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## **ASSESSING THE PERCEPTION OF FRINGE COMMUNITIES ON WETLAND MANAGEMENT IN UGANDA: CASE STUDY OF RUFUUHA WETLAND, NTUNGAMO DISTRICT**

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### **ABSTRACT**

To ensure the health and wellbeing of the human population, wetlands should be managed sustainably to continue the services they provide and the justifiable exploitation of the earth's resources. Cautious action needs to be directed towards the maintenance of the significant support systems of the ecosystem services on the globe, such as wetlands. This study aimed to assess the perception of fringe communities on the management of the Rufuuha wetland, Ntungamo District in south-western Uganda. The methodologies used in this study included simple random sampling. Results indicated that the state of Rufuuha wetland has been notably influenced by a lack of awareness of the wetland laws and regulations and a high local illiteracy level on sustainable wetland management. There is a need for sensitization of the community and an encouraging bottom-up approach in formulation and implementation of wetland laws.

**Key words:** Perception, fringe community, wetland management, Ntungamo District.

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## 1. INTRODUCTION

Wetlands are defined as areas that are permanently or seasonally flooded by water and where plants and animals have become adapted (National Environment Act 1995). They provide a wide variety of goods and services ranging from flood control, water purification, food supply, cultural value, aesthetic beauty, medicinal values and recreation services, among others (Mitsch & Gosselink 2015). Worldwide, wetlands play a critical role in maintaining many natural cycles and are an important biodiversity reservoir and it is, therefore, important to protect them (Daigneault et al. 2012). They are also regarded as one of the most important and productive ecosystems. Wetlands degrade due to increasing population, policy failure, inadequate awareness and lack of baseline information. Plant and animal biodiversity has been lost due to different agricultural practices and other land use in wetland areas which the community perceives to be more beneficial. Due to population increase and poverty, it is difficult to change the perception of local people and conserve wetlands. They see these wetlands as their immediate alternative to support their livelihood. Wetland management differs depending on the ecosystem services they provide. Different management techniques depend on target species. It should be noted that about 40% of the world's species depend on wetlands during their life cycle (Erwin 2009).

Ntungamo District in south-western Uganda is endowed with wetlands that are categorized as seasonal and permanent. They provide social, economic and regulating services, such as water for both domestic use and livestock, fishing, grass for mulching and thatching, flood control, climate modification, and others (Ntungamo District Development Plan 2015-2016/2019-2020).

Despite the ecosystem services provided by the wetlands, the fringe communities have continued to degrade them (Verma & Negandhi 2011). Efforts have been put in place to sensitize communities, enforcement has also been carried out by technical staff, wetland compliance monitoring has been taking place, but no remarkable transformation is seen. Therefore this study on assessing the perception of fringe communities on wetland management in the Ntungamo District has been carried out.

This study had specific objectives:

- i. To examine community perception on the value of the wetland in the Ntungamo district.
- ii. To examine the levels of community awareness on wetland laws and regulations
- iii. To examine wetland management approaches used in the Ntungamo District

Furthermore, this study aimed at answering the following questions: What are the perceived values of the Rufuuha wetland? Are you aware of the laws and regulations on wetland management? What are the wetland management approaches used in the Ntungamo District?

### 1.1 Justification

Wetland degradation in Uganda has recently received considerable attention within many studies focusing on activities like wetland draining, urbanization, overgrazing, economic evaluation, and mining (Muriithi 2014). However, the understanding of the perception of fringe communities on wetland management in the Ntungamo District, Uganda, is very limited. Despite the Ugandan

Government attempt to involve all stakeholders including local communities in the management of natural resources there is little knowledge about residents' perceptions and attitudes towards wetlands management in the Ntungamo District (Ministry of Water and Development n.d.).

The Rufuuha wetland is one of the largest wetlands in Ntungamo, occupying 20.5 km<sup>2</sup>. It provides water for domestic use and livestock, food, mulch, thatching material, and grazing land during the dry season, and it controls floods, purifies water and provides income for the people who surround it.

Without understanding the perceptions of local communities on the values and attitudes towards wetland management in the Ntungamo District, it would be difficult to protect the Rufuuha wetland. It will also be impossible to properly manage the Rufuuha wetland when the local communities in the Rufuuha catchment are not aware of laws and regulations on wetland management in Uganda. There is thus a need to examine their level of awareness on the laws and regulations governing the wetland.

District Environmental officers in Uganda have been involved in wetland compliance monitoring and inspection, sensitizing the public on environmental policies as well as enforcing the environmental laws and regulations. The most important tool that has been guiding their work is the National Environment Act Cap 153 of 1995. Despite all efforts at issuing improvement notices, sensitization continuous monitoring wetlands have continuously been degraded.

The study will inform the District Council of permanent solutions for mitigating wetland degradation and enable budgeting for wetland-related activities since it has been the least funded department in the District. Since this is a pilot study it will contribute to the management of the wetland in the District.

The study will also inform policymakers of the fringe community's perception and come up with recommendable solutions since they are the primary users of the resource that the government protects. Stakeholder participation will have to be involved in the formulation of laws and policies because the approach has been more of a top-bottom approach which has brought more challenges at the implantation level since the communities are the ones responsible to manage wetlands in their areas of jurisdiction.

## **1.2 Importance of wetlands**

Wetlands regulate nutrient retention, flood, water storage and wastewater treatment (Pattison-Williams et al. 2018). Wetlands perform several ecosystem services that are internationally recognized as an important ecosystem conservation of biodiversity (Namaalwa et al. 2013). They also perform some functions in the regulation of hydrology, water purification and flood control (Huisling 2001). Some aesthetic values and significant ecotourism potential can also be derived (Cubbage et al. 2007). Wetlands improve the health of human beings through the provision of a variety of foods, for example fish, rice, and livestock rearing. Milk as a product is also beneficial for the health conditions and income for most people and hence supports an improved standard of living (Turyahabwe et al. 2013).

Wetlands store surface water and maintain a high water table (Chuma et al. 2012). However, the performance of wetlands in improving water quality depends on applied loading rates and natural conditions, i.e. wetland structure, hydraulic and water flow patterns within the wetlands (Mitsch & Gossilink 2000).

### **1.3 Wetlands in Uganda**

Uganda is gifted with vast wetland resources ranging from grass swamps, marshes and a seasonal floodplain (Namaalwa et al. 2013). These resources serve a greater proportion of the community that depends on them for water, fish, construction materials, food crops and livestock grazing (Uganda Bureau of Statistics 2012).

