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A REVIEW OF INSTITUTIONAL FRAMEWORKS FOR CONSERVATION OF THE SHEA NUT TREE IN UGANDA

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ABSTRACT

Throughout the shea belt of Africa, the shea nut tree continues to be exploited for charcoal production despite its ‘vulnerable’ status. Charcoal represents a significant portion of the domestic energy consumption in sub-Saharan Africa; as human population increases throughout the continent, demand for fuel is expected to soar placing an exceedingly greater burden upon tree resources preferred by the charcoal industry. In Uganda, charcoal and fuelwood account for 92% of the national energy demand. Uganda’s annual energy consumption growth rate of 6% is expected to double by 2025 (MEM 2007), meanwhile the country’s charcoal industry remains largely unregulated.

The main purpose of this study was to review the institutional framework for the conservation of the shea nut tree in Uganda. The study consisted of a desk study reviewing literature on the decentralisation of environmental governance and policy in Uganda, and of a questionnaire administered to district environmental officers (DEOs) in Uganda. The DEOs were asked to assess effectiveness of the institutional framework for natural resource management in supporting the conservation of the shea nut tree, as well as to respond to the question of whether the institutional framework can be enhanced to improve applied approaches for the conservation of shea nut tree.

The study’s results highlighted the need for a national policy with a clear implementation strategy to guide regional and national interventions to conserve the shea nut tree. It also identified the

need for ministerial collaboration towards the regulation of Uganda's charcoal trade. Further, the study revealed gaps and overlaps existing within the environmental resources management institutional framework that need to be addressed. Finally, it acknowledged the existence of tensions between political and technical heads in many local governments in Uganda, and the tension has affected the functionality of many district local governments in conservation of the shea nut tree.

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1. INTRODUCTION

If many little people, in many little places, do many little things, they can change the face of the earth. (African Proverb).

The shea nut tree (*Vitellaria paradoxa*) is a tree species indigenous to the sub-Saharan region of Africa north of the equator. It grows wild across the continent from Senegal in the west through to Uganda in the east. Its population in recent years has, however, undergone a considerable decline owing to a range of anthropogenic factors, but chiefly charcoal production (Joel & Lamoris 2015). Charcoal and fuelwood represent 90% of total wood removals in the African continent (accounting majorly for domestic energy consumption) and 47% in the world (FAO 2014). According to the International Energy Agency, the population of Africa will likely double by 2040, and this is expected to be accompanied by an 80% growth in energy demand (IEA 2014). According to Uganda's Ministry of Energy and Minerals (also referred to by its former name of the Ministry of Energy and Mineral Development), the country's annual energy consumption growth rate of 6% will likely double by 2025 (MEMD 2007).

Africa's energy policies largely emphasize the development of modern and advanced energy resources, though these currently contribute to less than 10% of energy needs within most of her countries (IEA 2014). In Uganda, for example, charcoal and fuelwood account for 92% of national energy demand, while fossil fuels and electricity account for 7% and 1%, respectively (Republic of Uganda 2010). Proficiency dictates that African nations should aim for superior goods within the energy sector. However, contrary to the concept of a 'fuel ladder' and the notion that wood is 'the fuel of the poor', studies show that charcoal will still remain a highly significant fuel in sub-Saharan Africa (Hiemstra-van der Horst & Hovorka 2008; Brouwer & Falcao 2004). Charcoal is expected to outcompete modern energy resources because of its affordability, accessibility and flexibility, coupled with the rising cost of fossil fuels (Ruhombe 2012).

Being an inferior good, however, charcoal does not enjoy popular status within national planning and policy domains (FAO 2010). Much of the time, the industry has been relegated to the informal sector where it's either very poorly regulated or unregulated (Ruhombe 2012). The nature of charcoal production activities is largely unorganized and distributed (Basu et al. 2013). In Tanzania, for example, at least 80% of charcoal is known to be produced and traded outside the formal economy (World Bank 2009; IEA 2014). Perhaps for this reason, charcoal production has over the years developed into a highly destructive trade.

There are African policies which prevent the cutting of certain tree species preferred by the charcoal industry; at times these policies, however, are not comprehensively thought out. For example, in 1990, Cameroon passed a law enabling resource users to cut down trees they had planted, which later proved to be impractical as resource managers could not validate resource users' claims (Cunningham et al. 2002). Often, law enforcement is also greatly challenged by the nature of charcoal production activities, coupled with inadequate human resource availability (Basu et al. 2013).

Natural resource management (NRM) interventions worldwide pay inadequate attention to institutional structures needed to bring about desired NRM outcomes, as they tend to focus more on the environmental issue of concern (Hassenforder et al. 2015). Informal institutions such as traditional belief systems and the tendency to corruption have thus often influenced NRM outcomes far more than formal institutions (Hassenforder et al. 2015).

Over the years, international development donors and NRM actors have become increasingly aware of this gap and have sought to remedy it. Having learnt from several unsuccessful attempts, however, a school of thought has arisen which throws caution to the ad hoc formation of institutional and organizational structures and notes that such arrangements may be less sustainable than the outcomes they seek to support (Hassenforder et al. 2015).

Uganda's decentralized NRM framework has, since its inception in 1996, realised very little realignment in spite of several social, economic and political reforms (Oosterveer et al. 2010). Hassenforder et al. (2015) denote that enabling frameworks need to exist, both at the national and local levels, as a precondition for decentralised governance to meet set NRM goals. They add that stakeholder relationships, resource availability, capacity development and accountability arrangements are also of paramount importance. This view is shared by Francis & James (2003), Arnold & Jongma (1977) and FAO (2014) who also take into consideration the following:

1. The extent of regional and national collaborations
2. The degree, complexity and nature of donor intervention
3. The nature of land reforms and associated land ownership disputes
4. The population of the biodiversity component growing ex-situ and in-situ
5. The existence of traditions and customary laws relating to resource conservation
6. The economic importance attached to the biodiversity component needing to be conserved.

For the shea nut tree, economic value lies in the production and sale of charcoal, as well as the production and sale of shea butter. In 2000 Africa realized US \$5 billion from exporting tree crop products worldwide, most importantly coffee, cocoa and tea (World Bank 2002). Shea nut production within Africa that year reached an estimated average of 650,000 tons, about one-quarter of which was exported, generating US \$13 million (Teklehaimanot 2004). West Africa, particularly Ghana, commands a lucrative shea butter export market to pharmaceutical companies in Europe, America and Asia. The sustainability of tree crop resources such as the shea nut tree is therefore essential towards attaining economic growth and poverty reduction in many African countries.

Statement of the problem

The number of shea nut trees (*Vitellaria paradoxa*) is declining rapidly throughout the African continent. This decline is caused by the interplay between increasing demographics, energy demand, limited affordable energy alternatives, poverty, urbanization and civil unrest. These factors, individually and collectively, fuel anthropogenic activities such as charcoal production, fuel wood harvesting, the expansion of agricultural farmlands and industrial development (IUCN 2014; ACCS (Advisory Consortium on Conflict Sensitivity) 2013)

In Uganda, local governments are custodians of the country's natural resource base. It is necessary to review the existing institutional framework intended to uphold the conservation of natural resources at this level before we can examine the conservation status of the shea nut tree in Uganda. Reviewing the conservation status of the shea nut tree in the rest of the African shea belt is also useful to gain new insight for the strategic and holistic management of this invaluable resource.

The information from this study is intended to contribute to the design of new approaches and re-tailoring of existing approaches used to conserve the shea nut tree at the local government level in Uganda. It is hoped that this study will be of practical use to local governments, policy makers and development partners currently working to conserve the shea nut tree and other biodiversity components in Uganda.

1.1 The goal of the study

The overall goal of this study is to enhance the institutional and policy frameworks for the conservation of the shea nut tree in Uganda.

1.2 Specific objectives of the study

The specific objectives of the study are as follows:

1. To examine the relationship between the shea nut tree and livelihoods in northern Uganda
2. To review the institutional framework and policies for conservation of the shea nut tree in Uganda
3. To identify challenges to the conservation of the shea nut tree in Uganda

2. BACKGROUND AND CONTEXT

2.1 Shea Nut Tree

Throughout Africa, distribution of the shea nut tree covers a 5,000 km belt of 21 countries (Lovett & Haq 2000; Hatskevich et al. 2011), as can be seen in Figure 1. Some literature also includes Zaire in this distribution (Fobil et al. 2005). Within Uganda, this distribution covers 18 districts spanning the northern, eastern and central parts of the country (Figure 2). This number may change in the future if new districts are created in the shea belt. See *'Appendix 4: District subdivision within Uganda's shea belt'*.

The shea nut tree is monospecific and has a lengthy juvenile period of 15 – 20 years. It produces recalcitrant seeds that lose viability within three weeks, and exhibit a widely out-crossing breeding system (Kolawole et al. 2011). The taxonomy of the tree is such that it belongs to the family Saotacea, genus *Vitallaria* and species *paradoxa*. It has only 2 subspecies: (1) *paradoxa*, which is endemic to West Africa, and (2) *nilotica*, meaning 'from the Nile', which is endemic to

east Africa. The tree's population in West Africa average 50 trees per hectare, compared to 7 trees per hectare in east Africa (Byakagaba et al. 2011).

