

Top-down or bottom-up? Decentralization, natural resource management, and usufruct rights in the forests and wetlands of western Uganda

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ABSTRACT

Natural resources, and their management, have played an important role in shaping Uganda's national identity since 1986. Through Uganda's decentralization agenda, the perception of unprotected forests and wetlands have gone from being wasteland and essentially ignored in the political arena, to key elements in securing livelihoods and important topics within political platforms. Despite the successes of government decentralization and legislated devolution of rights and responsibilities to the local level, mandated regulations instituted by the central government can remain ignored or unheard of locally. What governs local resource use is a combination of prescriptive national legislation and regulations, local by-laws, and perceived ownership. Usufruct rights of forests and wetlands largely depend on local circumstances, which are unique to individual communities or particular forests and wetlands. This paper describes the entwined recent history of decentralization and natural resource management legislation in Uganda. We then present a case study of local perceptions of access and use of unprotected wetlands and forests in western Uganda. We show that there is confusion among local residents and village leaders with regards to access and use of these areas despite prescribed national legislation. We suggest that better operational success of resource management at the local level could be achieved by disseminating information at multiple levels. This need is particularly pressing in the more remote areas of the country where forest and wetlands face enormous pressure from high population growth and heavy human reliance on natural resources.

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Introduction

Rural livelihoods in sub-Saharan Africa are heavily dependent on the land and its resources (Abalu and Hassan, 1998; Scoones, 1998). Almost 70% of forest loss in sub-Saharan Africa is directly attributable to unsustainable timber, charcoal or fuelwood extractions, which will have large impacts on both biodiversity and the people who rely on the land (Cordeiro et al., 2007). Uganda is a case in point; people are dependent on the land for economic opportunity, energy, shelter, and sustenance to support their entire livelihood structure. Nearly 80% of the 27 million people are rural, who for the most part derive their livelihoods from farm-based activities. More than 80% (180,000 km²) of the land is used for small-scale farming (Mukiibi, 2001a). High rates of in-migration and natural growth led to Uganda's population growing by 240%

between 1960 and 2000. Population growth rates are among the highest in the world (about 3% annually; US Census Bureau, 2006), placing further need on cultivatable land and resources to sustain livelihoods.

In 2001, Ugandan forests and woodlands covered approximately 21% (49,000 km²) of the land surface, of which 60% remained unprotected under national legislation. The rest is vulnerable to overexploitation and agricultural encroachment, and country wide, an estimated 500 km² (0.8%) are lost each year (NEMA, 2001). These forests provide ecological services such as stabilization of the local climate, erosion control, nutrient uptake, and carbon sequestration (Laurance and Bierregaard, 1997). Forest fragments also serve as wildlife species corridors, habitat, and breeding and feeding grounds (Marsh, 2003; Onderdonk and Chapman, 2000). These areas are also important for commercial and subsistence purposes, providing fuelwood, timber, charcoal, poles, and non-timber products such as medicinal plants and supplemental food.

Wetlands include all areas where plants grow and animals live in association with permanent or temporary flooding (Kisamba-Mugerwa and Nuwagaba, 1993). Uganda's wetlands comprise

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about 13% (~30,000 km²) of the country's total land surface (Mukiibi, 2001a). Wetlands have many environmental values including maintenance of water quality and volume, pollutant filtration, flood abatement, and serve as habitat for a diverse range of aquatic and terrestrial species (Bakema and Iyango, 2001; Crisman et al., 2003; Mukiibi, 2001b). They are also important to the livelihoods of surrounding communities in several ways. They provide a subsistence resource base for water, thatch, handcraft materials, and local medicines, and are commercially important, providing a source of revenue from visiting tourists, and medicinal plant and handcraft sales.

Along with the scattered fallow and bushlands, Uganda's forests and wetlands are the main resource caches and essential for the survival of the majority rural population (Gombya-Ssembajwe and Banana, 1998). Despite their documented social and ecological benefits (Hartter, *in press*), Uganda's forests and wetlands are under serious threat of unsustainable conversion due to population growth, in-migration, and agricultural expansion (Chapman et al., 2001; Hamilton, 1984; Hartter and Southworth, 2009; Maclean et al., 2003a). Drainage and conversion into other land uses such as cultivation, woodlots, and pasture is common in order to offset resource and land scarcity (Crisman et al., 2003).

The backdrop to this rural lifestyle and increasing population pressure is a tumultuous political history that gave way recently to a period of detente and decentralization of government. Since its independence from Great Britain in 1962, Uganda experienced decades of political instability and natural resource management neglect. There have been eight changes of government since independence, four of which were forced by military *coups*. Historically, chieftains had reign over land allocation, local law and natural resource allocation. That changed after Uganda gained independence. After Idi Amin seized power in 1971, he stripped traditional leaders of their powers (Mutibwa, 1992). Then, Yoweri Museveni came to power in 1986 after years of failed governments, civil war, abolishment of traditional kingdoms, and centralization of government functions and powers. Recognizing the inextricable link of rural peoples (his power-base) to the land, Museveni and his National Resistance Movement (NRM) sought to re-establish the governance of the country from the bottom up (Mutibwa, 1992).

A national policy of decentralization devolved rights and responsibilities to the local government. At the same time, the focus was on transition of government powers. Natural resources consequently received comparably less emphasis, leading to confusion, miscommunication, and neglect at multiple levels (Howard, 1991; Banana et al., 2004). A well-earned aversion to top-down national regulation enforcement can translate into uncoordinated local scale management of common goods. In this paper, we attempt to trace the entwined histories of decentralization and natural resource management in Uganda, in order to understand the current state of management. We then examine a case study of two ethnic groups, the Batoro and the Bakiga, living near Kibale National Park in western Uganda. We present results of interviews with local farmers and village leaders, and to compare use of forests and wetlands with the perceptions of access and regulation at the individual landholder and local management scales.

Natural resource management and Museveni

When Museveni came to power, discussions began immediately to reorganize Uganda's natural resource management. In the past, natural resources had largely been ignored in the national political arena. Their status became more of a by-product of political agendas, rather than a primary political platform. Museveni worked to slow the downward spiral of unmonitored resource destruction and incorporate natural resource management into the national

agenda. In 1989, the first notable proof of progress came with the establishment of the National Wetlands Programme (NWP), which was a mechanism to formulate a national policy for the conservation and management of wetlands (Bakema and Iyango, 2001). In 1993, the objective and operations of the NWP were expanded to include issues relating to sustainable local wetlands management. Despite these efforts, Uganda still lacked a cohesive framework to coordinate broader environmental issues.

In 1995, Uganda clearly stated its national environmental agenda in the new constitution by asserting the significance of environmental conservation and that natural resources are held in trust by the government for the people of Uganda (Chapter 15, Articles 237 and 245). Thus, a national natural resource management agenda emerged in three important ways: a national decentralization policy, new legislation, and devolution of rights and responsibilities to the local level.