Wetlands in Uganda cover approximately 26,600 km<sup>2</sup> or about 11% of the total land area (241,500 km<sup>2</sup>). The Ntungamo District has 258.6 km<sup>2</sup> of wetland and 62% of this is regarded as permanently wet and 38% seasonally wet (Turyahabwe et al. 2017). Most wetlands in the Ntungamo District are dominated with papyrus species which include grasslands and traces of swamp forest.

The wetlands in Uganda have experienced reduction because of the continuous use by the population. This has led to a reduction to 10.9% in 2008 (Nsubuga et al. 2014). In Uganda, 80% of the population is directly involved in agriculture and others are reliant on the wetlands around them for different goods and services for both domestic and commercial uses (Uganda Bureau of Statistics 2016; Mitsch & Gossilink 2000). The continuous use of the wetland has led to an increase in clearance of vegetation, draining and diversion of water flow, crop cultivation, overgrazing, sand mining, and exposing the soil surface to erosion. These trends continue to be observed in different parts of the country of which Western Uganda is no exception.

### **1.4 Fringe Communities**

The commitment of fringe communities to protect wetlands is essential in wetland management. However, in many areas of Uganda former strategies, including coercion, kept humans from wetland areas (Huising 2001). Fortunately, more recent authorities tend to allow the local communities to monitor or take control of the management of the wetlands but little is known about residents' perceptions, beliefs, and attitudes towards management of wetland areas (Glass 2007).

Educated people are more likely to be able to comprehend information on wetland policy and legislation provided through various channels more easily than those not educated. This is attributed to: (i) industrial expansion in Uganda that target wetlands in urban areas; (ii) abundance of poor urban people who depend on subsistence farming especially in the Lake Victoria Crescent agro-ecological zone comprising wetlands adjacent to Kampala and the nearby towns of Wakiso, Entebbe and Mukono and Jinja (formerly, an industrial city) (Turyahabwe et al. 2013); (iii) the lack of awareness about informal rules can also be pinned on the fact that the influx of people to wetland areas in search of livelihood opportunities as suggested by Vodouhê et al. (2010).

## **2. METHODS**

This section discusses the study area, methods that were used during data collection and data analysis. The project was carried out in the Ntungamo District, south-western Uganda.

### **2.1 Study Area**

The study was carried out in the Rufuuha wetland system, which is a chain of wetlands along the Rufuuha stream, a tributary of the River Kagera in south-western Uganda (Fig. 1, 2, 3) in Ngoma and Rweikiniro sub-counties, Ntungamo District. The Rufuuha wetland is a permanent wetland dominated by papyrus and the largest wetland in the Ntungamo District (NDDP, 2015-2016/2019-2020).

Ntungamo District is in south-western Uganda between latitudes 0° 35' and 1° 15'south and longitude 30° 05' east. It lies in the Ankole-South Uganda Climatic Zone. The rainfall received is mainly conventional and averages about 900 mm per annum. There are two rainfall regimes. One season runs in March to May and the wetter season in August to November. Two dry seasons occur, with a pronounced one in June-July and a less severe one and often interrupted by scattered showers between December and February (Ntungamo District Development Plan 2015-2016/2019-2020).

The Ntungamo District borders the Kabale District in the south, the Rukungiri District in the west, the Shema and Mitooma Districts in the north, the Mbarara District in the north-east, the Isingiro District in the east, and the Republic of Tanzania and Rwanda in the south-east (Fig. 1).

The District was created in 1993 as part of the decentralization policy to draw services nearer to the people. It covers an area of 2,158 km<sup>2</sup> with a population of 483,841 according to the Uganda Bureau of Statistics (2017). Females constitute 52% of the population compared to 48% males. Furthermore, 85.8% of the population live in the rural areas and are entirely dependent on agriculture for their survival.

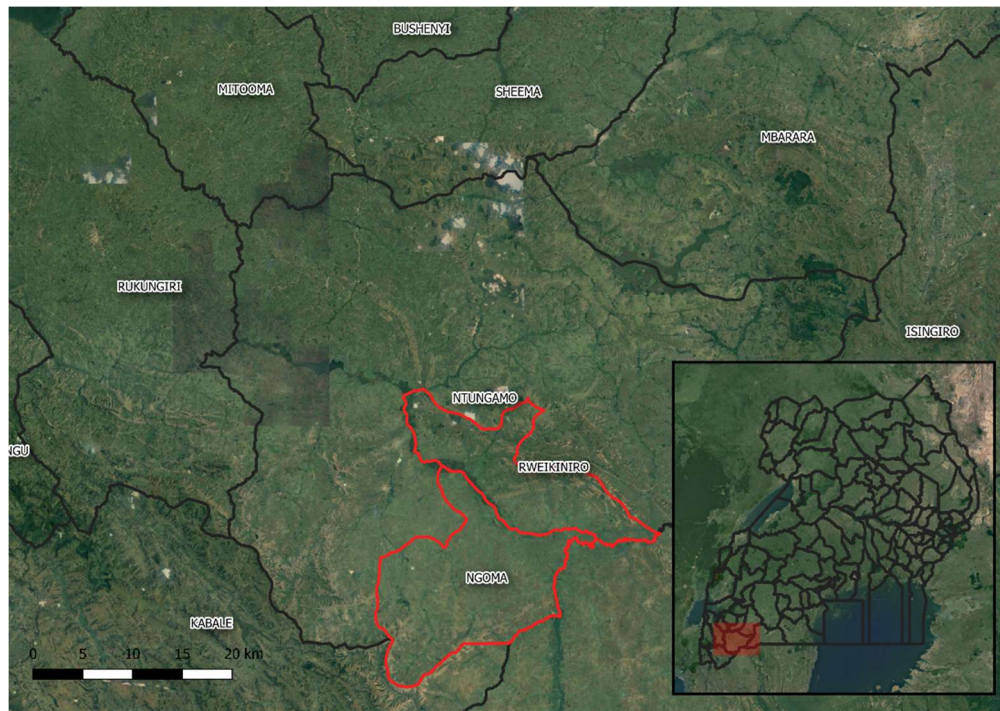


Figure 1. Map Showing Ntungamo District, south-western Uganda (Basemap source: Google Earth 2018).



Figure 2. Section view of Rufuuha wetland south-western Uganda showing a well dug for livestock water and the watering troughs (Photo: E Turyamureeba 27 June 2018).





Figure 3. Section view of Rufuuha wetland south-western Uganda showing mudfish trapping (Photo: E, Turyamureeba 27 June 2018).

