



Original article

The role of wetland management agencies within the local community in the conservation of wetlands in Uganda

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ABSTRACT

Wetlands in Uganda are believed to be socio-economically important for providing water for drinking, irrigation, fisheries, recreation, transport and agriculture among others. Bearing in mind the host of benefits wetlands provide to local communities, if they are harnessed without the mind, they could end up being over utilized and ultimately degraded and not continue to provide a stream of functions, attributes and services. This could be one of the primary reasons why special Departments and Institutions like the National Environment Management Authority and Wetlands Management Department were created to manage the country's natural resources including wetlands. The study was initiated to explore how wetland management agencies influence members of the local community on matters concerning the conservation of wetlands in Uganda. A cross-sectional research design was used to collect qualitative and quantitative data. A questionnaire survey was conducted amongst four hundred households to collect information concerning the role of wetland management agencies among members of the local community for the conservation of wetlands in Uganda. More information was obtained from senior officials from the National Environment Management Authority, Wetland Management Department, and District Natural Resources Officers from the study area using a non-structured questionnaire. Key informant interviews and direct observations were also used to collect data. The study revealed that gathering materials for building and for making crafts, agricultural activities, unsustainable mining of clay and sand for building contributed to wetland degradation. Some circumstances like high population growth, unclear wetland ownership, unawareness of the indirect functions of wetlands also contributed to wetland degradation. It was found that the wetland management agencies have been ineffective towards the conservation of wetlands mainly due to inadequate funding, political interference, and lack of specific judges for wetland related court cases among others. For wetland management agencies to effectively perform their duties leading to the protection and conservation of wetlands in Uganda, the study recommends that members of the local community should be allowed to practice wetland edge farming, fish farming in ponds constructed in wetlands, and to leave some parts of these vital wetlands that have been reclaimed to regenerate, in addition to addressing the main reported hindrances that are stifling the smooth running of the activities of the agencies.

KEY WORDS: local community, Wetland Management Agencies, conservation, wetlands, Uganda

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1. Introduction

Wetlands are regarded as the most productive life supporting systems in the world and are of immense socio-economic and ecological importance to mankind (MINISTRY OF NATURAL RESOURCES, 1995). They are a habitat for wildlife resources (NATURE UGANDA, 2003). According to MITCH & GOSSELINK

(2000), UNEP (2003), BOS ET AL. (2005), MILLENNIUM ECOSYSTEM ASSESSMENT (2005), NYAKANA (2008), and NEMA (2010), wetlands are known to be a source and sink for green-house gases; influence local and regional temperature; recharge and discharge ground water; they retain, recover and remove excess nutrients and sediments; and are important in nutrient recycling. Wetlands also

retain water which enables them to control flooding by storing the collected water and releasing it slowly (UNEP, 2003). In this way, they prevent erosion by slowing the velocity of flood waters, binding the soil with its roots and causing suspended soil particles to settle before they reach open waters (BOS ET AL., 2005, EPA, 2006).

Uganda's wetlands according to MINISTRY OF WATER AND ENVIRONMENT (MWE) (2005) consist mostly of permanently flooded papyrus and grass swamps, swamp forest, upland bogs and areas of impeded drainage which range in altitude from 1134 m at Lake Victoria to over 4000 m in the Rwenzori mountains. According to MWE (2005) and BAKEMA & IYANGO (2001), wetlands in Uganda are socio-economically important for providing water for drinking, irrigation, hydropower generation, fisheries, recreation, transport, industrial use and waste disposal, and agriculture. In Uganda, at least 50% of the nation's wetlands are reportedly under human use to secure livelihoods through either direct consumption of wetland products (including cultivation of crops in wetlands) or the sale of wetland products to generate cash (TURAHABWE ET AL., 2013).

Despite the contribution of wetlands to livelihoods in Uganda, wetlands have continuously been degraded and lost, stifling their functions like flood control, industrial and domestic waste water filtration, shoreline stabilization, and erosion control among others (BOS ET AL., 2005). For example, the wetland coverage in Uganda reduced from 37,575 km² (15.6%) of the nation's land area in 1994 to about 26,308 km² (10.9%) in 2009 (TURAHABWE ET AL., 2013). This loss represents 30% of the national wetlands (WMD, 2009), and yet, it has been reported that Uganda's wetland sector employs over 2.7 million people (about 6% of the entire population) as reported by GOU (2010) and WMD (2009). The loss is partly due to the unsustainable activities that members of the local community practice in wetlands like agriculture, industrial usage and house construction, to mention but a few (BARAKAGIRA & DE WIT, 2017; KAGGWA ET AL., 2009; NEMA, 2005; and BOS ET AL., 2005).

In a bid to safeguard wetlands from further loss, some wetland management agencies including the National Environment Management Authority (NEMA) and the Wetland Management Department (WMD), were set up, among others, to coordinate, monitor and supervise all the activities that take place in wetlands so that the wetlands are not continuously degraded (NATIONAL ENVIRONMENT MANAGEMENT POLICY, 1994). In addition, some policies and statutes, including the NATIONAL ENVIRONMENT STATUTE (1995), the NATIONAL ENVIRONMENT

MANAGEMENT POLICY (1994), and the NATIONAL POLICY FOR THE CONSERVATION AND MANAGEMENT OF WETLAND RESOURCES (1995) were formulated in Uganda to control activities that take place in wetlands and also in areas of the environment that may lead to their degradation. The implementing agencies of the Statutes and Policies include NEMA and WMD in Uganda.

NEMA is a semi-autonomous Institution that was established under the National Environment Act, Cap 153 and was one of the core aims of formulating the NATIONAL ENVIRONMENT STATUTE (1995) in Uganda. Section 38 of the National Environment Statute 1995: provides NEMA with authority towards the sustainable management of wetlands in Uganda. It (NEMA) spearheads the development of environmental policies, laws, regulations, standards and guidelines; and guides government on sound environmental management in Uganda. The Authority is further empowered, in consultation with the District Environment Committees and Local Environment Committees to establish guidelines for the sustainable management of wetlands. Hence, the Authority (NEMA) was borne in mind after realizing that Uganda's rich natural resource potential including wetlands was being degraded at an alarming rate. NEMA was set up as a principal agency, charged with the responsibility of coordinating, monitoring, regulating and supervising environmental management including wetlands in the Country. NEMA spearheads the development of environmental policies, laws, regulations, standards and guidelines; and guides government on sound environmental management in Uganda.

