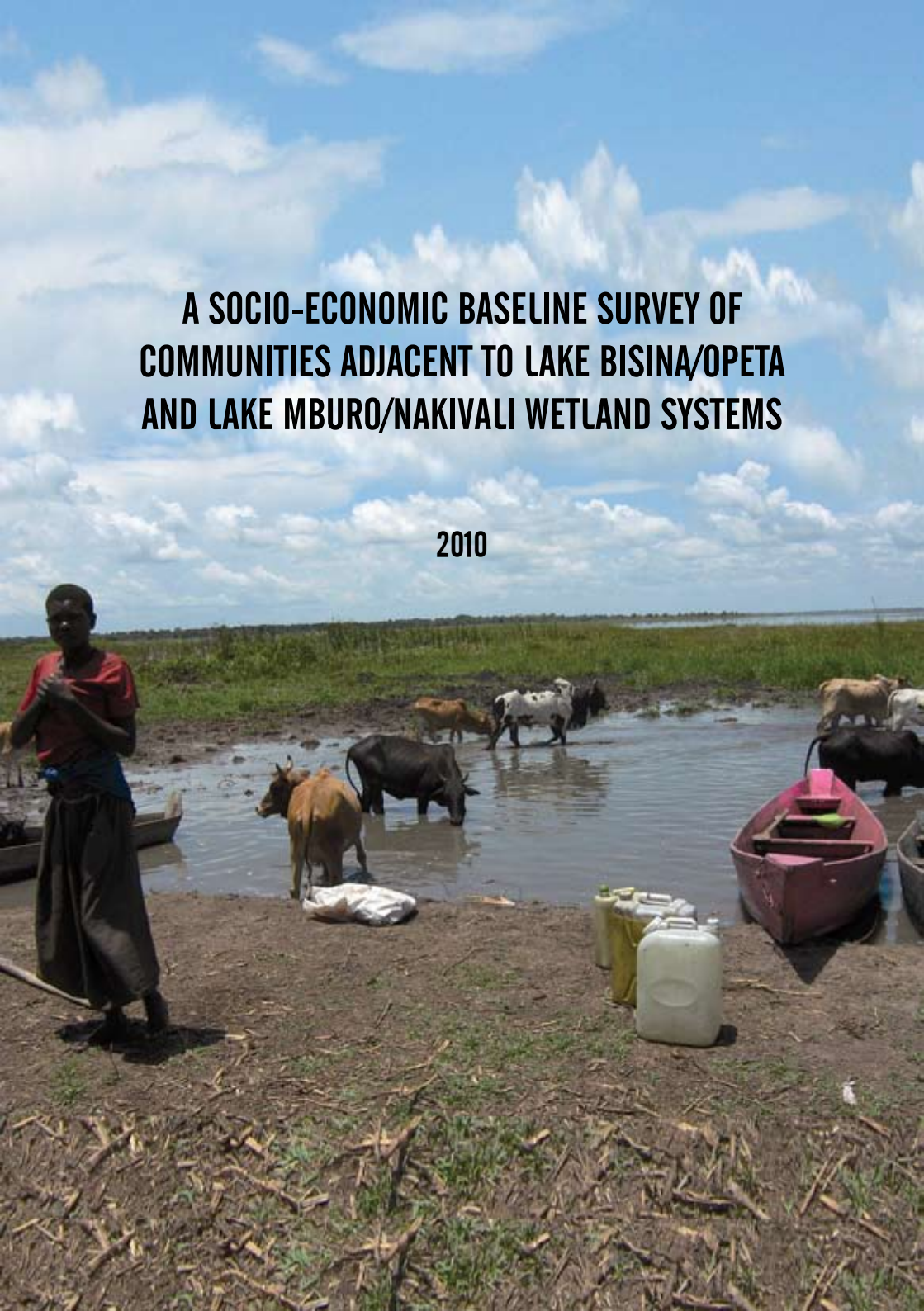
A SOCIO-ECONOMIC BASELINE SURVEY OF COMMUNITIES ADJACENT TO LAKE BISINA/OPETA AND LAKE MBURO/NAKIVALI WETLAND SYSTEMS

2010



Cover Photo: *Multiple wetland resource uses on Lake Bisina wetlands in Katakwi District – a challenge to sustainable exploitation amidst competing resource uses.*

A SOCIO-ECONOMIC BASELINE SURVEY OF COMMUNITIES ADJACENT TO LAKE BISINA/OPETA AND LAKE MBURO/NAKIVALI WETLAND SYSTEMS

Providing baseline information for the implementation of the COBWEB project in Western and Eastern/North-Eastern Uganda

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Acknowledgments

The importance of wetlands in Uganda and world over has been emphasized. The COBWEB project seeks to bring together all stakeholders in an effort to revive the enjoyment of wetland goods and ecological services for the good of humans and the environment. The socio-economic survey was conducted to generate baseline data on community, its livelihood base, institutional and legal issues in order to create a foundation upon which to gauge progress and to evaluate impact at the end of the four year period of the COBWEB project.

The IUCN, Uganda Wildlife Society/Nature Uganda and Wetlands Management Department present this survey report conducted under the COBWEB project in Eastern and Western Uganda. First all, we thank the United Nations Development Programme (UNDP) for their continued support and specifically for funding this project, which made it possible for this study to be undertaken.

Our sincere appreciation to all the respondents in the survey areas for sharing information and their invaluable ideas, but also for their heartiest cooperation during our field visits. The authors deem their heartfelt gratitude to all District Environment/Wetland Officers who took off time to guide the survey team in their respective districts.

Special thanks go to the IUCN staff in Uganda for doing a commendable job in coordinating the logistics for fieldwork in a professional manner as well as their continuous guidance to the survey team both in Kampala and the districts considered for COBWEB activity implementation. Without you exhibiting this level of commitment, we would never have had this product in a timely and excellent shape.

We are greatly indebted to the survey team for their devotion even amidst their busy schedules. Without your support, efforts to make this survey a success would have been elusive. Thanks to the survey team including Ivan AmanigaRuhanga, Julius Mafumbo, Mark Jordahl, Juliet Nabulumbi, Tim Osire Frankie, Sarah Madanda, James Malinga, Bernard Arinaitwe and Joseph Mwesigye.

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List of Acronyms

COBWEB	Community Based Wetland Biodiversity conservation Project
CWMP	Community-based Wetland Management Plan
DDP	District Development Plan
DWO	District Wetlands Officer
EIA	Environmental Impact Assessment
ENR	Environment and Natural Resources
SDP	Sub-county Development Plan
IBA	Important Bird Area
IUCN	International Union for Conservation of Nature
LG	Local Government
MDG	Millennium Development Goals
MEA	Millennium Ecosystem Assessment
NEMA	National Environment Management Authority
NRM	Natural Resources Management
PA	Protected Area
PIT	Project Implementation Team
PWD	Persons With Disabilities
SDP	Sub-county Development Plan
UBOS	Uganda Bureau of Statistics
UGX	Uganda Shillings
UNDP	United Nations Development Programme
UWS	Uganda Wildlife Society
WMD	Wetlands Management Department
WSSP	Wetland Sector Strategic Plan

Executive Summary

Uganda covers a total area of about 241500 sq. km, of which 30105 sq. km are wetlands (NEMA 2000). The Ramsar Convention of 1971 defines wetlands as *"areas of marsh, fen, peat land or water whether artificial or natural, permanent or seasonal with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed 6 meters."*

Wetlands represent one of the vital natural resources Uganda is endowed with. They provide ecological services (climate modification, water purification, waste water treatment, flood control and water storage and distribution in space and time); direct uses such as water for domestic purposes, livestock watering, source of fish, medicinal plants and animals and various materials. Although the overall value of wetlands in Uganda has not been quantified, it is clear that they have vital attributes such as biological diversity, gene pool research materials, cultural values and aesthetic values. They are among the most productive ecosystems and directly or indirectly support millions of people and provide goods and services to them. They facilitate important processes like the movement of water into streams and oceans; decay of organic matter; release of nitrogen, sulfur, and carbon into the atmosphere; removal of nutrients, sediment and organic matter from water moving into the wetland; and the growth and development of all organisms dependent on them. The direct benefits of wetlands are in the form of products such as fish, agriculture, fuelwood, recreation and water supply, etc. and their indirect benefits arise from functions performed by the ecosystem such as flood control, ground water recharge and storm protection. They are dynamic ecosystems, continually undergoing natural changes due to infilling with sediments and nutrients, subsidence, rise in sea level, etc. They sustain all life and perform some useful functions in the maintenance of overall balance of nature.

Rapid urbanisation, reducing soil fertility, effects of climate change, increasing human population and their various activities have contributed to the decline of quality and quantity of wetlands due to pressure beyond the ecosystem carrying capacity. Hence, it is imperative to focus on conservation of these endangered habitats to achieve ecological sustainability.

This study was undertaken to identify and analyze the socio-economic aspects of communities adjacent to wetlands in COBWEB implementation areas. As such, ten (10) districts Kumi, Bukedea, Soroti, Sironko, Katakwi, Nakapiripirit and Mbarara, Kiruhura, Isingoro, Rakai, which are adjacent to the two wetland

systems of Lake Mburo-Nakivali in Western Uganda and Lake Opeta-Bisina in Eastern and parts of North-Eastern Uganda respectively for the baseline. This report provides the 'before project' situation as well as data to be used for project impact monitoring.

The findings of the study indicate that the surrounding communities are largely dependent on wetlands as the main source of income and food security, although in varying degrees in the direct, indirect, option and existence values/benefits to the communities. It also indicates that the ecological services availed by wetlands include the long lake shoreline of water, aquatic resources and moist soils to many, barrier against erosion and siltation of water (water purification), water storage, habitat to biodiversity where dense covers of papyrus, *Typha, Vossia* and *Phragmites* under moist cover provide zones of food, reproduction, rest and passage for fish, birds and mammals. Additionally, the wetland systems are the main sources of water, provide the trans-boundary water transport facility, fishing and recreation ground (swimming) to many. To the riparian community and beyond, fish/fishing is an important source of food/proteins, income and recreation. The terrestrial and wetland areas are cultivated with food crops e.g. rice, beans, maize, sorghum, cassava and bananas, sweet potatoes, Irish potatoes, ground nuts, soya beans, vegetables and fruits, animals are also kept and they include cattle, goats and sheep.

Key Survey Findings – a summary

- Wetlands provide the basic means of survival to the majority of the households in Eastern and Western Uganda.
- There are a number of wetland resource conflicts that impede conservation efforts.
- The level of awareness about the importance of wetland conservation is slowly growing but is not yet adequate.
- A number of community wetland activities are not necessarily ecologically acceptable and pose a variety of conservation challenges.
- Stakeholder roles in wetland resources management are not clearly delineated.
- More than 90 percent of the respondents were found to be engaged in wetland-supported farming and petty trade.
- The appreciation of the regulating services of wetlands is still inadequate amongst local communities.
- The two survey areas were over populated in some parts and had a number of human activity with the associated ecological footprint.

- Former predominantly pastoral communities in the Karamoja region are gradually turning to cultivation, thus increasing the pressure on wetlands.
- Wetland issues do not feature prominently in Local Government planning whether at district or sub-county level
- Communities do not have viable alternative sources of products and services they obtain from wetlands.
- There is a total lack of incentives for wetland resources conservation (especially) at community level
- Respondents think that proper boundary marking and a strong governance infrastructure will go a long way in securing wetland sanity while at the same time maximizing community benefits.

Further, the analysis of data collected indicates total dependency of 78%, 18% moderate and 4% less with a variety of livelihood activities including cultivation (54%), cattle keeping (28%), crafts making (4%), fishing (7%), brick making (4%) and firewood collection at 3%. Against this background, the economic value of wetlands to the neighbouring communities cannot be underrated. It explains the way community members interact with wetlands and consequently determines the efforts that can be used to ensure the wise management of these ecosystems.

In both systems, wetlands are threatened by the already high and increasing population density of both humans and livestock, the reduced soil fertility elsewhere, the effects of climate change (prolonged droughts), changing community lifestyles, pollution of surface water sources, the unpredictable and low rainfall, the de-vegetation/deforestation, the limited access to clean water/ sanitation and the inappropriate and degrading fishing practices.

Therefore, in an effort to ensure the wise-use of wetland ecosystem goods and services and improved livelihood, the COBWEB project must seek to bring on board all stakeholders, key to the project being local communities whose involvement or neglect has the power to lead the project to the achievement of its set goal or not. Relatedly, the project should be able to advise on livelihood alternatives for strategic purposes of reducing the ecological footprint. At policy level, COBWEB should make an effort in encouraging the inclusion of wetland issues in planning and decision-making frameworks such as District Development Plans (DDP) as well as Sub-county Development Plans (SDP) to give wetland management some mandatory backing.