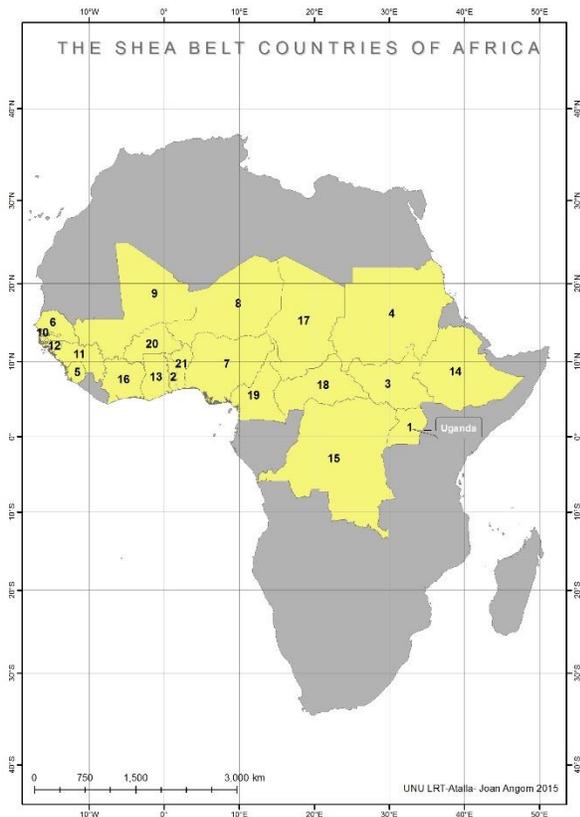


Figure 1. Map showing the shea belt of Africa
Key to Countries

1 Uganda	6 Senegal	11 Guinea	16 Côte d'Ivoire
2 Togo	7 Nigeria	12 Guinea-Bissau	17 Chad
3 South Sudan	8 Niger	13 Ghana	18 Central African Republic
4 Sudan	9 Mali	14 Ethiopia	19 Cameroon
5 Sierra Leone	10 Gambia	15 Congo DRC	20 Burkina Faso
		21 Benin	

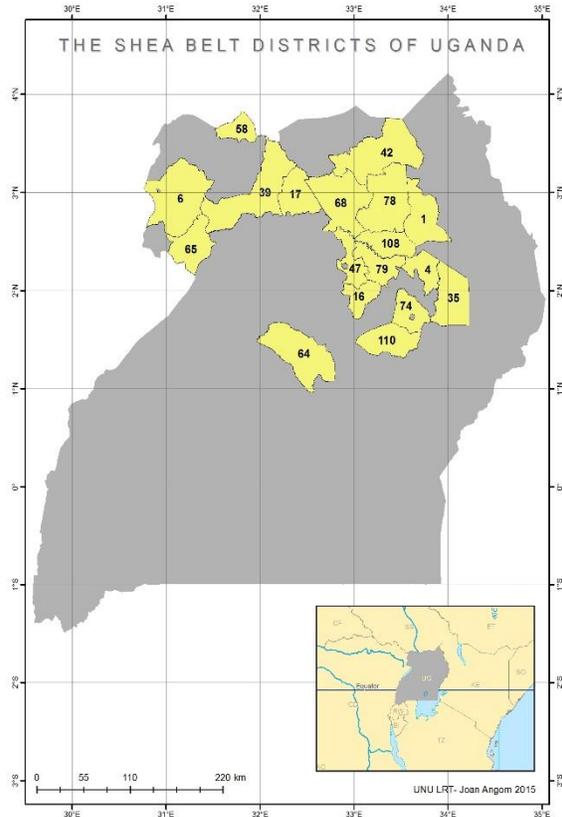


Figure 2. Shea belt in Uganda
Key to Districts

1 Abim	42 Kitgum	74 Soroti
78 Agago	47 Lira	74 Nakasongola
39 Amuru	65 Nebbi	79 Alebtong
6 Arua	108 Otuke	4 Amuria
16 Dokolo	68 Pader	58 Moyo
17 Gulu	35 Katakwi	110 Serere

The shea nut tree has remained a 'darling' of the charcoal industry both within Uganda and throughout its range in Africa. A high bulk density means that shea charcoal burns with efficiency and is less susceptible to damage during transit. For this reason, it is easy to transport by locally available means, such as bicycles and motorbikes; offsets losses to the dealer who sells by measure of basin, bucket or heap; and has a higher profit margin over other charcoal (Knöpfle 2004).

The charcoal industry in Uganda represents a basic skill set requirement and ready money that appeals to various classes of people, from those who have no formal education to degree holders. The industry has an unwavering demand because energy is a basic necessity, and it is supported by a substantial retail market in urban, peri-urban and town centres, whereas production is carried out mostly in the rural setting (Knöpfle 2004). Basu et al. (2013) underscore that the charcoal trade in Uganda reflects the vested interests of some parties within government who are committed to safeguarding its value chain from undue disruption which would otherwise see their interests threatened. According to Knöpfle (2004), the country’s capital city Kampala has the highest demand for charcoal of all districts in Uganda. Traders in the city sometimes refer to charcoal as ‘black gold’ (Basu et al. 2013).

In 1995, charcoal consumption within urban centres in Uganda was an estimated 270,000 tonnes; however, by 2007 this figure had grown to 11 million metric tonnes (MWE DEA [Ministry of Water and Environment Directorate of Environmental Affairs], 2013). In 2008, an estimated 40% of households in Nakasongola district alone (in central Uganda) were recorded to be engaged in charcoal production activities (Shively et al. 2010). Studies indicate that the district was in the past one of the main charcoal suppliers to Kampala (Knöpfle 2004). Today, studies indicate that charcoal production ranks as the district’s greatest threat to local conservation of the shea nut tree (Joel & Lamoris 2015) as can be seen in Table 1.

In Northern Uganda, the LRA conflict, from 1986 to 2007, gave rise to excessive production of shea charcoal by soldiers, displaced communities, and eventually returnees who adopted charcoal production as a livelihood strategy (International Alert & EASSI [Eastern African Sub-Regional Support Initiative for the Advancement of Women], 2010). The use of taboos, rituals and customary rules to maintain an ecological balance underwent erosion during this period (NEMA 2008).

Table 1. Threats to local conservation of *Vitellaria paradoxa* in Nakasongola district, Uganda. The table is adapted from Joel & Lamoris (2015).

Threats	Percent
Charcoal burning	81.7 %
Land/ tree tenure	76.7%
Overstocking	68.3%
Bush fires	66.7%
Prolonged drought periods	63.3%
Rapid human population growth	56.7%

Sudan has effectively managed to regulate its charcoal industry by: 1) recognising it as a key sector; 2) placing it under a single entity which plans and regulates the industry; and 3) acknowledging and supporting the private sector and trade associations engaged in charcoal production (Russell & Franzel 2004). This is an illustration of how the charcoal industry can potentially be organized to effectively meet energy needs, create legitimate employment and replenish the natural resource base. Drawing from the experiences of Chad, Kenya and Tanzania where attempts to regulate the charcoal trade resulted in increased illegal production and a rise in charcoal prices, Basu et al. (2013) have called for greater sectoral integration and stakeholder engagement in any attempts which may be made to regulate the charcoal trade.

Uganda does not have a formal charcoal sector to organize and regulate charcoal production activities, but according to Basu et al. (2013), the Ministry of Energy and Minerals is perhaps better positioned to champion this cause. The Ministry has, however, one great limitation in that it lacks decentralised structures. To bridge this gap, the German Agency for International Development Cooperation (GIZ) has piloted the appointment of District Energy Officers in some parts of the country to coordinate energy issues arising in their districts (Basu et al. 2013). These are either district forestry officers, district environment officers or district planners. While this is a step in the right direction, the program is still very much in its infancy and does not directly address the conservation of the shea nut tree as a preferred charcoal tree species threatened with extinction.

The Uganda Vision 2040 (refer to Table 5) is a framework document developed by the National Planning Authority of Uganda. It bears the vision of: “A transformed Ugandan society from a peasant to a modern and prosperous country within 30 years” (Republic of Uganda 2010; Basu et al. 2013). Although the framework acknowledges that 95% of Uganda’s population is dependent upon charcoal and/or fuelwood, the long term development of the country’s charcoal value chain does not form any critical part of the framework’s long term energy strategy for the country (Kaggwa et al. 2009; Basu et al. 2013). The framework places priority on rural electrification and the promotion of alternative energy sources such as solar, biogas and natural gas (Republic of Uganda 2010; Basu et al. 2013).

2.2 Livelihood

“The nature and function of institutions are key in influencing the way in which livelihood opportunities may (or may not) manifest themselves to the poor” (Lewins 2004, p.38)

Shea butter production and charcoal production are conflicting uses directly associated with the shea nut tree in northern Uganda. Shea butter, which is produced by women, supplements family income and livelihood; it is used as an edible fat (polyunsaturated fatty acids and glycerol are essential to family health, Hatskevich et al. 2011); a skin unguent; and a lotion, particularly for babies. It has long term but sustainable benefits.

Charcoal production, on the other hand, is predominantly a male occupation because of the arduous nature of the task and the patrilineal system of land ownership, which prevails in Uganda, (men possess the decision making rights over land and its associated resources, Okiror et al. 2012). According to Shively et al. (2010) “charcoal producers are likely to be poor, with low agricultural capacity and few productive assets. They often turn to charcoal production because they lack the skills or opportunities for diversifying into other livelihood activities.” (p. 271). Charcoal production has short term, unsustainable benefits.

Natural resource managers must guide communities to utilize natural resources sustainably. But this essentially requires human capital to accomplish various tasks and ensure that all communities are reached. Alternative livelihood strategies must also be identified to compensate for the unsustainable livelihood alternatives that are foregone. This is particularly important for the case of northern Uganda, where the economy is characterized by a low level of investments,

and livelihood options are few. In the northern region, 64% of people live below the poverty line compared with 38% nationally; human development indicators for the region rank lowest in the country (Emwanu et al. 2007; NEMA 2008). Table 2 provides an overview of human development indicators for different regions in Uganda.

Table 2. Human development indicators for different regions in Uganda. The table is adapted from Higgins (2004) and NEMA (2008).

	Poverty 2005/2006 (%)	Annual average population growth (1991 – 2006) (%)	Fertility (births per woman 2000) (%)	Dwelling type, i.e. hut (2005/2006) (%)	Ownership of mobile phones (2005/2006) (%)
Central	16.4	2.6	5.7	3	23
East	35.9	3.5	7.4	31	11
North	60.7	4.2	7.9	68	5
West	31.1	3.2	--	22	17

In West Africa, the shea nut tree has proven that it can significantly augment both national and local economies as a tree crop. Peace Corps Ghana (2008) highlights the fact that countries in West Africa annually export between 150,000 to 200,000 tons of shea nuts, of which 33% come directly from Ghana. Over several years, Ghana’s shea butter industry has evolved beyond what was an ‘*opportunistic trade*’ - (where shea nuts were gathered freely and private tree ownership did not exist) to what is a thriving industry today supporting the livelihood of an estimated 90,000 women (Peace Corps Ghana 2008; Fobil et al. 2005). Ghana’s shea butter industry dominates the world’s largest shea butter export markets in North America and Europe, where shea butter is used primarily in cosmetics and cooking products (Bup et al. 2014).

Although Uganda falls within the ‘*zone of highest production potential for shea nuts*’, as can be seen in Table 3, it has failed to develop and maximally exploit her shea butter industry owing to a number of reasons (Masters 2002).