The other Agency is WMD which is under the Ministry of Water and Environment. It is mandated to manage wetland resources in Uganda, and its goal is to sustain the biophysical and socio-economic values of the wetlands for present and future generations.

It can be observed that the Wetland Management Agencies together with the policies and Statutes supposed to spearhead the management and protection of wetlands in Uganda are in existence. However, wetlands in Uganda have progressively been reclaimed and degraded as reported by BARAKAGIRA & DE WIT (2017) rendering them ineffective towards their primary functions and services.

2. Legislation on wetlands in Uganda

In the colonial period (before 1962), most wetlands in Uganda were designated as reserves and legally belonged to the British Crown under

British Law (NTAMBIRWEKI, 1998). However, wetlands outside the reserves remained the property of nobody, accessible to everybody and did not receive special protection from the state. However, traditional Institutions through the monarchical system played a big role in their protection particularly in Buganda and Toro Kingdoms where the management of wetland resources was almost exclusively based on traditional beliefs and spiritual attachment. With political changes since independence, the powers of traditional institutions were reduced; and as a result, they lost direct control over these resources (MINISTRY OF NATURAL RESOURCES, 1995; NTAMBIRWEKI, 1998).

In Uganda, according to the 1995 Constitution, wetlands are 'held in trust' by Government and local Governments for the good of all the citizens. However, up to the mid-1980s, members of the local community attached little value to wetlands in Uganda, because the then governments did not prioritize wetland conservation and also, the citizens did not directly exploit wetlands to satisfy their immediate needs, which was the reason the citizens referred to them as 'waste lands' (MINISTRY OF NATURAL RESOURCES, 1995). Because of this, wetlands were then massively drained for agriculture and industrial developments, pollution was unabated, and later were used for human settlement which led to the proliferation of unplanned settlements as reported by KAMUGISHA (1993), NTAMBIRWEKI (1998); and NEMA (2005).

The importance of wetlands to national development and the threats to their continued existence were then recognized in 1986, when the National Resistance Movement, a guerrilla force captured power by force of arms. They promised a fundamental change and immediately embarked on a process of restructuring the entire state and reforming existing laws (MISR, 1998; NTAMBIRWEKI, 1998). This is when the government of Uganda banned further large scale drainage of wetlands. As reported by the MINISTRY OF NATURAL RESOURCES (1995) the National Wetlands Conservation and Management Programme within the Department of Environment Protection, was instituted to analyze activities and the full range of functions and values provided by the wetlands. By 1994, the importance of wetlands had been realized which led to the formulation of the Wetlands Policy in 1995. The Ministry of Natural Resources, in consultation with some stakeholders, prepared the Wetlands Policy which was aimed for conservation and management of wetland resources. The Policy which was then approved by the government aimed at curtailng the rampant loss of wetland resources and ensuring that benefits

from wetlands are sustainable and equitably distributed to all people of Uganda. The Policy also aimed at promoting wetland conservation in order to sustain their values for the present and future well-being of the people of Uganda (MINISTRY OF NATURAL RESOURCES, 1995; NEMA, 2005).

In addition to the Uganda Constitution, wetlands are articulated and protected in law by the LAND ACT (1998), the NATIONAL ENVIRONMENT STATUTE (1995), the LOCAL GOVERNMENT ACT (1997), and the WETLANDS POLICY (1995) as reported by the NILE BASIN INITIATIVE REPORT (2009). In Uganda, there are other laws such as the NATIONAL WATER POLICY (1999) which are supposed to provide extra protection for the wetlands by placing ownership of all the water in Uganda into government hands and closely restricting the use and abuse of water and wetlands. The National Policy for the Management of Wetland Resources recommends the promotion of the optimal and sustainable use of wetland resources.

All of these that have been stated in the aforementioned Constitution, Acts, Policies, and Statutes are supposed to be implemented by the lead agencies namely, NEMA and WMD to the members of the local community, for the sustainable utilization and conservation of wetland resources in Uganda. Despite what is well stipulated in the Constitution, Acts, Policies, and Statutes, wetlands in Uganda have continuously been drained and subsequently degraded by members of the local community and yet the Agencies (NEMA and WMD) which are supposed to promote wetland protection and conservation in the country are operational. It is against this background that this study tried to assess the role of the wetland management agencies amongst the members of the local community towards the conservation of wetlands in Uganda. To achieve this broad aim, the following objectives were pursued:

- (i) To determine local community activities that are carried out in wetlands which are promoting wetland degradation in the central and western regions of Uganda;
- (ii) To investigate the circumstances that have hindered the wetland management agencies from effectively managing and conserving wetlands from degradation in Central and Western Uganda; and
- (iii) To determine the link that needs to happen between the wetland management agencies and members of the local community for the effective management and conservation of wetlands in Uganda.

3. Study area

The study focused on the central and western regions of Uganda (Fig. 1). This is because the majority of wetlands found in these regions are still undergoing degradation, or have already been degraded by mainly anthropogenic activities (MINISTRY OF WATER AND ENVIRONMENT, 2009; WETLANDS MANAGEMENT DEPARTMENT, 2013).

Only permanent wetlands in the central and western regions were included in the study. This is because; temporary wetlands would be difficult to locate in dry seasons during the course of the study. The central and western regions in Uganda are divided into districts. Bearing in mind that wetlands in Uganda are diverse and spread throughout the country as reported by NTAMBIRWEKI (1998) and BOS ET AL. (2005), the selection of the districts of study was probabilistic. A simple random sample of ten districts, five districts from each

region, was taken to determine the districts to include in the study. The districts that were selected include Kampala, Mpigi, Mukono, Rakai, and Wakiso in the central region. From the western region, the districts that were selected include Bushenyi, Kabale, Mbarara, Ntungamo, and Rukungiri. After randomly selecting the districts, where the study would be undertaken, a simple random sample of two permanent wetlands from each district was conducted to arrive at a total of twenty wetlands within which the study was conducted.

