

**AN INSTITUTIONAL ANALYSIS OF THE
MANAGEMENT OF WETLAND RESOURCES:
A COMPARATIVE STUDY OF FLÓAHREPPUR MUNICIPALITY IN
SOUTH ICELAND AND OYAM DISTRICT IN UGANDA**

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ABSTRACT

Wetlands occur at all latitudes, from the polar areas to the tropics, and cover about 6% of the earth's surface. Wetlands perform a number of ecosystem services, some of which are well recognised, others less so, and are internationally recognised as being one of the most important ecosystems for the conservation of biodiversity. Wetlands also have important primary functions in the regulation of hydrology, water purification and flood control, and coastal wetlands can help to alleviate the impacts of storm surges. Further, wetlands have aesthetic values and significant eco-tourism potential. This study examined the adequacy of the policy, legal and regulatory framework for sustainable utilization and management of wetlands in Uganda and Iceland. The analyses of stakeholders involved in the utilization and management of wetlands in the Oyam District and Flóahreppur Municipality were accomplished using the "stakeholder analysis" tool. The analyses clarified the returns, roles, responsibilities and relationships of the various stakeholders, with regard to sustainable utilization and management of wetlands. Wetlands utilization and management issues in the Oyam District were compared with those of Flóahreppur Municipality. The challenges of sustainable wetlands utilization and management in the Oyam District were discussed, with relevant recommendations. The policy and legal framework for

sustainable utilization and management of wetlands in Uganda is adequate. However there is need for more regulations to make the laws more effective. The institutional framework is also sufficient, but there is a need to build more capacity and for stronger collaboration among allied sectors. Iceland on the other hand, has a weak policy, legal and regulatory framework for sustainable utilization and management of wetlands. There is need for a comprehensive policy and a legal and regulatory framework. Institutions for wetlands management should also be established at the local government and “wetland users” level. The challenge of sustainable utilization of wetlands is linked to the private ownership of wetland areas in the Flóahreppur Municipality. The Municipality did make commendable progress in protecting wetlands of local importance through apt land use planning.

1. INTRODUCTION

Wetlands cover about 6% of the earth’s surface. The Ramsar convention on wetlands of international importance defines wetlands as “areas of marsh, fen, peatland or water whether natural or artificial, permanent or seasonal with water that is static or flowing, fresh, brackish or salty, including areas of marine water the depth of which at low tide does not exceed six metres.” (Ramsar, 1971)

Wetlands occur at all latitudes, from the polar areas to the tropics, and occur in most countries.

Wetlands perform a number of ecosystem services, some of which are well recognised, others less so, and are internationally recognised as one of the most important ecosystems for the conservation of biodiversity (Carp, 1980). Wetlands also have important primary functions in the regulation of hydrology, water purification and flood control, and coastal wetlands can help to alleviate the impacts of storm surges. Further, wetlands have aesthetic values and significant eco-tourism potential (Millennium Ecosystem Assessment, 2005).

Peatlands are estimated to store more than twice the amount of carbon as all global forest biomass combined. Drained and disturbed peatlands emit a massive amount of carbon dioxide and other greenhouse gases (Anonymous, 2008).

According to the Millennium Ecosystem Assessment, wetlands are the habitat that has been most affected by development and are being lost more rapidly than any other habitat in the world. However, 80% of the global peatland area is still pristine and not severely modified by human activities. Globally, natural peatlands are destroyed at a rate of 4000 square kilometres per year, with 50% attributed to agriculture, 30% to forestry and 10% to peat extraction.

In Uganda, wetlands are one of the most valuable ecosystems and cover about 30,105 square kilometres, representing 13% of the country’s total area (National Environment Management Authority, 2000)

The national environment act of Uganda defines wetlands as “areas which are permanently or seasonally flooded by water and where plants and animals have become adapted”. There are two broad categories of wetlands in Uganda, namely, those which are associated with lakes (lacustrine) and rivers (riverine) (National Environment Act, 1995).

The lacustrine types include: the Kyoga/Kwania complex; Lakes George, Edward and Albert; the Bunyonyi lake/swamp complex; Bisina and Opetta; Wamala; and other smaller lakes. The riverine wetlands include the Okole and Kafu systems (National Environment Management Authority, 2000).

In Uganda, wetlands have many uses and functions in addition to those described above, including: hunting and fishing; cultivation including rice growing; grazing; brick-making; source of water for domestic and livestock requirements; harvesting materials for craft and building houses (National Environment Management Authority, 2000).

But despite the important ecosystems services wetlands deliver, Ugandan wetlands have been greatly altered by human activities. The Government of Uganda made significant progress in establishing a comprehensive policy, legal and institutional framework for wetlands management.

Nonetheless, there are numerous challenges that undermine the sustainable utilization and management of wetlands in Uganda (National Environment Management Authority, 2000). It is therefore imperative to examine the adequacy and effectiveness of the policy, legal and institutional framework with regard to sustainable wetlands utilization and management.

Further, greater understanding on wetland management can be gained by comparative analyses, drawing upon experiences from other countries. Iceland is a developed country, ranked number one on the Human Development Index and with a natural resources-based economy, and can therefore be seen as a good candidate to compare with the Ugandan situation. Iceland has extensive network of wetlands (Fig. 1) that have undergone significant modifications since settlement of the country 1100 years ago. Additionally, the country has a long history of government supported, systematic drainage of wetlands to expand the agricultural area and increase the amount of pasture.

A comparison of the utilization and management of wetlands in Uganda and Iceland is therefore valuable in identifying the common management challenges, recognizing good management practices and enriching perspectives in policy, legal and institutional arrangements for sustainable wetlands utilization and management.

Aim and objectives of the study

The key aim of the study was to examine wetlands utilization and management in Uganda and Iceland and ultimately compare wetlands management in the Oyam District with the Flóahreppur Municipality in South Iceland so as to understand the issues and alternatives in sustainable utilization and management of wetlands.