1.0 PREAMBLE

The COBWEB project is a multi-stakeholder implemented 4-year project on a mission to strengthen Ugandan National Protected Area network by expanding the coverage of the PA network to include the country's biologically important wetland ecosystems through piloting the model at 2 wetland sites adjacent to 2 Protected Areas (East & West) by means of targeting 3 outcomes that contribute to the WSSP, Strategic Objective 5, 6 and 7. This survey was conducted as a requirement to establish baseline information on the economics of the communities that the project seeks to benefit during and after its life span. The socio-economic survey falls under outcome II of the project, which is *"Wise-use strategies for bio-diverse wetlands are implemented without loss of biodiversity function"*

This is a report of a Socio-Economic survey of selected sites around the wetlands of Lake Mburo – Nakivali and Lake Bisina – Opeta system, a COBWEB project focus area covering ten districts of Mbarara, Kiruhura, Isingiro, Rakai in western Uganda; and Kumi, Soroti, Nakapiripirit, Bukedea, Katakwi and Sironko in the Eastern region. As will later be seen in the methodology section, two sub-counties in each of the districts were purposively sampled and visited during data collection.

1.1 Background

The National Environmental Statute (1995) defines wetlands (or swamps) as areas, which are permanently or seasonally flooded with water and where plants and animals have become adapted. In general, a wetland can be defined as a shallow water body with teaming life of complex fauna and flora.

Wetlands cover 30,105km2 of Uganda's total land area of 241,500km2. With the coverage of 13% of the total land area, they represent one of the most vital ecological and economic resources the country is endowed with. These wetlands are a storehouse of globally significant biodiversity. Wetland biodiversity values are highlighted by both the diversity in the bird, fish and plant communities, and in habitat richness (beta diversity). Unfortunately their importance is associated more with the direct consumptive use value like crop cultivation, human settlement, and extraction of useful materials. The essential life support processes for example stabilization of hydrological cycle and microclimates,

protection of riverbanks, nutrient and toxin retention and, sewage treatment are the least recognized because of their indirect nature. Destruction of these ecosystems is a serious environmental problem the country is currently faced with. The problem has reached alarming levels in Eastern Uganda where about 20% of wetlands have been degraded. For instance, in 2006, with the exception of two Ramsar sites, about 20 community wetlands managed under community based management plans and pockets of wetlands in various protected areas, a large portion of the wetland still face degradation (Apunyo, 2008).

1.2 Objectives of the survey

1.2.1 Broad objectives

The overall objective of the survey was to collect baseline socio-economic information on conditions around Lake Mburo/Nakivali and Lake Bisina/Opeta wetland systems.

12.2 Specific objectives

The specific objectives were:

- To provide the COBWEB project and other conservation and development agencies working on wetland issues with information on socio-economic aspects to guide the planning of their activities;
- To determine the economic dependency of people living in the survey area on wetlands;
- To explore suitable restoration and conservation strategies based on current use and value attached to wetlands; and,
- To provide a monitoring framework to assess project impact during the project mid-term review and end of project evaluation.

1.3 Specific tasks

- Development of the questionnaire, design tools and checklists for data collection and analysis
- Conducting a survey of the wetland benefits, users and beneficiaries.

- Documenting the current wetland problems and threats to people's wellbeing.
- Documenting any existing threats to the wetland system in question.
- Developing key indicators for monitoring changes.
- Performing data analysis of the findings.

1.3 Expected Outputs

The study was expected to result in a final report documenting socio-economic activities, wetland benefits and status of livelihoods of people around selected wetland areas that will serve as an instrument for monitoring impacts of the interventions arising from the management planning processes as under the design of the COBWEB project. Specifically the outputs included:

a. Activities in which resource users are involved, benefits accruing and beneficiaries.
b. Numbers and profiles of resource users differentiated by resource use, gender, age and origin.
c. Training needs to harness sustainable utilization of wetland resources.
d. The output, resource viability and relative importance of major/small scale resource users
e. Effects of activities on resource sustainability and the environment.
f. Interventions to enhance community livelihoods from wetland products
g. Proposals for implementation strategies of the identified approaches for sustainable utilization and management of the selected wetlands.

2.0 SURVEY MATERIALS AND METHODS

The study used both primary and secondary data sources. It blended qualitative and quantitative methods of inquiry buttressed by participatory research/survey techniques. Qualitative data was largely (but not exclusively) generated by key informant interviews and focus group discussions, putting in consideration issues of gender. Quantitative data was elicited largely from official reports/documents and publication.

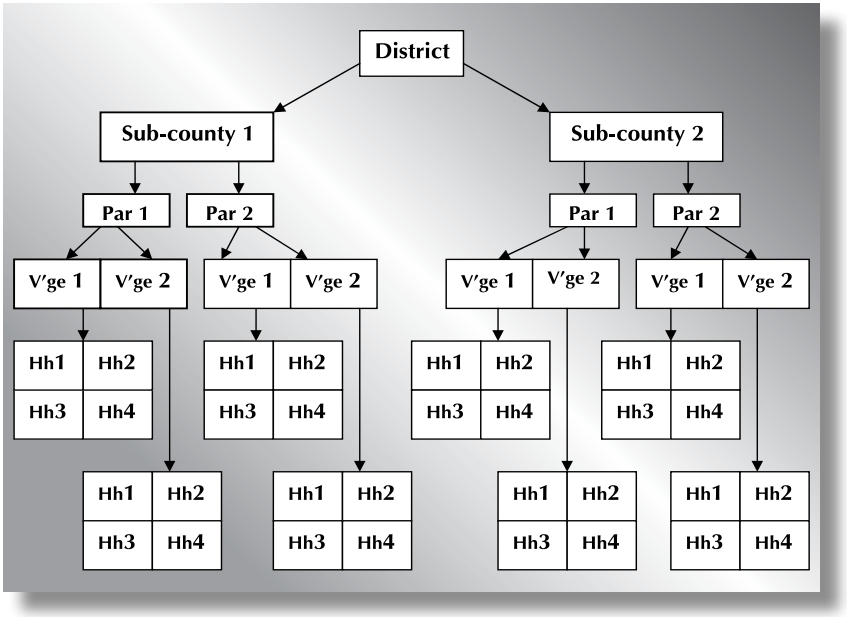
2.1 Sampling procedure

The survey was conducted in six districts of Eastern and North-Eastern Uganda (Sironko, Bukedea, Soroti, Katakwi, Kumi and Nakapiripirit) and four districts of Western Uganda (Mbarara, Kiruhura, Isingiro and Rakai). The methodology used in this work was especially guided by the terms of reference and available documentation on wetland management in the above districts of survey consideration. A multistage purposive sampling procedure was employed in the selection of the survey population. The main sampling unit of the survey was the household. The team relied on the opinion of the local leadership to select truly representative but feasible samples, given the limited time frame and coverage of the exercise. Purposive sampling of the study areas was used (from Sub-county, Parish and up to village level). The purposive sampling method employed in this survey was based on the understanding that communities are not homogenous particularly in terms of levels of wetland utilization, conservation challenges, socio-economic values attached and development concerns and threats.

Subsequently random sampling was done in identified villages to select households to participate in the survey as respondents. Two sub-counties in each District of consideration were identified for the survey. On reporting to the sub-counties sampled, the study team held discussions with the Sub county leadership (Chief and LCIII Chairperson) who then provided lists of parishes within the selected sub-counties that are adjacent to the wetlands. After selecting the Parish, a list of all villages within that Parish was obtained from the parish chief. Using the lottery method of random sampling, two villages were selected from each of the two parishes in each sub-county under consideration.

Overall, a total of ten (10) districts, twenty (20) sub-counties, forty (40) parishes, eighty (80) villages and three hundred and twenty (320) households were considered representative enough for the socio-economic survey in the two regions of project operation. The figure below illustrates a summary of the sampling procedure.

Fig. I: Sampling procedure (*Also see Appendix III*)



2.2 Data collection methods

2.2.1 Questionnaires

The basic method used in this survey was qualitative/key informant interviews. Using this method the researchers held several interviews various stakeholders in the development and management of wetland resources around the project sites. Although respondents were randomly selected, every attempt was made to

get a balanced opinion of the socio-economic issues in the study areas and how they affect wetland management, putting issues of gender, age and disability in consideration.

2.2.2 Literature review

The researchers also used secondary data content analysis. In this method, published research work about wetlands in Uganda in general, and the wetland systems of Lake Mburo - Nakivali and Lake Opeta – Bisina in particular was analyzed to assess trends and analyze changes and correlate such data with the current facts on ground.

2.2.3 Focus Group Discussions

Subsequently, group discussions were conducted as a follow-up to the content analysis and individual interactions in interviews. FGD were conducted at the community level mainly with people whose depend largely on wetlands. This helped researchers to identify, enumerate and analyze occurrences and developments in the wetlands sub-sector in addition to corroborating information in the different reports reviewed.

2.3 Data processing and analysis

A data code sheet was developed by the team, and used to code the data uniformly for data entry purposes. The data was then entered and analyzed using the SPSS program. MS Excel was also used for data analysis. The research team specified the most crucial questions to be analyzed and the kind of analysis they needed. Some of the survey questions allowed the respondent to give more than one response. The advantage of this method of inquiry is that it allows the respondent to give all possible responses to the issue in question. The analysis of such data used the method of aggregating the various responses according to their frequencies.

2.4 Quality control

Interviewers were instructed to check questionnaire completeness and accuracy on interview site. At the end of each day, questionnaire debriefing sessions were held between the supervisor and all interviewers, to identify any complications, and to agree on common definitions. Interviewers were asked to write down all additional qualitative information, which was analyzed by the team per

wetlands under consideration. This was important in capturing important data that would have otherwise been left out by the restrictive design of the research instruments.

Overall, the assessment of socio-economic conditions involved identification of frontline stakeholders, competing uses, wetland based economic activities, social interactions and overall contribution of wetland systems to the local socio-economic conditions of the households. Field consultations were focused on understanding the key livelihood needs communities obtain from the wetland systems, and the associated values they attach to them. Using baseline indicators this study would then generate an M&E framework for the project against which the project measurement of process and impact will be done.

3.0 SURVEY FINDINGS: PRESENTATION AND DISCUSSION

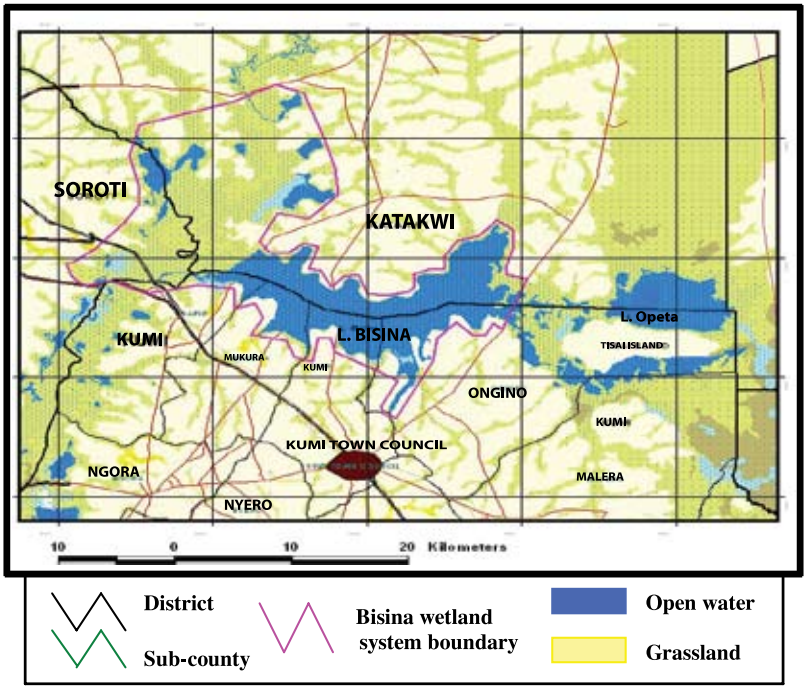
3.1 Description of survey area

3.1.1 Lake Opeta – Bisina Wetlands

The wetland system covers a total of six (6) Districts of Eastern and North-Eastern Uganda. On one hand, the Lake Bisina section is situated in Kumi, Katakwi and Soroti districts in eastern Uganda in the shadow of Mt.Elgon between 01°43'N and 033°54'E. Lake Bisina wetland system covers an area of 54,229 ha and it is an Important Bird Area (IBA).

Lake Bisina is a shallow fresh water lake with a thin strip of fringing papyrus swamp. Water lilies and a declining habitant dominate the shallow area which is important for its diversity of macrophytes. It is used as a feeding ground for wading birds including the globally vulnerable shoebill (balaeniceps rex). The system is also important as refuge for fish species that have gone extinct in the main Ugandan lakes such as Lake Victoria and Kyoga. The lake is very important for the surrounding communities in terms of fishing, transport and supply of water for domestic use and livestock. It is especially critical during times of famine (e.g. a rhizome of the Nymphea genus is used as food during droughts). The site falls under the Karamoja Protected Area system. A Community based Wetland Management Plan (CWMP) has been prepared for Bisina wetland system (RIS information, 2006).