Table 3. Zonal classification of the annual production potential for shea nuts. Information adapted from Bup et al. (2014)

Zone	Classification	Country
1	High production zone with yearly production potential of 70, 000–300, 000 tons of shea nuts per year;	Benin, Burkina Faso, Cote D’Ivoire Ghana, Mali, Nigeria, Sudan and Uganda
2	Average production zone with yearly production potential of 10,000–70,000 tons per year	Cameroon, Chad, Central African Republic, Guinea Conakry, Senegal and Togo
3	Low production zones with yearly production potential less than 10,000 metric tons.	Democratic Republic of Congo, Ethiopia, Gambia, Guinea Bissau, Niger and Sierra Leone

The inadequacy of technical and financial support to the shea butter sector is perhaps one of the chief reasons and the industry is heavily reliant upon international donor support for expertise and funding (Byakagaba et al. 2011). The geography of Uganda as a land-locked country also does not favour ease of access to international markets (Masters 2002). Lack of semi- and fully

mechanized production methods such as milling and processing machinery is yet another constraint (Bup et al. 2014). This can be coupled with limited transfer of business development skills such as record keeping and financial planning to women in the region (Esuruku 2012). Additionally, war in northern Uganda stagnated economic development in the region for two decades, contributing greatly to the current state of affairs (Advisory Consortium on Conflict Sensitivity 2013).

Compared to West Africa however, women in Uganda realize higher prices for their shea butter products, owing to the high olein to stearin content of nilotica shea butter (Masters 2002). Nilotica shea butter is also known to have a milder fragrance (Masters 1992).

In northern Côte d'Ivoire, the opportunity cost associated with different shea products determines the landowner's willingness to conserve. When *Vitellaria* nuts or butter sell for high prices, regeneration is promoted. Yet, as Boffa (2000) states: "if fuelwood prices outstrip those of the tree's other products, trees tend to be felled and sold on the fuelwood market." (p. 13)

2.3 Conservation

Whatever understanding of development one may adopt, the development takes place within a set of environmental conditions. The protection of these conditions therefore, should be a fundamental objective of development intervention, since the resource base for development will inevitably decline if they are not maintained (Oakley 1991, p. 34)

Throughout the shea belt region of Uganda, local governments and civil society organizations (CSOs) alike, have sought for ways to conserve the shea nut tree. While local governments tend to be financially constrained and so focus on experimenting with various regulatory approaches, international donors and CSOs often resort to financial incentive measures that try to strike a balance between conservation and livelihood (Turyahabwe et al. 2007) .

These incentives include efforts to formalize and support women's shea processing enterprises through the securing of organic certification and price premiums. International donors hope to see a positive change in attitude towards conservation by promoting the shea nut tree as a cash crop (Ferris et al. 2003). It is however argued that the existing partnerships within this sphere need to be strengthened, and a proportion of revenue channelled back into the management of existing tree stocks, if conservation results are to be made tangible (Ferris et al. 2003). The community environmental conservation funds (CECFs) which provide quarterly low interest loans to village groups have been employed in a more gender inclusive light and piloted in a number of districts in Uganda. Their ability to diversify livelihoods successfully creates incentive for conservation of the shea nut tree (IUCN 2013). A significant limiting factor, however, is that the interventions of non-governmental organizations (NGOs) tend to promote donor dependency and often lack sustainability (Ferris et al. 2003).

Local governments, in attempting to enforce existing laws, are confronted with the challenges of inadequate staff numbers, high staff turnover and poor road infrastructure (NEMA 2008, Shively et al. 2010). Consequently, there has been a shift from charcoal production licenses towards loading fees and transportation licenses which, though less demanding in terms of time and

human resources, are also less effective in regulating the use of preferred charcoal tree species (Turyahabwe et al. 2007). It is also argued that the use of district ordinances and byelaws which prevent the cutting of shea nut trees are counterproductive to tree planting and tree management on farm land (Turyahabwe et al. 2007). Meanwhile, the involvement of sub-county leadership in regulating charcoal production has been attempted by some districts, though without much success due to lack of institutional structures and incentives (Shively et al. 2010).

In reviewing the National Forestry Plan 2002, the National Forestry Authority (NFA) noted that District Forestry Offices (DFOs) cannot conveniently execute their constitutional mandates of supervising the management of forests located on private lands. The report argues that during the sector reform government did not decentralize this role with a concomitant transfer of funds. Furthermore, it recognises that while community and private sector interest in the establishment of commercial forest and woodlots has increased since 2002, very little attention has been accorded to private natural forests which are fast being reclaimed for agricultural production (MWE DEA 2013). Consequently, the annual rate of deforestation occurring on private and communal lands in Uganda is twice the amount realized in central forest reserves, i.e. 2.2%: 1.1%, while the deforestation rate in national parks and wildlife reserves stands at 0.4% (MWE DEA 2013).

The traditional conservation approach of species maintenance on newly opened agricultural land (also referred to as farm management in some literature) is practised almost throughout the shea belt of Africa, but registers various degrees of success (Sanou & Lamien 2011; Gwali et al. 2012). The approach is challenged by the tree's long juvenile period; intensified agriculture; land tenure systems and reforms; high cost of seedlings; termite attacks; and lastly overgrazing (Gwali et al. 2012; Sanou & Lamien 2011; Leakey et al. 1996). Other determining factors for its adoption include farm size, family size, and gender issues in ownership of land (Lovett & Haq 2000; Gwali et al. 2012). In northern Ghana, elders are able to enforce this traditional conservation approach because of the prevailing inequality in regional development. Natural regeneration and a healthy distribution of shea nut trees thus abound in the region (Fobil et al. 2005). In the south and central regions of Ghana where urbanization has taken root, however, the practical implementation of traditional conservation approaches has been greatly hindered (Lovett & Haq 2000; Fobil et al. 2005). In northern Uganda, the success of species maintenance is closely linked to the existence of alternative livelihood options. Kitgum district has attempted to encourage community adoption of this approach by integrating it with apiaries. Through its applied research on the ecology and biology of the shea nut tree, the Cocoa Research Institute of Ghana (CRIG) at Bole recommends the introduction of grazing animals into shea areas to enhance kernel yield (Fobil et al. 2005), contrary to traditional thinking.

Tradition in Ghana dictates that the shea nut tree is very rarely planted; more than often saplings result from natural regeneration. Many farmers maintain that the shea nut tree is wild and claim that methodical selection for tree improvement is laborious (Lovett & Haq 2000). Certain regions of Ghana even have strong taboos against the planting of shea nut trees, clearly depicting that human-environment interactions are greatly moderated by informal institutions and indigenous knowledge (Peace Corps Ghana 2008)

Within Uganda, the Ngetta Zonal Agricultural Research Institute (Ngetta ZARDI) is engaged in shea propagation trials through seeds, cuttings and ring barking. Ngetta ZARDI hopes that

experimentation of this kind will in subsequent years produce trees that bear fruit, hopefully within eight years (M. Gloria, 20th February 2015, Ngetta Zonal Agricultural Research Institute-Lira, Uganda, personal communication). Dissemination of knowledge by the institute is largely dependent upon the personal initiative of individual farmers to visit the research centre; extension advice is, however, provided during the collection of seed samples from farmer's fields (M. Gloria, 20th February 2015, Ngetta Zonal Agricultural Research Institute-Lira, Uganda, personal communication). The seeds of the shea nut tree take about nine months to germinate after planting and require slightly over a year before they are ready for transplanting into the field (Peace Corps Ghana 2008).

3. METHODOLOGY

This study was designed to use two methods of research. The first was a desk study reviewing key literature which was used to gain an overview of national policies, regulations and institutional frameworks governing conservation efforts for the shea nut tree in Uganda. The second method was a questionnaire survey to document the experience and views of district environmental officers (DEOs) from the shea nut districts in northern Uganda working within the existing institutional framework supporting conservation of the shea nut tree.

Research setting and selection of study sites

The study's site covers the districts in north, east and central Uganda, which constitute the country's shea belt. District administrative units were selected for their jurisdictional mandates relevant to the study. It proved to be challenging to define such spatial boundaries which have continued to change quite rapidly and non-uniformly over time, facilitating adjustments in the numbers of districts considered for the study's sample size. Firstly, the researcher's own district 'Alebtong' was not included in the study. Secondly, two more districts were eliminated from the study based on information obtained in the data collection process (further discussed later in the results sections). Thus, initially the study was to cover 19 districts which later was changed to 17 districts (see map, Figure 2 where the shea nut districts in north, east and central Uganda are identified).

Data collection

The primary data required for this study were acquired by means of a questionnaire survey, mainly comprised of open-ended questions to allow for a degree of flexibility in responses (see a copy of the questionnaire in the appendix). The questionnaire consisted of 10 questions focusing on district and sub-county institutional framework arrangements and challenges, as well as the support rendered by NEMA and non-governmental organizations (NGOs), all in regard to conservation of the shea nut tree.

DEOs in the 19 districts were chosen as participants for the questionnaire because of their centrality and role on natural resource management within Uganda's shea belt. The questionnaire was administered through e-mail in June to July 2015. It was followed up by a letter from NEMA, in addition to an initial phone call to each of the officers alerting them to check their e-

mails (internet is not readily available in some districts and irregular in others). Follow-up calls were later made at intervals on two separate occasions, as reminders to the officers. All responses were treated with utmost confidentiality. Data interpretation was coded to maintain anonymity of respondents.

Secondary data used in the study involved a review of the institutional framework for ENR management in Uganda, focusing on the local government and lower local government. It included literature on decentralization of environmental governance and policy in Uganda. Further literary articles were centred on the contribution of shea nut trees to livelihoods in the study area, as well as strategies for its conservation within Africa's shea belt to permit a comparative analysis from which recommendations could be developed.

Data Analysis

The collected primary data were entered and analysed in Microsoft Excel, where responses were categorized and classified. The core objective of the study was to review the institutional framework for conservation of the shea nut tree at the district and local government levels in Uganda, and primary data collection permitted the study to successfully capture the perception of DEOs in this regard.

4. REVIEW OF INSTITUTIONAL FRAMEWORKS

“What is required is to bring community and environment back into harmony..... this requires either the recovery and rebuilding of traditional, collective resource management institutions, or their replacement with new ones.” (Leach et al. 1999, p. 229)

Uganda has 111 districts and one city, Kampala. Its five tier system of governance, depicted in Figure 3. shows that under each district there exist a county/counties), sub-counties, parishes and villages. Other government and administrative units such as the municipality, divisions, town and wards that are found in the district, are not considered in this study.

The fact that Uganda has so many districts, means that resources are very often thinly distributed, affecting the quality and sustainability of both government service delivery and various environmental conservation approaches (Steiner 2006). For example, the development and implementation of environmental policy should effectively engage different key stakeholders and be informed by reliable data as well as the priorities of the poor. Oosterveer & Van Vliet (2010) however point out that “different policy goals compete heavily for resources available in the district's general budget, and the environmental sector is relatively weak in this competition” (p. 290). NEMA (2008) also acknowledges that there is low prioritization of environmental management by district planning and budgeting processes, while case studies by Nyangabyaki (2003) reveal that mandates for ENR (environment and natural resource) conservation are rarely achieved in isolation of international donor funding or support.

