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## Water Disconnections and NWSC Performance in Iganga Municipality, Uganda

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This study investigates the relationship between water disconnections and bills receivable management at the National Water and Sewerage Corporation (NWSC) in Iganga Municipality. The research uses a mixed-methods approach to analyse customer perceptions regarding disconnections and their impact on revenue recovery. The findings indicate a positive correlation between the disconnection of water services due to non-payment and the financial performance of the NWSC, with the corporation recovering over 100 billion UGX annually from disconnections and reconnection fees. Despite a total billing of 3,049,102,366 UGX for the last financial year, the NWSC managed to collect only 2,728,709,173 UGX, resulting in a collection efficiency of 91%. However, infrastructure issues, economic uncertainties, and customer financial hardships affect overall revenue collection efficiency. Based on these findings, the study recommends enhanced customer engagement, improved infrastructure, flexible payment options, and the use of technology to optimize billing and revenue collection processes.

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## INTRODUCTION

Water supply management is a crucial aspect of urban infrastructure that significantly impacts public health, economic development, and overall quality of life. Access to reliable water services is

essential for communities, particularly in developing regions where water scarcity can exacerbate health issues and hinder economic growth. In many areas, including Iganga Municipality, the management of water bills and

the recovery of unpaid dues pose significant challenges for water service providers, such as the National Water and Sewerage Corporation (NWSC). The effective management of these challenges is vital for ensuring a sustainable water supply and maintaining financial viability (Estache et al., 2000).

The NWSC employs various strategies to manage revenue collection, including the disconnection of water services for customers who fail to pay their bills. This method is intended to incentivize prompt payment and reduce outstanding debts. Previous research indicates that such disconnection practices can yield significant financial benefits, as seen in studies conducted by Nicollier, & Casarin (2018), which highlight the operational and financial enhancements experienced by utility companies that implement strict disconnection policies. However, the implications of these practices on customer satisfaction and service accessibility remain a topic of concern.

Furthermore, the economic context in which the NWSC operates plays a critical role in shaping customer behavior. Factors such as economic instability, drought, and unemployment can hinder customers' ability to pay their bills, leading to increased disconnections and subsequent financial strain on the corporation (Shaw, 2011). The challenges faced by the NWSC are compounded by a collection efficiency of only 91%, resulting in a shortfall of 320,393,193 UGX in revenue recovery for the last financial year (NWSC Annual Report, 2019). This situation underscores the need for a comprehensive understanding of customer perceptions and the effectiveness of disconnection practices.

This study aims to explore the dynamics of water disconnections and bills receivable management within the NWSC, focusing on how these practices influence revenue collection and operational sustainability. By examining customer experiences and attitudes toward disconnections, the research seeks to provide insights that can inform policy and operational improvements for the NWSC and similar water

service providers. Understanding these dynamics is crucial for developing strategies that enhance revenue recovery while ensuring equitable access to water services for all residents.

### Statement of the Problem

The management of water services in Iganga Municipality faces significant challenges related to revenue collection and customer compliance with billing. Despite employing disconnection strategies to encourage timely payments, the NWSC experiences a notable shortfall in revenue, with a collection efficiency of only 91% and a cost coverage ratio of 48.4% (NWSC Annual Report, 2019). This raises concerns about the sustainability of water services and the financial health of the corporation. Additionally, customer perceptions of disconnections vary; some view it as a necessary enforcement mechanism, while others perceive it as a punitive measure that imposes undue financial hardship (Kumar, 2021).

Research indicates that disconnections not only affect individual customers but also have broader implications for community water access and public health. For instance, Estache et al. (2000) noted that aggressive revenue collection methods could lead to increased financial strain on vulnerable populations, potentially exacerbating inequities in access to water services. Furthermore, the disconnecting practices may result in increased operational costs associated with reconnection fees and customer dissatisfaction, which can ultimately undermine the NWSC's ability to provide reliable services (Ongore, & Kusa, 2013).

Therefore, this study seeks to address the following questions: How do water disconnections influence customer payment behavior? What are the implications of these practices for the economic performance of the NWSC? Understanding these dynamics is crucial for developing strategies that enhance revenue recovery while ensuring equitable access to water services for all residents.