In addition, all the Natural Resources Officers who work in the randomly selected districts of the study were purposively selected and included in the study, together with some members from NEMA and WMD who occupy managerial positions, in order to solicit information concerning the activities of the wetland management agencies at the grass roots level.

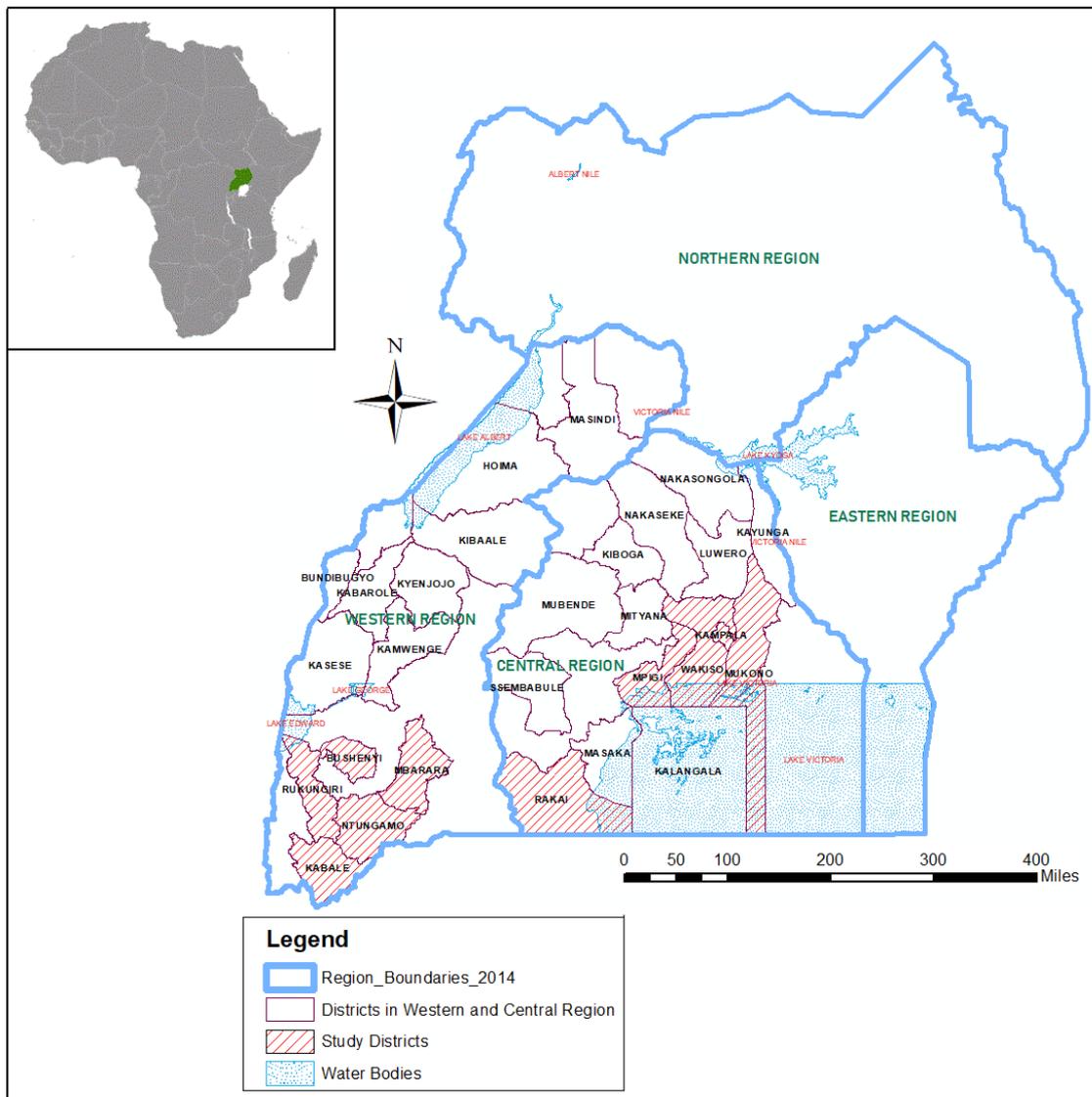


Fig. 1. Map of Uganda showing Central and Western Regions

4. Materials and methods

The research project was centered on determining local community activities that are carried out in wetlands that are promoting wetland degradation in the central and western regions in Uganda; to investigate the circumstances that hindered the wetland management agencies from effectively conducting activities that concern wetland conservation in central and western Uganda; and to determine the link that needs to be made between the wetland management agencies and members of the local community for the effective management and conservation of wetlands in Uganda.

Both qualitative and quantitative data was obtained from the respondents in order to generate the information needed for the community conservation of wetlands in Uganda. Qualitative data as reported by SARANTAKOS (2005) and LINDLOF & TAYLOR (2011), helped to verify and enrich the quantitative data obtained from the study. A series of complementary methods were used to collect a vast amount of data with the advantage that the methods enhanced the capacity for interpreting the data captured as suggested by HOGGART ET AL. (2002).

Questionnaires were used to collect primary data from the respondents in the study area, from officials from the wetland management agencies, and all the Natural Resources Officers from the selected districts where the study was conducted. The questionnaire used to collect data from members of the local community was pre-tested in one district that was not part of the selected sample. Pre-testing allowed the interviewers to gain familiarity with the questionnaire and provided an opportunity to apply and review the method. The focus was on assessing how respondents understood the questions and to identify any problems encountered in providing answers. Changes were proposed, reviewed and incorporated into the final questionnaire. The questionnaire focused on the respondents' understanding of the activities members of the local community carried out in wetlands that culminated in their degradation and how the wetlands management agencies contributed towards the management and conservation of wetlands in the study areas.

A questionnaire survey was conducted among four hundred households which were randomly selected. The four hundred households were obtained by first, randomly selecting twenty permanent wetlands from the central and western regions. This was followed by a systematic random sample of twenty households from nearby, or around, the selected wetland (within 500 meters).

The first household was randomly selected and the successive households were selected after every 5th household. One adult person (18 years and above) from each household was then selected, approached, briefed and informed that the purpose of the research was purely academic and had no implications whatsoever, and that the respondents were also assured of confidentiality and anonymity. The questionnaire was then administered to the respondent which in most cases was semi-structured and in the common local language, since the majority of the respondents (73.6%) had not attained secondary level of education and their level of comprehension of the information in the questionnaire was regarded as low (Table 1).