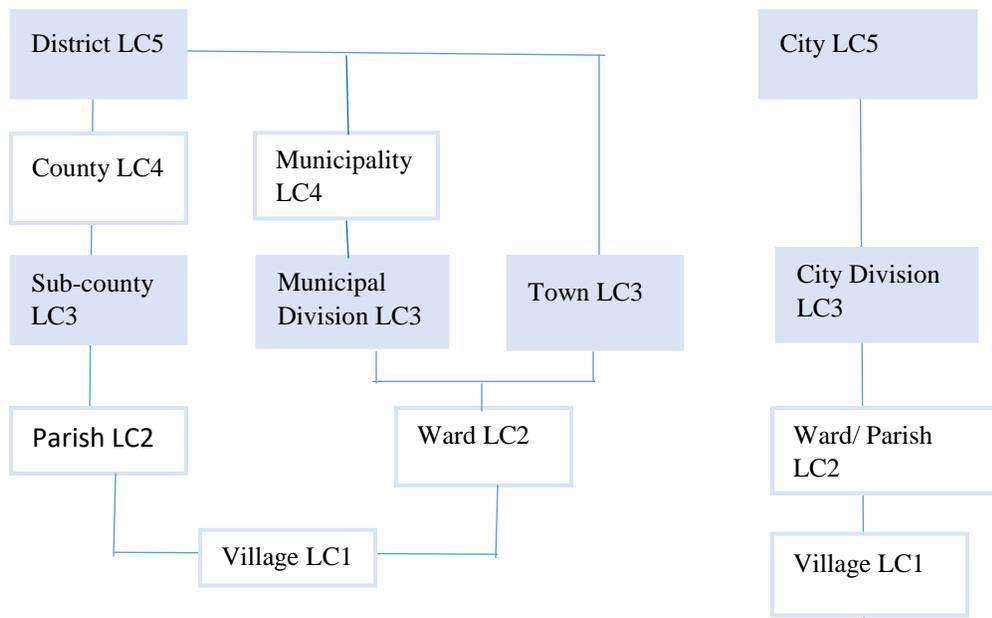


Figure 3. The five-tier system of local governments and administrative units in Uganda. Adapted from Francis & James (2003). Highlighted institutions are government institutions, others are administrative units. Uganda has only one city, Kampala.

The institutional framework for environment and natural resource management in Uganda has several organs, as shown in Figure 4. The National Environment Management Authority (NEMA) was created in 1995 as a semi-autonomous body to coordinate, regulate, supervise and monitor all environmentally related activities in Uganda. In 1996, district environmental officers (DEOs) were appointed as technical officers in a move to decentralize the country's ENR management framework (Green 2008; Government of Uganda 1995, 1998). This move, however, came three years after decentralization of all other sectoral frameworks had already taken place in 1993 (Banana et al. 2001). It is suggested by Oosterveer & Van Vliet (2010) that the decentralization was largely driven by the country's need for international recognition and financial support. They argue that many international development funds emerging at the time had environmental conditions attached to their funding, which necessitated that the country formed some kind of ENR management framework. Several years later, it would seem that the framework is still struggling to ascend beyond the status of a pre-condition that was necessary to be met for donor funding.

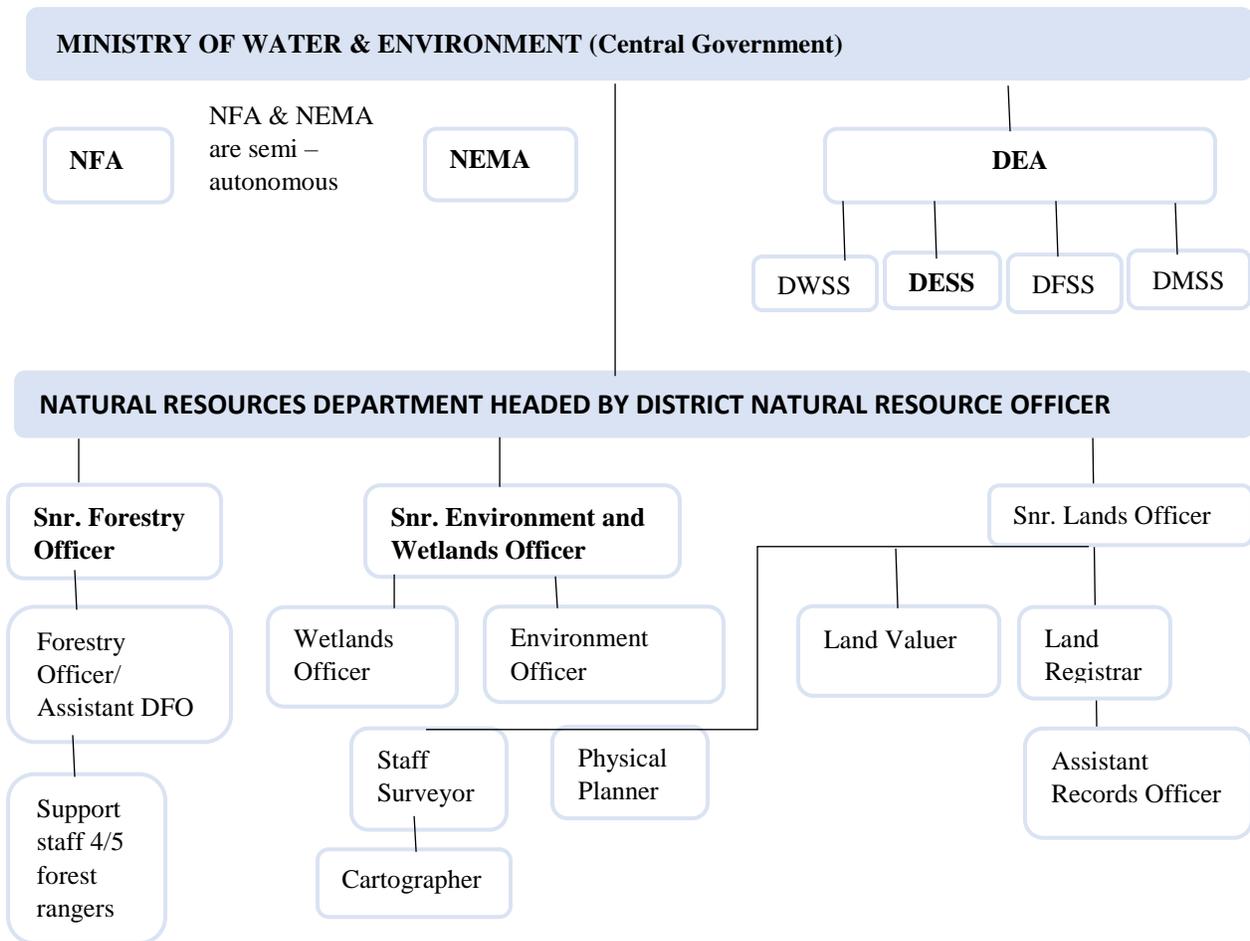


Figure 4. Uganda’s decentralized Environment and Natural Resource Management framework from central government to local government. Adapted from Uganda 1997; Government of Uganda 1995, 1998.

The main responsibility for environmental management at district level is vested within the district environment office, district environmental committee, district technical planning committee and the local environment committee at sub-county level (Government of Uganda 1995, 1998). Throughout the Ugandan shea belt, these organs play a key role in the conservation of the shea nut tree. NEMA (2008), however, notes that the ENR institutional framework is characterized by “a relatively ineffective and inadequate local government ENR management

structure, occasioned by the low status of the district environment office and lack of representation at lower levels, particularly at the sub-county level” (p. 63). It further suggests that many of these natural resource management organs lack environmental management capacity and that there is “a high turnover of district leaders and staff whose capacities had been built for ENR management” (NEMA 2008, p. 63). In spite of this, environmental management is still considered to be best administered from the district and sub-county levels (NEMA 2008; Oosterveer & Van Vliet 2010). Buscher and Dressler (2007) dismiss the idea that a centralized approach would yield better results, adding that decentralization itself is not the problem.

The roles of various central and local government agencies that have either a direct or indirect mandate towards conservation of the county’s biodiversity are highlighted in Table 4. The Ministry of Water and Environment has a wide range of mandates which include forestry management, energy coordination, and climate change mitigation and adaptation (Basu et al. 2013).

Both MWE (Ministry of Water and Environment) and MEM (Ministry of Energy and Minerals) have responsibility for policies related to charcoal; however, MWE lacks decentralized structures for the coordination of energy issues within districts (Basu et al. 2013). Attempts have been made by some Environment Officers and Forestry Officers in Uganda to regulate charcoal production and trade within their districts. However, the findings of Joel & Lamoris (2015) and Shively et al. (2010) indicate that such attempts have largely been unsuccessful. While a tree stands it is under the purview of MWE, but the moment it is cut for the production of charcoal the responsibility for it shifts to MEM, which according to Basu et al. (2013) is a complex arrangement. In borrowing from the experiences of Kenya, Chad and Tanzania, where unsuccessful attempts to regulate the charcoal trade increased illegal production activities and elevated charcoal prices, Basu et al. (2013) suggest that a high degree of collaboration, coordination and comprehensive organisation should characterize any attempt at regulating the charcoal trade.

Table 4. Institutional mandates of central and local government agencies for conservation of Uganda’s natural resources. Information adapted from Uganda (1997), Du Plessis (2011), and Nyangabyaki (2003).

