum collinum* Fresen.**	Combretaceae	Tree
Mpigi	Endagi	***Combretum molle* R.Br. ex G.Don**	Combretaceae	Tree
Jinja	Eilanda	**Commelina benghalensis Wall.**	Commelinaceae	Herb
Jinja	Wamala	*Conyza bonariensis* (L.) Cronq., Kayala	Asteraceae	Herb
Mpigi	Mutele	***Corchorus olitorius* L.**	Tiliaceae	Herb
Mpigi	Mbatyaimeku	***Crabbea velutina* S.Moore**	Acanthaceae	Herb
Mpigi	Seziwumdu	***Crassocephalum crepidioides* (Benth.) S.Moore**	Asteraceae	Herb

Mpigi	Kasambandege	***Crotalaria incana* L. Akasamba ndege**	Leguminosae	Herb/Shrub
Jinja	Kafulu	***Cryptolepis sanguinolenta* (Lindl.) Schltr.**	Asclepiadaceae	Herb
Jinja	Amaliimbwa	***Cucurbita maxima* Lam.**	Cucurbitaceae	Herb
Mpigi	Eisunsa	**Cucurbita sp.**	Cucurbitaceae	Herb
Jinja	Kyayi subi	***Cymbopogon citratus* Stapf**	Poaceae	Herb
Jinja	Lufaafa	***Cynodon dactylon* (L.) Pers.**	Poaceae	Herb
Mpigi	Mukoma	***Desmodium velutinum* DC.**	Leguminosae	Shrub
Jinja	Bbuza	*Dicrocephala integrifolia* (L.f.)	Asteraceae	Herb
Mpigi	Olumbugu	*Digitaria abyssinica* (A. Rich.) Stapf.	Poaceae	Herb
Mpigi	Ekajolyenjovu	***Dracaena steudneri* Engl.**	Dracaenaceaea	Shrub
Jinja	Embaluka	*Elaeodendron buchananii* Loes.	Celastraceae	Tree
Jinja	Kamukasa	*Emilia coccinea* G.Don	Asteraceae	Herb
Jinja	Omwoolola	*Entada abyssinica* Steud.	Leguminosae	Tree
Mpigi	Omusambamaadi	*Entada abyssinica* Steud.	Leguminosae	Tree
Mpigi	Enzilugaze	**Epiphytes**	---	---
Jinja	Ejirikiti	*Erythrina abyssinica* Lam.	Leguminosae	Tree
Mpigi	Ejirikiti	*Erythrina abyssinica* Lam.	Leguminosae	Tree
Jinja	Kalitunsi	***Eucalyptus* L'Her.**	Myrtaceae	Tree
Jinja	Kakuukulu	***Euphorbia heterochroma* Pax**	Euphorbiaceae	Shrub
Jinja	kafadanga	***Euphorbia heterophylla* Desf.**	Euphorbiaceae	Herb
Jinja	Kifalu	*Euphorbia* L.	Euphorbiaceae	Herb
Mpigi	Kabajankoni	*Euphorbia* L.	Euphorbiaceae	Herb
Mpigi	Ekitonto	***Ficus asperifolia* Miq.**	Moraceae	Shrub
Jinja	Muwo	***Ficus glumosa* Delile**	Moraceae	Shrub/Tree
Mpigi	Omukunu	***Ficus mucuso* Welw. ex Ficalho**	Moraceae	Tree
Mpigi	Mugaire	***Ficus natalensis* Krauss ex Engl.**	Moraceae	Tree
Mpigi	Enkame	***Ficus platyphylla* Delile**	Moraceae	Tree
Mpigi	Lukwaata	***Flueggera virosa* (Willd.) Voigt**	Euphorbiaceae	Shrub/Tree
Mpigi	Namukago	***Funtumia elastica* Stapf**	Apocynaceae	Shrub/Tree
Mpigi	Omweese	**Game**	---	---

Jinja	Obukoda	***Grewia* L.**	Tiliaceae	Tree
Mpigi	Omuziku	***Hallea rubrostipulata* (K.Schum.) J.-F.Leroy**	Rubiaceae	Tree
Mpigi	Mukaabiransiko	***Harungana madagascariensis* Poir.**	Clusiaceae	Shrub/Tree