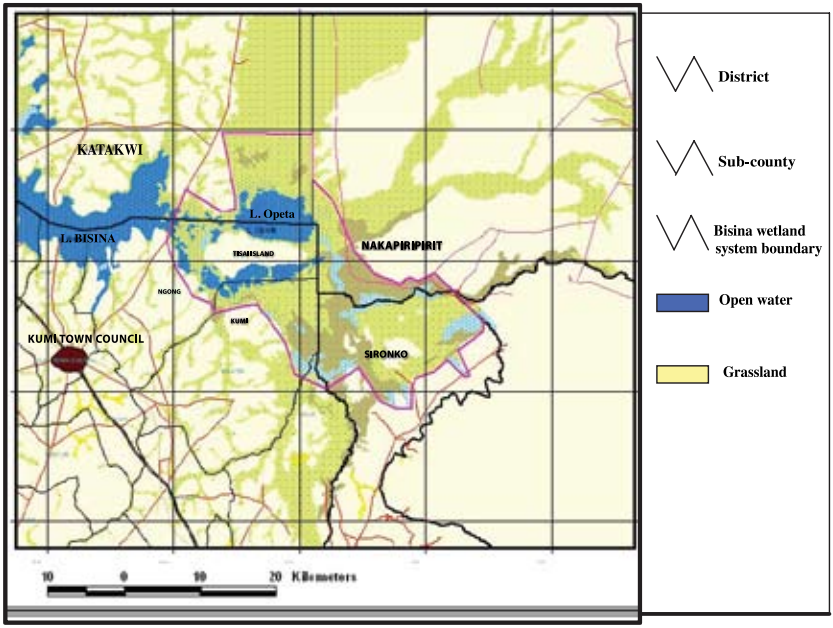
Map of Bisina Wetland System showing administrative boundaries



Source: *NatureUganda (2009)*

On the other hand is the Lake Opeta part of the wetland system which is located in North Eastern Uganda between 01°42'N 034°14'E.in the districts of Nakapiripiriti, Sironko, Katakwi, kumi and Bukedea with a coverage of 68,912 ha. It is predominantly an extensive swamp of *Vossia cuspidate* to the east and south graduating into dry hyparrhenia grassland savannas. The wetland is of great importance for the conservation of birds (e.g. fox's weaver) and for its life support functions for the survival of human and wildlife. The information below summarizes the profiles of the districts covered by Lake Bisina/Opeta wetland system.

Map of Opeta wetland system showing administrative boundaries



Source: *NatureUganda (2009)*

a) Bukedea District

Covering a total land area of 1,049.34 Sq. Kms, Bukedea district borders Mbale and Sironko districts in the East, Kumi district in the north, Katakwi and Nakapiripirit districts in the North-East and Pallisa District in the South. The district is generally a flat land with a large coverage of wetlands. Based on the 2002 Population and housing census, there are 122,433 people in the district, with 63835 females and 58,598 males.

In terms of economic engagement, over 84% of the households are engaged in agriculture, and particularly in subsistence farming. In addition to crop farming, there is animal rearing mainly of the local Zebu cattle, sheep, pigs and poultry.

b) Sironko District

In terms of location, Sironko borders the districts of Kapchorwa in the East, Kumi in the West, Nakapiripiriti in the North and Mbale in the South. The district covers a geographical area of 1,090.8 Sq. km and lies at an approximate altitude of between 1,299m – 1,524m above sea leveLake In addition the district receives rainfall totaling 1,191mm per annum and low temperature within a subtropical climatic zone.

According to the 2002 Housing and Population census, Sironko has a population of 309,000 people; 157,300 female, 151,700 male – whose main economic activity is agriculture with emphasis on;

i. **Food crops:** Millet, sorghum, ground-nuts, cassava, sweet potatoes, beans and Irish potatoes
ii. **Cash crops:** Cotton and coffee
iii. **Fruits:** Passion fruits
iv. **Vegetables:** Tomatoes, onions and cabbages

c) Kumi District

With an area of 2,848 Sq. Km, Kumi borders the districts of Bukedea in the East, Pallisa in the South, Soroti in the West, Katakwi in the North and Nakapiripiriti in the North-East. Lakes Bisina and Opeta form Kumi's border with Katakwi district.

In terms of climate and relief, Kumi district lies at an approximate altitude of between 1,036m and 1,127 above sea level in a modified equatorial climatic zone with both heavy rainfall and high temperature. Based on the population projections of 2006 there are 333,067 people in the district. Agriculture is the main economic activity in the district with emphasis on food crops such as; finger millet, ground-nuts, sweet potatoes, cassava, sorghum, rice, cow peas, soy beans, bananas, sunflower and onions; and cash crops such as cotton.

d) Soroti District

Located in Eastern Uganda, Soroti borders the districts of Kaberamaido in the West, Kumi in the East, Katakwi in the North, with a geographical coverage of 3,373.8 Sq Km. The district lies at an approximate altitude of 1,036m – 1,127m above sea level with rainfall totals of up to 1,000 – 1,500mm per annum and high temperatures.

Like most other districts in Uganda, agriculture remains the main economic activity in the area with emphasis on food crops and cotton as the main cash crop. Finger millet, sorghum, ground-nuts, cassava, cowpeas, sweet potatoes, maize, soy beans, simsim (sesame) and sunflower form the main source of food for households, while fruits (such as passion fruits, oranges and mangoes) and vegetables such as tomatoes, onions and cabbages are also grown in the district whose population estimates stand at 445,800 people, with 228,000 female, 217,800 male.

e) Katakwi District

With its geographical location in North-Eastern Uganda, Katakwi district borders the districts of Moroto to the North-East, Nakapiripirit in the East, Amuria in the West; Lake Bisina forms its border with Kumi on the south. The district covers an area of 2,477.13 Sq Km.

In terms of climate, relief and vegetation, the district located on the Northern plateau. It is characterized by extensive flat plains with grassland savannah and frequent shrub vegetation. There is a marked long dry season and rainfall is relatively low, ranging from 850mm – 1500mm, with the Northern parts receiving less rainfall.

The National Housing and Population Census (2002) put its population figures at 137,200 people – 70,900 female, 66,300 male. This population survives on agriculture, cultivation of food crops (sorghum, finger millet, ground-nuts, sweet potatoes, cassava, bananas, soya beans, simsim, maize, cow peas and vegetables), cash crops (cotton) and cattle rearing are the main economic, activities.

f) Nakapiripiriti District

Bordering the districts of Moroto in the North, Katakwi in the West, Sironko and Kapchorwa in the South, Nakapiripiriti District in North-Eastern Uganda covers an area of 5,825.3 Sq. Km with a population of 192,300 people (94,400 female, 97,900 male) according to UBOS (2002).

A look at climate, relief and vegetation shows that the district lies at an approximate altitude of 1,356m – 1,524m above the sea level with rainfall totaling 400 - 600mm per annum and average temperatures of around 30°C. This area is semi arid and the vegetation includes isolated thorny trees and shrubs.

With the main economic activity being cattle rearing, agriculture has some potential as exhibited in the small-scale farming of sorghum, ground-nuts,

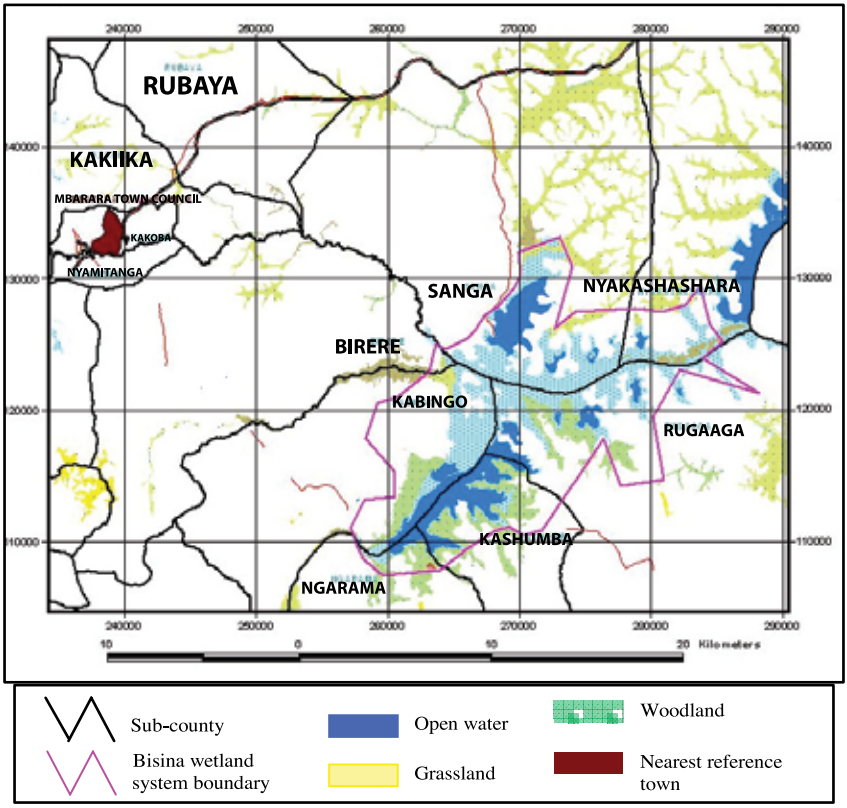
sunflower, sweet potatoes, cassava, and fruits and vegetables as the area's cash crops. Of recent, rice growing in the district has picked for both subsistence and commercial purposes.

3.1.2 Lake Mburo – Nakivali Wetlands

Covering an area of 26,834ha and lying on the geographical coordinates of 30° 49′ – 31° 04″ E and 00° 33′ – 00° 47″ S, Lake Mburo – Nakivali wetlands comprise of open and wooded savanna, seasonal and permanent wetlands and five lakes of which Lake Mburo is by far the largest. Most of the wetland system lies in Lake Mburo National Park, gazetted in 1982. The other part lies outside the National Park and covers Lake Nakivali and the surrounding swamps in the sub-counties of Rugaaga, Kashumba, Ngarama and Kabingo. The wetlands are a unique habitat, which lie at the convergence zone of two biogeographical zones - the Lake Victoria regional mosaic and the Guinea-Congolian biogeographic region.

It supports globally threatened species of birds, including two of the endangered cichlid fish species which have gone extinct in the main lakes and it is the only system in Uganda in which the Impala is found. The system also provides refugia to 22 species of Palaearctic and Afro-tropical migrant birds during adverse conditions, within the wooded Savanna with *Acacia/Commiphora* thicket and grasslands. The Lake Mburo wetland system is of immense socio-economic value. It is a source of water for domestic use, livestock and wildlife. The system is a source of pasture for the local herds during droughts, a source of fish and raw materials for crafts and thatching.

Map of Lake Mburo-Nakivali wetland system showing sub-counties of coverage



Source: *NatureUganda (2009)*

The Lake Mburo – Nakivali Wetland System covers the districts of Isingiro and Rakai, Kiruhura and Mbarara in Western Uganda. Presented below are brief district profiles.

a) Mbarara District

Mbarara borders the district of Kiruhura in the East and North East, Ibanda in the North, Isingiro in the South-East, Ntungamo in the South and Bushenyi in

the West. The district covers an area of 1,788.24 Sq. Km. with a population of 396,300 people – 202,800 female, 193,500 male (UBOS, 2002).

The district lies at an altitude of between 129m – 1,524m above sea level with temperatures averaging between 25° – 27°C and rainfall of up to 1,200mm per annum in some areas. The vegetation is a combination of bush and short grass which is good for animal rearing. The main economic activity in the district is agriculture with emphasis on;

i. **Food crops:** beans, sorghum, millet, maize, cassava, sweet potatoes, irish potatoes, ground-nuts, bananas and peas;
ii. **Cash crop:** coffee
iii. **Fruits:** passion fruits
iv. **Vegetables:** tomatoes, onions and cabbage
v. Ranching and diary farming.

b) Isingiro District

Formerly part of Mbarara district**,** Isingiro borders the districts of Rakai in the East, Kiruhura and Mbarara in the North, Ntungamo in the West and the United Republic of Tanzania in the South. With a total population of 350,100 people (180,700 female, 169,400 males), the district covers an area of 2657.18 Sq. Km.

In terms of climate, relief and vegetation, the district has a hilly terrain with vegetation characterized by a combination of bush and short grass which is suitable for animal rearing. The area receives rainfall of about 957mm annually, which support crop and animal production. In addition, the district has a high potential in terms of mining and lumbering.

c) Kiruhura District

Kiruhura district was curved out from Mbarara district and it borders the districts of Rakai to the East, Mbarara to the South, Ibanda to the West, Sembabule and Kyenjojo to the North. As per the 2002 National Housing and Population Census, the population stood at 241,000 people (119,600 female, 121,400 male) sitting on an area of 4,607.98 Sq Km.