## 2.2 Data collection and data analysis

Simple random sampling was used to obtain target respondents in the Rufuuha wetland catchment area. Data were collected using an approved structured questionnaire which consisted of both open- and closed-ended questions (see Appendix I). This tool was used because the survey involved mixed groups that were literate and illiterate and was able to accommodate both categories to fill out the questionnaire.

Rweikiniro and Ngoma sub-counties were the pilot areas where 30 approved questionnaires were administered to respondents. Eight technical officers answered the questionnaires, including the Chief Administrative officer, production coordinator, parish chief, Agricultural Officer, Senior Land Management Officer, sub-county Chief of Rweikiniro, two sub-county local council chairpersons, local council councillor and 22 local people that neighbour the wetland. This totalled 30 respondents who participated in the survey.

The interview was steered by three research assistants: District Staff surveyor, senior land management officer and a graduate trainee from the Environment Department, since they were familiar with the area and were also fluent in the local language. Data were collected between 25<sup>th</sup> of June and 8<sup>th</sup> of July 2018 (Fig. 4 – 6). Questionnaires were based on the objectives of the study. (Appendix I & II). Secondary data were also collected through a search of the relevant literature connected to the project.



Figure 4. Research Assistant administering a questionnaire to a community member (Photo: E. Turyamureeba 28 June 2018).



Figure 5. Technical staff concentrating on filling out the questionnaire (Photo: E. Turyamureeba 26 June 2018).



Figure 6. Showing field surveyor collecting data in the community (Photo credit: E. Turyamureeba 28 June 2018).

The data were coded and analysed using the Microsoft Excel computer program. It was used to generate tables, graphs, and pie charts that were used as a basis of the results, discussion, and conclusions.

### **3. RESULTS**

This section represents the responses obtained from the respondents that include demographic information, community perception on the values of the Rufuuha wetland, and their level of awareness about the laws and regulations and wetland management approaches used in the Ntungamo District. The data are presented using tables, pie charts, and graphs. All participants responded to all the questions. The wetland is being used by both men and women and therefore answers from everyone were all factored in the data collection.

#### **3.1 Demographic Information**

The majority of the respondents were male or 73%, while 27% were females. The age groupings of respondents are shown in Figure 7.

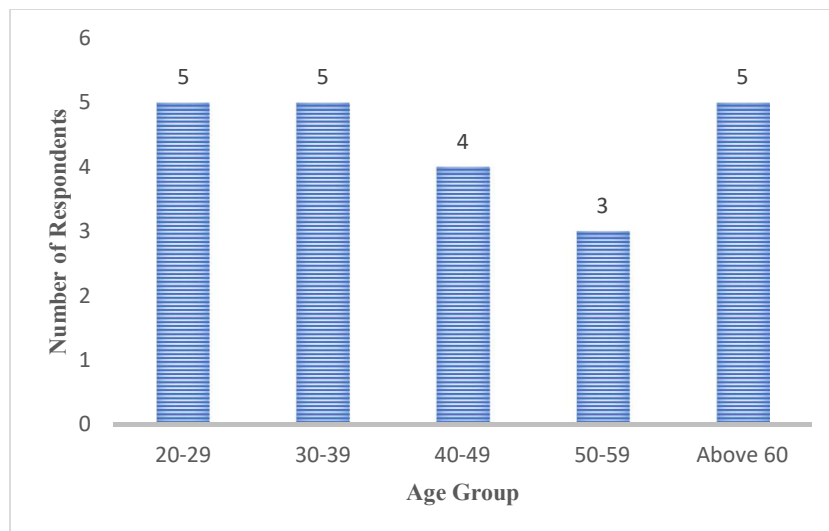


Figure 7. Age groups of respondents (Appendix I, question 2).

The educational level of the respondents is shown in Figure 8. The survey shows that 11 respondents did not go to the highest school level, whereas just two people had gained a secondary education, and three people received college or university education.

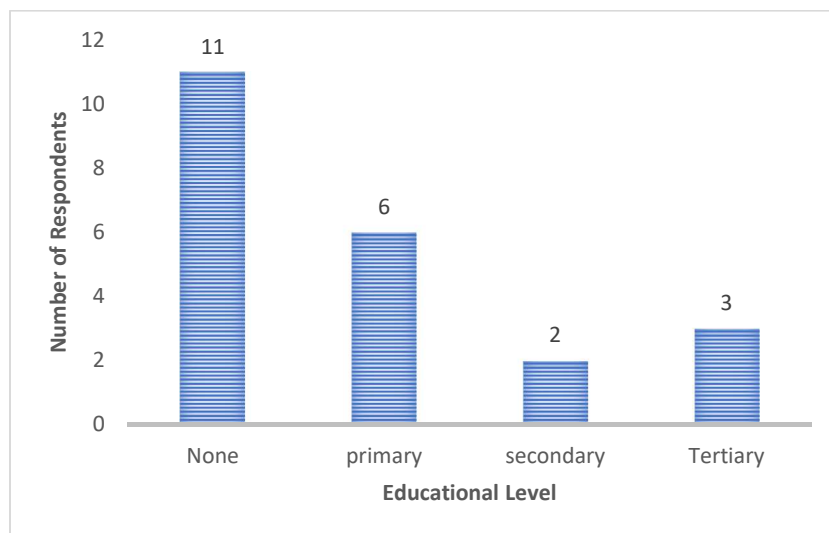


Figure 8. Educational level of respondents (Appendix I, question 4).

### 3.2 Community perception of the values of the Rufuuha wetland

When asked about the values of the Rufuuha wetland respondents provided a list of the values (fishing, water supply for both domestic use and livestock, grazing land, etc.). Figure 9 shows the responses by the community. Fishing recorded the highest percentage (24%) and recreational purposes recorded the least (14%).

