

Culture and Environment in Africa Series 9

Joel Kigenyi

**Coping with resource extinction:
the case of medicinal plants in
Kawete village, Iganga district,
Uganda**

Edited by the Cologne
African Studies Centre

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Dedication

In memory of my grandmother, Anna-Ruth Ngabe Napio

Preface

This thesis sheds an innovative look at a neglected field of ethnomedical research. After the colonial condemnation of herbal medicine the independent Ugandan State legalized and developed herbal medicine. In recent years concerted efforts were made to integrate western bio-medicinal approaches and traditional herbal medicine. Due to the affirmative legal framework and due to increasing numbers of clients – herbalists heal at much cheaper rates than bio-medicinal practitioners – the number of herbalists has increased profoundly during the last years. This has led to increased pressure on the resources used by herbalists and in a number of instances has led to the extinction of plants urgently needed for medical treatment along herbal lines. Kigenyi asks how practitioners experience and evaluate resource extinction and how they cope with loss of species which were firmly integrated into their repertoire. In an interesting way Kigenyi portrays perceptions of resource extinction. Kigenyi interestingly shows that a number of respondents also saw the loss of local knowledge as resource extinction. Not only the physical absence of a plant mattered. If its use for medical purposes was forgotten the resource was viewed as extinct. In a sound analytical manner Kigenyi describes a number of factors contributing to resource extinction. He highlights that it is not only the overuse from herbalists but also the profound transformations of the land use system that has contributed to the extinction of herbs and forbs. He also details how herbalists practically cope with resource extinction. It is interesting in this context that a number of healers has turned to the cultivation of medicinal plants. Also property rights in plants have been developed. The marketing of medicinal plants allows practitioners to access plants from a much wider area than before.

Abstract

In the past two decades in Uganda, there has been an upsurge in the use of herbal medicine in both rural and urban communities. As a consequence, many medicinal plants have been over-harvested, resulting in the increased risk of extinction of specific medicinal plants, yet herbalists report that some medicinal plants have become extinct. In spite of the medicinal plant resource being constrained, herbalists have continued to dispense herbal medicine to meet people's healthcare needs. This study, conducted in Kawete village, explores how herbalists are coping with the extinction of medicinal plants to sustain the use of herbal medicine. Anthropological methods such as participant observation, interviews, focus group discussions, free listing and review of documents were used to collect data. The herbalists in Kawete village demonstrate profound knowledge about the concept of extinction in relation to medicinal plants. They perceive the extinction of medicinal plants at two levels, the physical level and the intellectual property level, and they identify a range of indicators of the extinction of medicinal plants. The causes of the extinction of medicinal plants emerge from both the community and the herbalists themselves. However, herbalists have adopted several coping strategies, including the cultivation of medicinal plants and creation of collaborative networks to address the challenge of medicinal plants becoming extinct. At the same time, various stakeholders support the herbalists in Kawete village in various ways to address the challenge of the extinction of plants of medicinal value.

Key Words: Coping, Extinction, Resource, Medicinal plants, Herbal medicine, Herbalist(s), Perception

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Conducting an ethnographic study calls for imposing on people's time, disrupting routine activities and breaking specific rules of the community especially in the early stages of fieldwork. I acknowledge with deep gratitude the tolerance, cooperation and hospitality of my study participants and the whole community of Kawete village. In addition, this study addresses a theme which is highly reserved in most communities in Uganda. Once again, I am deeply indebted to all the study participants for generously providing the information which was required in order to write this thesis. I am grateful to the Natural Chemotherapeutics Research Laboratory (NCRL)-Kampala for granting me access to their resource centre where I was able to access various literature concerning medicinal plants and herbal medicine in Uganda. I thank Maria Nalika Nusula and Francis Omujaal, the researchers at NCRL for their cooperation whenever I approached them during fieldwork for professional advice concerning medicinal plants and herbal medicine. I am grateful to the Cultural Research Centre-Diocese of Jinja, where I had the opportunity to gain some experience in carrying out ethnographic research. The authors whose works I consulted and quoted are appreciated for providing a basis upon which my study was developed. Lastly, I am grateful to my family, and friends. They have been a very important source of encouragement during my studies and stay in Germany. I cannot exhaust the list of people who have contributed to what I am today. Whereas your names have not been mentioned here, your invaluable contribution is treasured.

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Abbreviations and acronyms

CCFU: Cross Cultural Foundation of Uganda
CRC: Cultural Research Centre
FGDs: Focus Group Discussions
IDRC: International Development Research Centre
IPGRI: International Plant Genetic Resources Institute
IUCN: International Union for Conservation of Nature
MoH: Ministry of Health
MPBU: Medicinal Plants and Biodiversity Uganda
NARO: National Agricultural Research Organization
NCRL: Natural Chemotherapeutics Research Laboratory
NEMA: National Environment Management Authority
PHC: Primary Health Care
PPPH: Public Private Partnerships in Health
SACCO: Savings and Credit Cooperative Organization
SSC: Species Survival Commission
TBA: Traditional Birth Attendant
TPC: Threatened Plant Committee
UBOS: Uganda Bureau of Statistics
UNEP: United Nations Environment Program
URAA: Uganda Reach the Aged Association
UWS: Uganda Wildlife Society
WHA: World Health Assembly
WHO: World Health Organization

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Chapter One: Scope of the study

1.1 Introduction

This study focuses on how herbalists in Kawete village¹ in Iganga district in Uganda are coping with the challenge of medicinal plants becoming extinct. The recent upsurge in the use of herbal medicine in rural and urban communities throughout Uganda has led to over-exploitation of medicinal plants. As a result, many plants have been threatened by extinction and some have been reported extinct. Plants “can become scarce or extinct” (Hamilton and Hamilton 2006: 9) at various levels. For instance, they can be globally extinct, locally extinct, commercially extinct, or culturally extinct² (ibid). In this study, the extinction of medicinal plants is presented in the context of local extinction, which I define as the disappearance of species within a particular area. Coping refers to the “manner in which people act within the limits of existing resources and range of expectations to achieve various ends” (Wisner et al. 2004: 113). It includes “defence mechanisms, active ways of solving problems and methods for handling stress” (Wisner et al. 2004: 113, referring to Murphy and Moriarty 1976).

Medicinal plants are “[...] those plants [...] used in treating and preventing specific ailments and diseases, and that are generally considered to play a beneficial role in healthcare” (Srivastava et al 1996: 1). They form an essential component of the natural resource base (see NEMA 2009: 36–37; UWS and UNEP 2010: 49) in Uganda. The World Bank defines natural resources as materials like land and forests that occur in nature and are vital or useful to people for production or direct consumption (United States Institute of Peace 2007: 4). In the present study, I treat medicinal plants as a resource for herbal medicines in Uganda. According to the World Health Organization (WHO) (2000: 4; 2002: 1), herbal medicines are “herbs, herbal materials, herbal preparations and herbal products that contain as active ingredients parts of plants.” In this study, I use the concept of herbal medicine interchangeably with the concept of herbs, which refers to “crude plant materials such as leaves, [...] stem, [...] bark, roots, [...] or other plant parts which may be entire, fragmented or powdered” (ibid. 2000: 3) for medicinal purposes.

The practice of healing using herbs existed for many generations in Uganda. Local communities knew and still know how to cure and care for themselves using herbs derived from plants believed to be of medicinal value (see Cultural Research Centre (CRC) 2012:

¹ The concept of a village in Uganda’s context extends far beyond the European usage of the concept of a village. In Uganda, a “village is not a cluster of dwellings but rather a stretch of land, usually co-extensive with an area of high land between swamps, over which homesteads are scattered in a more or less uniform distribution, each homestead set in among its own cultivated plots” (Fallers 1965: 51). See Fallers (ibid.: 97 – 179), for a detailed description of and discussion on the structure and setting of a village, particularly in Busoga region, where Kawete village is located.

² Hamilton and Hamilton (2006) defines culturally extinct plant resources as those plants which were “once valued” but are “no longer regarded as resources” (ibid.: 9).

78). Unfortunately, this practice declined in the late 19th century and early 20th century, when Uganda came in contact with Western education, the Western medical system and Christianity. These three elements as introduced by the colonialists and missionaries played a critical role in marginalizing the importance of traditional herbal medicine. First, Western education rarely valued local knowledge including traditional herbal medicine and healing. Second, hospitals introduced conventional medicine to the complete exclusion of herbal medicine and third, Christianity condemned African cultural practices as primitive and heathenish. In addition, the use of herbal medicine was strongly associated with negative practices such as witchcraft (Akinkugbe 1978: 62), a fact that intensified people's negative attitude towards its use.

In recent decades however, the number of people using herbal medicine to meet their healthcare needs has increased in both rural and urban communities in Uganda. The World Health Organization estimates that eighty percent of Uganda's population depend on herbal medicine for their healthcare (WHO 2002: 1). The "ratio of herbalists to patients is between 1:200 and 1:400 compared to the modern medical doctors where the ratio is 1:20,000" (The Republic of Uganda 2010: 268; WHO 2002: 2; see also Hamilton and Hamilton 2006: 40). There are several reasons for the increased use of herbs in Uganda's communities. First, the 1987 Uganda health sector review identified and revealed herbalists as key contributors to the country's Primary Health Care (PHC) (Cross Cultural Foundation of Uganda (CCFU) 2008: 2). Second, the resolutions made by the World Health Assembly between 1970 and 2009 (some examples of the resolutions are given in chapter four) paved the way for recognizing and integrating herbal medicine into the country's national PHC system (Akerlele 1990: 66). Moreover, Ugandans themselves give various reasons for using herbal medicine: herbalists' prescriptions are affordable, they are flexible and accessible almost at all times (modern health services are hardly or never available), and there is less wait when visiting herbalists (modern health services are reportedly very congested³). In addition, many people believe that some conditions require the expertise of an herbalist. The top conditions are some skin infections as well as transverse and breech pregnancies. For example, a pregnant woman who visited a Traditional Birth Attendant (TBA) during this study said:

When health workers diagnose transverse or breech pregnancy, they tell us that these conditions cannot be medically managed. So they ask us to go back home and find a way of managing the condition. To 'find a way' they mean using herbal medicine [...] and when we go back to hospital for a review after using the herbs, the condition will have improved (Interview with N.R: 29.8.2013).

³ See Government of Uganda 2010:6 for details about users' satisfaction with the public health delivery system in Uganda.

Furthermore, some people believe that culturally defined illnesses and conditions such as the violation of taboos⁴ (for an example, see Cultural Research Centre 2012: 82–85), exorcising spirits, elimination of curses, safe guarding a marriage (for an example, see Cultural Research Centre 2012: 108), witchcraft and barrenness can be resolved by consulting herbalists.

The reasons mentioned above have helped to create a positive perception of herbal medicine and healing in both rural and urban communities in Uganda. Consequently, the number of people working as herbalists has dramatically increased and many people have resorted to trading in herbs as a potential form of livelihood. This trend towards increased utilization and commercialization of herbal medicine has resulted in a constrained plant resource, that is, many plants of medicinal value have been over-harvested. This has had far reaching implications: Besides degrading the environment, many medicinal plants have seriously been exposed to the risk of becoming extinct, as mentioned earlier. This status of medicinal plants raises important questions about the future of herbal medicine. For example: Will Uganda's communities continue depending on herbal medicine to meet their healthcare needs in the next decades? Can the herbalists continue dispensing herbal medicine in the next decades amidst the extinction of medicinal plants? If so, what are the strategies employed by the herbalists to ensure the continuity of their practise? It is my aim to answer these questions in the present study by showing how herbalists in Kawete village are addressing the challenge of the extinction of medicinal plants to sustain the use of herbs in meeting the healthcare needs of their community.

The increasing role of herbal medicine in Uganda's healthcare system has influenced a number of scholars to conduct studies concerning medicinal plants, – (for example, Nalumansi et al. 2014; Tabuti et al. 2003; 2012; and Namukobe et al. 2011). However, these scholars have focused mainly on documentation of medicinal plants and their usage. Some scientists have emphasized standardizing herbal medicine, and have proposed further investigations into its curative properties. They also concentrate on identifying useful remedies and practices and eliminating those that they find ineffective (Akerle 1990: 67–73). This aspect of how herbalists cope with the extinction of medicinal plants has not been given due attention, especially within the social sciences. This study contributes to that gap by discussing coping and response strategies used by herbalists in Kawete village to address the challenge of the extinction of medicinal plants.

⁴ Taboos are cultural specifications that forbid people of a specific culture to do, eat, touch, use, or talk about certain things. See Keitumetse et al. (2011:160 – 164) and Kyewalyanga (1976), for a detailed discussion on taboos.

1.2 Research questions

The purpose of this study is to answer one main question: How are herbalists in Kawete village coping with and responding to the extinction of medicinal plants to sustain the practise of herbal medicine? To be able to answer the main research question, I derived sub-questions focused primarily on the qualitative aspects of the main question, although some quantitative aspects were also considered. First, it was necessary to assess whether the herbalists in Kawete village were aware of the concept of extinction. For this purpose, I asked: How do herbalists perceive the extinction of medicinal plants? Second, it was necessary to find out which of the medicinal plants are believed by the herbalists to be extinct. For this purpose, I asked: What medicinal plants are considered extinct? Third, it was necessary to establish whether or not the herbalists were informed of the reasons leading to the extinction of medicinal plants. For this purpose, I asked: Why are medicinal plants becoming extinct? Fourth, it was necessary to understand how herbalists continued dispensing herbs although the medicinal plants were reportedly becoming extinct. For this purpose, I asked: What strategies are applied by herbalists to cope with the extinction of medicinal plants and its likely effects? Fifth, it was necessary to explore whether there were some stakeholders concerned with the extinction of a resource, upon which the majority of rural communities in Uganda depend for their healthcare needs. For this purpose, I asked: Which stakeholders are supporting herbalists in Kawete village to address the challenge of medicinal plants becoming extinct?

1.3 Structure of the thesis

The present chapter is aimed at defining the scope of the study by describing some key concepts and explaining the research question in detail. Chapter two presents a review of literature related to this study, including literature related to the perception of extinction, extinct plants, the causal factors of plants' extinction, the strategies of coping with the extinction of plant resources, as well as stakeholders and their role in support communities to address the challenge of the extinction of plant resources. Chapter three presents the study's methodology, describes the setting of the study area and various methods used to collect data. This chapter also discusses the limitations to the study. Chapter four introduces the findings of the study by presenting the ethnography and legal context of herbalists and herbal medicine in Uganda. This chapter also defines more of the concepts used in this study. Chapter five discusses the findings regarding the local perception of the extinction of medicinal plants. Chapter six discusses the findings concerning the coping strategies employed by the herbalists in Kawete village to address the challenge of medicinal plants becoming extinct. This chapter also describes the stakeholders and their role in supporting the herbalists in Kawete village to address the

challenge of the extinction of plant resources. Chapter seven presents the discussion, and concluding remarks as well as recommendations for further action.

Chapter Two: Literature review

This chapter presents a review of literature related to the subject of this study. The literature focuses on the perception of extinction, the causal factors of extinction of plant resources, extinct plant species, coping with species (plants) extinction and the likely effects, as well as the stakeholders supporting communities to address the challenge of plant extinction.

2.1 Perception of extinction

Extinction is not a recent occurrence as Ehrlich and Ehrlich (1981: 27) observe. These authors try to perceive extinction as a phenomenon induced by natural processes such as climatic changes. They argue that natural processes that can lead to the extinction of species have been occurring for billions of years. Although these authors perceive extinction as a phenomenon that has occurred throughout human history, they acknowledge a significant increase in the rate at which plant and animal species are becoming extinct. They associate the increased rate of species extinction to industrialization, “which has since then been responsible for the loss of organic diversity” (ibid.). I, therefore, argue that extinction is inevitable just as all natural phenomena are, but, it should cause concern when the entire population of a specific species is threatened by extinction.

Williamson (1989: 461), following Darwin (1859: 109) observes that “rarity is the precursor of extinction.” His view alludes to the fact that rare species are not necessarily extinct. Rather, they may eventually become extinct if their rarity and perturbation persist. The author points out that rarity of a species takes different forms. His view is similar to that of Rabinowitz (1981: 206–208), who describes the three forms of species rarity. For instance, a species can be rare in terms of “[...] geographical range, which may either be large or small”, “[...] habitat specificity, which may be wide or narrow”, and “[...] local population size, which may be large or small” (for more examples, see Rabinowitz 1981: 208). Supporting the views of the above authors, Harpers (1981: 189–199) argues that “[...] rarity is a phenomenon of space,” that is to say, the size, number and carrying capacity of habitable sites. In addition, the author relates rarity of species to time. For example, he states that “species which tend to have a slow recovery rate from a disaster will usually be rare” (ibid.: 193).

In summary, the authors cited here appear to perceive extinction in relation to its causes, time scale and the factors that have influenced the rate of species extinction over time. In addition, Williamson (1989) seems to perceive extinction as a gradual process that is started because a specific species is rare to begin with; he gives four main factors that

contribute to species rarity: geographical distribution, habitat restrictions, local population size, as well as species' ability to recover from disaster.

2.2 Causal factors of extinction

In their discussion on Tropical Deforestation and Species Extinction in Tropical Africa, Heywood and Stuart (1992: 95) attribute extinction of plant species to the introduction of plantation economies, – particularly in the late 19th and early 20th centuries. They argue that plantation economies destroyed large areas of tropical lowland forests in Africa (for an example, see Mshigeni 1979: 141). Their argument is supported by Ehrlich and Ehrlich (1981: 139–141) who assert that agriculture is the primary cause of extinction for huge numbers of plants and animal species. The authors elaborate that intensive agriculture has devastated native plants in the Cape Province of South Africa, “[...] with over 1,200 species of flora threatened, several hundred at the brink of extinction, and 36 recently have disappeared entirely” (ibid.).

According to Williamson (1989: 462), “[...] environments will become [...] different from the way they were, and this in itself will lead to the environmental extinction of populations.” Williamson seems to suggest two things: First that the environment is ever changing and will continue to change, second, that species extinction is simultaneous with environmental change. In my opinion, this means that populations will continue to disappear as long as environmental changes are constant. However, the author highlights that “the fate of species [...] depends on the distribution of its populations and on its ability to adapt [...] to environmental changes.” His view is supported by Ehrlich and Ehrlich (1981: 29–30), who argue that species are not likely to disappear under the pressure of environmental change. These authors explain that several factors, including total population size, reproductive ability, ecological relations with other species, and genetic characteristics influence species vulnerability to extinction (ibid.).

