Power Sector Reforms and Electricity Deficit in Nigeria: Stakeholders' Perspective

Caleb Muyiwa Adelowo[1]*, Mary Oladuni Fadare[2]

[1]Faculty of Economic and Management Sciences, North-West University, Potchefstroom Campus, South Africa, [2]Ibadan Electricity Distribution Company, Ede Business Hub, Osun State, Nigeria. *Email: calebakinrinade@yahoo.com

ABSTRACT

Inadequate generation and distribution of electricity constitute major bottlenecks to productivity and industrial growth in Nigeria. Over the years, several reforms have been implemented in the power sector but the challenges persist, and many socio-economic activities are negatively impacted. The problems are exacerbated by inconsistent policies of the government on the management of the power sector and the inefficient capacity of the private operators. In this article, we examine the kernels of power sector reforms, the depth of the reforms' awareness, the level of implementation, and the degree to which customers were satisfied with the electricity supply. Primary data were collected through a cross-sectional survey conducted on the management and customers of electricity distribution companies in Ibadan, Ekiti and Lagos States, using two sets of validated questionnaires. Six hundred and sixty-seven (667) management and staff members, and one thousand one hundred and nineteen (1,119) customers participated in the survey. The results show that a major reform to the sector is privatisation, leading to the unbundling of the Power Holding Company of Nigeria. Some of the measures taken to implement the reforms include staff training and redeployment, organisation restructuring, public sensitisation, disengagement of redundant staff, and introduction of more efficient monitoring and evaluation mechanisms. The study observes that a large proportion of customers are aware of the power sector reforms and understood the implications but they claimed there was no significant improvement in the power supply compared to pre-reform periods. The paper concludes with appropriate policy recommendations for the government, operators and stakeholders in the sector.

Keywords: Power Sector, Reforms, Electricity Generation, Electricity Distribution, Customer Satisfaction
JEL Classifications: H03, H04

1. INTRODUCTION

It has been established that adequate generation, transmission, and efficient distribution of electricity is an integral enabler for a prosperous and modernised economy (Adenikinju, 2018; WIPO, 2018). In fact, electricity access is a key component of sound socio-economic and industrial development indicators, particularly the standard of living (Adusei, 2012; World Bank, 2020). Energy access has also been regarded as the fulcrum of innovation and sustainable development (WIPO, 2018). The reliable electricity sector contributes not only to efficient overall economic production, but also plays important role in attracting foreign investment thereby improving national competitiveness (Eshun and Amoako-Tuffour, 2016). However, Nigeria has experienced consistent gap electricity demand and supply, leading to socioeconomic paralyses in the country. The World Bank puts the consequence and economic cost of inadequate power supply in Nigeria at about 2% of the national GDP (World Bank, 2020). In fact, getting access to uninterrupted electricity is a major impediment to non-oil sector growth, including the poor performance of small and medium-scale enterprises in the country (Smedan, 2019). The energy crisis in Nigeria is multi-faceted, ranging from the complexity of power generation, transmission, and distribution to policy measures adopted by the government to

open up the sector to private investors. The sector has also suffered neglect in terms of infrastructure, investments, and management at both downstream and upstream levels. These challenges have delayed the expansion of national grid capacity to sub-urban areas, forcing businesses and individuals to rely on high-cost diesel and petrol generators, leading to the closure of many companies and making the country unfriendly to foreign investors.

