



The influence of service quality determinants on electricity quality service delivery in Tanzania: A case of Tanzania Electric Supply Company Limited Call Centre

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ABSTRACT

The Tanzania Electric Supply Company Limited (TANESCO) call centre plays an important role in responding to customers' electricity-related inquiries, complaints, and service requests. However, concerns regarding delays in responding to customers and resolving service-related issues continue to raise questions about the quality of service delivery. This study examined the influence of service quality determinants on Electricity Quality Service Delivery (EQSD) at the TANESCO call centre in Kinondoni District, Tanzania. Specifically, the study examined the influence of reliability, responsiveness, and empathy on EQSD. Service Quality (SERVQUAL) Model anchored this research. The study employed a mixed-methods approach and a descriptive research design. Data were collected using structured questionnaires from customers and interviews with TANESCO staff. The study involved 400 customers and 30 call-centre employees and supervisors. The sample size of 400 customers was determined using the Yamane formula at a 5% level of precision. Customers were selected using convenience sampling, while call-centre employees and supervisors were selected using purposive sampling based on their involvement in customer-service activities. Quantitative data were analysed using descriptive statistics and multiple regression analysis, while qualitative data were analysed thematically. The findings indicate that reliability had a positive but statistically insignificant influence on EQSD ($\beta = 0.089$, $p = 0.077$). Responsiveness had a positive and statistically significant influence on EQSD ($\beta = 0.321$, $p < 0.001$), while empathy had a positive and statistically significant influence ($\beta = 0.548$, $p < 0.001$). The regression model was statistically significant ($F = 407.280$, $p < 0.001$) and explained 80.9% of the variation in EQSD ($R^2 = 0.809$). The study concludes that responsiveness and empathy are important determinants of EQSD at the TANESCO call centre, with empathy emerging as the strongest predictor. The study recommends strengthening timely responses, complaint handling, customer communication, and continuous customer-care training to improve electricity quality service delivery.

Keywords: Electricity Quality Service Delivery, Empathy, Reliability, Responsiveness, Service Quality, SERVQUAL

I. INTRODUCTION

Electricity is a fundamental service for economic activity, social development, industrialisation, and household welfare (Maruta, 2025; Khan et al., 2025). However, access to electricity does not necessarily mean that consumers receive electricity services of acceptable quality. Electricity service quality also concerns the reliability, continuity, adequacy, timeliness, and effectiveness of the services provided to users. Recent evidence shows that poor power quality and reliability remain important challenges in sub-Saharan Africa, including among customers who are already connected to electricity networks. Osunmuyiwa et al. (2025), for example, found significant disparities in power quality and reliability across urban areas in Ghana and demonstrated that poor power quality can affect households' ability to use electricity effectively. Similarly, Nsabimana et al. (2024), in an assessment of electricity systems in six East African countries, including Tanzania, found substantial differences in the effectiveness of electricity systems and emphasized the importance of access to reliable electricity for economic and social development. These findings indicate that expanding electricity access needs to be accompanied by efforts to improve the quality and reliability of electricity services.

The importance of reliable electricity services is particularly relevant in Africa, where electricity systems continue to face technical, institutional, and resource-related challenges. Agoundedemba et al. (2023) identify inadequate access, infrastructure limitations, and sustainability challenges among the major issues affecting the African energy sector, while Foster et al. (2021) highlight the continuing electricity-access and sector-performance challenges in sub-Saharan Africa. Reliable electricity is also important for economic activity and social welfare because interruptions and inadequate supply can constrain productive activities and household well-being (Zenelabden et al., 2026). Consequently, the quality of electricity service delivery has become an important consideration alongside the expansion of electricity access.

At the regional utility level, the performance of electricity providers remains an important concern. Twesigye (2022), in a comparative analysis of electricity utilities in Tanzania, Kenya, and Uganda, found considerable differences in utility performance and reported that TANESCO performed poorly relative to the other utilities examined. The study further identified governance, regulatory, institutional, and operational factors as important influences on utility performance. In Tanzania, electricity-sector challenges have also been associated with policy implementation, institutional arrangements, and the performance of sector reforms (Dye, 2021; Mwampashi, 2024). These challenges suggest that improving electricity service delivery requires attention not only to infrastructure and electricity supply but also to the effectiveness of the institutions and service processes through which electricity services are delivered to customers.

In Tanzania, the importance of improving electricity services is consistent with the country's current national development aspirations. The Tanzania Development Vision 2050 (Dira 2050) identifies energy as an important driver of socioeconomic transformation and emphasizes the development of a resilient, efficient, clean, and sustainable energy system capable of providing reliable and affordable energy access (United Republic of Tanzania, 2025). The Vision further links reliable energy infrastructure with industrialisation, innovation, economic diversification, and improved quality of life. Thus, improving electricity quality service delivery is relevant to Tanzania's broader development agenda because the benefits of electricity infrastructure depend partly on the reliability and effectiveness of the services experienced by electricity users.

The Tanzania Electric Supply Company Limited (TANESCO) plays a central role in the provision of electricity services in Tanzania. Therefore, the quality of services delivered by TANESCO is important to households, businesses, and public institutions that depend on electricity. Previous research has established the relevance of service quality to customers' experiences with TANESCO. Peter and Batonda (2022), for example, examined service quality among TANESCO residential customers in Nyamagana District and found that reliability, responsiveness, empathy, assurance, and tangibility were positively associated with customer satisfaction. Mbullo (2024) also reported a positive relationship between service quality and customer satisfaction in the Tanzanian public sector, including TANESCO. These studies demonstrate the importance of service-quality dimensions within the Tanzanian electricity sector. However, their focus was primarily on customer satisfaction rather than electricity quality service delivery as an outcome, and they did not specifically examine the TANESCO call-centre environment.