Schmid (1991) conducted a study of people and plants in Nokopo village in Papua New Guinea. In this study, she observes that domestic pigs among Nokopo people are responsible for forest destruction because they “dig up the forest floor and uproot small seedlings as they search for food” (ibid.: 292). Her observation concurs with that of Ehrlich and Ehrlich (1981: 140), who observe that “the grazing of domestic animals is an aspect of agriculture that threatens plant populations everywhere.” For instance, in Cameroon and areas around the Horn of Africa, *Euphorbia* is virtually extinct because of over grazing (ibid.).

Invasive plants pose a variety of threats to native vegetation. They tend to modify “native habitats by replacing diverse systems with single species stand of aliens in such a way that all native species are replaced” (Cronk and Fuller 1995: 4; Diamond 1989: 474; see

also Hamilton and Hamilton 2006: 28–31). As a consequence, native plant resources are threatened by extinction if alien plants replace them. Cronk and Fuller (1995: 4), referring to Stirton (1980), support their view by observing that in South Africa, “the *Acacia* have formed nearly pure stands with only few other species present.” In addition, they stress, following Lucas and Synge (1978), that “the spread of *Acacia saligna* in South Africa is directly threatening several species” (Cronk and Fuller 1995: 6), with the majority being “listed as endangered by International Union for the Conservation of Nature” (ibid.).

Some scholars stress the critical role that fire can have in relation to the extinction of plant species. For example, Schmidt (1991: 291) argues that during dry seasons in Nokopo village in Papua New Guinea, fire destroys large tracts of unproductive grassland including the seedlings of pioneer shrubs and trees that sprout during the wet season. On the other hand, other scholars hold a different view of the role of fire in relation to the survival of plants. Although Balee (2006: 77) begins by maintaining that wildfires tend to have a degrading effect on plants, he asserts that “controlled fires in indigenous societies” have played a big role in “enhancing species diversity through prevention of fuel build-ups and the likelihood of wildfires.”

In addition, areas with advantages like sufficient water resources and moderate climates potentially attract intensive settlements accompanied by the establishment of cities. The same areas are, however, areas endowed with a plausible range of species or biodiversity (Ehrlich and Ehrlich 1981: 135). These authors observe that the settlement and urbanization processes threaten the survival of species in affected areas. For example, with respect to plants, they point out that “flora is contracting in one of the world’s most species-rich areas, the cape province of South Africa, as its cities expand” (ibid).

Furthermore, resource extinction is a product of over-exploitation of species of commercial value (Srivastava et al. 2006: 5; Ehrlich and Ehrlich 1981: 105). These authors attribute over-exploitation of resources to failure of the resource users to care about the future. In addition, they argue that resources may be devastated if they are considered to be a “[...] ‘common property’ [...] owned by no one and desired by all” (Ehrlich and Ehrlich 1981: 105). Influenced by the reasoning that “[...] ‘if I don’t use it someone else will use it’, resource users struggle to increase their stocks” (ibid.), a process which not only exhausts the resource but also results in its eventual extinction.

Plant resources become extinct due to increasing pressure on habitats especially forests and swamps (Myers et al. 2000: 857; Pain et al. 2005: 133; Diamond 1989: 234). These authors suggest that severe habitat destruction is the prime cause of species extinction. The authors take a common stand on the fact that habitat destruction is profoundly human-induced but they fail to state explicit examples of human engagements that damage habitats. Hedberg (1979: 85) gives specific examples of human activities that

have a degrading effect on habitats (such as land clearance for settlement and agriculture). Similarly, Myers et al. (2000: 857) make an attempt to clarify why habitat destruction results in extinction of plant species. They argue that plants are lost due to ecological disequilibrium if a significant section of the habitat is degraded (ibid.).

Several factors are responsible for the extinction of plant resources. They include agricultural activities, fire, settlement, resource over-exploitation, and increased pressure on habitats. Other factors as suggested by various authors are alien species and environmental change. In this study, I show (see chapter five) how specific factors mentioned above have contributed to the extinction of medicinal plants in Kawete village.

2.3 Extinct plant species

Despite the numerous attempts that have been made in Africa in the last few years to identify and compile lists of threatened plant species, insufficient information (Heywood and Stuart 1992: 95; Hedberg 1979: 84) is available concerning threatened, rare, vulnerable or extinct species. The authors agree on the fact that there is lack of sufficient information about plants threatened by extinction but, unlike Heywood and Stuart (1992), Hedberg goes further to explain the lack of such information. For instance, the author argues that limited knowledge about flora and its distribution pattern in particular countries in Africa (Hedberg 1979: 84) account for the insufficient information concerning the status of plants. However, the same author points out that there are some exceptional countries like Kenya and Ghana, which have some information based on threatened habitats and rarity of plants respectively (ibid.: 88–99). This suggests that specific countries experience a variation in the availability and access to information concerning the status of plant resources.

In addition, Myers et al. (2000: 857) assert that although endemic and threatened plants exist in specific regions, (such as Southwestern Uganda, Northern Rwanda and the Eastern part of the Democratic Republic of Congo) adequate documentation of plant resources is lacking. This conforms to what Hedberg (1979: 93) envisages: That there are no possibilities to catalogue endangered plants in Uganda. However, Hedberg (1979) goes ahead to propose a way forward; he urges that attention should be drawn to the serious threats (for some examples, see Hedberg 1979: 93) to swamps and riverine forests and the plants that grow in such habitats (ibid.).

The authors above discuss that all plant resources in general lack information concerning their extinction status. Based on the assumption that all plants are potentially medicinal, the authors suggest that information concerning the status of specifically medicinal plants may not be available or if it is available, it is sparse. The present study contributes to filling this gap.

2.4 Coping with species extinction and the likely effects

A range of response mechanisms can be adopted to cope, reverse and sometimes mitigate the damage done to plant resources resulting from human and non-human factors. However, as Bærenholdt and Aarsæther (2002: 152) observe, people's choice of coping strategies in different communities depends on the nature of the problem at hand; strategies in communities confronted with limited natural resources concentrate on how to use their resources to benefit everyone (for an example, see Bærenholdt and Aarsæther 2002: 153). In this study, I attempt to show the nature and effectiveness of the strategies applied by herbalists in Kawete village to cope with the extinction of various medicinal plants (see chapter six for a comprehensive overview).

In their work on *Plant Invaders*, Cronk and Fuller (1995: 35–59) argue that the main categories of actions to mitigate the degrading effects of invasive plants on native plants are “[...] education and awareness, legislation, prevention of introduction, information, and control.” Furthermore, they assert that the use of chemicals against invasive plants has been successful in South Africa, just as biological and physical control methods have been successfully used to eliminate invasive plants in Hawaii and Mauritius respectively (*ibid.*). On the other hand, the authors observe that some preventive and control methods, burning for example and the use of chemicals (see *ibid.*: 49–50) are associated with devastating effects on native vegetation if not carefully applied. Besides, Hamilton and Hamilton (2006: 30) assert that it is difficult to cope with the threats posed by invasive plants “through preventive measures and programmes of eradication” without adequate ecological knowledge about specific invasive plants.

Ehrlich and Ehrlich (1981: 233) suggest the rehabilitation of habitats as one of the ways to mitigate the extinction of plant species. They argue that vacant land including small plots should be used to recover native vegetation. They also observe that rehabilitation of habitats can be achieved through abstaining from introducing exotic plants over large areas (*ibid.*), because of their devastating effect on indigenous plants. These authors propose more specific methods of rehabilitating habitats. They point out that agriculturally non-productive areas and “degraded savannahs could be used for planting forests of pine and eucalyptus to lessen the need for further clearing of virgin forest for timber” (*ibid.*: 135).

Man is experiencing disequilibrium with natural resources, which are an essential resource base for human life (Lucas 1979: 127). The current situation presents a major problem in which plant resources appear to be vulnerable, endangered, or even extinct. This author strongly argues that such a dilemma can be resolved through conservation initiatives which emphasize both wise use and development of plant resources, in addition to integrating conservation plans with development plans (*ibid.*) in national and local

community contexts. In a similar perspective, Maunder (2000: 654) recommends ex-situ and in-situ strategies as important approaches to conserving plants resources (see also Okigbo et al. (2008: 128–129). While ex-situ focuses on “collection and cultivation of plants in locations off their natural habitats,” in-situ focuses on “protection of plants in their natural habitats” (ibid.). As Okigbo et al. (2008: 128–129), referring to Cunningham (1997), observe that the ex-situ strategy enhances the availability of alternative sources of plant resources while the in-situ strategy allows “natural processes” that support plant survival to continue uninterrupted (ibid.). In my opinion, this would eventually contribute to a sustainable resource supply.

In addition, effective conservation of plant resources goes hand in hand with two other strategies, namely education and training as well as research and monitoring (ibid.: 129–130; Srivastava et al. 1996: 12–13). The authors observe that successful conservation of medicinal plants lies in a trained staff and a public that is aware of the crisis. Focusing on rural communities, government decision-makers and pharmaceutical companies, public awareness should “encourage appreciating the value and cultivation of medicinal plants” (Okigbo et al. 2008: 128; McNeely 2006: 29). Okigbo et al. (2008: 128), referring to Cunningham (1997), point out that research and monitoring play various roles in conservation. For example, “areas with abundant plant species of medicinal value can be identified through research and monitoring (ibid.). The “interactive forums with the users of medicinal plants may contribute to the discovery of perceived scarcity of plants” (ibid.), and the status of “commonly used medicinal plants and the perceived challenges related to their conservation” (ibid.) can as well be discovered.

Myers et al. (2000: 853–857) suggest that conservationists can engage in a systematic response to the challenge of large-scale extinctions through the hot-spot strategy. The hot-spot strategy focuses on identifying and protecting areas with exceptional concentrations of endemic species and experiencing exceptional loss of habitat (ibid.). Although I agree with the authors, they do not state precisely how such areas can be protected. In addition, the same authors observe that although “protection can be done in some areas undergoing habitat loss, human settlements and other activities make it impractical in some other areas” (ibid.).

Furthermore, to cope with the extinction of medicinal plants, McNeely (2006: 29) argues that harvest and trade of medicinal plants can be controlled at national and local levels. To support his argument, he points out that control can be enhanced through domestication of medicinal plant species, as this can increase the supply and substantially contribute to the reduction of pressure on wild sources (ibid.; see also Srivastava et al. 2006: 13). In addition, he argues that permit systems (for an example, see Srivastava et al. 2006: 13 and Saad 1979: 140) can regulate and ensure sustainable collection of medicinal plants

through provision of guidelines. However, the author stresses that successful enforcement of the guidelines depends solely on the competence of the enforcers (McNeely 2006: 29). Lucas (1979: 128) suggests that one of the ways of coping with extinction is the acquisition of accurate data concerning available plants in an area as well as their conservation. For instance, he enumerates questions to consider when dealing with the extinction of plant resources: first, “[...] are the plant species abundant or infrequent?” second, “[...] are they under threat and if so from what?” third, “[...] has anything been done so far to protect them” (ibid.)? The author, however, argues that merely collecting information about the status of plants does not mitigate plant extinction unless such information is accompanied by action plans, which must also be compatible with national development plans (ibid.).

On the whole, different authors propose different approaches to address the challenge of plant resource extinction. Their approaches range from building the capacity of affected communities to address extinction to establishing legislation relating to the utilization of plant resources. This study attempts to show (see chapter six) the effectiveness of some of these approaches, and how other similar approaches have been applied by herbalists in Kawete village to mitigate the extinction of medicinal plants.

2.5 Stakeholders supporting communities to address plant extinction

Several stakeholders at global, regional and national scales support communities to address the extinction of plant resources and its likely consequences (Srivastava et al. 2006: 5; Lucas 1979: 128). For example, the Threatened Plant Committee (TPC) exists at the global scale (ibid.). At the regional scale, “the subcommittees comprising of botanists, ecologists and other categories that are both interested in and have knowledge concerning their regional floras” (ibid.) exist. Finally, botanic gardens, University departments, research institutes and other bodies which have “the infrastructure and professional competence to raise plants through cultivation or in seed banks” (ibid.), exist at the national level. The authors stress that the stakeholders mentioned above are charged with various responsibilities. For instance, they identify threatened floras, plant groups, and individual species in their respective areas. They document adverse changes affecting floras, advising on how to mitigate their effects, as well as taking part in mitigation and recovery initiatives (ibid.).

In a related context, Maunder (2001: 655–656) observes that international agencies such as the International Plant Genetic Resources Institute (IPGRI) and the Species Survival Commission (SSC) of the World Conservation Union (i.e. IUCN) have established national networks responsible for the conservation of plant resources. As the author points out, the networks engage in several roles including “supporting collaborative relationships

between government agencies and Non-government organizations” (ibid.). They also train botanists from respective countries and constitute “national systems through which priorities for plant and habitat conservation” are determined (ibid.).

The literature above reveals a range of organizations whose general aim is to conserve the plant resource. They seek to achieve their aim through activities such as research, identification and documentation of threatened species, offering technical advice related to conservation of plants, as well as engaging in other mitigation and recovery initiatives. In chapter six, this study tries to show how specific stakeholders are involved in various conservation activities in Kawete village.

Chapter Three: Methodology

This chapter presents a detailed methodological approach used in the present study. I describe the study design, the area and participants of the study. I also present the methods applied to collect data. Data analysis and limitations to the study are also discussed at the end of this chapter.

3.1 Study design

This study is based on fieldwork conducted in Kawete village. I spent two months, August and September 2013, doing fieldwork in Kawete village. Focusing on medicinal plants, I primarily worked with herbalists in the village to assess the perceived extinction of medicinal plants and the causes of the extinction of specific medicinal plants. In addition, we (the herbalists and I) explored the coping strategies as applied by herbalists to address the challenge of the extinction of medicinal plants and its likely consequences. I also explored the stakeholders supporting the herbalists to mitigate the extinction of medicinal plants. The study involved additional categories of participants (see Table 1). I used mainly qualitative methods to collect data. The data was recorded in form of field notes and audio recording.

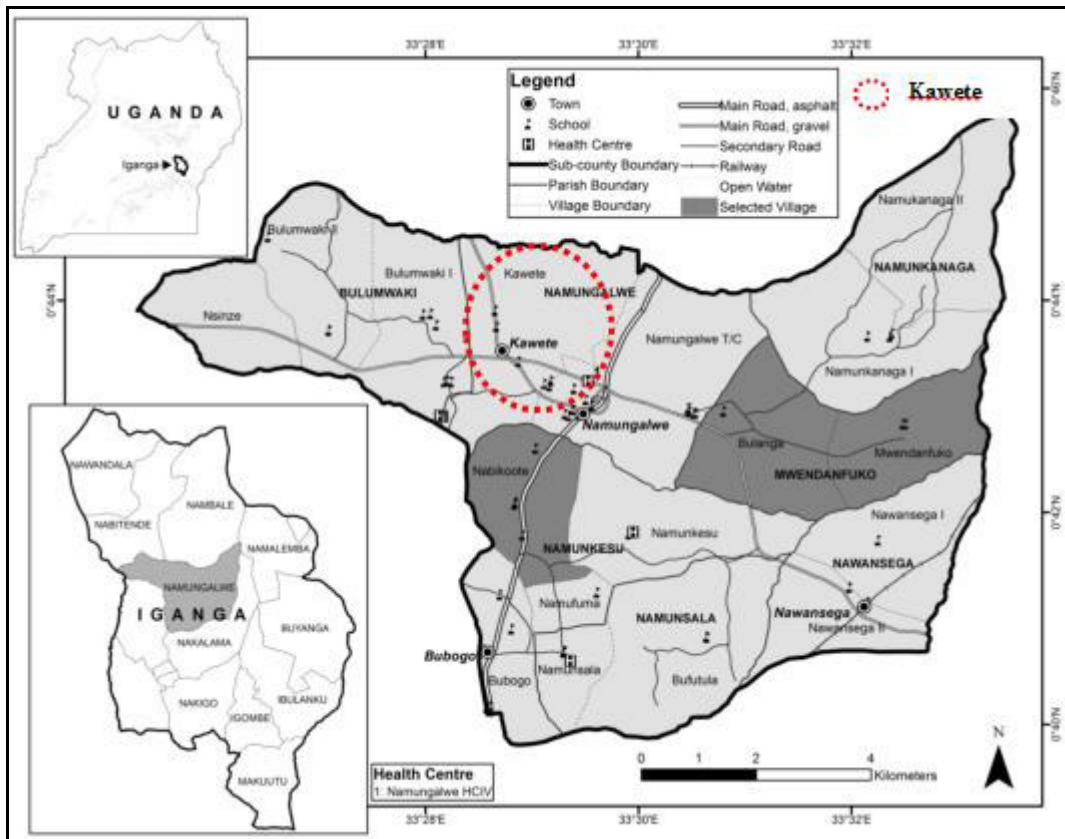
3.1.1 The study area

Kawete village is located in Namungalwe parish, Namungalwe sub-county, Iganga district in Busoga sub-region in eastern Uganda (see Map 1). The inhabitants of Kawete village and the entire sub-region (*Busoga*) are called *Basoga*.⁵ They are speakers of *Lusoga*, a Bantu language belonging to the Niger-Congo family.⁶ A village among the *Basoga* is referred to as *mutala*. The *mutala* is usually bounded by swamps. It is sub-divided into zones known as *bisoko*⁷ (for further details about how *Basoga* conceptualize a village, see Fallers 1965: 97–179). Kawete village covers a total land area of approximately five square kilometres. It is bounded by Bugaba swamp in the South and Southwest (which separates it from Nabikoote village) and Nalukandwa swamp in the North. In the West and East, it is bounded by Bulumwaki village and Namungalwe trading centre respectively.

⁵ *Basoga* is the plural form of the name of the inhabitants of *Busoga* sub-region. The singular form is *Musoga*.

⁶ See www.ethnologue.com for more information about *Lusoga* as a language.

⁷ *Bisoko* is the plural form of the *Lusoga* name for sub-villages. The singular form is *Kisoko*.