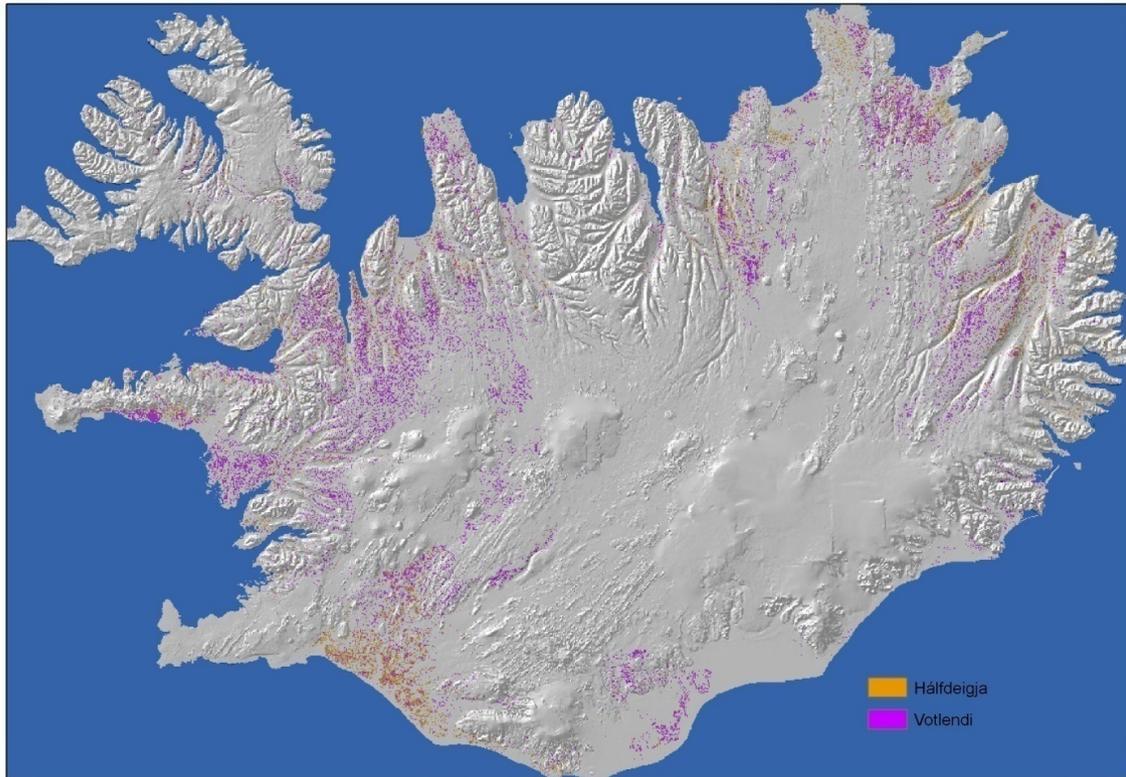


Figure 1. Current extent of wetlands in Iceland according to the Nytjaland database.

The objectives of the study are:

- I. To examine and compare the adequacy of the policy, legal and regulatory framework for wetlands management in Uganda and Iceland.
- II. To identify the wetlands in the Oyam District and Flóahreppur Municipality in South Iceland.
- III. To identify and analyse the stakeholders involved in the utilization and management of wetlands in the Oyam District and Flóahreppur Municipality.
- IV. To compare wetlands utilization and management in the Oyam District with Flóahreppur Municipality.

2. METHODOLOGY.

This study used various methodologies. The examination of policy, legal and regulatory framework for wetlands management in Uganda was obtained through a literature review and perusal of the relevant documents.

The wetland resources in the Oyam District and Flóahreppur Municipality were identified from relevant maps, satellite images and inventories. The stakeholders involved in the management and utilization of wetlands in the Oyam District and Flóahreppur Municipality were identified from relevant policy documents, reports and focus discussions. The key stakeholders were then within a “stakeholder analysis framework”, thereby assessing their rights, returns, relations and responsibilities, also framed as the 4R’s (Vedeld, 2006).

A comparison of the utilization and management of wetlands in the Oyam District with Flóahreppur Municipality was then undertaken, focusing on the policy, legal, regulatory and institutional issues.

3. CASE STUDY AREAS

The case study areas were the Oyam District in Uganda and the Flóahreppur Municipality in Iceland. This study focused on the policy, legal and institutional issues in the management of wetlands in the Oyam District and Flóahreppur Municipality.

3.1 Oyam District

The Oyam District is located in Northern Uganda, situated between latitudes 2° N and 2°7' N and longitudes 32°2' E and 32°10' E. The district covers a total area of approximately 2,207 km², of which 2% is open swampland and water while 1% is forests. The district is made up of seven sub-counties comprised of 39 parishes and 810 villages and one town council comprised of 2 wards and 19 cells (Fig. 2). The sub-counties and town council are lower local governments while the parishes and villages are administrative units (Oyam, 2008)(Table 1).

Table 1. Lower local governments and administrative units in Oyam District.

S/N	Name of lower local government	Number of parishes/wards	Number of villages/cells
1	Aber Sub-county	7	95
3	Acaba Sub-county	5	65
7	Iceme Sub-county	5	120
2	Loro Sub-county	4	99
6	Minakulu Sub-county	6	151
4	Ngai Sub-county	6	129
5	Otwal Sub-county	6	151
8	Oyam Town Council	2	19
	Total	41	829

Source: Oyam District Development Plan, 2008-2011.

tropical areas, the district experiences distinctly separate wet and dry seasons. The wet season is from April to November while the dry season is from December to March. The average minimum and maximum temperatures are 17°C and 29°C, respectively. The absolute maximum temperature seldom goes beyond 36°C and the absolute minimum rarely falls below 13°C (Oyam, 2008).

The Oyam district is endowed with three extensive riverine wetland systems, namely, Tochi, Olony, Okole (Fig. 3).

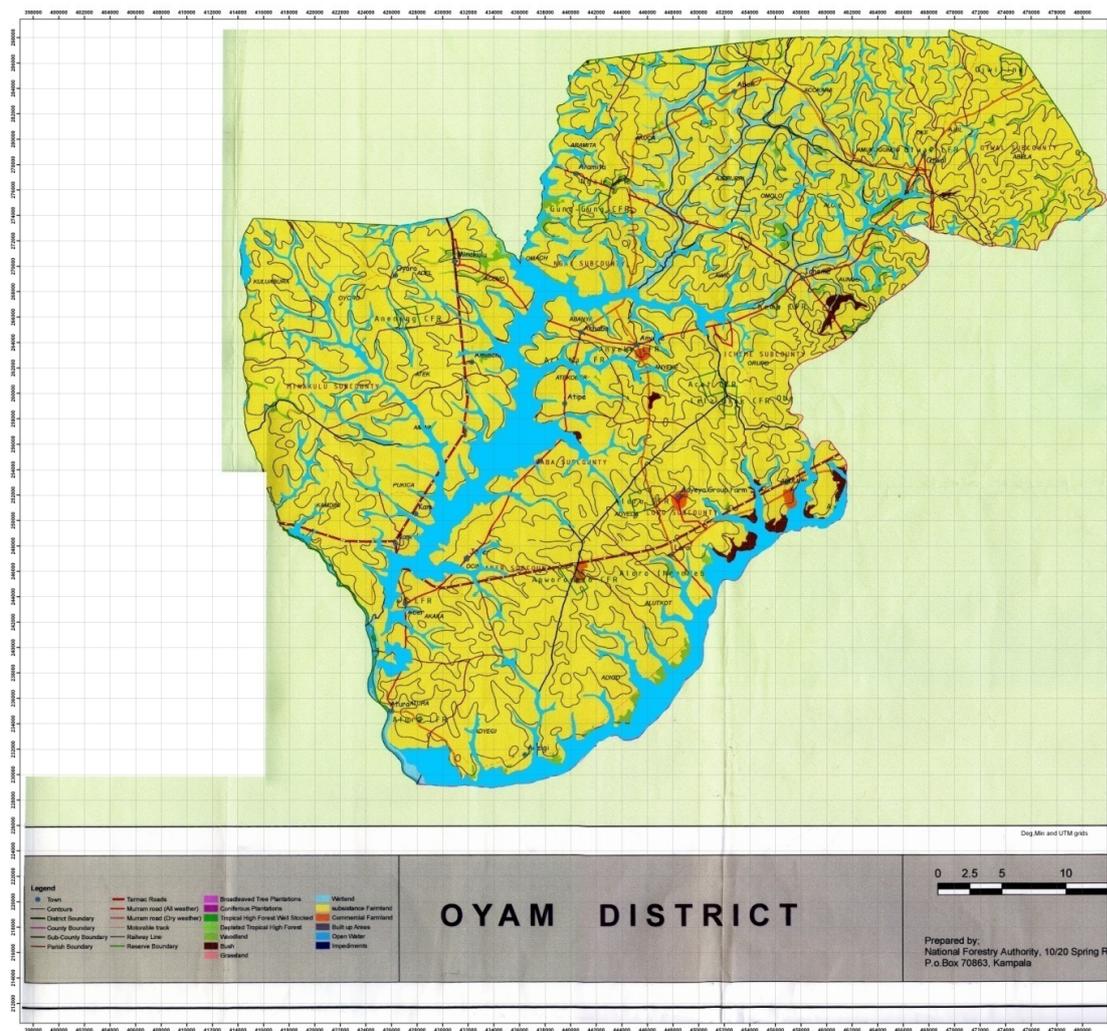


Figure 3. Map of wetland areas in Oyam District.