Table 1. Household characteristics of respondents, (Researcher's questionnaire survey)

Characteristic	Frequency	Percentage
Gender		
Male	187	46.8
Female	213	53.2
Level of Education		
None	101	25.4
Primary	192	48.2
Secondary	68	17.1
Post-Secondary	26	6.5
Graduate	11	2.8
Occupation		
Peasant	269	67.9
Student	17	4.3
Business person	44	11.1
Public Servant	18	4.6
Other	48	12.1
Household Size		
1 - 3	128	32.2
4 - 6	150	37.8
7 - 9	79	19.9
10 and above	40	10.1

Another questionnaire was designed and administered to some members who occupy managerial positions in the wetland management agencies, that is, NEMA and WMD, and they were purposively selected as suggested by HYMAN ET AL. (2001) and SARANTAKOS (2005). The aim was to gather information concerning the bottlenecks encountered during implementation of the guidelines, rules, and regulations for wetland management and conservation at the grass roots level.

Furthermore, key informant interviews were held with District Natural Resources Officers in the study area, managers of NGOs operating in the selected study areas, Sub-County Chiefs, Local Council I Chairpersons and Village Environmental Councilors, who were also purposively selected. The aim was to collect information about the activities that members of the local community are carrying out in wetlands that are contributing to their degradation. Also, to ascertain the circumstances that may be hindering the effective management and conservation of wetlands by the wetland management agencies in Uganda.

In addition, direct field observations were made on activities undertaken in the sample wetlands to ascertain whether they are contributing to wetland degradation. Direct field observations were also used to verify the reliability of the information the research participants had provided to the researcher regarding the study topic. The state of wetlands in relation to the utilization of wetland resources and their conservation by members of the local community were depicted with the help of digital photographs and their location was recorded as coordinates in a Global Positioning System for the purpose of further reference.

Questionnaire responses were edited, coded, and analyzed using SPSS version 16.0 for windows. This informed descriptive statistics concerning local community activities that are carried out within the wetlands. The analyzed data was then accompanied with notes to direct the readers' attention to important values for comparison. Percentage values were used to relate what is in the frequency distribution tables together with the likely cause of the outcome. Generalization of the data was made while reporting on the data based on the percentages obtained for particular items in the survey. Generalization as reported by BRYMAN (2004) and SARANTAKOS (2005) ensures extrapolation of the research findings beyond the boundaries of the research sample to the whole population.

Qualitative data collected during key informant interviews was sorted and categorized into themes according to particular items of interest as reported by SARANTAKOS (2005). In cases where the research participant gave a narrative for a particular response, efforts were made to reproduce the actual words, or conversations that were given from the field, based on the popular themes of the study. In some cases, the Chi-square test was used to test for association of attributes.

5. Results

5.1. Household characteristics

The majority (53%) of the respondents were female and 73% of them had never studied beyond Primary seven level of education (elementary level), while 91% of the respondents never studied beyond Secondary level of education. The main occupation of the respondents was farming. Their other sources of income included petty trade in household items, craft and brick making, casual labour, and a few were civil servants. Slightly over two-thirds (68%) of the respondents had at least four family members in each household, of whom about 85% depended on immediate natural resources for a livelihood (Table 1).

5.2. Local community activities carried out within wetlands responsible for their degradation

The majority (80%) of respondents stated a host of activities that are responsible for wetland degradation in the study area. Activities including gathering materials for building and for making crafts (59%), in most cases left wetland ecosystems bare and contributed the most to wetland degradation especially in the Western Region of Uganda (Table 2).

Table 2. Activities carried out in the wetlands by members of the local community in the study area, (Researcher's questionnaire survey, Note: Total percentage of cases* is more than one hundred percent due to multiple responses)

Activities	Responses (N=400)	Percent of cases*
Gathering materials for building and for making crafts	235	58.8
Farming	182	45.5
Fishing	122	30.5
Hunting	58	14.5
Clay mining	20	5.0
Bird and game watching	2	0.6



Fig. 2. Community members tilling one of the wetlands for crop cultivation in the Western Region (Barakagira, 2013)



Fig. 3. Bricks that have been made using clay mined from the wetland by one of the members of the local communities in the Central Region, Rusoke, 2013

Other activities that significantly contributed to wetland degradation include farming (46%) and clay mining as reported by 5% of the respondents (Table 2). Farming is predominantly practiced in the wetlands found in the Western Region (Fig. 2 at S01°24.673/ E029°56.361/) while clay mining is predominantly carried out in the Central Region (Fig. 3 at N00°18.347/ E032°30.859/). Construction of residential houses and industries are also some of the activities that caused wetland degradation in the study area.

In addition to the direct activities that contributed to degradation of wetlands in the study area, some circumstances led to wetland degradation in Uganda.

(i) High population growth in the country, and more specifically, where the majority (68%) of the respondents in the study area reported a minimum of four children in each household, and

of whom, 69% are peasants. A high population growth coupled with reported infertile upland soils created a landless class of people who might have turned to wetlands that are regarded as more fertile by members of the local community, and ended up reclaiming them for agriculture as observed in Fig. 2. In relation to this, one key informant at N00°28.820/ E032°26.577/ stated:

‘When we settled in this area about sixty years ago the available land for agriculture was enough. But as time went by, we started experiencing land shortage since the numbers of individuals in each household increased which forced us to reclaim our neighbouring wetland for agriculture. The situation would have become worse if some of our children did not migrate to the city to seek for casual jobs’.

(ii) Wetland ownership in the study area is not yet clear to members of the local community and this could have contributed to wetland degradation. Although Article 237 of Uganda's Constitution empowers the citizens of Uganda to own land, it does not clearly itemise how wetlands should be owned. In addition, land in Uganda is managed according to four different tenure systems which include: the customary; freehold; mailo; and the leasehold tenure system. These tenure systems operate under different objectives and yet more than one tenure system may operate in the same region. This could have exacerbated the misunderstanding about ownership of wetlands among members of the local community and ended up being degraded. Although, the 1995 Constitution for the Republic of Uganda clearly states that 'wetlands are held in trust by the government for the good of all citizens of Uganda', slightly over half (51%) of the respondents reported that, wetlands are either owned by members of the community who own land near the wetlands, or by the local organized groups of members locally known as society members. Only 34% of the respondents reported that wetlands are owned by the Government. Such misconceptions about wetland ownership among members of the local community could have compelled them to utilize the wetlands without heeding to any conservation measures and ended up degrading them.