Map 1: Map of Uganda (modified) showing Iganga district, Namungalwe sub-county, and Kawete village. Source: Nalumansi et al. 2014: 3, figure 1.

The village is divided into nine zones: Bukiwule, Bugulumo, Bugaba, Musenze, Bulwanyi, Kyankutikyankoko, Bugabo, Bukisaame, and Kawete trading centre. With the exception of Kawete trading centre, each of the zones is named after the lineage head (for example, Bugaba is named after the lineage head called Gaba) and is primarily inhabited by members of the same lineage. Kawete lies at a relatively high altitude of about 1,070m and 1,616m above sea level. The annual rainfall of the village ranges between 1,250mm and 2,200mm (Uganda Districts Information Handbook 2005: 77). The village experiences uniformly high temperatures of about 21oC (ibid.). The vegetation in the village “is predominantly forest and savannah mosaics, which is a mixture of isolated forest remnants and colonizing savannah trees integrated with grasses and shrubs” (ibid.). As mentioned above, Kawete village has a trading centre with some retail shops where people convene to trade. Compared to other villages in Namungalwe sub-county, Kawete is well connected by gravel roads to the neighbouring villages, as well as trading centres and towns. For example, Mulwanyi and Namungalwe roads connect Kawete to Namungalwe trading centre in the east and eventually to Iganga and Kaliro towns. In the west, Mulwanyi road has smaller roads connecting Kawete to Nawankonge, Bulumwaki and Kabira villages as well as Luuka town. Namungalwe road also runs through Kawete

village to connect it to Nabitende-Kalungami and Nawandala trading centres. The same road also has a smaller road that connects Kawete to Nasuuti trading centre.

The trading centre in Kawete village hosts an auction market on a weekly basis (every Saturday). The auction market operates from between 6.00am and 7.00am until after 6.00pm, when the vendors and market-goers gradually return to their homes. The market attracts vendors and market-goers from within and beyond Kawete village. The vendors trade in a range of commodities including herbs, livestock, new and second-hand clothes, and foodstuff. According to interviews, the presence of this weekly auction market in Kawete village is one of the factors that contribute to the popularity of the village.

Kawete village has a range of social amenities although some are relatively of poor standard. For instance, there is electricity (mainly restricted to the trading centre), three primary schools; one operated by the Lutheran community along Mulwanyi road, one is government-aided and another is privately owned. The village has two secondary schools: Country side and Kawete parents. There are two health centres within the village: Kawete Health Centre II and Namungalwe Health Centre III. Several retail drug-shops are also available in Kawete, especially in the trading centre. Additionally, Kawete village has access to Bugono Health Centre III and Iganga Main Hospital, which are approximately 12 and 15 kilometres away from Kawete, respectively.

The village is inhabited by approximately 1,070 people (Uganda Bureau of Statistics (UBOS) 2011: 17). The inhabitants are settled rather unevenly throughout the village. While some homesteads are concentrated around the trading centre, other homesteads form a linear pattern along the roads, and isolated homesteads also exist at the village periphery. The trading centre in Kawete village and the roads that criss-cross it seem to have largely influenced the current settlement pattern. The residents are predominantly subsistence farmers although there is a gradual shift to the commercial cultivation of sugarcane, as can be observed from recent and extensive sugarcane plantation establishments within the village. I discuss the implications of sugarcane cultivation on medicinal plants in chapter five. Residents cultivate food crops such as maize, sweet potatoes, rice, cassava, sorghum and finger millet. Some homesteads rear cattle, goats and pigs. Poultry farming is practised in almost all the homesteads.

In addition to subsistence agriculture as an economic activity, individuals (in some cases couples) in several homesteads in Kawete village work as herbalists, with at least seven herbalists in each of the zones mentioned above. Although the interviewees could not quote the exact number of herbalists in each zone, interviews and observations indicated that Bugaba zone has the highest number of herbalists. During this study, the homesteads of herbalists were easily distinguished from the homesteads of non-herbalists. Herbalists' homesteads had a much higher variety and quantity of plants growing in almost all

available spaces whereas non-herbalists had a strict separation between the garden and the house. In some herbalists' homesteads, herbs were drying in the sun, and small shrines had been constructed.

The motivation to choose Kawete village for this study was driven by two reasons. First, as mentioned earlier, Kawete village has a high concentration of herbalists. The herbalists are organised in an umbrella association known as Uganda Herbalists and Cultural Association. This association has leadership structures starting from the village level through the parish and sub-county up to the district level.

Second, between 2000 and 2005, the Natural Chemotherapeutics Research Laboratory (NCRL), a department of the Ministry of Health-Kampala established a community centre for traditional herbal medicine in Kawete village. Established with financial support from the International Development Research Centre (IDRC) in Nairobi, the aim of the community centre was to promote herbal medicine through training herbalists in authentic herbal medicine practices. The centre also would be used to gather and disseminate information about medicinal plants. The ultimate goal of NCRL is to pave way to integrate herbal medicine into the national healthcare system (see Alele-Amai 2005: 15). Additionally, this study coincided with the period when herbalists in the village decried extinction of medicinal plants. The combination of all these factors made Kawete village the ideal location for this study.

3.1.2 The participants of the study

Both male and female participants were involved in the study. They included herbalists, herbalists' clients or patients, the Forest ranger of Iganga district, Botanists or researchers from the NCRL, social and health workers within the community. Table 1 summarizes the categories of the study participants.

Table 1: Overview of the study participants

S/No.	Category of participants	Number	Percent
1	Herbalists (in Kawete village)	15	50
2	Herbalists (in markets)	4	13.3
3	Herbalists' clients (patients)	3	10
4	Forest ranger	1	3.3
5	Botanists (researchers)	2	6.7
6	Social workers	3	10
7	Health workers	2	6.7
Total		30	100

Source: Field data, August/September 2013

To identify the participants for this study, I applied snowball and purposive sampling methods. An explanation for the choice of each of the seven categories of the study participants is detailed here. It was necessary to interview the herbalists to be able to explore the perception of the concept of extinction in relation to medicinal plants, and the extinction status of medicinal plants. This is because the herbalists are directly involved in harvesting the medicinal plants to process herbs before dispensing them to their clients. The herbalists 'in markets' were selected because of the need to confirm claims by herbalists in Kawete village that some of the medicinal plants that had disappeared from the village were being bought from markets. Herbalists' clients/patients were chosen in order to understand why people in communities like Kawete village would choose to visit a herbalist instead of the conventional health centres to meet their healthcare needs (discussed in chapter one). The Forest ranger and the Botanists, who were also working as researchers at the NCRL, MoH-Kampala, were selected to provide scientific identification of the medicinal plants. The Botanists were also selected because they were working with herbalists in Uganda including the herbalists in Kawete village, through the NCRL to promote herbal medicine. I interviewed the health workers for three reasons: First, to cross-check claims that herbalists are capable of treating particular conditions and ailments, which could not be treated using conventional medicine, second, to identify the conventional terms for specific illnesses and diseases (see Appendix 3) since the herbalists could only describe them in *Lusoga*, and third, the health workers were working with the herbalists to implement the integration of herbal medicine in the national healthcare sector. Additionally, I selected the social workers because they were involved in steering development initiatives in communities through sensitizing and building the capacity of the community members.

3.1.3 Entering the field

I started fieldwork by making an informal visit to Kawete community centre for traditional medicine, which I found closed at the time of my arrival. This gave me the opportunity to interact with the neighbours to the centre. Interacting with the centre's neighbours enabled me to discover some of the influential and reputable herbalists in Kawete village. I also discovered that herbalists convene at the centre every Wednesday between 2.00 and 4.00pm, to evaluate their professional duties, as well as their saving and credit organization. This information played a crucial role in adjusting my fieldwork schedule. For instance, based on such information, I planned my first official visit to the centre (and Kawete village) to coincide with the herbalists' meeting (which I also attended). This was important in many ways. It enabled me to introduce myself and the study to the herbalists (the would-be participants), and I was able to seek permission from the leadership of the

herbalists to allow me to execute my study through their centre, Kawete Community Centre for Traditional Medicine. I also used the same opportunity to ask the herbalists to cooperate during the study, and to build rapport before embarking on the interviews. Identifying the influential and highly reputable herbalists enhanced the use of the sampling methods (mentioned in 3.1.3) used in this study.

During the meeting, I presented to the herbalists the letter of introduction to the field that I obtained from the University of Cologne, Department of Cultural and Social Anthropology (where I was a student). The letter briefly described my thesis (coping with the extinction of medicinal plants) and study area (Kawete village) among other things. This letter helped me to build confidence among the herbalists that data collected would be used for academic purposes. Building this confidence was important because some herbalists had expressed fear that the study was a conduit through which their knowledge of herbal medicine would be taken for commercial purposes. As a result of confidence building, the willingness and interest of the herbalists to participate in the study increased.

However, during the study, only one herbalist completely refused to be interviewed on account of safeguarding his knowledge of herbal medicine. Two herbalists were hesitant to be interviewed as could be judged from the vagueness of their responses, and one herbalist (in the market) became furious along the interview when I asked him to identify some of the places where he obtained the herbs for sale in the market– he accused me of stealing their knowledge for the ‘white man’.

3.2 Data collection methods

Conventional anthropological methods such as participant observation, interviews: informal and semi-structured, free listing, review of documents, and Focus Group Discussions (FGDs) were applied interchangeably to collect data relevant to this study. Below is a description of how I applied each of the methods.

3.2.1 Participant observation

Participant observation that emphasizes participatory and immersive approaches belongs to the essential methods of an ethnographic study. Bernard (2006: 342) observes that participant observation “involves getting close to people [...] so that you can observe and record information about their lives.” As discussed above (in section 3.1.4), I started my fieldwork by making an informal visit to Kawete village before conducting the actual interviews. This informal visit enabled me to interact and build rapport with the villagers, especially the herbalists. Additionally, I attended and contributed to discussions in the herbalists’ weekly evaluation meetings as well as savings and credit meetings at Kawete Community Centre for Traditional Medicine. As a result of this rapport building, most

participants willingly discussed the subject of herbal medicine, a theme highly reserved by many communities as secret knowledge⁸. Bernard points out that “fluency in the local language” can help to improve rapport (Bernard 2006: 260–361). My ability to speak *Lusoga*, the native language of the inhabitants of Kawete village was crucial in building rapport with the herbalists as well as other participants of the study.

Participant observation also entails “immersing yourself in a culture” (ibid.: 344), reflecting on, putting into perspective and writing about what “you have seen and heard” (ibid.). I spent the two months of fieldwork in Kawete village, interacting with the herbalists in their routine activities both at the Community Centre for Traditional Medicine and in their respective homes. This enabled me to observe and record data concerning key activities such as harvesting, processing, and preservation of herbs. In some cases, I witnessed herbalists treating and dispensing herbs to their clients. Attending the workshop aimed at sensitizing herbalists on the national policy on Public Private Partnership in Health (PPPH), organized by Uganda Reach the Aged Association (URAA) in Iganga town enriched the data concerning the legal status of herbal medicine and the cooperation between herbalists and the MoH.

3.2.2 Interviews

Interviews, especially with herbalists, were conducted simultaneously with participant observation. Two main forms of interviews, informal and semi-structured were conducted. As Bernard (2006: 211) states, informal interviews involve recalling “conversations heard during the course of the day in the field [...], constant jotting [...] and developing field notes.” In addition, he points out that an informal interview “is also used [...] to uncover new topics of interest that might have been overlooked” (ibid.). Through informal conversations with herbalists and other inhabitants of Kawete village, I was able to expand the data concerning the role of herbalists in the community. I also gained a broader understanding of the perceived preference of herbal medicine to conventional medicine by community members.

A semi-structured interview necessitates the use of an interview guide (ibid.: 212). In this case, I prepared an interview guide covering topics such as perception and causes of extinction of medicinal plants, coping strategies as applied by herbalists, and stakeholders supporting the herbalists to address the problem of medicinal plants becoming extinct (see Appendix 1). The interview guide for other participants like the botanists or researchers at the NCRL and the Forest ranger included topics like invasive plants,

⁸ Secret Knowledge is a form of indigenous knowledge, which is “the local knowledge that is unique to a given culture or society” (Warren et al. 1995: xv).

scientific identification of medicinal plants, and the role of the NCRL in promoting herbal medicine in Uganda (see Appendix 2).

3.2.3 Free listing

According to DeMunck (2009: 47), “the free list [...] offers a powerful emic snapshot of the cultural domain that you are interested in studying” (see also Bernard 2006: 301–305). At the beginning of the study, and later during participant observation and the interviews, I asked the herbalists to list the medicinal plants they use to treat various diseases. This was important in two ways: First, the herbalists indicated the specific issues they are facing, such as the scarcity of particular medicinal plants, second, I was able to compile a general list of 70 of the medicinal plants (see Appendix 3) commonly used by herbalists as raw materials for the herbs. I compiled the list of medicinal plants by reviewing the lists as given by respective herbalists. The final list formed the basis for assigning extinction status to specific medicinal plants (see chapter five).

3.2.4 Review of documents

Both published documents and manuscripts were reviewed in order to clarify and supplement specific data. For example, I reviewed the visitors’ books, correspondences from various organizations to the herbalists, the herbalists’ registers, photographs, hand-outs, brochures, wall charts, as well as the foundation stone of Kawete Community Centre for Traditional Medicine to gain further insight into specific stakeholders (discussed in chapter six) supporting herbalists to mitigate the extinction of medicinal plants and the nature of trainings received by herbalists. The documents also enabled me to identify scientific names of some medicinal plants, as well as specific dates of key events like the establishment and launch of the centre. Registers of patients, when available, provided a clear picture of the number of people who seek the services of herbalists and the nature of diseases treated by the herbalists. The files for patients referred by herbalists at Namungalwe Health Centre III provided an insight into the nature of cooperation between herbalists and health workers.

3.2.5 Focus Group Discussions (FGDs)

Bernard (2006: 232) asserts that “focus groups are recruited to discuss particular topics-anything from people’s feelings [...] to their experiences [...].” He adds that “[...] you can convene a focus group discussion to help interpret the results of the survey” (ibid.: 233). In the context of this study, we (the herbalists and I) used focus groups to re-examine and discuss in detail the subject of the extinction of medicinal plants. The subject of taboo

observation in the use of herbal medicine was also discussed in the focus group. Some contradictions relating to the categories of herbalists and the local names of specific medicinal plants arose during interviews. These were also explored during the focus group discussion. Also, the FGD was the main forum for assessing the extinction status of various medicinal plants. The author (Bernard 2006) discusses the composition of focus groups. For example, “focus groups typically have 6–12 members, plus a moderator” (Bernard 2006: 237). The focus group in this study comprised of ten herbalists, six male and four female. I identified the members of the focus group discussion basing on their experience and knowledge of the practice of herbal medicine, as revealed during interviews and participant observation.

3.3 Data and data analysis

Although I was primarily interested in qualitative data, some quantitative data (presented in Tables 1 to 3, and Figure 1) was also collected. Qualitative data were collected in two forms, namely: audio recording and field notes. To analyse this data, I employed the principles of grounded theory. Following the protocol of the grounded theory, I transcribed the interviews, identified potential themes and compared them to find out how they were linked (Bernard 2006: 492). This enabled me to develop the theory (see chapters five and six), that I present using exemplars⁹. Simultaneously, I analysed and converted quantitative data into statistical diagrams using Microsoft excel.

3.4 Ethical considerations

In this study, I observed specific ethical considerations. For instance, I obtained a letter of introduction to the field from the department of Cultural and Social Anthropology, University of Cologne. By stating the purpose of my fieldwork, the letter helped me to introduce myself to the participants and various authorities in the field (section 3.1.4). Furthermore, I obtained consent from the study participants to record their views before any interviews were conducted or recorded in this study (see Appendices 1 and 2). Consent was also obtained before taking photographs such as photographs 2, 5a and b, as well as 6a and b. Although there are photographs of the study participants, I try to conceal the identity of the participants by avoiding stating their full names, especially where critical issues (for an example, see 5.3.2, 5.3.5 and 5.3.7) are discussed. Instead, the initials are used throughout.

⁹ Bernard (2006: 492) describes exemplars as “quotes from the interviews that illuminate the theory.”

3.5 Study limitations

Various limitations were encountered in this study. For example, challenges like poor storage facilities, poor record keeping and the irregularity of some office schedules made it difficult to access some data (such as the specific population of herbalists and the administrative map of Kawete village). In cases where I was able to access some documents, especially at Kawete Community Centre for Traditional Medicine, some pages of specific documents were lacking. To address this limitation, I relied on interviews and observations to enrich the data I collected by reviewing documents.

The application of methods like participant observation in an ethnographic study requires a considerable amount of time. The two months of fieldwork could not permit a comprehensive application of all the aspects of participant observation. In addition, the limited time prohibited me from reaching some organizations like the National Agricultural Research Organisation (NARO) and National Environment Management Authority (NEMA) for a detailed interview on their specific roles in supporting herbalists to address the challenge of extinction of medicinal plants. Comparing the views of the above organizations on the subject of the extinction of medicinal plants also could not be undertaken due to limited time. Although I encountered the above limitations, data to answer the central questions to this study was successfully gathered. I present this data in the following chapters.

Chapter Four: Ethnography of herbalists and herbal medicine in Uganda

In order to give an insight into the herbalists, herbal medicine and its status in Uganda, this chapter is intended to present an overview of the ethnography of herbalists and herbal medicine. In addition, the legal context of herbal medicine in Uganda is also discussed in this chapter.

4.1 Herbalists and their role in society

The herbalist *muyigha*¹⁰ is usually an elderly man or woman who has mastered the art of diagnosing illnesses and prescribing appropriate herbs (Cultural Research Centre 2012: 7–8; 2003: 144; Tabuti et al. 2003: 20). Most villages in Uganda including urban areas have access to an herbalist(s). Members of the community respect their herbalists. The herbalists hold official positions in addition to their healing duties. For instance, in Kawete village, some herbalists held leadership positions in churches, village associations, and Local Councils (LCs). However, I discovered during fieldwork that in some cases, community members fear some of the herbalists (especially diviners) because of their perceived ability to cause harm through witchcraft.