There are also numerous seasonal wetlands within the district, however a detailed inventory has not yet carried out (Oyam, 2007).

The attributes of the wetlands are biodiversity, aesthetics and cultural heritage. The predominant plant species in the wetlands are papyrus, phoenix rectlinata, combretum, grewia mollis, water star grass, albizia coriaria, raspherelia regia, elephant grass and acacia species.

The common animals are waterbuck, antelope, foxes, rats, wildcats, tortoise, toads, frogs, and green and black snakes. The main species of fish found in the wetlands are mudfish and lungfish. The common birds in the wetlands are crested cranes, weaver birds, white egrets, doves, “kwilikwili” and “gweno kulu” (Oyam, 2007).

The major functions of wetlands in Oyam are flood impact reduction, ground water recharge, water quality protection, micro-climate modification, wildlife habitat, sediment and nutrient retention.

The uses of the wetlands are fishing, hunting, grazing, cultivation, havens for rituals and recreation. The goods and services provided by the wetlands are water for domestic and livestock requirements, materials for building and crafts, herbal medicine, and sand and clay for pottery and brick-making (Oyam, 2007).

The wetlands are being increasingly encroached on and there is accelerated degradation. Wetlands encroachment is attributed to ignorance, population pressure, and poor enforcement of laws and regulations. Degradation of the wetlands is mainly caused by overexploitation of products, drainage for cultivation, and burning for hunting and pasture regeneration (Oyam, 2007).

3.2 Wetlands in Flóahreppur Municipality

The wetlands in Flóahreppur are mainly peatlands, ponds and lakes (Fig. 4). They are important for migratory birds in spring and autumn (Table 2).

Table 2. Protected wetlands in Flóahreppur Municipality.

Name of wetland	Description of importance	Farms
Tjarnir við Sviðugarða	Productive ponds and peatlands with evidence of historical land use.	Súluholt og Sviðugarðar
Villingaholtsvatn	Lake Villingaholtsvatn is important for waterflow.	Vatnsholt, Vatnsendi, Villingaholt
Egilsstaðasandur og nágrenni	A wetland and a sandy area with unique plants. Has aesthetic value.	Egilsstaðir, Villingaholt,
Hurðarbaksvatn	Lake Hurðarbaksvatn is an important bird area.	Hurðarbak

4. RESULTS AND DISCUSSION.

4.1 The policy, legal and regulatory framework for wetlands management in Uganda and Iceland

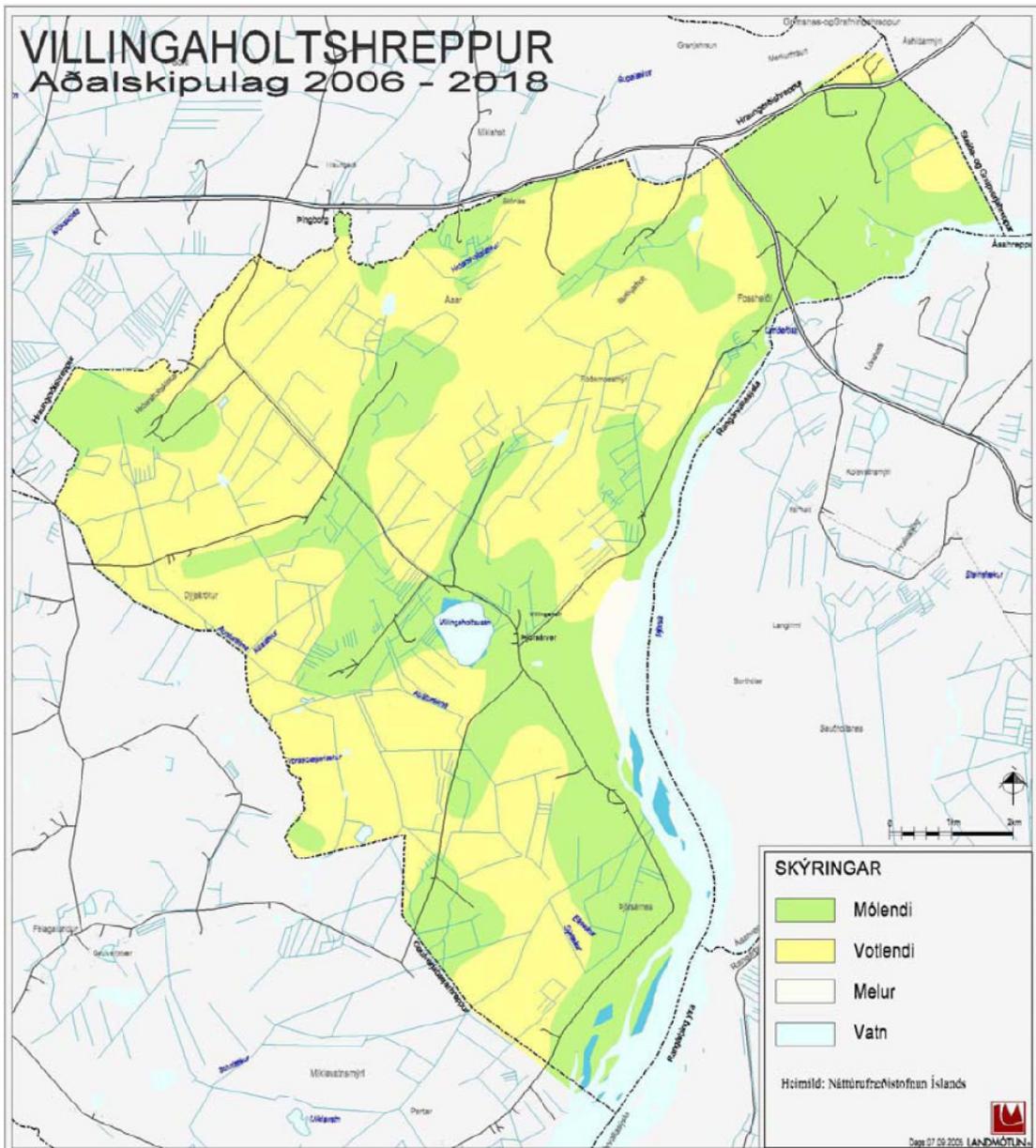


Figure 4. Wetlands in the Villingaholtshreppur part of Flóahreppur. Wetlands are shown in yellow. NB: Most of the wetlands are drained, as evident by the number of drainage ditches. The wetlands are significantly degraded by drainage. Nonetheless, four wetlands are protected from disturbance by the Flóahreppur Municipality (Flóahreppur, 2006). These wetlands are described in Table 2.

4.1.1 Uganda

In spite of the uses and valuable ecological functions, wetlands continue to be degraded by various human activities in Uganda (National Environment Management Authority, 2004).

Wetlands are drained for agricultural purposes; especially those with shallow water have been put under intensive cultivation for crops like sugar cane, yams, potatoes and eucalyptus. In most cases, the ecosystems of these wetlands have been substantially modified by the drainage. The situation of wetlands drainage has reached a critical level in the eastern region of Uganda, with about 20% of

wetlands destroyed compared to 2.8%, 2.4% and 3.6% in the central, northern and western regions, respectively (National Environment Management Authority, 2004).