The misconception about wetland ownership was confirmed by a Chi-square test about the respondents' perceptions concerning who owns wetlands and their level of education. The test revealed that there is an association between the level of education of the respondents and their perceptions about who owns wetlands ($\chi^2= 17.5$, $df= 15$, $P= 0.291$). Since the majority (91%) of the respondents never studied beyond Secondary level of Education, they might not have been aware of the law governing ownership of wetlands in Uganda. To affirm to the advanced statements, some respondents from the central region, where there is a strong attachment to the monarchy posited that wetlands are owned by the Kabaka (Traditional King), while in some other parts, where some members of the communities practice traditional ceremonies, especially those at N00⁰40.158/ E032⁰52.352/ believe that wetlands are owned by some gods.

(iii) Lack of knowledge by members of the local community about the indirect functions wetlands provide could also have contributed to their degradation in the study area. During the study, it was revealed that a quarter (25%) of the

respondents reported that the presence of wetlands in their area have not benefitted them at all, because they have not been allowed to harvest wetland resources, or cultivate crops for household consumption in the wetlands. Three quarters (75%) of the respondents reported that wetlands have benefitted them because they are the areas where members of the local community practice agriculture, build residential and industrial houses, and mine sand and clay 'free' of charge. None of the respondents stated the indirect benefits like erosion control, microclimatic stabilization and other wetlands provide. It is no wonder, that the majority (66%) of the respondents reported that they were not ready to incur any cost in a bid to save wetlands from being degraded. Even then, the 34% of the respondents, who were willing to incur some money in a bid to save wetlands from being degraded, attached little monetary value when they reported that they were willing to pay an average of UGX. 500 (approximately US\$ 0.185) per month for the same purpose.

The lack of knowledge about the indirect functions wetlands provide might have been as a result of inadequate awareness concerning wetland functions and wetland conservation measures among members of the local community. The majority (56%) of respondents were not aware of programmes concerning the conservation of wetlands in their environs, and those who were aware of the programmes received information mainly from community meetings (51%); local radios (28%); and from hear say (12%). Members of the community received least wetland conservation information from local television (4%); areas of worship (3%); and newspapers (2%).

The awareness of wetland conservation programmes by the respondents was associated with their level of education ($\chi^2= 36.6$, $df= 30$, $P= 0.190$) since up to 91% of the respondents never studied beyond the Secondary level of education. A few members of the local community were aware of the conservation programmes concerning wetlands in the study area, where the majority might probably have been involved in degradation activities of the wetlands.

5.3. Circumstances that hindered effective management and conservation of wetlands by the wetland management agencies in Uganda

Wetlands in Uganda are under the management of the agencies, namely, NEMA, and WMD which is housed in the Ministry of Water and Environment. In addition to the agencies, the 1995 Constitution of the Republic of Uganda protects the wetlands

where it is stated that wetlands are 'held in trust' by the Government for the good of all citizens of Uganda, and in this case, no one can claim ownership of any wetland or part of a wetland after the coming into force of the 1995 Constitution.

However, the study revealed that the majority (67%) of the respondents disagreed that wetlands are under the management of these government agencies, while the remaining 33% agreed. Among the 67% of the respondents, they stated that wetlands are under the management of the members of the local community, local organized groups (societies), and others like the Kabaka (King). Little evidence is available on the ground that wetlands in Uganda are under the management of the NEMA and WMD (Government Agencies).

Several circumstances are reported not to have allowed the government agencies' activities to be pronounced at the grass roots level and hence rendered the agencies ineffective towards protection and conservation of wetlands in Uganda. These circumstances may include but are not limited to:

i) Inadequate funding of these agencies for wetland protection and conservation activities. Limited funds could not enable the agencies, especially NEMA, to employ some extra workforce to fill the vacancies that exist at the grassroots level, which would assist NEMA to implement conservation measures for wetlands. The unfilled vacancies include environment and production at the lowest level of governance, and the Environment Committees at the sub-county level. In fact, it was revealed during the study that inadequate funds could only allow employment of one Natural Resources' Officer per district of study apart from Kampala and Wakiso districts (the capital city and neighbouring district respectively), which employed two Natural Resources Officers that are responsible for conducting activities related to the protection and conservation of natural resources including wetlands.

In relation to the limited manpower present at the lower levels responsible for protection and conservation of wetlands, one of the Natural Resources Officer in the Central region stated:

'Wetlands in this area in most cases are degraded over the weekends when I have taken leave. Many trucks are used to ferry soil and concrete and dump it into the wetlands in preparation for industrial and house construction, taking advantage of none of the Natural Resources Officer on duty. By the time it is realized that a particular wetland has been degraded, it is too late to avert the situation.'

In addition, it was reported that the Environmental Protection Police, a section of the Police force that was created aimed at helping the wetland management agencies towards the protection and conservation of wetlands, is only operating in areas within the Lake Victoria basin, again citing insufficient funds. Of course, bearing in mind that wetlands are diverse, those that are located in areas where there are no operations of the Environment Protection Police are prone to degradation.

ii) Political interference towards the matters related to protection and conservation of wetlands in Uganda might also have rendered the wetland management agencies ineffective. Political interference was connected to matters concerning the inability of the wetland management agencies to execute members of the local community who are involved in the degradation of wetlands and are believed to be very well 'connected' to high ranking officials in the central government or politicians. It is on this note that one of the Natural Resources Officer in the Western region lamented:

'Although we advocate for the protection and conservation of wetlands in this area, they are always degraded by members of the community who are regarded as 'heavy weights' (rich) and are politically connected to officials in the central government. In some other cases, some political leaders in this area shield and protect those members within the community who are regarded as electorates from being evicted from the reclaimed wetlands.'