In Uganda, there are two main categories of traditional healers: herbalists and diviners. Herbalists are those who have gained extensive knowledge and experience of how to use plants for medicinal purposes. They know how to prepare, administer and preserve the herbs. Diviners are herbalists, who in addition to the mastery of the art of herbs, are believed to possess specialized skills of using supernatural powers to establish the 'cause' (Iwu 1993: 344) of the problems and illnesses of specific clients.¹¹ As Una (1978: 162) observes, the clientele of diviners "consists of patients whose complaints are deep seated and persistent, and for whom other doctors have proved useless." The two categories of traditional healers are, however, further sub-divided depending on their focus and orientation. For example, those skilled in healing fractures are termed as bonesetters; those skilled in the provision of pre-natal, ante-natal and post-natal care are categorised as Traditional Birth Attendants (TBAs); and others who derive their divination abilities and powers from ancestral spirits are termed as spiritualists. Mbiti (1969: 166) acknowledges that "the question of terminology is extremely difficult, in describing either collectively or individually" the herbalists. He argues that the terms tend to "overlap just as the nature and role" (ibid.) of some of the herbalists do. The categories and sub-categories discussed above give a hint on how herbalists differ (see also Gelfand 1964: 28). However, all herbalists share one common feature: They all rely on medicinal plants

¹⁰ *Muyigha* is the *Lusoga* name for a traditional healer or herbalist. *Lusoga* is the native language of the inhabitants of the study area.

¹¹ The Ministry of Health in Uganda encourages herbalists who do not use supernatural powers in the healing process and discourages those that use supernatural powers.

to prepare the herbs they use to treat various illnesses and diseases. Therefore, I use the term herbalists in this study to refer to all categories of traditional healers.

Herbalists play various roles both in individual and community life but I will limit my discussion to the healing role in the interest of saving space. The herbalists provide remedies to ailments and diseases of the members of their communities (see Mbiti 1969: 168 – 171). They treat a range of diseases including mental illnesses, blood pressure, and bilharzia (for more examples of the diseases treated by herbalists, see Appendix 3). I observed during fieldwork that various people regardless of age, sex, education level and religion seek for healthcare from herbalists.¹² However, I discovered that the elderly and women rely on herbalists more heavily than men and youths. The elderly are often unable to travel long distances due to age or illness. They disproportionately have to take care of orphans and other neglected children, and they are often too poor. For all these reasons, they are often unable to travel to and pay for modern medical care. Like the elderly, women are also responsible for the bulk of the household work and their families and earn very little pay if any at all (for a similar discussion, see Hamilton and Hamilton 2006: 10). For example, a mother who gave birth in the home of a TBA during fieldwork said:

When my labour pains started, I asked my husband for money to go to hospital. He told me that he has no money and asked me to find a solution. I had nothing to do apart from coming here; [...] she charges little money and I can pay her later (Interview with N.J.K:3.9.2013).

4.2 Becoming a herbalist

Herbalists acquire their knowledge and earn their title through various ways¹³. Some are apprenticed to an expert or senior herbalist at an early age. The expert gradually introduces the candidate to the skills of identifying, collecting, preparing, and administering the herbs. Some people become herbalists by birth. Community members believe that this category of herbalists possess innate healing abilities and are by far considered to be the most effective ones (a detailed discussion is made by CRC 2003: 155). There are those herbalists who inherit healing powers from their parents or grandparents. Other herbalists are chosen by their family and ancestral spirits. In this case, the prospective herbalist receives the revelation through dreams or they are possessed by the ancestral spirits (Mubiru et al. 1994: 157; see also Mbiti 1969: 167 and Gelfand 1964: 27).

¹² Some people were reported to visit herbalists under the oath of secrecy especially due to religious reasons.

¹³ A detailed account of how herbalists attain their profession in various African societies is given by Mbiti (1969: 166 – 168).

The parents or grandparents and the family as well as ancestral spirits consider a range of attributes before specific individuals are chosen to undergo apprenticeship or to inherit the healing powers. According to interviews, the prospective individuals are evaluated on attributes such as patience, trustworthiness, passion and kindness. There is no specific duration for evaluating the candidates but it takes years. The increasing demand for herbal medicine is attracting many people to the profession of traditional healing. As a result, there are many people becoming herbalists through trainings and buying the healing 'powers' from expert herbalists. In this case, the most important factor considered to become a herbalist is the ability and willingness of a particular individual to pay the expert herbalist for the training service and the healing powers.

4.3 Harvesting, processing, and administering herbs

It is important to describe the harvesting, processing as well as the administering of herbs. Interviews revealed that these aspects of herbal medicine contribute to the extinction of medicinal plants. In chapter five, I discuss how these aspects contribute to the extinction of medicinal plants. It is the duty of herbalists to harvest, process, preserve and administer the herbs. In some cases, herbalists delegate these duties to apprentices. Herbalists harvest medicinal plants mainly from the wild, in areas such as forests, fallow-land, swamps, and up-lands. The herbalists harvest different parts from particular plants; they pluck the leaves of some plants, for others, they harvest the bark, for still others, they cut the roots, and in some cases the whole plant may be harvested. Herbalists use rudimentary tools such as hoes and pangas to harvest some plants while other plants are harvested by plucking or uprooting using hands.

Traditionally, there are a range of taboos associated with harvesting, processing and administering herbs. For example, herbalists do not harvest medicinal plants before the morning dew disappears (Cultural Research Centre 2003: 149). When roots of certain plants are harvested, the exposed roots of the plant must not be covered with soil. Herbalists are required to observe these protocols to prevent the herbs from being rendered ineffective in curing specific ailments. I present and discuss the implications of such taboos on the status of medicinal plants in chapters five and seven. Herbalists process most herbs from plant leaves, followed by roots (see Appendix 3 and Tabuti et al. 2003: 21). Several methods are used to process the herbs. For instance, herbalists pound some herbs in a mortar or grind them on a grinding stone to process them into powder form, some herbs are processed by simply sun-drying, some are "burnt to ashes," and some are pounded or boiled to be transformed into liquid form (ibid.: 41; see also Gelfand 1964: 66 for more forms of processing and administering herbs).

The spectrum of processing methods suggests a range of approaches used by herbalists to administer herbs. To get the benefits of the herbs in liquid form, the patients either drink or bath in them. Powdered forms may be mixed together with jellies or oil and applied on the skin. Powdered forms of herbs may also be applied through incisions (Tabuti et al. 2003: 42). They can be added on hot water or milk and taken in form of tea. They can also be cooked together with plantain or *sim-sim* (*Sesamum indicum*) and eaten as food (ibid.). Some herbs are applied by smoking on a potsherd or in a pipe (for an example, see CRC 2003: 150 – 156). The herbalist may use one or more methods in healing. The choice of the method(s) largely depends on the nature of the illness or disease of the client. For instance, illnesses emanating from spirits or a curse are treated by smoking herbs (see ibid.). Most herbalists consider it important to make some incantations during harvesting, processing and administering of herbs. This is due to the belief that the herbs may be “powerless without the influence of the appropriate spoken word, uttered according to ritual prescription” (Una 1978: 162). Generally, the activities which herbalists go through to harvest, process and administer herbs represent a rigorous and complex process.

4.4 Uganda’s herbal medicine: legal context

Herbal medicine and its use in Uganda have been contested for several reasons. As earlier mentioned, it was associated with negative practices such as witchcraft. In response to this, colonialists instituted the 1957 Witchcraft Act. The act out-lawed the use of herbal medicine among other cultural practices (Cross Cultural Foundation of Uganda 2008: 2). Similarly, herbalists have been criticized for using unhygienic utensils to process herbs (Hirt and Bidanda 1995: 19). These authors observe that the use of unhygienic utensils increases the chances of contracting other infections rather than curing a specific illness. Likewise, without a comprehensive formula to standardize dosages, herbalists’ credibility is degraded. Some people perceive this as a danger since it is therefore possible that poisonous plants could be administered in excessive quantities (ibid.). As a result, it has been difficult to legalize the status of herbal medicine during and after the colonial period in Uganda.

However, since Uganda’s independence in 1962, there is evidence that herbalists and their practice are increasingly being recognized by various organizations including the Ministry of Health, as important contributors to the healthcare system. In 1964, the government of Uganda established the Natural Chemotherapeutics Research Laboratory (NCRL) through the Ministry of Health (MoH)¹⁴. The aim of NCRL was and is to validate the “claims made by traditional healers on the efficacy of medicinal plants [...] and [...]

¹⁴ See health.go.ug/mohweb/?page_id=666 for more information concerning the mandate and activities of the Natural Chemotherapeutics Research Laboratory (NCRL) in relation to herbal medicine.

methods employed in the treatment of various diseases” (Mubiru et al. 1994: 4). The Medical Practitioners and Dental Surgeons Act of 1968 protects herbalists and the use of herbal medicine (see WHO 2001: 36).

Although it appears that a specific policy to regulate herbalists and the use of herbal medicine in Uganda has not yet been instituted, Uganda’s government has established several other policies that approve the legitimacy of herbalists and their practice. For instance, the policy on Public Private Partnerships in Health (PPPH)¹⁵ calls for “the integration of traditional [...] medicine into the national healthcare system” and recognizes its “potential to augment, strengthen and promote better health for all [...]” (Government of Uganda 2010: 72). The national health policy outlines a commitment of Uganda’s government to further strengthen partnership “between the public and private sectors in health including [...] traditional practitioners, while safeguarding the identity of each” (Ministry of Health 1999: 8). However, the absence of well established regulatory structures of herbalists at local levels has impeded the implementation of the provisions enshrined in the above policies (see Ministry of Health 2010: 25).

The resolutions of the World Health Assembly (WHA)¹⁶ made between 1970 and 2009 reflect a potential for legitimizing the herbalists and herbal medicine in Uganda. For example, the resolution WHA 29.72 (1976) highlights the manpower reserve that herbalists represent and resolution WHA 30.49 (1977) calls upon member countries to use their traditional systems of medicine. The resolution made in 1978 (resolution WHA 31.33) focuses on medicinal plants. Other resolutions concerning herbal medicine and conventional healthcare, profiling and conservation of medicinal plants were made from 1988 to 2009 (for details of the resolutions, see Akerele 1990: 66–67).

Today, the government encourages herbalists to register with a local traditional medicine practitioners’ association (Tabuti et al. 2003: 20) to regulate the activities of herbalists and the use of herbs. The associations (for some examples, see Mubiru et al. 1994: 160) usually constitute structures from the village to the national level. They are anticipated to play a leadership role in the development of herbal medicine, in addition to their regulatory function (ibid.: 161). This evidence, as reflected in the various legal instruments of Uganda’s ministry of health and the World Health Assembly urges me to assert that the legal status of herbalists and the use of herbal medicine is gradually being established and streamlined. It is likely that a comprehensive policy on herbal medicine may be the ultimate goal of the government of Uganda (through the ministry of health) in the subsequent decades.

¹⁵ Private sector includes the NGOs and the traditional health care system of the traditional healers and midwives (Ministry of Health 1999: 23).

¹⁶ World Health Assembly (WHA) is an organ of the World Health Organization of which Uganda is a member state.

Chapter Five: Local perspectives of the extinction of medicinal plants

This Chapter concentrates on how the herbalists in Kawete village conceptualize the extinction of medicinal plants. Three of the specific questions which this study sought to answer are addressed in this Chapter. They include: How do herbalists in Kawete village perceive the extinction of medicinal plants? Which medicinal plants are considered by the herbalists to be extinct? Why are medicinal plants disappearing?

5.1 Perception of extinction

To be able to answer the question, I asked the herbalists to explain what they understand by the concept of extinction in relation to medicinal plants. The herbalists were conscious of the concept of extinction. They discussed how they perceive extinction, especially in relation to medicinal plants. Some herbalists perceived extinction in terms of loss of particular medicinal plants. They attributed the loss of plants to mainly anthropogenic factors (presented in section 5.3 of this study).

Some herbalist discussed extinction in the context of not being able to find medicinal plants of their choice when they go to harvest medicinal plants. The herbalists interviewed reported that they rarely or never found medicinal plants in the wild unlike in previous years, when herbs of their choice were abundant. It was common for the herbalists to come across other or similar plants instead of the plants of their interest. As a result, some herbalists perceive the failure to find medicinal plants of their choice in the wild as extinction.

Other herbalists explained extinction in terms of absence of medicinal plants from a regular source as one of the herbalists reported:

If particular medicinal plants cannot be found or harvested from the places where we usually harvest them, this means that they are extinct from that source [...] (Interview with K.B.M: 19.8. 2013).

Another group of herbalists described extinction in terms of disappearance of medicinal plants from regular areas. The main sources of medicinal plants in Kawete village were shrubs and forests such as Bugaba forest. Other sources were swamps, in particular Bugaba and Nalukandwa swamps. Although a variety of medicinal plants were abundant in the past years in the forests and swamps mentioned above, some varieties were disappearing as their populations were gradually reducing, and some specific varieties like Kagaya (unidentified) had completely disappeared from Bugaba and Nalukandwa swamps. To some herbalists, this gradual disappearance (see 5.1.1 for a related discussion) was perceived as extinction, as one of them said:

When the number of specific medicinal plants identifiable in a habitat starts to reduce, it means that some of the plants are disappearing or have already disappeared. And if they disappear one after another, that is extinction [...] (Interview with K.D: 19.8.2013).

In addition, three of the herbalists interviewed had further insights regarding extinction. They perceived extinction in terms of loss of knowledge concerning the names and utilization of specific medicinal plants. The herbalists associated loss of knowledge to death and fading memories of people they believed to be experts in herbal medicine and healing. The herbalist argued that it becomes impossible to use plants for medicinal purposes if there is no information to identify relevant plants and to show how such plants can be applied to treat ailments. The following summarizes the views of one of the herbalists concerning the loss of knowledge about specific medicinal plants:

My uncle was a great herbalist. He knew all sorts of herbs. He loved his profession of healing. He died without passing on to me or his other relatives the knowledge of particular medicinal plants. I remember when I was installed a healer in 1970, he asked me to give him a cock so he could reveal to me more herbs and corresponding instructions. Unfortunately, he died before I gave him the cock. We lost him together with his knowledge concerning specific herbs. I know and use a few of the several medicinal plants he knew; the rest I have no idea and I don't think I will ever know them because he did not write them down. For me this is also extinction; the plant might be available but if you don't know it; what specific disease it cures and how it can be used [...] (Interview with N.A: 9.9.2013).

Table 2 illustrates how the herbalists in Kawete village perceive and define extinction in relation to medicinal plants.

Table 2: Herbalists' perception and definitions of the extinction of medicinal plants

S/no	Extinction is when:	Herbalists
1	...medicinal plants are completely lost due to the activities of man.	5
2	...we are not able to find medicinal plants of our choice from the wild.	5
3	...when specific medicinal plants are absent from a regular source.	2
4	...when medicinal plants gradually disappear from a habitat.	4
5	...particular medicinal plants disappear as well as the knowledge about their names and usage.	3
Total		19

Source: Field data, August/September 2013.

5.1.1 Indicators of extinction of medicinal plants in Kawete village

In exploring how herbalists perceived the extinction of medicinal plants, I asked them to identify and describe some of the indicators of extinction that they were experiencing. The herbalists identified and described in detail several indicators of the extinction of medicinal plants. They acknowledged that increased inquiries among herbalists about the presence of specific medicinal plants within the village were common. The herbalists interviewed revealed that it was unusual for a herbalist to inquire from fellow herbalists or ordinary members of the village about the presence of particular plants, since this would be considered revealing the secrets associated with the knowledge of herbal medicine. On the contrary, herbalists reported that it had become common for herbalists in Kawete village to ask fellow herbalists, including other members of their community about the presence of specific plants. Herbalists interpreted this action as an indicator to extinction, as a participant working as a Traditional Birth Attendant (TBA) said:

These days, when herbalists meet, before they greet each other, one of them asks the colleague for a specific medicinal plant or where to find specific medicinal plants. If they meet with ordinary community members, they ask them if they have specific medicinal plants in their homes (land); some herbalists end up pledging big offers in exchange of medicinal plants[...] (Interview with G.M: 29.8.2013).

Compared to the past decades, herbalists were spending more time in searching the forests and other wild areas in order to collect the required amount of specific plants to process herbs. Time spent to collect medicinal plants has reportedly increased from hours in the past to a day or days at the time of this study. The herbalists in Kawete spent a lot of time searching for medicinal plants because they had to visit several areas before collecting the desired plants and quantities, as a senior herbalist in the village stated:

[...] this is a real indicator that plants are becoming extinct, otherwise why would you spend a day or days to collect just one tin of herbs yet at home you have so many clients waiting for you?" (Interview with N.A: 9.9. 2013).

In addition, the herbalists in Kawete village were noticing serious declines in the quantity of particular medicinal plants obtainable from specific areas during a single harvest or collection. For instance, herbalists interviewed said that in the 1990's, they would find a sack worth of medicinal plants from Bugaba forest, Nalukandwa swamp and the shrubs scattered in Kawete village where as today they may find a tin worth or none at all. One of the herbalists who used to harvest medicinal plants from Bugaba forest reported:

We no longer harvest so many medicinal plants from Bugaba forest compared to the past. In the 1980s and also in the 1990s, it

was possible to go to Bugaba forest and come back with a full sack of herbs. Today, if you go to Bugaba, it is possible to come back with nothing (Interview with B.S: 3.9. 2013).

Access to land beyond the jurisdiction of herbalists was increasingly being restricted in Kawete village. All herbalists interviewed reported restricted access to areas which were not in their jurisdiction. It had become nearly impossible to search medicinal from areas belonging to neighbours. This was because everybody was struggling to protect what few medicinal plant resources remained. In cases where the land lords were lenient and allowed the herbalists to harvest medicinal plants, the landlords demanded some payment. The herbalists strongly agreed that the protectiveness over an individual's land is a sign of medicinal plants becoming extinct. They argued that there was free access to land within Kawete and beyond in the past decades, and they would harvest medicinal plants from anywhere and without any costs, as one of the senior herbalists working as a TBA in Kawete village said:

Some years back, no one could stop you from harvesting medicinal plants from their land area; we could harvest medicinal plants from any habitat regardless of the landlord. The situation has changed these days. You cannot go to a neighbour's land, especially herbalists to harvest medicinal plants. They safeguard the little they have, if any, for their own use, or they ask you to pay money. Neighbours who are not herbalists save the trees in their land for firewood (Interview with G.M: 29.8.2013).