Institution	Mandate for conservation of the shea nut tree
Ministry of Water and Environment (MWE)	-Policy formulation, regulation, inspection, monitoring and coordination across line ministries
Directorate of Environmental Affairs (DEA)	-Oversight on agencies in the ENR sub-sector with respect to their functions.
Department of Environmental Support Services (DSS)	
Ministry of Energy and Minerals MEM	
Department of Forestry Support Services (DFSS)	-Offers supportive back-up to both NFA and the DFO

National Environment Management Authority (NEMA)	-Principal Agency in Uganda responsible for the management of the environment by coordinating, monitoring, regulating, and supervising all activities in the field of environmental concerns
District Environmental Officer (DEO)	-Advise DEC and liaise with NEMA on matters relating to conservation -Serve as secretary to DEC; promote conservation awareness -Assist LEC in performance of their functions -Gather and manage ENR information -Assist the district to incorporate environmental concerns in district development plans -Increase community participation in the design of ENR programs and projects.
District Forestry Office (DFO)	-Responsible for local government forests, community forests and forests on private land
District Council (DC)	-Set policy guidelines and enact ordinances -Direct the technical staff in general terms to ensure that guidelines are followed -Strengthen the national legislation and fine-tune it to district circumstances
Committees	Mandate for conservation of the shea nut tree
District Executive Committee (Ex-Com)	-Initiate and formulate policy for approval of the district council -Oversee the implementation of the Government and the council's policies -Monitor and coordinate activities of nongovernmental organizations in a district -Monitor the implementation of council programmes and take remedial action where necessary -Recommend to the council persons to be appointed members of the district service commission, local government public accounts committee, district tender board, district land board or any other boards, commissions or committees that may be created -Receive and solve problems or disputes forwarded to it from lower local government councils -Consider and evaluate the performance of the council against the approved work plans and programmes -Carry out any other duty as may be authorized by the council or any law
District Environment Committee (DEC)	-Has executive and legislative roles and reports to DC -Coordinate the activities of the district council relating to the management of the environment and natural resources -Ensure that environmental concerns are integrated in all plans and projects approved by the district council -Assist in the development and formulation of ordinances and byelaws relating to the management of the environment -Promote the dissemination of information about the environment through education and outreach programmes -Coordinate with NEMA on all issues relating to environment management -Coordinate the activities of local environment committees in the management of the environment -Receive reports from the local environment committees and advise the local environment committees -Prepare a district state of the environment report every year -The district environment committee shall follow such procedure at its meetings as may be prescribed by the district council.
Technical Planning Committee (TPC)	-Coordinate and integrate all the sectoral plans of lower local governments for presentation to the district council.
Local Environment Committee	-Prepare a local environment work plan which shall be consistent with the national environment action plan and the district environment action plan -Carry out public environmental education campaigns -Mobilize the people within its local jurisdiction to conserve natural resources through self-help

	<ul style="list-style-type: none"> -Mobilize the people within its local jurisdiction to restore degraded environmental resources through self-help -Mobilize the people within its local jurisdiction to improve their natural environment through voluntary self-help -Monitor all activities within its local jurisdiction to ensure that such activities do not have any significant impact on the environment -Report any events or activities which have or are likely to have significant impacts on the environment to the district environmental officer, or to the appropriate executive committee, local council or such other person as the district council may direct -Carry out such other duties as may be prescribed by the district council or urban council in consultation with the authority.
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Another highly important organ concerned with local environmental management is the District Council (see Table 4). It is the highest political authority in the district and possesses legislative powers to make byelaws and ordinances. In addition, it has executive powers over the monitoring and implementation of environmental laws (Uganda 1997). The sub-county council has similar mandates (regarding byelaws) which it executes within its smaller jurisdiction (Uganda 1997).

District environment committees and local environment committees were created within Uganda's ENR institutional framework to purposely decentralize ENR policy, as in Table 4. (Government of Uganda 1995; 1998). The district environment committee often exists as an alias of the Production and Marketing Committee, owing to the fact that local governments are mandated to fund the running of sectoral committees from their own resources (Nyangabyaki 2003). And as mentioned earlier, resource distribution within districts is thin, and environmental considerations tend to attract minimal prioritization within district council affairs.

The merging of the district environment committee, with the committee for production and marketing creates an apparent conflict in the role of the committee chairperson. The district council secretary for Production, Marketing and Natural Resources who chairs the dual committee is required to uphold both production and marketing/economic development, as well as environmental protection. This conflict of interests does not favour the natural resource conservation of forests or wetlands (to mention but a few cases) which are seen as idle resources that should be exploited for timber, charcoal or large scale rice production (Du Plessis 2011).

According to Oosterveer & Van Vliet (2010) and NEMA (2008) district environment committees and local environment committees tend to be non-existent or dysfunctional within many of the districts in Uganda. Nyangabyaki (2003), Green (2008) and Oosterveer & Van Vliet (2010), agree that both types of committees have problems in effectively protecting the environment, which has fueled debate on the process and practice of decentralized environmental policy in Uganda. It is also interesting to note the observations of Du Plessis (2011) and Nyangabyaki (2003) that while the secretary for Production, Marketing and Natural resources, the DEO and the Sub-County Chiefs are required to ensure that environmental laws are followed. Thus, it is not clear how these organs should relate to one another in fulfilling this requirement.

Furthermore, the relations between elected officials and technical staff can have an impact on the effectiveness of institutional frameworks and their processes. It has been suggested by Steffensen et al. (2004) that a poor working relationship tends to exist between the technical and political leadership in a number of districts in Uganda. They present the view that this may be due to

conflicts, similarities or overlaps in the roles and functions of the two parties. Steiner (2006) in turn suggests that differences in the level of formal training attained by technical and political authorities in the district create room for conflict. Communities are not oblivious to the power struggles within districts, nor to the drawbacks which arise from it in terms of service delivery and project implementation. Indeed, at times local government functions have been brought to a complete standstill, while council meetings have deviated from developmental issues to heated debates over the distribution of powers (Steiner 2006).

In Uganda, it has been recognized that environmental policies, laws and regulations are rarely complied with (NEMA 2008). NEMA (2008) identifies that this could be due to the unclear delineation and assignment of institutional roles at the district level, coupled with the circulation of at times very contradictory messages by both national and local leaders. Oosterveer & Van Vliet (2010) mention that elected leaders, by virtue of their mandate as representatives of the people, are not inclined to uphold or enforce environmental laws that may appear to be inconveniencing to their voters. As such, they suggest that “[p]oliticians often find it difficult to manage the interrelationship between policy formulation and policy implementation; which results repeatedly in their interference with implementing measures, that previously had been agreed upon by the local council” (p. 291). Nyangabyaki (2003) also highlights that the disjointed fashion in which environmental policies were created over the years has affected the ability of local governments to exercise environmental powers. Emmanuel & Alexander (2011) observe that there is need for strict division of labour and specialization of tasks if public policy and legislation are to be effectively implemented.

Uganda’s major policies on biodiversity protection and charcoal include: the National Environment Act 1995, 1998 Cap 153; National Environment Action Plan 1994; National Environment Management Policy 1994; National Forest Policy 2001; Energy Policy of Uganda 2002; Renewable Energy Policy of Uganda 2007; and The Biomass Energy Strategy ‘BEST’ 2014. Uganda does not have any specific national law for conservation of the shea nut tree that could be used to steer a unified regional movement by international NGOs, development partners and local governments. The laws, strategies and plans that may be used in conservation of the shea nut tree are listed in Table 5.

Table 5. Laws, strategies and plans which may be used in conservation of the shea nut tree in Uganda. Information adapted from Akello (2007), Republic of Uganda (2010), Government of Uganda (1995, 1998), Basu et al. (2013) and Rural Electrification Agency (2007)

Uganda Vision 2040	-A framework document, intended to guide Uganda towards achieving a national vision: “A transformed Ugandan society from a peasant to a modern and prosperous country within 30 years” -Plans to raise access to electricity from 11% (2010) to 80% (2040) -Plans for the development of alternative energy sources as well as biogas and natural gas, but makes no long term plans for the development of Uganda’s charcoal value chain.
¹National Environment Act 1995, 1998 Cap 153	-Established the National Environment Management Authority (NEMA) - the principal agency concerned with environmental management in Uganda and mandated to coordinate, supervise and monitor all activities in the field of the environment;
¹National Environment	-Gave rise to the formulation of the national environment management policy 1994, and

¹ Major policies in Uganda with impact on conservation and charcoal

Action Plan 1994	to an environmental legal framework under the Constitution of Uganda 1995. -Provided a framework for the development of sectoral policies such as the 1996 National Wetlands Management Policy, the 1996 Wildlife Policy, the 2000 Fisheries Policy, the 2001 Forestry Policy and several district environment management policies from 2000 onwards.
¹National Environment Management Policy 1994	-A framework policy broadly addressing management of all matters relating to the environment and natural resources to meet the needs of the present generation without compromising the ability of future generations to meet their own needs
¹National Forestry Policy 2001	Provides for the conservation of biodiversity and the need to involve communities and private owners in the management of forest resources
The National Forestry Plan (NFP) (2002)	Three objectives: (a) raise the incomes and quality of life of poor people through forestry developments, targeting sustainable livelihoods amongst small-scale, mainly rural stakeholders, with strategies based on the farm, in natural forests or off-farm, (b) increase economic productivity and employment in forest industries, targeting large scale, commercial investors, with strategies based mainly on plantation forestry, (c) achieve sustainable forest resource management, targeting local, district, national and international interests in biodiversity and environmental conservation.
The National Forestry and Tree Planting Act (2003)	Established the National Forestry Authority (NFA) at the national level and the District Forest Service (DFS) at the local government level. Objectives - create an integrated forest sector that will facilitate the achievement of sustainable increases in economic, social and environmental benefits from forests and trees by all people of Uganda, ensure that forests and trees are conserved and managed in a manner that meets the needs of the present generation without compromising the rights of future generations by safeguarding biological diversity and environmental benefits that accrue from forests and trees.
¹Energy Policy of Uganda 2002	-A broad energy policy with focus on petroleum, rural electrification, hydropower generation, renewable energy and energy efficiency.
¹Renewable Energy Policy of Uganda 2007	-Its formation arose from the need to focus the energy policy more on renewable energy -Its key objective is to increase modern renewable energy usage from 4% to 61% by 2017. -Considerations for the scaling up of charcoal related technologies include improved woodstoves, improved charcoal stoves, institutional stoves, baking ovens and kilns.
¹Biomass Energy Strategy 'BEST' 2014	-Under implementation by MEM, with support from the German Agency for International Development Cooperation (GIZ), the German Financial Cooperation (KfW) and the Centre for International Migration (CIM). -Aims to provide skill and capacity development in energy policy. -Aims to provide resource development support in disseminating modern biomass energy technologies, promoting energy efficiency and rural electrification.
The Constitution of the Republic of Uganda (1995)	-General government policy on natural resource conservation is enshrined in the Constitution, which provides that the State shall protect important natural resources such as land, water, wetlands, minerals, fauna and flora on behalf of the people of Uganda
The Local Government Act (LGA) (1997)	Introduces a decentralized system of governance in Uganda in which local governments are mandated to conserve the natural resource base
Decentralization Policy (1997)	Provides the basis for devolving natural resources management to the local government level and encouraging local participation in decision making, as well as enhancing community benefits and cost-sharing of management of the environment and natural resources

As can be seen in Table 5, energy policies in Uganda place much emphasis on modern and advanced energy resources for a population that is largely dependent upon wood fuel and charcoal. Basu et al. (2013) suggest that the Forestry Policy 2001 lacks a clearly defined strategy for its implementation, though it addresses a number of issues concerning charcoal.