These and many other challenges still question the essence of several reforms (privatisation and opening the sector to competition) that had been implemented in the Nigerian electricity sector. For instance, successive governments have considered privatisation as the lasting solution to the inefficient management of the national energy sector, but the political will to completely implement it is largely missing. Today, after several reforms have been implemented in the sector, with little or no improvement, it is now clear that a more holistic approach and strong political are necessary. In this article, we use large survey data conducted among the customers and management of the electricity distribution companies to provide empirical understanding of how stakeholders perceived the reforms, its implementation and gauge the level of satisfaction electricity consumers experience in south-west Nigeria. The study becomes necessary to provide empirical analysis of how effective the reforms were perceived by the staff and customers, and suggesting appropriate intervention to improve electricity supply in the country. The perception of all citizen matters when it comes to taking vital decisions affecting the generality of the populace. However, most decisions taken by policymakers hardly follows inclusive process where affected individuals are either sidelined or incapable of participation due to their status in the society. This explains the use of "elite theory" in the determination of social and development matters in developing countries. For instance, Okibe and Mokuye (2018) argued that electricity reforms in Nigeria were orchestrated by a cluster of governing and non-governing elites to benefit select interest. The argument may not be unconnected with the way and manner the reforms have been conducted over the years without any positive impact on the socio-economic lives of the citizens (Ayamolowo et al., 2019). While reforms in the sector is justifiable, particularly to extinguish corrupt practices and inefficiency, it is time for the government to extrapolate from the experience of telecommunication sector to liberate electricity impasse in the country. The reminder of the article discusses brief kernel of the reforms, then research methods and data collection process and key findings. The paper concludes with policy recommendation and practical implications.

2. ELECTRICITY REFORMS IN NIGERIA: A BRIEF

The first practical step towards electricity deregulation in Nigeria started in 2005 when the then National Electric Power Authority (NEPA) was partially privatized to become the Power Holding Company of Nigeria (PHCN), largely owned by the Nigerian government but with business mindset. The decision was taken by the government with the hope that inefficiency and corrupt

practices would be eliminated while the new investors could force the operators to harness value through quality services. The sector was unbundled into generation, transmission and distribution companies while the assets, liabilities and staff were transferred from NEPA to PHCN at the time. The PHCN was mandated to create competitive market for electricity services in Nigeria and set up independent regulator for the sector, that is, the National Electricity Regulatory Commission (NERC), responsible for licensing and regulating generation, transmission, distribution and supply of electricity in the country. It also enforces performance standards, consumer rights and obligations and oversees the tariffs determination. In November 2013, the Federal government of Nigeria formerly handed over the power sector to private investors, that is, eleven distribution companies and five generation companies, after due process had been followed (NERC, 2015; Ogunleye, 2017). The 2013 Power Sector Reform Roadmap serves to speed up the implementation of the reform; ownership structure, control and regulation for improved electricity access (Ogunleye, 2016). The core objectives of the reform at the time were to increase energy generation by 13,000 megawatts in 2015 and 40,000 megawatts by 2020 to realise the then national vision 20:2020 (NERC, 2015). Moreover, the reform targeted the need to define new national policy that allows for private investment in the sector to spur innovation and efficient management. It also sets up appropriate framework of engagement among the owners and government and provides clear guidelines for the commercialisation of the sector. Moreover, the reform roadmap outlines the creation of bulk buyer and articulates the need to strengthen the Nigerian Electricity Regulatory Commission (NERC). Furthermore, the government have to provide credit enhancement for the operators, operationalize the Nigerian Electricity Liability Management Company (NELMCO), strengthen the National Power Training Institute of Nigeria, strengthen technical and managerial capacity of the Transmission Company of Nigeria (TCN) and the disposal of power generating companies and distribution companies to the private operators (Oguleye, 2017; Fadare, 2019). To further boost power generation during the reform, Babatunde (2011) observed that the Federal government repaired and constructed some new power plants (Independent Power Projects), thereby increased the hourly average of electricity distribution to 3,500MWh. Establishing a more competitive electricity market with multiple operators thereby providing wide array of opportunity for consumers to choose their service provider represent the core driver of the reform. However, given the poor development of the sector over the years, it became difficult to realise this at the inception of the reforms. However, the introduction of Multi-Year Tariff Order (MYTO) provided opportunity for the private investors to set predictable prices that guarantee return on investment. Given that MYTO may not be realized within a short period considering the socio-economic prevalent at the time. In fact, government made provisions for subsidies to cover the difference between actual and cost-effective tariff over 3 years (Bamidele, 2011). In addition to the subsidies, the Power Consumer Assistance Fund (PCAF) was established to cater for the categories of consumers who might not be able to pay for electricity prices. The great thing about MYTO was the removal of guesstimated billing system for electricity consumers and the bold steps toward metering every customer.