Furthermore, the herbalists explained that another indicator of extinction is increased encroachment on formerly prohibited and culturally significant areas. Interviews revealed that some forests like Bugaba, Walumbe and Ndibairira were prohibited from any form of exploitation because the community perceived these forests as homes of prominent spirits in both individual and community life. For example, as revealed by two of the herbalists who were senior residents of Kawete, community members would appeal to the spirits by offering a sacrifice to bring rain in case of a drought. Others said that the herbalists and other members of the community avoided these particular forests because of frightening and dangerous manifestations of the inhabiting spirits. They believed that the spirits would punish the invaders with illness and death. As a result, the herbalists had to harvest medicinal plants from other areas within the village but as some of the herbalists confirmed, the trend had changed. Most herbalists had turned to harvesting medicinal plants from these forests which were formerly prohibited, because they were the only surviving sources of specific medicinal plants. To the herbalists, encroaching on prohibited habitats was an indicator of extinction of medicinal plants in non-prohibited areas. A herbalist in the neighbourhood of Walumbe forest reported:

There is a well inside that forest. Both the well and the forest were named after the Walumbe spirit, which inhabits that forest. Walumbe is the spirit of death here in Busoga. It is a bad spirit, especially if disturbed. In the past years, even at present, the spirit manifests itself in terrifying forms, for example, snakes; some snakes have two heads; some have three; others have five and my grandfather told me of one which had seven heads. The water in that well sometimes looks like blood. The forest has all sorts of medicinal plants any herbalist would need. You can find Olugerogero (unidentified); you can find Omusasa (unidentified); Omuvongo (unidentified); Endogabalogo (unidentified); Omunhalisa (Spathodea campanulata); even Omuziru (Pseudospondias microcarpa); they are so many. But the fear of the wrath of the spirit made that forest to be prohibited. I remember my grandfather and my parents restricted us as young boys and girls from going closer to the forest. Over the years, my neighbours who have gardens surrounding the forest have been careful not to encroach on the home of Walumbe, by cutting down the forest in favour of cultivation. But due to scarcity of medicinal plants from other areas, we the herbalists have no option. We have now discovered peaceful ways of entering into that forest. The spiritualists carry with them a hen, a cock or a goat to offer a sacrifice to Walumbe before they enter the forest to harvest medicinal plants. Once the sacrifice is offered, the spirit calms down; you cannot see those snakes I told you about. Then, some herbalists carry with them eight coffee beans. They throw the beans into the forest upon arrival at the forest. They accompany the beans with incantations: 'Walumbe (name of the spirit) I have come to your forest to collect medicine to heal your people. I implore you to save me from your wrath.' The moment herbalists perform these rituals, the spirit allows them to collect medicinal plants. And these days, I see many herbalists heading to Walumbe forest (Interview with N.P: 2.9. 2013).

Most of the herbalists interviewed expressed disappointment with the high charges demanded by vendors of medicinal plants. Moreover the vendors had considerably reduced the quantity of herbs supplied for a specific cost. The herbalists also indicated that the supply intervals had also increased from monthly to once in every three to four months. But as the herbalists reported, the vendors justified the high charges and prolonged intervals by arguing that the medicinal plants were increasingly becoming scarce. Consequently, the vendors required more time to search for medicinal plants or to travel to distant places where medicinal plants were still abundant. The herbalists, however, felt they had to buy the medicinal plants from the vendors instead of sending away the patient or client, as a Traditional Birth Attendant (TBA) in Kawete said:

I buy most of the herbs I use from vendors. The vendors used to carry sacks with them but today, they carry a quarter or a half or less. Sometimes, the quality of the herbs they bring is not good; they bring scratches of small roots instead of the big and good-looking roots they used to bring before; they give reasons that they cannot find medicinal plants of better quality. The scratches

of small roots are measured in tiny quantities and sold expensively. As a result, we are also forced to increase our charges yet our clients cannot afford the high charges. The vendors go to some places far away; some go deep in Bulamogi and some go to Bukooli (Interview with G.M:29.8. 2013).

Resorting to the use of substitute medicinal plants to treat some ailments had become a common practice among herbalists in Kawete village. The herbalists explained that some ailments could be treated using several options of medicinal plants but some of the optional medicinal plants would rarely be harvested. However, the disappearance of the commonly used medicinal plants compelled many herbalists to resort to other plants believed to have a similar curative effect on a specific ailment. For example, the disappearance of *Mukitimbo (Indigofera garckeana)*, a medicinal plant famous among herbalists for healing snake bites compelled them to resort to the use of *Mugaire (Ficus natalensis)* for the same purpose. Many herbalists consider substituting medicinal plants as an indicator of extinction of medicinal plants, as the head of the herbalists' research committee in Kawete village said:

The most famous herb we had for curing snake bites was Mukitimbo (Indigofera garckeana). But since it started disappearing, most herbalists are using other herbs. Some are using Mugaire (Ficus natalensis). The herbs vary from herbalist to herbalist (Interview with K.D: 19.8.2013).

In addition to the above indicators of extinction, the herbalists in Kawete village had started experiencing symptomatic indicators of the extinction of specific medicinal plants. For instance, some herbalists reported that the medicinal plants had been stolen from their backyard gardens. At least four of the herbalists who had established backyard gardens of medicinal plants had experienced theft of some of the medicinal plants they were cultivating. The herbalists quoted *Omutaamataama (Sarcocephalus latifolius)* and *Omuwaiswa (Maytenus senegalensis)* as some of the medicinal plants which were commonly stolen from the herbal gardens. They associated theft of their medicinal plants with their disappearance from the wild, as one of the affected herbalists said:

The major problem I have these days is thieves. They come and steal some of the medicinal plants from the small herbal gardens in my home. And I am sure that they are my colleagues who steal my plants because an ordinary person cannot brave to intrude the home of a herbalist. But all this happens because medicinal plants are becoming scarce every other day (Interview with G.M: 29.8. 2013).

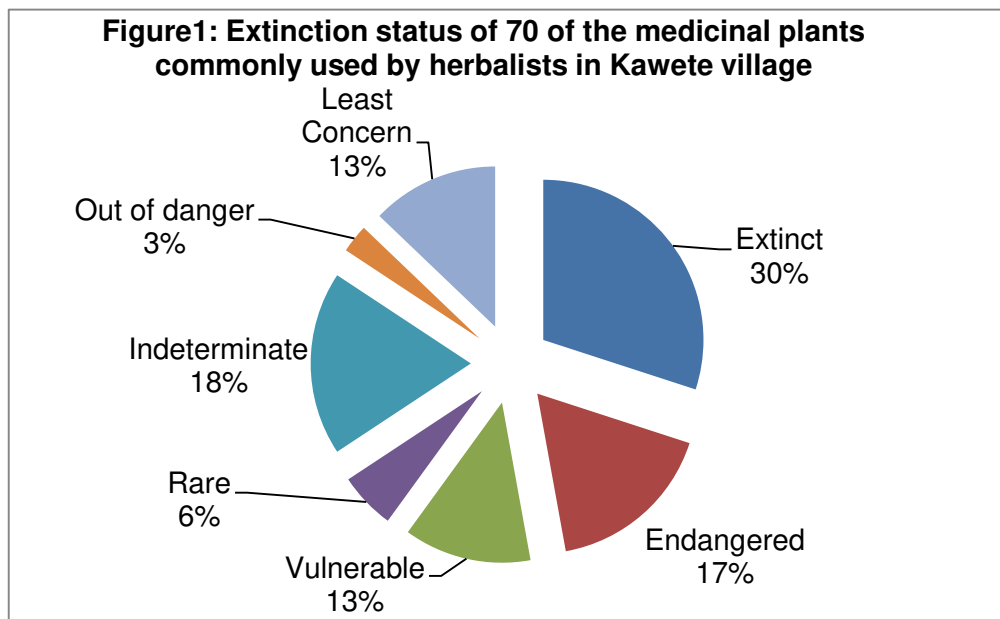
In short, the herbalists in Kawete village perceive extinction of medicinal plants in various ways. They experience several indicators as a result of the scarcity of medicinal plants from the village. The indicators include increased inquiry for herbs amongst herbalists, an

increase in the amount of time spent to harvest a specific quantity of herbs, decreased quantities of herbs harvested at a specific time, restricted access to individual land, encroachment on formerly prohibited areas, high charges imposed by vendors of herbs and the use of substitute medicinal plants. Symptoms of the extinction of medicinal plants such as the theft of specific medicinal plants are also experienced by herbalists in Kawete village.

5.2 Extinct medicinal plants

In addressing the question concerning which medicinal plants were considered extinct in Kawete village, I asked the herbalists to identify the medicinal plants they commonly harvest to prepare the herbs they use to treat various diseases. A list of 70 medicinal plants was compiled (see appendix 3). Following this list in a Focus Group Discussion (FGD), I asked the herbalists to assign extinction status to each of the medicinal plants. To be able to describe the extinction status of specific medicinal plants, we (the herbalists and I) applied the International Union for Conservation of Nature concepts of extinction. The concepts include Extinct, Endangered, Vulnerable, Rare, Indeterminate, Out of danger (Synge 1981: 531–535) and Least concern (Hamilton and Hamilton 2006: 156). ‘Extinct’ refers to “species which are no longer known to exist in the wild after repeated searches of the type of localities and other known or likely places” (Synge 1981:531). ‘Endangered’ refers to plant species “in danger of extinction and whose survival is unlikely if the causal factors continue operating” (ibid.). ‘Vulnerability’ refers to plant species “likely to move into the endangered category in the near future if the causal factors continue operating” (ibid.: 532). ‘Rare’ refers to plant species “with a small population that are not at present endangered or vulnerable but are at risk” (ibid.: 532). ‘Indeterminate’ refers to plant species “known to be extinct, endangered, vulnerable or rare but where there is not enough information to say which of the four categories is appropriate” (ibid.: 534). ‘Out of danger’ refers to plant species previously “included in one of the above categories [...] but are now [...] relatively secure because effective conservation measures [...] or the previous threat [...] has been removed” (Synge 1981: 535). Finally, ‘Least Concern’ (LC) refers to species which are “widespread and abundant” (Hamilton and Hamilton 2006: 156)¹⁷. Figure 2 below shows a summary of the extinction status of 70 of the medicinal plants commonly used by the herbalists in Kawete village.

¹⁷ At the beginning of the discussion, I explained to the herbalists (in the mother-tongue) the definition of each of the concepts.



Source: Field data, August/September 2013

According to Figure 1, of the 70 medicinal plants commonly used by herbalists in Kawete village, majority of the plants (30 percent) were believed to be extinct. Eighteen percent had indeterminate status. Seventeen percent were endangered. While the medicinal plants with the vulnerable and least concern status were thirteen percent each, those which had a rare status were six percent, and only three percent were out of danger.

5.3 Causal factors of the extinction of medicinal plants

To identify the causes of the extinction of medicinal plants in Kawete village, I asked herbalists to describe what they believed to be the causes of the extinction of medicinal plants. The herbalists identified and described several causes leading to the extinction of plants of medicinal value. The causes are discussed in section 5.3.1–5.3.8.

5.3.1 Land tenure change

Herbalists in Kawete village blamed the loss of medicinal plants on the change in the land tenure system. An interview with a senior herbalist indicated that many people including the herbalists were gradually selling off part of their land for money to solve immediate household problems such as the payment of tuition or bride wealth for their children. This created a situation where households are left with plots of land instead of larger tracts. The herbalists stressed that the reduction in the land size from tracts to plots meant that the available small pieces of land were being cleared and restricted to cultivation and settlement. This had three main consequences on plant resources. First, landowners would cut down all the useful plants due to cultivation and settlement needs. Second,

following which would safeguard some plant resources and allow re-growth of specific plants was no longer possible due to decreased land sizes. Finally, selling land resulted in the new landlords denying former landlords access to the resources in the land. The following summarizes an interview with a widow who was working as a TBA, and supporting a family of fifteen in Kawete village:

We also do not have enough land; the tracts we used to own have been converted into plots. Most of us are selling the land bit by bit to solve family problems. With the big chunks we had, it was to practise fallows and this allowed us to leave some parts of our land uncultivated. We would at least find medicinal plants in the fallow areas; but this is no longer possible due to the reduced land sizes. And when you sell the land, that is the end of everything; the new land lord does not allow you to take any resource from it, whatsoever [...] (Interview with G.M: 29.8. 2013).

5.3.2 Sugar cane cultivation

In Kawete village, sugarcane cultivation as a new form of livelihood in the area (since the last six to ten years) was having devastating effects on medicinal plants. Most herbalists reported that the majority of people within Kawete were either engaged in extensive cultivation of sugarcane or were renting out their land to other individuals to cultivate sugarcane. Many inhabitants of Kawete village were clearing the shrubs, forest remnants and wetlands to establish sugarcane plantations. As a consequence, potential habitats of various medicinal plants were being degraded and lost during the process of preparing sugarcane fields. Photograph 1 shows one of the sugarcane plantations in Kawete village.



Photograph 1: A partly harvested sugarcane plantation in Nalukandwa swamp, Kawete village. Source: Field data, August/September 2013.¹⁸

According to interviews, the increased interest in sugarcane cultivation followed the establishment of Mayuge Sugar Industries (established in 2005) and Kaliro Allied Sugar

¹⁸ All the photographs presented in this study were taken by me during fieldwork.

Industries Limited (established in 2011) in the proximity of Kawete village. The farmers found it easy to turn to sugarcane cultivation because the factory owners were providing them with incentives in form of field ploughing, sugarcane seedlings, herbicides and pesticides. Although the cultivation of sugarcane seemed economically promising to other villagers in Kawete, it was threatening the occupation of herbalists by contributing to the disappearance of medicinal plants, as the head of Kawete Herbalists Association described:

We had a big forest in Bugaba. The forest had a lot of herbs but cultivators have cleared it. The whole area is now covered by sugarcane fields. Omuwaiswa (Maytenus senegalensis) was one of the abundant herbs in the forest in Bugaba but today, you cannot find any plant of its kind [...]. In the same forest, there was also another herb used to treat epilepsy; it also disappeared [...]. Now, it is only cultivation taking place, sugarcane has replaced the forest. We have remained with nothing (Interview with N.A:9.9. 2013).

In a similar vein, interviews also revealed that wetlands, which constitute one of the richest sources of medicinal plants in Kawete village, were undergoing rapid conversion. As a result, many medicinal plants were disappearing due to excessive pressure from wetland users. For example, herbalists reported that it was no longer possible to find Empangula (*Clematis hirsute*) in Nalukandwa and Bugaba swamps, which are the biggest swamps in the village. The herbalists attributed the rapid conversion of wetlands to the fact that they were the potentially most productive areas, allowing the growth of several other crops like rice and maize, as well as livestock grazing, in addition to sugarcane cultivation. Photograph 2 shows a case of conversion of Nalukandwa wetland to agricultural use in Kawete village.



Photograph 2: Clearing the swamp for rice growing in Kawete village.

5.3.3 Population increase in Kawete

The number of people inhabiting Kawete village had significantly increased during the past three decades, which created the need to clear more land for agriculture and

settlement. Interviews revealed that clearing more land for agriculture and settlement had led to a severe loss of habitats and eventually plants of medicinal value, as one of the senior residents who was also working as herbalist explained:

This village Kawete had very few people and was underdeveloped. The homesteads were isolated. There were no houses between Kawete and Namungalwe trading centre. I remember you could ride a bicycle all the way from Namungalwe to Kawete without coming across a homestead. The only thing you could see was the Cooperative society building, which was used to store seeds before distributing them to farmers. Kawete trading centre had two houses; one for Erusania and another for Erina at the present day Kawete weekly auction market site [...]. Not many buildings existed in Kawete at that time. All these places surrounding us were full of banana plantations. If it rained on you, our grandparents used to ask and compliment: 'Where did the rain find you? Did it find you in Kawete, the village without houses?' All these houses you see have been built during this regime of president Museveni. We were the first to build in this area here. Then, I remember another house was down in Nalukandwa valley; it belonged to Dr. Musana. Another house was in the next village, Nabitende [...] (Interview with B.M: 16.9. 2013).

Herbalists suggested that the severe population increase is due to high birth rates and in-migration. Interviews revealed that in-migrants were attracted to the village for several reasons. First, land was readily available at affordable prices. Second, new settlers hoped to benefit from the economic advantages brought about by the presence of the trading centre for trade in Kawete village, by engaging in simple trading to improve their income. In parallel to the overall population increase in Kawete village, the number of herbalists within the village increased as well. The number of herbalists reportedly increased from less than five herbalists in the 1970s to over fifty in the 2000s. The herbalists interviewed attributed the increase to the rise in the demand and popularity of herbal medicines. These factors have influenced many people in the village to turn to dispensing herbs as a potential form of livelihood. The following summarizes an interview with a senior herbalist and resident of Kawete village:

Before I became a herbalist in 1969, there were not many herbalists in this village. We had Gaba in Bugaba zone. We had another herbalist called Lukuutu. He was prominent for treating Kawongera (Sleeping sickness), a disease that killed many of our grandparents. Then, I also joined the group. If you did not want to visit any of us that time you had to visit herbalists in the neighbouring villages. There was Mukama Kyasaasa in Nabikoote village; there was Lukowe Bagiira in Bulumwaki village; and in Nawankonge village, there was Maganda who was later nicknamed Lusongerero. Those are the only herbalists I knew. But today as we talk, we are over fifty herbalists in Kawete. In Bugaba zone alone, there are over fifteen herbalists. There is Vikitoolo and

another Moslem herbalist called Ameri. Unfortunately I do not know some of them by name. But Ameri helps us a lot. He supplies us with the herbs that we cannot find in this village anymore (Interview with N.A: 9.9. 2013).

As the participant argued, the increase in the number of herbalists consequently meant increased exploitation of medicinal plants, leading to their extinction.

