Survey Data on Problems with Electricity Distribution in Delta State, South-South, Nigeria

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Authors’ contributions

This work was carried out in collaboration among all authors. Author JT supervision, writing original draft preparation, conceptualization, methodology. Author AA writing, reviewing and editing. Author JM investigation software. All authors read and approved the final manuscript.

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Abstract

The dataset presented captures both the customers’ experience and observed problems with electricity distribution in Delta State, South-South, Nigeria. The data is obtained by means of a well-structured questionnaire implemented by trained interviewers in obtaining the demographic information respondents mostly had to tick(✓) the appropriate responses on the questionnaires. To obtain the customers’ experiences with the distribution company (DISCO), the respondents were presented with a series of positive statements and were expected to assign numbers between 1 and 5 on a five-point scale to indicate their level of agreement with the positive statements. For the observed problems with the services of the distribution company, respondents were to assign scores between 0 and 10 inclusive depending on the severity of the observed problems. The data was analysed by means of two computer software packages; Microsoft Excel, 2016 Edition and IBM SPSS Version 23. The data is presented in charts, tables, database and spreadsheet files.

Keywords: Survey data; survey data presentation; electricity distribution problems; electricity customers’ perception.

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1 Introduction

Electricity distribution in Nigeria is faced with a lot of problems especially as it relates to customers’ experience with electricity distribution companies [1,2]. Delta state is one of the 36 states of the Federal Republic of Nigeria with location coordinates; $5°30'N 6°30'E$ [3], Data was acquired through a field survey by means of a well-structured questionnaire administered by trained interviewers. Each interviewer was issued a letter stating the purpose of the survey which was read to each respondent. The questionnaire was administered on willing respondents who voluntarily offered their responses. The questionnaire and a copy of the letter issued to the interviewers are appended to this data article as Appendix. Data was collected from customers of electricity distribution companies, both in urban and rural areas of Delta State, South-South, Nigeria. A local government area headquarter was designated as an urban area, while villages were designated as rural areas. The data collected were spread across the three Senatorial Districts of Delta State.

A well-structured questionnaire was administered to electricity customers by trained interviewers on a person-to-person basis. The respondents were made to assign values between 1 and 5 by ticking the appropriate responses to positive statements about their experiences with their distribution company. To collect data on observed problems with the services of their distribution company, respondents were asked to assign scores between 0 and 10 to listed observed problems, depending on the severity of the problem. The dataset is available in the online repository in [4].

2 Materials and Methods

The data were acquired in a field survey by means of a well-structured questionnaire implemented by trained interviewers. In this section we state the software packages used, and provide descriptions for questionnaire used together with the method of administration.

2.1 Computer software packages

Two software packages were used namely; Microsoft Excel, 2016 Edition [5] and IBM SPSS Version 23 [6]. After the collection of the data they were collated. The various data base fields were created to hold the 43 different data items collected by means of the questionnaire. The parameters for various fields are self-contained in the database file and can be accessed in the data view of the SPSS package. The input of the data into the database file was done in the data view of SPSS. The initial analysis of the data was done in SPSS. Output files were exported to Microsoft Excel, which was used for further analysis and in the creation of tables and charts.

2.2 Questionnaire design

The questionnaire was designed to collect both numeric and alphanumeric data. It was divided into three sections. Section 1 of the questionnaire was for respondents’ biodata, Section 2 was for the customer’s experiences with the services of their DISCO, while Section 3 covers the observed problems with the services of the DISCO. Some of the surrogates used in Section 2 of the questionnaire were adapted from those used in [7]. The questionnaire is designed in such a way that the respondents were mostly asked to tick(✓) their responses from provided options. In Section 2 of the questionnaire, respondents were required to score positive statements about their experiences with the DISCO on a five-point scale. Respondents were to assign the values 1 to “strongly disagree”, 2 to “disagree”, 3 to “uncertain”, 4 and 5 to ”agree” and “strongly agree” respectively. In Section 3 of the questionnaire the respondents are expected to score the observed problems with the services of the DISCO on a score of 0 to 10 inclusive depending on the severity of the observed problem. The lowest score zero(0) means the observed problem was limited from the customer’s experience, while a score of 10, which was the maximum, means the problems is extreme.
2.3 Administration of questionnaire

The questionnaire was administered at random by well-trained interviewers simultaneously across the three Senatorial Districts of Delta State [8]. Three different interviewers were used, with one being assigned to each of the three Senatorial Districts. The questionnaire was administered both in urban and rural areas, which were selected at random from a list of designated towns by the use of urn, from which the designated names written on paper were picked. The interviewers were issued temporary ID cards and given a letter of introduction stating the purpose of the administration of the questionnaire.