Despite the reforms, the electricity generation, transmission and distribution could not match the needs of customers. This indicates that the reform is the first step towards addressing hydra-headed challenges in the power sector. On customer satisfaction, the criticism of electricity sector is in the metering systems that usually result to non-transparent and the use of estimated billing. Many customers with analogue meters are billed on estimation because those meters are said to be old and not capable of picking accurate energy consumed. Also, meters should be supplied to customers at most 45 days after payment according to the NERC regulations, but unfortunately many of these customers could not receive prepaid meters several years after they have made the payment, forcing the distribution company to place them on direct billing system. Amadi (2013) observed that the issuance of estimated bills by the electricity distribution companies (discos) gives room for cheating the customers, just because they could not afford meter payment that even the government through the NERC promised to distribute freely to customers. A number of evidences suggest that electricity metering system in Nigeria is still highly unpredictable (Oyedepo, 2012; Okafor et al., 2017; Fadare, 2018; Dahunsi et al., 2021). Transitioning from electromechanical meters to electronics and later to smart meters in Nigeria has been on since the end of the reform in 2005, however the implementation has been stalled by inadequacies, both on techno-managerial and finance stance (Dahunsi et al., 2021). In more recent time, there has been more interventions from the government and international development partners to encourage local production and supply of meters to all consumers (Agbakwuru, 2020).

3. RESEARCH METHODS

This paper adopts cross-sectional survey where primary data were collected from the staff and customers of electricity distribution companies across South West Nigeria, including Ibadan, in Oyo state, Lagos and Ekiti States, using two sets of validated questionnaires. The concentration of high distribution capacities and business operations in Ibadan and Lagos, compare to other states in the country (RPSR, 2010). Lagos state happens to be the commercial headquarters in Nigeria and it is home to most businesses, hence it represents a key hub for electricity distribution in the country. Although, the distribution company serving Ekiti state falls into the Benin Electricity Distribution Company (BEDC), however the state is within the South-West catchment, hence it was included in the survey. Wide arrays of customer were covered in the study, including the residential, commercial and industrial. Given the complexity of population and their geographical spread, a multi-stage sampling technique was adopted to choose a representative sample. Out of eleven electricity distribution companies in Nigeria, three of them operate fully in the study areas while there is one of the states, Ekiti, whose operation hub overlaps with the South-South Operator (BEDC). The final selection was done using simple purposive sampling technique while aslo applying the Taro Yamane formula (Tamane, 1967). The formula allows for sample calculation where the population and confidence level are known. Across the three states, a total number of six hundred and sixty-seven (667) staff participated in the survey. From the pool of customers in the region,

one thousand one hundred and ninety-nine (1,199) were drawn across the three states.

Two sets of similar questionnaires were design to obtain relevant information from both the customers and the staff of the distribution companies in the study areas. Trained field officers were deployed for the data collection exercise that lasted 4 months, between February and May 2018. The major questions contained in the questionnaires were the perception of customers on the awareness and implementation of reforms that had occurred in the power sector and whether they had experienced better electricity supply since them. Their level of satisfaction with services of the distribution companies was also gauged using Likert scale questions. Measures put in place to implement the main thrust of the reforms were also measured using Likert scale questions posed to the staff of the distribution companies.

The basic demographic characteristics of the customers and staff were elicited in the study. For the staff of the distribution companies, various strategies put in place by the company to implement the reforms were interrogated, including whether there have been positive changes to the quality and availability of electricity supply to the customers. Data collected were analysed using descriptive statistics and the SPSS tool.

4. RESULTS AND DISCUSSION

4.1. Socio-Demographic and Economic Characteristics of Respondents

The basic information on the socio-demographic and economic characteristics is provided in Table 1 to have a clear understanding of the background characteristics of the survey participants, including both the staff and the customers. The Table shows that 37.3% of the staff were between 20 and 35 years, 32.6% were in age group 36-45 years, close to one-quarter of the staff (24.9%) were in the age bracket 46-55 years and just a few (5.2%) of them were 55 years and above.