5.3.4 Invasive plants

Invasive plants in Kawete village were having devastating effects on other plants. Interviewed herbalists asserted that some plants such as *Kapanga (Lantana camara)*, *Kawunawuna (Vernonia cinerea)*, and *Kayongo (Parthenium hysterphorus)* had the capacity to outcompete other plants in specific areas. Herbalists quoted *Kasaitira (Zornia glochidiata)* and *Kafadanga (Euphorbia heterophylla)* as some of the medicinal plants outcompeted by *Vernonia cinerea*. The outcompeted plants were reportedly dying, leaving behind pure stands of the invasive plants, as one of the herbalists in Kawete revealed:

Like this grass we call Kawunawuna (Vernonia cinerea); other herbalists call it Lukowe, we use it as a herb but it is dangerous to other grasses; it grows in big, big, big numbers and in a wide area. When they grow in a specific area, other plants like Kasaitira (Zornia glochidiata) and Kafadanga (Euphorbia heterophylla) disappear from that area yet we also need them for medicine. And when Vernonia cinerea ceases to grow in that specific area, it is replaced by Kayongo (Parthenium hysterphorus), which is also a dangerous grass because it displaces other forms of grasses and affects crop production as well (Interview with N.P:2.9. 2013).

Interviews with the Iganga district Forest ranger and the Botanist at NCRL revealed that particular invasive plants have a serious degrading effect on some other particular plants. They asserted that invasive plants can lead to the extinction of specific plants. They explained that whereas some invasive plants like *Kapanga (Lantana camara)* prevent the growth of other plants due to dense canopies, some of the invasive plants tend to reproduce at a high rate, which makes them to grow out of hand and to colonize other plants. Unfortunately, although the herbalists were aware of the presence and effects of specific invasive plants, they could not explain their mode of dispersal.

5.3.5 Methods of resource use

Herbalists were convinced that poor methods of harvesting, processing, and administering medicinal plants and herbs were contributing to the extinction of many plant species of medicinal value. Observations and interviews revealed that some herbalists in Kawete were harvesting the entire bark of specific medicinal plants (see Photograph 3a and b).

Some herbalists would harvest all the leaves including the shoot. Other herbalists were reported to harvest all the roots (see Photograph 3c), and in extreme cases, some herbalists would harvest the entire plant.



Photograph 3a (Left): Excessive debarking of Omusambamaadhi (*Entada abyssinica*), an example of bad methods of harvesting medicinal plants. Photograph 3b (Centre): Omuyirigiti (*Erythrina abyssinica*) dried up due to excessive debarking. Photograph 3c (Right): Akawuna (*Gardenia aqualla*) hardly regenerating after the herbalists harvested nearly all its roots.

According to the herbalists, the methods of harvesting presented above have had a negative impact on some of the medicinal plants. The plants were drying up since their regenerative capacity had been compromised by harvesting the reproductive parts. The following summarizes an interview with one of the senior herbalists in Kawete village:

*Some herbalists climb the trees and cut off the tender leaves, or branches. Medicinal plants harvested in this manner hardly survive because the shoot has been cut off. Some people harvest all the bark of the tree, from bottom to top; round the plant. But some plants like Naibere (unidentified) end up drying if all its bark is harvested. Omuyirigiti (*Erythrina abyssinica*) is one of the species on high demand. But all the plants we had in this village have dried up due to poor harvesting methods. Some people cut all the roots, others collect the whole bark. One species had survived in the whole village but it has also dried because all the herbalists were harvesting from the same plant [...]. We also have herbalists who simply uproot the whole plant even when they intend to use just a part of it; nothing remains if you uproot. Then, some colleagues harvest even seedlings [...]. If we continue like*

this, I am afraid about the future [...] (Interview with N.S: 11.9. 2013).

The herbalists in Kawete village associated excessive debarking and harvesting of the roots and leaves to some specific plants being rare (Photograph 3a to c). The rarity of specific medicinal plants has forced many herbalists to depend on the few available species of medicinal plants in the village. According to an interview with a senior herbalist in the village, over-harvesting of rare medicinal plants was a consequence of the feeling some herbalists have that if they do not harvest enough, other herbalists would harvest the rest. The interview with one of the senior herbalists in Kawete village is summarized as follows:

If you spot a medicinal plant in a particular locality, you can hardly find it in the same locality after a few days because other herbalists will have harvested it. This has created a situation where herbalists opt to harvest massively for fear that they may not find the medicinal plant the next time, due to the high demand visa-vi the scarcity. Before medicinal plants started disappearing, herbalists would harvest and spare the plants (Interview with B.K.M: 10.9. 2013).

Interviews revealed that some herbalists would harvest premature plants (seedlings) to prepare herbs. However, an in-depth interview with the Botanist indicated that herbalists harvesting premature medicinal plants would require more plant materials to prepare adequate dosages while herbalists who harvested mature plants would require less plant material for the same dosage. They argued that the more herbalists harvest premature plant materials, the more they expose such plants to the risk of extinction. The interview with the Botanist is summarized as follows:

If a plant is mature, then there are more active constituents in it but if it is still young, it is less concentrated; so one would need more plant material to make medicine, [...] when the plant is mature one would harvest and use less of it and in this case extinction is regulated (Interview with N.N.M: 24.9. 2013).

Poor processing methods among some herbalists in Kawete have exposed many medicinal plants to the risk of extinction. Many herbalists were using wasteful methods to process herbs. For example, some herbalists were boiling medicinal plants without crushing or pounding them. However, as the Botanist argued, herbalists boiling crushed medicinal plants would require a smaller volume to extract healing ingredients compared to herbalist boiling medicinal plants without crushing or pounding them. The Botanist who had trained the herbalists in Kawete village in improved methods of handling herbs explained:

If herbalists use plants without crushing them, they use bigger volumes than they would use when the medicinal plants are crushed. Crushed herbs are more concentrated and easy to extract by boiling. But if the herbs are boiled without crushing them, a herbalist would need a bigger volume, which would eventually result in over-harvesting and eventually some medicinal plants would disappear as the herbalists continue to harvest bigger volumes but extracting less constituents (Interview with N.N.M: 24.9. 2013).

Furthermore, in Kawete village, most herbalists dry their herbs in direct sunshine as shown in Photograph 4.



Photograph 4: Drying herbs in direct sunshine.

However, as the Botanist explained, this form of processing and preserving herbs has a damaging effect: direct sunshine reduces the strength of the healing properties. The Botanist argued that reducing the strength of the healing properties would have two implications. First, the herbalists would harvest more plant materials in order to cure a specific illness. Second, specific illnesses would be treated for months instead of weeks. In either case, the botanist observed that the herbalists would be required to harvest more medicinal plants, which would eventually increase the vulnerability of such plants to extinction.

Although most herbalists in Kawete demonstrated adequate knowledge and skills of how to determine dosages of herbs, a section of the herbalists, particularly those who were joining the profession as a form of employment were quoted to lack adequate knowledge and skills to determine the right dosages. As a result, they were administering greater quantities of herbs to their clients. Interviews indicated that the herbalists who did not have adequate skills to determine appropriate doses were contributing to the extinction of specific medicinal plants by over-harvesting the plants to match their supplied quantities. With respect to this problem, one of the Botanists who had implemented a project concerning medicinal plants and biodiversity among herbalists in Kawete village said:

Local people are knowledgeable on the right doses. They know how to determine the appropriate doses. But there are people who are joining the profession of healing just for survival; those would use more herbs than what they are required to, because they are not knowledgeable about how to administer specific herbs. Some of them administer to their patients mugs instead of table spoons. You find that one is taking more than what she would have taken; like for this Ekikaka (Aloe lateritia), some people drink mugful of aloe drinks yet three table spoons are just enough for a day [...] (Interview with F. O: 24.9. 2013).

5.3.6 Cultural beliefs

During the interviews with many of the herbalists in Kawete village, they articulated the degrading effect of particular cultural beliefs on specific medicinal plants. They quoted some of the herbalists to be involved in observing taboos related to harvesting specific medicinal plants. The interviewed herbalists were convinced that some of the taboos being observed by certain herbalists would cause specific medicinal plants to wither and eventually to die. For example, the herbalists pointed out the taboo connected to harvesting the roots of *Omwerula (Aristolochia elegans)*, a medicinal plant used by herbalists to induce blessings. The taboo deters the herbalists from digging back the soil to cover the remnant roots of *Aristolochia elegans* after harvesting the desired quantity of herbs. An in-depth interview with one of the herbalists revealed the logic: the herbalists reported to be observing this taboo believed that the herb would not be effective since the act of digging back the soil to cover the exposed roots of *Aristolochia elegans* was equated to burying the blessings. Thus, to dig back the soil would 'invalidate' the herb just as burying is synonymous with 'the end of life'. As a result, the affected medicinal plants, such as the above, would wither and eventually disappear by drying up, since the failure to cover the exposed roots would compromise the capacity of the plant to recover, as one of the senior herbalists in the village said:

Some herbalists do not cover the roots of Omwerula (Aristolochia elegans), as one of the taboos related to our traditional medicine. They believe that if they cover them, they are burying the blessings they intend to induce. So for the herb to be effective, they must not dare to cover the remaining roots of the surviving plants. Many plants dry because of this taboo but we cannot change because our grandparents observed this taboo as well (Interview with N.A: 9.8.2013)

5.3.7 Commercial exploitation and external demand

Most herbalists believed that exploitation of medicinal plants for commercial purposes was contributing to the extinction of some medicinal plants. Interviews indicated that many people, both herbalists and non-herbalists were engaged in collecting medicinal plants from rural areas including Kawete village. The herbalists believed that some of the people collecting the medicinal plants were herbalists operating big herbal clinics in major towns like Kampala. They also suspected that the herbalists operating from towns would collect the medicinal plants for export. The following summarizes an interview with a herbalist in Kawete village:

There are some herbalists operating from big towns like Jinja, Kampala. They send people to the villages to harvest for them medicinal plants. They promise big sums of money to the people they send to the villages. I have a nephew. He lives in Nabitende-Banada. He is not a herbalists; but his in-laws live in Kampala. They are herbalists. Usually, they send him a list of medicinal plants they want. When he gets the list, he comes home and spends a month going around the village to harvest specific medicinal plants. Sometimes he pays some people to help him collect the herbs. He goes everywhere; even to the neighbouring villages. When he has harvested enough medicinal plants, he loads them on a lorry to transport them to Kampala [...] but we hear some herbalists export herbs to other countries like Southern Sudan; Tanzania; and we hear that some export herbs to South Africa (Interview with N.P: 3.9. 2013).

The herbalists suggested some reasons to explain the intensification of commercial exploitation of some medicinal plants. They pointed out that commercial exploitation of medicinal plants was largely due to increased demand for specific plants by companies which were involved in the manufacture of herbal soaps and jellies. In addition, they quoted some companies like Bidco Uganda Limited¹⁹ to be depending on *Omukunhu* (*Ficus sycomorus*) as raw material for the manufacture of plastic products including rubber sandals (locally known as 'Bidco'). Consequently, the company was traversing villages to search for *Ficus sycomorus*, a plant which was also being used by herbalists for medicinal purposes (for an example, see Appendix 3). Herbalists in Kawete village also stressed that many medicinal plants were being lost by cutting down *Ficus sycomorus* since it would support the undergrowth of several other species of medicinal value, including creepers such as *Engulukira y'okumukunhu* (*Diaphanathe fragrantissima*). An in-depth interview also revealed that specific medicinal plants like *Omusita* (*Albizia coriaria*), *Omusaali* (*Symphonia globulifera*) and *Naibere* (unidentified) were commercially exploited due to other uses like firewood, handcrafts and timber or poles in the village.

¹⁹ Bidco Uganda Limited is a factory which produces products such as oil, soap and other plastic products. The Jinja complex was established in 2005. See www.bul.co.ug/about-us.html for more information about Bidco Uganda Limited, Jinja.

Consequently, the medicinal plants mentioned above were increasingly becoming exposed to extinction, as one of the herbalists said:

We do not have freedom because of people cutting down trees to burn charcoal, to get timber and poles for construction. We also have this company called Bidco. It is another threat. They have cut all the species of Ficus sycomorus in this village. Even our neighbouring villages are complaining about the same. I hear that Bidco uses Ficus sycomorus as a raw material to produce jerrycans and rubber shoes. Cutting down Ficus sycomorus is a serious problem because many medicinal plants like Oluganiraganira (Desmodium gangeticum) and Ekifu (Vernonia cistifolia) and many others grow under this tree. And others creep on it, but when it is cut down all these plants are affected. They die. Bidco is indeed a big threat to us (Interview with B.M: 16.9. 2013).

5.3.8 Increased disease outbreak

The herbalists in Kawete village perceived increased incidences of diseases as being among the causes of the extinction of many of the medicinal plants. Interviews, review of documents and observations revealed that herbalists were receiving an increasing number of people consulting them on a range of diseases including malaria, syphilis, ulcers, high and low blood pressure as well as diabetes. At the same time, the scope of social and cultural problems, for example marriage instabilities, the search for blessings and spirit possessions, which require the intervention of herbalists, were rampant in the community. The herbalists observed that the increased number of people seeking herbal remedies has had a negative bearing on the status of medicinal plants. This was because the herbalists were compelled to harvest more medicinal plants to meet the increasing healthcare needs of the members of their community. This eventually resulted in cases of extinction of a variety of medicinal plants.

In brief, the factors responsible for the disappearance of medicinal plants in Kawete village include the changing land tenure system, sugarcane cultivation, increased population of the inhabitants as well as the herbalists in the village, invasive plants, and poor methods of resource use. Specific cultural beliefs, commercial exploitation of medicinal plants and increased outbreak of diseases were also among the reasons leading to the extinction of various medicinal plants.

Chapter Six: Coping with extinction: strategies of the herbalists and stakeholders

Although many medicinal plants were becoming extinct, the herbalists in Kawete village were able to continue meeting the healthcare needs of their community members. This chapter explores how the herbalists were able to continue meeting the healthcare needs of their community, in spite of medicinal plants disappearing. It also discusses various stakeholders working with the herbalists in Kawete village to promote herbal medicine.

6.1 Herbalists' coping strategies

To answer the question regarding how herbalists in Kawete village were coping with the extinction of medicinal plants, I asked them to explain the strategies they were employing to sustain the practice of using herbal medicine. Various strategies as described by the herbalists are presented in the following sub-themes.

6.1.1 Cultivation of medicinal plants

In Kawete village, cultivating medicinal plants by herbalists had turned out to be the priority strategy to cope with the extinction of particular medicinal plants. The herbalists were highly involved in domesticating specific plants. For example, observations and interviews revealed that most herbalists interviewed had planted several species of *Entaseesa (Prunus Africana)* and *Toddalia asiatica*. To cultivate the medicinal plants, the herbalists put more emphasis on bringing specific medicinal plants from the wild into their home gardens. One of the herbalists who had established a herbal garden in his home in Kawete village said:

We get medicinal plants from the wild to our homes, in our herbal gardens. We are mobilizing all herbalists to establish backyard herbal gardens. We have tried to plant Entaseesa (Prunus Africana) and Toddalia asiatica with the help of some researchers from Universities. This is better than relying on the forests because cultivators are cutting them down. Bush burning has also destroyed many plants of medicinal value (Interview with B.M: 9.8. 2013).

While most herbalists interviewed had established medicinal herb gardens within their homes, some were still in the process of establishing them. The gardens, which varied in size, were established as backyard gardens. Observations further revealed that some herbalists were integrating medicinal plants into their crop fields; especially coffee and banana plantations, as shown in Photograph 5a and b. Other cultivation initiatives were

observed at the Kawete Community Centre for Traditional Medicine where herbalists had established a demonstration herbal garden.



Photograph 5a (left): Herbalists showing some of the medicinal plants grown in a banana and coffee plantation. Photograph 5b (right): A herbalist identifying some of the medicinal plants in her backyard herbal garden.

Some herbalists had established their herbal gardens around their shrines. Others established them in the graveyards. An in-depth interview with one of the senior herbalists revealed that graveyards and shrines were preferred by most herbalists as sites for herbal gardens because they are usually out of bounds to non-family members. The herbalists strongly believed that such an approach would guarantee the security of some of the medicinal plants from other outside users. However, most herbalists in Kawete village were facing several challenges in attempting to cultivate particular medicinal plants. On the one hand, some medicinal plants were difficult to propagate, requiring the expertise of a specialist. On the other hand, some medicinal plants were restricted to specific areas, that is to say, they thrive in specific conditions. In an interview with a herbalist who had the largest herbal garden in Kawete village, it was revealed that:

Some medicinal plants grow in restricted conditions; like this plant called Kagaya (unidentified), it grows near the swamp or the lake. It is difficult to domesticate it because most of us lack access to a wetland, yet the plant is multipurpose. We use it to treat stomach pain, loss of appetite, yellow fever, and measles. Another plant

called Lukiiko (unidentified) survives only in rocky areas (Interview with N.A: 9.9.2013).

Herbalists in Kawete were well informed of their culture. They knew and observed a range of cultural beliefs and practices associated with medicinal plants. However, certain beliefs had a negative influence on the cultivation of specific plants of medicinal value, particularly in the home gardens of the herbalists. For example, although herbalists attached high medicinal value to plants like *Kyasango* (unidentified), *Oguwaani ogunene* (unidentified), *Sekabembe* (unidentified) and *Kikondoolo* (unidentified), they would not cultivate them in their home gardens. The herbalists associated the above plants with misfortune. For instance, herbalists believed that the household head would die if the roots of *Sekabembe* were allowed to grow up to the house, as one of the herbalists asserted:

In most homes where they (Sekabembe) exist, the family heads there died (Interview with D.K: 20.9. 2013).

Secondly, cultivating *Sekabembe* in home gardens also had to be accompanied with annual sacrifices as a way of minimizing its negative consequences to the household members. Most herbalists claimed that they would not cultivate *Sekabembe* because they could not sustain the annual sacrifices. As a consequence, they had to abandon the domestication of *Sekabembe*. *Kikondoolo* was associated with many taboos: pregnant women and breast feeding mothers were prohibited from being in contact with the plant. The herbs obtained from *Kikondoolo* were never pounded from home and squatting or urinating near the plant was prohibited. The herbalists revealed during the focus group discussion that the consequences of violating any of the above restrictions ranged from serious illness to death. Consequently, herbalists did not cultivate these medicinal plants because they did not wish to expose their families to danger.

