**THE IMPACT OF ELECTRICITY POWER OUTAGE ON CUSTOMER SATISFACTION IN RURAL AREAS IN TANZANIA: THE CASE OF MANYONI DISTRICT, SINGIDA REGION**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION IN (FINANCE)**

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**202****3**

# CERTIFICATION

The under signed certifies that he has read and hereby recommends acceptance of the search entitled, *“****The******Impact of Electricity Power outage on Customer Satisfaction in Rural Areas in Tanzania: The Case of Manyoni District, Singida Region”***, in partial fulfilment for the requirements of the degree of Master of Open University of Tanzania.

………………………………………..

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………………………………….

Date

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I, **Pascal Yekonia Sanga,** declare that, the work presented in this dissertation is original. It has never been presented to any other University or Institution. Where other people’s works have been used, references have been provided. It is in this regard that I declare this work as originally mine. It is hereby presented in partial fulfillment of the requirement for the Degree of Master of business Administration in Finance of the Open University of Tanzania.

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Signature

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Date

# DEDICATION

I dedicate this dissertation to Almighty God, who gave me life, ideas, courage, and power to pursue this study. The study is also dedicated to my beloved son and daughters, Morgan, Elisa, and Melinda, respectively, and to my beloved parents, Yekonia Andarwisye Sanga and Beatrice Paul Sanga. Also, it is dedicated to my brothers, Mr. Paul Sanga, Mr. David Sanga, and Mr. Emmanuel Sanga, for their encouragement, assistance, advice, understanding, and prayers during the entire period of my study.

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# ABSTRACT

This study examined the impact of electricity power outage on customer satisfaction in Manyoni district, Singida region. Specifically, examined the relationship between power loss, activity losses, service uncertainty and customer satisfaction. The study used explanatory design through quantitative approach, whereas purposive sampling methods was used to collect information from Government Offices, Micro Enterprises Community, Villagers, Local businesses, Local Government Leaders and Private Firms. The study applied descriptive and inferential statistics in the data analysis. The study found out that power loss, losses in activities, and service uncertainty had positive and significant effects on customer satisfaction. This signifies the fact that customer satisfaction is indeed influenced by electricity outages. The study therefore recommends that service provider should ensure that infrastructures (generation, transmission, and distribution infrastructures) and facilities are certain through major improvements and that there is good and adequate prosperity as far as service quality is concerned. The study also recommends that service providers have the tendency to make preventive infrastructure repairs and maintenance on a routine basis and not wait until mechanical failure results from underproduction electricity, grid outages result from tower tears and wearing, falling down of poles result from rotten poles. The study also recommends that once there is a planned electricity power outage, the service provider should communicate with stakeholders prior to the outage event, and if it is an unplanned outage, the service provider communicate with stakeholders after the event to apologize.

**Keywords:** *Electricity Outage, Customer Satisfaction, Power Loss, Losses in Activities and Service Uncertainty.*

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# LIST OF ABBREVIATIONS

JNHPS : Julius Nyerere Hydro Power Station

OMS : Power outage through outage management systems

REA : Rural energy agency

REB : Rural Energy Board

REF : Rural Energy Fund

SAIDI : System Average Interaction Duration Index

SAIFI : System Average Interaction Frequency Index

TANESCO : Tanzania electric supply company limited

URT : United Republic of Tanzania

# CHAPTER ONE

# GENERAL INTRODUCTION

# 1.0 Introduction

This chapter provides background information on the impact of electricity outages on customer satisfaction in rural settings in Tanzania. The chapter consists of various sections, including the background to the problem, the statement of the problem, the research objectives and questions, the significance of the study, and the organization of the study.

# 1.1 Background to the Problem

Electricity power outages occur in small-scale and large-scale areas and can stop production, manufacturing, and several other activities in an area (Carreras et al., 2013). On top of that, it affects several sectors, causing severe damage to some entities and organizations, such as hospitals and telecommunication facilities. Countries all over the globe have taken several measures to reduce the extent of electricity power outages, though it may be inevitable to avoid them completely due to several reasons, such as natural calamities that may affect established infrastructure and cause a power blackout, transient fault, or brownout (Dave, 2018).

The significance of uninterrupted electricity supply has been recognized, and various measures have been implemented to address power outages using outage management systems (OMS). The current efforts aim to further enhance these measures by ensuring prompt detection of temporary or permanent outages in both primary and secondary distribution networks (Hoffmann & Payton, 2014). The primary objective of these efforts is to minimize the impact of power outages on consumers and ensure uninterrupted power supply to critical infrastructure, such as hospitals, data centers, and emergency services. Advanced monitoring systems are utilized to detect power outages as soon as they occur, and contingency plans are put in place to quickly restore power in affected areas. In addition, proactive maintenance and repair schedules are implemented to prevent outages before they occur, thereby ensuring a reliable electricity supply for all users. These efforts are crucial in ensuring the continuity of essential services and minimizing the economic impact of power outages (Sarkodie, 2021). Power outage systems are well monitored and guided under a set of global standards to ensure efficiency and effectiveness prior to power stability through the System Average Interaction Duration Index (SAIDI) and System Average Interaction Frequency Index (SAIFI) (Saleh et al., 2015).

Countries have resorted to placing smart meters in various locations because they are useful in giving immediate feedback to the utility company on power outages, whether temporary or permanent, necessary for measures to be taken either within the company(s) or through the restoration crew (Fairly, 2014). The purpose is to reduce power outages completely, and when they occur, the problem must be sorted quickly in a manner that is effective and efficient (Motter, 2014). This is the strategy that has been employed in countries all over the globe, both developed and developing ones.

The initiatives have been set to be executed in all settings, including urban and non-urban areas with electricity facilities (Dave, 2018). This is the case because the purpose is to transform the areas and societies from their previous outlooks to modern settings. In that case, power outages are something that are highly avoided in all areas, including rural settings, to assure that customers are satisfied with the services (Fairly, 2014). This is mostly facilitated by governments, since they are the key actors in the provision of electricity services in rural settings in various jurisdictions all over the globe.

Electricity power outages are a major problem in Tanzania, and this crisis is caused by inadequate electricity infrastructure and supplies both in urban and rural areas (Frey, 2009). This contradicts the current vision of the government towards reaching a middle-income economy by achieving industrial development because the initiatives require an adequate and stable power supply both in urban and rural settings (Magambo, 2015). This has been attributed to weaknesses in outage management systems and insufficient funds allocated to overcome the problem.