Excavation for sand mining and extraction of clay is also an important threat to Ugandan wetland areas. The sand used for construction in Uganda is mined from wetlands. The clay used for brick-making and pottery is also extracted from wetlands. The pits left behind accumulate water, which remains stagnant. These offer breeding grounds for mosquitoes that spread malaria. Sand excavation and brick-making are closely linked with developments in urban centres, where there are high demands as a result of construction projects.

Illegal dumping of solid wastes is rampant in wetlands all over Uganda. These wastes are mainly generated from municipalities, industries, medical facilities and construction sites. The waste pollutes the wetlands in addition to providing nutrient enrichment, thereby causing eutrophication. The proliferation of illegal dumping of waste is attributed to inadequate waste dumping sites. The mechanisms for monitoring, inspection and law enforcement regarding waste disposal are also inefficient (National Environment Management Authority, 2004).

Deforestation of swamp forests for wood and other craft products significantly alters Ugandan wetlands. Rattan cane and Phoenix palm are some of the raw materials harvested from wetlands for making crafts. Population pressure and high demand for these products results in over-harvesting, yet the capacity of wetlands to provide them has declined. It must further be stated that guidelines for sustainable harvesting of wetland products are generally lacking.

Deliberate swamp fires are rampant and pose a threat to the biodiversity in wetlands because some species are not tolerant of fire. Swamp fires also trigger succession changes leading to replacement of natural wetlands vegetation. Swamp fires are mainly started by hunters to facilitate hunting or other wetland users to encourage regeneration of new papyrus and pasture for grazing (National Environment Management Authority, 2004).

But despite such widespread threats to Ugandan wetlands, significant steps have also been taken to protect the wetlands. Uganda became a signatory to the Ramsar Convention in 1987, and ratified it in 1988. The mission of the Ramsar Convention, is “the conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world.” The “vision for the Ramsar List” is “to develop and maintain an international network of wetlands which are important for the conservation of global biological diversity and for sustaining human life through the ecological and hydrological functions they perform” (Ramsar, 1971).

Presently Uganda has eleven Ramsar sites covering a surface area of 354,803 hectares. These sites are the Lake George Wetland System, Lake Nabugabo Wetland System, Lake Bisina Wetland System, Lake Mburo-Nakivali Wetland System, Lake Nakuwa Wetland System, Lake Opeta Wetland

System, Lutembe Bay Wetland System, Mabamba Bay Wetland System, Murchison Falls-Albert Delta Wetland System, Nabajjuzi Wetland System and Sango Bay-Musambwa Island-Kagera Wetland System (Ramsar, 2008).

These sites provide the desired extra protection to the habitats of endangered species such as the globally vulnerable Shoebill stork, the Gonolek papyrus and the Sitatunga, which constitute important tourist attractions.

Additional to the Ramsar convention, in 1986 the Ugandan Government undertook a major step to protect the wetlands by declaring a ban on large-scale drainage and in 1989, a National Wetlands Conservation Program (1989) was established. The following legislation, aimed at addressing issues pertaining to ownership, access to, and management of wetlands which is currently in place include: (a) the Constitution of Uganda, 1995; (b) the Uganda National Environment Management Policy, 1994; (c) the National Environment Statute, 1995; (d) the Local Governments Act, 1997; (e) the Water Statute, 1995; (f) the Land Act, 1998; and, (g) the Wetlands Policy, 1995.

All of the above are aimed at enhancing sustainable utilization and management of wetlands resources in Uganda (National Environment Management Authority, 2004).

There is an elaborate institutional arrangement for wetlands management in Uganda. The overall responsibility for wetlands management in Uganda is vested in the Wetlands Inspection Division, under the Ministry of Water, Lands and Environment. The Wetlands Inspection Division, basically carries out a supportive role to the different players including the Forestry, Fisheries and Water resources sectors.

The Wetlands Inspection Division implements the Uganda National Wetlands Conservation and Management Programme, which aims to assist the government in developing the policy and guidelines for conserving and managing sustainably the nation's wetlands and to acquire the technical capacity to do so. The National Wetlands Conservation and Management Programme promotes collaboration with many other agencies or institutions, namely: the National Environment Management Authority, Department of Fisheries, Department of Forestry, Department of Agriculture, Department of Animal Industry, Fisheries Research Institute, Makerere University Institute of Environment and Natural Resources, National Water and Sewerage Corporation, Uganda Electricity Board, and the Uganda Wildlife Authority.

A partnership of such complexity with diverse partners operating in a coalition requires co-ordination. The National Wetlands Inter-Agency Co-ordination Committee was established to carry out this function at the national level. The District Environment Committees and Local Environment Committees play a similar role at the district and sub-county levels, respectively.

The 1995 Constitution of Uganda

The Constitution has provisions for enhancing conservation and management of the environment

and natural resources. Objective X111 of the National Objectives and Directive Principles of State Policy and article 237(2)(b) of the Constitution pronounce the public trust doctrine which mandates that the State protect important natural resources including land, water, wetlands, oil, minerals, fauna and flora on behalf of the people of Uganda.

The Constitution also enshrines the constitutional right to a clean and healthy environment in its article 39 (Constitution, 1995).

The Uganda National Environment Management Policy, 1994

The overall goal of the National Environment Management Policy is sustainable social and economic development which maintains or enhances environmental quality and resource productivity on a long-term basis and that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. The policy provides strategies to guide and assist decision makers and resource users in determining priorities in the national context and also at the sectoral, private sector and individual levels (National Environment Policy, 1994). It provides for integration of environmental concerns in the national socio-economic development planning process, avenues for inter-sectoral co-operation, and comprehensive and co-ordinated environmental management. The Policy also recognises the need for sectoral policies in addressing the specific concerns of the identified environmental sectors and in addition, provides a basis for the formulation of a comprehensive environmental legal framework under the 1995 Constitution and the National Environment Act.

The National Environment Act, Cap. 153, Laws of Uganda

The National Environment Act is the framework law on environment. It provides for sustainable management of the environment and established the National Environment Management Authority as the principal government agency for the management of the environment.

The National Environment Management Authority is mandated to co-ordinate, monitor and supervise all activities in the field of the environment (National Environment Act, 1995).

The Uganda National Policy for the Conservation and Management of Wetland Resources, 1995
The overall aim of the policy is to promote the conservation of Uganda's wetlands in order to sustain their ecological and socio-economic functions for the present and future well-being of the people (National Wetlands Policy, 1995).

In support of this aim, the policy sets five goals:

- I. Establish the principles by which wetland resources can be optimally used and their productivity maintained into the future.
- II. End existing unsustainable exploitative practices in wetlands to avert the decline in their productivity.

- III. Maintain a biological diversity in wetlands either in the natural community of plants and animals or in the multiplicity of agricultural activity.
- IV. Maintain the functions and values derived from wetland resources throughout Uganda.
- V. Promote the recognition and integration of wetland functions in resource management and economic development decision making with regard to sector policies and programs such as forestry, agriculture, fisheries, wildlife and sound environmental management (National Wetlands Policy, 1995).

The Uganda Local Government Act, Cap. 243, Laws of Uganda

The Uganda Local Government Act is a framework act directing decentralization processes. Its objective is to ensure democratic participation in and control of decision-making by the people, as well as to establish a democratic, political and gender-sensitive administrative set-up in local governments.

The functions of local government councils include promoting democratic governance and ensuring district implementation and compliance with government policy.

The Local Government Act devolved some of the environmental management responsibilities to local governments. The second schedule of the act outlines environmental management areas for which district councils are responsible and includes wetland management (Local Government Act, 1997).

