
**THE IMPACT OF INDUSTRIALIZATION ON ENVIRONMENTAL MANAGEMENT IN UGANDA, A
CASE STUDY OF IGANGA NORTHERN DIVISION**

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ABSTRACT

Wetlands are among the most productive ecosystems on earth; they are areas permanently or periodically waterlogged which offers the neighboring communities socio-cultural, economic and ecological values. In the past, people in Uganda have used wetlands as a source of building materials, crafts, furniture, and places to go hunting and fishing. In this study, wetland resilience around Walugogo Wetland in Iganga Town Council, Iganga District, was examined in relation to the effects of growing urbanization. The goal of this study was to catalog the various activities that take place surrounding Ngaiga Wetland, the methods by which neighborhood residents are made aware of environmental issues, and the sustainable environmental awareness practices used by these groups around Walugogo Wetland. Simple random sampling was utilized to choose a sample of people who worked and lived near the marsh as part of the study's data gathering techniques, which included both quantitative and qualitative approaches. Data were gathered by observation, photographing, open-ended and closed-ended questionnaires, observations, interviews, and reviews of pertinent literature. SPSS was used to evaluate quantitative data. SPSS stands for statistical package for social scientists. The correlation of the data variables was determined using straightforward descriptive statistics like percentages and frequency distributions. The findings revealed that the main industries near the Walugogo wetland were agriculture, brick production, sand mining, and crafts, with brick production leading the pack at 44%. The outcomes further demonstrated that the operations were having a detrimental effect on the wetland. The findings specifically identified sand mining, agricultural invasion, and the exploitation of clay for brickmaking as the key activities significantly impacting the environment. According to the study, the lack

of understanding and knowledge of the wetland's values, uses, and norms was what caused the environmental deterioration that the activities had caused. People should be educated on the benefits, uses, and significance of wetlands, the study suggested. A new activity should be added, like fish farming, that does not destroy the wetland but rather helps it become economically viable. The report also suggests that appropriate rules be developed to speed up environmentally acceptable sand and brick clay mining in the wetland.

Key words: industrialization on environmental management

Background of the problem

Urbanization has always been linked to specialized industry and subsequent economic growth. Territorial adaptation to economic structural changes is urbanization. The worsening ecological circumstances of many big cities are evidence that uncontrolled and unguided urbanization has its own issues. Ecological sound, commercially viable, and socially inclusive urban settlements are necessary for sustainability (Sharma P., 1989). Urbanization is a significant factor in the deterioration of wetlands and has directly led to the loss of wetland acreage (Jackline et al., 2023).

Globally wetlands occupy about 6% of the earth's surface and this ranges from 5.3% to 12.8% million km squared. Uganda's wetlands occupy about 3-4%, which is approximately 14,000km squared the land surface and fluctuates up to 6% in the rainy seasons. However, due to high rates of wetlands and catchment degradation, the total percentage of wetlands area is estimated to be below 2% (GOK, 2008).

Ugandans' quality of life depends on wetlands since they provide the nation with major economic and social advantages. Wetland habitats in Uganda continue to face major risks despite their high production and abundance of advantages. They are the primary supply of water for drinking and irrigation, and as a result, are prone to invasion and exploitation throughout the entire country. (2010) Japheth O. This is more of a global phenomenon than just a phenomenon in Uganda, reflecting the effects of wetlands invasion elsewhere. 2013 (Ndungu B). Due to the increasing urbanization, which is

predicted to have an annual growth rate of 1.6% (UN, 2009), the effects are more pronounced in metropolitan areas.

Statement of the problem

At the local as well as global levels, there is growing concern and understanding that different development initiatives are depleting the environment and natural resources (Flint, 2004). Ecosystems have undergone more fast and comprehensive change in the past 50 years than at any other time in history (MEA, 2005). With over 50% of humanity residing in river basins, this has caused significant changes in freshwater ecosystems and a resulting loss of diversity (Christopher & Felex, 2022).

Some of the main concerns to wetland preservation and administration in Uganda, Africa, and worldwide are the draining and reclaiming of wetlands for agriculture expansion, human settlement development, increased tourism, and industrial growth (UBOS, 2014).