The implementation of the decentralization policy meant a review and realignment of the environment and natural resources management sectors. More responsibilities were passed on to communities. In 1997 the government's national position on decentralization to break up central government and extend power to the local governments was ensured with the Local Governments Act 1997 (Article 206 of the new Constitution). Local councils (LCs) were given power to manage resources according to the Constitution (1995) and Local Governments Act 1997.¹

Decentralization came through the enactments of key pieces of legislation, which demonstrated the central government's commitment to devolution and building local government functions and land/resource management (Fig. 1). The Ugandan government's objectives for natural resource management were twofold: to restructure environmental management through reorganization of land, resources, and wildlife ownership; and to address many of these issues locally through the LCs.

The National Environment Management Authority (NEMA) was established in 1995 by the National Environment Statute as the "principal agency for the management of the environment" (NEMA, 2001). Through new mandates, NEMA established the district environmental authority and management of local resources was devolved to the local councils. The 1998 Uganda Land Act reversed the Land Reform Decree No. 3 of 1975² and re-recognized four tenure systems (customary, freehold, leasehold, and mailo³), affirmed that all land is vested in the people of Uganda, and further acknowledged the need for protection of the environment. It charged any person that occupies or owns any piece of land to manage and utilize it in accordance with environmental laws (NEMA, 2001). The National Forestry Policy and Forestry Act 2001 (NFPA) was probably the weakest legislation in terms of the decentralization from central government to the local levels (Nsita, 2003). Within the Act, only general parameters through which local involvement might be developed are acknowledged as essential.

¹ Local council (LC) system was implemented to serve as institutions for local self-governance. It would enable Ugandans to participate in decision making at a more equal level regardless of gender, age, ethnicity or political affiliations, while giving local governments autonomy, meaning they have the legislative and executive authority within their listed areas of jurisdiction. The LC system has five levels of local government: village, parish, sub-county, county, and district. For more on the LC system, see Saito (2003).

² Decreed that all land in Uganda be vested in the state in trust for the people to facilitate its use for economic and social development. It declared all land in Uganda public land belonging to the government and abolished the four types of land tenure: customary, freehold, leasehold, and mailo.

³ Mailo tenure was introduced as a result of the 1900 Buganda Agreement. Under this agreement, land was divided between the Kabaka (King) of Buganda, other notables and the Protectorate Government. The basic unit of sub-division was a square mile (Gombya-Ssembajwe and Banana, 1998).

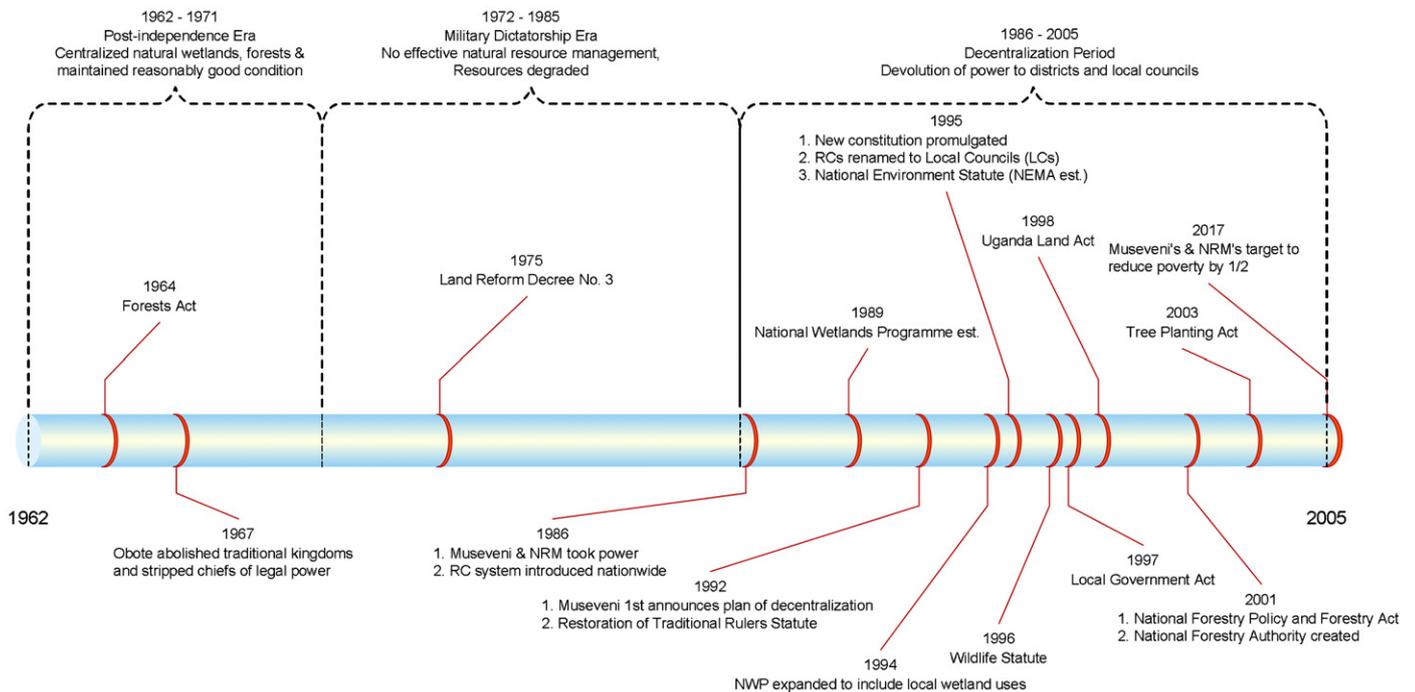


Fig. 1. Key legislations in Uganda's evolving natural resource management at the national level.

Furthermore, at the local level, each LC is responsible for overall planning and implementation of development activities, including environmental conservation. The NFPA provided only a loose structure for communication, monitoring, and evaluating environmental issues, which primarily aimed at upward communication. Local involvement through local governments and citizens would collaborate with the National Forestry Authority with respect to use of government held forest reserves. Additionally, local governments would collaborate with the district and sub-county councils with smaller forests.

By the early 1990s Uganda had 70 statutes dealing with aspects of environmental management and protection (Richardson, 1993) while moving towards decentralization. These laws were essentially resource management laws, concerned primarily with the allocation and distribution of rights to exploit resources among the various bureaucratic agencies. The environment was then parceled out into separate laws governing the exploitation of water, wetlands, forests, etc. (Richardson, 1993). The specific legislative actions of the Ugandan government since 1986 were necessary in providing an overarching decentralized framework, in which landholders could operate.