The Uganda Land Act, Cap. 227, Laws of Uganda

The Land Act provides for the tenure, ownership and management of land. Section 43 of the Land Act obligates owners and occupiers of land to manage it in accordance with the National Forestry and Tree Planting Act, the Mining Act, the National Environment Act, the Water Act, the Uganda Wildlife Act, the Town and Country Planning Act and any other relevant legislation.

Section 44(1), (4) and (5) of the Land Act enshrines the public trust doctrine and provides that the government or the relevant local government holds in trust and shall protect for the common good of all citizens of Uganda certain environmentally sensitive areas such as natural lakes and rivers, groundwater, natural ponds and streams, wetlands, forest reserves, national parks and any other land reserved for ecological and touristic purposes.

The government or the relevant local government has no powers to lease or otherwise alienate any natural resource referred to in this section (Land Act, 1998).

4.1.2 Iceland

Iceland has a rich variety of wetlands, including extensive bogs, marshes and inland waters. Wetlands cover 8,000-10,000 square kilometres, approximately 10% of the area of Iceland. The largest continuous wetland areas were in the South lowland, the Borgarfjörður and Myrar Districts in West Iceland and the Hunavatn District in NE Iceland (Lecture Notes, 2008).

Sloping mires probably accounted for up to half of the wetlands, whereas flood plains covered the least part of wetlands area in Iceland. The wetlands provide excellent habitat for waterfowl migrating from the Canadian Arctic and Greenland to Western Europe and vice versa, as well as wintering grounds for several species, particularly for sea ducks (Carp, 1980).

Further evidence of their international importance is the fact that in several Icelandic wetlands the numbers of breeding, feeding, moulting or resting waterfowl may reach the level of fifty to one hundred thousand individuals of a single species. Moreover, the freshwater lakes, which may be of glacial, volcanic or tectonic origin, are extremely diverse in their characteristics and hence offer the limnologist a wide field of study, which underlines their scientific importance (Carp, 1980).

Wetlands, especially peatlands, provide the biggest carbon storage area on land. Since the time when Iceland was settled, wetlands were the main grazing and haymaking areas. The wetlands were also a source of peat, shrubs, turf, rhizomes and bog iron ore (Lecture Notes, 2008).

Iceland signed the Ramsar Convention in 1977 and ratified it in 1978. There are three Ramsar sites in Iceland, namely: Lake Mývatn and the River Laxá, the Þjórsárver wetland and the Grunnafjörður wetland.

The policy of the Government of Iceland was for decades to drain wetlands systematically to enhance agricultural production, using financial incentives to landowners and paying according to the length of drainage measures (Anonymous, 2008).

The drainage and degradation of wetlands turns them into a net source of greenhouse gas emissions. Drainage leads to oxidation of soil carbon and thus to carbon dioxide emissions. It is estimated that up to 97% of mires in some of the lowland areas have been disturbed, though only negligible areas in the highlands (Anonymous, 2008).

The restoration of damaged wetlands can halt emissions of carbon dioxide and even reverse them, causing carbon removal from the atmosphere.

Emissions of nitrous oxide and methane can also be reduced or halted by restoration. There is a high technical mitigation potential in wetland restoration in Iceland, which could be utilized by providing incentives. However part of the drained and damaged wetlands in Iceland cannot be easily

restored. Some of the land is used for habitation and most of it is used for agriculture, both croplands and grazing (Anonymous, 2008).

It is politically, economically and technically most likely impossible, and not desirable, to restore all disturbed wetlands to their former state. Restoring wetlands would in many instances involve changes in land use, where the costs and benefits would have to be assessed in each case. Restoring drained wetlands presently used for agriculture, for example, could lead to a decrease in production (Anonymous, 2008).

It is certain, however, that there are significant areas of drained wetlands where restoration would lead to an increase in net benefits, in some cases even if potential climate benefits are not taken into consideration.

Restoration of wetlands in Iceland would most likely focus on neglected and marginally used wetlands. There is great need for a comprehensive inventory of wetlands, both disturbed and undisturbed, to be in place, together with a system to monitor activities that would cause restoration or degradation.

There is also need to explore possibilities of providing incentives to restore and manage wetlands and disincentives to drain or degrade wetlands (Anonymous, 2008).

The policy, legal and institutional framework for wetlands utilization and management in Iceland is not comprehensive and can be seen as relatively weak, as is shown by the following analysis.

Legislation on wetlands protection in Iceland

The Nature Conservation Act no. 44/1999 has the purpose to direct the interaction of man with the environment so that it harms neither the biosphere nor the geosphere, nor pollutes the air, sea or water. Wetlands are specifically addressed under Article 37 that provides special protection to a range of landscapes. The Article states that bogs and fens 3 hectares or more in area shall enjoy special protection and their disturbance shall be avoided if at all possible.

Further, protected sites of natural interest can be established according to Article 50. The protection can be divided into the following classification where wetlands protection can be a specific objective: (a) national parks, (b) nature reserves, (c) natural monuments on land or (d) protected organisms, habitats and ecosystems (Iceland Government, 1999).

Several wetland areas have been protected under the Act, including Thjórsárver and Pollengi.

Nature Conservation Strategy

The Minister for the Environment shall, no less frequently than at five-year intervals, have a Nature Conservation Strategy drawn up for the entire country and submitted to the Parliament. The current Strategy proposes protection of a number of wetland areas throughout the country. It is an ongoing process to follow up the Strategy.

Other Icelandic Acts related to wetlands

A few other Acts have an impact on wetlands conservation and management. According to the Environmental Impact Assessment Act no. 106/2000, the equivalent of wetlands that are disturbed during road construction or other activities are supposed to be reclaimed elsewhere.

Wetlands of national and international importance are protected by special legislation. The following wetlands are protected by special Conservation Acts: Lake Mývatn and The River Laxá, Grunnaufjörður and Breidafjörður Bay.

International Conventions

The most important international convention Iceland has signed related to wetlands conservation and management is the Ramsar Convention. It was ratified by Iceland in 1978 (Ramsar, 1971).

Institutional and Policy issues

The Environmental Agency is the governmental authority that has the mandate to enforce the Nature Conservation Act, under the jurisdiction of the Minister for the Environment.

Local governments have currently a limited stake in wetland conservation and management. Their stake might however become more significant as they are now responsible for physical planning of their respective rural areas.

The official policy has been for decades to drain wetlands to enhance agricultural production using financial incentives; it is seen as a major institutional change to address wetland restoration. It is estimated that up to 97% of mires in some of the lowland areas have been disturbed, as against only negligible areas in the highlands. As a significant part of Icelandic wetlands are privately owned, it is a major challenge to propose such a dramatic change as restoring the relatively recently drained wetlands.

4.2 Stakeholder analyses

4.2.1 Stakeholders involved in the utilization and management of wetlands in Oyam District

The key stakeholders involved in the utilization and management of wetlands in the Oyam District are user communities living adjacent to the wetlands, fishermen, commercial papyrus dealers, brick-makers, Sub-county councils, District councils and the Central Government.