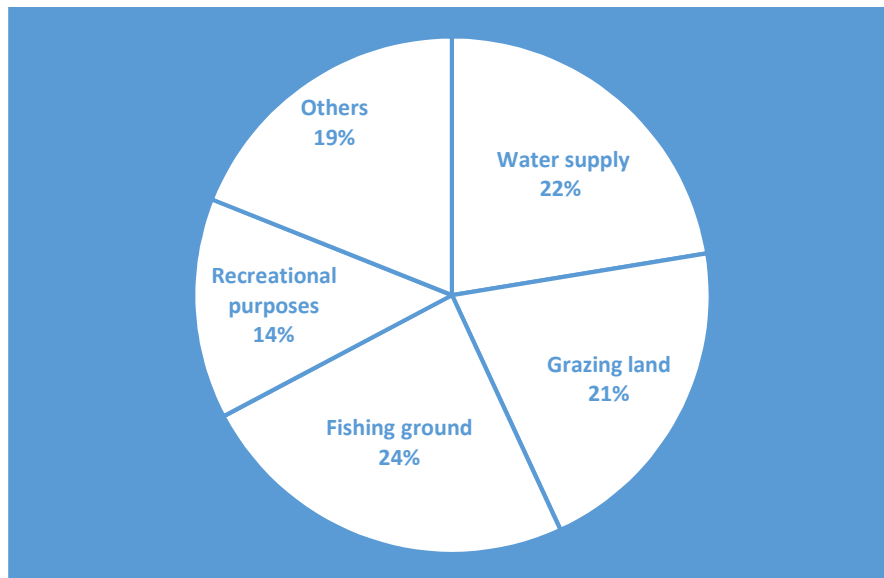


Figure 9. Community perceived values of Rufuuha wetland (Appendix I, question 5).

Respondents showed a high level of importance (20) of the wetland when asked about the importance of the wetland in the community, as presented in Figure 10 (Appendix I, question 6).

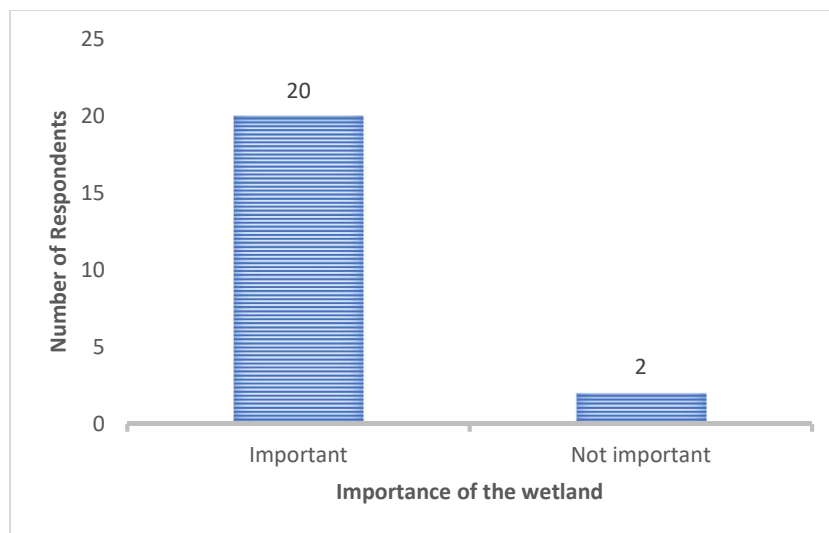


Figure 10. Importance of Rufuuha wetland to community livelihood (Appendix I, question 6).

### 3.3 Community awareness of the wetland laws and regulations

The majority of respondents (20) were not aware of the laws and regulations already passed concerning management and use of wetlands. Only two respondents were aware of the laws and regulations, representing the least responses (see Fig. 11).

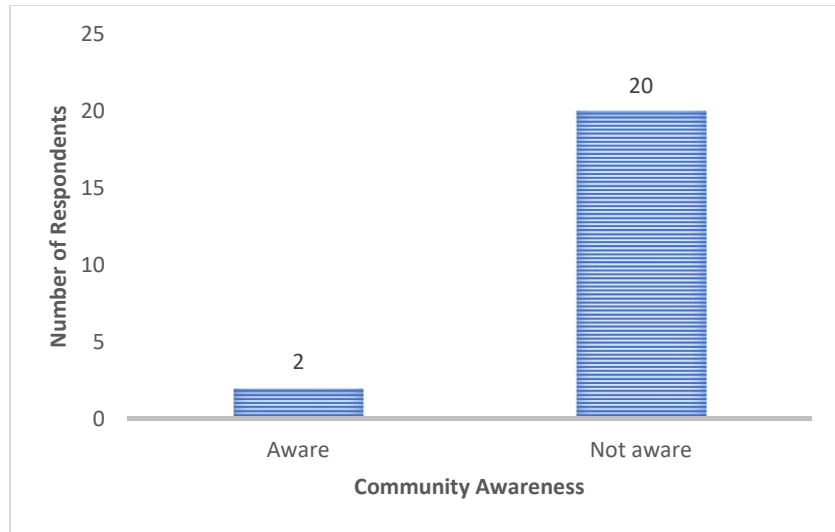


Figure 11. Community awareness of the laws and regulations of the wetland (Appendix I, question 9).

The results show that both men and women will be affected when the wetland in the community no longer exists, as indicated in Figure 12. Of the 22 respondents, 11 said that both men and women (11) would be affected since the goods and services derived from this wetland benefit them all, and responses for females recorded the least affected.

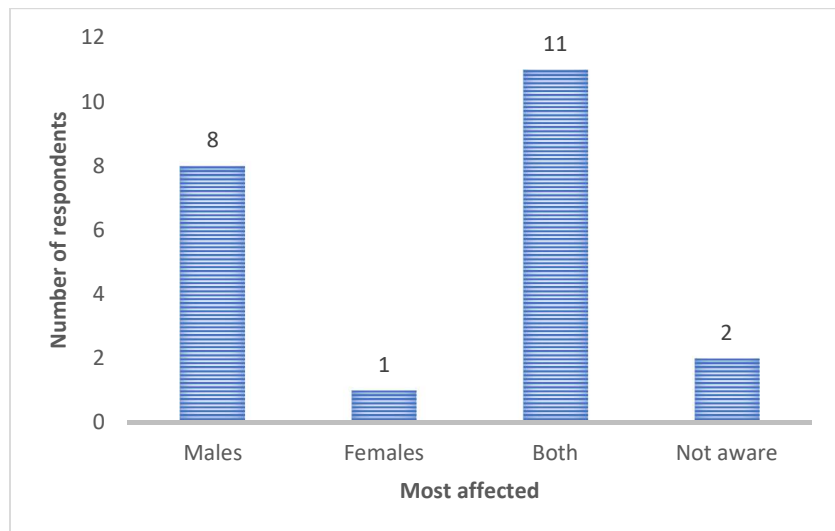


Figure 12. Opinion of the gender that is most affected when the wetland disappears (Appendix I, question 15).

Based on the responses on why wetlands are protected. 81% of the respondents showed some awareness of the protection of the wetland but 19% said they were not aware (see Fig. 13).