### LITERATURE REVIEW

## Theoretical Review

The idea of Reasoned Action (TRA) (Jenner et al., 2012) and its advanced expansion, the concept of Planned Behavior (TPB) (Cheung et al., 2009), provide the theoretical framework that has been widely adopted to understand and justify human higher cognitive operation and response to obligations. These models are applied to higher cognitive functioning and responsibility fulfillment to comprehend and forecast a genuine spectrum of human behaviors.

According to the TPB, a person's intention to carry out or not fulfill a commitment made to them is what instantly determines their behavior in higher cognitive functions and fulfilling obligations. Three factors influence behavioral intentions sequentially: the individual's attitude towards the selection, which describes how they perceive the decision to be made; the subjective norm, which could be a social or economic factor about the perceived pressure to carry out the commitment or not; and the degree of perceived control over the selection, which describes how easy or difficult they believe the decision to be carried out, (Mugabi, 2017). People should have high expectations for carrying out the selection to the extent that they have positive attitudes toward the task, believe that there is normative support for fulfilling the commitment, and believe that they will do so with ease, (Petty et al., 2011).

Furthermore, one important feature of the TPB is that it does more than just pinpoint the factors that directly influence intentions to fulfill the commitment. According to Kayaga et al. (2014), the concept also suggests that attitudes, perceived social and economic norms, and insights of control are expected to follow from the perceptions formed by a pair of decisions. In keeping with the idea, an individual's attitude is shaped through an expectancy-value analysis, in which his or her subjective beliefs that the choice will result in a favorable outcome are based on an assessment of those consequences (outcome evaluations). It is believed that perceptions of economic and social heaviness serve as a mechanism through which people differentiate

between additional obligations they must fulfill (normative beliefs), with the motivation to fulfill these commitments being weighed heavily, (Pineda, 2009).

Finally, it is expected that principles about the factors that support or obstruct the implementation of the selection, weighted by the expected benefit these factors would have if they were to be realized, will lead to perceptions of control over the commitment (Casey et al., 2016). According to Ajzen (2011), the TPB is a suitable framework for actions that are not fully within an individual's control. It takes into account the deliberate and contemplative process of weighing the advantages and disadvantages of undertaking different kinds of responsibilities. Since the customer has some control over the choice to "pay water bills promptly," this study considered the TPB theoretical framework. It can be impacted by both external (such as inconsistent bill delivery or non-billing) and internal (such as time and money constraints).

## Empirical Review

According to Nicollier, & Casarin's (2018) study, which involved an electricity company survey, disconnecting power meters for customers who owe money has additional benefits. These benefits include decreased outstanding amounts or bills in arrears, improved funding allocation for power distribution to other areas, and improved power company operations and finances. The benefits of disconnecting the power include increased bill payment and, consequently, higher profit margins for the companies, (Estache, et al., 2000).

According to Shaw (2011), businesses experience a decrease in income losses when their meters are disconnected due to nonpayment. A study by Njiiri (2015) examined the correlation between Tanzanian water companies' financial performance and meter disconnections. According to the study, the disconnection strategy greatly decreased revenue losses and enhanced the company's revenue performance. The impact of revenue investment in Kenya was investigated by Alan (2017). The study's findings showed a significant positive association between revenue

operational efficiency and meter disconnections, which also increased the impact on the water company's investment.

A study by Ongore, & Kusa (2013) concentrated on factors that affect an electricity company's financial performance. The results demonstrated that, except for the liquidity variable, stringent monitoring of billing meters and meter disconnections in arrears had a substantial impact on the company's revenue performance. They came to the conclusion that tight oversight of the billing meters and meter disconnections of the customers who are behind on their payments is what primarily drives the financial performance of Kenya's power companies.

According to Leask et al. (2012), implementing revenue management techniques like meter disconnections maximizes revenue management and collections. Meter disconnections increase revenue collection, as Hassan et al. (2012) have observed. Mathies et al., (2013) took a step further and proposed that a combination of billing, stringent follow-ups, and temporary meter disconnections might increase revenue collection. However, because meter disconnections affect revenue maximization, Yu, & Wee (2013) stated that meter disconnections should be considered when determining tariff levels. Cheng (2013) offered a different perspective, concluding that public water utilities should not lose money by disconnecting meters in an attempt to increase tax collection.