6.1.2 Formation of collaborative networks

Herbalists in Kawete village had established collaborative networks among themselves to enhance their ability to cope with the scarcity of medicinal plants. The networks, both within and beyond Kawete village, helped the herbalists in several ways. The herbalists used the networks to exchange information concerning the presence of medicinal plants in an area and the uses of those plants, since they believe that some plants can be used to cure a range of diseases. Through the networks, the herbalists were able to support each other with the herbs they did not have at a given time for a specific ailment. Some networks extended beyond Kawete village and herbalists used those to secure access to

areas and accommodation while in a foreign land harvesting medicinal plants, as one of the herbalists said:

We try to exchange information about medicinal plants and the diseases they cure because some herbalists use different medicinal plants to cure a particular disease. Some medicinal plants can cure more than one disease but a herbalist may not know all the diseases. We contact fellow herbalists to help us to get medicinal plants we are not able to find in Kawete. When we go to places like Luuka, our colleagues there are so helpful. They lead us to the forest; they accommodate us and most important they introduce us to the local authorities for security reasons (Interview with N.A: 9.9. 2013).

However, the herbalists discussed some challenges connected to the networks. For instance, some herbalists were not willing to share details concerning the use and availability of some medicinal plants. Interviews revealed that some herbalists hesitated to share information because of the need to protect and control some of their traditional knowledge about herbs. Other herbalists feared to lose some of their clients to their colleagues consequentially reducing their income. The views of a TBA in Kawete village concerning the challenges associated with collaborative networks are summarized as follows:

Herbalists are hard people to deal with. It is very difficult for a herbalist to reveal all the information concerning the medicinal plants he knows. If he mentions the first medicinal plant, the second one and the third one as well as the corresponding disease, he will omit the medicinal plant he believes to be the most effective. That is how we herbalists work to safeguard our knowledge. This makes sharing information about healing and medicinal plants difficult” (Interview with G.M: 29.8. 2013).

6.1.3 Out-sourcing medicinal plants

The herbalists in Kawete village were depending on out-sourcing as a strategy to cope with the disappearance of medicinal plants. Interviews indicated that each of the herbalists regularly travelled beyond Kawete village to collect particular medicinal plants, as one of the herbalists said:

If I want to harvest medicinal plants, I have to go to places like Luuka, which still have some medicinal plants. When I go to Luuka, I spend about three days searching and harvesting medicinal plants. If I fail to get specific medicinal plants from Luuka, then I have to go to Bukooli (Interview with N.A: 9.9. 2013).

The herbalists named several places they would visit to collect medicinal plants. For example, they named Maghembe in Luuka, Bukooli, Budioppe, Bulamogi, Bunha and

Mabira. The places are located in distances that range from 35km to 130 km from Kawete village (see Table 3). As earlier mentioned, the networks among herbalists play a crucial role in making this strategy viable.

Table 3: Names and distances of places visited by herbalists to collect herbs

S/no	Herbs collected from:	Estimated distance in Km
1	Maghembe/Luuka	35
2	Bukooli	42
3	Bunha	51
4	Budiope	130
5	Mabira	60
6	Bulamogi	38

Source: Field data, August/September 2013

Although the herbalists would acquire desired medicinal plants by out-sourcing, they argued that the approach was time consuming since they had to spend between three days and two weeks on a single trip to collect medicinal plants. Besides, they would also incur a lot of costs in terms of transport. This had resulted in two consequences. First, the herbalists would not attend to their patients as much as required. Second, most herbalists would increase the charges on their healing services.

6.1.4 Buying the herbs from markets and hawkers

Buying herbs from vendors and hawker (people who move from village to village and from town to town selling herbs) was one of the ways through which herbalists were trying to cope with the challenge of the scarcity of medicinal plants. The herbalists interviewed revealed that specific medicinal plants which had disappeared from the village were being accessed by buying from nearby markets and hawkers of herbs, as one of the herbalists in Kawete said:

According to how medicinal plants have disappeared, I buy most of the herbs. I buy Omutaamataama (Ficus dicranostyla). This herb is no longer available in our village, Kawete. It is completely not seen. I buy some herbs from Kawete weekly auction market or from the market in Iganga Town. There are some people operating stalls of herbs. I also buy Omukundaanume (unidentified); but this particular herb is hard to find even in the markets. Others herbs I buy are Omusaali (Symphonia globulifera), Katasubwa (Acacia senegal), Omukondwa (Securidaca longepedunculata) and Omuzikiiza (unidentified) (Interview with N.A: 9.9. 2013).

Most herbalists bought the herbs from vendors who visited Kawete auction market (see Photograph 6a). Herbalists also cited Iganga market as another important source of the herbs. Field observations confirmed the views of the herbalists: Some people were operating permanent stalls of herbs in Iganga Central Market and Iganga Old Market Street (see Photograph 6b). In addition, some herbalists were buying herbs from hawkers. As witnessed during the fieldwork, some hawkers would visit the herbalists' homes to sell to them the herbs.



Photograph 6a (Left): Selling herbs in Kawete auction market. Photograph 6b (Right): A stall of herbs along Iganga Old Market Street.

6.1.5 Diversification of income sources

The main source of income for most herbalists was fees from patients and clients. While some of the herbalists were already experiencing a decrease in income resulting from lack of herbs, it had not yet affected others, although they anticipated a decrease in their income, too, as many medicinal plants continued to become extinct. They argued that although there would still be many patients, they would not be able to obtain money from them through healing due to lack of herbs. In order to address this economic effect resulting from the extinction of medicinal plants, herbalists were diversifying their income. Many herbalists were getting involved in additional income generating activities. Some herbalists were operating small restaurants in Kawete trading centre, in addition to other commercial activities. Most of the herbalists interviewed were members of a village Savings and Credit Cooperative Organization (SACCO). Observations further showed that herbalists had established a savings project, with membership restricted to herbalists only. In the savings project, each herbalist was required to deposit an equivalent of 0.45 US Dollars on a weekly basis.

6.1.6 Partnerships with organizations

The herbalists in Kawete village, through their Centre for Traditional Medicine, were attempting to establish partnerships with several organizations that would build their capacity to address the challenges caused by the extinction of medicinal plants. As revealed by the chairperson of Kawete Herbalists Association, some partnerships had been established with the Natural Chemotherapeutic Research Laboratory (NCRL), the National Agriculture Research Organization (NARO), various Universities, the National Environment Management Authority (NEMA), and Non- government organizations such as Uganda Reach the Aged Association. The details of how each organization was supporting the herbalists to address the challenge of the extinction of medicinal plants are presented in section 6.2.

6.1.7 Minimization of herb waste

In Kawete village, herbalists were embarking on a project to minimize the amount of herbs wasted as one of the ways to address the challenge of extinction. The minimization strategies were focusing on specific aspects of harvesting, processing, preserving and administering herbal medicine. For example, herbalists were using local materials such as jackfruit seeds and blackjack (*Bidens pillosa*) to preserve the herbs, especially those which were prepared in liquid form. Interviews revealed that the shelf life of the herbs went from one week or less without preservatives to a period of one to two months with the preservatives. In addition, the herbalists were changing from using uncrushed herbal materials to crushed or powdered herbal materials which were easy to quantify, store, preserve and to extract active healing ingredients. Furthermore, they were changing from drying herbs in direct sunshine to drying herbs under shades. Interviews revealed that drying herbs in direct sunshine would reduce the strength of specific herbs. The following summarizes an interview with one of the successful herbalists in preserving herbs using local materials:

We are trying to preserve the medicine using local knowledge. We use jackfruit seeds. We also use Obukaala (Bidens pilosa). When we boil the medicine, we boil it together with the leaves of blackjack. The medicine can stay for a month without going bad. We also sun-dry and pound the jackfruit seeds to form powder. Then we boil this powder together with the medicine. For this one, the medicine can stay for at least two months without going bad. We also try to process most medicinal plants into powder form because this form of medicine hardly goes bad compared to medicine in liquid form, and also, it's easy to store. We also use Avocado (Persea Americana) seeds in the same way as Jack fruits to preserve medicine. Sun-drying is also a form of preserving medicine but one has to be very careful because direct sunshine

reduces the healing matter of some herbs. Some medicinal plants must be used in a fresh form, for example, the herb for the treatment of cataract. Most herbalists dry the herbs by spreading them on rocks. But through trainings by NCRL, we learnt that direct sunshine affects the medicine by reducing the strength of the healing properties (Interview with K.D: 19.8. 2013).

6.1.8 Family based apprenticeship

Family based apprenticeship in Kawete village was being adopted by some herbalists to address the extinction connected with loss of knowledge concerning plants of medicinal value. Observations and interviews indicated that some herbalists were involving members of their respective families in the different activities connected with herbal medicine. Some herbalists would send their wives and children to harvest and process herbs for the clients. In some cases, they prescribed and administered the herbs to the clients in the presence of other members of the family. Interviews revealed that the herbalists intended to ensure that their children would continue the profession in future, as a Traditional Birth Attendant in Kawete village said:

I am trying to teach my all my children, regardless of their age. I teach them how to heal people. I show them the relevant medicinal plants and tell them corresponding ailments. I tell them how to use specific herbs because some herbs need a lot of care. My children will have to continue with this job in future, when I am too old or when I die (Interview with G.M:29.8. 2013).

However, specific herbalists were still hesitant to pass on the knowledge of healing to other family members. According to interviews, many herbalists had the fear that some members of their families, especially children, were bound to reveal the knowledge of medicinal plants to outsiders. They were convinced that this would reduce the number of their clients and consequentially their income. On the other hand, although some of the herbalists were willing to pass on the knowledge of healing to their children, they encountered a dilemma: The younger generation did not show interest in the profession. Instead, they preferred to study for 'better' occupations compared to traditional healing.

In summary, the herbalists have adopted a range of strategies to cope with the scarcity of medicinal plants. Cultivation of medicinal plants, formation of collaborative networks, outsourcing medicinal plants, buying herbs from the markets and diversification of income sources were some of the strategies. Other strategies included partnerships with organizations to strengthen the capacity of the herbalists so that the herbalists themselves can address the challenge of extinction, minimization of herb waste, and family based apprenticeship.

6.2 Supporting herbalists: stakeholders and roles

As mentioned in section 6.1.6, several organizations were getting involved in supporting herbalist in Kawete village to address the extinction of medicinal plants. Some of the organizations were focusing on specific aspects of herbal medicine rather than directly addressing the extinction of medicinal plants. The roles of various organizations are presented under the following headings.

6.2.1 Natural Chemotherapeutics Research Laboratory (NCRL)

NCRL is Uganda's designated organization for carrying out research on medicinal plants and herbal medicine. The organization, which mainly targets herbalists, works with herbalists to promote herbal medicine. Interviews and documents reviewed during the study revealed that through advocacy and lobbying, NCRL implemented the Medicinal Plants and Biodiversity Uganda (MPBU) project in Kawete village, funded by the International Development Research Centre, Nairobi. The project was implemented between 1990 and 2005. It was set to achieve various objectives including assessing the collection, trade, and conservation status of medicinal plants. The project resulted in the establishment of Kawete Community Centre for Traditional Medicine. The Centre serves as the focal point for NCRL to support the herbalists in Kawete village to promote herbal medicine. For example, through the centre, NCRL sensitizes and trains herbalists in: conservation of medicinal plants, preparation and preservation of herbal medicines using local preservatives, basic knowledge of botany, sustainable methods of harvesting and post-harvest handling of plant materials, as well as propagation methods of specific medicinal plants. In addition, NCRL was using the centre as a means for researching into, improving and documenting the knowledge of herbalists concerning medicinal plants and their usage. However, the herbalists were divided over who would benefit from the activities which were taking place at the centre. As one of the herbalists explained, herbalists associated with the use of supernatural powers were discriminated by herbalists who were not using supernatural powers. As a result, the herbalists associated with the use of supernatural powers had limited opportunities to participate in the training and sensitization activities.

6.2.2 National Agricultural Research Organization (NARO)

NARO is the organization responsible for the guidance and coordination of all agricultural research activities in Uganda's agricultural research system.²⁰ In 2013, the institution worked with the herbalists in Kawete village to identify and assess plants based on their

²⁰ See www.naro.go.ug/ for more information about NARO.

nutritional, health and income values. Interviews and a review of documents showed that they also worked with herbalists to categorize medicinal plants according to their degree of scarcity.

6.2.3 Universities

Through Kawete Community Centre for Traditional Medicine, various Universities were conducting research on medicinal plants in conjunction with the herbalists in the village. The universities included Dar Es Salaam, Nairobi, Makerere, the Norwegian University of Life Science, and Kanazawa University. Three of the Universities (Dar Es Salaam, Nairobi Makerere) focused on the medicinal value, domestication and processing of specific plants like *Toddalia asiatica*. The Universities provided seedlings of *Toddalia asiatica* to the herbalists to enable them to grow the plant. They donated a milling machine to help the herbalists to process herbal materials into powder form, and a solar drier to help the herbalists to minimise drying herbs under direct sunshine. Unfortunately, the lack of power in the Centre was a major setback to the utilization of the milling machine since 2007, when it was donated and installed by Makerere University on behalf of the other universities. In addition, the carrying capacity of the solar drier was too low to meet the drying needs of all the herbalists in the village.

6.2.4 Uganda Reach the Aged Association (URAA)

URAA is a voluntary not for profit non-government agency working towards improved quality of life and the preservation of the dignity of older people in Uganda.²¹ URAA was mainly concerned but not limited to capacity building, advocacy and influencing the policy in relation to Uganda's elderly population. Interviews indicated that that URAA targeted the herbalists because they were composed of mostly old people. As witnessed during field work, URAA was supporting the herbalists in Kawete village by building their capacity to improve on herbal medicine practices. For instance, they trained herbalists in how to process, package and label the herbs. URAA mobilized the herbalists to establish shelves for storing herbs to minimize the quick expiration of herbs resulting from poor storage. At the national level, URAA was one of the arms influencing and establishing a policy on herbal medicine and the National Council for Herbalists in Uganda, by engaging in discussions with the Ministry of Health and parliament. Some herbalists were applying some of the skills acquired though with a range of constraints.

²¹ See www.eldis.org/go/home&id=44274&type=Organisation for more information about URAA.

6.2.5 National Environment Management Authority (NEMA)

NEMA is Uganda's central authority established in 1995 to manage the current environment and to protect it from further degradation²². As revealed by the herbalists in Kawete village, NEMA supported them by supplying seedlings of some medicinal plants that are difficult to propagate. Specifically, NEMA provided seedlings of *Prunus Africana* to most herbalists in the village to establish home gardens of medicinal plants.

In summary, there were at least six stakeholders involved at various levels in supporting herbalists to address the challenge of medicinal plants becoming extinct. They include the Natural Chemotherapeutics Research Laboratory, National Agricultural Research Organization, Universities, Uganda Reach the Aged Association, and the National Environment Management Authority.

²² See www.nemaug.org/reports/Current_reports/NEMA_s_role.pdf for more information about NEMA.

Chapter Seven: Discussion and conclusive remarks

7.1 Perception of the extinction of medicinal plants

The herbalists in Kawete village perceive the extinction of medicinal plants in closely related but differing perspectives (see Table 2). Although the perspectives and coping mechanisms differ, they all have one primary characteristic in common: The herbalists have restricted access to specific medicinal plants. The variations in how herbalists perceive the extinction of medicinal plants reveal two broader perspectives of extinction, the physical perspective and the intellectual property perspective. In terms of the physical perspective, particular plants gradually disappear. In terms of the intellectual property perspective, knowledge concerning the identity and use of specific medicinal plants is gradually lost. Other groups in East Africa are experiencing similar situation, with the loss of plants. The Pokots of northern perceive the loss of vegetation in many terms that are similar to those of the herbalists in Kawete village. The Pokots identify vegetation loss in two perspectives, the physical perspective where “specific plants are lost [...] and a supernatural” perspective (Bollig and Schulte 1999:498).

The extinction of medicinal plants perceived in terms of knowledge loss is likely to intensify in the next decades. This is because the young people who, in other circumstances would receive knowledge from and continue the practice alongside their parents dismiss and disregard traditional systems (see 6.1.8). Rather, they prefer the conventional methods of healing, such as going to a hospital or to see a modern doctor. Moreover, the dependence on the memory of elderly persons as a source of knowledge about herbal medicine poses another danger of knowledge extinction. As Keitumetse et al. (2011:158) referring to Connerton (2008) observe, the main challenge facing memory as a source of knowledge is forgetting.

The indicators of the extinction of medicinal plants identified and described by the herbalists in Kawete village (presented in 5.1.1) reveal several facts. They reveal that the herbalists in Kawete village are experiencing the challenge of specific medicinal plants becoming extinct. They reveal that the herbalists are conscious and knowledgeable about the concept of extinction. It also suggests that the extinction of medicinal plants in Kawete village is increasingly becoming severe and calls for effective and efficient counter measures.

7.2 Extinct medicinal plants

While herbalists believed that 21 of the 70 medicinal plants identified in the current study are extinct from the village, the majority of the medicinal plants are either endangered or vulnerable or rare (Figure 1 and Appendix 3). This status points to the fact that more

medicinal plants are likely to become extinct if the factors responsible for the extinction of medicinal plants (see 5.3.1–5.3.8), are not controlled. Notably, only two of the 70 medicinal plants are out of danger; this suggests that the magnitude at which the herbalists are addressing the challenge of medicinal plants disappearing is still very low.

A significant proportion of herbs are prepared from either the roots or leaves or the bark of particular medicinal plants (see Appendix 3). This increases the risk of some medicinal plants becoming extinct especially if herbalists continue to use unsustainable methods (presented in 5.3.5) to harvest the plants. Tabuti et al. (2003:40), referring to Dhillion and Amundsen (2000), Dhillion and Gustad (2003) and Shrestha and Dhillion (2003), present a similar concern. These authors argue that a “selection of [...] plant parts such as roots, [...], or reproductive plant parts [...], for use as herbal medicines can threaten plant populations [...]”(ibid.).

7.3 Causes of extinction

The factors responsible for the extinction of medicinal plants in Kawete village are mainly anthropogenic in nature. The factors emerge at two levels: First, the internal level where herbalists are themselves responsible for the extinction of certain medicinal plants and second, at the external level where other members within the community contribute to the extinction of medicinal plants. At both levels, most factors leading to the extinction of medicinal plants as established in the current study confirm the findings of other studies. For example, in Kawete village, extensive agriculture and invasive plants (discussed 5.3.2 and 5.3.4 respectively) had a destructive effect on plants resources. Ehrlich and Ehrlich (1981); Cronk and Fuller (1995: 4); and Diamond (1989: 474) make similar observations in South Africa (see Chapter Two).