It is a known fact that Tanzania Electricity Supply Company Limited (TANESCO) is unable to detect power outages in secondary distribution networks due to the unavailability of smart meters, which is attributed to the high cost of these facilities and technology applications (Tsakhara, 2015). Although the company has installed a limited number of smart meters in some primary distribution networks, the absence of these devices in most areas means that power outages persist without prompt detection, resulting in delayed actions to be taken (Tsakhara, 2015).

Smart meters play a crucial role in outage management by sending alerts to the utility company, which triggers the necessary actions to restore power supply. Without the deployment of smart meters, the timely detection of power outages in secondary distribution networks becomes a challenge, leading to prolonged disruptions in electricity supply to consumers. Besides that, the other issue with power outage persistence in Tanzania is that as it occurs, a large secondary distribution network loses power, making it a challenge to locate the source of the outage in the particular affected area (Msyani, 2015). This has been causing the restoration crew and other responsive teams to take time in restoring power, which automatically affects the effectiveness and efficiency of power stability and restoration.

It should be noted that in rural areas, electricity supply is facilitated by the Rural Energy Agency (REA), which is an autonomous entity operating under the Ministry of Energy and Minerals of the United Republic of Tanzania (URT) (Frey, 2009). The entity is entrusted with the duty of assuring, promoting, and facilitating access to modern energy services in rural settings on the Tanzania mainland since it is a non-union matter. The key concern of the government has been to transform rural settings and people into modern economies and also to improve livelihoods, whereas such transformations and improvements cannot occur with no or poor access to modern energy services (Msyani, 2015).

The Tanzanian government seeks to improve the rural setting by ensuring that they transform the industry by facilitating the supply of modern energy services at affordable costs, with the government carrying a large portion of the responsibility to serve its people (Msyani, 2015). Rural Energy Fund (REF), Rural Energy Board (REB), and the organization itself, Rural Energy Agency (REA), were established and became operational towards ensuring adequate supply of modern energy services in the areas.

Regardless of that, electricity outages are still a major problem, such that as faults occur requiring maintenance, it takes a long time for the company to fix the situation, causing the users to stay without power for a couple days (Magambo, 2015). This has been affecting the satisfaction of customers to a great extent because the services are not freely supplied, but the beneficiaries pay, and this gives them the right and necessity to be well served in terms of service provision and quality (Ibid.). With the persistence of the situation, customers seem to experience dissatisfaction in different ways.

Scholars such as Dave (2018) and Motter (2014) suggest that customers, as beneficiaries of electricity services with outage persistence, tend to experience power loss because power becomes unavailable completely. Despite that, the beneficiaries tend to encounter losses in economic activities because of the existence of power outages. Some economic activities cease to operate, subjecting the beneficiaries to severe losses (Ibid.). Furthermore, the beneficiaries as customers tend to be uncertain about service availability, which entails service dissatisfaction. This entails the need to conduct the study in the area since the concern about power outages in rural settings has been less articulated.

# 1.2 Statement of the Problem

Power outages in rural areas have been a crisis in Tanzania in areas with electricity services (Magambo, 2015). This has been affecting the beneficiaries to a great extent, and it becomes an issue of concern prior to satisfaction. This is the case because the services are paid for when accessed. It can be recalled that during the fifth regime of government, the services were subsidized in rural areas, whereas customers were required to pay 27,000 Tanzanian shillings to access the services (Ibid.).

After securing the services, they constitute the lowest tariff charges to access and utilize the services. However, the sixth regime refrained from subsidizing the access to electricity services in rural areas, which gives the beneficiaries the right to receive adequate services (Msyani, 2015). With the situation persisting regarding electricity outages leading to customer dissatisfaction, it is critical to undertake the study in order to address the situation. In that note, several studies have been conducted on electricity services and practices in Tanzania, including Magambo (2015), which aimed at assessing the role of prepaid meter systems towards electric supply among users in Tanzania.

Despite that, Xinhua (2015) also assessed the relevance of the existence of rivals in power distribution in Tanzania apart from TANESCO alone. Both studies recommended further inquiries into electricity generation, transmission, and supply, whereas outages in rural areas with regard to customer satisfaction could be an essential area of focus. This signifies those few studies that have been conducted in the area that serve as the gap to be filled. Therefore, the inquiry is conducted to assess the impact of electricity outages on customer satisfaction in rural settings in Tanzania.

# 1.3 Research Objectives

# 1.3.1 General Objective

The general objective of the study was to assess the impact of electricity outages on customer satisfaction in rural Tanzania.

# 1.3.2 Specific Objectives

1. To examine the relationship between power loss and customer satisfaction in rural areas of Tanzania.
2. To examine the relationship between activity losses and customer satisfaction in rural areas in Tanzania.
3. To examine the relationship between service uncertainty and customer satisfaction in rural areas of Tanzania.

# 1.4 Research Questions

1. To what extent does power loss affect customer satisfaction in rural areas of Tanzania?
2. To what extent do activity losses affect customer satisfaction in rural areas of Tanzania?
3. To what extent does service uncertainty affect customer satisfaction in rural areas of Tanzania?

# 1.5 Significance of the Study

The study is useful in the sense that it seeks to address the effect of electricity power outages on customer satisfaction in rural Tanzanian areas since the phenomenon has been less articulated in the respective context. The study findings will enable the realization of the actual outcomes prior to the situation at hand, in line with the realities in Tanzania. Researcher, the study assures completion of the program since it is the requirement that must be fulfilled.

To the organization (Tanesco), The study will help Tanesco understand to what extent power outages are related to customer satisfaction through power loss, losses in activities, and service uncertainty. To a government, regulator, and policymaker, the study will help the government facilitate Tanesco as a public parastatal to improve electricity infrastructures from generation, transmission, and distribution. A good example is how the government of Tanzania built JNHP. How the government finances REA projects and their continuity.

# 1.6 Organization of the Study

The study is organized into five chapters. The first chapter described an overview of the inquiry and the gap. The second chapter highlights the literature review of the study. The third chapter describes the methodology of the study. The fourth chapter describes the findings, analysis, and discussion of the findings. The last chapter presents the summary, conclusion, and recommendations of the study.

# CHAPTER TWO

# LITERATURE REVIEW

# 2.1 Introduction

This chapter describes the literature review, which specifically presents the definition of key terms used in the study, theoretical reviews, and empirical studies. The chapter also includes a framework highlighting the study variables.