In general, the responsibility for land tenure administration and usufruct rights to land fell on local councils (Gombya-Ssembajjwe and Banana, 1998; Nsamba-Gayiyi, 1999). Rights and rules developed by the central government were handed down. In reality though, the local situation was complicated. The national level laws did not address local specifics nor account for variants (Bazaara, 2002; Banana et al., 2004; Nkonya et al., 2005). Furthermore, the Local Council Chairmen (LC1s) faced a difficult task of managing resources that sustained local livelihoods but which lacked clear governance. LCs were handed down an operational framework so they could manage resources and access, enforce compliance, and educate constituents (Bazaara, 2002).

Until 1966 public lands were governed *de facto* by traditional chiefs and rulers with little government influence (Place and Otsuka, 2002). As a result, user rights developed through a process of popular consultation and arbitration amongst landholders

and local council members, and also are relics of customary tenure and tribal authority. Despite changes in government and new legislation, these traditions and norms persisted. To some degree, these new mandates were followed, but generally they were followed only selectively by villages. The national decentralization policy produced semi-autonomous local government units. The village chairmen (LC1) thus chose to follow certain rules, ignore others, or create new ones based on local tradition, custom, or precedent.

Local forest ownership, access, and use

The new constitution defined forest management based on the 1964 Forest Act (Republic of Uganda, 1964), which was a relic of British colonial rule and hardly inclusive of rural Ugandan needs. According to the Forest Act, no one may reside, cultivate, or graze livestock in a reserve without the written permission of a Senior Forest Officer (Banana et al., 2004). Certain species remain reserved for non-timber forest products and may only be cut with National Forestry Authority permission both on forest reserve lands and on private and communal lands. Local communities have some special privileges in the use of resources in unprotected forests. Individuals may extract "minor forest products" – including fuelwood, indigenous medicines, poles, and other non-timber products – in reasonable quantities for their own domestic use without a permit or the payment of fees (Banana et al., 2001; Ntambirweki, 1998). The National Forests and Tree Planting Act of 2003 attempted to clarify ambiguities associated with larger tracts of forests – local and central forest reserves, as well as those in protected areas (Nsita, 2003).

While these Acts were important in shaping state property, common and private property regimes remained ambiguous. The Local Governments Statute 1993 decentralized forests, but local governments were not prepared to engage in professional forest management at the time (Nsita, 2003). To date, legislations continue to be focused at the state level and communities are left to enact local by-laws (Nkonya et al., 2005). Little has also been mandated for private landholders – only that they have the right of exclusion. They do not necessarily have the right to manage

their land unsustainably, but they do not have the legal obligation to manage their land in the interest of the community either (Kisamba-Mugerwa and Nuwagaba, 1993).

Local wetland ownership, access, and use

The management of wetlands is less defined than forest management, and despite their importance in livelihoods, little emphasis was placed on their sustainable use by the majority of Ugandans (Bakema and Iyango, 2001). The 1995 Constitution and the subsequent National Environment Act 1995 rationalized the importance of these areas to Ugandans and worked towards better management (Nkonya et al., 2005). NEMA confirmed this by stating that permanently inundated wetlands were public land, managed by NEMA (Republic of Uganda, 1995a). Prior to this, these areas were considered vested in the Uganda Land Commission (ULC) and subject to individual rights of reasonable use for domestic and agricultural purposes (Richardson, 1993). In the past, people treated wetlands more like wastelands or as a repository of land for potential agricultural expansion (Mukiibi, 2001b). Until recently, government policy encouraged the drainage of wetlands to reclaim them mostly for agricultural use, but also for other commercial and subsistence-based activities (NEMA, 2001). Though their existence was hinted at in legislative proceedings, the explicit mention of swamps and marshes remained absent in legislative directives.

The Constitution in Article 237 Clause 2 (b) states that, “government shall hold in trust for the people and protect natural lakes, rivers, wetlands, forest reserves game reserves, national parks and any land to be reserved for ecological and tourist purposes for the common good of all citizens” (Kakuru et al., 2001, p. 9). The Ugandan government (Wetlands Division of the Ministry of Natural Resources) is therefore mandated to regulate and control wetland use activities. Permanently inundated wetlands cannot be privately held, but are instead held by the government and managed by local councils. These areas should then be managed with the size of the wetland taken into account and so the community can have access to the wetland (Richardson, 1993). Users may harvest and collect resources – e.g., water, papyrus, fuelwood – according to ‘wise use’ for domestic purposes (Bakema and Iyango, 2001). According to the National Wetlands Policy, any activity that results in excluding water from the wetland is prohibited (Republic of Uganda, 1995b). Such activities include: digging channels, planting high water demanding trees in high densities, diversion of water entering a wetland, filling with soil or dumping of wastes, and burning (Maclean et al., 2003b). Therefore the three common land conversion practices: cutting papyrus and planting trees for fuelwood (most commonly *Eucalyptus* spp.), cultivating crops, and planting pasture grass are deemed illegal.

Case study: The Kibale landscape

Kibale National Park (KNP) is a good example of an island park – a dense, closed-canopy forest surrounded by a large agricultural population, large tea estates, and a vast network of wetlands and bottomland forest fragments. Outside KNP, a rapidly increasing population, agricultural expansion, and intensive smallholder agriculture place enormous pressure on the land and its resources. Landholdings are small (average <5 ha), and 43% of the land within a 5 km periphery of the park is used for agriculture (Hartter and Southworth, 2009).

The population in the sub-counties bordering the park is extremely high – almost 240,000 people in the 2002 census and

projected to exceed a quarter of a million by 2008.⁴ The population outside KNP has been growing extremely rapidly since the 1950s due to in-migration and natural increase, although this has started to slow in recent years as the area has become very densely populated (Uganda Bureau of Statistics, 2005), suggesting that it is reaching a saturation plateau.

The population in the two main districts that border the park and in which our survey regions are located (Kabarole and Kamwenge Districts) increased by 76% between 1980 and 2002 (Uganda Bureau of Statistics, 2005); extrapolation of recent growth rates in the area suggests that the district-level populations doubled between 1980 and 2008. In our research areas within 5 km of the park boundary, estimated population densities are approximately 260 individuals/km² in the region west of the park and 335 individuals/km² on the east side (Hartter, 2009).

Two main ethnic groups occupy most of the land surrounding KNP. The west side of KNP is dominated by the Batoro, who began to settle in the area around KNP during the first half of the 20th century (Naughton-Treves, 1999), although the Toro kingdom in the larger region dates back at least to the early 19th century (Steinhart, 1977). Much of the area east of the park is populated by the Bakiga, but there are also Bakiga areas in parts of the west side of the park. Most current Bakiga residents, or their parents, arrived in the area sometime between the 1950s and 1970s, and the oldest current residents say they arrived in the area in the 1930s (Goldman et al., 2009). The rehabilitation and expansion of tea estates in the area in the 1990s led to further in-migration to meet the increased demand for tea workers and drew Bakiga migrants from south-western Uganda (Mullan et al., 2008; Mulley and Unruh, 2004).