In contrast, specific findings in this study disagree with some of the findings of other studies. For instance, Keitumetse et al. (2011: 160) referring to Colding and Folke (2001) and Baidu (2008) discuss that cultural aspects such as taboos as have a key role in the conservation of natural resources. In the current study, specific taboos and other cultural beliefs (discussed in 5.3.6 and 6.1.1 respectively) are reported to have a degrading effect on the plant resource and conservation initiatives in Kawete village.

7.4 Coping with extinction

The herbalists in Kawete have adopted a range of coping strategies to address the challenge of medicinal plants disappearing. On the one hand, strategies such as the cultivation of medicinal plants in home gardens and in graveyards seem to promote a sustainable supply of plant resources. Many communities in Uganda and beyond have resorted to the cultivation of medicinal plants to save them from further disappearance.

For example, in Nabikoote and Mwendanfuko villages, which are neighbouring villages to Kawete, the traditional healers and women cultivate medicinal plants as a conservation strategy (see Nalumansi et al. 2014: 7). In Ghana, traditional health practitioners cultivate “plants of spiritual significance” in their villages (Cunningham 1997: 127). The cultivation of medicinal plants in graveyards concurs with the findings of the Cultural Research Centre (2003: 148) which shows that specific plants are grown in graveyards to save them from extinction. In Indonesia, the cultivation of medicinal plants in the homes of herbalists, implemented under the concept of *Taman Obat Keluarga* (TOGA)²³, has had a fundamental role in the survival of herbal medicine (Slikkerveer and Slikkerveer 1995: 22-29; see also Hamilton and Hamilton 2006: 96). A similar approach focusing on the cultivation of scarce herbs in “communal gardens or kitchen gardens” was adopted in Thailand (Cunningham 1997: 127; Amanda and Wondergem 1992: 29).

The herbalists have created collaborative networks among themselves. Pretty emphasizes the advantages of social networks, describing such networks as “social capital and collective action” (Pretty 2002: 69). He focuses on the low costs of working together and how cooperation can be utilized to enhance a sustainable management of resources (ibid.), in this case plant resources.

On the other hand, some coping strategies such as out-sourcing and buying herbs from the markets (discussed in 6.1.3 and 6.1.4 respectively) adopted by herbalists to resolve the extinction challenge would not contribute to the sustainable supply of medicinal plants. Instead, they appear to perpetuate and compound the extinction problem beyond Kawete village. This is because the herbalists and vendors of herbal medicine are likely to continue harvesting the medicinal plants using the same methods which have a devastating effect on plants (discussed in 5.3.5.1). In Bulamogi, which is one of the areas visited by herbalists to collect medicinal plants (see Table 3), plants such as *Sarcocephalus latifolius* have “disappeared in four of the sub-counties, and remain only in Nawaikoke sub-county” (Tabuti et al. 2003: 40). These authors attribute the disappearance of medicinal plants to the use of unsustainable ways of gathering plant resources (ibid.).

7.5 Stakeholders

The various stakeholders (presented in 4.6.1) which have so far supported the herbalists in Kawete village to promote herbal medicine represent a diversity of expertise. It is everyone’s hope that this expertise will promote effective conservation of plant resources in Uganda’s rural communities including Kawete village. The need for expertise in sustainable management of resources like medicinal plants is highlighted by Amanda and

²³ According to Slikkerveer and Slikkerveer (1995:15), *Taman Obat Keluarga* (TOGA) refers to Family Medicinal Gardens (FAME Gardens).

Wondergem (1992). They stressed that in Thailand, “it was necessary to develop specific expertise on soil management, cultivation of rare species, and on storage and preservation of products” (ibid.: 29). In spite of the fact that herbalists in Kawete village have access to a range of experts in various fields of conservation, the herbalists reported several negative challenges related to the cultivation of specific medicinal plants (see e.g., 4.4.1). This suggests that these stakeholders seem not to address specific needs of the herbalists concerning the cultivation of medicinal plants. If they do, then the herbalists appear to find it difficult to implement the relevant skills and procedures.

7.6 Conclusion

In this study, I have explored how herbalists in Kawete village cope with the challenge of the extinction of medicinal plants and its likely consequences. Medicinal plants are a vital resource in Kawete village. The majority of the people in the village rely on them for their healthcare needs. Furthermore, medicinal plants are an essential means of livelihood to the herbalists in Kawete village. The herbalists believe that some of the medicinal plants they commonly harvest to prepare herbs are extinct while the majority of the plants face a high risk of extinction. The herbalists demonstrated detailed knowledge about the concept of extinction; they perceive extinction as the physical disappearance of plants of medicinal value and the loss of knowledge regarding how specific plants can be used for medicinal purposes. There are several indicators in Kawete village which confirm the fact that the herbalists in the village are witnessing the extinction of medicinal plants, and experiencing the effects. The reasons for the extinction of various medicinal plants stem from both the herbalists themselves and from the wider community. The herbalists in Kawete village have adopted various strategies to cope with the challenge of medicinal plants becoming extinct. However, specific strategies such as out-sourcing and buying herbs from the market can only offer short term solutions. The herbalists in Kawete village have attracted the concern of various stakeholders. The expertise rendered by these stakeholders must be tapped into to effectively address the loss of medicinal plants in Kawete village.

7.7 Recommendations

Herbalists in Kawete village have adopted several coping strategies that enhance sustainable utilization of medicinal plants. Although some strategies (e.g., buying herbs from markets and out-sourcing herbs) do not comprehensively address the issue of medicinal plants becoming extinct, the stakeholders working with the herbalists should examine and build on specific strategies that contribute to the effective conservation of medicinal plants. Some of the current strategies as applied by the herbalists constitute an essential background which can be developed to enhance the capacity of the herbalists to

address the impending extinction and its likely consequences. In addition, the herbalists must intensify their effort on specific strategies (e.g., the cultivation of herbs) to enhance sustainability of plant resources as well as environmental protection.

The stakeholders working with the herbalists to reverse the current trend of extinction of medicinal plants should prioritize a needs assessment approach during the planning and implementation of community projects geared towards saving plants from extinction. Assessing the needs of a specific community, in this case Kawete village, would help to identify conservation needs, challenges and priorities. The following list illustrates some of the important questions to be considered by organizations helping rural communities like Kawete for the effective conservation of plant resources: Who are the resource users? What is their socio-economic and formal educational status? Are plant resources harvested for commercial or subsistence purpose, or both? Which plant resources have a high demand and value (culturally and economically)? Who controls access to the plant resources (now and in the past), and what are the relevant village institutions? What are the effects of harvesting on plant populations and which species are most vulnerable to overexploitation? (Hamilton and Hamilton 2006:228, following Cunningham 1997a and 2001a).

Some countries in Africa and in other parts of the world have successfully developed systems to enhance the constant supply of medicinal plants to meet the healthcare needs of their respective communities. In Ghana, herbs are cultivated in family herbal gardens (Amanda and Wondergem 1992: 29) although the scale of cultivation needs to be increased. In Indonesia, medicinal plants are cultivated by families living in rural communities (see Slikkerveer et al. 1995: 14–15). These systems both have a positive effect on the maintenance and availability of medicinal herbs. Such systems should be evaluated and considered for application in Uganda's rural communities. The systems would be an avenue to strengthen the current initiatives of the herbalists to safeguard medicinal plants from extinction.

Where cultural beliefs and practices pose threats to the conservation of medicinal plants, a cultural audit and inventory should be conducted. This would help to identify cultural beliefs and practices that have positive and those that have negative effects on plants resources. In such an audit, various stakeholders would plan and implement conservation projects in the context of existing cultural beliefs and practices, and the community would be encouraged to promote those beliefs and practices that have a positive effect on plant resources.

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Appendices

Appendix 1: Interview guide for the herbalists

Dear Participant, I thank you for taking the time to host me. My name is Joel Kigenyi. I am a Master student of Culture and Environment in Africa (CEA) at the University of Cologne, Germany. I am conducting a study on coping with resource extinction, taking a case study of medicinal plants in Kawete village. I would like to talk to you about your experience concerning this topic. I will record our discussion to be sure that I don't miss any of your comments. Although I will take some notes during the discussion, I cannot write fast enough to capture all your comments. All your responses will be treated anonymously during further development of this study. Feel free to ask questions, if any, before the session. Thank you for accepting to participate in this study.

1. What do you understand by the term extinction in relation to medicinal plants?
2. What medicinal plants do you consider to be extinct?
3. What are some of the indicators of extinction of the medicinal plants?
4. Why are medicinal plants disappearing?
5. How are you addressing the challenge of medicinal plants disappearing?
6. List all the medicinal plants that you commonly use to heal.
7. What are the sources of the various medicinal plants you use?
8. How does the disappearance of medicinal plants affect you as a herbalist?
9. Tell me everything you know about Kawete Centre for Traditional Medicine.
10. What traditional beliefs are connected to the use of herbal medicine?
11. What organisations are collaborating with the herbalists in Kawete village?
12. How does each of the Organisations support the herbalists to promote herbal medicine?

Appendix 2: Interview guide for the Botanists and the Forest ranger

Dear Participant, I thank you for taking the time to host me. My name is Joel Kigenyi. I am a Master student of Culture and Environment in Africa (CEA) at the University of Cologne, Germany. I am conducting a study on coping with resource extinction, taking a case study of medicinal plants in Kawete village. I would like to talk to you about your experience concerning specific aspects of this topic. I will record our discussion to be sure that I don't miss any of your comments. Although I will take some notes during the discussion, I cannot write fast enough to capture all your comments. All your responses will be treated anonymously during further development of this study. Feel free to ask questions, if any, before the session. Thank you for accepting to participate in this study.

1. What is the policy on herbal medicine in Uganda?
2. How does NCRL support the herbalists in Kawete village?
3. What is the evolution of herbal medicine in Uganda?
4. What is the status of herbal medicine in Uganda?
5. What are invasive plants?
6. How does plant maturity explain extinction?
7. Why is it important to identify medicinal plants using scientific names?
8. What are the scientific names of the following medicinal plants? (see appendix 3)

Appendix 3: Medicinal plants, parts used, the diseases they cure and their extinction status

Key: (-): information not provided, Rt: roots, L: leaves, B: bark, W: whole plant.

S/n o	Species name		Part Used	Diseases	Extinction status
	Vernacular	Scientific ²⁴			
1	<i>Abaki/Balwegiira</i>	<i>Warburgia salutaris</i>	B,Rt, L	Fibroids, Constipation, hernia, malaria	Out of danger
2	<i>Akambula</i>	<i>Cardiospermum halicacabum</i>	L	Infertility	Endangered
3	<i>Akasoone</i>	<i>Acacia seyal</i>	Rt	Abdominal pain	Vulnerable
4	<i>Akawuna</i>	<i>Gardenia aqualla</i>	B,Rt	Tonsillitis	Least concern
5	<i>Bakitya</i>	Unidentified	Rt	Wounds	Extinct
6	<i>Balinoonia</i>	Unidentified	-	-	Extinct
7	<i>Ekifu</i>	<i>Vernonia cistifolia</i>	L	Cornea irritation, abdominal pain	Indeterminate
8	<i>Ekirama (Ekisaadha)</i>	<i>Piliostigma reciculatum</i>	Rt	Sores	Indeterminate
9	<i>Empangula</i>	<i>Clematis hirsute</i>	Rt	Epilepsy	Vulnerable
10	<i>Empoza</i>	<i>Solanecio angulatus</i>	Rt,L	Cough, itching eye lid, stomach ache, bilharzia, pregnancy	Least concern
11	<i>Emwani</i>	<i>Coffea canephora</i>	L	Yellow fever	Least concern
12	<i>Entasesa</i>	<i>Prunus Africana</i>	L	Pregnancy	Out of danger
13	<i>Fakedo</i>		L	Dandruff	Endangered
14	<i>Fuula</i>	Unidentified	L	Anemia,	Endangered
15	<i>Kaanhunu</i>	<i>Oxalis sp</i>	W	Stomachache, migraine, Uterine cancer	Endangered
16	<i>Kagaya (ow'omumaadhi)</i>	Unidentified	L	Lactation	Extinct
17	<i>Kaisokampanga</i>	<i>Acalypha villicaulis</i>	Rt	Dysentery, erection	Vulnerable
18	<i>Kakubansiri</i>	<i>Ocimum lamiifolium</i>	-	-	Extinct
19	<i>Kanzironziro</i>	<i>Eugenia bukobensis</i>	Rt	Tuberculosis	Indeterminate
20	<i>Kasibante</i>	<i>Sporobolus sp.</i>	Rt	Toothache,diarrhea, tonsillitis, hernia	Indeterminate
21	<i>Katasubwa</i>	<i>Acacia Senegal</i>	Rt	Bilharzia	Extinct
22	<i>Kayala</i>	<i>Conyza sumatrensis</i>	L	Acne	Extinct
23	<i>Kayayana</i>	Unidentified	L	Fortune	Endangered
24	<i>Kayungamagumba</i>	<i>Cissus Quadrangularis</i>	L, S	Fracture	Vulnerable
25	<i>Kibundubundu</i>	<i>Steganotaenia araliacea</i>	L	Spirits	Indeterminate

²⁴ In addition to the botanist, I obtained scientific names of other plants by literature review. for example, Tabuti *et al.* (2003) and Katende *et al.* (1995).

		<i>Hochst.</i>			
26	<i>Kifaalu (Creeping)</i>	Unidentified	Rt	Mental problem	Extinct
27	<i>Lukandwa</i>	<i>Flueggea virosa</i>	–	–	Endangered
28	<i>Lukiiko</i>	Unidentified	–	–	Indeterminate
29	<i>Mugaire</i>	<i>Ficus natalensis</i>	Rt	Cancerous wounds, snake bite	Least concern
30	<i>Mukitimbo</i>	<i>Indigofera garckeana</i>	Rt	Snake bite	Extinct
31	<i>Mukontambaale</i>	<i>Lannea kerstingii</i>	–	–	Rare
32	<i>Mukunhu</i>	<i>Ficus sycomorus</i>	Rt, B	Birth Control	Rare
33	<i>Mulebera</i>	Unidentified	B	Fallopian tube infection	Indeterminate
34	<i>Museru</i>	Unidentified	–	–	Rare
35	<i>Musita</i>	<i>Albizia coriaria</i>	Rt	diarrhoea, Fatigue	Rare
36	<i>Muvumbulakyama</i>	Unidentified	–	–	Extinct
37	<i>Muvuvuumira</i>	<i>Senna didymobotrya</i>	Rt,L	Diarrhoea,Fever, Heart disease	Indeterminate
38	<i>Muwologoma</i>	<i>Acacia macrothyrsa</i>	Rt	Mental problem	Indeterminate
39	<i>Muyirigiti</i>	<i>Erythrina abyssinica</i>	Rt	Bilharzia, malnutrition	Extinct
40	<i>Muyonza</i>	<i>Carissa edulis</i>	–	–	Extinct
41	<i>Muzingaano</i>	<i>Capparis tomentosa</i>	Rt,L	Diarrhoea, Elephantiasis, Headache, Menstrual problems, hernia	Vulnerable
42	<i>Mwerula</i>	<i>Aristolochia elegans</i>	–	–	Indeterminate
43	<i>Nabiryelugaba</i>	Unidentified	L	Lactation	Extinct
44	<i>Naibeere</i>	Unidentified	–	–	Endangered
45	<i>Nakasero</i>	Unidentified	L	Malaria	Least concern
46	<i>Nalwebe</i>	<i>Chlorophytum comosum</i>	Tuber	Infertility	Endangered
47	<i>Namazira</i>	Unidentified	–	–	Extinct
48	<i>Namuvu</i>	<i>Chenopodium opulifolium</i>	L	Measles, Anorexia, fever	Vulnerable
49	<i>Olweto (Olweivu)</i>	<i>Crotalaria glauca</i>	L	–	Endangered
50	<i>Omufuuwandhuzi</i>	<i>Acacia seyal</i>	Rt	Mental problem	Indeterminate
51	<i>Omukaakale</i>	<i>Ricinus communis</i>	L	finger/toe inflammation, Antenatal, Miscarriage, Premature ejaculation	Least concern
52	<i>Omukondwa</i>	<i>Securidaca longepedunculata</i>	R	Snakebites, headache, fainting	Extinct
53	<i>Omukundaanume</i>	Unidentified	–	–	Extinct
54	<i>Omukuukulu</i>	<i>Euphorbia candelabrum</i>	–	–	Endangered
55	<i>Omulirira</i>	Unidentified	–	–	Extinct
56	<i>Omunhalisa</i>	<i>Spathodea campanulata</i>	Rt	Menopause	Least concern

57	<i>Omupeera</i>	<i>Psidium guajava</i>	L	Diarrhea, cough, bleeding wounds, toothache Blood pressure, constipation	Vulnerable
58	<i>Omusaali</i>	<i>Symphonia globulifera</i>	Rt,B	Cough, stomachache	Extinct
59	<i>Omusambamaadhi</i>	<i>Entada abyssinica</i>	Rt, B	Mental problem, Wounds	Endangered
60	<i>Omutaamataama</i>	<i>Sarcocephalus latifolius</i>	Rt	Lumbago, syphilis	Vulnerable
61	<i>Omutooga</i>		L, Rt	Poison	Indeterminate
62	<i>Omuvongo</i>	Unidentified	–	–	Extinct
63	<i>Omuvule</i>	<i>Milicia excelsa</i>	Rt,B	Fatigue, wounds, hypertension	Endangered
64	<i>Omuwaiswa</i>	<i>Maytenus senegalensis</i>	Rt	Stomachache, infertility, tetanus	Vulnerable
65	<i>Omuyembe</i>	<i>Mangifera indica</i>	B,Rt,L	Malaria, skin rushes, diarrhoea, joint pain, pressure, ulcers, cough	Least concern
66	<i>Omuzikiiza</i>	Unidentified	–	–	Extinct
67	<i>Omuziru</i>	<i>Pseudospondias microcarpa</i>	–	–	Indeterminate
68	<i>Tandu/Bwanda</i>	Unidentified	–	–	Least concern
69	<i>Tusangaire</i>	Unidentified	–	–	Extinct
70	<i>Ziiba</i>	Unidentified	Rt, L	Backache, Food poisoning	Extinct

Source: Field data, August/September 2013.

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