Electricity quality service delivery should be distinguished from customer satisfaction and from the technical supply of electricity alone. Customer satisfaction represents a customer's evaluation or response to a service, whereas electricity quality service delivery concerns the quality and effectiveness of the service provided by the electricity utility. In addition to the physical supply of electricity, customers interact with electricity providers when reporting faults, requesting information, making inquiries, submitting complaints, and seeking assistance. Souza et al. (2021) demonstrate that users' assessment of electricity distribution services involves multiple aspects of service and should not be restricted to technical measures of electricity supply alone. Therefore, examining electricity quality service delivery requires consideration of the customer-facing processes through which an electricity provider responds to and serves its customers.

The TANESCO call centre provides an important customer-facing channel through which such services are delivered. Customers use the call centre to report electricity faults, make inquiries, seek information, lodge complaints, and request assistance. The quality of these interactions may therefore influence the effectiveness of electricity quality service delivery. In this context, reliability concerns the ability to provide dependable and accurate service; responsiveness concerns the willingness and ability to assist customers promptly; and empathy concerns the provision of caring and individualized attention to customers. These dimensions correspond to the SERVQUAL framework developed by Parasuraman et al. (1985), which identifies reliability, responsiveness, empathy, assurance, and tangibles as important dimensions through which customers evaluate service quality. The present study focuses specifically on reliability, responsiveness, and empathy because these dimensions are particularly relevant to the direct interactions between call-centre personnel and electricity customers.

Empirical studies from electricity-service contexts further demonstrate the relevance of these service-quality dimensions, although their effects are not necessarily consistent across settings. Jawneh and Manneh (2020), in a study of electricity consumers in The Gambia, identified service-quality dimensions including responsiveness and empathy as important determinants of consumers' perceptions of electricity services. Peter and Batonda (2022) similarly found positive relationships between reliability, responsiveness, empathy, assurance, tangibility, and customer satisfaction among TANESCO residential customers. In contrast, Yunana et al. (2023), in an assessment of service quality in electricity distribution in Nigeria, reported a negative and significant effect of reliability on customer satisfaction. Such differences indicate that the influence of individual service-quality dimensions may vary according to the institutional, operational, and customer-service context in which electricity services are provided. This provides a basis for examining the individual contribution of reliability, responsiveness, and empathy within the specific context of the TANESCO call centre.

The practical importance of customer-facing electricity services is also demonstrated by recent concerns regarding the performance of the TANESCO call centre. In January 2025, the Deputy Prime Minister and Minister for Energy directed an overhaul of the TANESCO call centre following concerns about unresolved customer queries, excessive waiting times, and poor customer service (The Citizen, 2025). This development indicates that customer-facing service delivery remains an important practical concern within TANESCO. However, reports of service problems do not establish which specific service-quality dimensions influence the quality of electricity services delivered through the call centre. Empirical investigation is therefore necessary to determine whether reliability, responsiveness, and empathy are associated with differences in electricity quality service delivery.

Although existing research provides evidence that service-quality dimensions are important in electricity-service contexts, an empirical gap remains in the Tanzanian call-centre setting. Previous Tanzanian studies have mainly examined service quality in relation to customer satisfaction among residential customers or within particular geographical areas (Peter & Batonda, 2022; Mbullo, 2024). Consequently, limited empirical evidence exists on how individual service-quality dimensions influence electricity quality service delivery at a TANESCO call centre. In particular, there is insufficient evidence on whether reliability, responsiveness, and empathy contribute differently to the quality of customer-facing electricity services. Addressing this gap is important because the call centre represents a direct point of interaction between TANESCO and its customers, and the effectiveness of these interactions can influence how electricity-related complaints, inquiries, and service requests are handled.

Therefore, this study examines the influence of reliability, responsiveness, and empathy on electricity quality service delivery at the TANESCO call centre in Tanzania. By focusing on electricity quality service delivery rather than customer satisfaction as the dependent variable, the study seeks to provide empirical evidence on the service-quality dimensions that contribute to effective, dependable, timely, and customer-oriented delivery of electricity-related services through the TANESCO call centre.

1.1 Research Objectives

- i. Examine the influence of reliability on Electricity Quality Service Delivery.
- ii. Examine the influence of responsiveness on Electricity Quality Service Delivery.
- iii. Examine the influence of empathy on Electricity Quality Service Delivery.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Service Quality (SERVQUAL) Model

The SERVQUAL model developed by Parasuraman et al. (1985) is widely used to assess customers' perceptions of service quality. The model identifies five dimensions through which customers evaluate service quality: reliability, responsiveness, assurance, empathy, and tangibles. Reliability refers to the ability of a service provider to perform promised services dependably and accurately. Responsiveness concerns the willingness and ability of employees to assist customers and provide prompt service. Assurance relates to employees' knowledge, courtesy, and ability to inspire trust and confidence. Empathy refers to providing customers with caring, individualized, and considerate attention, while tangibles concern the physical facilities, equipment, personnel, and communication materials associated with service delivery.

Although the SERVQUAL model comprises five dimensions, this study focuses specifically on reliability, responsiveness, and empathy. The selection of these three dimensions is guided by the nature of the TANESCO call-centre environment, where service delivery occurs primarily through direct interactions between customers and call-centre personnel. Reliability is relevant because customers expect their complaints, inquiries, and service requests to be handled accurately and consistently. Responsiveness is particularly important because customers contacting the call centre expect timely responses, prompt assistance, relevant information, and effective attention to their service problems. Empathy is also important because call-centre personnel interact directly with customers who may be experiencing electricity-related problems and therefore require individualized, respectful, and caring attention.

In contrast, assurance and tangibles were not included as independent variables because they are less directly aligned with the specific customer-service processes examined in this study. Assurance primarily concerns employees' knowledge, courtesy, and ability to inspire confidence, while tangibles focus on the physical aspects of service delivery, such as facilities, equipment, and communication materials. Although these dimensions may contribute to overall perceptions of service quality, the present study is concerned specifically with how reliability, responsiveness, and empathy influence Electricity Quality Service Delivery through a customer-contact call centre. The three selected dimensions therefore provide a focused framework for examining the service characteristics most directly associated with the handling of customers' electricity-related inquiries, complaints, and service requests.