The once dominant moist, evergreen, closed-canopy forest that dominated the region has for the most part succumbed to agricultural expansion at least since 1959 (Gillespie and Chapman, 2006). For example, in Kabarole District, where the western part of KNP lies, only 2501 km² of forest remain but most is severely degraded (NEMA, 2001). Nearly all of the forest found on potentially arable lands has been converted to small-scale agriculture, tea, or pasture and soil degradation is a major concern (NEMA, 2001). In the patchwork landscape of western Uganda, agricultural intensification and extensification have left forests confined to the steep rims of crater lakes and bottomlands. Wetlands have succumbed to a similar fate. By 1964, an estimated 16 km² of wetland areas in Kabarole have been reclaimed through drainage while currently 24 km² of wetlands have been reclaimed (NEMA, 2001). Kabarole currently has 8318 km² of wetlands, a loss of nearly 1.6% since 1964 (NEMA, 2001) (although the undocumented loss of smaller, interstitial wetlands is likely to be much higher). The forests and wetlands that remain range in size from 0.5 ha to a couple hundred hectares (Hartter and Southworth, 2009).

The forest fragments and wetlands that remain are extremely important in supporting rural livelihoods. However, these forest fragments outside KNP are not designated as local forest reserves or protected by any administrative (local or otherwise) regulatory mechanism.

Interview methodology

This analysis draws on household interviews and interviews with local village council leaders (LC1) that represented various communities around KNP. This case study builds on recent work

⁴ Census estimates are complicated by the continued of subdivisions of sub-counties (as recent as February 2009), so exact counts in the study region are not feasible. These population estimates from the 2002 census represent only 5 of the 13 sub-counties around KNP.

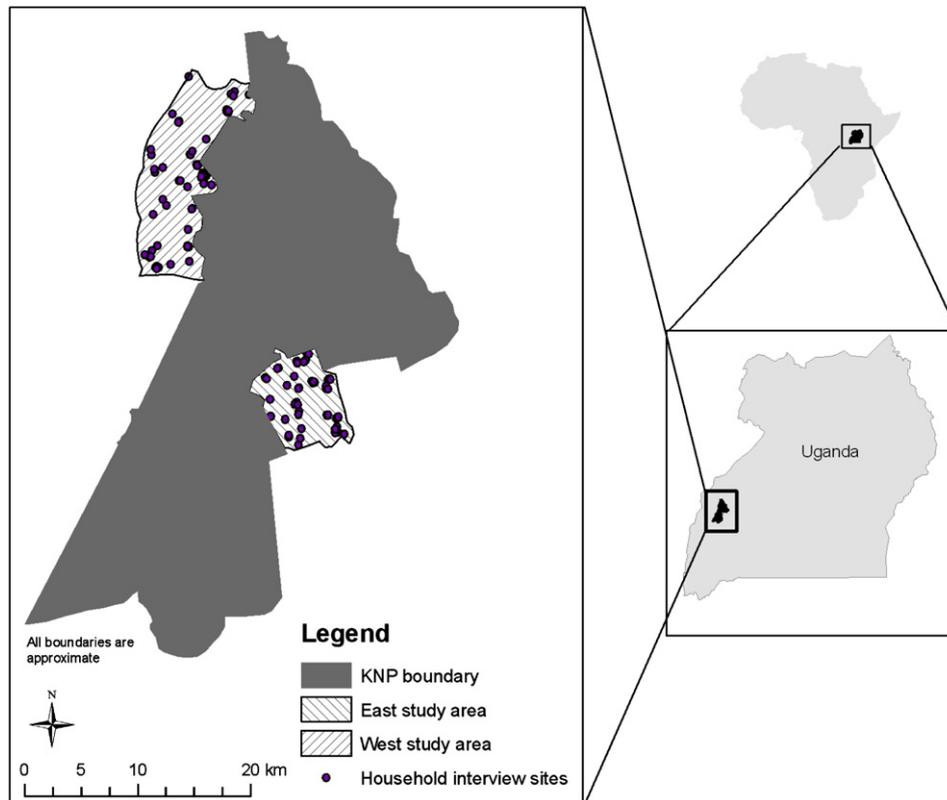


Fig. 2. Location of east and west study areas and household interview sites outside Kibale National Park.

examining resource use (Hartter, *in press*) to answer more detailed questions about perceptions of access and regulation. A full description of the geographic selection methodology can be found in Hartter (2009). Briefly, a five-kilometer perimeter around park boundaries was defined as the general research area and then two mid-scale research areas for social science research on the east and west sides of the park (comprising approximately 110 km² on the west and 56 km² on the east) were identified (Fig. 2). The two regions differ to some extent in altitude, ethnic composition, and settlement and land use history. A set of 95 random geographic coordinates within these areas was selected, and those points became the centers of 9 ha areas (circles with radii of 170 m) termed “superpixels” (Goldman et al., 2008). Land cover, use, and holder-ship were surveyed for each superpixel, and interview respondents were selected from among landholders in each of the superpixels for which there were landholders ($n=68$, 36 on the west and 32 on the east sides of the park) (Fig. 2) (see Hartter, 2009 for details). In addition, we conducted 16 interviews with Local Council Chairmen (LC1s) who represented some of the 60 villages we worked in. To establish trust and credibility within the communities, affiliated researchers have been working in these communities since 2004; a pilot study was conducted May–August 2005, permissions were obtained from local government officials and village chairmen (LC1), and a local field assistant was hired. The survey was pre-tested to assess clarity, perception of researchers, and training of field assistants (Kaswamila et al., 2007). Interviews were conducted in person by JH using a trained interpreter in one of the main local languages, Rutoro or Rukiga, or in English. Questions to all respondents were mostly open-ended, allowing respondents to respond freely. Respondents could further expound on their responses. Although the researcher had worked in the area for 2 years, the researcher and his team were still likely perceived as an “outsider”, which inevitably affected data to some extent.

Responses were then coded into categories during data analysis. While many samples were quite small and did not lend themselves to rigorous statistical analyses, to compare results between categories of wealth, in regards to wetland and forest use and permission, a chi-square analysis was used. This was conducted in JMP 7.02 software.

Interview responses

Most respondents ($n=130$) used local forests (101, 78%) and wetlands (120, 92%) as resource caches to provide firewood, building poles, medicinal plants, food, timber, water, materials for handicrafts (e.g., baskets, granaries, mats) (Hartter, *in press*). However individual uses of nearby forests and wetlands differed; based on access, extraction privileges, and individual household needs. Each of the unprotected forests and wetlands in the Kibale landscape are governed differently: rights, privileges, and regulations are based on a mixture of national level legislation, local by-laws, and perceived land ownership rights. While the usufruct governance of each forest and wetland is unique, there are general (both formal and informal) guidelines that are followed in the Kibale landscape. We describe the local forest and wetland ownership, access, and use as perceived by local farmers and village leaders below.