3 Data Description

3.1 Database files

The database files associated with this data article are presented in two different formats viz; (i) IBM SPSS format (filename: Tsetimi_dib_dataset.sav) and (ii) Microsoft Excel format (filename: Tsetimi_dib_dataset.xlsx). The original input and coding of the responses was done in SPSS, which was also used for the analysis and generation of tables. The tables generated were exported to Microsoft excel which was used for further analysis and creation of the charts and tables presented.

3.1.1 IBM SPSS file (Tsetimi_dib_dataset.sav)

This database file contains 266 records and 50 fields. The 266 records correspond to the individual responses from the 266 respondents. While the first 43 fields correspond to the 43 different data items collected with the use of the questionnaire. The remaining 7 fields are calculated fields. The description of the fieldnames are self-contained in the database file and can be accessed in the variable view of SPSS. The coding of the various responses was done with SPSS and is also self-contained in the database file.

3.1.2 Microsoft Excel file (tsetimi_dib_dataset.xlsx)

This file was exported from the SPSS database file and the contents are the same with SPSS database file. This spreadsheet format is included for ease of accessibility and presenting the users of the dataset with a choice of two different formats to choose from. The spreadsheet file contains 267 rows and 50 columns. The first row contains the same fieldnames as in the SPSS database file, the remaining 266 rows correspond to the individual responses from the 266 respondents. The 43 columns of the Microsoft Excel file correspond to the first 43 fields in the SPSS database file.

3.2 Demographics

The demographics for this dataset are presented in charts and tables. Table 1 shows the age distribution of respondents. The type of towns in the dataset are depicted in Chart 1, while the sex distribution is presented in Chart 2. The number of dependants of the electricity customers in the survey are shown in Tables 2. Table 3 shows the highest educational qualification of the respondents. Charts 3 and 4 shows the type of customers and billing periods of respondents respectively.

Table 1. Age distribution of respondents

| Age Bracket | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------------|-----------|---------|---------------|--------------------|
| 18 - 30 years | 196       | 73.7    | 73.7          | 73.7               |
| 31 - 40 years | 39        | 14.7    | 14.7          | 88.3               |
| 41 - 50 years | 24        | 9.0     | 9.0           | 97.4               |
| 51 - 60 years | 5         | 1.9     | 1.9           | 99.2               |
| 60 years and above | 2 | .8     | .8 | 100.0            |
| Total       | 266       | 100.0   | 100.0         |                    |
Chart 1. Type of town

Chart 2. Sex distribution of respondents
Table 2. Number of dependants of respondents

| Number of Dependents | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------------|-----------|---------|---------------|--------------------|
| No Response          | 76        | 28.6    | 28.6          | 28.6               |
| 0                    | 50        | 18.8    | 18.8          | 47.4               |
| 1                    | 21        | 7.9     | 7.9           | 55.3               |
| 10                   | 2         | .8      | .8            | 56.0               |
| 12                   | 1         | .4      | .4            | 56.4               |
| 15                   | 1         | .4      | .4            | 56.8               |
| 2                    | 30        | 11.3    | 11.3          | 68.0               |
| 20                   | 1         | .4      | .4            | 68.4               |
| 3                    | 28        | 10.5    | 10.5          | 78.9               |
| 4                    | 24        | 9.0     | 9.0           | 88.0               |
| 5                    | 19        | 7.1     | 7.1           | 95.1               |
| 6                    | 9         | 3.4     | 3.4           | 98.5               |
| 7                    | 2         | .8      | .8            | 99.2               |
| 8                    | 1         | .4      | .4            | 99.6               |
| S                    | 1         | .4      | .4            | 100.0              |
| Total                | 266       | 100.0   | 100.0         |                    |

Table 3. Highest educational qualification of respondents

| Qualification      | Frequency | Percent | Valid Percent | Cumulative Percent |
|--------------------|-----------|---------|---------------|--------------------|
| Basic education    | 15        | 5.6     | 5.6           | 5.6                |
| Secondary education| 97        | 36.5    | 36.5          | 42.1               |
| National diploma   | 43        | 16.2    | 16.2          | 58.3               |
| HND/BSC            | 103       | 38.7    | 38.7          | 97.0               |
| MSc/MA             | 5         | 1.9     | 1.9           | 98.9               |
| PhD                | 3         | 1.1     | 1.1           | 100.0              |
| Total              | 266       | 100.0   | 100.0         |                    |

3.3 Responses from respondents

In this section we present pictorial descriptions of responses from respondents. In cases where more than one positive statement in the questionnaire is used to collect data from the respondents, the average of the responses is taken. The positive statement(s) used for the collection of each data items is(are) as shown in the questionnaire in the Appendix.