The district is generally flattish with undulating hills covered with savannah grass lands. It is located in the cattle corridor, and cattle keeping is the main economic activity, with banana growing and apiary supplementing food security and household incomes.

d) Rakai District

With an area of 4,908.5 Sq. Km. Rakai borders the districts of Lyantonde and Masaka in the North and North-East, Mbarara in the West, Lake Victoria in the East and the United Republic of Tanzania in the south. The district lies in a modified equatorial climatic zone with high temperatures and heavy rainfall almost all year round.

Based on population projections of 2006 there are 433,561 people in Rakai district. Agriculture is the main economic activities with a bias towards food crops such as beans, sorghum, millet, maize, cassava, sweet potatoes, Irish potatoes, ground-nuts, bananas; cash crops such as coffee; fruits and vegetables such as passion fruits, tomatoes, onions, pineapples and cabbage in addition to cattle keeping.

3.2 Basic socio-economic and demographic features of respondents

3.2.1 Position of respondents in households and communities

There was a deliberate effort made to interview the household head in most of the households sampled and this formed 64.4%. Similarly, the team gave consideration to special groups and of the total number of respondents, 31.8% were women interviewed in the survey, while 4.7% of the respondents were the elderly in communities. 7.0% were youths while the People with Disabilities (PWD) formed 0.9% of the participants in the survey. As such, the information gathered is considered representative of all community groups, since most of the respondents were responsible persons within the households.

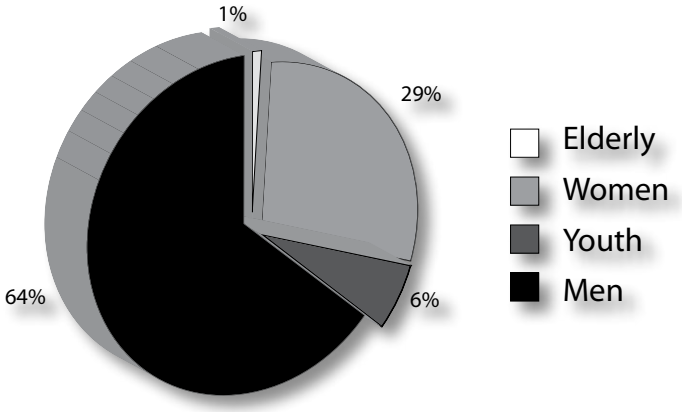


Fig 2: Showing the percentage of household heads interviewed

Table 1: Position of respondent within the household interviewed

Position of respondent	Frequency (f)	%
Household Head	223	69.6
Wife to head	65	20.3
Husband to head	4	0.1
Child	20	6.5
Other	8	2.5
Total	**320**	**100.0**

3.2.2 Education level

Majority of the sampled households were headed by people educated up to primary level (52.8%). About 28% had no formal education at all, while only 17.2% were educated above secondary level. Only 2% had attained tertiary education. Similarly, the respondents were mainly primary level-educated people (65.7%). Over a fifth of them (21.3%) had no formal education at all, while only 13% had secondary education and above. This demonstrates that the formal education levels of the communities are not very high in general.

These statistics may well reflect the national average where 24.3% of people of 15 and above years do not have formal educational attainment. Therefore wetland adjacent communities do not necessarily have lower education attainment than other rural communities. However the fact that a fifth of the household decision makers have no formal education and a half have only primary education has implications for the type of resource use and subsequently the wetland management and conservation strategy they can ably practise.

Analyzed by system, there were more heads of households without formal education around the Bisina-Opeta (68.8%) as compared to Mburo-Nakivali (31.2%). The table below summarizes the education attainment levels of household heads in the two wetland systems under survey.

Table 2: Education level of Household Head by system

Educational level	Bisina-Opeta	Mburo - Nakivali	Total
None	42	19	61
Primary	58	36	92
Secondary	25	18	43
Tertiary	16	09	25
Total	141	82	221[1]

3.2.3 Sex of respondents

A deliberate effort was made to give consideration to sex in the sampling process to choose respondents in the survey. This was based on the background that women and men interface with wetlands differently and the associated challenges that come with this interaction are different for women from men. Although it was not possible to balance the numbers in the distribution, views of 118 women were captured out of the total 320 respondents to the survey questions. The figure below illustrates this distribution.

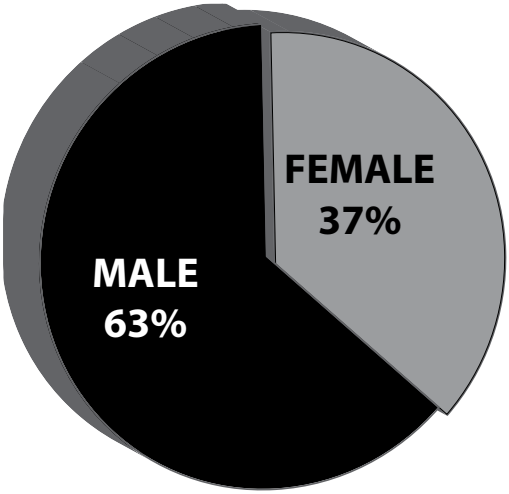


Fig. 3: Sex of respondents

3.2.4 Age

Results regarding the age of households in the study were found to be interesting. Age was found to have implications on wetland utilisation. Four categories of age groups were used to analyse the age data. Almost half of the respondents were youths (18-39 years), and it was also revealed that most households were headed by youths aged between 18 and 35 years old.

Table 3: Age distribution of respondents in the survey area

Age (yrs)	Bisina/Opeta Freq (n)	%age	Mburo/Nakivale Freq (n)	% age
Below 20	5	3.9	3	1.6
20-29	14	10.9	28	14.6
30-39	32	25	62	32.3
40-49	56	43.8	71	36.9
50+	21	16.4	28	14.6

3.2.5 Settlement

An investigation into the history of settlement shows that very few households (1.8%) have settled in the survey areas for the Mburo/Nakivali wetlands in the last year, while the figure is slightly less (1.4%) for the Bisina/Opeta site. A total of 21.6% had settled in the surroundings of Lake Mburo/Nakivali wetlands and 23.2% in communities around Lake Bisina/Opeta wetlands in the last 5 years. On average, slightly more than a quarter of the households (25.2%) had settled in the last 10 years. This is cause for concern, because it demonstrates significant immigration into the areas adjacent to wetlands. This implies that the pressure on the resources is increasing gradually. The bulk of the households (51.4%) had lived in their localities for more than 20 years or were in their ancestral homes. The graph below illustrates the length of stay.

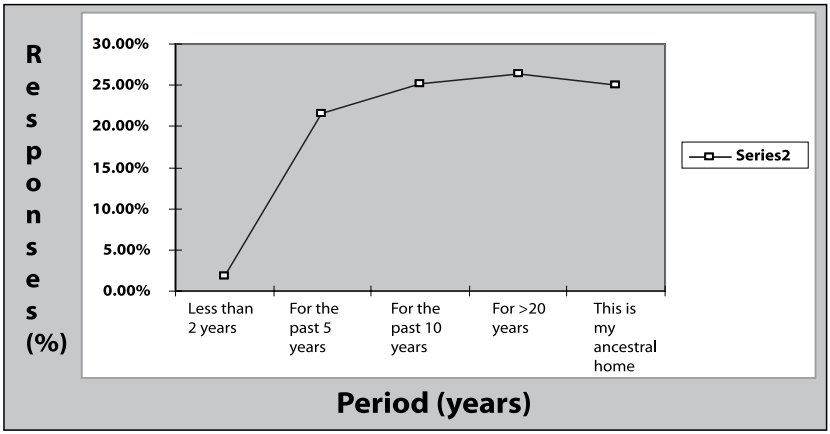


Fig.4: Length of stay in the survey area

3.2.6 Ethnicity and ethnic groups

There is a diversity of ethnic groups in the surveyed areas. The most diverse area was the Western (with Banyankole, Bakiga, Banyarwanda, Bahima, Baganda) around the Lake Mburo-Nakivali site, while the North-Eastern site was relatively homogeneous in terms of ethnicity (mainly with Itesots and Karimojong and a few Bagisu). The differences may partly be due to high levels of immigration and refugee resettlement schemes to most parts of western Uganda and the variety of livelihood activities that provide means of survival to the vast majority. As will be discussed later, this has a bearing on wetland resource use and management dynamics both at community and policy/planning level.

Table 4: Ethnic groups in the survey area Ethnicity in Bisina-Opeta site

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Itesots	101	52.6	52.6	52.6
	Karimojong	59	30.7	30.7	83.3
	Bagisu	32	16.7	16.7	100.0
	Total	192	100.0	100.0	

Ethnicity in Mburo-Nakivali

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Banyankole	82	42.7	64.1	64.1
	Bakiga	22	11.5	17.2	81.3
	Banyar-wanda	16	8.3	12.5	93.8
	Baganda	8	4.2	6.3	100.0
	Total	128	66.7	100.0	
Missing	System	64	33.3		
Total		192	100.0		

3.2.7 Household size

It was found out that most of the sampled households had 6-10 residents (70.3%). This shows that majority of the households are large, implying high demand for food and other household sustenance needs. Again, this implies increasing pressure on the wetland resources to satisfy basic needs. For households already involved in wetland utilisation, this may translate into further wetland exploitation. The fact that cultivation is the major economic and social activity for the majority of the communities adjacent to wetlands is a confirmation that pressure on the natural resource base is high. Most respondents indicated that more that 90% of the households were supported by wetland-based agriculture (as will be seen later) and that it was one of their top five priority economic activities. The discussion of this issue also synthesizes the question of whether or not wetland agriculture, in the current form that it is done is sustainable or not and points to the next steps.

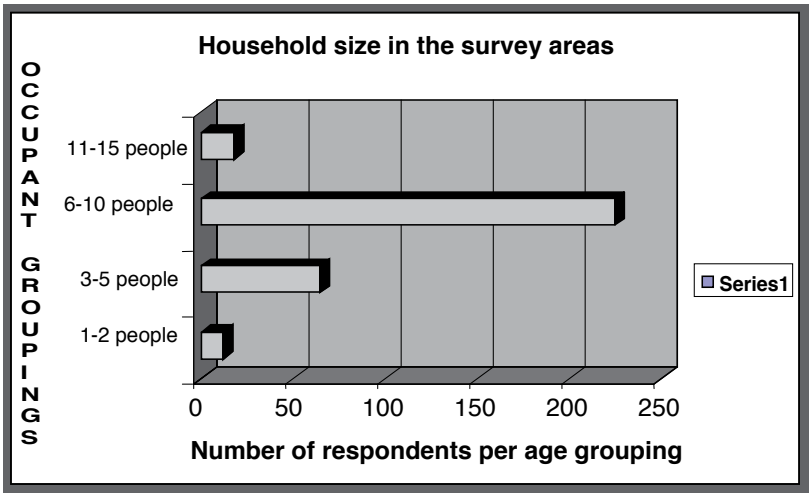


Fig. 5: Size of sampled households in the survey areas

3.2.8 Wealth status

There has not been any effort to quantify community wealth status. The survey team therefore agreed on a simple criterion upon which judgement was made to qualify a particular household to be well-off, moderate, poor, or very poor. However given that a detailed wealth ranking was not carried out, determination of the wealth of individual households could have been influenced by personal biases of the research team members. It should also be recalled that the Sub-counties included in the survey were purposively sampled according to their proximity to wetlands. This aside, it is our deep conviction that the results give a fair picture of the wealth status of households visited. According to the criteria set in this study for wealth indication (see appendix II), and according to the regional contexts, majority of the surveyed households were classified as poor (62.4%) and moderately well off (26%). Very few households (3.1%) qualified to be classified as well off and only (8.5%) fell under the category of very poor. The wealth status of wetland adjacent communities has a lot of implications for resource management/utilization especially when it is indicated that majority are poor. This leaves them with limited alternatives, the most convenient being wetland exploitation.

There are a number of differences in terms of natural, physical, financial, social and human capital. As such, it is important to note that the results given from the

criterion used in the survey to determine wealth status is limited in its scope and is largely context specific. Consequently, for instance households categorised as poor in one wetland system may be considered well-off in another system and vice-versa. The most important finding under this aspect as revealed by the results is that more than half of all households across the sites were assessed as poor; with gross implications of this status for wetland management. The major indicators of poverty to quality the assessment of the survey team included poor housing status, lack of sanitary facilities, inability to have enough food in the house, inability to have adequate dressing materials and malnutrition in children among others (see appendix II). At least 78% of respondents in the Bisina-Opeta site were found to be staying in grass-thatched temporary and semi-permanent structures with no sanitation facilities.