Rural-urban migration has caused Iganga Town's population to grow quickly, which has resulted in an increase in condominiums recently, especially around the town council. This has had a significant impact on Walugogo Wetland, which has been invaded to make room for rising housing demand. This keeps putting strain on the few resources available on land, which has a negative impact on the quantity and quality of wetland-derived products (Jackline et al., 2023). Wetland degradation has had a significant negative impact on the river profiles that depend on it, as well as difficulties with contamination, loss of biodiversity, and decreased water levels in the wetland. Raw, natural water's quality has declined and deteriorated. As a result, the price of treating water has increased.

The purpose of this study was to identify and record the significant urban development activities occurring within the marsh and their effects on the wetland. Wetland harming urbanization activities were supposed to be understood by policy implementers, decision-makers, and environmentalists in order to develop ways to stop them (Christopher,

2022).

Specific Objectives

1. To identify the different activities being carried out around Walugogo wetland
2. To find out how the awareness information is disseminated to the local communities around Walugogo wetland.
3. To establish the sustainability awareness used by local communities around Walugogo wetland.

Research questions

1. What are the different activities being carried out around Walugogo wetland?
2. How is the awareness information being disseminated to the local communities around Walugogo wetland?
3. What is the sustainability measures being used by the local communities around Walugogo wetland?

Methodology

Research design

The study employed both quantitative and qualitative methods for data collection using SPSS.

Target population

The study targeted the communities living in and around Walugogo wetland, officials from the natural resource department, Iganga district local government.

Sample size and sampling procedures

The sample was drawn from residents operating and living in and around Walugogo wetland. Other persons interviewed were Iganga district local government officials from the natural resources department. Simple Random sampling methods was used to ensure each member of the target population had an equal and independent chance of being included in the sample.

Data collection and data collection tools

Primary data was obtained from the field through questionnaires, interview schedules and observation. Secondary data was got from existing literature such as reports, journals which had relevant information to the study.

Interview-Interviews was conducted to key informants, with a well-structured checklist to guide the discussion.

Questionnaires-Questionnaires was both open ended and close ended questions, Observation- this involved looking at what actually was taking place. A limited time was spent within the study area taking note of the activities taking place and looking at the visible impacts.

Data analysis

The data was coded, entered and cleaned in Statistical Packages like SPSS (Nelson et al., 2022). Both quantitative and qualitative methods of data analysis was used. For quantitative data, descriptive statistics was applied. Statistics, frequencies, percentages, mean, standard deviation, standard error, and range was calculated

RESULTS

The different activities being carried out around Walugogo wetland.

Agriculture

One of the main industries in the areas surrounding the Walugogo wetland and its location is agriculture. By establishing eucalyptus trees, which are renowned for having enormous powers to drain water, people have colonized a portion of the swamp. The ability of the wetland to filter and cleanse water is lost when it is indiscriminately drained for farming and grazing (Anaba et al., 2007). The wetland's former habitat is being steadily consumed by this condition, which could eventually cause it to vanish. Wetland areas sometimes have gardens next to them where crops like sorghum, g-nuts, cassava, rice, and mangoes

are produced. Mango and sorghum farms employ herbicides and pesticides.

Brick making

One of the main things going on in the Walugogo Wetland is this. According to the poll, nearly half of the people polled (44%) were producing bricks in wetlands. The marsh is utilized to extract the clay needed to make bricks. Through the sale of bricks, the activity contributes to the community's general economic growth and the reduction of poverty. However, the activity has a number of detrimental effects on the ecology, particularly in the eastern section of the Walugogo wetland. The wetland, for example, is where commercial brick production has an adverse influence on the ecosystem. The wetlands are now nothing more than enormous gaps filled with filthy, stagnant water.

Sand mining:

The survey showed that 16% of the respondents were involved in sand mining (surface sand mining) within the wetland. Most of the sand used for construction in Iganga and Iganga town is mined from Walugogo wetland alongside river Iganga. The activity has helped in eradicating poverty in the communities adjacent to the wetland. However, the activity is being carried out in a way that does not limit environmental damage during exploitation. After mining operations land restoration practices are not conducted.

How the awareness information is disseminated to the local communities.

Three categories of wetland policies were given and there was a wide variation in the extent of awareness by local people of their existence. 22% of the respondents showed to be aware of informal or traditional rules and regulations, 47% were aware of other provisions in formal policies and laws and only 11% of the respondents were aware of the national wetland management and conservation policy.