Chart 5 shows the distribution of responses for the overall satisfaction with the services of the DISCO. Only one positive statement was used for the collection of this data item. The average of the responses for quality and reliability of power from the distribution company in which the respondents evaluated two positive statements is shown in Chart 6. Chart 7 shows the reasonableness of bills. To determine the reasonableness of bills the respondents scored just one positive statement. Four positive statements were evaluated in respect to the billing system as to the accuracy, understandableness, clear explanation and satisfaction with the bills. The average of the responses on the billing system is as shown in Chart 8.

The positive statements on corporate image of DISCO borders on trustworthiness, hard work, technical knowhow, customer focus, care for the community and whether the DISCO help their customers. The average of the responses for the corporate image of DISCO is presented in Chart 9. Chart 10 shows the average of the responses for the effectiveness of communication by DISCO with customers. The respondents evaluated three positive statements on effective communication with stakeholders. The statements were on whether the DISCO was easy to reach, have good feedback system and whether the DISCO send regular information to all customers using available media.
Chart 3. Type of customers

Chart 4. Billing period of respondents
To evaluate the customers service of the DISCO, the respondents scored five positive statements. The statements involve ease of doing business with DISCO, concern and care for customers and whether the employees were courteous. They also scored whether the DISCO had knowledgeable employees and whether they always apologise for long power outages. The average of the responses for the customer service of DISCO is presented in Chart 11.

Chart 5. Responses on overall satisfaction with services of DISCO

Chart 6. Average responses on quality and reliability of power supply
Nine observed problems with the services of DISCO were evaluated by the respondents which includes; low voltage, incessant power outages, load shedding inadequate number of meters and distribution lines. Other problems evaluated by the respondents were unreasonable price of power, illegal connections, inadequate number of transformers and stealing of distribution facilities. The customers rated the problems on a scale of 0 to 10, zero(0) being that the problem is limited and 10 being that the problem is extreme. Respondents ratings of problems associated with the services of DISCO are shown in Chart 12.

Chart 7. Average responses on reasonableness of bills/rates

Chart 8. Average responses on effectiveness of billing system
Chart 9. Average responses on corporate image of DISCO

Chart 10. Average responses on effectiveness of communication of DISCO with stakeholders
Chart 11. Average of responses on customer service of DISCO

Chart 12. Means and standard deviations of scores for severity of problems on a scale of 0 to 10
4 Value of Data

- The dataset captures the problems faced by electricity customers in Delta State, Nigeria. This dataset is important because, knowing what the problems [9] are is the first step towards proffering solutions.
- Researchers on problems of electricity distribution in Nigeria will benefit from the dataset. The dataset will also be beneficial to the government, electricity distribution companies and other stakeholders who are trying to find lasting solutions for the plethora of electricity distribution problems that have eluded solutions for so long.
- The data can be used by researchers for the analysis of the problems associated with electricity distribution in Nigeria.
- The dataset may assist policy makers and developmental agencies in properly situating the problems of electricity distribution with other economic development problems in Nigeria.

5 Conclusion

In this data article, we have elected to present a dataset on problems of electricity distribution in Delta State, South-South, Nigeria. We described the associated database and spreadsheet files. We also presented the demographics and the responses from respondents in the field survey. The associated database and spreadsheet files are available in the public repository (8), Interested researchers can download the files in two different formats. An in-depth analysis of the descriptive statistics is presented in [10]. The analysis covers demographics, customers experience with DISCO and ratings of observed problems. The present endeavour is a pilot survey of a nationwide survey, covering the entire country, Nigeria. Further work is being done on the statistical inferences that can be drawn from the dataset presented in this article

Consent and Ethical Approval

As per international standard or university standard guideline participant consent and ethical approval has been collected and preserved by the authors.

Disclaimer

The dataset was collected using a survey questionnaire and the respondents voluntarily gave their responses. The questionnaires were administered at random to willing electricity customers who were neither coerced nor induced. The names and addresses of the respondents were not collected. The volunteered information cannot be traced to any individual electricity customer. The trained interviewers were issued letters of introduction/identification informing the respondents that the data collected was purely for research purposes. There are no additional requirements for this type of survey in Delta State, Nigeria. A copy of the letter of introduction/identification issued to interviewers is attached in the Appendix.