Mpigi	Olusaada	***Hibiscus fuscus* Garcke**	Malvaceae	Herb/Shrub
Jinja	Enfoodo	*Hoslundia opposita* Vahl	Lamiaceae	Herb/Shrub
Mpigi	Enfoodo	*Hoslundia opposita* Vahl	Lamiaceae	Herb/Shrub
Mpigi	Mbaluka	***Hymenocardia acida* Tul.**	Euphorbiaceae	Shrub/Tree
Mpigi	Olubembe	***Imperata cylindrica* (L.) P.Beauv.**	Poaceae	Herb
Mpigi	Keyeyo	***Indigofera arrecta* Benth. ex Harv. & Sond.**	Leguminosae	Shrub
Jinja	Enfuni enkazi	***Indigofera circinella* Baker f.**	Leguminosae	Herb/Shrub
Mpigi	Muizabajaa	***Indigofera emarginella* Steud. ex A.Rich.**	Leguminosae	Shrub
Mpigi	Mukitimbo	***Indigofera garckeana* Vatke**	Leguminosae	Herb
Jinja	Amakaba gembooli	***Ipomoea batatas* (L.) Poir.**	Convolvulaceae	Herb
Jinja	Omwaso, Mudugisamgoma	***Ipomoea hildebrandtii Vatke***	----------	----------
Jinja	Ekiloowa	*Jatropha curcas* L.	Euphorbiaceae	Shrub/Tree
Mpigi	Ekiloowa	*Jatropha curcas* L.	Euphorbiaceae	Shrub/Tree
Mpigi	Mugoya, Kifaalu	***Jatropha multifida* L.**	Euphorbiaceae	Shrub
Jinja	Ekisanasana	***Kalanchoe densiflora* Rolfe**	Crassulaceae	Herb
Jinja	Ziizi	***Kedrostis foetidissima* (Jacq.) Cogn.**	Cucurbitaceae	Herb
Jinja	Omussa	*Kigelia africana* (Lam.) Benth.	Bignoniaceae	Tree
Mpigi	Omussa	*Kigelia africana* (Lam.) Benth.	Bignoniaceae	Tree
Jinja	Mukontambaale	***Lannea barteri* Engl.**	Verbenaceae	Tree
Jinja	Kapanga	***Lantana camara* L.**	Verbenaceae	Herb
Jinja	Akasekelannoni	***Lantana trifolia* f. albiflora Moldenke**	Verbenaceae	Herb/Shrub
Jinja	Ekifumufumu	*Leonotis nepetifolia* Schimp. ex Benth.	Lamiaceae	Herb
Mpigi	Olususuni	*Leonotis nepetifolia* Schimp. ex Benth.	Lamiaceae	Herb
Jinja	Akonsunsani Akatono	***Leucas martinicensis* (Jacq.) R.Br.**	Lamiaceae	Herb
Jinja	Ekiwondowondo	*Maesa lanceolata* Voigt	Myrsinaceae	Shrub/Tree
Mpigi	Ekiwondowondo	*Maesa lanceolata* Voigt	Myrsinaceae	Shrub
Jinja	Omusizi	***Maesopsis eminii* Engl.**	Rhamnaceae	Tree

Jinja	Muyembe	*Mangifera indica* Blume	Anacardiaceae	Tree
Mpigi	Omuyembe	*Mangifera indica* Blume	Anacardiaceae	Tree
Jinja	Muwogo	***Manihot esculenta* Crantz**	Euphorbiaceae	Shrub
Jinja	Musambya	***Markhamia lutea* K.Schum.**	Bignoniaceae	Tree
Mpigi	Olusambya	***Markhamia platycalyx* Sprague**	Bignoniaceae	Tree
Jinja	Waiswa	*Maytenus senegalensis* (Lam.) Exell	Celastraceae	Shrub
Mpigi	Nabuliko	*Maytenus senegalensis* (Lam.) Exell	Celastraceae	Shrub
Jinja	Muvule	*Milicia excelsa* (Welw.) C.C.Berg	Moraceae	Tree
Mpigi	Muvule	*Milicia excelsa* (Welw.) C.C.Berg	Moraceae	Tree
Jinja	Kalagala	***Mimosa Pudica* L.**	Leguminosae	Herb