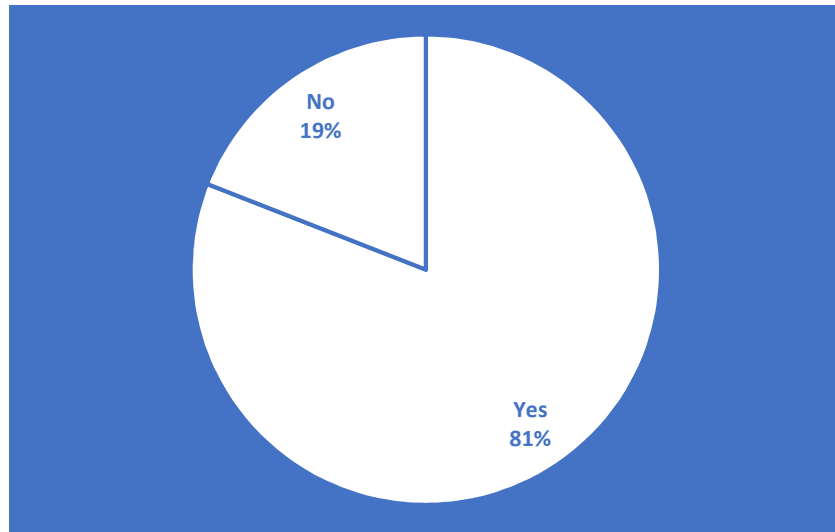


Figure 13. Awareness of wetland protection by the respondents (Appendix I, question 14).

Responses from 86% of the respondents showed that they had seen the wetland change due to different agricultural practices and this has been evidenced through continuous reduction of the size of the wetland (see Fig. 14) (see Appendix I, question 14).

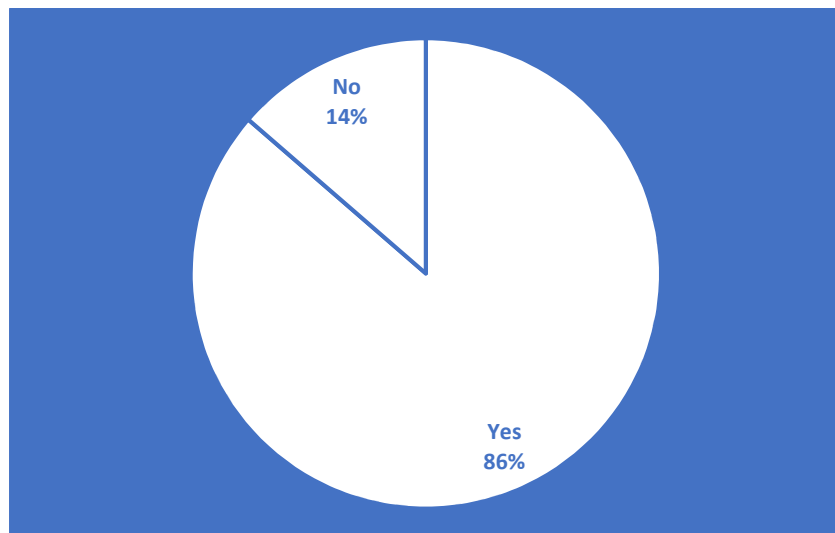


Figure 14. Number of respondents that recognized changes in wetland size (Appendix I, question 17).

Respondents envisaged a big change in the Rufuuha wetland, with 11 citing encroachment as the highest cause of change and change in rainfall patterns recorded by eight respondents (see Fig. 15).

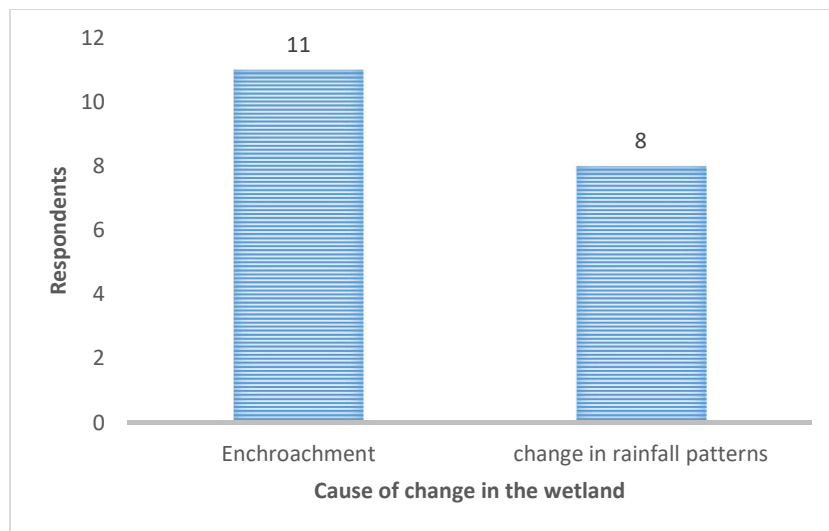


Figure 15. Detected causes of the change in the wetland by the respondents (Appendix I, question 17).

As shown in Figure 16, 77% of the respondents noted that the sub-county and parish officials do not carry out wetland inspections and sensitizations.

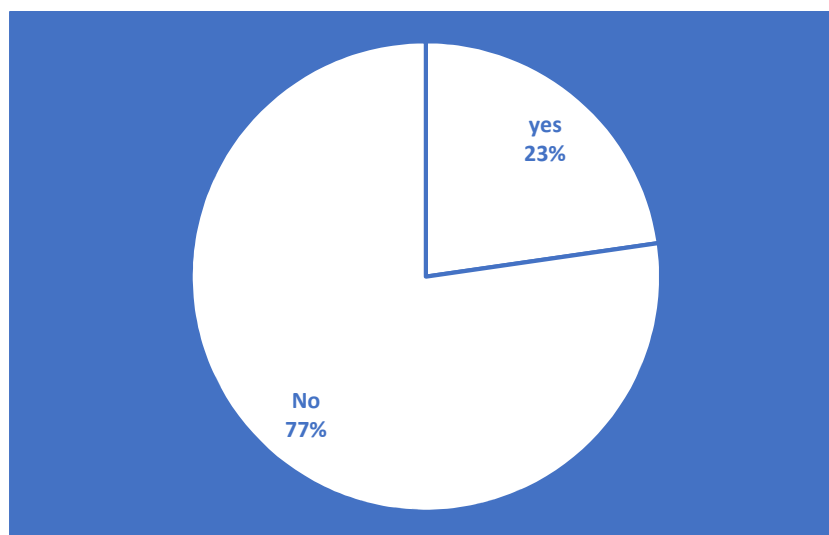


Figure 16. Community perception on the carrying of sub-county inspections/training on locals (Appendix I, question 13).