About 44.2% of the staff were male while the remaining 55.8% were female. Regarding their educational status, only 7.4% had secondary school education, 31.6% had National Diploma (NCE/OND) education, 48.1% had BSc/HND education and the remaining 12.9% had master 'degrees. The distribution of the staff across the department indicated that 23.7% of them were in the electricity distribution unit, close to half (48.1%) were in commercial unit and a little above one quarter (28.1%) were in finance and account unit. Regarding year of service in the industry, slightly more than one quarter (26.4%) of the staff have spent 1-5 years, 42.2% have spent between 6 and 10 years, 22.9% have spent 11-15 years and the remaining 8.6% have spent 16 years plus in the industry. The results further showed that 15.3% of the staff have witnessed one reform, slightly more than half (53.6%) have witnessed two reform and 31.1% of the staff have witness more than two reforms. The result suggests that series of reforms had occurred in the industry in the past.

The percentage distribution of customers' background and characteristics is presented in Table 2. The results revealed that

above two third (67.7%) of the customers, 19.8% of the customers were in age bracket 36-45%, just 8.0% were in age group 46-55 years and only 4.5% of the customers were above 55 years and

Table 1: Distribution of staff background characteristics

Characteristics	Frequency	Percentage
Age		
20-35	222	37.3
36-45	194	32.6
46-55	148	24.9
above 55	31	5.2
Gender		
Male	263	44.2
Female	332	55.8
Education		
O'level	44	7.4
NCE/OND	188	31.6
B.Sc./HND	286	48.1
M.Sc. and above	77	12.9
Department		
Distribution	141	23.7
Commercial	287	48.2
Finance and account	167	28.1
Location		
Oyo	270	46.0
Ekiti	126	21.5
Lagos	191	32.5
Year of service in the industry		
1-5 years	157	26.4
6-10 years	251	42.2
11-15 years	136	22.9
above 15 years	51	8.6
Number of reforms witness		
One	91	15.3
Two	319	53.6
above two	185	31.1
Total	595	100

Table 2: Distribution of customers' background characteristics

Characteristics	Frequency	Percentage
Age group		
20-35	812	67.7
36-45	237	19.8
46-55	96	8.0
above 55	54	4.5
Gender		
Male	467	38.9
Female	732	61.1
Marital status		
Married	334	27.9
Single	801	66.8
Separated	26	2.2
Divorced	16	1.3
Widow	22	1.8
Level of education		
WAEC	237	19.8
N.C.E/OND	256	21.4
B.Sc./HND	611	51
M.Sc. and above	95	7.9
Customer rate		
Residential	770	64.2
Commercial	323	26.9
Industrial	106	8.8
Total	1199	100

above. Also, one third (38.9%) of the customers were male while 61.1% were female. With respect to the customers' marital status, 27.9%, 66.8% were single as at the time survey, just 2.2% of them were separated, 1.3% were divorced, and 1.8% of the customers were widow. Considering customers' educational status, 19.8% of them had SSCE, 21.4% had ordinary diploma (NCE/OND), about half (51.0%) of the customers had B.Sc./HND education while paltry 7.9% had Postgraduate degree. Customer rate shows that 64.2% of the respondents were residential, 26.9% were commercial and 8.8% were industrial.

4.2. Level of Awareness of Customers about the Electricity Reforms in South-Western Nigeria

This part of the study presents the results of the first objective. The results presented in Table 3 revealed that most customers (78.6%) were aware of the electricity reforms in the country while the remaining 21.4% claimed otherwise. For those customers where were aware of the electricity reforms, about half (56.5%) of them understood what electricity reform stood for and 43.5% of them did not know the implications of the reforms. Regarding customers' level of awareness of electricity reform, 14.3% of the customer reported that the awareness was very high, 22.5% reported that the awareness was high, 26.8% claimed that the awareness was low, 26.3% were of the view that the awareness was very low and 10.1% have no idea about the customers' level of awareness about the electricity reform. Deductively, slightly (36.8%) of the customer were aware of electricity reforms while 53.1% were not aware. The result is a reflection of level of awareness of electricity reform among the customers.