Local forest ownership, access, and use

The majority of respondents (86%) believed that forests outside KNP could be owned by an individual. Of those that found forest fragments useful ($n=101$), 46% of them used forests that they believed were personally owned and 58% that were perceived as owned by another individual (Table 1). Landholders commonly believed they “own” forested lands down-slope to the stream. Since most believed that these forests could be owned by an individual,

Table 1
Of 130 total respondents, 101 had forest fragments and 120 had wetlands that were useful to their household within 2 km. For each forest fragment and wetland the respondents used, they were asked to identify who was the perceived “owner” for at least the portion they used. Note: some households used more than one forest fragment and/or wetland.

Who is the perceived owner?	Forests (n = 101)		Wetlands (n = 120)	
	Proportion (%)	n	Proportion (%)	n
Individual	86	87	69	83
• Respondent	46	46	41	53
• Another individual	58	59	44	57
Community	1	1	2	2
Central government	8	8	16	21
Tea company	7	7	7	9
Church			1	1
Local community conservation group			1	1
Do not know	0	0	5	6

many felt that they needed to provide permission for collection of certain resources on their forest or to collect resources on the forest owned by another individual (Table 2). In some cases individuals collecting resources stated that they obtain permission from local tea estates or landholders before collecting. Often non-destructive harvests are acceptable, such as non-timber forest products and indigenous medicines. Most individuals believed that all community members had a right to collect downed and dried firewood (93%) and water (100%) and no owner had exclusive rights to these areas if they were “natural” trees (not planted). However, landowners may exclude locals from gathering other resources (e.g., medicines, food, building poles, thatch, timber). Respondents reported that permission for non-timber forest products is less stringent and often an arrangement can be worked out so that these resources can be collected for subsistence use; while in most cases specific permission must be granted from the landholder for cutting any trees for timber or building poles (endemic or exotic species).

Eighty percent of the respondents that found forests useful believed there were no limits on the amount of resources they could take. Only 33% believed permission was needed for access to particular forests to collect resources. However, some respondents reported that there were specific resources that they could not take (Table 2). A tri-level division of wealth, established in a previous study (Hartter, 2009, in press), via hierarchical cluster analysis of land, number and type of livestock, and house construction, was used to examine potential effects on the perceived permission needed. In all three categories, greater than 50% of respondents felt that they did not need permission for use of forest fragments (I. 65.52%; II. 71.19%; III. 68.46%) or wetlands (I. 82.76%; II. 64.41%; III. 84.62%). There was not a statistically significant effect of wealth increase on this response (forests $X^2 = 0.439$, $p = 0.80$, $n = 130$; wetlands $X^2 = 5.99$, $p = 0.05$, $n = 130$). However, respondents suggested that use and conversion of these areas is often unobstructed to perceived wealthy landowners because local perceptions dictate

a higher social standing and political influence in the community by these individuals. One respondent expressed a common perception among respondents, “What can we [small landholders] do when those rich men cut the forests? They have money, know many important people, and can do what they want.”

This is indicative of respondents perception of land ownership and rights and privileges associated with them, but also the current or impending future shortages of certain resources. Most respondents believe that “destructive” uses were not allowed, such as draining wetlands, cutting live trees, and burning charcoal. In general respondents believed that “non-destructive” uses, such as collecting fuelwood, water, medicines, food, and materials for handicrafts, were acceptable. These resources could be collected only for household consumption and not collected on a larger scale for commercial sale. In general, building poles and sand were permitted, but many respondents perceived that these could only be collected when an individual is building or repairing a house. All respondents (100%) agreed that a person cannot exclude another individual from collecting water and most (95%) also believed that any individual had the right to collect firewood, as long as they do not cut trees. Building poles are often taken, but are typically not allowed. However, it is generally believed that an individual, when permitted to cut poles, cannot cut the last of the poles in a forest. If a person cuts natural trees, then sometimes he/she is required to plant trees.

Local wetland ownership, access, and use

Most respondents believed that all or a portion of wetlands outside KNP could be owned by an individual, but a larger proportion believed also they belonged to the central government (Table 1). Even if individual ownership was a commonly held belief among locals, only about one third of respondents felt permission must be granted for usufruct access to those areas. Respondents most often collect water, medicinal plants, fuelwood, thatch, and papyrus for

Table 2
Some “owners” of forests and/or wetlands restrict resource collection or certain activities. Respondents report a variety of activities and resources from which they were prohibited.

Activity/resource	Forests (n = 101)		Wetlands (n = 120)	
	Proportion (%)	n	Proportion (%)	n
Cut live trees for timber or poles	33	33	19	23
Drain	N/A	N/A	8	9
Burn charcoal	11	11	8	9
Sand/clay	7	7	7	8
Fish	N/A	N/A	7	8
Crafts, thatching, medicinal plants	7	7	3	4
Plant trees, crops	7	7	11	13
Grazing livestock	7	7	9	11
Collect fuelwood	7	7	9	11

Table 3LC1 perceptions of an individual's rights regarding wetlands and forest fragments ($n = 16$), compared with landholder's perceptions ($n = 130$).

Perception	LC1s		Landholders	
	Proportion (%)	<i>n</i>	Proportion (%)	<i>n</i>
"own" part/all of wetland	38	6	85	110
"own" part/all of forest	69	11	81	105
sell their portion of wetland	25	4	N/A	
sell their portion of forest	63	10 ^a	N/A	
exclude others from firewood collection in their wetland	25	4	8	11
exclude others from firewood collection in their forest	38	6	5	7
exclude others from water collection (wetland or forest)	0	0	0	0

^a Note: Three respondents reported that sale of forest land depended on its location. If the forest was on a hill, then a sale was permissible. If the forest was in the bottomland, then a sale was not permissible.

crafts, and 97% of them said they could take as much of the resource as they wanted. However, some resources/activities were not permitted for collection in certain wetlands (Table 2). In the case of smaller wetlands (no particular size, but in practice about 0.5–3 ha), landholders whose land abuts these wetlands may exclude all harvests except fuelwood and water. They consider these areas as *their* land and they may cultivate crops or grow eucalyptus trees. As with forests, respondents believe that individuals cannot exclude others from collection of water in wetlands.

Perceptions from local leaders

Village chairmen (LC1) perceived ownership of forests similarly to local landholders, while the perceived ownership of wetlands differed (Table 3). In contrast to forests that can be public and private, wetlands remain in the public domain. Of the 16 LC1s interviewed, 11 (69%) believed that individuals could own part or all of a forest, as did 85% of landholders. Among LC1s, 10 of those 11 believed landholders could sell the forest they owned. In contrast, only six (38%) of LC1s reported that individuals could own all or part of a wetland, while 81% of individual landholders did. Among LC1s, only four reported sales rights to wetlands. This suggests an information lapse both among LC1s, in regards to wetlands, and a gap in information sharing for landholders from their local legislation (LC1s).