# 2.2 Definition of Key Terms

**2.2.1 Electricity Power Outage**

This refers to the exact point of source pertaining to the cause of a power outage in an area for the end users (Dobson et al., 2001). This is an important phenomenon because any power outage in an area is from a source and must be detected for the purpose of solving the problem, which may be found within the area among the transformers, distribution points, transmission points, generation points, or any other established facilities to supply electricity (Crucitti et al., 2004).

**2.2.2 Customer satisfaction**

Customer satisfaction refers to the situation in which the beneficiaries of certain services are happy and able to attain their expectations, hence the realization of their needs and wants (Nitzan & Bitchler, 2009). This entails the realization of service quality in the process of service provision.

# 2.3 Theoretical Literature Reviews

# 2.3.1 SERVQUAL Model

This theory explains service quality and is mostly connected to and centered on business practices that provide that effective and efficient business undertakings are usually facilitated by service quality provision and attainment (Asubongteng et al., 1996). The theory suggests that effective service quality may be realized through five key measurements: reliability, assurance, tangibility, empathy, and responsiveness (Carman, 1990). Reliability entails that the services are reliable, while assurance implies that there is assurance on the services that may be provided to the customers and those in need of being served.

Further, tangibility means that all visible aspects of the services are attractive and assure adequate service provision (Lam & Woo, 1997). Empathy entails that the service providers are keen and willing to assist the customers and those in need of the services. Responsiveness entails the fact that the entities are accountable for ensuring quality service delivery (Buttle, 1996). The theory is useful since it guarantees that the service delivery pattern is adequate and positive to assure the generation of adequate output, which is useful to make sure that services are effective and efficient.

The theory is also relevant to the study due to the fact that satisfaction of customers with electricity services is determined by the components suggested in the theory. This is because the outage problem implies that the services are less reliable or assured, such that the outcome is likely to lead to customer dissatisfaction.

# 2.3.2 Theory of Value

This is an economic theory that asserts that any progress in an economy within a country depends on the value that is being generated in the sector or segment(s) within the sector(s) (Hunt, 2015). This entails that performance in the economy depends on the value that has been generated in the responsible sectors (Milios, 2013). Basically, value implies the investments that have been undertaken and carried out in the sector and may determine the outcome pertaining to the expected rewards in the economy (Gray, 2011).

The theory is useful for the study because it strictly emphasizes the relevance of investment undertakings in various sectors for the purpose of generating value to ensure the multiplier effect of income generation in various actors within societies, including households (Horn, 2016). Also, the theory is related to the study on the ground that rural electrification implies value generation in the country, which automatically boosts several sectors in terms of development and advancement in the country. It has an effect on household income and the entire changes pertaining to the growth of the areas and the livelihood improvement of the habitats.

# 2.4 Empirical Literature Review

The empirical literature review presents the scholarly works that have been done relating to your chosen topic. In the empirical literature review, you compare and contrast different studies done in various parts of the world that relate to your topic.

# 2.4.1 Studies in Tanzania

Msyani (2015) examined the status of the energy sector in Tanzania in terms of electricity supply and availability. A survey design was employed, with the findings showing that at that time most rural areas were in terrible conditions due to the availability of electricity, though supply had already been in place due to the existence of the Rural Energy Agency (REA) since 2007. REA was in place with efforts to facilitate the supply of electricity in rural areas. In that case, with the current government, the efforts have been severely enhanced to the extent that transformation of the areas as well as livelihood improvement are seen in the areas. With few studies being conducted on the satisfaction of the beneficiaries with the services, the inquiry is undertaken to address the situation.

Minja (2019) assessed the effect of service quality on customer satisfaction with electricity services in urban Tanzania. The study employed a survey design, and the findings revealed that customer satisfaction in Tanzania is affected by reliability, assurance, empathy, and responsiveness. This entails that the services are far from reliable, assuredly possessing less empathy and being less responsive. This further fostered the need to envision further in rural settings, whereas the study was undertaken to bridge the gap.

Rwegasila (2015), which was titled "Impact of Power Outage to Small and Medium Enterprise at Small Industries Development Organization in Dar es Salaam," The case study is SIDO Dar es Salaam. This study aimed to explore the effects of power outages on SMEs. Data collected through face-to-face interviews was conducted with TANESCO officials (35 respondents) from Headquarters and SIDO facilities (30 respondents), and SME owners (55 respondents) located in Dar es Salaam, for a total of 120 respondents. The research findings show that out of 120 respondents, 56 (46.7%) selected 1; 39 (32.5%) selected 2; 11 (9.2%) selected 3; and the remaining 14 (11.2%) selected Often. Furthermore, out of 120 respondents, 93 respondents (77.5%) agree their business frequently faces the problem of power outages, and 17 respondents (14.2%) disagree that their business frequently faces the problem of power outages. There was no power blackout, and why the 10 respondents (8.3%) selected it, I don’t know. Hence, from the findings of this study, 46.7% face one-time outages per day and 32.5% face two-time outages per day; therefore, we acknowledge that there is a problem of frequency power outages. With few studies being conducted on the satisfaction of the beneficiaries with the services, the inquiry is undertaken to address the situation.

# 2.4.2 Foreign Studies

Peters et al. (2019) assessed the challenges of rural electrification through minigrid technology and measures. It was performed in the Caribbean through a cross-sectional survey design, whereas results showed that rural electrification through mini-grids or any form of technology is constrained mostly by limited resources because the task is costly and expensive in most cases. Since the government is the responsible actor in the operations and practices, they are conducted in the manner that resources allow. A similar situation exists in Tanzania, where rural electrification measures are not properly implemented regardless of the aims of the government to achieve the results, affecting the satisfaction of the beneficiaries. Therefore, since few studies have been conducted in the area, the inquiry is addressed specifically to fill the gap in the satisfaction of the beneficiaries.

Frey (2019) assessed the pattern of business guidance in electricity service provision towards a customer-focused approach. The study was conducted in Germany using a survey approach, and the results indicated that electricity services are important and among the highest needs of the people as beneficiaries or customers, which assures the existing business. The business is therefore facilitated with assurance towards service quality attainment and the satisfaction of customers. The concern is to ensure that outages are reduced or avoided completely. This brought about the need to further explore the area in the Tanzanian context prior to the outage's effect on customer satisfaction in rural settings.