## RESEARCH METHODOLOGY

### Research Philosophy

This study adopts a pragmatic research philosophy, which emphasizes the practical application of research findings to address real-world issues. Pragmatism is particularly suited for this research as it allows for the integration of both qualitative and quantitative methods to gain a comprehensive understanding of the factors influencing bills receivable management and the performance of the National Water and Sewerage Corporation (NWSC) in Iganga Municipality. By focusing on the practical implications of the

research, this philosophy ensures that the findings can inform policy and operational improvements within the NWSC.

### Research Design and Paradigm

A descriptive survey method was employed to gather information pertinent to the study's objectives, specifically to analyze the factors influencing bills receivable management and the performance of the NWSC. The descriptive design is effective for defining, estimating, predicting, and examining relationships between independent variables (IVs) and the dependent variable (DV) (Mugabi, 2010). This approach provides valuable insights into the "who," "what," "when," and "how" of the research questions, allowing for a thorough exploration of customer perceptions and behaviors regarding water disconnections and billing practices. The data collected through this method serves to provide accurate and relevant information to address the research questions effectively.

### Study Population

The target population for this study consists of the water consumers served by the NWSC in Iganga Municipality, specifically in the Knono II zone, which comprises 5,808 individuals. To determine an appropriate sample size for the survey, Morgan's (1970) table for sample size determination was utilized. This approach ensures that the sample is representative of the broader population, facilitating reliable and valid conclusions regarding the factors affecting bills receivable management and the overall performance of the NWSC. By employing a well-defined sample size, the study aims to enhance the accuracy of the findings and their applicability to the water service context in Iganga Municipality.

### Sample size

Owing to the size of the sample frame, the researcher employed Morgan's, (1970) table for establishing the sample size for the study. Based on the population size (5,808), the sample size for the study was 361 water consumers who were sampled for the study.



### Data Collection Instruments

Primary data was collected using a structured questionnaire, which has closed-ended questions. The structured questions are usually standardized to allow the respondents to reply to the same questions in a defined manner. The questionnaire was justified to allow the intended respondents, who were all literate and hence able to understand the questions posed therein on their own, more time to reflect on their answers thereof. The researcher provided guidance and clarifications on how to answer the questions. The researcher also conducted some interviews to confirm and clarify issues arising during the data. Secondary data was collected from existing documents from the water resource management stakeholders. The main source of secondary information was published guides, journals, and information from internal sources at the NWSC.

The researcher first obtained a letter from the University approving and introducing her to the respondents. Before the data collection, the study first conducted a pilot test on the research tool, where data for testing was collected from respondents who were not allowed to participate in the final data collection for the study. During data collection, the researcher first sought an appointment with the local leaders to guide in the sampling and conducting the interviews in their localities. Arrangements were made on when and

how to conduct the data collection. Research Assistants were recruited to assist in data collection.

### Ethical Considerations

Ethical considerations in research can be defined as ensuring that the researcher conforms to the standards of conduct of the authorities in the area of research. Examples of ethical issues that may arise are voluntary participation of respondents, deception to participants, anonymity, and confidentiality of information given, analysis and reporting, harm or danger to participants, and any other professional code of ethics expected. To ensure that the research was done ethically according to the expectations of all authorities, a letter from the university was obtained. The researcher first obtained an introductory letter from the University to collect data from the organization. The researcher held a moral obligation to treat sensitive information with the utmost decorum. The researcher informed the respondents that the instruments being administered are for research purposes only and the respondents' identities would be kept confidential.