Mpigi	Enzingu	***Mitragyna stipulosa* Kuntze**	Rubiaceae	Tree
Mpigi	Eibombo	***Momordica foetida* Schumach.**	Cucurbitaceae	Herb
Jinja	Moringa	*Moringa oleifera* Lam.	Moringaceae	Tree
Mpigi	Mulinga	*Moringa oleifera* Lam.	Moringaceae	Tree
Jinja	Ekigogo ekitto	*Musa* sp.	Musaceae	Herb
Jinja	Obutikko	**Mushrooms**	---	---
Jinja	Obutiko Obuisonkere	**Mushrooms**	---	---
Mpigi	Omweganza	***Neoboutonia macrocalyx* Pax**	Euphorbiaceae	Tree
Jinja	Kakubansili	*Ocimum* L.	Lamiaceae	---
Mpigi	Kakumbansili	*Ocimum* L.	Lamiaceae	Herb
Jinja	Omujaaja	***Ocimum suave* Willd.**	Lamiaceae	Shrub
Jinja	Kanunu	***Oxalis corniculata* L.**	Oxalidaceae	Herb
Jinja	Nkenge	***Oxygonum sinuatum* Dammer**	Polygonaceae	Herb
Jinja	Ovacado	*Persea americana* Mill.	Lauraceae	Tree
Mpigi	Ovacado	*Persea americana* Mill.	Lauraceae	Tree
Jinja	Kabalira	***Phyllanthus nummulariifolius* Poir.**	Euphorbiaceae	Herb
Jinja	Entuutunu	***Physalis peruviana* Mill.**	Sapotaceae	Herb
Jinja	Eikobokobo	***Phytolacca dodecandra* Sessé & Moc.**	Phytolaccaceae	Shrub
Mpigi	Empewere	***Piptadeniastrum africanum* (Hook.f.) Brenan**	Leguminosae	Tree
Mpigi	Ekilaiga	***Plectranthus barbatus* Andrews**	Lamiaceae	Herb

Jinja	Mbagirawo	***Polygala sadebeckiana* Gürke**	Polygalaceae	Herb
Mpigi	Setaala	***Polyscias fulva* Hutch. & Dalziel**	Araliaceae	Tree
Mpigi	Enkami	***Priva cordifolia* Druce**	Verbenaceae	Herb
Jinja	Lakvatankoko	***Priva flabelliformis* (Moldenke) R.Fernandes**	Verbenaceae	Herb/Shrub
Mpigi	Enteseesa	***Prunus africana* (Hook.f.) Kalkman**	Rosaceae	Tree
Jinja	Omuziru	*Pseudospondias microcarpa* Engl.	Anacardiaceae	Tree
Mpigi	Omuzilu	*Pseudospondias microcarpa* Engl.	Anacardiaceae	Tree
Jinja	Amapeera	*Psidium guajava* L.	Myrtaceae	Tree
Mpigi	Amapeera	*Psidium guajava* L.	Myrtaceae	Tree
Jinja	Kanzilozilo	*Psorospermum febrifugum* Spach	Clusiaceae	Shrub/Tree
Mpigi	Kanzilozilo	*Psorospermum febrifugum* Spach	Clusiaceae	Shrub/Tree
Jinja	Akakansokanso	**Rhus sp.**	Anacardiaceae	----------
Jinja	Tebudda	*Rhus vulgaris* Meikle	Anacardiaceae	Shrub
Mpigi	Tebudda	*Rhus vulgaris* Meikle	Anacardiaceae	Shrub
Jinja	Omukakale	*Ricinus communis* L.	Euphorbiaceae	Herb
Mpigi	Mukakale	*Ricinus communis* L.	Euphorbiaceae	Herb
Jinja	Ekikaado	***Saccharum officinarum* L.**	Poaceae	Herb
Jinja	Omusasa	***Sapium ellipticum* Pax**	Euphorbiaceae	Tree
Mpigi	Mutaamataama	***Sarcocephalus latifolius* (Sm.) E.A.Bruce**	Rubiaceae	Shrub/Tree
Jinja	Mukondwa	***Securidaca longipedunculata* Fres.**	Polygalaceae	Shrub/Tree