Accordingly, the SERVQUAL model provides an appropriate theoretical foundation for this study because it recognizes service quality as a multidimensional construct based on customers' perceptions of service encounters. By

concentrating on reliability, responsiveness, and empathy, the study is able to examine the dimensions that are most closely connected to the customer-facing activities of the TANESCO call centre and their influence on Electricity Quality Service Delivery.

2.2 Empirical Review

2.2.1 Reliability and Electricity Quality Service Delivery

Reliability is an important dimension of electricity service quality because customers expect electricity-related services and responses to be provided accurately and consistently. Peter and Batonda (2022), studying TANESCO residential customers in Nyamagana District, found a positive and significant relationship between reliability and customer satisfaction. Similarly, Tamu et al. (2024) found that reliability significantly influenced customer satisfaction among electricity consumers in Nigeria. However, Yunana et al. (2023) reported a negative and significant effect of reliability on customer satisfaction in Kaduna, Nigeria. These mixed findings suggest that the influence of reliability may vary across electricity-service contexts. However, existing studies have mainly focused on customer satisfaction rather than electricity quality service delivery, and limited evidence exists concerning TANESCO's call-centre environment.

2.2.2 Responsiveness and Electricity Quality Service Delivery

Responsiveness concerns the promptness and willingness of service providers to assist customers and address their concerns. Peter and Batonda (2022) found that responsiveness positively and significantly influenced customer satisfaction among TANESCO residential customers. Jawneh and Manneh (2020) also identified responsiveness as an important determinant of perceived service quality among electricity consumers in The Gambia. In contrast, Yunana et al. (2023) reported a negative relationship between responsiveness and customer satisfaction in Nigeria. These differences indicate that responsiveness may operate differently depending on the service context. This dimension is particularly relevant to a call centre because customers expect timely responses when reporting faults, making inquiries, or seeking assistance.

2.2.3 Empathy and Electricity Quality Service Delivery

Empathy involves providing customers with caring, individualized, and considerate attention. Peter and Batonda (2022) found a positive relationship between empathy and customer satisfaction among TANESCO residential customers. Jawneh and Manneh (2020) similarly identified empathy as an important determinant of perceived electricity service quality in The Gambia. Yunana et al. (2023) also reported a positive effect of empathy on customer satisfaction in Nigeria. These findings suggest that individualized attention may be important in electricity-service interactions. Nevertheless, limited empirical evidence has examined whether empathy influences electricity quality service delivery specifically within a TANESCO call-centre setting.

2.2.4 Empirical Review Synthesis and Research Gap

The reviewed studies demonstrate that reliability, responsiveness, and empathy are relevant dimensions of service quality in electricity-service contexts. However, much of the existing evidence uses customer satisfaction as the dependent variable and focuses on residential electricity consumers or general electricity-distribution services (Peter & Batonda, 2022; Yunana et al., 2023; Jawneh & Manneh, 2020). Consequently, there is limited empirical evidence on the influence of these three dimensions on electricity quality service delivery, particularly within a customer-contact facility such as the TANESCO call centre. Furthermore, the mixed findings concerning reliability and responsiveness suggest that their effects may depend on the specific service context. This study therefore examines the influence of reliability, responsiveness, and empathy on electricity quality service delivery at the TANESCO call centre in Tanzania.

III.METHODOLOGY

3.1 Research Approach and Design

The study employed a mixed-methods research approach to examine the influence of service quality determinants on Electricity Quality Service Delivery (EQSD) at the Tanzania Electric Supply Company Limited (TANESCO) call centre. The quantitative approach was used to determine the influence of reliability, responsiveness, and empathy on EQSD, while qualitative data provided additional information on customer service practices at the call centre. A descriptive cross-sectional research design was adopted. The design enabled the researcher to collect data at a single point in time and describe the existing service quality and delivery practices at the TANESCO call centre.

3.2 Study Area and Population

The study was conducted at the TANESCO call centre in Kinondoni District, Tanzania. The study population comprised TANESCO customers, call-centre employees, and managers. According to the information used in the study,

Kinondoni District had approximately 311,446 households (Kinondoni Municipal Council, 2018), while the TANESCO call centre had 108 employees (TANESCO, 2023).

3.3 Sample Size and Sampling Techniques

The study involved 400 customers and 30 call-centre employees and supervisors. The sample size of 400 customers was determined using the Yamane (1967) formula at a 5% level of precision. Customers were selected using convenience sampling, while call-centre employees and supervisors were selected using purposive sampling based on their involvement in customer-service activities.

The 400 customers provided the primary quantitative data used to examine the influence of reliability, responsiveness, and empathy on EQSD. The 30 employees and supervisors provided qualitative information to complement the quantitative findings.

3.4 Data Collection Instruments and Procedure

The study used structured questionnaires and interviews to collect primary data. A structured questionnaire was administered to customers using a five-point Likert scale, ranging from 5 = Strongly Agree to 1 = Strongly Disagree. The questionnaire measured reliability, responsiveness, empathy, and Electricity Quality Service Delivery (EQSD). The service-quality measures were informed by the SERVQUAL framework developed by Parasuraman et al. (1985) and adapted to the electricity customer-service context.

Structured interviews were conducted with selected call-centre employees and supervisors to obtain additional information concerning customer-service practices and service delivery. Permission to conduct the study was obtained from the relevant authorities before data collection.

3.5 Measurement of Variables

The study examined reliability, responsiveness, and empathy as independent variables and Electricity Quality Service Delivery (EQSD) as the dependent variable. All variables were measured using questionnaire items rated on a five-point Likert scale ranging from 5 = Strongly Agree to 1 = Strongly Disagree.