In addition, a high ranking official from NEMA had this to say in regard to political interference towards protection and conservation of wetlands.

'I have on several occasions received strong threats from high profile politicians and people who are believed to have strong connections to officials in the ruling government because of spearheading a campaign to demolish buildings which have been constructed in wetlands. I sometimes have had to change the means of transport I use to disguise my movements for fear of being trailed and harmed. I even no longer attend public ceremonies because of fearing for my life!'

If many officials who are supposed to implement protection and conservation measures for wetlands receive such threats, they may see it as unnecessary to confront such people who are believed to be 'well connected' to the ruling government and are involved in the degradation of wetlands, leading to further destruction of the wetlands.

iii) Lack of specific judges to expedite cases concerning wetland encroachers is yet again believed to be the reason behind the ineffectiveness of the wetland management agencies from protecting and conserving wetlands in Uganda. During the study, some senior officials of NEMA reported that whereas wetland encroachers are always arrested and taken to Courts of Law for prosecution, most times the offenders are let off because some judges seem not to be very conversant with environment related cases. In relation to this, some of the wetland related cases take an unnecessarily long time before they are resolved, and yet wetland degradation takes place all the time, which has escalated the disappearance of wetlands in the study area.

In relation to the lack of specific judges, it was realized that there is a vacuum in the leadership at the grassroots level, where the chairpersons at the lowest level of governance have not been democratically elected into their offices since the year 2006. The last time elections for the chairpersons of the local council 1 were held was in 2001. This has been attributed to the ruling government citing lack of funds for the exercise. Since the leaders at the lowest level of governance seem to be 'illegitimately' occupying the offices, effective implementation of the laws and regulations concerning protection and conservation of natural resources including wetlands, are left wanting. It is on this note that one of the respondents at S01⁰25.039/ E029⁰56.643/ in the western region stated:

'In this area, we are like orphans in terms of governance after the passing on of our late Chairman. Since his demise in 2007, we have never got any replacement leaving the deputy to be the one in the acting position. The deputy chairman is not as strong as our late chairman and this has negatively affected resolving of the community cases including those concerning wetlands in this area.'

iv) Uncoordinated activities and conflicting interests between different government departments responsible for natural resource management could yet again have been another reason that caused degradation of wetlands in Uganda. During the study, it was revealed that some members of the local community possessed valid land titles that have been issued by the officials from the Ministry of Lands and Urban Development and they covered some parts of the wetlands. The same piece of land might have been designated as a wetland by the officials from the Ministry of Water and Environment. Such confusion was reported to be happening in many parts of the central region

(near the Capital City), where the value of land is believed to be high. These circumstances have rendered the wetlands management institutions ineffective and have promoted the disappearance of wetlands in the region. To confirm this statement, one of the study participants from WMD had this to say:

'Some members of the local community legally own some wetlands where they possess land titles which have been issued by officials from Ministry of Lands and Urban Development. Such members of the community can neither be evicted from the reclaimed wetlands nor charged in Courts of law for wetland degradation since they are in possession of valid land titles.'

5.4. Important Linkages That Need to Exist Between Local Community Activities and Wetlands Management Agencies that would Promote the Conservation of Wetlands in Uganda

For effective protection and conservation of wetlands in Uganda, the activities of the local communities need not be antagonistic with the policies put forth by wetland management agencies for the same purpose. To achieve this, members of the local community would be allowed to undertake some activities within, or around, the wetlands which would not be detrimental to the existence of wetlands and at the same time being viewed by the agencies as the activities that may facilitate the conservation of wetlands in a win-win scenario. Some of the activities that need to be practiced by members of the local community in Uganda may include:

i) Wetland edge farming by members of the local community. It was observed during the study that some members of the local community, especially those who own some land adjacent to the wetlands practice some farming along the edges of wetlands. Where edge farming has been practiced, there has been little or no degradation of the wetlands in question. Members of the local community who practiced edge farming also respected the existence of wetlands boundaries that promoted the protection and conservation of wetlands, especially those found in the central region. This is in agreement with one of the respondent who reported that:

'We were allowed to practice farming along the edges of the wetlands by Officials from NEMA. However, we were instructed not to cultivate beyond the planted trees (boundaries) and we adhered since the crops grown along the edges of wetlands produce good yields.'

In addition to wetland edge farming, members of the local community should be encouraged to apply some fertilizers especially natural (compost) on their lands found uphill that have been reported to be infertile, so that the land can promote the growth of food crops. In this way, the pressure mounted on wetlands that are regarded as 'more fertile' would reduce and end up being conserved.

ii) Fish farming in some parts of the wetlands by members of the local community. It was observed that some members of the local community are practicing fish farming in the ponds that have been constructed in wetlands. The government of Uganda also encourages its citizens to embrace fish farming in order to avail food sources rich in proteins for the growing population (Section 5.2). It was realized that the construction of fish ponds in wetlands to a large extent does not significantly lead to degradation of the wetlands compared to complete drainage of wetlands for crop cultivation and house/industrial construction. Fish farming would act as an alternative activity undertaken by members of the local community who no longer practice subsistence agricultural activities on the land on uphill soils that have been reported to be infertile and unproductive, incapable of supporting the growth of food crops, other than just serving as areas that mainly support the growth of trees (see background of Fig. 1).

In addition, fish farming could be taken as an economic activity, where fish grown in the ponds could be sold by the farmers to get some income which would be used by members of the local community to buy some other necessary household requirements. When there are alternative methods of earning a livelihood by members of the local community, wetland resources may not solely be viewed as the main providers of household requirements for members of the local community and hence may end up being conserved.

iii) There should be no further draining of the remaining parts of the un-reclaimed wetlands by members of the local community. In addition, the Ugandan government should implement the policy which was put in place proposing the eviction of all wetland encroachers, especially those who reclaimed wetlands after the promulgation of the 1995 Constitution (New Vision, October 14, 2014), so that wetlands are left to regenerate. During the study survey, it was observed that some of the wetlands especially those at S01°25.039'/E029°56.643' that have been left to regenerate regained their original state and are now said to be performing their usual functions like providing

materials for making crafts. On the regeneration of wetlands, one key informant at S01°25.039'/E029°56.643' observed that:

'This neighbouring wetland was saved from being destroyed by officials from NEMA. When members of the local community had almost finished reclaiming it for crop cultivation, they were instructed to halt further draining and vacate it. It can now be seen that the wetland has returned to its original state and some local community members now visit it to harvest some materials for making crafts.'