Jinja	Mugaba	***Senna didymobotrya* (Fresen.) H.S.Irwin & Barneby**	Leguminosae	Shrub
Mpigi	Omukose	***Sesamum angustifolium* (Oliv.) Engl.**	Pedaliaceae	Herb
Mpigi	Omuzanvuma	***Shirakiopsis elliptica* (Hochst.) Esser**	Euphorbiaceae	Tree
Jinja	Empozia	***Solanecio angulatus* (Vahl) C.Jeffrey**	Asteraceae	Herb
Mpigi	Omugongolo	***Solanecio manii* (Hook.f.) C.Jeffrey**	Asteraceae	Shrub/Tree
Jinja	Katunkuma	***Solanum anguivi* Lam.**	Sapotaceae	Herb
Jinja	Nswiga	***Solanum nigrum* Tausch ex Dunal**	Sapotaceae	Herb
Jinja	Sorghum	***Sorghum stipoideum* (Ewart & Jean White) C.A.Gardner & C.E.Hubb.**	Poaceae	Herb
Jinja	Ekifabakazi	*Spathodea campanulata* Buch.-Ham. ex DC.	Bignoniaceae	Tree

Mpigi	Ekifabakazi	*Spathodea campanulata* Buch.-Ham. ex DC.	Bignoniaceae	Tree
Jinja	Lugaba	**Spirit name**	---	---
Mpigi	Ekibundubundu	***Steganotaenia araliacea* Hochst.**	Apiaceae	Tree
Jinja	Omusaali	*Symphonia globulifera* L.f.	Clusiaceae	Tree
Mpigi	Omusaali	*Symphonia globulifera* L.f.	Clusiaceae	Tree
Jinja	Jambula	***Syzgyium cuminii* Linn.**	Myrtaceae	Tree
Mpigi	Omukooge	***Tamarindus indica* L.**	Leguminosae	Tree
Mpigi	Nzo	***Teclea nobilis* Del.**	Rutaceae	Shrub/Tree
Jinja	Muluku	***Tephrosia vogelii* Hook. f.**	Leguminosae	Shrub
Mpigi	Omukejje	***Tetrochidium didymostemon* (Baill.) Pax & K. Hoffm.**	Euphorbiaceae	Shrub/Tree
Jinja	Obusitaani	***Thevetia peruviana* (Pers.) K.Schum.**	Apocynaceae	Shrub/tree
Mpigi	Kawule	***Toddalia asiatica* Lam.**	Rutaceae	Herb
Mpigi	Ekiyugege	***Tylosema fassoglensis* (Kotschy) Torre & Hillc.**	Leguminosae	Herb
Mpigi	Ekikwatandiga	***Urena lobata* L.**	Malvaceae	Shrub
Jinja	Mululuza/Lubirizi	*Vernonia amygdalina* Delile	Compositae	Shrub
Mpigi	Omululuuza	*Vernonia amygdalina* Delile	Compositae	Shrub
Mpigi	Kayayana	***Vernonia cinerea* (L.) Less.**	Asteraceae	Herb
Jinja	Abasi	***Warburgia salutaris* (G.Bertol.) Chiov.**	Canellaceae	Tree
Mpigi	Omuya	***Warburgia ugandensis* Sprague**	Canellaceae	Tree
Mpigi	Omufumbyantamu	***Withania somnifera* (L.) Dunal**	Sapotaceae	Shrub
Jinja	Entaleyedungu	*Zanthoxylum chalybeum* Engl.	Rutaceae	Shrub/Tree
Mpigi	Munyenye	*Zanthoxylum chalybeum* Engl.	Rutaceae	Shrub/Tree
Mpigi	Omutatembwa	***Zanthoxylum gilletii* (De Wild.) P.G.Waterman**	Rutaceae	Tree
Mpigi	Omuyenye	***Zanthoxylum* L.**	Rutaceae	Shrub/Tree
Jinja	Duma	***Zea mays* L.**	Poaceae	Herb
Mpigi	Entangawuzi	***Zingiber officinale* Roscoe**	Zingiberaceae	Herb
Jinja	Mutambulakiro	***Ziziphus pubescens* Oliver**	Rhamnaceae	Tree
Mpigi	Kasatila	***Zornia glochidiata* Rchb. ex DC.**	Leguminosae	Herb