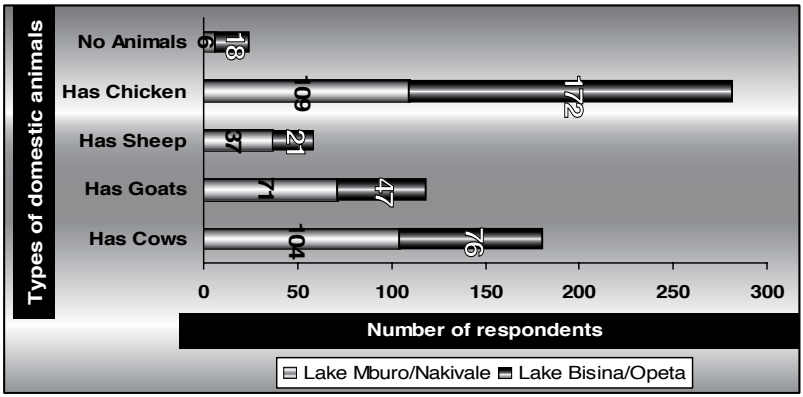


Fig 6: Showing numbers of domestic animals in the possession of households in the survey areas

Some of the other indicators of wealth were, for instance, possession of a car, bicycle, television and an iron sheets roofed house. As earlier indicated, the yardstick upon which wealth was judged was not all encompassing and so could have a number of criticisms. But in the figure above for example, it was not easy to convince the survey team that one is in the 'poor' category when they have 80 cows. In fact this was also relative, depending on which site we are talking about. For instance someone with 80 zebu or long horned cows in Nakapipirit (Lorachat sub-county) might not necessarily be more well-off than the other in Mbarara (Kakiika division) with 5 Friesian cows.

3.3 Economics and Livelihoods of Households in the COBWEB Project Sites

3.3.1 Sources of income in Lake Opeta-Bisina area

As earlier indicated, the main sources of livelihood in the districts around Lake Bisina-Opeta in Eastern and North-Eastern Uganda have connections with cultivation and livestock rearing. By extension, the relationship with wetlands covers crafts making, fishing and brick laying, as presented below, more comprehensively.

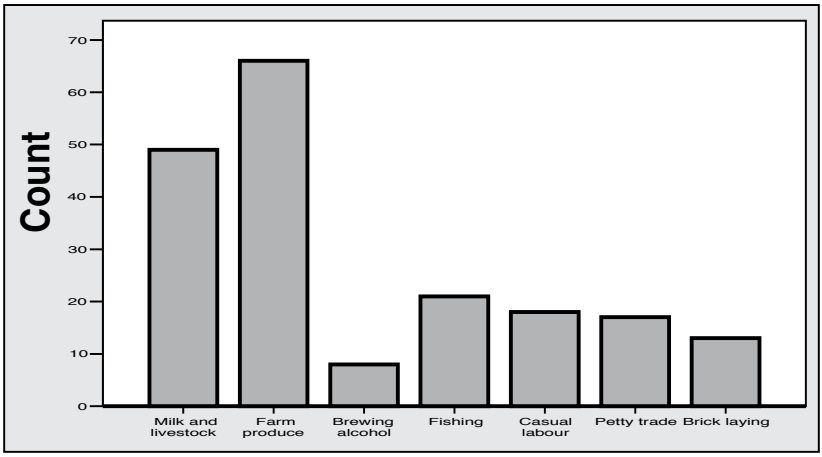


Fig 7: Sources of income in communities around Lake Bisina-Opeta site

i) Sironko District

The survey interviews indicated that communities in Sironko are dominated by poor natural resource dependent communities, who mainly rely on rain-fed agriculture and wetland-supported cultivation during the dry seasons. When asked about the main sources of their income, respondents from Sironko indicated that much of the earnings came from sale of agricultural produce, livestock, firewood and charcoal, horticulture, crafts and poultry in that order. However, this is not without challenges and the average monthly household income for those generating income from these sources was computed to be UGX 400,000, yet with most of the crops seasonal in nature. Rice was found

to be the crop grown most, for commercial and subsistence purposes and it was found to do well in wetlands. The other crops predominantly grown in Bunambutye and Muyembe sub-counties include; beans, maize, and ground nuts. There is also considerable reliance on sand mining and extraction, with gross implications on the status on wetlands in the area. The report expounds on issues of value attachment in greater detail in the subsequent sections.

There are a number of unsustainable practices in the wetlands of Sironko district that participants raised as impeding efforts towards achieving meaningful wetland resource use and conservation. It was noted that local community members were engaged in some unsustainable farming practices such as spraying in the wetlands, cultivating in the wetlands, overgrazing, and conflicting over resource use due to competing wetland uses. Captured as perceived by respondents in the survey, this impacts negatively on water quality, eases disease spread, leads to loss of biodiversity and fuels food insecurity at household and community level.

Some of the emerging issues in Sironko include accelerated wetland drainage, raising levels of awareness on wetland uses, increasing numbers of livestock whose survival is supported by wetlands, prolonged drought periods and immigration that is increasing pressure on natural resources.

ii) Bukedea District

The focus of the team in Bukedea District was concentrated in the sub-counties of Korir and Malera. Whereas the socio-economics of the land were not significantly different from those in Sironko District, the Ateso culture brought in livelihood issues that stood out. In addition to crop farming, there was a considerable level of engagement in cattle keeping and bee keeping in Bukedea. More to this, rice and millet growing is predominant in the district together with fishing, both of which require water that can only be reliably provided by wetlands.

In Bukedea, activities such as charcoal burning and rice growing were identified as the most instrumental in wetland degradation.

The wetlands were found to be utilized for domestic needs such as water for household use while they also play a role of contributing towards household income with regard to the products communities derive from them for commercial purposes. Although dependent communities identified a number of problems with a bearing on their socio-economic way of life they face due to their close proximity to the ecosystems, they said that they were short of solutions, mainly due to lack of financial capacity and poor skills. Some the

problems they mentioned include flooding during rainy seasons and a high incidence of malaria due to mosquitoes harboured in the wetlands. In addition, for all the benefits they derive from wetlands, communities did not have viable alternatives. They intimated that their lives were inseparable from wetlands and had no idea of how life would be without the functions of these ecosystems in their area. In a way, this pointed to the need to build capacity of community members in livelihood options either away from wetlands or in sustainable wetland-based means of livelihood.

iii) Kumi District

Agriculture defines the socio-economic way of life of communities in Kumi district generally and specifically about 97% of households in the sub-counties sampled for the survey in the district. It is important to note that in addition to being less plentiful, rainfall in Kumi is more concentrated over a shorter period, with onset of the main rains coming later, leaving a longer dry period from December to February or March.

Some of the products communities in Korir and Malera obtain from wetlands

- Water for domestic use
- Water for livestock
- Papyrus for crafts making
- Fish for household feeding
- Fish for sale
- Fertile land for crop growing
- Honey from beekeeping
- Poles for construction
- Sand for construction
- Sand for sale
- Pasture for grazing animals
- Firewood for cooking
- Firewood for sale

The soils are generally lighter and poorer, being mainly sandy sediments with some sand loams. Following this geophysical make up, crop cultivation does not yield much outside wetlands especially during the dry seasons. As such, crop cultivation is one of the most pronounced causes of wetland degradation in the district. Cattle keeping, which is the next ranking economic activity also relies on wetlands for the supply of water and pasture to animals.

Photo 2: Wetland contamination/pollution: Local alcohol brewing containers in a wetland from where the local brew is prepared and cooled in Mukura S/C, Kumi district

The past decade has seen a lot of vegetation clearance for settlement and charcoal burning, leaving the landscape bear with short grass. In the course of the discussions in the district, participants revealed that wetlands are the only remaining source of biomass to rural communities. This has negative implications on the survival of the resource and faunal and foral species therein with a possibility of extinction. However a warning was sounded with regard to the escalating levels of bush burning and tree cutting for charcoal, which raises a number of questions about the sustainability of such ecosystem services under unregulated resource use. It calls for enactment and enforcement of stringent regulatory mechanisms (laws), and strengthening of the institutional infrastructure mandated to manage natural resources in the district.

A deeper investigation into what is being done to foster wise use of wetlands and wetland resources in the district pointed to the fact that the district has a wetland ordinance which was passed by the district council to control wetland management challenges. Whereas the production department officials are proud to be the only one with such a piece of legislation in the country, it has not been fully implemented due to financial and personnel challenges.

Table 5: Sources of income for communities around Lake Bisina-Opeta system

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Milk and livestock	49	25.5	25.5	25.5
	Farm produce	66	34.4	34.4	59.9
	Brewing alcohol	8	4.2	4.2	64.1
	Fishing	21	10.9	10.9	75.0
	Casual labour	18	9.4	9.4	84.4
	Petty trade	17	8.9	8.9	93.2
	Brick laying	13	6.8	6.8	100.0
	Total	192	100.0	100.0	

The table above indicates that more than a quarter of the survey population (25.5%) around Lake Bisina/Opeta depend on Livestock, while 34.4% depend on crop cultivation. Considering that both of the activities are wetland supported and that the current practices are unsustainable, it therefore emerges that the survival of these ecosystems is at stake.

iv) Soroti District

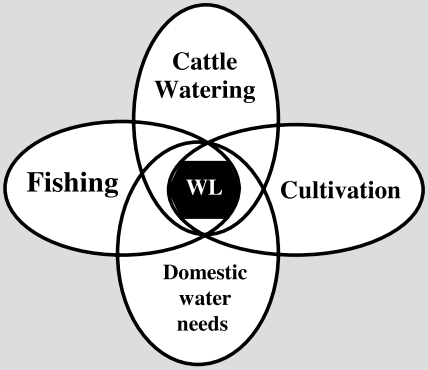
In Soroti district, it emerged that rural communities and wetlands are virtually inseparable. The farming households formed 69% of our sample in the district, the cattle keepers (26%) and the beekeepers (4%) in Soroti. These categories of resource users attach a lot of importance to wetlands in terms of provision of water, pasture and other ecological functions that facilitate the survival of life. The growing of rice, cassava, sweet potatoes, millet and sim-sim, ground nuts, cow peas and beans as well as cattle keeping is all wetland supported especially during the long dry seasons that affect the region.

Due to effects of climate change, partly characterized by long drought periods, the food security history has been affected. The pressure of wetlands has mounted as people desperately look for moist and fertile lands for crop growing. The respondents indicated that they earn some income from their small-scale economic activities, which when computed averages to UGX 265,000 per month. They noted that their stay in close proximity with wetlands is associated with a number of problems. These include diseases, flooding of their farm lands and scarcity of arable land for farming. Despite these, participants noted that benefits outweigh the problems and that given more skills on how best to use the available land meaningfully, their monthly incomes could drastically rise.

The analysis of gender interaction with wetlands shows an almost balanced level of involvement although roles and responsibilities of men and women are clearly delineated in their respective communities. The only marked difference came in when it came to expressing themselves about their personal involvement with wetlands. Whereas women were open and free to share their points, men were a bit shy, something that could easily be attributed to their nature of interface with the ecosystem that is not ecologically sound e.g. in brick laying, charcoal burning and bush burning for pasture.

v) Katakwi District

In this district, the main economic activities include cattle keeping, alcohol brewing and crop growing. With 87% of the households assessed as poor, most of the production is at household level to meet subsistence needs with only little finding its way to the market. The Ateso culture which is pastoralist in nature is dominant in the district, even when households do not have enough land for such an activity. As a result, wetlands present the only way out for cattle rearing. More to this, a number of wetland resource conflicts can be noticed in the district, with domestic water needs competing with livestock rearing, crop cultivation and fishing. The competition is fueled by the 'tragedy of the commons' as wetlands are public trust resources and therefore not under the ownership of any individual.



From the diagram on the left, it is seen that a single natural resource can be put to various uses to meet human and livestock needs, both for commercial and domestic purposes. It is important to note that such natural resources as wetlands have a limited carrying capacity and the regeneration capacity of wetland resources needs to be considered. As a result, there is a limit to the level of foot print that such a wetland can accommodate beyond which it loses its ecosystem values and functions.

Fig. 8: Competing wetland uses: a recipe for conflicts

Household income levels in the surveyed sub-counties are still low, with minimal diversification of wetland-based means of livelihood. On average, a household was found to raise UGX 154,000 only per month. We asked community members about the possibility of living the same lifestyles without going to the wetlands. To this, they said it would need intensive training in alternative livelihoods and that should not be expected to be easy to change. They also noted that such a change would have an effect on their culture, which makes it near impossible to happen. As a team, we felt that such a community needs a package of innovations in economically viable alternative livelihood enterprises that neither conflict with their culture nor the sustainability of wetland benefits (goods, services and functions).

vi) Nakapiripiriti District

This semi-desert region in the Karamoja region is dominated by pastoral communities with most households owning cows, goats or sheep. Wetland conservation efforts by the district technical staff in the past have come in conflict with their culture, especially when residents were advised to reduce animal numbers to sustainably utilize wetland resources. They derive incomes from the sale of milk and livestock. During the interviews, it was observed that respondents did not have keen interest in matters to do with wetland conservation, something that may be attributed to their nomadic nature of life. They keep large numbers and practice the free range system of grazing, in some instances leading to the degradation of one grazing areas. Unfortunately, this does not leave out wetlands, which are a source of water for the animals. As a result, some wetlands have dried out, while others have shrunk and continue to dry out due to the effect of the large numbers of livestock dependent on these wetlands some of which are seasonal in nature.