The summary of customers' level of awareness is as presented in Table 4, showing that customers were just aware of electricity reforms in Nigeria. The mean score (2.8) of the level of customers'

Table 3: Awareness of customers about the electricity reforms in south-western Nigeria

Electricity reforms	Frequency	Percentage
Awareness of establishment of electricity reforms		
Yes	943	78.6
No	256	21.4
Total	1199	100
Understand what electricity reforms stands for		
Yes	533	56.5
No	410	43.5
Total	943	100
Level of awareness of customers about electricity reforms		
Very high	76	14.3
High	120	22.5
Low	143	26.8
Very low	140	26.3
No idea	54	10.1
Total	533	100

Table 4: Summary level of awareness of customers about electricity reforms

Variable	Observation	Weights	Mean	SD
Awareness level	479	1090	2.80	1.00

awareness is a reflection of their view. The understanding of the essence of the reforms is critical to effective implementation.

4.3. Strategies for the Implementation of the Electricity Reform

This section presents the perspectives of the staff on the strategies put in place by the management for the implementation of the reforms. The most important strategy, as reported by the participants and presented in Table 5, is the training of staff members with a mean score of 2.11 and standard deviation of 0.65. Training and re-training are necessary to improve performance, especially when new strategies are injected into the Organisations. It should be noted that electricity reforms in Nigeria came with diverse chaotic happening, particularly to make it more efficient, some redundant staff were disengaged while some fresh blood were injected. This leads to the second strategy reported by the staff that some of them were disengaged. Staff disengagement had a mean score of 2.05 and standard deviation of 0.62. Another strategy deployed was the redeployment of staff with mean score of 2.02 and standard deviation of 0.61. In addition, staff motivation and over all monitoring and evaluation of the processes were reported as another forms of strategy put in place by the management with mean score of 1.97, and standard deviation of 0.71 and 0.72 each respectively. Next to these is organisational restructuring (i.e. office decentralization) with mean score of 1.94 and standard deviation of 0.66. Further, ICT deployment was reported as strategy put in place management with mean score of 1.92 and standard deviation of 0.69. Adequate tools for clearing of faults and Tariff regime(s) were reported as strategies put in place with mean scores of 1.85 and 1.86, and standard deviation of 0.73 and 0.66 each respectively. However, the least important strategy was customer sensitisation (i.e. community engagements) with mean score of 1.20 and standard deviation of 0.66. Three strategies identified as strategies put in place by the management sometimes are training of staff members, staff disengagement and redeployment of staff.

To further ascertain the level of training participation among the participants, Table 6 present the distribution of staff by training and the kind of training attended. The results showed that 56.97% of the staff have not attended any training while 43.03% of them have attended training in the last three years. Among the staff who had attended training, 63.67% have attended training on resource management, 55.08% on ICT training, 48.83% of the staff have attended training on customer care processing skill training, 35.94% have attended training on response on fault clearing training and 7.42% have attended other trainings. Those

who have not attended any training gave reported some reasons for not attending training which included lack of organization support (72.57%), lack of funding (69.32%) and inability to identify relevant training (47.79%).

4.4. Effects of the Power Sector Reforms on Perception of Electricity Supply

This section presents the results of the perception of staff on electricity supply before and after the reforms. The results as presented in Table 7 showed that staff perception was assessed by 10 constructs (statements). All the statements were measured according to 4 points scale of level of supply (4 = High, 3 = Moderate, 2 = Low, 1 = Poor). Analytic weighted mean was adopted for the analysis of the data generated. Analytic weights are weights that are inversely proportional to the variance of an observation. Typically, the observations represent averages and the weights are the number of elements that gave rise to the average. In the analysis, weighted mean equals 2.5 was considered as the cut-off point. This however indicated that if the mean value of a statement or construct is >2.5, respondents have positive perception towards this statement while mean value of <2.5 reflect negative perception. Thus, mean score close to 4 indicate high perception while mean score close to 1 indicate low perception.

The results however revealed that staff have positive attitude towards item 2 (Electricity tariff) and item 9 (Frequency of power outages). The results suggest that electricity tariff and frequency power outages were high before the reform. Meanwhile, staff have negative attitude towards the remaining items including improved power supply, supply of meter, repair of faulty transformers, adequate tools for clearing of faults, quality of electricity supply and response rate to customer complaints. These items mean score are around 2 point indicating that staff have low attitude towards each of the constructs. Though the important item which staff have high perception towards was electricity tariff with mean score of 3.22 while the least item was repair of faulty Analogue meters with mean score of 1.99. This suggests that electricity tariff was high and repair of faulty analogue meters was low before the reform.