Reliability (REL) was measured in terms of the consistency, accuracy, dependability, and ability of the TANESCO call centre to handle customers' electricity-related requests and complaints as promised.

Responsiveness (RESP) was measured in terms of the promptness and willingness of call-centre personnel to respond to customers' requests, provide relevant information, and address reported electricity-service problems.

Empathy (EMP) was measured in terms of the extent to which call-centre personnel provided caring, individualized, and considerate attention to customers.

Electricity Quality Service Delivery (EQSD) was measured in terms of the effectiveness of the TANESCO call centre in providing electricity-related customer services, including timely assistance, accurate information, effective handling of complaints and requests, appropriate communication, and follow-up or resolution of reported service problems.

3.6 Data Analysis

Quantitative data were coded and analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were used to summarize respondents' responses, while correlation analysis was used to examine the relationships among the study variables. Multiple linear regression analysis was employed to determine the influence of reliability, responsiveness, and empathy on Electricity Quality Service Delivery.

The regression model was specified as follows:

$$EQSD = \beta_0 + \beta_1 REL + \beta_2 RESP + \beta_3 EMP + \varepsilon$$

Where:

EQSD = Electricity Quality Service Delivery

β_0 = Constant

β_1 – β_3 = Regression coefficients

REL = Reliability

RESP = Responsiveness

EMP = Empathy

ε = Error term

Qualitative interview data were analysed thematically. The qualitative findings were used to complement and provide context to the quantitative results.

3.7 Ethical Considerations

Ethical considerations were observed throughout the study. The researcher obtained an introductory letter from the Institute of Accountancy Arusha (IAA) and permission from TANESCO before collecting data. Respondents were

informed about the purpose of the study and participated voluntarily. Confidentiality and anonymity were maintained throughout the research process, and the information collected was used solely for academic purposes.

IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Reliability and Electricity Quality Service Delivery

The first objective examined the influence of reliability on Electricity Quality Service Delivery (EQSD) at the TANESCO call centre. Respondents assessed different aspects of reliability using a five-point Likert scale. The findings are presented in Table 1.

Table 1

Reliability of Electricity Customer Services

Reliability item	Mean	Std. Deviation
Complaints/requests are handled quickly	2.27	1.235
Services are delivered within the promised/right time	2.18	1.092
Call-centre personnel are concerned, reassuring and helpful	4.01	1.000
Calls are reachable most of the time	2.53	1.005
Accurate records are kept of services requested	3.69	1.026
There is an adequate number of staff	3.44	1.044

Source: Field Data, 2024

The findings show that respondents had mixed perceptions of reliability. The lowest mean score was recorded for services being delivered within the promised or right time ($M = 2.18$, $SD = 1.092$), followed by the handling of complaints and requests ($M = 2.27$, $SD = 1.235$). The relatively low score for call accessibility ($M = 2.53$, $SD = 1.005$) also suggests challenges in reaching the call centre consistently.

In contrast, respondents rated the helpfulness and concern of call-centre personnel highly ($M = 4.01$, $SD = 1.000$). The keeping of accurate records of requested services also received a relatively high rating ($M = 3.69$, $SD = 1.026$), while the adequacy of staff recorded a mean of 3.44 ($SD = 1.044$). These findings suggest that reliability was stronger in terms of staff assistance and record keeping than in terms of timely service delivery and accessibility.

The quantitative findings were further supported by interview evidence. Participant 2 explained that customer complaints are formally recorded and handled according to their nature:

“We usually handle customer complaints in a timely manner. However, customers may not understand that all complaints, whether received telephonically, in person, or in writing, must be logged into the complaint register or system. The nature of the complaint then determines how quickly it can be addressed...” (Participant 2, TANESCO, 8 October 2024)

Similarly, Participant 7 explained that TANESCO follows established procedures for handling complaints:

“Here in TANESCO, we follow all procedures according to our guidelines, and we have a Customer Standard Charter in place. It depends on the nature of the complaint. For example, written complaints should be responded to in writing within 3 working days, and the issue should be resolved within one month. If the issue cannot be resolved within a month, the customer will be informed...” (Participant 7, TANESCO, 25 October 2024).

The interview evidence therefore indicates that formal procedures and service standards are in place, although the customer responses show that these procedures do not always translate into timely service delivery. Overall, the findings indicate that reliability at the TANESCO call centre is relatively stronger in staff helpfulness and maintenance of service records, while timely handling of requests, service delivery within promised periods, and call accessibility remain areas requiring improvement.

4.1.2 Responsiveness and Electricity Quality Service Delivery

The second objective examined the influence of responsiveness on Electricity Quality Service Delivery (EQSD) at the TANESCO call centre. Respondents assessed different aspects of responsiveness using a five-point Likert scale. The findings are presented in Table 2.

Table 2*Responsiveness of Electricity Customer Services*

Responsiveness item	Mean	Std. Deviation
Call is received in time	2.11	1.172
Call is received courteously	4.01	1.019
Call centre keeps promise by providing feedback	3.51	1.118
TANESCO apologizes when customers experience inconvenience	3.54	1.145
Important information is shared with customers	3.76	1.134
Customer problems are solved immediately	3.37	1.194

Source: Field Data, 2024

The findings indicate that respondents had mixed perceptions of responsiveness at the TANESCO call centre. The lowest mean score was recorded for calls being received in time ($M = 2.11$, $SD = 1.172$), suggesting that customers experienced challenges in accessing the call centre promptly. Similarly, the ability to solve customer problems immediately received a moderate mean score of 3.37 ($SD = 1.194$).

In contrast, respondents rated courteous handling of calls highly ($M = 4.01$, $SD = 1.019$). The sharing of important information with customers also received a relatively high rating ($M = 3.76$, $SD = 1.134$). Keeping promises through feedback recorded a mean of 3.51 ($SD = 1.118$), while apologizing when customers experienced inconvenience recorded 3.54 ($SD = 1.145$).