## RESULTS AND DISCUSSION

### Water Disconnections and Bills Receivable Management

**Table 1: Perception of Disconnections and Bills Receivable Management**

Measuring water disconnections and bills receivable management	Strongly disagree	Disagree	Neither	Agree	Strongly agree
1. Failure to pay for the bills the NWSC disconnects the water meter	15.7	18.8	4.9	52.2	8.4
2. I have ever been disconnected for a delay to pay the bills	19.7	12.2	4.9	52.8	10.4
3. We pay for the bills as soon as we're disconnected	24.4	49.6	2.6	19.1	4.3

Disconnection of water meters and or pipes is one way of recovering the revenue from the water bills among the defaulters. The customers interviewed contend that the NWSC indeed disconnects water in the event of failure to clear the water bills. This was agreed upon by the majority of customers sampled (60.6%). And it is agreed by the majority

of the customers (63.2%) that they have ever been disconnected for the delay to pay the bills. This could be true since the largest number of the customers hurry to pay for the bills as soon as we're disconnected, but this puts the customers at a high cost in terms of reconnection fee after being disconnected. The NWSC is indicated to be

recovering over 100 billion UGX annually after disconnecting the customers, and a reconnection fee of over 50 million annually is charged for reconnecting the meters after disconnection. The

overall picture from the results reveals that either way the NWSC benefits financially, however, the delay in collecting the revenues from the bills may delay the provision of the services to the public.

**Table 2: Overall Economic Performance of the NWSC in Iganga Municipality**

What was the total billing for the last financial year? UGX	3,049,102,366
What was the total collection for the last financial year? UGX	2,728,709,173
What is your revenue collection efficiency? (%)	91
Is the collection efficiency obtained satisfactory? (%) Yes	40
Does collection efficiency influence revenue generation among water companies? (%) Yes	90
What was the total operating revenue for the last financial year? UGX	3,085,000,000
What was the total operating and maintenance expenditure for the last financial year? UGX	1,397,666,000
What was your cost coverage for the last financial year?	48.4

The overall projected revenue for the cooperation from the water bills in the municipality during the last financial year 2019 stood at UGX 3,049,102,366. However, from the total projected revenues, the cooperation managed to recover UGX 2,728,709,173 from the bills creating a shortfall of UGX 320,393,193 about 9% of the revenues from the bills unrecovered. The overall recovery rate at the municipality level is higher than for the Knono II zone – the area of the study which shows that the population from other zones in the municipality are responding well on remitting the water bills, hence more effort needs to be put into Knono II zone customers to reinforce the payment of water bills for the cooperation to attain its full revenue recovery efficiency from the water bill.

Surprisingly, the management was not contented with the bills' recovery efficiency as they indicated a satisfactory level at 40% for the bills recovery efficiency – this could be a result of underperforming zones, a case in point of Knono zone II. The management interviewed cited attributed the low efficiency in revenue from the bills' collections to - water loss through leakages and during supply which leads to the reduction in low bills and revenues, in addition to the uncertainty in the economy, drought, lack of jobs and poor earnings among the customers partially influence the revenue collection efficiency from the water bills. To overcome the operation efficiency the management highlights to consider -involving the security organs like the police to curb water theft to fight the invasion of bills,

encouraging half of the payments for those completely off supply, and motivating of staff to provide a high degree of customer care to the customers.

Moreover, on the question of whether collection efficiency influences revenue generation among water companies, 90% of the management interviewed agreed that collection efficiency influences revenue generation for the cooperation. In supporting their view, the management interviewed noted that,

*“It influences positively if water consumed is all paid back through revenue, then efficiency will be high and if water consumed is not paid back then efficiency will be low.” “If customers don't pay their bills no money would be generated thus less revenue generated but if the bills are paid higher efficiency and revenues will be attained thus, the ability for companies to keep in business.”*

Besides, the survey findings show that the overall operating revenue for the last financial year 2019 for the municipality amounted to UGX 3,085,000,000, of which the cooperation managed to utilize UGX 1,397,666,000 on operation and maintenance expenditure, in percentage terms, indicating the cost coverage below average (48.4%). The projected operating revenue in the financial year indicates how much the cooperation plans to spend on extending the water services in the communities. Based on the operating revenue recovery rate (48.4%), it shows the cooperation is

constrained by the finances to facilitate water distributions in the communities that need water.

### **Relationship between Water Disconnections and the Economic Performance of the Cooperation**

The research findings reveal a positive and statistically significant relationship between water disconnections and the performance of the cooperation since the significance level is greater than 0.05 (0.0014). As shown by the revenue recoveries from the disconnections and reconnection fees charged, it is evident that disconnecting water due to delayed payment awakens the customers to pay the bills.