### 3.4 Wetland management approaches used in Ntungamo

The gender ratio of technical staff was also surprising, as the majority were males (see Fig. 17) and there is a dire need to recruit female staff to have a reasonable gender balance for effective service delivery.



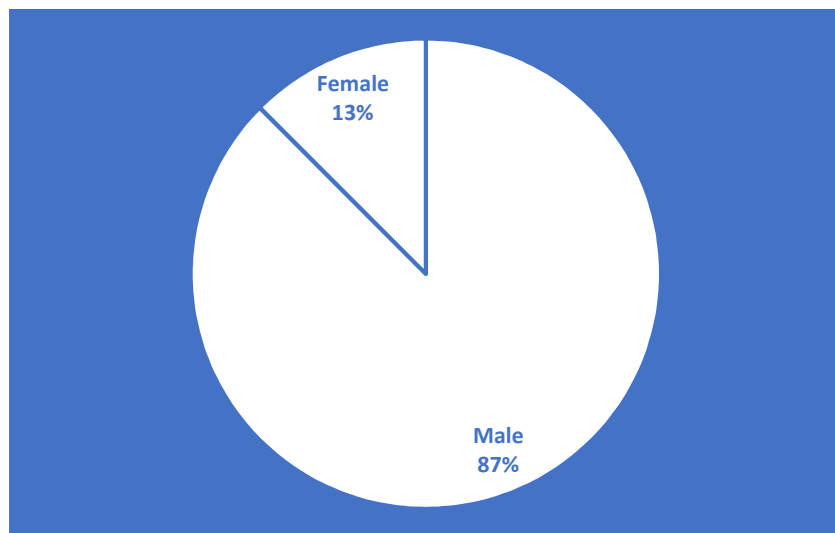


Figure 17. Gender of Respondents (Appendix II, question 1).

The majority of the respondents fell in the group range of 30-39, and 40-49 (see Fig. 18).

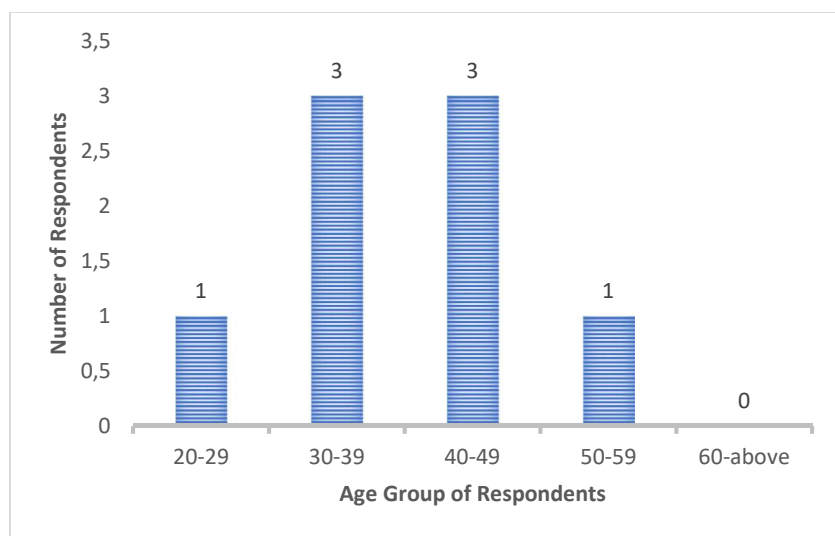


Figure 18. Age Group of Respondents (Appendix II, question 2).

All the technical staff (according to the technical staff responses) had attained college/university training and are supposed to lead the community in awareness and sensitization.

The majority of the respondents carried out monitoring quarterly, and this could be because release of funds from the central government is carried out on a quarterly basis, hence making them do most of their monitoring in that period (see Fig. 19).

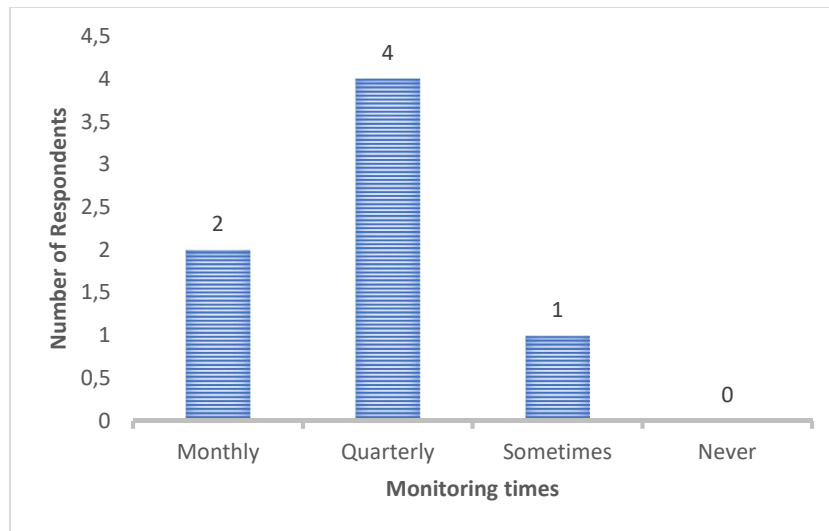


Figure 19. Monitoring schedules by Technical officers (Appendix II, question 6).

According to the technical respondents they mentioned sensitization, enforcement, and restoration of wetlands as approaches to wetland management (see Fig. 20).

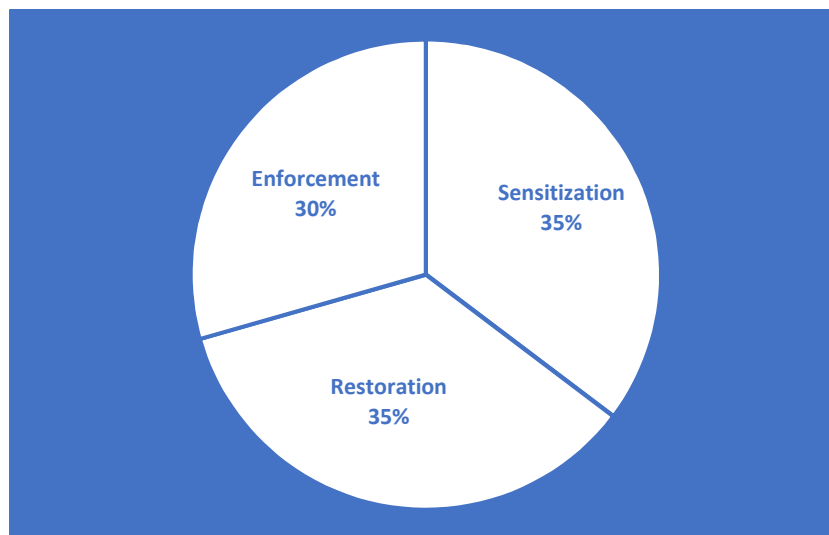


Figure 20. Wetland management approaches conducted by the technical respondents (Appendix II, question 5).