These findings suggest that responsiveness was relatively stronger in courteous communication and information provision than in timely call reception and immediate resolution of customer problems. Thus, although customer's recognized positive aspects of the call centre's interaction with them, challenges remained in providing prompt access and resolving some customer problems immediately.

The quantitative findings were complemented by qualitative information obtained from TANESCO staff. Participant 5 emphasized the importance of providing customers with relevant information, particularly when electricity services are unavailable:

"It is a mandatory duty for the Department of Public Relations to provide customers with information about our services. This is especially crucial when services are unavailable, such as during power outages or other emergencies like maintenance." (Participant 5, TANESCO, 16 October 2024).

Participant 4 explained the procedures and expected response time for written customer requests:

"All written customer requests (e.g., meter relocations, meter changes, pole movements, change of supply mode) should be responded to in writing by TANESCO within 2 weeks of receiving the request. The response should include the cost to the customer, their obligations, and the timeline for completing the request." (Participant 4, TANESCO, 12 October 2024).

The issue of resolving customer queries within the prescribed period was also emphasized by a TANESCO participant:

"Unless there is a prior explanation, queries should be resolved within one week, as stated in the customer service charter." (Participant 19, TANESCO, 20 October 2024).

Regarding apologies when service problems occur, Participant 7 explained:

"We are all human beings, and sometimes things go wrong and are beyond our control. In such cases, public apologies are made." (Participant 7, TANESCO, 25 October 2024).

Further evidence of improvement in call-centre responsiveness was provided by Participant 2:

"There has been an improvement in the quality of service offered by TANESCO. For instance, in the area of call center services, there have been significant improvements compared to past years. Calls are received on time and with courtesy..." (Participant 2, TANESCO, 8 October 2024).

Overall, the quantitative and qualitative findings indicate that responsiveness is an important aspect of Electricity Quality Service Delivery at the TANESCO call centre. The strongest customer perception was related to courteous handling of calls ($M = 4.01$), followed by information sharing ($M = 3.76$). However, timely receipt of calls recorded the lowest mean ($M = 2.11$), while immediate problem resolution was moderate ($M = 3.37$). The findings therefore suggest that TANESCO has strengths in customer communication and courteous service, but further improvement is needed in prompt access to the call centre and timely resolution of customer problems.

4.1.3 Empathy and Electricity Quality Service Delivery

The third objective examined the influence of empathy on Electricity Quality Service Delivery (EQSD) at the TANESCO call centre. Respondents assessed different aspects of empathy using a five-point Likert scale. The findings are presented in Table 3.

Table 3*Empathy in Electricity Customer Services*

Empathy item	Mean	Std. Deviation
Staff listen carefully to customers	4.17	1.073
Staff are interested in what the customer says	4.13	1.060
Staff show integrity and create trust	4.06	1.027
Staff are willing to help customers	4.06	1.038
Employees give individualized attention to customers	4.09	1.020
Employees act towards the benefit of the customer	3.01	1.027

Source: Field Data, 2024

The findings indicate that respondents generally had positive perceptions of empathy among TANESCO call-centre personnel. The highest mean score was recorded for staff listening carefully to customers ($M = 4.17$, $SD = 1.073$), followed by staff showing interest in what customers say ($M = 4.13$, $SD = 1.060$). Similarly, giving individualized attention to customers received a high mean score of 4.09 ($SD = 1.020$).

Staff demonstrating integrity and creating trust, as well as their willingness to help customers, each received a mean score of 4.06, with standard deviations of 1.027 and 1.038, respectively. These results suggest that customers generally perceived TANESCO employees as attentive, trustworthy, and willing to assist them.

However, the lowest mean score was recorded for employees acting towards the benefit of the customer ($M = 3.01$, $SD = 1.027$). Although this represents a moderate perception, it is substantially lower than the other empathy indicators. This suggests that while employees were perceived as listening to and interacting positively with customers, customers were less convinced that employees consistently acted in their best interests.

The qualitative findings further support the positive perceptions regarding empathy. Participant 6 explained that TANESCO customer-care employees are trained to provide personalized treatment to customers:

“One of the important things we’ve succeeded at is how we handle customers. Our customer care staff are well-trained to provide standard treatment to each customer in a unique and personalized manner.” (Participant 6, TANESCO, 21 October 2024).

Participant 6 also explained how ethical conduct contributes to building trust and willingness to assist customers:

“To build trust with our customers, customer service staff are required to adhere to a code of ethics and good conduct in all daily activities. This fosters a willingness to help customers without expecting or requesting anything in return.” (Participant 6, TANESCO, 21 October 2024).

The quantitative and qualitative findings therefore indicate that empathy was a relatively strong aspect of Electricity Quality Service Delivery at the TANESCO call centre. Customers particularly valued careful listening ($M = 4.17$), staff interest in customer concerns ($M = 4.13$), and individualized attention ($M = 4.09$). However, the comparatively lower score for acting towards the benefit of customers ($M = 3.01$) indicates an area requiring further improvement.

Overall, the findings suggest that TANESCO call-centre personnel demonstrate important elements of empathy through attentive listening, personalized attention, integrity, and willingness to help customers. These characteristics provide a positive foundation for improving Electricity Quality Service Delivery, although greater emphasis may be required on ensuring that customers consistently perceive employees' actions as being in their best interests.

4.2 Electricity Quality Service Delivery (EQSD)

Electricity Quality Service Delivery (EQSD) was assessed based on respondents' perceptions of the quality and effectiveness of services provided through the TANESCO call centre. The assessment focused on the extent to which the call centre meets customers' electricity-service needs, provides accurate information, addresses service requests and complaints, provides effective assistance, maintains consistency between communicated and experienced services, and provides relevant information about electricity services and changes. The findings are presented in Table 4.