To sum up, Uganda lacks a specific national policy for conservation of the shea nut tree. Its national energy policies do not address charcoal production and trade even though charcoal and fuelwood account for 92% of national energy demand. The charcoal trade in Uganda therefore remains largely unregulated, despite being the single greatest threat to the shea nut tree. Although the institutional framework which is in place for conservation appears quite elaborate, it does not actually reach to the sub-county level and the roles of its various organs seem to be vague and overlapping. In this framework, the position of the environment officer appears to be relatively weak, particularly in the policy arena.

5. QUESTIONNAIRE RESULTS

A questionnaire, structured for both categorical and open-ended responses, was administered to 19 DEOs whose districts form the shea belt of Uganda. The districts vary in age from 9 to 35 years, with staff numbers ranging from 2 to 10, though a staff number of 4 was most common.

Fourteen out of 19 DEOs answered the questionnaire. Two respondents (from Kotido and Luweero) were eliminated from the data analysis owing to the following reasons:

- a. The district 'Kotido' had undergone subdivision in 2006, which resulted into the creation of a new district 'Abim' and the shea nut trees fell within the jurisdiction of the latter. Some recent literature still refers to the former. The new district 'Abim' has been included in this study.
- b. In the district of 'Luweero' the officer was uncertain about the existence of the shea nut tree in the region: "*Shea nut tree does not grow in Luweero District. Currently it is not there.*" Although the district underwent subdivision in 2005 to form 'Nakasongola' district, it was listed in the Presidential Directive on Shea Butter Trees 2006 as one of the four areas known to have an abundant numbers of the tree at that time. The district has also been cited in the literature as containing the shea nut tree.

Results presented below therefore summarize the views of 12 DEOs (N=12), and they are presented in frequency tables. As the questionnaire consisted mainly of open-ended questions, allowing flexibility in responses (respondents could list more than one item/issue in their answers) the frequencies listed in the tables below do not necessarily add up to the total sum of 12.

District Level (LG)

The first part of the questionnaire focused on the conservation of the shea nut tree at the district level of government. The DEOs were asked about whether they have made attempts to conserve the shea nut tree at the district level. All the officers responded positively, except one who sighted financial constraints as his reason. Between 1 to 4 conservation approaches were employed by each officer (see Table 6), though sensitization featured strongly - the use of radio media to achieve this was not at all popular. It was also clear that enforcement was not necessarily dependent upon the possession of a district ordinance either. At times traditional institutions were strengthened and their laws and rituals used alongside or in place of conventional laws. As one officer stated: "*... the cultural institutions, when re-organized and*

trained, are more effective in enforcing shea nut tree conservation". It is perhaps important to note that Uganda as a country has no national legislation specific to conservation of the shea nut tree.

Respondents reckoned that the legitimacy and efficacy of enforcement stood in the balance between (1) collaborative and concerted effort by multiple partners (i.e. legislators, technocrats, parastatals, NGOs and the community) - here they voiced that any weak link could sabotage the whole affair and (2) resource availability in terms of manpower, logistics and funds (see Table 7).

While a section of the officers handled enforcement at the district level, others attempted to empower lower local governments and lower administrative units to enforce within their jurisdictions. As one officer stated: *"it is the sub-county authorities to establish revenue check points and arrest all charcoal from shea nut trees."* For a number of reasons discussed later in these results, many of the officers noted that the level of enforcement within their district was low, or as one officer stated: *"There is limited enforcement of the ordinances and byelaws at both sub-county and district level."*

Table 6. Participants respond to the question: Briefly describe the approaches which you have employed to conserve the shea nut tree?

Approaches used by DEOs to conserve the shea nut tree	Frequency (n=11)
Ordinance formulation	4
Enforcement	6
Traditional laws, rituals and cleansing	5
Sensitization through 'Community Outreach'	9
Sensitization through 'Radio Media'	2
Regeneration through community planting of shea nut trees	2
Energy Alternative: Community or institutional establishment of fuel woodlots by use of exotic/ fast growing maturing trees	1
Energy Efficiency: Demonstration and establishment of household and institutional energy efficient cookstoves	1

Table 7. Participants respond to the question: What lessons have you learnt from your applied approaches in conserving the shea nut tree?

Lessons learnt from applied conservation approaches for the shea nut tree	Frequency (n=11)
Enforcement is effective if collaborative – but easily becomes unrealistic from any lack of commitment and concerted effort	4
Enforcement is resource intensive (manpower, logistics, funds)	4
Enforcement must be regular to be effective	1

Politicians at times sabotage enforcement	1
Police do not work well if the DPC is not highly involved	1
Use of traditional laws and rituals against culprits is more effective than constitutional laws	2
Alternative livelihood options must essentially be tailored into all approaches	3
Regeneration is not an effective approach	3
Fuel woodlot establishment of exotic/fast growing trees is an effective energy alternative and doubles as a livelihood option	2

Regarding the question of support rendered by local government framework towards conservation, 11 of the officers acknowledged they received support (see Table 8). However, ‘conflict of interest’, ‘lack of foresight by district technical officers’ and ‘low level of political commitment’ were issues that came out very strongly concerning the level of support realized.

Table 8. Participants respond to the question: How does the district structure (LG) support conservation approaches for the shea nut tree?

LG framework support towards conservation of the shea nut tree	Frequency (n=11)
District Council (DC): Budget allocation	3
District Council (DC): Enactment of ordinance	4
Production, Marketing and Natural Resources committee of council (DEC) & departmental staff; Regular radio education programs to rally support for shea nut tree conservation	2
Production, Marketing and Natural Resources committee of council (DEC): Regular monitoring	2
DEC or DC: slight engagement in community sensitization or awareness creation	4

Speaking of whether they realized local government support, an officer volunteered, “*Yes, lip service of environmental concerns by the political wing*”, while another stated, “*Yes, but to a small extent. More or less verbal than actual incorporation.*” Only 4 out of the 12 district councils had enacted an ordinance.

Ultimately, political engagement at LG level seemed to be low throughout the districts. The same can be said for the level of cross-sectoral engagement considering the fact that there was no mention of agricultural or production officers in any of the DEOs’ responses.

Sub-County Level (LLG)

The second part of the questionnaire focused on the support rendered by lower local government structures (also referred to as the sub-county level) towards conservation approaches for the shea nut tree. The responses here reflected the state of affairs in the district level. Eight officers reported that some of their LLGs upheld/ supported approaches to conserve the shea nut tree, but to a very minimal extent, as seen in Table 9.

The DEOs were asked whether their districts realized any international NGO support towards conservation of the shea nut tree. Six out of 12 answered yes to this question. They classified these interventions (administered at the lowest level of service delivery i.e. the sub county), as can be seen in Table 10.

Table 9. Participants respond to the question: How does the sub-county structure (LLG) support conservation approaches for the shea nut tree?

Sub-county support towards conservation of the shea nut tree	Frequency (n=8)
Council: Passing of byelaws	3
Council: Budget allocation to shea nut tree conservation approaches	1
Council: Community shea nut tree sensitization and awareness meetings	2
Technical staff: Enforcement; Hotspot monitoring, arrest and fining of those found cutting shea nut trees	2
Technical staff: Establish revenue check points and impound shea charcoal	1
Designated Environment Focal Point Persons (EFPP): Coordinate shea nut tree conservation at LLG level	1
Technical staff & some council members: Community mobilization and sensitization	5

Table 10. Participants respond to the question: How are your approaches for conservation of the shea nut tree supported by international NGOs?

NGO interventions towards conservation of the shea nut tree	Frequency (n=6)
Advocacy, awareness creation, sensitization	4
Support and training of school environment conservation clubs	1
Training of local environment committees	2
Establishment and training of community resource persons to coordinate conservation efforts at the community level.	1
Support fuel woodlot establishment of exotic/fast growing trees species	1
Support community management systems for the natural regeneration of indigenous trees	1
Produce energy efficient cookstoves and support the use improved charcoal production technologies	1
Support and facilitate policy formulation (ordinance or byelaws) on shea nut tree conservation	1

Provide logistical support for the implementation of ENR activities	1
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In one district, where an NGO helped to create and train community resource persons, the DEO reported the highest level of LG and LLG support. Appendix 3 provides a table of NGOs which are directly or indirectly engaged in shea nut tree conservation within the respondent's districts.

Local Environment Committees

The third part of the questionnaire focused on the engagement of local environmental committees (LECs) in shea nut tree conservation efforts. In 6 out of 12 districts, LECs were engaged in community mobilization, awareness creation, supervision, monitoring and enforcement, as can be seen in Table 11. The 6 DEOs were however quick to add that many of these committees were actually non-functional, owing largely to the voluntary nature of their work. The response of all 12 DEOs regarding the functional challenges of LECs is presented in Table 12; only one officer noted their low level of cross-sectoral linkage, stating: *"They are never recognized by even other sectors such as agric, health, who instead put up other committees."*

Table 11. Participants respond to the question: How instrumental have LECs been in your conservation approaches for the shea nut tree?

Instrumentality of local environment committees to conservation approaches for the shea nut tree	Frequency (n=6)
Community mobilization	2
Supervision, monitoring and reporting	6
Awareness creation	4

Table 12. Participants respond to the question: What factors hinder the functionality of LECs?

Factors that hinder functionality of LECs	Frequency (N=12)
Conflict of interests by political heads of the committee	3
Low Capacity	4
Voluntary basis of work that causes them to quickly lose morale	10
Office term restricted to (their) political term of office	2
Low status since they are not recognized by other sectors	1

Local government and Lower Local government Framework Challenges to conservation of the shea nut tree.

Eleven officers stated that they encountered challenges with the institutional framework at the LG and LLG levels. One officer lamented: *"An independent unit of enforcement needs to be instituted urgently to support the districts in efforts to conserve the shea nut tree."* Another officer stated: *"The number of properly equipped staff at the district level is too low. This affects*

any programme implementation; inadequate budgetary allocation affects consistency in the implementation of any programme; there is no established staff position at sub-county level slowing down implementation of programmes.” A third officer added: “There are cases of section of politicians making concession that permit the public to cut the shea nut tree; even when enforcement is undertaken – they tend to act in order to have the culprits set free.”