Photo 3: *AmanigaRuhanga, the team leader plays with a dog after a Focus Group Discussion with pastoralists in Namalu S/C, Nakapiripiriti district during the survey*

The homesteads are mostly grass-thatched temporary huts, with high numbers of children. The homesteads however lack sanitation facilities and have high incidences of diseases such as diarrhea, malaria and skin diseases. A household with 150 cows, 80 goats and with an average monthly income of UGX 450,000 is still housed in a grass-thatched hut and would prefer to be considered poor in this survey, as per the responses. Thatching materials are mostly obtained from wetlands, this partly explains the high levels of wetland degradation in Nakapiripiriti district. The wetlands of the area are most appreciated by the community for their socio-economic importance particularly direct products such as poles for construction, fuel wood, food/fodder, herbal medicine and raw materials for handcrafts.

One of the interesting findings is that Karamoja region, where the survey area is located, formerly known for cattle keeping is slowly shifting to crop growing. For instance Nakapiripiriti district is a known producer of Rice and Irish potatoes in the region. Considering that this area has semi arid characteristics, these crops are grown in areas where they can be supported by swampy conditions for their survival and yielding.

3.3.2 Sources of income in Lake Mburo-Nakivali area

Just as in equal measure as crop cultivation, cattle keeping is an important economic activity in the area. This area relatively food secure through out the year and it is considered a food basket for city dwellers There are a number of wetlands both within and outside the Lake Mburo National Park that support these economic activities. During the dry season, the local communities normally graze and water their animals in the park in accordance with terms and conditions stipulated in the Memorandum of Understanding with Uganda Wildlife Authority. The local community uses the nearby wetlands as a source of water for both domestic use and livestock feeding.

Photo 4: Community initiatives for Natural Resource Management

One of the tree nurseries established by the community in Kashumba S/C with the technical support of Isingiro District Wetlands Office

Local communities also harvest the natural herbaceous vegetation e.g. papyrus for crafts and for production of fish-mats by fishermen. The lakes (especially Lake Mburo) are an important source of fish proteins for domestic consumption as well as commercial purposes. Fishing is a long established activity in the Lake Mburo – Nakivali area and remains one of the area's most significant economic activities in addition to cattle keeping and banana growing. Fishing therefore offers considerable employment opportunities to a number of fishermen in the nearby villages.

The communities in this area have started to appreciate the need for wetland management and have, accordingly, taken it on proactively. For instance in Isingiro district a community is raising seedlings to plant along Lake Nakivali to curtail further degradation.

The discussion below focuses on the specifics of each district and their socio-economic lifestyles in this COBWEB project site.

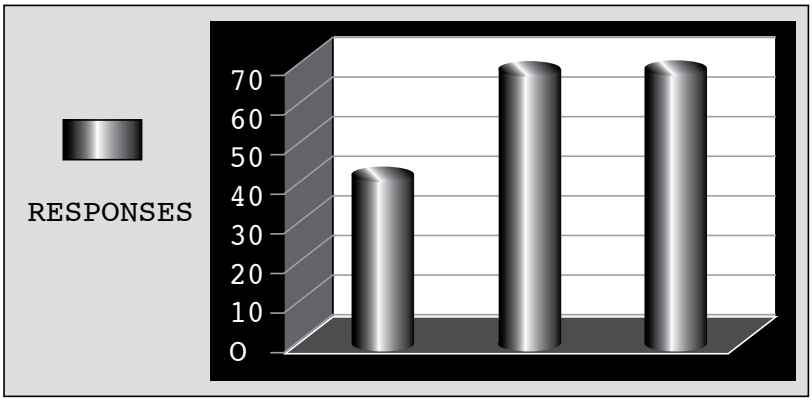


Fig. 9: *Main sources of income in the communities around Lake Mburo – Nakivali system*

a) Mbarara District

Mbarara is one of the urban districts in the western region. On her part, local people in Mbarara district are engaged in trade, crop growing and cattle keeping, while the private sector and business community are involved in large scale businesses, manufacturing and production. The survey carried out in Kakiika and Kakoba divisions of the municipality shows that most respondents fell in the 'well-off' and 'moderately well-off' categories of wealth status (as per the teams wealth assessment criteria).

Although it may be said that there is minimal direct interaction with wetlands in Mbarara, a visit to Rwemigina Parish in Kakiika division showed that farmers had cultivated up to the wetlands in the area, thus gradually reducing their size. In an interview with the District Wetlands Officer, emerging water quality issues downstream were attributed to negative human activity in wetlands. In addition, Mbarara is seen as the source of silting in Isingoiro district with an upstream impact on Lake Nakivali and the adjacent wetlands. Apart from the sensitization programmes conducted by the district about wetlands, there is nothing much

being done at community level to counter the destructive/degrading practices in wetlands in the district.

b) Isingiro District

Formerly part of Mbarara district, Isingiro hosts Lake Nakivali and the Government refugee resettlement programme. The latter presents a multiplicity of cultural and socio-economic factors owing to the differences in ways of life of people that converge in the resettlement camp. Fishing is a key economic activity in the area, with limited regulation of the activity. Due to reduced fish stocks in the lake, communities have resorted to wetlands especially for mudfish. Wetlands also serve as sources of water for cattle and fertile land for crop cultivation.

In Isingiro, the degradation of wetlands had received district and community attention, and some restorative measures have been put in place. For instance the communities together with Isingiro Local Government have raised tree nurseries to restore the lost vegetation and also reduce pressure on wetlands by providing alternative sources of wood, poles and biomass sources that communities currently harvest from wetlands. It is also believed that once the seedlings are planted, it will create an opportunity for wetlands areas to recover, and also perform their functions once again.

However, participants noted that a combination of lack of clear wetland boundaries and lack of wetland by-laws to foster compliance poses a challenge to implementation of efforts towards the wise use and conservation of wetlands in the district. Indeed, opportunistic and direct observation showed that bush burning and cultivation inside the wetlands was considered normal with hardly any concern about the ecological functions and services at stake.

c) Rakai District

In Rakai district, the hilly terrain leaves little productive land for crop cultivation and cattle keeping, which in addition to fishing are the main economic activities of communities in the district, and in the sub-counties of Kyarurangila and Kakyeera in particular. During the dry seasons, Rakai is one of the districts in Uganda that are affected by famine and this drives farmers to wetlands for moisture. In addition, interviews also indicated that their soils are getting exhausted and that wetlands remain the only alternative for cultivation.

About 72.8% of the households interviewed fell into the 'poor category' and just above a quarter were found to be 'moderately well-off' according to the survey team's grading criteria. The sources of income included the sale of farm produce, fish, milk and livestock, and providing casual labour – in that order. On average, monthly household income were found to be in the range of UGX 60,000 – 270,000 only.

Unlike most of the other districts visited, the awareness about degrading practices in wetlands was very noticeable amongst respondents. As put by an interviewee,

> *"…charcoal burning, brick laying and burning grass in wetlands for pasture are the main causes of wetland degradation, yet there is no effort to stop those involved".*
>
> **- Orishaba Madinah, 30, Rwambajjo – Kyarurangila in Rakai -**

Whereas respondents reported that there have been some attempts, such as, sensitization campaigns by the district to advise wetland resource users on best user practices in wetlands. These were not adequate enough to effect changes in the ways local communities utilize wetlands. This points to the need for more capacity development and strengthening community engagements on wise use strategies for wetland resources.

d) Kiruhura District

The survey was conducted in the sub-counties of Sanga and Kanyaryeru in Kiruhura district. The two sub-counties were sampled because they are representative enough of the socio-economic setup of the entire district. The area has a very sparse population ranging between 16-48 persons/sq km. This could be because a big part of the population are pastoralists, who own relatively large pieces of land, and much of the remaining land in Sanga sub-county land is occupied by Lake Mburo National Park in the south and the government ranches to the north. The population here is mixed with pastoralists and cultivators living side by side. Due to large cattle herds kept in this mainly dry cattle corridor, the seasonal wetlands are completely overgrazed in the dry season, but get flooded in the wet season. The district experiences extreme dry periods here and wetlands become an important life support system for humans, livestock and wildlife. Whereas access to resources in the permanent wetland within Lake Mburo National Park is regulated by issuance of permits, the rest of the wetlands outside the PA are subjected to the open access regime, which fuels resource overexploitation and consequent degradation.

Crop growing and fishing are the other economic activities in this area that deserve a mention. Catfish fish *(Clarias gariepinus)* locally known as *emale* in particular serve both commercial and household purposes. Communities get papyrus and water from these wetlands as and when need arises. Papyrus is an important roofing material, and is also used to weave mats and baskets for sale. Wetland grass and poles are also important for thatch and construction respectively.

Table 6: Sources of income around Bisina-Opeta * Sources of income around Mburo-Nakivali Crosstabulation

		Sources of income around Mburo-Nakivali				Total
		Milk and livestock	Farm produce	Commercial businesses	Fishing	
Sources of income aroung Bisina-Opeta	Milk and livestock	40	9	0	0	49
	Farm produce	0	54	0	0	54
	Brewing alcohol	0	6	2	0	8
	Fishing	0	0	5	12	17
Total		40	69	7	12	128

From the crosstabulation of sources of income in the two sites in the table above, it emerged that wetlands support the main means of livelihood with cattle keeping, cultivation and fishing overlapping responses both in Eastern/ North Eastern Uganda as well as Western Uganda project sites.

Table 7: Correlating sources of income in the different project sites to establish the possibility of a relationship

Correlations

		Sources of income around Bisina-Opeta	Sources of income around Mburo-Nakivali
Sources of income aroung Bisina-Opeta	Pearson Correlation	1	.918(**)
	Sig. (2-tailed)	.	.000
	N	192	128
Sources of income around Mburo-Nakivali	Pearson Correlation	.918(**)	1
	Sig. (2-tailed)	.000	.
	N	128	128

** *Correlation is significant at the 0.01 level (2-tailed).*

Pearson correlation (in the table above) indicates a significant relationship between the two project sites in terms of economic engagements for household income. This is explained by the involvement of communities in crop growing and cattle keeping, which feature in both sites predominantly.

Table 9: Ranking the occupations/sources of household income for the surveyed households

	1st Rank		2nd Rank		3rd Rank		4th Rank		5th Rank	
Economic Activity	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**
Crop farming	125	39.0	42	14.3	16	11.3	8	11.7	09	16.4
Business	18	5.65	32	10.7	14	9.80	14	20.6	06	10.9
Salaried employment	08	2.50	06	2.00	10	7.00	0	0.0	01	1.80
Livestock farming	67	20.9	98	32.7	15	10.5	06	8.70	0	0.0
Casual labour	09	2.80	13	4.30	05	3.50	0	0.0	2	3.60
Building/construction	21	6.60	04	1.30	0	0.0	01	1.5	0	0.0
Rental income	04	1.20	11	3.60	02	1.40	0	0.0	0	0.0
Brewing (local alcohol)	06	1.80	11	3.60	04	2.80	02	3.00	04	7.20
Remittances from relatives	07	2.10	04	1.30	01	0.70	02	3.00	1	1.80
Fuel wood sale	08	2.50	09	3.00	2	1.40	0	0.0	0	0.0
Fishing	24	7.50	10	3.30	10	7.00	07	10.3	2	3.60
Fish farming	03	0.90	06	2.00	0	0.0	02	3.00	0	0.0
Charcoal burning	01	0.30	03	1.00	08	5.70	01	1.50	01	1.80
Craft making	05	1.50	10	3.30	09	6.40	04	5.8	02	3.60
Poultry farming	02	0.60	11	3.60	22	15.5	09	13.2	14	25.5
Forestry/woodlot	01	0.30	03	1.00	0	0.0	0	0.0	0	0.0
Brick making	09	2.86	21	7.30	16	11.3	10	14.7	12	22.0
Bee keeping	02	0.60	05	1.7	08	5.70	02	3.00	01	1.80
Total	**320**	**100**	**299**	**100**	**142**	**100**	**68**	**100**	**55**	**100**

3.4 Value attachment to wetlands

The survey reveals that communities derive a number of benefits from wetlands, which they say contribute enormously to their livelihoods. Asked for their opinions on whether or not the wetland areas in their respective localities should be maintained in the same kind of land use, 99.1% answered in the affirmative while 0.9% did not seem to care. However, the appreciation seemed to be largely limited to tangible benefits derived from wetlands. Only 11.9% of the respondents were able to articulate some intrinsic values of wetlands in the project areas where the survey was conducted.