Table 4*Electricity Quality Service Delivery*

Electricity Quality Service Delivery item	Mean	Std. Deviation
The TANESCO call centre provides electricity-related services that meet customers' service needs	3.90	0.991
The TANESCO call centre provides accurate and dependable information about electricity services	3.82	1.145
The TANESCO call centre effectively addresses customers' electricity-service requests and complaints	2.43	1.146
The TANESCO call centre provides effective assistance in addressing customers' electricity-service needs	2.32	1.107
The electricity services communicated by the call centre are consistent with the services experienced by customers	3.40	1.177
The TANESCO call centre provides customers with relevant information about electricity services and service changes	4.58	0.960

Source: Field Data, 2024

The findings indicate that respondents had varying perceptions of Electricity Quality Service Delivery at the TANESCO call centre. The highest mean score was recorded for the provision of relevant information about electricity services and service changes ($M = 4.58$, $SD = 0.960$). This suggests that customers generally recognized the call centre as an important source of information concerning electricity services.

The call centre also received relatively positive ratings for providing electricity-related services that meet customers' service needs ($M = 3.90$, $SD = 0.991$) and providing accurate and dependable information about electricity services ($M = 3.82$, $SD = 1.145$). These findings indicate that customers generally perceived the information and basic service support provided by the call centre positively.

However, lower perceptions were observed regarding the effective handling of electricity-service requests and complaints ($M = 2.43$, $SD = 1.146$) and effective assistance in addressing customers' electricity-service needs ($M = 2.32$, $SD = 1.107$). These were the two lowest-rated indicators of EQSD. This suggests that although the call centre performs relatively well in information provision, customers may experience challenges when they require their complaints, requests, or service needs to be effectively addressed.

The consistency between services communicated by the call centre and services experienced by customers received a moderate mean score of 3.40 ($SD = 1.177$). This indicates that customers had neither strongly positive nor strongly negative perceptions regarding consistency between the information provided nor their actual service experience.

Overall, the findings demonstrate that EQSD was relatively strong in information provision and meeting general customer service needs but weaker in the effective handling of customer requests, complaints, and specific service needs. The results therefore indicate that improving the effectiveness and timeliness of complaint handling and customer assistance could contribute to better Electricity Quality Service Delivery at the TANESCO call centre.

The findings in Table 4 also provide an important basis for examining the influence of reliability, responsiveness, and empathy on EQSD, which is addressed in the subsequent regression analysis.

4.3 Regression Analysis

Multiple regression analysis was conducted to examine the combined and individual influence of **reliability**, responsiveness, and empathy on Electricity Quality Service Delivery (EQSD) at the TANESCO call centre. The regression model was specified as follows:

$$EQSD = \beta_0 + \beta_1 REL + \beta_2 RESP + \beta_3 EMP + \varepsilon$$

Where EQSD represents Electricity Quality Service Delivery, REL represents reliability, RESP represents responsiveness, EMP represents empathy, β_0 represents the constant, β_1 – β_3 represent the regression coefficients, and ε represents the error term.

4.3.1 Model Summary

Table 5*Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.899	.809	.807	2.41499

Predictors: Reliability, Responsiveness, Empathy

Source: Field Data, 2024

The results in Table 5 show a strong positive relationship between the three independent variables and Electricity Quality Service Delivery, with $R = 0.899$. The coefficient of determination ($R^2 = 0.809$) indicates that 80.9% of the variation in EQSD is explained jointly by reliability, responsiveness, and empathy. The adjusted R^2 of 0.807 indicates that the model retains a high explanatory power after adjustment for the number of predictors included in the model. The remaining 19.1% of the variation in EQSD is explained by other factors that were not included in the model.

4.3.2 Analysis of Variance (ANOVA)

Table 6

ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	7125.971	3	2375.324	407.280	.000
Residual	1685.497	397	5.832		
Total	8811.468	400			

Dependent Variable: EQSD

Predictors: Reliability, Responsiveness, Empathy

Source: Field Data, 2024

The ANOVA results show that the overall regression model is statistically significant ($F = 407.280$, $p < 0.001$). This indicates that reliability, responsiveness, and empathy, when considered jointly, significantly explain variations in Electricity Quality Service Delivery. Therefore, the regression model provides a statistically significant basis for examining the contribution of the three service-quality dimensions to EQSD.

4.3.3 Regression Coefficients

Table 7

Regression Coefficients

Model	B	Std. Error	Beta	t	Sig.
(Constant)	.435	.693		.628	.531
Reliability	.095	.054	.089	1.772	.077
Responsiveness	.310	.055	.321	5.630	.000
Empathy	.549	.042	.548	12.952	.000

Dependent Variable: Electricity Quality Service Delivery (EQSD)

Source: Field Data, 2024

The regression results show that reliability has a positive but statistically insignificant influence on EQSD ($B = 0.095$, $\beta = 0.089$, $p = 0.077$). Although the coefficient is positive, its significance level is above the conventional 5% threshold. This means that, based on the study results, reliability does not have a statistically significant independent effect on EQSD at the 5% significance level.

Responsiveness has a positive and statistically significant influence on EQSD ($B = 0.310$, $\beta = 0.321$, $p < 0.001$). This indicates that an improvement in responsiveness is associated with an improvement in Electricity Quality Service Delivery, holding the other variables constant.

Similarly, empathy has a positive and statistically significant influence on EQSD ($B = 0.549$, $\beta = 0.548$, $p < 0.001$). Empathy has the largest standardized beta coefficient ($\beta = 0.548$) among the three predictors, indicating that it makes the strongest unique contribution to EQSD in the model.

The estimated regression equation is therefore:

$$EQSD = 0.435 + 0.095REL + 0.310RESP + 0.549EMP + \epsilon$$

Overall, the regression results demonstrate that responsiveness and empathy significantly influence Electricity Quality Service Delivery, whereas reliability does not have a statistically significant independent effect at the 5% level. Among the three dimensions, empathy is the strongest predictor of EQSD, followed by responsiveness and reliability. These findings provide the basis for the subsequent discussion, where the results are compared with findings from previous empirical studies.