## 4. DISCUSSION

### 4.1 Demographic information

The Respondents were both males and females of different age groups (see Fig. 18). The gender of respondents shows a balance between the age groups, indicating a differential use of the wetland for their livelihood through fishing, grazing and harvesting grass for thatching and mulching. The results showed that the majority of community respondents had no formal education. This

indicated a high level of illiteracy by the community members, which in turn affects the management of the wetland. It is very difficult for them to understand the laws and regulations that govern wetland management, much less understanding the reasons for the management. This is reflected in a study by Rojas et al. (2017) which shows that most users (communities) around wetlands do not understand the laws and regulations governing it. The age grouping of respondents also suggested that the wetland is used by all, based on the need or value derived from it, as has been also suggested by Turyahabwe et al. (2013).

#### **4.2 Community perception of the values of the Rufuuha wetland**

According to the results from the community, the wetland provides a water supply for both domestic use and livestock, food, fishing for domestic and commercial purposes, and grass for mulching and thatching houses. The majority of the respondents indicated the importance of the wetland in their daily activities and mentioned more than one benefit they gained from the wetland. This related to the study by Muriithi (2014) who indicated the major services wetland provides to the users. Nsubuga et al. (2014) also suggested that wetlands play a crucial role in domestic water supply, watering livestock, agriculture and fish resources, as is also documented in UNCCD (2017). It is based on these values that the people derive from the wetland that they attach importance to it. MEA (2005) also mentioned that access to high quality water is an important component in human wellbeing, and therefore, wetlands and fringe communities are symbiotic.

#### **4.3 Awareness of wetland laws and regulations**

Based on the results, most of the respondents are not aware of the laws and regulations that govern wetland management and that could be the cause of the high levels of encroachment and wetland destruction. This could also be due to low levels of education and income status (Turyahabwe et al. 2013). The communities are not involved in the formulation of the laws and policies; hence the need for a bottom-up approach and more effort on community sensitization about the laws and policies. It is paramount in wetland management for them to appreciate that the wetland is a finite resource; hence the need to protect it for sustainability. Reflecting on the results from the technical staff, it was seen that officials do not carry out regular monitoring and inspections or sensitize them to the need to protect the wetland. The results in Figure 12 also revealed that everyone is using the wetland and that, therefore, both men and women would be greatly affected if the wetland were to disappear. When asked about the changes in the wetland due to the continuous use by the community members, the majority of the respondents indicated a change in the wetland based on the decrease in the water level and reduction of the size since most people are now farming in the wetland as their source of livelihood. Others are continuously fetching water from the wetland for domestic purposes. This is supported in a study by Turyahabwe et al. (2013) stating that when people or users of the wetland are not educated on the laws and regulations governing the ecosystem, they tend to use it uncontrollably.

#### **4.4 Wetland management approaches used in the Ntungamo District**

The results indicated that the wetland management approaches used in the Ntungamo District included restoration, sensitization, and enforcement (see Fig. 20), and these has often been carried out by the District staff on a quarterly basis (see Fig. 19) The management approaches were being

implemented by the technical staff though not on a large scale because the natural resource sector in the Ntungamo District in western Uganda is one of the least funded and more understaffed and therefore it becomes difficult to reach all 17 sub-counties.

Enforcement as one of the approaches carried out by only gazetted environment inspectors who have the power to prosecute in courts of law in accordance with the National Environment Act Cap 153. This leaves a loophole at the enforcement since the officers at the sub-county level don't have the full mandate of enforcement. Restoration of the wetlands is pertinent in wetland management since it is the best way for the local community to be sure of access to clean and safe water for domestic and livestock use since hydrological functions will be restored for sustainability (UNCCD 2017).

## **5. CONCLUSIONS AND RECOMMENDATIONS**

The research has opened eyes to the issues that were taken for granted by the district and therefore multiple approaches must be employed to sustainably manage the Rufuuha wetland. The values of the wetland were well known to the community and they recognized the importance the ecosystem has in sustaining their livelihood. It is paramount that the communities are involved in the restoration and management of the Rufuuha wetland since they have seen a reduction of the wetland size through encroachment by digging channels and the introduction of invasive species. This study provides a series of recommendations for the future management of the Rufuuha wetland based on the obtained results:

- ❖ The community should be made aware of the wetland laws and regulations through continuous sensitization as a gradual process since they are the primary users of these resources and the non-existence of the ecosystem affects all genders.
- ❖ The enhancement of the role of the local Government Institutions at parish, sub-county, and the district levels need to be streamlined so that everyone has an impact on good wetland management.
- ❖ The laws and regulations that govern wetland management should be translated into the local language since most of the respondents have not gone to school and officers at the parish level, for example parish chiefs, take part in sensitizing them to the needs.
- ❖ The importance and values of the wetland provided the people are well known to them and therefore with community involvement and making the research results known will make it possible for the country to always make informed decisions.
- ❖ Sensitization and awareness creation should be enhanced to manage the Rufuuha wetland and this can be done through community mobilization to enhance sustainable wetland management. The existing laws and regulations that govern wetland management should be disseminated to the end users and charged with a responsibility to properly manage wetlands in their areas of jurisdiction.

- ❖ The Department of Natural Resources should be staffed since it is seen that it has only skeletal staff that find it difficult to reach the communities and adequately sensitize communities and regularly carry out enforcement of the law and regulations. The capacity of wetland management interventions should be strengthened to have broader stakeholder engagement, knowledge development, and be able to protect the wetland.
- ❖ There is a need to rejuvenate the environment committees at the parish sub-county levels so as to capture issues that affect people at all levels.
- ❖ There is a need for stronger political will and engagement to protect wetlands since their voices can easily be heard by the community who entrusted and voted for them; as their leaders, this will encourage and enhance more local participation and involvement in wetland management.
- ❖ There should be encouragement for attendance at adult literacy classes as the findings showed that the majority of the respondents had never gone to school; adult literacy classes will help them appreciate more the values and functions of wetlands and thus the need for protection.
- ❖ The District and central government should take into consideration the creation of alternative means of livelihood for the people who have been integrated during restoration and sensitization so that they have hope even when they don't encroach on the wetland. The concept of wise use should prevail and alternatives be presented, for example an apiary, to reduce wetland degradation.
- ❖ A bottom-up approach should always be taken as a key consideration when policies and laws are being formulated in order to enable the community fully to participate in formulation and implementation.
- ❖ The District should annually come up with a District state of environment report to track the progress of wetland management, associated challenges, and strategies to solve the problems.