All LC1s believed that access to water was a basic right of all people and no individual could exclude access on their land for individuals collecting water (Table 3). However, they were more divided on the collection of firewood in forests and wetlands. For example, only six (25%) of the 16 chairman believed that individuals could exclude others from firewood collection in wetlands, which is in line with landholders' minority response of only 8% perceiving that individuals could exclude others from collecting firewood from wetlands.

Fuelwood collection and cutting live trees is often a contentious issue amongst those that have land and trees and those that do not. Given the increase in population and growing scarcity of land and wood resources, many landholders prohibit or strictly limit the extraction of woody materials. Although cutting live trees for timber is generally not permitted, pole-sized trees (those used for building poles, approximately 4–6" dbh) can be cut. In many cases when a tree is cut, then sometimes he/she is required to plant a tree. These rules are mere suggestions in terms of species and replacement quantity and generally not enforced and have been developed locally through the LC1's training and personal beliefs (Table 4).

Destructive uses in wetlands such as draining, planting crops, and cutting trees are not permitted according to national environmental legislation and LCs. However, if an individual's land is adjacent to the wetland or perceives ownership, they often will convert some of the wetlands to pasture, grow crops or trees, and cut trees, whether or not this action is allowed. Regardless, the LC1s do not say anything. When asked why he does not report such peo-

Table 4LC1 rules for cutting natural trees and replanting rules ($n = 16$).

Response to cutting natural trees	%	<i>n</i>
Individual must replant	38	6
Individual does not have to replant	62	10
Number of trees that should be planted when one tree is cut		
1	50	3
2	0	0
3	33	2
4	0	0
5	0	0
>5	17	1

ple, one chairman replied, "I used to report them in the past . . . But if you keep reporting [your neighbors] then you will be hated" (J. Byaruhanga, LC1 Makoby Zone, pers. comm.).

Discussion

Uganda's forests and wetlands continue to be threatened by land conversion and exploitation due to population growth, immigration, and agricultural expansion (Hamilton, 1984; Chapman et al., 2001; Maclean et al., 2003a, 2003b). Unprotected forests and wetlands are often viewed by locals as "unclaimed" and "unused" areas — opportunities to increase landholdings. The "use it or lose it" mentality is evident as people convert or use lands because there is no security of resources for the future, and they perceive few alternatives (Maclean et al., 2003a; Nkonya et al., 2005).

Local institutional arrangements can be more useful than central governments at providing rules related to access, harvesting, and management because both the issue and response are derived locally (Banana et al., 2005). They provide a forum that can respond to conflicts quickly and cost-effectively, and provide monitoring methods that are more efficient than those of centralized institutions (Ostrom, 1990). Devolved decision-making mechanisms can facilitate the active participation of communities, articulating local priorities and helping to ensure that programs are appropriate to local needs (Francis and James, 2003). Without power, local governments cannot gain the legitimacy they need to effectively represent local populations (Ribot, 2003).

Under the 1995 Ugandan constitution and the 1997 Local Governments Act, local councils were given the power to manage local resources. By having a strong national agenda, these regulations and values would be brought to the rural sector through extension services or trickle to the rural areas through word of mouth or through local councils (UPIMAC, 2004). This attention helped not only to promote sustainable natural resource programs, but also to garner support for the decentralized national government. The national government's move to confront an issue that was vital to the rural majority, increased confidence in the newly established government and likely boosted political tenure.

The 1995 Constitution embraced the plan of decentralization and while its intention of natural resource management reorganization and legislations were recognized, it remained ambiguous regarding “on-the-ground” management of forests and wetlands (Nsita, 2003).

At the local level, Uganda has struggled to connect the national level natural resource management goals with local needs and sustaining rural livelihoods – livelihoods that depend directly on access to land and resources. To date, legislations continue to be focused at the state level and communities are left to enact local by-laws (Nkonya et al., 2005).

In the communities outside KNP, local access rules govern individual (or household) usufruct rights. These access rules define and limit access and use rights to resources among community members. In rural western Uganda, as is common across other regions in Uganda, *de facto* access regimes were likely established because despite the efforts of the central government to create a nested layers of responsibilities and accountability measures for natural resource management, more remote locales find it difficult to implement this framework in its entirety due to one or a combination of the following factors: lack of financial resources, lack of information, and adoption of new by-laws developed to replace ones deemed too harsh or restrictive (UPIMAC, 2004; Banana et al., 2007). Governed by the local council by-laws and by the social norms and culture, communities have developed their own sets of rules to regulate forest and wetland use.

In the study area around KNP, we found that the majority (86%) of respondents thought either they (46%) or another person (58%) were the individual owner of the forest fragment they used near to their households. Only 1% thought the fragment was owned by the community and 8% thought it belonged to the central government (Table 1). Local chairmen respondents (LC1s) thought that individuals could own part or all of a forest fragment (69%), and 63% thought that the owner could sell that forest portion. In addition, 38% of LC1s responded that individuals could exclude others from collecting firewood in their forest, but not from water collection (Table 4). Individuals had perceptions that somewhat corresponded with this, with 7% perceiving prohibition on firewood collection, and 33% instead perceiving prohibition on live tree cutting (Table 2).

While collection of downed and dead firewood was generally acceptable, many individuals and LCs felt people should not cut live trees for this purpose. In Uganda, “natural trees” on private land belong to individuals, but cannot be cut without permission from the Forestry Department (Republic of Uganda, 2003). Perhaps the belief that live trees should not be cut is derived from this rule. However, when natural trees were cut, most people did not think individuals needed to replant. This suggests a level of perceived rights of ownership that is not only high at the individual level, but also reinforced at the local level of government, without the intended level of regulation on the actual use of the forest land. Regulation on the use, rather than ownership, of forest fragments is likely where better information and education would be most useful. Without clarification regarding the maintenance of trees within forest stands, and the sustainable management of them, these fragments are likely not to be replanted and be converted instead to agricultural holdings. This evidence is in line with previous studies in Uganda which reported that once the forests are cleared, individuals can claim the land for cultivation (Gombya-Ssembajjwe and Banana, 1998). In many cases, people prefer to cut down natural trees and plant eucalyptus trees or crops in the former fragments. The “natural” trees belong to the government while the planted trees are their own (Nabuguzi and Edmunds, 1993). As they expand and “claim” this land, the apparent right of exclusion is perceived to be attached.