Discussion of Findings

The discussion of findings is organized according to the three study objectives. The findings are interpreted in relation to the empirical studies reviewed and the Service Quality (SERVQUAL) model. The discussion focuses on Electricity Quality Service Delivery (EQSD) as the dependent variable and explains whether the findings support, contradict, or extend previous empirical evidence.

4.5.1 Influence of Reliability on Electricity Quality Service Delivery

The study found that reliability has a positive but statistically insignificant influence on Electricity Quality Service Delivery (EQSD) at the TANESCO call centre ($\beta = 0.089$, $B = 0.095$, $p = 0.077$). Although the direction of the relationship was positive, the p-value was greater than the 0.05 significance level. Therefore, the study does not provide sufficient statistical evidence to conclude that reliability independently influences EQSD in the study context.

The descriptive findings in Table 1 provide further insight into this result. Respondents gave relatively low ratings to services being delivered within the promised or right time ($M = 2.18$, $SD = 1.092$) and complaints and requests being handled quickly ($M = 2.27$, $SD = 1.235$). Similarly, the accessibility of calls recorded a relatively low mean ($M = 2.53$, $SD = 1.005$). In contrast, respondents rated the helpfulness and concern of call-centre personnel relatively highly ($M = 4.01$, $SD = 1.000$), while accurate record keeping recorded a mean of 3.69 ($SD = 1.026$). These results suggest that although some elements associated with reliability are present, weaknesses in timeliness and accessibility may reduce its overall contribution to EQSD.

The finding partly supports Peter and Batonda (2022), who reported a positive relationship between reliability and customer satisfaction among TANESCO residential customers in Nyamagana District. The similarity lies in the positive direction of the relationship. However, the present study differs because the relationship was not statistically significant, while the earlier study examined customer satisfaction rather than EQSD. The difference may therefore reflect differences in the dependent variable, study setting, and the specific customer-service context.

The finding also contradicts Yunana et al. (2023), who reported a negative and significant effect of reliability on customer satisfaction in the Kaduna electricity distribution context. The contrasting results may be associated with differences between the Nigerian electricity-distribution environment and the Tanzanian call-centre context, as well as differences in how customers evaluate reliability. The present study further extends the existing literature by showing that, within a TANESCO call-centre setting, reliability may be positively associated with EQSD without producing a statistically significant independent effect.

4.5.2 Influence of Responsiveness on Electricity Quality Service Delivery

The study found that responsiveness has a positive and statistically significant influence on EQSD ($\beta = 0.321$, $B = 0.310$, $p < 0.001$). This finding indicates that improvements in the ability of the TANESCO call centre to respond promptly to customers, provide information, give feedback, and address customer concerns are associated with improved Electricity Quality Service Delivery.

The descriptive findings in Table 2 support this result. Customers rated courteous receipt of calls highly ($M = 4.01$, $SD = 1.019$), while the provision of important information recorded $M = 3.76$ ($SD = 1.134$). Feedback on promises recorded $M = 3.51$ ($SD = 1.118$), and apologies when customers experienced inconvenience recorded $M = 3.54$ ($SD = 1.145$). However, the relatively low mean for calls being received in time ($M = 2.11$, $SD = 1.172$) and the moderate rating for immediate problem resolution ($M = 3.37$, $SD = 1.194$) indicate that responsiveness still has important areas requiring improvement.

The finding supports Peter and Batonda (2022), who reported that responsiveness positively contributes to customer satisfaction in the TANESCO electricity-service context. The present finding is also consistent with the broader evidence from electricity-service research that customers value timely responses and effective handling of their concerns. The present study is particularly important because it demonstrates that responsiveness has a statistically significant positive relationship with EQSD in a TANESCO call-centre setting.

However, the finding contradicts Yunana et al. (2023), who reported a negative effect of responsiveness on customer satisfaction in Nigeria. This difference indicates that the effect of responsiveness may depend on the institutional and operational context in which electricity services are delivered. In the TANESCO call-centre context, customers appear to place considerable importance on prompt communication, information provision, feedback, and courteous interaction.

The finding also extends previous research by demonstrating the importance of responsiveness specifically within an electricity call-centre environment. While previous studies have largely focused on customer satisfaction, this study shows that responsiveness is a significant predictor of Electricity Quality Service Delivery, providing evidence that improving customer-response mechanisms can contribute directly to perceived service delivery outcomes.

4.5.3 Influence of Empathy on Electricity Quality Service Delivery

The study found that empathy has a positive and statistically significant influence on EQSD ($\beta = 0.548$, $B = 0.549$, $p < 0.001$). Among the three explanatory variables, empathy had the largest standardized beta coefficient ($\beta = 0.548$). This indicates that empathy made the strongest unique contribution to Electricity Quality Service Delivery in the regression model.

The descriptive results in Table 3 reinforce this finding. Respondents rated staff listening carefully to customers highest ($M = 4.17$, $SD = 1.073$), followed by staff being interested in what customers say ($M = 4.13$, $SD = 1.060$) and

employees providing individualized attention ($M = 4.09$, $SD = 1.020$). Staff integrity and trust and willingness to help both recorded means of approximately 4.06. However, acting towards the benefit of the customer received a comparatively lower mean of 3.01 ($SD = 1.027$). The results therefore indicate strong perceptions of interpersonal attention and care, while also identifying an area in which customer-oriented behaviour could be strengthened.

The finding supports Jawneh and Manneh (2020), who identified empathy as an important determinant of service quality perceived by electricity consumers in The Gambia. It also agrees with Mbullo (2024), who reported a positive relationship between service quality and customer satisfaction in the Tanzanian public sector, and with Peter and Batonda (2022), who reported positive effects of service-quality dimensions in the TANESCO context.