The inability to adequately comprehend wetland values in totality is on the one hand a signal for a gap in the awareness campaigns spearheaded by district wetland offices, while on the other hand it is an eye opener for COBWEB implementation on urgent requirements for the success of the project. Taking the 'first things first approach', then the PIT could prioritize such information needs to lay a firm foundation for other project outcomes.

Table 10: Responses to wetland products highlighted by communities

Which wetland resource does this household use?	Frequency (f)	Percentage (%)	Rank
1. Water for domestic use	262	81.8	1
2. Water for irrigation	68	21.2	14
3. Water for brewing	24	7.50	20
4. Water for livestock	196	61.2	3
5. Land for cultivation	228	71.5	2
6. Land/pasture for grazing livestock	184	57.5	4
7. Land for growing trees (woodlots)	0	0.00	25
8. Fish	171	53.4	5
9. Land for settlement	6	1.80	22
10. Building materials	98	30.6	10
11. Papyrus	105	32.8	9
12. Hunting	27	8.40	19
13. Crafts materials	120	37.5	8
14. Grass	72	22.5	13

15. Fibre	38	11.8	17
16. Wild fruits	4	1.25	23
17. Medicinal herbs	66	20.6	15
18. Rattan cane	2	0.60	24
19. Palm leaves	18	5.60	21
20. Bee keeping	79	24.6	12
21. Fish farming	39	13.2	16
22. Cultural activities	31	9.60	18
23. Clay	132	41.2	7
24. Sand	87	27.2	11
25. Firewood	163	50.9	6

3.4.1 What drives people into the wetlands?

Discussions were held on what drives people into wetlands with the purpose of establishing what value the respondents attach to the wetland ecosystem. This was intended to gauge the level of flexibility in terms of accessing and using wetland goods and services. The findings indicate that some community members chose the current locations because of the presence of a wetland. Important to note also is that some wetland products have no substitutes and yet community members cannot do without them. For instance in Nakapiripiriti, the respondents noted that stopping them from accessing wetlands is doom for their livestock. The same sentiments were echoed by those who go to wetlands in search of herbs. The diagram below shows the main goods and services that drive community members into wetlands.

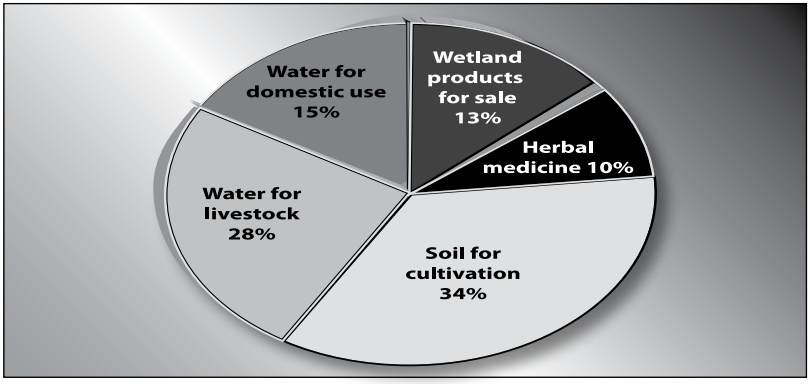


Fig. 10: *Resource uses that drive communities into wetlands*

3.4.2 Viability of alternatives

The survey team took off time to find out from the communities about the alternatives to the current wetland uses and use type. Then subsequently, a viability check was run on each to be able to advise the implementation of the project more practically. Some of the alternatives the community members raised include; cultivating only in the wet season, using wetland friendly methods of farming, planting trees on their lands and no alternatives were raised for cultural uses such as fishing, cattle keeping and herbs from wetlands. Additionally, in areas where wetlands are the only connection between communities and the Lake for water transport, no quick alternative could be thought of.

It is also important to note from the previous sections that activities that can be sustainably carried out in wetlands did not rank high as current livelihood/ income sources for each of the sites. These include fishing, fish farming, craft making, forestry/woodlot management and bee keeping. This demonstrates that the COBWEB project will have to put in a lot of effort in identifying and promoting sustainable activities, to increase their profiles in household economies as alternatives to unsustainable uses of wetlands. However, it should be born in mind these will be different for different regions/project sites, bearing in mind societal value attachment, culture and contribution to the achievement of the project goals and objectives.

Photo 5: The wetland in Korir S/C, Bukedea district is used to connect to Lake Bisina for water transport

3.4.3 Interventions to ensure sustainable utilization of wetlands

Respondents were asked what needs to be done to ensure sustainable wetland utilization. The need to intensify sensitization on wise wetland use topped the list of suggestions as identified by 30% of the survey participants, followed by the need to enact and enforce laws and enact by-laws at community level (28.3%). Also important was the need to clearly demarcate wetland boundaries (26.3%) Communities claim that it is unclear where their land ends and wetlands begin.

People also identified the need for planning at local level, to draft wetland zoning systems and village resource use plans although this was not ranked among the top three priorities. Other suggestions hinged on training in improved natural resource management (soil conservation, fishing to be overseen by community resource persons), and interventions that would reduce community dependency on wetland resources such as tree planting, water sources like dams, boreholes, gravity and piped water and fish ponds.

3.4.4 Community training needs

Respondents were asked whether, according to them, there are any aspects in which their communities needed to be trained in order to improve the manner in which they interface with wetlands and the resources therein. Virtually everybody (99.2%) answered in the affirmative. Training needs cited included awareness creation on wetland laws and guidelines which topped the list as mentioned by 40% of the respondents. In addition, 22% said there is need to raise awareness on the values of wetlands. .

Most of the other training needs were to do with improving wetland resource management (such as farming methods within the wetlands, beekeeping, fishing methods, livestock management, craft making) and training in options to reduce dependency on wetlands (such as alternative income generating projects and fuel saving technologies). The range of training needs was quite diverse as shown in the table below.

Photo 6: Rice growing in wetlands in Bunambutye S/C, Sironko District

Table 11: Aspects in which community members require training

Training needs	Bisina/ Opeta (%)	Mburo/ Nakivali (%)	Total (%)
Wetland laws and guidelines of wetland utilisation and ownership	48.7	37.0	85.7
Better farming methods	13.2	54.4	67.6
Awareness raising on values of wetland	28.3	15.4	43.7
Better fishing methods in wetlands	5.3	0.0	5.3
Tree planting and management	0.0	8.7	8.7
Fish farming	2.7	6.7	9.4
Improved livestock management	2.6	2.7	5.3

Alternative income generating projects management	1.3	5.4	6.7
Bee keeping	1.3	2.0	3.3
Organic farming	0.7	0.0	0.7
Craft making	2.0	0.0	2.0
Pollution control	0.8	1.1	1.9
Financial management within the home	0.7	2.1	2.8
Fuel saving technologies	1.5	0.0	1.5
Group formation and dynamics	1.3	1.0	2.3
Don't know	23.8	34.4	58.2

Respondents were also asked to identify who in the community needs to be trained. Cultivators were the most cited (57%) because, as this survey revealed, cultivation is the most widespread use of wetlands at the moment, and at the same time communities were of the view that it is also the activity with the highest negative effect on wetlands. The next training target identified were the landowners adjacent to wetlands (17%) because these are the wetland "owners" and they make key decisions for utilization of wetlands. Livestock grazing is another common use of wetlands and so livestock keepers were identified as training targets (13%).

3.5 Factors affecting communities in surveyed areas

The analysis of social interactions in communities and economic lifestyles pointed to a number of factors with a bearing on their socio-economic wellbeing. Whereas wetlands are looked at as source of livelihood, community needs are not met adequately, and yet there is potential for satisfaction. The survey also generated information to the effect that the current wetland practices are not sustainable, and there are evidences in shrinking wetland sizes, with reducing associated community and individual benefits. The following factors were identified as limiting the levels of access of wetland benefits to the communities considered for the socio-economic survey.

Photo 7: Julius Mafumbo, WMD (white T-shirt) takes notes in a group discussion as respondents in Kapujan S/C, Katakwi district brain-storm on their social problems.

There is a general level of ignorance and a lack of awareness among the population of the adverse consequences of their actions on the wetlands. Communities, who generally are agro-based and look at wetlands as a means towards achieving high production levels. There are hardly any thoughts put to the survival of the wetlands and their ability to adequately meet future needs. It is therefore not surprising that when asked about the importance of wetlands, respondents mainly thought of tangible benefits until probed to think about other ecological aspects.

The sites visited exhibited a lack of trained and committed personnel in wetland resources management at community level. The only service provider in the Local Government is a Wetlands Officer based at the district. The DWO on the other hand is incapacitated by financial, technical and personnel issues, which renders this office insufficient to deliver on its mandate and as result to ensure wise use of wetlands while at the same time maximizing community benefits.

There is inadequate and/or weak institutional coordination and links on environment management in general and wetland conservation in particular. Wetland use and management is dispersed in several Government and Non-Governmental Organizations strategies and programmes with no operational coordinating mechanisms at most levels. As a result, interventions calculated to maximize benefits from wetlands to communities are not sustained and end up not causing the expected impact on the ground.

The other notable factor is about the selfish nature of community members that debars them from looking at a community as a whole but rather themselves as individuals. During the discussions, it emerged that respondents did not attach much value to the benefits that accrue to the community, singling out only benefits that come to them in their individual capacities. Such an attitude is so challenging to programme design in terms of how interventions are framed to meet the needs of their target beneficiaries in an environmentally friendly and wetland supportive manner.

Overdependence on agriculture and an apparent minimal diversification of livelihoods is a limiting factor to enjoyment of wetland resources. Most people are entirely dependant on crop cultivation and animal rearing. These are seasonal activities that are dictated upon by seasonality (dry or wet conditions) and this ultimately impacts a lot on wetlands especially during the dry season when agricultural activity can only meaningfully thrive in wetlands, also in the absence of irrigation structures at community level. Under this aspect, communities neither have the means nor the capacity for a viable alternative.

4.0 INTERVENTIONS/ RECOMMENDATIONS TO ADDRESS THE EMERGING ISSUES

Considering the in-depth assessment of community socio-economics, their interactions with wetlands, the value they attach to wetlands, the problems therein, community expectations of the COBWEB project and their limitations, the survey gave respondents an opportunity to input into the way forward for wise wetland use and resource conservation. This gave participants an opportunity to make recommendations from their own perspective. The survey team used these and their general understanding of the project sites to advance a number of next steps in an effort to advise COBWEB from this information point of view.

4.1 Develop, update and implement CWMP: The survey found out that there are some CWMP in place around the Lake Bisina and Lake Mburo areas but none for other areas of project focus. There has also been an effort to start on the process of developing management plans for wetlands of Lake Nakivali, which need to be finalized. The process of coming up with a CWMP is usually consultative and participatory in nature and this gives an opportunity for project implementers to instill and strengthen a sense of ownership in communities over project outcomes. Besides, it is much easier to implement a project of COBWEB's nature of design in an area that has a Community based Wetland Management Plan for political and stakeholder considerations. It is upon this background therefore that we recommend that the project embarks on an exercise to formulate management plans and update those others where they exist for a smooth implementation.

4.2 Demarcate wetland boundaries and create buffer zones: With the support of the Local Government, the COBWEB implementation needs to initiate efforts targeting the demarcation of wetland boundaries from community and individual land. As it is now, the survey discovered that wetland boundaries have never been marked out in most of the areas visited and there was confusion on where community land ends or where the wetland starts. This looked more of a weakness currently exploited by wetland resource users to encroach on wetlands. Once the process of demarcating boundaries is on course, then buffers zones can be put in place as a measure to reinforce the 'respect' for those boundaries.

4.3 Intensify awareness creation: While community participation is already being archived through formation of Community Based Wetland Management Plans (CWMP), sensitization and educational programs to empower local communities with knowledge and awareness particularly on the ecological roles of wetlands need to be scaled up to influence a positive shift of attitude and practices towards these ecosystems

4.4 By-law formulation: The survey team made an observation that there was a general lack of by-laws to guide the implementation of interventions geared towards wetland resources management, and that resource degradation was being done with impunity. To counter this, we recommend that the COBWEB project triggers a process of enacting wetland by-laws and advises districts on an effective implementation mechanism. This can be done by bringing district councils on board in the implementation of the 4-year interventions in their respective jurisdictions.

4.5 Needs assessment: The current level of reliance on wetlands for survival is too overwhelming and in most areas the footprint can be seen. The demand for wetland resources in the surveyed areas is far beyond the ecosystem's carrying capacity, which is a recipe for resource degradation, reduced production, poor community health and aggravated poverty. There is, therefore, a need for COBWEB, with the support of the district, to assess needs of communities adjacent to wetlands and advise accordingly on how such needs can be addressed without necessarily degrading the wetland resource.