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**APPENDICES**

**APPENDIX I**

**QUESTIONNAIRE FOR FRINGE COMMUNITIES**

Dear respondent I am Dinnah Tumwebaze a fellow at United Nations University pursuing a post graduate certificate in land restoration and sustainable land management in Iceland.

I am carrying out research entitled, “Assessing the Perception of Fringe communities on wetland Management. Case study Rufuha wetland Ntungamo District.” The information that you will provide in this questionnaire and your personal identification will be kept confidential while using the information for research activities. So, I humbly request you to mention your own reality in this questionnaire with full confidence. Please feel free to express your opinion

Name: \_\_\_\_\_  
 Sub-county: \_\_\_\_\_ village: \_\_\_\_\_ Parish: \_\_\_\_\_

**SECTION I: DEMOGRAPHIC INFORMATION**

Tick the correct option

**1. Gender**

Male: \_\_\_\_\_ Female

**2. Age group**

20-29, 30-39, 40-49, 50-59, Above 60

**3. Marital status**

Single Married Divorced Widow

**4. Level of education**

None Primary, Secondary, tertiary

**SECTION II: COMMUNITY PERCEPTION ON THE VALUE OF RUFUHA WETLAND (1)**

5. What are the perceived values of Rufuuha wetland?

a) Source of water for supply

b) Grazing lands

c) Fishing ground

d) Recreational purposes

Others specify.....

6. In your view do you think Rufuuha wetland for your livelihood? Yes/No (1)

If yes How?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

7. Attitude of people towards Rufuuha wetland on Values. (Tick the correct answer)

S/N	Statement	Agree	Don't know	Disagree	Not applicable
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1	<b>Non- consumptive use values</b>				
	Rufuuha wetland provide a place of beauty				
	It beautify rural landscape				
	Help to conserve native plants and animals				
	Provide habitat for fish				
2	<b>Indirect use values</b>				
	Rufuuha wetland increase bird life				
	Reduces water pollution				
	Help to trap and recycle nutrients				
3	<b>Production impacts of Rufuuha wetland</b>				
	Help to control floods				
	Help to prevent erosion				
	Help to purify water				
4	<b>Direct use value</b>				
	Provide grounds for fishing				
	Provide grounds for hunting				
	Provide grounds for tourism and recreation				

8. What are the perceived costs of Rufuuha wetland?

- a. Harbors nuisance animals
- b. Water logging
- c. Limits access to some areas
- d. Others specify.....

**SECTION III: COMMUNITY AWARENESS ON WETLAND LAWS AND REGULATIONS (2)**

9. Are you aware of the laws and regulations that protect wetlands in Ntungamo District?

Yes or No  
If yes state them

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10. As a resident of this area do you have any roles in the protection of this wetland? a) Yes or No

b) If yes mention them.

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11. If you were given powers to protect this wetland would you?

Yes How?

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If No why?

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**SECTION IV: WETLAND MANAGEMENT APPROACHES USED IN NTUNGAMO**

12. What are the wetland management approaches used in Ntungamo District (3)

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1. Do District officials normally come for inspections for Rufuuha wetland?

Yes or no

If yes how often do they carry out inspections in a financial year

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13. Do the sub-county, parish officials carry out environment inspections and trainings?

Yes or no

If yes how often do they carry out inspections and trainings in a financial year?

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14. Do you know why wetlands are protected?

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During wetland management approaches are gender issues mainstreamed?

15. Who is mostly affected when the wetland no longer exists? \_\_\_\_\_

How?

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Why?

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16. Do you think there is any encroachment /destruction in this system?

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17. Do you see any changes in the wetland size?

Yes/No

How?

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18. Have you experienced conflicts in this wetland over access and control of wetland resources?

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19. What advice do you have as a resident in the area? (3)

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I thank you so much for being part of my research, looking forward to meeting you at the dissemination of my results.

**APPENDIX II**

**QUESTIONNAIRE FOR TECHNICAL STAFF**

Dear respondent I am Dinnah Tumwebaze a fellow at United Nations University pursuing a post graduate certificate in land restoration and sustainable land management in Iceland.

I am carrying out research entitled, “Assessing the Perception of Fringe communities on wetland Management. Case study Rufuuha wetland Ntungamo District.” The information that you will provide in this questionnaire and your personal identification will be kept confidential while using the information for research activities. So, I humbly request you to mention your own reality in this questionnaire with full confidence. Please feel free to express your opinion

Name: \_\_\_\_\_

Sub-county: \_\_\_\_\_ village: \_\_\_\_\_ Parish: \_\_\_\_\_

Name of Organization \_\_\_\_\_

**SECTION I: DEMOGRAPHIC INFORMATION**

Tick the correct option

**1. Gender**

Male: \_\_\_\_\_ Female \_\_\_\_\_

**2. Age group**

1) 20-29, 2) 30-39, 3) 40-49, 4) 50-59, 5) Above 60

**3. Marital status**

Single \_\_\_\_\_ Married \_\_\_\_\_ Divorced \_\_\_\_\_ Widow \_\_\_\_\_

**4. Level of education**

None \_\_\_\_\_ Primary, Secondary, tertiary \_\_\_\_\_

**SECTION I: WETLAND MANAGEMENT APPROACHES USED IN NTUNGAMO**

5. What are the wetland management approaches used in Ntungamo District?

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6. How often do you conduct monitoring and inspection of Rufuuha Wetlands 1) Monthly 2) Quarterly 3) Sometimes 4) Never 5) others

7. Is it important to protect Rufuuha wetland? 1) Yes 2) No

8. In your own opinion how does the community perceive the wetland management approaches in the District.

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9. What is your opinion on the efficiency of the structures in the District?

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10. What would you for recommend proper management of Rufuuha wetland? 1) Yes 2) No

11. If Yes, please explain why

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12. Are you involved in any implementation of wetland management? Yes / No

13. To what extent have you been involved?

1) highly 2) moderately 3) lower 4) not at all

14. What impact have you created in your involvement

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15. Are there plans initiated to enhance community perceptions and attitudes to protect wetland

Yes/No

16. If yes what are the plans and strategies for their full participation in wetland management.

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17. Any other suggestions

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**THANK YOU!**