Kufeolu (2015) assessed the economic impacts of electric power outages and evaluated customer interruption costs in a case study at Aalto University. Findings show that the economic worth of electric power reliability covers a wider range of outage impacts, while the calculation of customer interruption costs focuses only on the direct impacts of the interruption events. A future research project that is based on the abovementioned goals is imperative. It is known that the indirect impacts of the blackouts can be much greater than the direct ones. Moreover, in the industrial sector, customers are susceptible to power quality events. A further study should analyze the economic costs of the voltage sags and momentary outages for industry customers.

# 2.5 Conceptual Framework

The conceptual model depicted in Figure 2.1 below shows the study variables and their relationships. The independent variables are power loss, activity losses, and service uncertainty, and the dependent variable is customer satisfaction.

Figure 2.1 Conceptual Framework

**Independent Variables Dependent Variable**

**Power Loss**

* Absence
* Response

**Customer Satisfaction**

**Activities Losses**

* Delays
* Postponements

**Service Uncertainty**

* Reliability
* Assurance

**Source:** Researcher (2022)

# 2.5.1 Study Hypotheses

The study assessed the effects electricity power outage on customer satisfaction in rural Tanzania. The study was guided by the assumption that customer satisfaction is affected by electricity power outage in rural areas. In that case, three hypotheses were formulated as follows.

**H1:** Power loss negatively affects customer satisfaction in Tanzania’s rural areas

**H2:** Losses in activities negatively affect customer satisfaction in Tanzania’s rural areas

**H3:** Service uncertainty negatively affects customer satisfaction in Tanzania’s rural areas

# CHAPTER THREE

# RESEARCH METHODOLOGY

# 3.1 Introduction

The chapter highlights the methodology that was used to facilitate the entire process of knowledge creation and generation. The methodology comprised various steps, which are represented in the following sections:

# 3.2 Research Paradigm

This section describes philosophical views and perspectives in the conduct of basic research studies (Kelly, 1999). There are several philosophies, depending on the focus of the study method and approach. This entails the perspective in the conduct of the study with implication to the source of knowledge and the reality under study. The study used post-positivism philosophy since knowledge was objectively generated using study hypotheses.

# 3.3 Research Design

Research design is the pattern in the study's conduct that assures the generation of information for the study (Creswell, 2012). There are several designs based on the philosophy and approach guiding the study. However, an explanatory design was used since causal relationship testing was performed in the information gathering process. This entails relationship testing between independent variables and the dependent variable.

**3.4 Study Area**

The study was conducted in Manyoni District, Singida Region. The areas were selected because it is one of the areas with rural features that has been well facilitated with electrification measures by the government, and the area is useful for the generation of adequate information to fill the gap.

# 3.5 Types of Data

The study used primary data, with information collected from the field through the respondents who were selected for the study. They were complemented by information from secondary sources in the discussion of the study findings.

# 3.6 Population of the Study

The study used the beneficiaries in the area as the study population. They include participants in the selected area, respectively, whereas the sample size was generated from the respective population.

# 3.7 Sampling Design

The study comprises the population specifically in the selected study area, whereas the respondents as participants to the study were obtained from the population, which consisted of the beneficiaries in the area. The design of the sample was further complemented by the sampling unit, sample size, and sampling procedures.

# 3.7.1 Sampling Unit

This entails the unit of analysis for the study, which comprises the individuals as beneficiaries in the area.

**3.7.2 Sample Size**

The study used beneficiaries as the sample size, as they participated in the research and provided useful information. The beneficiaries were members of the selected study area. This was because it was assumed that they had relevant insights and experiences that could contribute to the research. Including beneficiaries in the study allowed researchers to gain first-hand information about the challenges, perceptions, and attitudes of the target population. This approach is often preferred as it promotes community participation and ensures that research findings reflect reality. The study used a total of 150 respondents from government offices, microenterprise communities, villager communities, local businesses, local government leaders, and private firms. Because they all served as members to assure the gathering of reliable information to fill the study gap. The sample size was derived through Yamane formula to ascertain sample size was deemed better. The formula and calculation of the sample size is described below.

n= N/1+N(α)2, Where,

n = sample size

N = population

α = level of precision which for this study is 0.05

n= 150/1+150(0.05)2, resulting in 150 households, according to the formula above. Yamane's formula was used because the population was so small. A total of 150 families were sampled, with 50 households from each wealth category picked at random in proportionate allocations. There were 50 households from a treatment village and 50 households from a non-treatment village (control village).

Table 3.1: Sample size

|  |  |
| --- | --- |
| **Participants** | **Sample Size** |
| (Government) Offices | 10 |
| Micro Enterprises Community | 9 |
| Villagers | 91 |
| Local businesses | 26 |
| Local Government Leaders | 10 |
| Private Firms | 4 |
| **Total** | **150** |

**Source:** Field Data (2022)

# 3.7.3 Sampling Procedure

The study used the purposive sampling technique because the respondents who were selected included participants who were skilled and knowledgeable on the issue under study to guarantee the information generation process. In addition to that, the use of the method was appropriate because the respondents were purposely selected and all participants had the chance to participate in the study.

# 3.8 Data Collection Methods

Since the study used primary data, questionnaires were used for data collection.

# 3.8.1 Questionnaire

Structured questionnaire research instruments were used for data collection in the field. They were given to respondents to fill in the requested information. This instrument was preferred in this research because the study was performed using a causality test, which required quantifiable data. Therefore, questionnaires are the only data collection tool that assures the generation of quantifiable data from primary sources. Furthermore, it reached a large population easily in a short time and reduced costs. This method also keeps records and references for future use.

# 3.9 Validity and Reliability

Validity and reliability were conducted to assure a quality pattern in the measurements. Validity was first conducted to check for accuracy in the filling of the facts. This was first tested using the pilot testing approach of the questionnaire until it was approved by the supervisor for the collection of the data. Besides, a reliability test followed to assure the consistency of the study variables, which was articulated using the Cronbach alpha test, with the results shown in Table 3.1 below.

Table 3.1 Cronbach Alpha Test

|  |  |  |
| --- | --- | --- |
| **Study Variables** | **Number of items** | **Cronbach’s Alpha** |
| Power Loss | 4 | 0.799 |
| Losses in Activities | 4 | 0.783 |
| Service Uncertainty | 4 | 0.804 |
| Customer Satisfaction | 4 | 0.748 |

**Source:** Field Data (2022)

The reliability test results vividly show that the variables under study, both the predictors and the dependent variable, are consistent and reliable. This is the case because the results from the alpha coefficients denote the outcome since they are all above 0.7. In that case, Kelly (1999) suggests that in testing reliability on study variables for inferential analysis, the Cronbach alpha test determines the reliability of the results based on the alpha results exceeding 0.7.