The perception of Staff after reform, as presented in Table 8, indicates that staff have positive perception towards four items including electricity tariff, frequency of power outages, improved power supply, and response rate to customer complaints. Each of these items has mean score greater or equal 2.5. On the other hand, staff have negative perception about the remaining items namely supply of meter, repair of faulty transformers, repair of

Table 5: Strategies for the implementation of the Electricity Reform

S. No.	Variable	Obs	Weight	Mean	SD	Rank
1	Training of staff members	510	954	2.11	0.65	1
2	Staff disengagement	451	824	2.05	0.62	2
3	Redeployment of staff	467	840	2.02	0.61	3
4	Staff motivation	457	770	1.97	0.71	4
5	Organisational restructuring e.g., office decentralization	454	766	1.94	0.66	5
6	Customer sensitisation e.g., community engagements	458	797	1.20	0.66	6
7	ICT deployment	446	734	1.92	0.69	7
8	Tariff regime (s)	456	728	1.85	0.66	8
9	Adequate tools for clearing of faults	467	731	1.86	0.73	9
10	Over all monitoring and evaluation of the processes	431	719	1.97	0.72	10

faulty analogue meters, supply of transformers, adequate tools for clearing of faults and quality of electricity supply. All these items have mean score below 2.5. This however indicates that staff perception of electricity after reform was low.

Table 9 presents the results of further examination of staff perception and electricity supply before and after reform and this was achieved through paired wise t-test. Items under the perception of power supply were added to generate a single score which was used for comparison. The results indicated there was significant difference in the perception of staff about electricity supply before and after the reform ($P < 0.05$). The average score of perception before 19.78 while it was 21.03 after the reforms. Deductively, staff perception after reform was more than the score before the reform. This implied staff have positive perception about electricity supply after the reform. However, whether this translate to a better electricity supply rests on whether the customers are satisfied with the services of the electricity company.

Moreover, Table 10 presents the result of staff perception before and after the reform. Staff perception score before and after were categorized into positive and negative perception to provide better understanding about perception of electricity supply within these two periods. As earlier indicated, mean value of statements or constructs ≥2.5 were categorized as positive perception while mean values of <2.5 were categorized as negative perception. The results showed that staff have high negative perception (83.9%) about electricity supply before the reform while staff with positive perception were just 16.1%. However, negative perception about electricity supply by the staff reduced to 70.3% though still high while staff with positive perception have increased to 29.7%.

Binary logistic regression was used to examine the association between the staff perception of the electricity after reform and staff characteristics. This was to determine staff characteristics that are associated with their perception of electricity reform. The result of the analysis was presented in Table 11. Considering the staff age, the results showed that staff aged 36-45 years were 52% less likely to have positive perception about electricity supply compared with reference category (OR = 0.4878; $P < 0.05$). Similarly, staff aged 46-55 years were 48% less likely to have positive perception about electricity reform compared with reference category (OR = 0.5231; $P < 0.05$) and staff in age bracket 55 years and above were 68% less likely to have positive perception about the electricity compared with reference category (OR = 0.3288; $P < 0.05$). Regarding the staff gender, the results revealed that female staff are 40% more likely to have positive perception about electricity supply compared with male staff (OR = 1.4047; $P > 0.05$). The results of the influence of department showed that staff that were in commercial unit were 46% less likely to have positive perception about electricity reform compared with reference category and staff in finance and account section were 11% less likely to have positive perception about electricity supply compared with

Table 6: Distribution of Staff by training attendance

Have attended any training	Frequency	Percentage
No	339	56.97
Yes	256	43.03
Specific training		
Resource management training	163	63.67
ICT training	141	55.08
Customer care processing skill training	125	48.83
Response on fault clearing training	92	35.94
Others training	19	7.42
Total	540	210.94
Reasons for no attendance		
Lack of organization support	246	72.57
Lack of funding	235	69.32
Inability to identify relevant training	162	47.79
Total	643	189.68