The returns, rights, responsibilities and relationships of the identified stakeholders with respect to the utilization and management of wetlands were clarified and explored using the stakeholder analysis tool (Table 3) (Vedeld, 2006). For the purpose of this analysis, returns were the various

Table 3. *Analyses of stakeholders involved in the utilization and management of wetlands in Oyam District.*

Stakeholder	Returns	Rights	Responsibilities	Relationships
User Communities	Water, clay, pasture, building poles, herbs, craft materials, cultivation, haven for customary rituals.	The national wetland policy, national environment act, pertinent wetland guidelines and local customs permit traditional uses of wetlands and regulates other uses.	Making community wetland management plan, compliance with pertinent laws, regulations, guidelines and local rules.	User communities depend on wetlands for their livelihood and cultural heritage. The user communities are governed by community institutions and sub-county councils.
Commercial Papyrus Dealers	Income by making and selling papyrus mats and fibres.	The national wetland policy, national environment act and local customs promote sustainable harvesting of wetland products.	Compliance with provisions in the community wetland management plan, pertinent laws, regulations, guidelines and local rules.	The commercial papyrus dealers depend on wetlands for their income. The papyrus dealers are governed by community institutions and sub-county councils.
Fishermen	Fish provide nutritious food. Income from selling fish.	The relevant national policies, laws, regulations, and local custom promotes sustainable fishing.	Compliance with provisions in the community wetland management plan, laws, regulations and local rules.	Fishermen depend on wetlands for food and income. They are governed by community institutions and sub-county councils.

Brick-makers	Good quality soil and water for bricks production.	The national wetland policy, national environment act and local custom promotes regulated brick-making in wetlands.	Compliance with provisions in the community wetland management plan, laws, regulations and local rules.	Brick-makers depend on wetlands for income. They are governed by community institutions and sub-county councils.
Sub-county Councils (Lower Local Governments)	Main source of water supply for communities, mitigates impact of floods on crops and roads, regulates micro-climate and have aesthetic value.	The lower local governments are mandated by the local government act and national environment act to manage natural resources within their jurisdiction in a sustainable manner.	Plan for wetlands conservation and management activities, make bye-laws, facilitate community wetland management planning, ensure compliance with laws, regulations and guidelines.	The sub-county councils are custodians of wetlands within their jurisdiction and hold them in trust. Sub-county councils govern communities, papyrus dealers brick-makers and fishermen.
District Council (Higher Local Government)	Wetlands recharge the ground water aquifers, mitigates floods impact regulates the micro-climate and have aesthetic value. Potential source of revenue from sand, clay products and crafts.	The Local Government Act and National Environment Act mandates District Local Governments to manage natural resources within their jurisdiction in a sustainable manner.	Plan for wetlands conservation and management activities in the district, make ordinances, disseminate policies, laws and guidelines, enforce laws and guidelines, provide technical backstopping to sub-counties.	The district council is the custodian of wetlands within her jurisdiction and holds them in trust. The district council governs supports and reinforces the sub-county councils.

Central Government (National Environment Management Authority, Line Ministries)	Wetlands recharge ground water aquifers, purifies waste water, mitigates floods impact, regulates climate and have aesthetic value. Wetlands have educational and scientific value. Potential source of revenue from eco-tourism.	The national environment policy, national wetlands policy and national environment act mandates the National Environment Management Authority, Line Ministries and Lead Agencies to manage the environment, wetlands and other natural resources in a sustainable manner.	Plan for wetlands management and conservation activities country wide, makes policies, laws, guidelines and sets standards. Enforces laws, guidelines and standards. Builds capacities of local governments and provides technical backstopping.	The central government is the custodian of all wetlands in Uganda and holds them in trust. The central government creates an enabling environment thereby supporting and reinforcing local governments.
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goods and services stakeholders received from the wetlands. A right is a socially and institutionally recognised power to access, utilize and manage the wetlands. The rights of a stakeholder can either be strong or weak and are only important if they can be respected and enforced (Vedeld, 2006). The responsibilities of stakeholders are the duties and obligations they perform as a formal or traditional requisite for holding the rights. Relationships are the linkages and interactions between the various stakeholders on the one hand and between stakeholders and wetlands on the other.

The stakeholder analysis is an invaluable tool for identifying and addressing both conflicts of interest between stakeholders and trade-offs between objectives. Identifying and specifying the factors involved can then ultimately lead to equitable sharing of wetland benefits, sustainable utilization and management of wetlands.

In the foregoing analyses, Sub-county councils are also called lower local governments. They are comprised of the executive committee, councillors, the local environment committee and civil servants. Similarly, the District council is comprised of the executive committee, councillors, the district environment committee and civil servants.

The central government institutions and agencies involved in environment and natural resources management are the Ministry of Water and Environment, other relevant ministries, the National Environment Management Authority and Lead Agencies.

Influence and importance of stakeholders

The stakeholders involved in the utilization and management of wetlands in the Oyam District have varying degrees of influence in the decision making processes such as in the implementation of policies and plans. The policies and plans regarding wetlands utilization and management in the Oyam District attach varying importance to the needs and interests of the stakeholders.

The influence and importance of the various stakeholders involved in the utilization and management of wetlands was assessed using “the influence and importance matrix” shown in Figure 5.

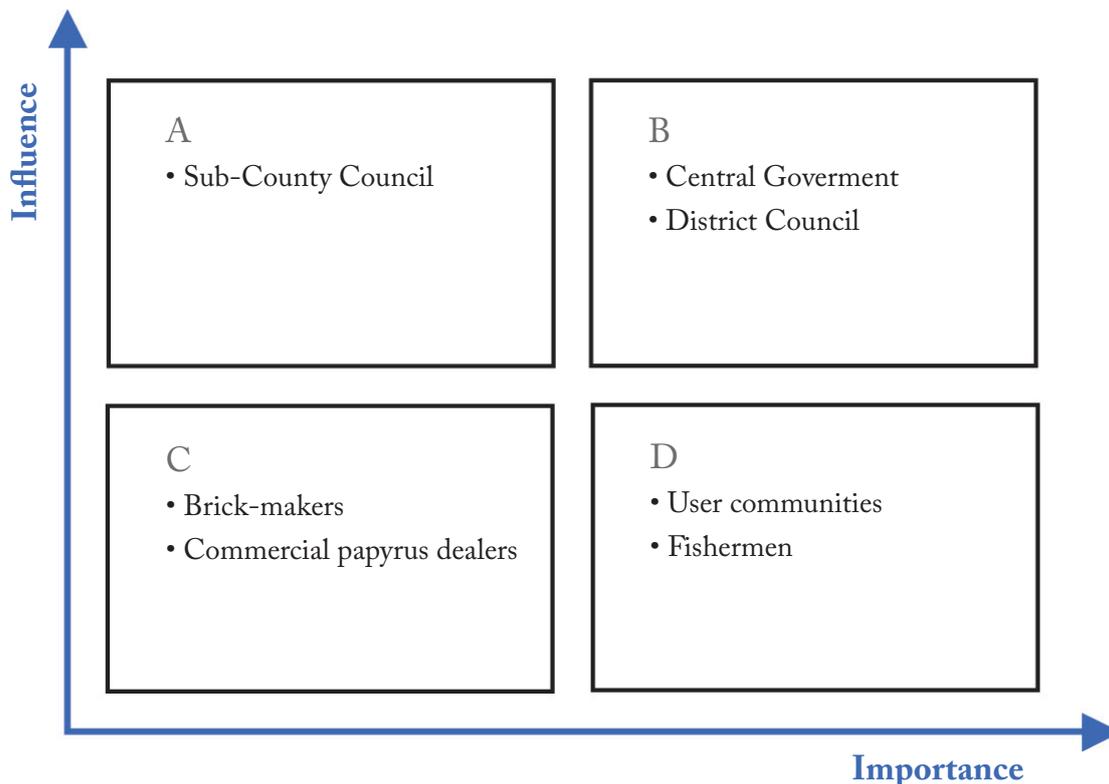


Figure 5. Influence and importance matrix of stakeholders in the Oyam District

The influence and importance matrix has four segments designated A, B, C and D. Each segment represents stakeholders with identical influence and importance as far as matters of utilization and management of wetlands in the Oyam District are concerned.