4.6 Popularize and enforce Environmental Impact Assessment: EIA as a tool for natural resource management (NRM) must be popularized and rigorously enforced for all proposed activities on wetlands for purposes of inclusion in wetland management planning and for resource use examination. In addition, with respect to Uganda's commitment to wetland management, new and innovative approaches that effectively integrate various aspects of wetland management be adopted to curtail the current excesses in human activity that degrade catchments and breed ecological imbalance.

4.7 Advise on wetland-based ecologically friendly enterprises: The COBWEB project should advise on activities that can be sustainably carried out in wetlands in an environmentally sound manner but yet making substantial contributions to household incomes. Enterprises related to eco-tourism, fish farming, craft making, forestry/woodlot management and bee keeping have proven their capacity to uplift communities from poverty and when well designed, they are more income generating than traditional destructive activities that communities find comfort in, in wetlands.

4.8 Factor in rural poverty: All through this report, we have laboured to demonstrate that the majority of the wetland adjacent communities are low income earners, perhaps due to limited alternative sources of income, low levels of education and cultural influence. Because of this, communities continually look at wetlands as the only means towards getting out of poverty, by way of using wetland-based goods and services to generate income but also for household survival. Indeed, discussions with communities revealed that poverty was one of the driving forces to wetland resource use (or misuse). This is likely to have implications on the extent to which project outcomes can be achieved. Thus there is need to promote alternative sustainable wetland-based activities and non wetland-based activities to double in reducing rural poverty, while at the same time easing the pressure on wetlands.

4.9 Information packaging: The way information on wetlands is packaged and communicated to its target audience will make a substantial difference from mere communication in the ordinary sense of the word. The survey findings reveal that formal education levels of most of the people in the communities neighbouring the wetlands are generally low. The fact that majority of the household decision makers have no formal education has implications for the type of wetland management and conservation message packaged for their consumption. As such the project ought to package its information in tailor-made styles and adopt direct communication methods e.g. village meetings and radio communication, and probably posters in the local languages as a more appropriate communication medium in communities of this kind of socio-cultural and economic set up.

5.0 CONCLUSIONS

There is evidence to indicate that Uganda's history in wetland management has not been without key milestones. Since1986, a number of landmarks have been made in legal and institutional development in response to undesirable trends in wetland destruction over the years. The constitution and the subsequent laws are quite realistic and impermeable. The requirement for Environmental Impact Assessments for example has been used as a decision making tool in the use of some wetlands. However a number of limitations and challenges still prevail and need serious attention. The success of the COBWEB project will be determined by the level of understanding of such impeding issues and the ability to design mechanisms for overpowering them.

The importance of wetlands in Uganda cannot be underrated and as evidence, almost all households surveyed in areas around Lake Bisina/Opeta and Lake Mburo/Nakivali benefit from wetlands in various ways. These findings show the role wetlands play in the lives of these communities. On the other hand this gives an idea on the extent of pressure that is being exerted to wetlands. Community training needs must be met, awareness creation on wetland values intensified, and laws and guidelines for wetland utilization formulated.

The project has raised expectations of stakeholders in their different capacities. A participatory approach to the implementation of COBWEB will go a long way in ironing out conflicts interest and giving an opportunity to stakeholders to partake in deciding on the next steps at different phases of project implementation. This will also concretize the sustainability plan, especially if target frontline beneficiaries (communities) get a sense that this is for their own good.

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APPENDICES

Appendix I: Indicators generated to monitor progress in achieving the project aim, objectives and outcomes

- Number of by-laws enacted and implemented for wetland conservation;
- Number of CWMP developed and implemented in the project sites;
- Number of policies influenced to integrate wetland issues;
- Number of wetlands with clearly demarcated boundaries;
- Number of planning processes influenced at district and sub-county levels to prioritize wetland issues in their jurisdictions;
- Number of people understanding the legal provisions on wetland utilisation and ownership among the communities;
- Number of Local Councils/Local Environment Committees actively engaged in monitoring wetland activities;
- Number of existing wetland use-related conflicts;
- Number of households involved in sustainable wetland utilisation activities (such as fishing, fish farming, beekeeping, craft making) in household economies;
- Wetland acreage under cultivation;
- Number of community members appreciating other ecological functions of wetlands apart from storing water and bringing rainfall;
- Number of community members appreciating, aesthetic and cultural values of wetlands;
- Number of technologies adopted by communities to reduce wetland degradation;
- Number of wetland resources used for commercial purposes that can be harvested sustainably;
- Number of people relying on wetland resources;
- Number of people undertaking wetland-based activities that have negative impact on wetlands;
- Number of people undertaking actions to reduce or mitigate negative impact of their activities on wetlands;
- Number of training events carried out among local communities to increase their knowledge of wetland laws and values;
- Number of people adjacent to the wetlands knowledgeable in laws and regulations governing wetland utilisation;
- Acreage of former degraded wetland area restored;
- Number of people knowledgeable in wetland values, both tangible and intrinsic;
- Number of local communities involved in the process of enacting wetland utilisation bylaws;
- Number of bye law enforcement cases handled by Local Environment Committees.

Appendix II: Wealth categorization criterion

Well-off	Moderately well-off	Poor	Very poor/ Destitute
• Owns a permanent house • House has adequate sanitary services • Owns a business • Owns a tractor • Has over 20 cows • Owns over 20 acres of land • Is able to sustain his family/provide for essential family needs	• Owns a semi-permanent house • Has 4 oxen and above • Owns 10 acres of land • Has a retail shop for daily income	• Does not own land • Resident in someone's house • Goes for casual labour to be able to feed his family • Sleeps on mats, rugs and no mattress	• Has no domestic animals/ birds • Has no source of income • Begs through out for survival

Appendix III: Sub-counties sampled for the survey in the project sites

Name of District	*Selected sub-counties*
Sironko	Bunambutye
	Muyembe
Katakwi	Magoro
	Kapujan
Kumi	Kumi
	Kolir
Nakapiripirit	Namalu
	Lorachat
Bukedea	Malera
	Korir
Soroti	Gweri
	Arapai
Isingiro	Kashumba
	Isingiro TC
Mbarara	Kakoba division
	Kakiika division
Rakai	Kyarulangila
	Kakyeera
Kiruhura	Sanga
	Kanyaryeru

Appendix IV: Survey instrument used during the field interactions

Name of interviewer: …….. Date: ……

Introduction: This survey is meant to collect the socio-economic information around Lakes Bisina-Opeta and Lakes Mburo-Nakivali, purposely to acquire information necessary for guiding use and sustainable management of the wetland system. The respondents have been randomly selected to ensure that the information selected is as representative as possible.

Village name:	Does the village boarder a wetland? Yes….. No……	If not, what is the distance from the nearest wetland ?	1. 0-5 Km 2. between 5-10 3. 10>	Parish	Sub-county	District

Name of respondent	Age of respondent (in years)	Sex of respondent: 1. Male 2. Female	Position of respondent in household 1. Head 2. Wife/ husband of head 3. child 4. Other	Education level of respondent 1. None 2. Primary 3. S1-S4 4. S5-S6 5. Tertiary
Number of household members in the household				
Wealth status of the household				

Summary of wealth status of the household 1. Well-off 2. Moderatly well-off 3. Poor 4. Destitute	General description of the homestead (type of houses, sanitation facilities)

1. Do all the school-age children attend school	1. Yes	2. No	
2. If they attend school, what type of school do they attend?	1. Tertiary (university/College) 2. Private secondary school 3. Government-aided secondary 4. Universal Primary school		5. Private Primary school 6. Other
3. If they do not attend school, why?	1. Cannot afford school fees and other school requirements 2. Children do not want to go to school		3. Lack of schools in the area 4. Other (specify)……
4. What is the main source of food for the household?	1. All food is produced on farm by household 2. Partly produced by household and partly bought 3. All is bought		1. Household members work for all the food 2. Receive handouts 3. Other……
5. Do you have enough food throughout the year?	1. Yes 2. No		
6. Does the family hire labour?	1. Yes 2. No		

7. What kind of work do they do?		1. Agricultural labour 2. Household work 3. Construction 4. Grazing of livestock 5. Shop keeping 6. Other (specify)……		8. How are they paid? 1. Monthly wage 2. Daily rate 3. In kind 4. Other (specify)
9. 10. Do members of your family sell their labour for cash/ or food?		1. Yes 2. No		
10. What kind of work do you do?			1. Agricultural labour 2. Household work 3. Construction 4. Grazing of livestock 5. Shop keeping 6. Other (specify)……	11. How are you paid? 1. Monthly wage 2. Daily rate 3. In kind 4. Other (specify)
12. Does the family have any means of transport? Yes No	13. What means of transports? 1. Motor vehicle 2. Motor cycle 3. Bicycle 4. Canoe/boat 5. Donkey 6. Other (specify)	15. Does this household have: 1. Radio 2. Television 3. Mobile phone	15. Does this household own any of the following: 1. Land in acres 2. Buildings for rent 3. Agricultural equipment (tractor/ os plough)	4. Livestock (list and give numbers) Cows…….. Goats…… Sheep…….. 5. Other (specify)……..

POPULATION MOVEMENTS AND SETTLEMENTS

16. How long has your household settled here?	**1. <5 years ago** **2. 5-10 years ago** **3. 11-15 years ago** **4. 16-20 years ago**	5. 20> years ago
17. If settled in the last 15 years, where did you come from?	**1. Within the same village** **2. From neighbouring village** **3. Within the same parish** **4. From neighbouring parish**	6. Within the same sub-county 7. From neigbouring sub-county 8. From another district 9. Other (specify)
18 Why did you choose to settle here	**1. Availability of land for cultivation** **2. Availability of land for grazing** **3. Availability of water** **4. Good climate** **5. Availability of market for produce**	6. Availability of fish 7. Availability of infrastructure (schools, health services etc) 8. Displaced by conflicts 9. Other (specify) .....

COMMUNITY AND HOUSEHOLD SOCIO-ECONOMICS

21. What are the main sources of income for this household? List them and rank	Rank according to importance	22. For the 3 ranked income sources, estimate the average income per month

BENEFITS AND CHALLENGES OF BENEFIT UTILIZATION

23.a) Do wetlands have any values beneficial to the community?	Yes …… No……..			
24. What benefit does the community derive from the wetlands? (list them)	Rank them			
26. Does your household experience any problem related to the existence of wetlands in this area?	Yes…….	No…….		
27. If yes, List them				
29. Which wetland-based enterprises are profitable in this area?				

28. Do you think your area should be maintained as a wetland?	1. Yes…….	2. No……..	
Give reasons			

ACCESS, USE AND OWNERSHIP OF WETLANDS

30. Do you own land in this area? 1. Yes 2. No	35. Under what land tenure do you own the land which is not under a wetland? 1. Freehold 2. Leasehold 3. Customary 4. Public land 5. Mailo land 6. Squatter
31. Approximately how much land do you own? In acres…….. ……acres	
32. How much is not wetland? In acres ……..acres	
33. How much of it is wetland? In acres ……..acres	
34. How did you acquire the land you own? 1. Inherited 2. Bought	3. Rented 4. Squatter 5. Other (specify) ……

36. Which wetland resource does this household use?	Rank	37. Who uses it? Men, women, both, youth-males, youth-girls	38. In what months is the resource used	39. Is the use commercial, subsistence or both	40. Where do you sell the products	41. If commercial, How much money do you get per month (approximately)
13. Water for domestic use						
14. Water for irrigation						
15. Water for brewing						

16. Water for livestock						
17. Land for cultivation						
18. Land/ pasture for grazing livestock						
19. Land for growing trees (woodlots)						
20. Fish farming						
21. Land for settlement						
22. Building poles						
23. Papyrus						
24. Hunting						
13. Crafts materials (specify)						
14. Grass (specify use)						
15. Fibre (specify use)						
16. Wild fruits						
17. Medicinal herbs						
18. Rattan cane						

19. Palm leaves (specify use)						
20. Bee keeping						
21. Fishing						
22. Cultural activities (specify)						
23. Clay						
24. Sand						
25. Firewood						

VALUES AND SUSTAINABLE UTILIZATION OF WETLANDS

46. Are there any practices or uses in your area that may have negative effects on wetlands? (list them) 1. Yes 2. No	Rank them	47. What are the negative effects associated with these activities	48. What is your community doing to minimize the negative effects
1			1
2			2
3			3
4			4
5			5
6			6

7			7
8			8
9			9
10			10
49. If your household was asked to reduce activities in wetlands, is there any alternative? (list them)		50. What does your household require to engage in alternative activities (list them)	51. What can your household do to develop alternative activities?
52. What can be done to ensure sustainable use of wetlands? (list)		53. Do you think people need training to use wetlands? Yes…….. No…….	54. Which people should be trained? (List) and on what should they be trained

(Footnotes)

1 Not every respondent was a household head. This is why the figure does not give a total of 320

Notes:

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