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Competing Interests

Authors have declared that no competing interests exist.
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Appendix

TO WHOM IT MAY CONCERN

This is to certify that........... is engaged in an academic research on Electricity Distribution and Generation in Nigeria. The research work includes collection and collation of data on electricity distribution through primary and secondary sources. The sources of data include, but not limited to, questionnaires, interviews and discussion groups. The data being collected is strictly for academic research purposes.

Please offer the needed assistance.

Yours Faithfully,

Dr. A.O. Atonuje
Head of Department

Appendix

SECTION 1

Respondent’s Data

1. State: __________________________
2. Town: __________________________
3. Type of town (Rural/Urban): _____________
4. Sex (Male/Female): ________________
5. No of dependents
6. Highest educational qualifications: (Please tick (√))
   (a) Basic Edu. (b). SSCE (c) ND (d) HND/BSc (e) MSc/M.A (f) Ph.D
7. Age bracket (Please tick (√)) (a) 18 - 30 (b) 31 - 40 (c) 41-50 (d) 50 - 60 (e) 60 and above
8. Average monthly income bracket (Please tick (√)) (a) N18,000 – N 50,000 (b) N 51, 000 – N 150,000 (c) N 151,000 - N 250,000 (d) N 251,000 - N 350,000 (e) N 351,000 and above
9. Average monthly bill: N
10. Name of Distribution Company:____________________
11. Type of consumer (a) Metered (post-paid) (b) Metered (pre-paid) (c) Non-metered
12. Billing period (a) Monthly (b) Quarterly (c) Bi-annual (d) Irregular

SECTION 2

Please read the statements below and circle the number which corresponds most closely to your experience with Disco in your geographical region. Provision has also been made for comments if any. The term ‘Disco’ stand for distribution company on your area.

| Strongly Disagree | Disagree | Uncertain | Agree | Strongly Agree |
|-------------------|----------|-----------|-------|---------------|
| 1                 | 2        | 3         | 4     | 5             |

Appendix

OVERALL SATISFACTION WITH DISCO
1. On the whole I am satisfied with

   the overall performance of the Disco.

QUALITY AND RELIABILITY OF POWER FROM DISCO
2. The quality of power distributed by Disco is good. 1 2 3 4 5
3. Power distribution by Disco is reliable 1 2 3 4 5

REASONABLENESS OF BILLS
4. The Bills/Rates of the Disco are very reasonable. 1 2 3 4 5

BILLING SYSTEM
5. Bills by Disco are always accurate. 1 2 3 4 5
6. Bills are easy to understand. 1 2 3 4 5
7. Charges are clearly explained on Bills 1 2 3 4 5
8. I am satisfied with Bills from Disco. 1 2 3 4 5

CORPORATE IMAGE OF DISCO
9. Disco is trustworthy. 1 2 3 4 5
10. Disco is hardworking. 1 2 3 4 5
11. Disco has the requisite technical know-how. 1 2 3 4 5
12. Disco is customer focused. 1 2 3 4 5
13. Disco cares for the community. 1 2 3 4 5
14. Disco does its best to help their customers. 1 2 3 4 5

EFFECTIVENESS OF COMMUNICATION WITH STAKEHOLDERS
15. Customer Service by Disco is easy to reach. 1 2 3 4 5
16. Disco has a good feedback system. 1 2 3 4 5
Appendix

17. Disco sends regular information to all customers using available media
                      1    2    3    4    5

CUSTOMER SERVICE
18. It is easy to do business with Disco.                      1    2    3    4    5
19. Disco shows concern and care for customers.                1    2    3    4    5
20. Disco has courteous employees.                            1    2    3    4    5
21. Disco has knowledgeable employees.                       1    2    3    4    5
22. Disco always apologizes for unusually long power outage.  1    2    3    4    5

Comments (if any).......................................................................................................................... 

SECTION 3
OBSERVED PROBLEMS WITH SERVICES OF DISCO
Rate these problems on a scale of 0 - 10. 0 being the problem is limited, and 10 being the problem is extreme.

23. Low voltage.                                             __________
24. Incessant power outages.                                 __________
25. Load Shedding.                                           __________
26. Inadequate number of meters.                             __________
27. Inadequate distribution lines.                           __________
28. Unreasonable price of power.                             __________
29. Illegal connections.                                     __________
30. Inadequate number of transformers.                       __________
31. Stealing of Distribution facilities.                     __________

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