The finding is also consistent with Yunana et al. (2023), who reported a positive coefficient for empathy in their electricity-service study. The consistency across these studies strengthens the argument that interpersonal treatment, individualized attention, and willingness to assist are important components of quality in electricity-related customer services.

Nevertheless, the present study extends previous research by identifying empathy as the strongest predictor of EQSD among the three dimensions examined. The standardized coefficient of $\beta = 0.548$ was substantially larger than that of responsiveness ($\beta = 0.321$) and reliability ($\beta = 0.089$). This suggests that, in the TANESCO call-centre environment, the manner in which employees interact with customers may be particularly important for perceived quality of electricity service delivery.

4.5.4 Overall Discussion of the Regression Findings

The overall regression model demonstrates that reliability, responsiveness, and empathy jointly explain a substantial proportion of variation in Electricity Quality Service Delivery. The model produced $R = 0.899$, $R^2 = 0.809$, and adjusted $R^2 = 0.807$, indicating that the three service-quality dimensions jointly explain 80.9% of the variation in EQSD. The ANOVA results further show that the overall model is statistically significant ($F = 407.280$, $p < 0.001$).

The results therefore provide strong evidence that the selected SERVQUAL dimensions are relevant to understanding Electricity Quality Service Delivery at the TANESCO call centre. However, their individual effects differ. Empathy was the strongest predictor ($\beta = 0.548$), followed by responsiveness ($\beta = 0.321$), while reliability had the weakest and statistically insignificant effect ($\beta = 0.089$, $p = 0.077$).

This pattern is important because it shows that good electricity service delivery at a customer-contact point is not determined only by whether procedures and services are reliable. How customers are treated and how promptly their concerns are addressed also matter considerably. The findings are consistent with the literature reviewed, which emphasizes responsiveness, empathy, and customer-oriented behaviour as important aspects of service quality in public utilities.

At the same time, the study contributes to the literature by shifting the emphasis from customer satisfaction alone to Electricity Quality Service Delivery. Several previous studies, including Peter and Batonda (2022), Mbullo (2024), and Yunana et al. (2023), primarily examined customer satisfaction or perceived service quality. The present study instead demonstrates how reliability, responsiveness, and empathy relate specifically to EQSD within a TANESCO call-centre setting.

Overall, the findings support the importance of responsiveness and empathy, while providing weaker evidence for reliability as an independent predictor of EQSD. The results also indicate that improving interpersonal customer care and responsiveness should be central to efforts aimed at strengthening electricity-service delivery through TANESCO's call-centre operations.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study concludes that the selected service-quality dimensions have different effects on Electricity Quality Service Delivery (EQSD) at the TANESCO call centre. The regression results show that reliability has a positive but statistically insignificant influence on EQSD ($\beta = 0.089$, $p = 0.077$), while responsiveness has a positive and statistically significant influence ($\beta = 0.321$, $p < 0.001$). Empathy also has a positive and statistically significant influence on EQSD ($\beta = 0.548$, $p < 0.001$).

Regarding the first objective, the findings indicate that reliability is present in some aspects of call-centre operations, particularly staff helpfulness and record keeping. However, customers reported relatively weaker performance in timely handling of complaints and requests, delivery within the promised time, and call accessibility. Consequently, although reliability is positively associated with EQSD, its independent contribution was not statistically significant.

For the second objective, the study concludes that responsiveness significantly contributes to EQSD. The findings show relatively positive perceptions regarding courteous handling of calls and provision of important information, although timely call reception and immediate resolution of customer problems remain areas requiring improvement.



For the third objective, the study concludes that empathy significantly contributes to EQSD and represents the strongest predictor among the three dimensions examined. Customers particularly valued employees' careful listening, interest in customer concerns, individualized attention, integrity, and willingness to help. However, the relatively lower rating for employees acting towards the benefit of customers indicates an area requiring further attention.

Overall, the regression model was statistically significant ($F = 407.280$, $p < 0.001$) and explained 80.9% of the variation in EQSD ($R^2 = 0.809$). The findings therefore demonstrate that responsiveness and empathy are particularly important for improving Electricity Quality Service Delivery at the TANESCO call centre, while reliability requires further improvement in practical service delivery, particularly with regard to timeliness and accessibility.

5.2 Recommendations

First, TANESCO should improve the reliability of call-centre services. Particular attention should be given to reducing delays in handling customer complaints and requests, improving call accessibility, and ensuring that services are delivered within communicated or promised timeframes. Although reliability was not statistically significant in the regression model, the descriptive findings indicate weaknesses in important reliability indicators that may affect customers' service experiences.

Second, TANESCO should strengthen responsiveness. The call centre should improve mechanisms for receiving calls promptly, managing customer queues, recording complaints, and providing timely feedback. Customer problems that cannot be resolved immediately should be tracked systematically until they are resolved, with customers receiving appropriate updates on the progress of their cases.

Third, TANESCO should continue strengthening employee empathy and customer-care practices. Since empathy was the strongest predictor of EQSD ($\beta = 0.548$), regular customer-service training should emphasize active listening, individualized attention, integrity, respectful communication, and willingness to assist customers. Employees should also be encouraged to ensure that their actions are clearly perceived by customers as being in the customers' best interests.

Fourth, TANESCO should strengthen information provision to customers. The high mean score for provision of relevant information ($M = 4.58$) indicates that customers value the call centre as an important information channel. TANESCO should therefore maintain timely communication regarding power outages, maintenance activities, service procedures, customer requirements, and expected resolution periods.

Finally, TANESCO should regularly evaluate customer experiences at the call centre. Periodic assessment of customer feedback can help identify persistent weaknesses in responsiveness, empathy, accessibility, and complaint resolution. Such assessments can provide management with evidence for improving call-centre systems, staff capacity, and customer-service procedures.

Declaration of Interest

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