The stakeholders in segment A are sub-county councils. They have high influence and low importance. A high influence is attributed to the legal mandate, formal authority and strong linkages with other stakeholders. Sub-county councils have low importance because they neither benefit directly from wetland returns nor engage directly in management measures. Sub-county councils are effective in mobilization of user communities, facilitation of policy implementation, and monitoring abuse and degradation of wetlands. Policies, programs, projects and activities should deliberately empower and facilitate sub-county councils to promote sustainable utilization and management of wetlands in the Oyam District.

The stakeholders in segment B are the Central Government and the District Council. They have high influence and high importance. The high influence is attributed to the legal mandate, formal authority and elaborate organizational structure with complementary organs. Their high importance is linked to control of strategic resources, strong negotiating position and possession of specialist knowledge and skills. The Central Government and District Council should deliberately play an enabling, facilitating and reinforcing role with respect to the other stakeholders. It is imperative for the Central Government and District Council to overcome coercive tendencies and promote consensus in matters regarding sustainable utilization and management of wetlands.

The stakeholders in segment C are the brick-makers and commercial papyrus dealers. They have low influence and low importance. Their low influence is attributed to poor organization, poor linkage with other stakeholders and dependence on other stakeholders. Their low importance is linked to a weak negotiating position and low social, economic and political status. Policies, programs, projects and activities pertaining to sustainable wetland utilization and management should objectively and appropriately address the concerns and interests of brick-makers and commercial papyrus dealers.

The stakeholders in segment D are the user communities and fishermen. They have low influence and high importance. Their low influence is attributed to poor organization and weak community institutions. Their high importance is linked to customs, their strong negotiating position and their geographical proximity to the wetlands.

4.2.2 Analyses of stakeholders involved in the utilization and management of wetlands in the Flóahreppur Municipality

The relatively weak legal protection and the huge government support to drain wetlands in Iceland present challenges in sustainable wetlands utilization and management which are at variance with the Ugandan case. There is also disparity between wetland stakeholders in Iceland and Uganda in terms of their organization as well as economic, political and social status.

The stakeholder analyses clarified the returns, rights, responsibilities and relationships of wetland stakeholders in Flóahreppur (Table 4). This then provided the opportunity to compare the impact and influence of Flóahreppur stakeholders on wetlands with those of Oyam stakeholders.

In the Flóahreppur Municipality the stakeholders are the farmers, bird life, Flóahreppur local government and the National Environmental Agency.

Table 4. *Analyses of stakeholders involved in the utilization and management of wetlands in Flóahreppur*

Stakeholder	Returns	Rights	Responsibilities	Relationships
Farmers	Drained wetlands for grazing, hay and fodder production. Subsidy from Government.	Legal ownership of wetlands within the farms.	Excavation and maintenance of drainage channels.	Farmers depend on drained wetlands for commercial agricultural production.
Bird life	Habitat for birds. Biodiversity.	Ramsar Convention provides for protection of wetlands of international importance. Nature Conservation Act provides for protection of wetlands of national importance. Special Acts provide for protection of particular wetlands.	Identification of wetlands of importance for birds, advocating for legal protection, implementing conservation activities and monitoring activities in protected wetlands.	Bird life is an advocate and steward of wetlands of importance to waterfowl.
Flóahreppur Municipality	Eco-tourism, aesthetic value, cultural heritage and scientific value.	Has the mandate to undertake land use planning. Nature Conservation Act provides for protection of wetlands of national importance. Special Acts and local guidelines protect particular wetlands.	Ensuring compliance with land use plans and local guidelines.	Has authority and control over wetlands preserved by land use plans and local guidelines.

National Environmental Agency	Biodiversity, climate change mitigation, carbon sequestration, aesthetic value, eco-tourism, scientific value.	Ramsar Convention provides for protection of wetlands of international importance. Nature Conservation Act provides for protection of wetlands of national importance. Environmental Impact Assessment Act provides for reclamation of disturbed wetlands. Special Acts provide for protection of particular wetlands.	Identifying wetlands of international and national importance for protection. Ensuring compliance with Ramsar Convention, Nature Conservation Act, Environmental Impact Assessment Act and Special Acts.	Has authority and control over Ramsar sites and wetlands protected by Nature Conservation Act and Special Acts.
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4.2.3 Case study of utilization of wetlands in the Flóahreppur Municipality

In this study, field visits to 28 different sites located in wetlands within Flóahreppur were carried out to ascertain the various uses. The different sites were selected randomly and most of them were within farms. The visits to selected sites were to determine the wetland uses and their status with regard to whether or not they had been drained. The findings are presented in Table 5 below.

Table 5. *The status and uses of selected wetlands in the Flóahreppur Municipality*

S/N	Site Location	Status	Wetland Uses
1	P-18	Moderately drained.	Rangeland, moderately grazed.
2	C-23	Well drained.	Rangeland, moderately grazed.
3	P-20	Well drained.	Rangeland, moderately grazed.
4	C-20	Well drained.	Rangeland, moderately grazed.
5	C-16	Well drained.	Rangeland, moderately grazed.
6	P-34	Well drained.	Rangeland, intensively grazed.
7	C-33	Well drained.	Rangeland, moderately grazed.
8	C-28	Well drained.	Forest Plantation.
9	C-32	Well drained.	Hay field.
10	C-35	Well drained.	Hay field.
11	C-36	Lake.	Aesthetics, recreation.
12	C-37	Well drained.	Rangeland, intensively grazed.
13	P-27	Well drained.	Rangeland, moderately grazed.

14	P-07	Mildly drained.	Rangeland, lightly grazed.
15	P-15	Mildly drained.	Rangeland, lightly grazed.
16	C-13	Mildly drained.	Rangeland, lightly grazed.
17	C-21	Well drained.	Hay field.
18	P-23	Well drained.	Hay field.
19	C-24	Well drained.	Hay field.
20	C-15	Well drained.	Rangeland, moderately grazed.
21	C-19	Well drained.	Rangeland, moderately grazed.
22	C-14	Well drained.	Rangeland, lightly grazed.
23	P-22	Well drained.	Rangeland, moderately grazed.
24	P-42	Well drained.	Hay field.
25	P-43	Well drained.	Hay field.
26	C-41	Well drained.	Rangeland, moderately grazed.
27	P-35	Not drained.	Preserved.
28	P-25	Mildly drained.	Rangeland, lightly grazed.

There were twenty-six drained wetland sites out of the twenty-eight visited; one site was not drained and another one is a lake. Eighteen sites are rangelands, seven sites are hay fields, one site is a forest plantation, one site is a conservation area and one site is a lake of aesthetic value, used for recreation.

The common grass species found in the drained sites that were visited were tufted hair grass, arctic fescue, cotton grass, carex spp, blue berry and crow berry. In contrast, the common grass species found on the conserved site which had not been drained were lyngbye's sedge, bottle sedge, common sedge, string sedge, bogbean, marsh cinquefoil, water horsetail, marsh horsetail and sphagnum spp. The difference in the diversity of grass species in the drained wetland sites and conserved wetland which had not been drained, is an indication that drainage modifies the ecosystem of wetlands.

4.2.4 Comparison of wetlands utilization and management in the Oyam District with the Flóahreppur Municipality

The stakeholders in the Oyam District value wetlands for the numerous goods and services they provide (Fig. 6). These include game meat, fish, water, pasture, herbal medicine, papyrus, building poles, firewood, sand, clay for pottery and brick-making, and land for cultivation. The services provided by the wetlands are flood impact mitigation, groundwater recharge, nutrient and sediment retention, micro-climate regulation, habitat for fauna and flora, a haven for rituals, aesthetics values and recreation.