Table 7: Perception of staff on Electricity Supply before the reforms in Nigeria

S. No.	Perceptions	Observation	Weight	Mean	SD	Perception
1	Improved power supply	595	1210	2.36	0.85	Negative
2	Electricity tariff	595	1590	3.22	1.04	Positive
3	Supply of meter	595	1078	2.10	0.76	Negative
4	Repair of faulty transformers	595	1130	2.22	0.82	Negative
5	Repair of faulty analogue meters (black meters)	595	991	1.99	0.82	Negative
6	Supply of transformers	595	1082	2.14	0.81	Negative
7	Adequate tools for clearing of faults e.g., ladders, vehicle etc.	595	1127	2.25	0.88	Negative
8	Quality of electricity supply	595	1135	2.24	0.84	Negative
9	Frequency of outages	595	1256	2.57	1.03	Positive
10	Response rate to customer complaints	595	1168	2.36	0.93	Negative

Table 8: Perception of Electricity Supply after the reforms in Nigeria

S.No.	Variables	Observation	Weight	Mean	SD	Perception
1	Improved power supply	595	1311	2.54	0.81	Positive
2	Electricity tariff	595	1548	3.20	1.07	Positive
3	Supply of meter	595	1184	2.33	0.83	Negative
4	Repair of faulty transformers	595	1177	2.30	0.78	Negative
5	Repair of faulty Analogue meters (black meters)	595	1078	2.22	0.91	Negative
6	Supply of transformers	595	1163	2.29	0.81	Negative
7	Adequate tools for clearing of faults e.g., ladders, vehicle etc.	595	1175	2.31	0.80	Negative
8	Quality of electricity supply	595	1246	2.44	0.82	Negative
9	Frequency of outages	595	1353	2.71	0.97	Positive
10	Response rate to customer complaints	595	1276	2.50	0.84	Positive

Table 9: Comparison of Staff Perception about electricity supply before and after Reform

Perception	Observation	Mean	P-value
Before	595	19.78	0.0000
After	595	21.03	

Table 10: Distribution of staff perception towards electricity supply before and after reform

Staff perception	Frequency	Percentage
Before reform		
Negative	499	83.9
Positive	96	16.1
After reform		
Negative	418	70.3
Positive	177	29.7
Total	595	100

Table 11: Logistics regression showing relationship between perception and staff characteristics

Characteristics	Odd ratio	P-value
Age group		
20-35[ref]	1000	-
36-45	0.4878	0.002
46-55	0.5231	0.009
Above 55	0.3288	0.019
Gender		
Male[ref]	1.000	-
Female	1.4047	0.076
Department		
Residential[ref]	1.000	-
Commercial	0.5491	0.010
Finance and account	0.8978	0.669
Number of reforms		
One[ref]	1.000	-
Two	2.1783	0.013
Above two	4.2141	0.000

[Ref]Reference category

reference category (OR = 0.8978; P > 0.05). Lastly, staff that have witnessed two were 100% more likely to have positive perception compared with reference category (OR = 2.1783; P < 0.05) and staff that have witnessed above two reforms were 300% more likely to have positive perception about electricity supply reform compared with reference category (OR = 4.21414; P < 0.05).

4.5. Customer's Perception on Electricity Supply before and after the Power Sector Reforms

Table 12 presents the findings of customers' perception about electricity supply before the reform. The results showed that customers have negative perception of all the items related to quality of power supply and satisfaction with the services provided by the electricity distribution companies in the study area. All the items have <2.5 mean score. This is a reflection of poor power supply before the electricity reform. In other words, customers have negative perception about power supply, appropriate tariff, supply of free meter, of supply meter paid for, repair of faulty transformers, supply of transformers, adequate tools for clearing of faults, service delivery, maintenance/replacement of distribution lines, and customer service.

Table 13 presents the summary of the customers' perception about electricity supply after the reform. Customer's perception after the reform of electricity showed that there was no improvement in the electricity supply. This is because customers' perception means score are far below the cut-off point of 2.5.

The results presented in Table 14 showed the distribution of customers' perception about electricity supply before and after the reforms. The results showed that 73.4% of the customers have negative perception while 26.6% have positive perception before the reform. Further, 60% of the customers have negative perception while 40% have positive perception thereafter.