Table 1: Level of awareness on wetland policies and laws among people operating around Walugogo wetland

Awareness about informal or traditional rules and regulations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Aware	11	22.0	22.0	22.0
	not aware	39	78.0	78.0	100.0
	Total	50	100.0	100.0	

SOURCE: Primary Data 2022*National wetland management and conservation policy*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Aware	5	11.0	11.0	11.0
	Not aware	44	89.0	89.4	100.0

Other provisions informal policies and laws

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Aware	24	47.0	47.0	47.0
	Not aware	26	53.0	53.0	100.0
	Total	50	100.0	100.0	

The respondents' overall level of education, which is a means of encouraging communities to engage in specific activities and of establishing human skills and knowledge, was found to be very low. The majority had only completed primary school (56%) and some had not completed any education at all (16%). Secondary-level graduates make up 22% of the population, and postsecondary graduates make up 6% (Table 2). However, these results suggest that individuals who had attended school at least knew how to read and write, which allowed them to adopt new technologies and better methods of managing wetlands. According to Singh et al.'s 2003 study, farmers' educational status plays a significant role in their decision to accept new technology.

Table 2: The education level of the respondents around Walugogo wetland

					Cumulative Percent
Valid	Primary	28	56.0	56.0	56.0
	Secondary	11	22.0	22.0	78.0
	Post-secondary	3	6.0	6.0	84.0
	None	8	16.0	16.0	100.0
	Total	50	100.0	100.0	

Due to the limited awareness, the local communities therefore still lay claim on the wetland area. The communities are still not aware that wetlands are legally owned by government for the good of all Ugandans. There is still assumed ownership of the resource leading to continued encroachment.

Source of awareness information on wetland policies and legal provisions

Local people reported access to a variety of sources of information on wetland policies, sustainability and legislations. Most frequently reported source was local leaders (50%) followed by radios (36%). Other sources through which the information is disseminated included newspapers, television, NGO's and public leaders.

Table 3: Respondent source of information on wetlands sustainability and legal

provisions.

Source of information on wetlands sustainability and legal provisions

					Cumulative Percent
Valid	local leaders	25	50.0	50.0	50.0
	Radio	18	36.0	36.0	86.0
	News papers	4	8.0	8.0	94.0
	Television	3	6.0	6.0	100.0
	Total	50	100.0	100.0	

The majority of residents close to the Walugogo Wetland are aware of what it is but do not consider it to be significant. They don't mind if it's put to use on things that will benefit them more. The individuals who responded to the field study's participants disagree that it should be retained.

recognized it as a viable site for sand mining, crop growing, and other activities such as grazing. The study found that 50% of those who work in, reside in, or are otherwise impacted by wetlands are aware of their rules and laws and can at least name one regulation governing their sustainable use. The majority of them, however, refuse to adhere to the prescribed norms because they claim that doing so would be against the law. However much they agree that wetlands are important ecosystems conserving them would mean no existence to them. Poverty was mentioned as the major driver to wetland degradation by most of the respondents.

Table 4: What respondents suggest about Walugogo wetland

Suggestion about wetlands

					Cumulative Percent
Valid	Drainage	27	54.0	54.0	54.0
	Conservation	23	46.0	46.0	100.0
	Total	50	100.0	100.0	

54% of the respondents suggested that the wetland should be drained for more activities while 46% suggested it should be conserved sustainably.

Conclusion

The Walugogo wetland is surrounded by activities such as the agricultural sector, brick-making, sand mining structures, and craft-making, with agricultural and brick-making holding the lead at 44 and 18 percent, correspondingly. Sand mining comes in second at 16%, followed by crafts at 12%, and other occupations at a pitiful 10%. The analysis found that the operations are being carried out in an unsupervised and unregulated way, which has seriously harmed the wetland's ecosystem. For example, the wetland's biodiversity and ecosystem have been changed by the excavation of clay for building bricks and sand from the ground.

Recommendations

Wetlands are fragile ecosystems, which provide multiple ecological and socio-economical products, services and functions. They need an integrated approach to their planning and sustainable use. In order to overcome the environmental problems such as destruction of water resources that we are facing, there is need to aim at improving adequate awareness against these problems.

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