# 3.10 Data Analysis

The collected data were clustered quantitatively, whereas the results were computed in SPSS datasheet version 23.0 to generate relevant statistical tools to present the primary data. Descriptive statistics were generated to describe the profile of the respondents, which include frequency tables and percentages. On top of that, correlation and multiple regression analyses were used to describe the existing relationship between study variables. In that case, the analysis is described by the model illustrated as follows:

***CS = βo + β1PL + β2LA + β3SU + e***

Where by

***CS*** = Customer Satisfaction

***βo*** = Constant factor

***β1PL*** = Power Loss

***β2LA*** = Losses in Activities

***β3SU*** = Service Uncertainty

***e*** = Random variable

# CHAPTER FOUR

# PRESENTATION OF FINDINGS

# 

# 4.1 Introduction

The chapter presents the results of the study based on the relationship between study variables, complemented by the analysis and discussions, respectively. In that note, the chapter consists of the description, which is as follows:

# 4.2 Response Rate

The study targeted 150 respondents among beneficiaries of electricity services in rural areas prior to the selected study area. However, the gathered results were 119 questionnaires, which is equivalent to a 79.3% response rate. The rate is certain for analysis because Webb (1991) suggests that if the response exceeds 65%, the results are suitable for analysis and the generation of an adequate conclusion. Since that is the case, the response rate for the study was 79.3%, which implies that the data were suitable for analysis.

# 4.3 Respondents' Profile

The section describes an overview of the beneficiaries of the electricity services in rural areas based on their demographic profile, and Table 4.1 provides the results.

Table 4.1 Profile of the Respondents

|  |  |  |
| --- | --- | --- |
| **Variables** | **Frequencies** | **Percentages** |
| **Gender** | 77  42  **119** | 64.7%  35.3%  **100%** |
| Male  Female  **Total** |
| **Age** | 17  33  41  28  **119** | 14.3%  27.7%  34.5%  23.5%  **100%** |
| 18-35  36-50  51-65  65+  **Total** |
| **Education Level** | 42  34  31  8  4  **119** | 35.3%  28.6%  26.1%  6.7%  3.3%  **100%** |
| Secondary Education  Certificate  Diploma  First Degree  Postgraduate Level  **Total** |

**Source:** Field Data (2022)

The results in Table 4.1 provide a profile of the beneficiaries of electricity services in rural areas. The findings indicate that among the respondents, 64.7% were male and 35.3% were female. This implies that beneficiaries of electricity services in rural areas are men and women in the society. The assertion is supported by Ginn (2016), who suggests that beneficiaries of electricity services in any country all over the globe, whether in rural or urban areas, are people of all sex categories.

The findings further reveal that 14.3% of the respondents were aged 18–35 years, while 27.7% were aged 36–50 years, 34.5% were aged 50–65 years, and 23.5% were aged above 65 years. This implies that beneficiaries of electricity services in rural areas are people of all age groups, from the young to the elderly. The assertion is complemented by Magambo (2015), who suggested that electricity is beneficial to all people, from children to adults and older individuals.

Moreover, the results indicate that 35.3% of the respondents had secondary education, while 28.6% had certificates, 26.1% had diplomas, 6.7% had a first degree, and 3.3% had postgraduate qualifications. This implies that beneficiaries of electricity services in rural areas comprise individuals with varying degrees of formal education. This is also acknowledged by Msyani (2015), who indicated that electricity beneficiaries in rural areas consist of varying levels of formal education: some are less educated, others are not educated at all, and some are highly educated.

# 4.4 Analysis of Study Variables

The analysis of study variables was conducted using measures of central tendency and inferential analysis.

# 4.4.1 Measures of Central Tendency

Measures of central tendency such as mean and standard deviation are used to determine the variable among the predictors with the strongest influence on the dependent variable and the minimum level of dispersion, respectively. Table 4.2 indicates the results.

Table 2.2 Mean and Standard Deviation

|  |  |  |  |
| --- | --- | --- | --- |
| **Study Variables** | **Mean** | **Standard Deviation** | **N** |
| Customer Satisfaction | 3.194 | 1.1138 | 119 |
| Power Loss | 3.481 | 1.1312 | 119 |
| Losses in Activities | 3.316 | 1.1285 | 119 |
| Service Uncertainty | 3.633 | 1.1449 | 119 |

**Source:** Field Data (2022)

The findings reveal that service uncertainty as a predictor has a stronger influence on the dependent variable than other predicting variables. This was attributed to the fact that service uncertainty has a higher mean value than the rest of the predictors. This implies that customer satisfaction through electricity outages in rural areas of Tanzania is affected more by service uncertainty than losses in activities and power loss. Despite that, the standard deviation reveals that the variance of the study variables is not high, with the values being less than 3, signifying that respondents’ opinions did not differ much.

# 4.4.2 Results of Inferential Analysis

Inferential analysis is performed to show the relationship between study variables through correlation and multiple regression analysis. The analysis is first preceded by a model summary test to describe the entire influence of all predictors on the dependent variable, and the results are as shown in Table 4.4 below.

Table 4.3 Model Summary

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Model** | **R** | **R square** | **Adjusted R Square** | **Standard Error of Estimate** | **Change statistics** | | | **Durbin- Watson** |
| 1 | .679 | .623 | .607 | 46.755 | .405 | 60.857 | .000 | 1.584 |

**Source:** Field Data (2022)

**Dependent Variable**: Customer Satisfaction

**Independent Variables**: Power Loss, Losses in Activities, and Service Uncertainty

The study results indicate the entire influence of the predictors on the dependent variable through the value of R2. Therefore, the results denote that customer satisfaction through electricity outages in Tanzania's rural areas is negatively influenced by power loss, losses in activities, and service uncertainty by 62.3%. The other remaining influence is attributed to other factors apart from the predicting variables. This implies that the study's assumptions have been met.

The test of autocorrelation between variables was calculated by using Durbin-Watson in Table 4.4. The autocorrelation of independent variables was low, as the coefficient Durbin-Watson was within an acceptable range (1.584) in Table 4.4. A Durbin-Watson coefficient of less than 1.5 (or above 2.5) may raise concerns (Field Data 2022).

# 4.4.3 Normality Test

This is illustrated to describe the pattern of distribution among variables based on their normality. Hence, Table 4.5 provides the results.