The lack of ENR technical structures at the LLG also presented DEOs with a daunting challenge. Under prioritization of the department and the lack of and limited availability of transport means only worsened the situation (Table 13).

Table 13. Participants respond to the question: Have you encountered any challenges with the LG or LLG framework in your efforts to conserve the shea nut tree?

Challenges encountered with the LG and LLG framework	Frequency (n=11)
Incoherence, disagreement and conflict of interest between political and technical organs on conservation targets, priorities, legislation and enforcement measures for conservation of the shea nut tree.	7
Logistical and financial resource constraints; under prioritization of ENR dept. in decision making fora (that determine budget and resource allocation)	8
Inadequate structure; lack of field support/ extension staff/ LLG structures for program implementation, monitoring and enforcement	6

In response to how these challenges could be resolved, recommendations were made for the recruitment of extension staff at the sub-county level. Meanwhile, bridging of the knowledge divide between politicians and technocrats was suggested as a strategy that could serve to harmonize their divergence of prioritize and interests (Table 14.)

Table 14. Participants respond to the question: In what ways do you think that the framework challenges at the LG and LLG levels can be addressed to enhance conservation approaches for the shea nut tree?

Recommendations to address LG and LLG framework challenges	Frequency (n=11)
Structural improvement; recruitment of extension/ sub county support structures	7
Bridging the knowledge divide between politicians and technocrats as pertains Conservation needs and goals.	1

NEMA

The last section of the questionnaire focused on the National Environment Management Authority (NEMA). DEOs were asked if, and then how, NEMA had been instrumental towards their approaches to conserve the shea nut tree? Six officers conceded that NEMA had been instrumental, while the other half conceded otherwise. Three officers recognized the ongoing contribution by NEMA in steering a draft national shea nut tree conservation strategy (see Table 15).

In response to how NEMA could become more instrumental, 4 out of the 6 officers who conceded that NEMA had not been instrumental cited the need for technical backstopping and logistical support, 2 additionally highlighted the need for a national policy that specifically addressed conservation of the shea nut tree. Two of the 6 officers did not volunteer any answer, thus n=4 (Table 16.)

Table 15. Participants respond to the question: How instrumental has NEMA been in your efforts to conserve the shea nut tree?

NEMA's instrumental role towards the conservation effort for the shea nut tree (n=6)	Frequency
Lobbying for funds	1
Logistical support to conservation efforts and enforcement activities.	2
Advocacy for good / adequate institutional structures for ENR management	1
Review of district ordinance	1
Steering of the draft national shea nut tree conservation strategy (still ongoing)	3
Sensitization through radio media	1

Table 16. Participants respond to the question: In what ways can NEMA play a more instrumental role in conservation of the shea nut tree?

How NEMA can be more instrumental to conservation efforts for the shea nut tree	Frequency (n=4)
Technical backstopping and logistical support	4
Issue national policy instruments for use in conservation of SNTs	2

The DEOs were asked to recommend ways in which the ENR institutional framework could be improved for conservation of the shea nut tree. They championed the need for resource availability (human, financial and logistic). Less than half, however, mentioned the need for increased sectoral and institutional collaboration.

Table 17. Participants respond to the question: How do you think the ENR institutional framework at district and sub-county levels can be improved for better conservation and management of the shea nut tree?

Recommendations to improve the ENR institutional framework at district and sub-county levels for conservation of the shea nut tree	Frequency (n=11)
Empower LECs to execute their roles	4
Create sub-county extension/ support structures	5

Resource provision and prioritization of ENR department in budget allocation	6
Establish minimum number of staff to be recruited before ENR dept. can be operationalized	2
Increased collaboration with sector working groups, institutions and NFA	3

6. DISCUSSION

“I cannot teach anybody anything. I can only make them think.”
Socrates.

This study identifies the production of shea butter and the production of charcoal as two alternative and competing uses of the shea nut tree. These productive usages are directly linked to people’s livelihoods in northern Uganda, and are observed to be gender specific. The patrilineal system of land ownership prevailing in northern Uganda implies that men possess the ownership and decision making rights over land and its associated resources. For this reason, it is men who chiefly engage in charcoal production.

It is well known in Uganda and well documented in reports and other publications that charcoal production is highly driven by consumer demand. However, the need to make ‘quick’ or ‘immediate’ cash by farmers also emerges as a significant driving factor in the statements of several DEOs. One DEO stated: *“Communities are aware about the importance of SBT², and its contribution to food security. The missing gap is the attitude towards quick generation of income to meet the household and social needs like alcohol consumption has compromised the need to conserve SBT, but a shift to quick raising of income from SBT.”* As a livelihood strategy involving use of the shea nut tree, charcoal production is highly unsustainable because of the tree’s lengthy juvenile period that both discourages and delays the re-establishment of tree stocks.

Women’s engagement in shea butter production contributes significantly to household domestic income. It enables women to meet basic household needs for the family, as well as medical bills and school fees for children. In northern Uganda the shea butter production represents a ‘long term and sustainable livelihood strategy’ for women, and consequently for the communities there as well. The findings of this study reveal that Uganda’s shea butter industry has significant potential for growth because of the country’s location within the zone of the ‘highest production potential for shea nuts’. Countries falling within this zone are estimated to be capable of producing between 70,000 – 300,000 tons of shea nuts annually (Bup et al. 2014). This potential, however, remains largely untapped. Women’s limited involvement in charcoal production activities can be attributed to their lack of ownership rights to land, coupled with the arduous nature of charcoal production.

² SBT (shea butter tree), also known as shea nut tree

The findings of this study illustrate the need for conservation approaches to address the link between environment and livelihoods. Conservation efforts where shea nut tree seedlings were distributed to communities registered a low level of success, as one DEO stated: *“The former NAADS³ program is not working well, since most communities prefer to plant exotic tree species like pines to shea nut trees because it’s marketable and fast growing than shea nut trees.”* This clearly illustrates that mismatches which arise between conservation approaches and people’s livelihood lead to a low level of adoption of such approaches.

Another officer highlighted the fact that poverty is a significant driving factor to species exploitation and depletion, as he stated: *“The community approach⁴ in protecting the trees works but the major challenge is poverty which drives the communities to cut down the tree.”* The study’s findings concur with Lewins (2004) and Leach (1999) in that as much as conservation approaches are well intended, they must observe the link between environment and livelihoods if they are to be accepted by communities and achieve intended outcomes. The direct approaches identified in this study, to be employed in the conservation of the shea nut tree in Uganda, are: regulatory approaches; sensitization; the use of economic incentives; and species regeneration and maintenance. Indirect approaches include the establishment of fuel woodlots and promotion of energy efficiency.

The use of traditional laws, rituals and cleansing appears closely alongside the use of formal laws in the districts. The study’s results appear to validate the claims of Hassenforder et al. (2015) that traditional institutions have significant and sometimes overarching influence over local environmental management. The DEOs expressed their views, however, that law enforcement can be unrealistic and unsustainable if it does not originate from a high level of stakeholder engagement and cross-sectoral collaboration.

There seems to be a higher level of success realized in conservation where DEOs try to engage sub-county authorities in regulatory approaches, when the sub-counties take charge of the distribution and quality of benefits that accrue from the approaches. From the response of the DEOs it would seem that in such instances the sub-counties develop a sense of ownership and enforce regulations more effectively.

Species regeneration and maintenance are not favoured by communities because of the shea nut tree’s long juvenile period. Its potential for adoption is largely dependent upon how successfully it can be merged with other livelihood alternatives that have more readily/ quickly realized benefits, such as an apiary. The use of economic incentives to support conservation identified in this study appear mostly as an undertaking of international NGOs, and it has been quite successful. Yet, the long term sustainability of such interventions is questionable. This is an important concern that should perhaps be addressed by international donors and local governments together. It is of no avail to conservation efforts if communities revert back to old natural resource use practices as soon as donor interventions end.

³ NAADS – National Agricultural Advisory Services (Government of Uganda programme).

⁴ Community approach here means the practice of maintaining the shea nut tree on farmlands, also known as ‘species maintenance’ or ‘farm management’ approach.

The institutional framework from which conservation approaches are administered, determines the level to which desired conservation outcomes will be achieved.

This study has identified that, while Uganda has several broad policies which address biodiversity and conservation, there is no national policy which specifically addresses the conservation of the shea nut tree. Broadly defined policies can fail to draw adequate attention to, or simplify, or even overlook, key issues of concern. The shea nut tree was declared vulnerable to extinction in 1998 by IUCN. Uganda still lacks a national policy (17 years later), with clear strategic objectives and a plan for implementation, to steer conservation efforts for the shea nut tree. This absence of a national policy appears to indicate a lack of national commitment towards biodiversity conservation.

Additionally, the findings of this study illustrate that energy policies in Uganda appear to be somewhat mismatched to the country's energy situation and needs. While it is commendable that Uganda is seeking to develop and modernize its energy resources, and to extend electrification to rural areas, research findings by IEA (2014) and Ruhombe (2012) suggest that there is also need to accord proper attention towards modernizing and regulating the charcoal trade. Charcoal is readily available and affordable and accounts for 92% of energy consumption in Uganda. This demand for charcoal is not about to go away any time soon and will likely outcompete modern energy resources. Uganda could learn from the experience of Sudan where the charcoal industry is properly organized and regulated. If Uganda were to regulate the country's charcoal industry it would not only create legitimate job employment, ensure species maintenance of trees, and guarantee a sustainable energy source, but also create a market for the establishment of fuel woodlots by farmers.

The existence of a national policy for conservation of the shea nut tree would perhaps serve to draw attention to the problem at hand. It could guide a unified and collaborative movement by international donors and partners, line ministries, DEOs, civil society organizations and other development partners engaged in natural resource conservation. It would ultimately aid in the identification of new solutions and alternatives to addressing the problem.

The MWE (Ministry of Water and Environment) and MEM (Ministry of Energy and Minerals) have a joint mandate concerning policies related to charcoal, but neither appears to be focusing much on this role. While a tree is standing, it is under the purview of the MWE; when the tree has been cut (intended for the production of charcoal) it is under the purview of the MEM. This arrangement is complex and unclear and would appear to be out of harmony with some environmental laws.

The literature reviewed in this study, i.e. NEMA (2008) and Emmanuel & Alexander (2011) point out that institutional roles for natural resources management at the district level in Uganda are unclearly delineated and assigned. This observation can in part explain the apparent unclear distribution of powers, evasion of roles and responsibilities, transfer of blame, and limited ownership of tasks for environment and natural resources management. This tends to exist within many local governments in Uganda and was alluded to by the DEOs in this study. Unclear roles can result in varied interpretations of roles being formed, such that actual environment and natural resource management outcomes differ from intended outcomes. This situation can serve

to render the position of the DEO quite weak and encourage the low prioritization of environmental issues in council affairs.