Many wetlands in Uganda are common property areas and communities set them aside for edge cultivation, fishing, grazing, and harvesting of natural products (Bakema and Iyango, 2001). Community regulations for use of all the permanent wetlands and the grazing areas stipulate free access and user rights for all community members. We found that 69% of respondents in the study area thought that either they themselves (41%) or another individual (44%) were individual owners of the wetland fragment they used. Five percent of the respondents did not know whether wetlands could be owned and 16% thought they belonged to the central government. Interestingly, 7% of respondents in the area thought they belonged to the tea company, suggesting a corporate stronghold in the perception of landholding in the area (Table 1). In comparison, 38% of local chairmen (LC1s) responding thought that individuals could own part or all of a wetland, and 25% of those respondents thought that the individual could sell their portion of wetland (Table 3). Given that no individual can legally own wetlands, this appears to be a miscommunication that is propagated at the level of decentralized information dissemination to local councils from the central government. Outside KNP, landholders bordering wetlands do not have the ability to exclude people from collecting water and dead and downed wood for fuel (Hartter, unpubl.). LC1s responded that individuals could not exclude others from water collection in wetlands, but 25% said they could exclude others from firewood collection in wetlands (Table 4). A small fraction of individuals responded that they thought owners of wetlands could restrict them from cutting live trees (19%), draining wetlands (8%), planting trees/crops (11%) and other extractive activities (Table 2). The resolution of the data does not permit rigorous analyses of chairmen and local individuals' perception correspondence, but these results (Table 3) suggest that information concerning the rights of ownership of wetlands is also missing at the level of local individuals. In the southwest district of Kabale, Maclean et al. (2003a, 2003b) reported that while most individuals were not prevented from accessing swamps, some recognized that property rights existed. In that study 58% percent of respondents stated that people owning land immediately adjacent to swamps had a right to prevent harvesting close to their land, but not elsewhere (Maclean et al., 2003a, 2003b).

Competing management regimes can have dramatic effects on natural resource use and in shaping the landscape. For instance, a farmer's view of wetlands as fertile areas to expand crop cultivation can conflict with communities who want to keep them in an undisturbed state because of their value for fisheries production. Many farmers maintain a “use it or lose it” mentality, meaning that standing wetlands and forests represent unclaimed and wasted lands. If they cut the papyrus and other vegetation and drain the wetland, they can expand their pasture. Once the wetlands are converted, they are generally treated as privately held entities and thus lawfully be used for cultivation and grazing (Carswell, 2002). So while draining is illegal, it results in a land use that is legal, further adding to confusion at the local level.

Where and when resources are abundant, there is usually space for most uses to be accommodated and less incentive to define use rights clearly (Richardson, 1993). As resources become scarcer, *de facto* rules become somewhat more closely aligned with *de jure* rules. More landholders “lock up” their own forests and wetlands and disallow certain resources to be harvested in order to ensure future supplies. Ostrom (1999) asserts that as long as areas are accessible and resource rich, there is little incentive for the community members to practice natural resource conservation.

In the worst cases, if there are no effective mechanisms for management, all compliance may be ignored. In other words, the resources become unregulated and access is gained by physical presence. Regardless of the *de jure* property regime, a forest or

wetland can be subject to a *de facto* open access regime if there are no effective institutions and mechanisms to enforce the rules (Banana et al., 2001). A lack of accountability for these areas provides little incentive for local communities to protect trees and water sources. As the confusion between management regimes continues, exploitation and degradation of wetlands and forests will likewise continue (Kisamba-Mugerwa and Nuwagaba, 1993).

The case study of KNP illustrates the present disconnect between available information and desired legislation at the national and local levels. The division of roles and responsibilities among the central government, the local government, landholders, and local communities has led to confusion or non-compliance at the local level. The lack of clear definition and understanding of land management responsibilities has fostered a situation where local communities have tended to lose control over determining use of wetlands and forests (Banana and Turiho-Habwe, 1998; Richardson, 1993), all of which have contributed to the decline and degradation of forests and wetlands country-wide (Banana et al., 2004; Kisamba-Mugerwa and Nuwagaba, 1993). As an attempt to usefully reveal some of the confusion and perhaps slow the unsustainable ongoing practices in this study area, we have summarized the *de jure* and *de facto* access and restrictions in place (Table 5).

We hope that, in conjunction with the results of this survey of perceived access and restrictions, some of the information mismatch can be reconciled.

While the national policies and legislations have provided a framework to include the natural resource agenda, they remain ineffective at the local level. Weak law enforcement renders most natural resources under the central government law and in some cases open access, hence open to depletion if economic conditions so dictate (Banana et al., 2001; Nkonya et al., 2005). Limited operating budgets and manpower force the district environmental officer to concentrate monitoring and enforcing efforts on large, more accessible areas (Gombya-Ssembajjwe and Banana, 1998). Moreover, heavy reliance on punitive measures and the top-down approach in enforcing state law can lead to poor compliance with statutory law and limited local community participation in monitoring and enforcing natural resource conservation regulations (Nkonya et al., 2005). In this study, village chairmen said that a more effective way is through education and promotion of best practices.

Hardin's (1968) "Tragedy of the Commons" asserts that the inevitable result of shared use is benefits for one and that ultimately these resources will succumb to pressure. Extensive commentary

Table 5
Summary of *de jure* and *de facto* access and harvest restrictions for usufruct access in (a) small forest fragments and (b) wetlands near Kibale.

(a)			
Resource	Land tenure	Access	Harvesting restrictions
Fuelwood (FW)	Privately held	<i>De jure</i> : open – must obtain permission for privately held land	<i>De jure</i> : may extract reasonable quantities for their own domestic use without a permit or the payment of fees. Collect dead, downed wood or branches for FW
Building poles		<i>De facto</i> : do not have to obtain permission. Communities may exclude "non-community members"	<i>De facto</i> : do not cut standing straight trees. Collect dead, downed wood or branches for FW. No limit
Timber	Privately held (local govt). Natural trees belong to government, planted trees do not	<i>De jure</i> : open – must obtain permission for privately held land	<i>De jure</i> : may extract reasonable quantities for their own domestic use without a permit or the payment of fees
		<i>De facto</i> : privately held lands, permission must be obtained and owner may exclude	<i>De facto</i> : all cutting is not allowed without permission
		<i>De jure</i> : private land holders – individuals must obtain permission from landholder	<i>De jure</i> : all cutting is illegal unless proper permissions obtained stating specific amount or number
		<i>De facto</i> : Central Forest Reserves, Local Forest Reserves – must obtain permission from LC. Private land holders – individuals must obtain permission from landholder	<i>De facto</i> : all cutting is illegal unless proper permissions obtained stating specific amount or number
(b)			
Resource	Land tenure	Access	Harvesting restrictions
Water	Held by central government "in trust" for people, but managed by local councils. Larger wetlands are managed by National Environment Authority. Cannot be privately held	<i>De jure</i> : open – no permission needed	<i>De jure</i> : "wise use" of resources. Any activity that results in excluding water from the wetland is prohibited
Medicinal plants		<i>De facto</i> : no permission needed, but Communities may exclude "non-community members"	<i>De facto</i> : no limit, but usually no diversion is allowed
Handicraft materials		<i>De jure</i> : open – typically no permission needed if harvested at a small scale	<i>De jure</i> : "wise use" of resources
		<i>De facto</i> : if large wetland, no permission needed, but Communities may exclude "non-community members". If small wetland or collecting for commercial use, landholders may/may not exclude	<i>De facto</i> : no limit for household consumption
		<i>De jure</i> : open – no permission needed if collecting for household consumption only. Harvesting large amounts requires permission	<i>De jure</i> : "wise use"
		<i>De facto</i> : if large wetland, no permission needed, but Communities may exclude "non-community members". If small wetland, owners may/may not exclude	<i>De facto</i> : no limit for household consumption, but may be limited for commercial use