Table 4.4: Normality Test

|  | Kolmogorov-Smirnova | | | Shapiro-Wilk | | |
| --- | --- | --- | --- | --- | --- | --- |
| Factors | Statistic | Df | Sig. | Statistic | df | Sig. |
| Power Loss | .502 | 119 | .003 | .518 | 119 | .016 |
| Losses in Activities | .466 | 119 | .021 | .464 | 119 | .028 |
| Service Uncertainty | .419 | 119 | .019 | .438 | 119 | .014 |
| Customer Satisfaction | .392 | 119 | .000 | .371 | 119 | .000 |
| a. Lilliefors Significance Correction | | |  |  |  |  |

**Source:** Field Data (2022)

The findings are evident that the p-values of all predicting variables, namely power loss, losses in activities, and service uncertainty, constitute significant effects (p 0.05) through the Shapiro-Wilk test of normality. The implication is that the distribution of variables for the study is normal on all accounts.

# 4.4.4 Multicollinearity Test

The test was undertaken with the aim of describing the condition pertaining to the multicollinearity error or problem in the study variables. Therefore, table 4.6 indicates the results as follows:

Table 4.5 Multicollinearity Test

| Model | | **Collinearity Statistics** | |
| --- | --- | --- | --- |
| Tolerance | Variable Inflation Factor (VIF) |
| 1 | Power Loss | .532 | 1.574 |
| Losses in Activities | .504 | 2.182 |
| Service Uncertainty | .516 | 2.779 |
| a. Dependent Variable: Customer Satisfaction | | |  |

**Source:** Field Data (2022)

The findings reveal that the predicting variables constitute a positive effect with regard to the tolerance coefficient results since they have exceeded 0.5 but are less than 1, which makes it clear that they possess a significant influence. However, with the variance inflation factor (VIF), the outcome is that they are less than 5 but greater than 1, which denotes that the multicollinearity error has been resolved. This is supported by Keith's (2006) proposal of a high VIF and low tolerance, which implies low collinearity. VIF ranges between 1 and 10, while tolerance is between 0 and 1.

# 4.4.5 Correlation Analysis

The analysis was conducted to determine which predicting variable correlated best with the dependent variables. The results are illustrated in Table 4.7.

**Table 4.6 Correlation Analysis**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Customer Satisfaction** | **Power Loss** | **Losses in Activities** | **Service Uncertainty** |
| Customer Satisfaction  Power Loss  Losses in Activities  Service Uncertainty | 1.000  .403  .327  .554 | 1.000  .005  .021 | 1.000  .018 | 1.000 |

**Source:** Field Data (2022)

The findings of the study show that the highest correlation among the study variables is between service uncertainty and power loss. Although all predictor variables were analyzed, service uncertainty was found to have the strongest correlation with customer satisfaction, exceeding the correlation values of the other variables. This implies that, when it comes to power outages in rural areas of Tanzania, service uncertainty has a greater impact on customer satisfaction than power loss and disruptions to activities. However, it should be noted that while the correlation between service uncertainty and customer satisfaction is positive, the coefficient is small, indicating the absence of multicollinearity. To address this issue, multiple regression analysis was employed to ensure the accuracy and reliability of the results.

# 4.4.6 Multiple Regression Analysis

This is conducted to describe the influence of each predictor variable to the dependent variable. Table 4.8 indicates the results of the study.

Table 4.7 Multiple Regression

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model** | **Unstandardized Coefficients** | | **Standardized Coefficients** | **T** | **Sig.** |
| B | Std. error | Beta |
| (constant) | -10.563 | 3.164 |  | -1.181 | .000 |
| Power Loss | 2.095 | .206 | .530 | 12.283 | .016 |
| Losses in Activities | 1.853 | .175 | .512 | 12.072 | .023 |
| Service Uncertainty | 2.163 | .261 | .557 | 12.649 | .008 |

**Source:** Field Data (2022)

The findings in Table 4.8 reveal facts about multiple regression analysis, which shows the influence of each predictor on the dependent variable. In that regard, the findings revealed that all three predictors, namely power loss, losses in activities, and service uncertainty, have a positive and significant effect on customer satisfaction (p 0.05). This signifies the fact that customer satisfaction is indeed influenced by electricity outages based on the stated assumptions as the study variables. Therefore, the implication of the results is that customer satisfaction through electricity outages in Tanzania's rural areas is affected by power loss, losses in activities, and service uncertainty.

# 4.5 Discussion of the Findings

# 4.5.1 Power Loss and Customer Satisfaction

The study findings revealed that power loss as a predictor has been found to have a positive, statistically significant effect on customer satisfaction (p 0.05). The findings imply that customer satisfaction through electricity outages in rural areas is affected by power loss. This is supported by Peters et al. (2019), who suggested that electricity outages in rural areas have been problematic as they have been and are still high, which distorts users’ satisfaction.

Customer satisfaction is mostly affected by power loss, which automatically affects service provision. Tsakhara (2015), on the other hand, suggests that a power outage is highly problematic with regard to service provision and delivery because it implies power loss, which in the end affects customer satisfaction.

# 4.5.2 Losses in Activities and Customer Satisfaction

The study findings show that losses in activities are positive, with a significant effect on customer satisfaction (p 0.05) as the dependent variable. This implies that customer satisfaction through electricity outages in rural areas of Tanzania is affected by activity losses. This is also supported by Mawhood (2015), who suggested that power outages are very problematic and affect customer satisfaction as the beneficiaries of the services because they affect the activities that are being performed. This is also attributed to the fact that the activities that depend on the power to operate and function tend to be affected, and the beneficiaries encounter losses.

Mawhood (2014) suggested that power outages are a shortcoming in income-generating activities, and for tasks that depend on power availability to operate and be executed automatically, they tend to foster losses. This is problematic since such activities tend to experience decline through delay and are sometimes unable to function and operate. This, in the end, affects the satisfaction of the beneficiaries.

# 4.5.3 Service Uncertainty and Customer Satisfaction

The study findings revealed that service uncertainty as a predictor was found to be positive, with statistically significant effects on customer satisfaction (p 0.05). This implies that customer satisfaction through electricity outages in rural areas of Tanzania is affected by service uncertainty. These findings are acknowledged by Msyani (2015), who suggested that power outages, whether in rural or urban areas, imply uncertainty in the services. This automatically affects the satisfaction of the customers, which is a setback to service quality and service provision, respectively.