### **Water Disconnections and the Economic Performance of the Cooperation**

The research findings reported a positive and statistically significant relationship between water disconnections and the performance of the cooperation since the significance level is greater than 0.05 (0.0014). In line with the research findings by Nicollier, & Casarin (2018) who surveyed the electricity companies found and established extra benefits of disconnecting power meters for the customers in areas, which include reduction of outstanding amounts or bills in arrears, operational and financial enhancement of Power Company and improved allocation of funds for the distribution of power in other areas. Estache et al. (2000) conclude that the benefits of disconnecting power as improving payment for the bills and thus the profit margins for the companies.

In the same way, Shaw (2011) states that meter disconnections for the failure to pay the bills reduce revenue losses among the companies. Njiiri's (2015) study investigated on the relationship between meter disconnections and the financial performance of a Water Company in Tanzania. The study established that the disconnection approach significantly reduced revenue losses and improved the revenue performance of the company. Alan's (2017)'s study examined the effect of meter disconnections on the impact of revenue investment in Kenya: Findings indicated that there is a strong positive

correlation between meter disconnections and revenue operational efficiency and caused improved impact on the investment of the water company. Similarly, Ongore, & Kusa (2013) study focused on determinants of financial performance of the electricity company. The findings showed that strict follow-up on the billing meters and meter disconnections in arrears significantly affect the revenue performance of the company, except for the liquidity variable.

### **CONCLUSION**

The findings of this study underscore the significant impact of water disconnections on the economic performance of the National Water and Sewerage Corporation (NWSC) in Iganga Municipality. The data reveals a positive and statistically significant relationship between disconnections and revenue recovery, indicating that the practice of disconnecting water supply for non-payment effectively encourages timely bill payments among customers. With over 100 billion UGX recovered annually from disconnections and reconnection fees, it is evident that this strategy not only enhances revenue collection but also contributes to the overall financial health of the NWSC. However, the challenges of delayed payments and the associated costs of reconnections highlight the need for a more proactive approach to billing and customer engagement to minimize service interruptions and enhance customer satisfaction.

Despite the financial benefits of disconnections, the study also reveals underlying issues that affect the NWSC's operational efficiency. With a collection efficiency of only 91% and a cost coverage ratio of 48.4%, the corporation faces significant financial constraints that hinder its ability to provide consistent water services. Factors such as water loss through leakages, economic uncertainties, and customer financial hardships contribute to these challenges. Addressing these issues will require a multifaceted approach, including improved infrastructure to reduce water loss, enhanced customer service strategies, and collaborations with security agencies to combat water theft.

Ultimately, while disconnections serve as a valuable tool for revenue recovery, a comprehensive strategy aimed at fostering customer relationships and operational efficiency is essential for the long-term sustainability of the NWSC and its ability to meet the water needs of the community.

## RECOMMENDATIONS

**Enhance Customer Engagement Programs:** Implement customer engagement initiatives that educate users about billing processes, the consequences of non-payment, and the benefits of timely payments. This could include workshops, informational brochures, and regular communication through various channels.

**Improve Infrastructure to Reduce Water Loss:** Invest in upgrading water supply infrastructure to minimize leakages and losses. Regular maintenance and prompt repairs can enhance service delivery and increase revenue by ensuring that billed water reflects actual consumption.

**Flexible Payment Plans:** Introduce flexible payment plans for customers facing financial difficulties. This could include installment options for overdue bills, which may encourage timely payments and reduce the need for disconnections.

**Strengthen Monitoring and Enforcement:** Collaborate with local authorities and security agencies to enhance monitoring and enforcement against water theft. Implementing stricter penalties for illegal connections can help protect revenue and ensure fairness among paying customers.

**Utilize Technology for Billing and Payments:** Leverage technology to streamline billing and payment processes. Implement online billing systems and mobile payment options to make it easier for customers to pay their bills promptly.

**Conduct Regular Revenue Audits:** Schedule regular audits of revenue collection processes to identify inefficiencies and areas for improvement. This can help the NWSC develop targeted strategies to enhance collection efficiency and overall financial performance.

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