suggests Hardin's claims do not hold true and that a community that shares resource pools has a strong incentive to protect them to the best of its ability, even if that means not maximizing current production, because those resources will be essential to the community's survival for in the long-term future (Cox, 1985; Bromley and Cernea, 1989; Appell, 1993).

Our results suggest that the latter commentary does not hold in the Kibale landscape. The natural areas (forest fragments and wetlands) have become "ticking clocks" because the growing population is consuming resources faster than the environment can sustain them, and those areas that remain may eventually succumb to this pressure. Households tend to forego what will not directly and immediately benefit their short-term gains, even if it does decrease the long-term standard of living or sustainability of resources and livelihoods (Hyden, 1998). As is the case of KNP, many parks are surrounded by dense agricultural populations (DeFries et al., 2005). As the population grows, land is used more intensively, and land parcels decrease in size as new farms are established. This, in turn, means that more land is needed, and remaining forest fragments and wetlands are converted to agriculture or used more intensively to fill resource needs. Effective institutions are needed to limit and regulate harvesting levels and management practices especially in park landscapes. Without them, forest and wetland resources can be overharvested and even irreparably degraded (Banana et al., 2001).

To avoid the "tragedy", and to avoid further weakening of institutions that protect forest and wetland resources, sustainable management of remaining forests and wetlands in the Kibale landscape and elsewhere in Uganda must ensure that all affected and concerned parties are involved in the policy process and feel that they benefit from management decisions (Bikaako-Kajura, 2002; Richardson, 1993). Natural resources cannot be monitored and regulated strictly through levying central government legislation. Resource sustainability depends on local rules and use-patterns; incentives and legislation created at the institutional level (Becker et al., 1995); and access to information.

In many cases, rural communities and their local council leaders are not informed of best management practices, nor national legislation and other environmental statutes. Many of these communities, and especially the more remote ones, have poor infrastructure and limited sources to obtain accurate information which affect their day-to-day livelihood strategies (Saito, 2004). It is vital that this information is accurate. Furthermore, a void in information dissemination may cause communities to remain unaware of problems or mechanisms that can be useful to address environmental issues. People may then lack an understanding of new legislation, policies, rights or new opportunities. Azfar et al. (2001) report that 70% of Ugandans use community leaders as their main source of information on local issues. Therefore, getting the accurate information to local leaders is important so they can act appropriately and consistently. As the pathways of *de facto* and *de jure* resource management continue to diverge, local leaders also may not disseminate the correct information to their constituents.

Passing information must go both ways. Decision-makers are often out of touch with grassroots issues because they are far removed geographically and socio-economically from them. Moreover, decision-makers are oftentimes working at a much larger scale that is inclusive of many other communities lobbying for political attention. In other instances, decision-makers simply ignore the issues moving upward through the channels of local government, regarding them as local problems not to be dealt with outside of the community. The national legislations, in theory, empower individuals and devolve power to local governments. However, sustainable natural resource management directives

must be initiated from the grassroots level, where the problem(s) and solution(s) are perceived as local. Therefore, local level management is the only viable option because no centralized management system will ever be able to effectively control the large wetland surface area and all the wetland edges in Uganda (Bakema and Iyango, 2001).

One of the most prominent factors underlying natural resource management problems in Uganda has been said to be the lack of or insufficient awareness of the functions and benefits of forests and wetlands (Bakema and Iyango, 2001; Maclean et al., 2003b). The abundance of natural resources may influence natural resource management directly (Nkonya et al., 2005). More than that, however, is the *perceived* natural resource condition. High agricultural potential increases the value of land. Numerous wetlands have been drained to grow crops. Good agricultural production is short-lived in converted wetlands as the highly organic soils are rapidly oxidized and depleted of nutrients (Crisman et al., 1996). Despite their inability to produce high yields for many years, wetlands are still considered highly productive lands and conversion to crops continues. Therefore, information is needed at the grassroots level to get people more informed and actively engaged in local natural resource management issues. The addition of information necessitates education and awareness. Nkonya et al. (2005) showed that promoting literacy can increase compliance with natural resource management by-laws. The national legislations, in theory, empower individuals and devolve power to local governments. However, sustainable natural resource management directives must be initiated from the grassroots level, where the problems and solutions are perceived as local.

We note that many of our conclusions are based on qualitative assessments: open-ended responses from surveys do not always lend themselves well to coding and statistical analyses. This may limit the confidence one can attach to results, from quantitative perspective. However, these open-ended survey responses permit a more nuanced and holistic understanding of the issues in question. Therefore, we suggest that studies such as this one provide the means to identify the mismatches between perception, practice and legislation. Dissemination of these results back to LCs and, through publication, to legislators at the national level, will create the incentives to inform village chairmen and local individuals to promote more sustainable local resource management.

Conclusion

Long overlooked, natural resource management has become a primary political platform rather than a by-product of past political agendas. Despite the relative success of decentralization at the national scale and legislated devolution of rights and responsibilities to the local level, a disconnect remains between the central government and local scales. Decentralization in Uganda is an improvement from former natural resource management. Despite a legislated framework that has been constructed to devolve rights and responsibilities to local governments/communities, the case of KNP illustrates confusion between management regimes continues at the local level, perpetuating exploitation and degradation of wetlands and forest fragments throughout Uganda (Gombya-Ssembajjwe and Banana, 2000; Banana et al., 2001, 2007; Paul et al., 2004; Nkonya et al., 2005). Heavy reliance on punitive measures and the top-down approach in enforcing state law leads to poor compliance with statutory law and limited local community participation in monitoring and enforcing natural resource conservation regulations. Therefore, sustainable natural resource management directives must be initiated from the grassroots level, where the problems and solutions are perceived as local. So long

as discrepancy between *de jure* and *de facto* persists, long-term resource sustainability of these resources is jeopardized.

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