# CHAPTER FIVE

# SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

# 5.1 Introduction

The chapter provides a description of the summary of the study, its conclusion, and its recommendations. The description is based on the findings of the study and the implications generated. Furthermore, the chapter describes areas for further study.

# 5.2 Summary of Findings

The study assessed the impact of electricity outages on customer satisfaction in rural areas of Tanzania. The study was guided mainly by three predicting variables, which were tested on customer satisfaction as the dependent variable. The predicting variables include power loss, losses in activities, and service uncertainty. The study employed an explanatory design through a causal relationship approach, whereas the findings were gathered using structured questionnaires from a sample of 119 respondents. The collected data were filled in in SPSS data set version 23.0 for the purpose of generating statistical measurements, which were used to present the findings. Descriptive statistics were used to show the profile of the respondents, while correlation and multiple regression analysis were used to describe the relationship between study variables. Findings revealed that all three predicting variables were found to be positive, with statistically significant effects on customer satisfaction at p 0.05. The results imply that customer satisfaction through electricity outages in Tanzania's rural areas is affected by power loss, losses in activities, and service uncertainty.

# 5.3 Conclusion

It is clear that customer satisfaction is affected by electricity outages through power loss, losses in activities, and service uncertainty. This has been the case since the predictors have been positive, with statistically significant effects on customer satisfaction. Since that is the case, though the services provide significant gains to the public and the communities at large, there have been challenges in the use of the services that affect the satisfaction of customers. They include power loss and losses in the activities and poor service quality that distorts the pattern of serving customers, which is essential for drastic measures to be undertaken to foster a solution to the situation.

**5.4 Implications of the Study**

This entails the policy and theoretical implications that the policy as the service provider constitutes a statutory provision seeking to assure service quality provision in line with customer satisfaction in service delivery. However, there are shortcomings in the running of the entity that have exacerbated the situation in that manner. Besides that, with theoretical implications, the outcome corresponds with the SERVQUAL model and theory of value in that the results reveal a service quality situation, which has implications for the value of the organization to the customers in service delivery.

**5.5 Limitations of the Study**

The study was limited on two main accounts, with the first being the results gathering, where some questionnaires were wrongly filled and others refused to cooperate, which made the researcher re-distribute until the number was accurate for analysis. Also, the study required further knowledge generation by the researcher to assure clarity and precision in the conduct of the study.

# 5.6 Recommendations

The study revealed the effects of power outages in rural areas and their effects on customer satisfaction. The study therefore recommends that the service provider ensure that infrastructures (generation, transmission, and distribution infrastructures) and facilities are certain through major improvements and that there is good and adequate prosperity as far as service quality is concerned.

The study also recommends that service providers have the tendency to make preventive infrastructure repairs and maintenance on a routine basis for their infrastructures, both generation, transmission, and distribution infrastructures, and not wait until mechanical failure results from underproduction electricity, grid outages result from tower tears, and the wearing and falling down of poles result from rotten poles.

The study also recommends that service providers replace wooden poles with concrete poles, starting in wet areas and later on countrywide. This can be done gradually, depending on the speed of rotten wooden poles, whereby once wooden poles are removed due to any cause, either defective, burned, or rotten, the service provider should replace them with concrete poles.

The study also recommends that once there is a planned electricity power outage, the service provider should communicate with customers and other stakeholders prior to the outage event, and if it is an unplanned outage, the service provider should communicate with customers and other stakeholders after the event to apologize.

The study also recommends that service providers have a varied portfolio mix of sources of electricity generation and not rely too much on one source, for example, hydroelectricity, which greatly depends on weather and climate conditions.

The study also recommends the establishment of an East Africa integrated national grid exchange network, with Tanzania's national grid, Kenya's national grid, Uganda's national grid, and Rwanda's national grid mutually integrating and connecting each other to the extent that if Tanzania faces under-generation of electricity power, that deficit can be supplied by one of the east African countries that has surplus electricity generation by that time, thereby facilitating international trade as regards electricity commodities.

Lastly, the study also recommends that the government should allow private sector entities to participate in service provision to assure high-quality service provision resulting from service quality competition. This is the case with the telecommunications sector, which has developed and rose to greatness in Tanzania as a result of getting away from monopolies, which prevent competition. Example: TTCL was the monopoly of the telecommunications sector by then.

# 5.7 Areas for Further Studies

The study was quantitatively undertaken using causal relationship testing. However, another study may be conducted qualitatively in the same area to generate more detailed facts beyond the tested predicting variables and/or hypotheses. Also, the study was conducted in the energy sector to find out the effects of power outages on customer satisfaction in rural areas. When referring to the "sector to assure the information generation process," we are essentially talking about the sector or group of people who are responsible for collecting and analyzing data to generate useful insights and information for decision-making purposes. In this context, it refers to the sector responsible for collecting data to inform the research study.

To ensure that the information generation process is efficient and effective, it is important to have a well-defined and organized sector responsible for data collection and analysis. This sector should have a clear understanding of the research objectives and questions to ensure that the data collected is relevant and useful. Furthermore, the sector should have the necessary tools and resources to collect and analyze data effectively, such as survey instruments, data management software, and statistical analysis tools.

Additionally, the sector responsible for information generation should be comprised of individuals who possess the necessary skills and expertise to carry out their respective roles effectively. For instance, data collectors should be trained on proper data collection techniques to ensure data quality, while data analysts should possess strong analytical skills to derive useful insights from the collected data.

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# APPENDICESAppendix: 1 RESEARCH QUESTIONNAIRES

This is a questionnaire on the study titled “Impact of Electricity Power outage on Customer Satisfaction in Rural Areas in Tanzania”

**Dear Respondent;**

Thank you in advance for devoting your time to participate in this study. Basically, the study is for academic purposes and for the completion of all requirements for the Masters program. I request that you participate in this study with free will and high degree of honest and openness. This is key towards achieving the intended goal of the study. No names of individuals or entities are required and strict confidentiality will be maintained in handling your responses.

**Part I: General Information**

1. Gender?
   1. Male
   2. Female
2. Age?
   1. 18-35
   2. 36-50
   3. 50+
3. Education Level
   1. No Formal Education
   2. Primary Education
   3. Secondary Education
   4. Tertiary Education
   5. Other (specify) …………………………………………………………….

**Power Loss**

The following are the attributes of power loss on customer satisfaction which are rated on Likert scale format seeking your response. Kindly respond by ticking (√) the appropriate box on the scale expressed in numbers within boxes.