Thus, if community activities including, but not limited to: wetland edge farming; fish farming in ponds constructed within the wetlands; and allowing the previously drained wetlands to regenerate; they would all contribute to the protection and conservation of wetlands in Uganda.

6. Discussion

Unsustainable harvesting of wetland resources especially for building and for making crafts, as reported by 59% of the respondents, together with farming (46%) and clay mining (5%) are the main activities members of the local community carry out within wetlands that are responsible for wetland degradation in the study area. As noted by SVOTWA ET AL. (2007), who conducted a study in Zimbabwe, stated that the level of sustainable utilization of wetlands began to decline due to infertile soils in upland soils and pressure factors forced the local farmers to scramble for wetland sites and ended up degrading them. Other scholars like GOMBYA-SSEMBAJJWE & BANANA (1998), CHAPMAN ET AL. (2001), MACLEAN ET AL. (2003), and HARTTER & SOUTHWORTH (2009) reported that Uganda's wetlands are declining because they are the main resource caches and are essential for agricultural expansion and survival for the majority of the rural population.

A high population, where at least 68% of the respondents reported to have a minimum of four members in each household, coupled with infertile soils in the uplands, also forced members of the local community to turn to wetlands which they regarded as fertile and reclaimed them for agriculture. In relation to infertile soils found in the uplands, COLCHESTER (2000) asserts that infertile soils in the uplands encourages members of the local community to search for a livelihood in a more ecologically sensitive area like wetlands and they end up being degraded. In addition, USAID (2011) states that poor people's mechanism for compensating reductions in agricultural yields leads to encroaching sensitive areas like wetlands. Soil erosion that causes massive depletion of

upland soil, especially among small agricultural production systems, as reported by NEMA (2005), gives the poor people who possess small pieces of land an incentive to further encroach and damage the environment especially wetlands. Areas, especially wetlands, which in most cases are regarded as more fertile by members of the local community as stipulated by BOS ET AL. (2005) attract many local people to carry out agriculture and end up degrading them.

In relation to high population growth, which is largely comprised of peasants, and is involved in the degrading activities of wetlands in the study area, HARTER & RYAN (2009) state that as the population grows, more land is parceled out and new farms are established, which creates more demand for land to be converted for agriculture that renders wetlands which are regarded as 'free' to be reclaimed. Other authors including NEMA (2008) and USAID (2011) reported that the rapid population growth in Uganda has resulted in an increase in the demand for domestic, industrial, and agricultural uses of wetlands, which is why they are declining. Demographic growth, as reported by AGRAWAL & GIBSON (1999) and LEACH ET AL. (1999), leads to an increase in consumption pressures on natural resources, including wetlands, and end to being degraded.

Unclear wetland ownership to members of the local community also contributed to the degradation of wetlands in the study area. Different land tenure systems including the customary, freehold, mailo (land parceled out using a square mile as a basic unit of measure), and leasehold which operate under different objectives, and are in most cases implemented in the same area, have also exacerbated wetland degradation. Some authors like MACLEAN ET AL. (2003) reported that in the Kabale district, which is located in south-western Uganda; people who own land immediately adjacent to the wetlands assume ownership of the wetlands. Insecure and non-uniform land tenure systems as reported by USAID (2011) are known to threaten sustainable natural resource management and biodiversity conservation. Also, authors like PIMBERT & PRETTY (1997) and TIMMER (2004) reported that in areas where ownership is clear and local communities have been granted secure usufruct rights over natural resources like wetlands, their degradation is witnessed to be reversed due to the fact that secure natural resource rights and ownership lead to greater interest and responsibility in maintaining a sustainable resource base. PAGDEE ET AL. (2006) and LE BEL ET AL. (2011) also assert that in places where a few local community members hold a legal title to land, and without

secure property rights, small holders show little inclination to participate in natural resource conservation. In addition, SCHWARTZMAN ET AL. (2000) states that unclear land tenure systems for local communities largely contribute to natural resource destruction including wetlands.

Lack of knowledge by most (75%) members of the local community concerning the indirect functions of wetlands also contributed to degradation of wetlands in the study area. Even then, despite the direct functions wetlands provide to members of the local community, the majority (66%) of them did not attach a lot of value to the wetlands when they reported that they were willing to incur an average of UGX.500 (about US\$ 0.185) per month in a bid to save wetlands from degradation. The lack of knowledge about the indirect functions wetlands provide is attributed to inadequate awareness (56% of respondents) about the functions of wetlands and conservation measures that have been proposed by wetland management agencies to protect the wetlands from degradation.

In relation to inadequate awareness, BAKEMA & IYANGO (2001) and HARTER & RYAN (2009) state that wetland management problems in Uganda have been as a result of insufficient awareness about the functions and benefits that wetlands provide. GOLDMAN (2003), and DECARO & STOKES (2008) affirm that a relevant education and training broadens stakeholders' understanding of conservation which increases them to envision additional means to contributing to natural resource conservation. If local people are not educated, trained and technically advised on issues concerning conservation, as reported by MARA (2003), then natural resource degradation, including wetlands, is likely to be pronounced. Other authors like NKONYA ET AL. (2005), SVOTWA ET AL. (2007), MASUKU VAN DAMMA & MESKELL (2009), note that if people are fed with enough facts about natural resource conservation, their environmental knowledge is raised and their attitudes towards natural resource protection are changed positively.

In addition to activities and circumstances that fuelled wetland degradation in the study area, the wetland management agencies' work for ensuring that wetlands which fall within their responsibility are protected and conserved was stifled. Several factors are believed to have contributed to their ineffectiveness towards protection and conservation of wetlands in Uganda. Some of the factors include inadequate funding to the agencies by the central government. Insufficient operating funds for particular activities have been reported by some authors including GOMBYA-SSEMBAJIWE & BANANA

(1998), and [HARTER & RYAN \(2009\)](#) who stated that limited operating budgets and manpower forced the District Environment Officers in Uganda to concentrate on monitoring and enforcement efforts only in more accessible areas leaving out those resources, including wetlands, that are in remote areas hence leaving them prone to degradation. [USAID \(2011\)](#) further asserted that NEMA, which is the agency responsible for ensuring sound environmental management and biodiversity conservation within the whole country, is underfunded and understaffed, which leads to mitigation measures about natural resource degradation often going unmonitored.