At the district level, the lack of autonomy of the district environment committee which often exists as an alias of the production, marketing and natural resources committee, creates a conflict of interest in the district council secretary for production and marketing, who chairs the committee. The role of the one officer and committee is to uphold both economic development and environmental conservation. This arrangement perhaps compromises environmental and natural resource management decisions and undermines the credibility of local government environmental management.

Throughout both primary and secondary data obtained in this study, local environment committees (LECs) have been portrayed in a predominantly derelict light. Although they are meant to function at the sub-county level, the study's results revealed that local environmental committees are quite often non-existent or ineffective because of the voluntary nature of their task which causes them to quickly lose morale. Additionally, the LECs' limited capacity, limited recognition by other sectors, and the perceived conflict of interests amongst their political heads are also mentioned as reasons for their failure.

Several of the DEOs in this study pointed to the institutional framework gap due to the lack of an environmental and natural resource management structure at the sub-county level. In some districts, attempts were made by NGOs to bridge this gap through the training of local environment committees or the formulation and training of Community Resource Persons to coordinate sub-county conservation efforts (see Appendix 2). While this is helpful, the sustainability of these interventions remains questionable. International NGO donor programmes have been known to acquaint local communities with financial incentives. While these incentives are well intended and helpful, they can at times lower the ability of local governments to sustain the outcomes of donor interventions once the donor has left. Local governments are not able to avail incentives to the communities, attuned to the quality and frequency established by international donors.

When the DEOs participating in the study were asked about the major challenges encountered in the implementation of conservation approaches, three issues were most significant in their responses:

Firstly, the DEOs agreed that the institutional framework is not ideal because of its inability to extend to the sub-county level. They mentioned the lack of field support, extension staff or some form of sub-county structure to aid in programme implementation, compliance monitoring and law enforcement. This was coupled with inadequate financial and logistical resource availability for project implementation.

Secondly, the DEOs cited a low level of political commitment. This was alluded to in many of the statements. Sometimes politicians were said to interfere with the implementation of enforcement measures and court proceedings. Other times they were said to assign a low level of prioritization to environmental concerns in the district council, leading to a low budget allocation to the environmental and natural resource management sector. The DEOs' responses to the tensions between the political and technical arms of the institutional framework support claims

made by Steffensen et al. (2004) and Steiner (2006) that a conflict does exist between the political and technical organs of government in Uganda. This is a matter that needs to be addressed because it adversely affects service delivery and project implementation across sectors. Environmental management is both individually and cumulatively impacted by this conflict, because of its cross-cutting nature.

Finally, the DEOs participating in the study mentioned that farmers generally do not feel obliged to take their advice because of the perception that tree resources on their (the farmers') land belong to them. An officer stated: *"The general feeling among landowners is that once the tree is on their land they have a right to cut it for their purposes."* This statement concurs with the findings of Francis and James (2003) and FAO (2014) in that a country's land reform policies greatly affect natural resource conservation.

7. CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

Natural resource management interventions worldwide have often overlooked the institutional frameworks needed to bring about desired NRM outcomes as they tend to focus more on the environmental issues of concern. Yet, institutional frameworks are believed to contribute significantly towards the attainment of conservation outcomes. The overall goal of this study has been to enhance the institutional and policy frameworks for the conservation of the shea nut tree in Uganda by examining the relationship between the shea nut tree and livelihoods in northern Uganda; reviewing the institutional framework and policies for conservation of the shea nut tree in Uganda; and identifying challenges to the conservation of shea nut tree in Uganda.

The shea nut tree is greatly threatened by unregulated charcoal production activities throughout sub-Saharan Africa. In Uganda charcoal and fuelwood account for 92% of the national energy demand, and the country's annual energy consumption growth rate of 6% is expected to double by 2025 (Republic of Uganda 2010; MEMD 2007). The study's findings revealed that although the shea nut tree has the untapped potential to augment the regional economy of northern Uganda, its conservation status has not been adequately addressed by the two line ministries in charge of charcoal policy (MEM and MWE), or by the ministry in charge of environmental policy. Uganda lacks a national law for the conservation of the shea nut tree and for the regulation of the charcoal trade. Regulation of the charcoal trade would benefit Uganda's population and environment in many ways, yet the regulation will require a very high level of collaboration between the MEM and MWE. It therefore follows that regulation of the charcoal trade cannot not be achieved in Uganda by the efforts of the country's ENR institutional framework alone, because the charcoal industry unites various interest groups that have complex and diverse economic and power relations, and who are able to bring different institutional dynamics into play, across sectors.

The findings of the study showed that women and men in northern Uganda engage in conflicting, alternate uses of the shea nut tree. Though charcoal production is unsustainable and destructive, it

represents a quick source of domestic income from shea butter production, and in this way it reflects the level of rural poverty. Conservation approaches should be targeted to complement existent livelihood strategies and marry them with long term conservation goals.

The study revealed that the institutional framework for the conservation of the shea nut tree in Uganda is incomplete and the roles of implementing organs are unclear. This situation is not aided by the fact that there is a low level of prioritization of environmental and natural resource management concerns in district council affairs, leading to low budgetary and logistical resource allocation to the natural resource management department. The study also highlighted that the limited technical capacity of various organs within the ENR institutional framework has also contributed towards the low conservation status of the shea nut tree in Uganda's shea belt.

Finally, this study would like to carry the message that the future is not just a place where we transition to, but rather it's a place that we get to create. Policies shape our future; they can be used to steer national movements towards realistic and desired outcomes that are environmentally sound and sustainable for the common good of the people. The policy domain in Uganda has undergone several challenges, owing to the state of insurgency which prevailed in the country, from the late 1980s to 2007. With the slow return of peace, there is now need to re-assess several aspects of Ugandans' policy and institutional frameworks, including those on natural resource conservation. The information from the study will be particularly useful in the next couple of years, especially in the Alebtong district of Uganda, as local governments realize newly elected leaders, institute new district councils and formulate new policies across various sectors. It is expected that this study will also contribute towards a better understanding of the current status of shea conservation within Uganda. Accordingly, the following recommendations are offered aimed at enhancing the institutional and policy frameworks for the conservation of the shea nut tree in Uganda:

1. A national policy with a clear implementation strategy that prioritizes the link between environment and livelihoods should be formulated for the conservation of the shea nut tree in Uganda.
2. A feasibility study should be undertaken for the regulation of Uganda's charcoal trade.
3. The roles of various organs engaged in ENR management should be reviewed to improve their delineation and assignment.
4. The district environmental committees should exist as autonomous committees from the production and marketing committees.
5. Environmental extension staff should be created within sub-counties to coordinate environmental management.

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APPENDICES

Appendix 1. Questionnaire

**RESEARCH TOPIC: A REVIEW OF INSTITUTIONAL FRAMEWORKS
FOR CONSERVATION OF THE SHEA NUT TREE
IN UGANDA**

Age:

Qualification:

Period in service:

Number of officers within ENR Department:

Year in which district was formed:

SNT: Shea Nut Tree

1. Have you made any attempts to conserve the shea nut tree in your district? - If NO, please explain why? If YES, please continue to question 2. _____

2. Briefly, describe the approaches/ strategies/ policy instruments which you have been using to conserve the shea nut tree in your district? _____

3. What lessons have you learnt from these approaches; i.e. what works? what doesn't work? _____

4. a) Are your conservation approaches for the shea nut tree supported by sub-county structures (e.g. technical offices/ political offices/committees, etc.) - If yes, please explain how? _____

b) Are your conservation approaches for the shea nut tree supported by district structures (e.g. technical offices/ political offices/committees, etc.) - If yes, please explain how? _____

c) Are your conservation approaches for the shea nut tree being supported/complemented by NGOs? - If YES, please name the NGOs? _____

5. With regard to the ENR institutional framework at the district or sub-County level, have you encountered any challenges in your shea nut tree conservation approaches/strategies? - If YES, please explain. _____

6. In your opinion, how can these challenges be addressed or solved? _____

7. Have the local environmental committees been instrumental in your shea nut tree conservation approaches? – If YES, please explain how? _____

8. What factors (if any) significantly hinder the functionality of this committee? _____

9. Has NEMA been instrumental in your efforts to conserve the shea nut tree? – If NO, please suggest ways in which they could be instrumental. If YES, please explain how they have been instrumental? _____

10. Do you think that the ENR institutional framework at the district and sub-county levels can be improved for better conservation and management of the shea nut tree? – If NO, please explain why? – If YES, please suggest how?

Thank you for your time.

Appendix 2. NGOs that support conservation efforts for the shea nut tree, either directly or indirectly

World Vision	Awareness creation; support and training of school conservation clubs and LECs; community afforestation (SNTs but largely exotic trees); addressing livelihoods of the communities. Support the use of improved charcoal production technologies; production of energy efficient cook stoves; support management of natural regeneration of indigenous trees to reduce pressure on SNT as an energy source.
Environmental Alert	Advocacy
OYIDO (Orungo Youth Integrated Development Organization)	Awareness creation.
SORUDA (Soroti Rural Development Agency)	Awareness creation; provision of tree seedlings; setting & training Community Resource Persons to coordinate conservation efforts at the community level.
Lutheran World Federation, Tree talk and UNDP	Sensitization; training of established LECs; facilitating the process of policy formulation; logistical support to ENR department; community tree planting and afforestation (mostly exotic trees)

Appendix 3. The sub-division of districts within Uganda’s shea belt. Information obtained from Green (2008) ACCS (2013) and UBOS (2002)

Parent district	Year of division	New district ^A	Year of division of ‘New district ^A ’	New district ^B
Lira	2006 2009 2010	Dokolo Otuke Alebtong		
Kotido ⁵	2006	Abim		
Arua	2006	Nyadiri		
Gulu	2006	Amuru	2010	Nwoya
Soroti	1997 2001 2009	Katakwi Kaberamaido Serere	2005	Amuria
Kitgum	2000 2009	Pader Lamwo	2010	Agago
Luweero ⁶	1997	Nakasongola		
Nebbi	2009	Zombo		
Moyo	1997	Adjumani		

⁵ This district does not contain the shea nut tree because it was sub-divided and the shea nut tree fell within the boundary of one of the newly created districts, i.e. Abim

⁶ Luweero district was eliminated from the study for reasons sighted in the chapter on ‘Questionnaire Results’