**Strongly Agree Agree Disagree Strongly Disagree Don’t Know**

**1 2 3 4 5**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **STATEMENTS** | **1** | **2** | **3** | **4** | **5** |
| **1.** | Power outage is typically affecting customers’ expectations on the services. |  |  |  |  |  |
| **2.** | Power distorts services reliability. |  |  |  |  |  |
| **3.** | Power outage is not compatible with assurance in the services. |  |  |  |  |  |

**Activities Losses**

The following are the activities losses due to power outage. Kindly respond on the appropriate answer by ticking (√) the appropriate box on the scale expressed in numbers within boxes.

**Strongly Agree Agree Disagree Strongly Disagree Don’t Know**

**1 2 3 4 5**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **STATEMENTS** | **1** | **2** | **3** | **4** | **5** |
| **1.** | Power outage affect activities performance among people in the society. |  |  |  |  |  |
| **2.** | Most activities in the society depends on electricity that with the presence of outage implies loss. |  |  |  |  |  |
| **3.** | The outage of power causes destructions to the activities of the customers. |  |  |  |  |  |

**Services Uncertainty**

The following are the attributes of services uncertainty. Kindly respond on the appropriate answer by ticking (**√**) the appropriate box on the scale expressed in numbers within boxes.

**Strongly Agree Agree Disagree Strongly Disagree Don’t Know**

**1 2 3 4 5**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **STATEMENTS** | **1** | **2** | **3** | **4** | **5** |
| **1.** | Electricity services are less reliable. |  |  |  |  |  |
| **2.** | There is limited assurance towards electricity services. |  |  |  |  |  |
| **3.** | There is less responsiveness pertaining to power outage occurrences. |  |  |  |  |  |

**Customer Satisfaction**

The following are the attributes of customer satisfaction which are rated in Likert scale format seeking your response. Kindly respond on the appropriate answer by ticking (**√**) the appropriate box on the scale expressed in numbers within boxes.

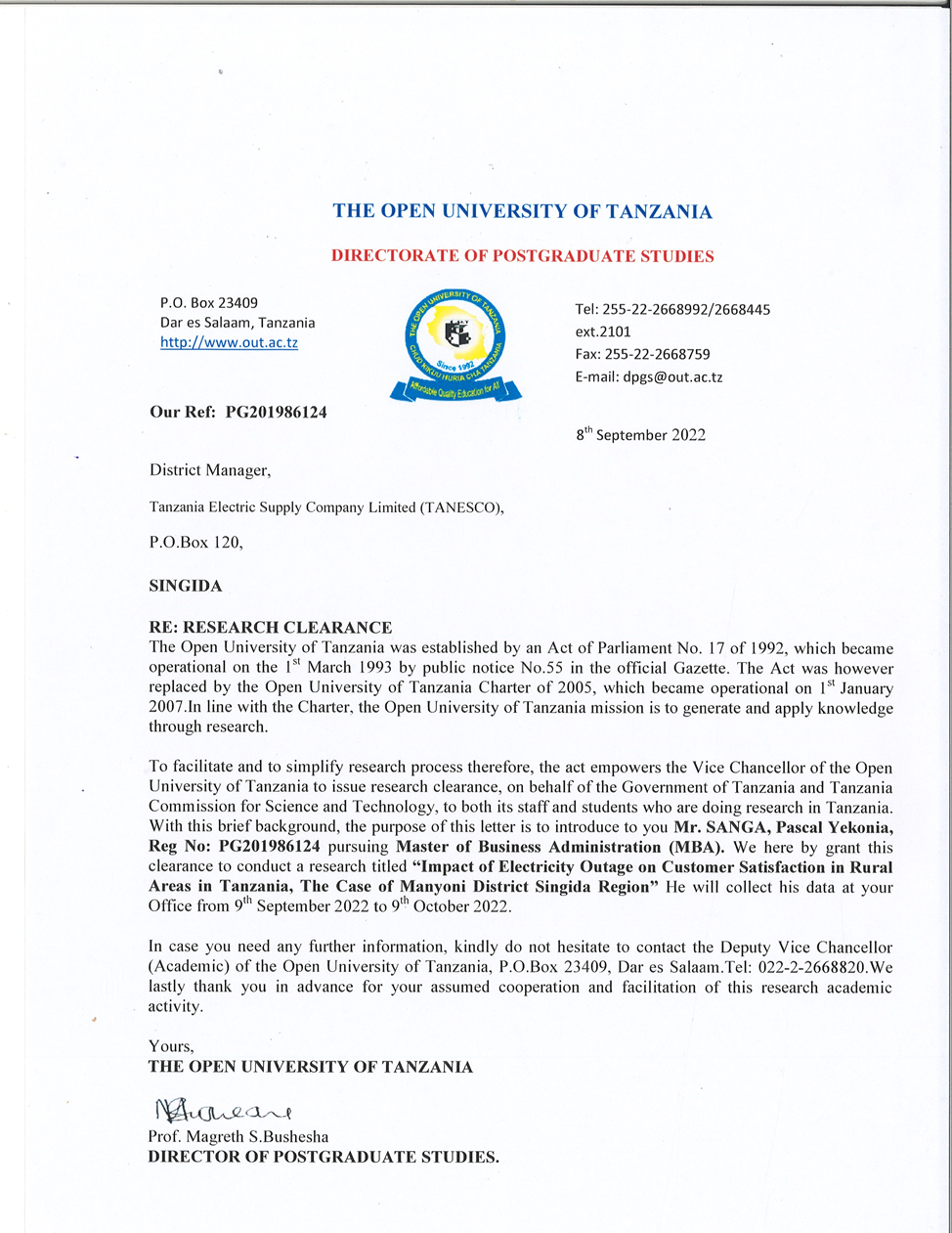
**Strongly Agree Agree Disagree Strongly Disagree Don’t Know**

**1 2 3 4 5**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **STATEMENTS** | **1** | **2** | **3** | **4** | **5** |
| **1.** | Customer satisfaction through Electricity Power outage is affected with power loss. |  |  |  |  |  |
| **2.** | Customer satisfaction through Electricity Power outage is affected with activities losses. |  |  |  |  |  |
| **3.** | Customer satisfaction through Electricity Power outage is affected with services uncertainty. |  |  |  |  |  |

**THANK YOU FOR YOUR TIME**

# Appendix: II OUT Research Clearance Letter



# Appendix: III: TANESCO Permission to Collect Data



# Appendix: 1V: Plagiarism Report