A lack of sufficient operating funds as reported by [ABRAMS ET AL. \(2009\)](#), has always been a roadblock towards effective natural resource conservation mechanisms in Africa. [DAHLBERG & BURLANDO \(2009\)](#) also stated that at national level, the true cost of conservation has to be recognized and budgeted for, if efforts aimed at conservation are to succeed.

Political interference is another factor that hindered the wetlands management agencies to effectively execute their work related to protection and conservation of wetlands in Uganda. This is congruent with [AKELLO \(2007\)](#) who stated that there is a general lack of respect for established institutions and laws, coupled with political interference, that undermine compliance as a mechanism for environmental protection in Uganda; and that inconsistent political positions and statements on the environment, especially during an election period always lead to natural resources being degraded. [USAID \(2011\)](#) adds that natural resources protection in Uganda has not been very effective due to a lack of political will to advocate for biodiversity conservation.

Others like [KELLERT ET AL. \(2000\)](#) state that in governments where natural resource conservation is not their primary goal, there is always a tendency for the governments to sacrifice high biodiversity areas like the wetlands for short term political gains. [NELSON & AGRAWAL \(2008\)](#), and [NELSON ET AL. \(2009\)](#) add that implementing policies toward the protection of natural resources in developing countries is challenging because conflicts over natural resource conservation between policy makers and implementers exist especially where political patronage play a major role in policy decisions.

Lack of specific judges to arbitrate wetland related cases expeditiously is yet another reason that might have contributed to the ineffectiveness of the wetland management agencies on matters concerning protection and conservation of wetlands in Uganda. In relation, the term of service for the

chairpersons of Local Council 1 (grass roots level) expired in 2006 and no fresh elections have been held to that effect. Yet, governance at the lowest level is believed to assist in the implementation of the rules and regulations concerned with the protection and conservation of natural resources including wetlands. Authors like [BAZAARA \(2002,\)](#) and [HARTER & RYAN \(2009\)](#) reported that Local Councils (LCs) in Uganda were given power to manage and enforce compliance to the country's natural resources according to the [1995 CONSTITUTION AND LOCAL GOVERNMENT ACT, 1997](#); and that now they (LCs) seem to be functionally absent, natural resources are left no alternative but to be misused. [SCANLON & KULL \(2009\)](#), and [RUIZ-MALLEN & COBERA \(2013\)](#) observed that for conservation of natural resources to be effective, conservation plans need to empower representative local institutions that are legitimate and accountable to members of society.

In relation to governance at grass roots level, [PIMBERT & PRETTY \(1997\)](#) stated that natural resource degradation in developing countries originates from the dissolution of local level institutional arrangements whose purpose is to give rise to sustainable resource use patterns. In rural areas, where the state agencies are virtually absent, or have failed, [HARA ET AL. \(2009\)](#) affirm that powerful local interest groups operate successfully, which may result in natural resource degradation. [MURPHREE \(2002\)](#) and [BERKES \(2004\)](#) add that devolution of authority at the local level plays a big part in the failure of community conservation of natural resources.

Last but certainly not least, conflicting interests between officials from different government ministries especially the Ministry of Water and Environment, and the Ministry of Lands and Urban Development might have also contributed to the ineffectiveness of wetlands management agencies on matters related to the conservation of wetlands in Uganda. This might have been as a result that whereas the Ministry of Water and Environment is mostly interested in utilizing and at the same time conserving wetlands, the Ministry of Lands and Urban Development may be interested in parceling out land and sometimes wetlands for development purposes like housing and industrial construction. This could be the reason why members of the local community possessed land titles which were found to even stretch into the wetlands.

In relation to the above statement, [LEACH ET AL. \(1999\)](#) stated that a lack of synchrony between members of the local community towards natural resource utilization and between different

developments leads to environmental degradation. BERKES ET AL. (2000) and DEARBON & KARK (2009) reported that different actors in natural resource management view natural resources in different perspectives, motives, and at different geographical scales which may culminate in natural resource degradation. USAID (2011) adds that inadequate coordination and lack of cooperation between central governments and local authorities in policy implementation often lead to contradictions, confusion, and conflict in land use practices resulting in threats to biodiversity.

It can be observed that a host of activities undertaken within wetlands by members of the local community, and some circumstances surrounding the use and utilization of wetlands by different stakeholders has hindered the effective management and conservation of wetlands by wetland management agencies in Uganda. If protection and conservation of wetlands by wetland management agencies is to be realized, the aforementioned hindrances must urgently be addressed.

7. Conclusions

A plethora of activities undertaken in wetlands by members of the local community have been mentioned to be ones that might have contributed to the degradation of wetlands in Uganda. Such activities include the unsustainable harvesting of wetland resources mainly used for thatching and for making crafts; draining of wetlands for the purpose of farming (both subsistence and diary); and unsustainable mining of sand and clay used for building. Some circumstances, in addition, have escalated the degradation of wetlands and they include: high population growth; unclear wetlands ownership; and unawareness of the indirect functions of wetlands by members of the local community.

The ineffectiveness of the wetland management agencies to execute their work in regard to protection and conservation of wetlands in Uganda has been attributed to inadequate funding for the activities aimed at the conservation of wetlands by central government. Political interference about the implementation of the work undertaken by these agencies geared towards conservation of wetlands; lack specific judges that could expedite wetlands related court cases; and the uncoordinated and conflicting interests that exist among some Ministries concerned with the management of natural resources.

For effective protection and conservation of wetlands in Uganda, members of the local community

need to be encouraged to practice wetland edge farming; fish farming in ponds constructed in wetlands; and allow some parts of those wetlands that have been reclaimed, after the promulgation of the 1995 Constitution, to regenerate. Also, the circumstances that are reported to have stifled the effectiveness of the wetland management agencies towards the protection and conservation of wetlands in Uganda must be critically and urgently addressed.

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