Table 12: Customers' perception of electricity before reforms

Variables	Observation	Weight	Mean	SD	Perception
Improved power supply	1096	167	1.81	0.73	Negative
Appropriate tariff	1029	1781	2.08	0.79	Negative
Supply of free meter	705	950	1.62	0.74	Negative
Supply of paid meter	1017	1506	1.78	0.75	Negative
Repair of faulty transformers	1045	1516	1.71	0.68	Negative
Supply of transformers	1000	1378	1.64	0.72	Negative
Adequate tools for clearing of faults	1021	1440	1.67	0.69	Negative
Improved service delivery	1037	1493	1.71	0.70	Negative
Maintenance/replacement of distribution lines	1025	1455	1.68	0.69	Negative
Customer service	1070	1582	1.75	0.71	Negative

Table 13: Customers' perception of electricity after reform

Characteristics	Observation	Weight	Mean	SD	Perception
Improved power supply	1.129	1890	1.94	0.68	Negative
Appropriate tariff	1.060	1842	2.07	0.77	Negative
Supply of free meter	796	1200	1.78	0.70	Negative
Supply of paid meter	1.030	1581	1.81	0.71	Negative
Repair of faulty transformers	1.064	1645	1.82	0.69	Negative
Supply of transformers	1.082	1650	1.78	0.67	Negative
Adequate tools for clearing of faults	1.039	1541	1.76	0.71	Negative
Improved service delivery	1.064	1662	1.83	0.69	Negative
Maintenance/replacement of distribution lines	1.064	1581	1.75	0.69	Negative
Customer service	1.091	1707	1.83	0.68	Negative

Table 14: Distribution of customer perception of electricity supply before and after reform

Perception	Frequency	Percentage
Before		
Negative	880	73.4
Positive	319	26.6
Total	1199	100
After		
Negative	719	60
Positive	480	40
Total	1199	100

5. CONCLUSION AND RECOMMENDATIONS

The study examines the perception of staff and customers on the level of awareness of power sector reforms and whether the reforms have translated to regular power supply. The study adopts a cross-sectional survey to obtain information from staff and customers of the electricity distribution companies in Nigeria. The results show that customers' level of awareness about electricity reform was low. This is an indication that National Electricity Regulatory Commission (NERC) has not played sufficient role in sensitizing customers about the electricity reforms. Although, a marginal improvement was recognised in the customers' perception of electricity supply after the reform, however, larger percentage of the customers still do not have access to regular electricity. The said reforms were implemented through adequate training of staff members, staff disengagement, redeployment of staff, staff motivation, appropriating proper tariff, establishment of customer care centres, over all monitoring and evaluation of the processes, and organisational restructuring. These strategies were put in place by the management for the implementation of the reforms. As deregulation is entrenched in Nigerian utility sectors including electricity, increase in customers' awareness should be given necessary consideration by the government and the electricity companies. Also, customers need to be enlightened and sensitized about electricity reform in Nigeria. Introduction of awareness programmes in the electronic (Television and radio) and print media (Newspapers) would assist enormously in advancing the course of customers.

The study also suggest that civil society organizations could contribute in advocating for customer awareness as part of their campaigns against social vices in the society. Government agencies and regulatory bodies involved in customer protection should be effectively empowered to enable them fulfil their responsibilities as provided by the laws establishing these bodies. Further legislation is required to alleviate production abuses and ensure adherence to the law by electricity companies. The provision of adequate transformer in all necessary areas could improve electricity supply to customers in the study area and subsequently enhanced customers' experience. Metering of all customers especially those who have paid meters are important to check estimated and wrong billing that is prevalent in the sector.

Moreover, there should be prompt response to customer complaints especially on issues that are to do with wrong estimation, account adjustment and meter programming. This could be done by setting up customer care centre at every service hub with an auditor on ground to verify and sign the necessary document without delay. Also, Staff motivation is necessary and should be encouraged in the sector to improve response to customers' complaints. The study further suggests that the transmission sector could be liberalised to allow private investors thereby increase the generation capacity. This will provide wide array of choices to customers on who supply them with electricity. This is the experience in the telecommunication sector in the country.

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