The Oyam District Environment Committee is responsible for environment, wetlands and other natural resources management issues. The functions of the District Environment Committee include: organization of forums for community members to discuss and recommend environmental



Figure 6. Women and children catching breeding and immature fish from a wetland in The Oyam District.

policies and bye laws to the District Council; offering advice to the District Technical Planning Committee, the District Council and the National Environment Management Authority on environmental management issues in the district; mobilization of members of the public to initiate and participate in environmental activities; development of District Environment Action Plans, in consultation with the District Technical Planning Committee; review and endorsement of draft District Development Plans; co-ordination of the activities of the District Council relating to the management of the environment and natural resources; ensuring that environmental concerns are integrated into all district plans and projects; and co-ordination with the National Environment Management Authority on all issues relating to environmental management.

There is a Department of Natural Resources in the district, with specific officers recruited to manage the wetlands, environment, forestry, lands and physical planning sections.

The Local Environment Committees are responsible for the environment, wetlands and other natural resources management at the sub-county and community levels. The functions of the Local Environment Committees include: preparing local environment work plans; mobilizing people, through self-help projects to conserve the environment, restore the degraded environment and improve the natural environment; and monitoring and reporting on any event or activity, which has or is likely to have a significant impact on the environment.

The District Council has the mandate to make ordinances to address specific environment, wetlands and natural resources management challenges. The District Council is also obligated to implement national policies and enforce laws and regulations.

The challenges of sustainable utilization and management of wetlands in The Oyam District are: overharvesting of wetlands products; encroachment on wetlands areas; swamp burning; drainage of wetlands; lack of ordinances and bye-laws; lack of wetland management plans; lack of comprehensive wetlands inventory; poor policy implementation; poor enforcement of relevant laws and regulations; and low awareness by stakeholders of the relevant policies, laws, regulations and guidelines.

In contrast to the Ugandan case, stakeholders in Flóahreppur drain the wetlands and use the land for pasture and hayfields. Drained wetlands are also used for cultivation of fodder and forest plantations (Fig. 7). The stakeholders in Flóahreppur also value wetlands for their biodiversity, eco-tourism, aesthetic appeal, recreation, waterfowl habitat and regulation of hydrology.



Figure 7. Wetland drainage in Flóahreppur Municipality.

The aim of Flóahreppur Municipality Authorities is to conserve wetlands of local importance, in accordance with provisions in the Nature Conservation Act and local regulations. A committee of three persons is responsible for the management of wetlands and environment issues in Flóahreppur. The committee members are elected officials. The specific duties of the committee include: making local regulations pertaining to wetlands and environment management; and ensuring that settlements and developments do not encroach on protected wetlands.

The committee is duly concerned about the proliferation of summer cottages and aim to put in place measures to control likely wetland encroachment. The Flóahreppur land use plan has protected a number of wetlands of local importance.

The Flóahreppur Municipality does not have a department or a specific officer responsible for wetlands management issues. However, officials responsible for land use planning and building inspection ensure wetlands are not disturbed during the planning process and inspection.

The challenges of sustainable wetlands utilization and management in the Flóahreppur Municipality include the previous government policy of drainage of wetlands for agricultural production. Additionally, farmers privately own the wetland areas legally and are not restrained by any policy or law. On the whole there is only a weak policy, legal and institutional framework for wetlands management.

5. DISCUSSION AND RECCOMENDATIONS

The Government of Uganda made substantial progress in establishing a comprehensive policy and legal framework for sustainable wetlands utilization and management. A number of regulations to operationalise the laws have also been made. However there is still need for more regulations to operationalise the National Environmental Act. A number of guidelines for wetlands utilization have been decided, but there is need to provide guidelines for sustainable harvesting of specific wetlands products.

In Uganda, the implementation of policies and enforcement of laws have generally been weak. This has been due to political interference, inadequate regulations and guidelines, and weak inter-sectoral linkages.

The provisions in the available policies, laws, regulations and guidelines are not well known to stakeholders in Uganda. There is great need to scale up ongoing awareness by creating more effective compliance and more and public education programmes.

The institutional arrangement for wetlands management in Uganda is adequate, but there is need to strengthen collaboration between the national institutions and local ones. The District Environment Committees and Local Environment Committees need to build up their capacity and to become more efficient and effective.

The overriding causes of wetlands encroachment and degradation in Uganda are population Pressure, poverty, industrial development and poor land use planning. The amount of available land has become insufficient for the high population, hence leading to the encroachment on wetlands. Poverty makes most rural people highly dependent on wetlands products for both subsistence and

income generation. This leads to over-harvesting of wetlands products. Industrial development in urban areas has led to both encroachment and pollution of wetlands. This is a consequence of poor land use planning, weak enforcement of laws and political interference.

The opportunity to achieve sustainable utilization and management of wetlands lies in the fact that wetlands are held in trust by the government of Uganda.

Iceland on the other hand, does not have a comprehensive policy or legal and regulatory framework for sustainable wetlands utilization and management.

Wetlands in Iceland have been conserved using provisions in the Nature Conservation Act, Special Acts and the Ramsar Convention.

It is imperative for the Government of Iceland to establish a comprehensive policy and legal and regulatory framework for sustainable utilization and management of wetlands.

The challenge of sustainable wetlands utilization in Iceland is the old government policy of promoting wetlands drainage for agricultural production. Extensive wetland areas were drained using very efficient machinery. Furthermore, the tenure regime makes it unlikely that it will soon be possible to regulate wetlands utilization on private farms. The farmers legally own the wetland areas on their respective farms.

The National Environmental Agency is the one institution responsible for wetlands and environment management in Iceland. There is urgent need to establish and empower wetlands management institutions at the local government and “wetlands users” levels.

The Oyam District Local Government urgently needs to undertake a comprehensive inventory of wetlands. This will facilitate wetlands action planning, monitoring and inspection of wetlands utilization and management. Presently, there is only an incomplete inventory of wetlands.

The District Council should make progress in making ordinances to address wetlands management challenges in the district. There is a great need for the Central Government to provide back-up for the process of making ordinances.

The capacity of lower local governments in the Oyam District should be built up by passing by-laws to address local wetlands management challenges.

Wetlands users in the Oyam District should be helped to make wetlands management plans that will guide the sustainable utilization and management of wetlands, while ensuring equitable benefits.

There is a need for a concerted effort to scale up awareness and the creation of public education programmes about the functions, values and benefits of the wetlands in the Oyam District.

Information about the provisions in the available policies, laws, regulations and guidelines should also be widely disseminated.

6. CONCLUSION

Globally, wetland ecosystems have important values, functions and uses which are beneficial to both man and the environment. However, wetland ecosystems are being increasingly threatened by abuse and degradation. The overriding causes of wetlands degradation are: pollution from municipal and industrial sources; conversion for agricultural production; encroachment for urban and rural settlements; and population pressure and poverty, leading to both over-dependence on and over-harvesting of wetland products.

The major challenges of sustainable utilization and management of wetlands are: failures in the policy, legal, regulatory and institutional arrangements; poor governance and attendant political interference, and poor participation of stakeholders in management issues.

It is of great consequence for governments to establish enabling policy, legal, regulatory and institutional frameworks for sustainable utilization and management of wetlands.

It is crucial to establish efficient and effective mechanisms for the co-ordination and collaboration of stakeholders involved in wetlands utilization and management, at national, local and user levels.

Most importantly, the creation and increase in awareness and availability of public education on pertinent issues regarding wetlands utilization and management should always be integrated into interventions.

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