

## Analysis of Factors Responsible for Erratic Power Supply in Nigeria

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### Abstract

This study examine the factors responsible for erratic power supply in Nigeria. Erratic power supply in Nigeria has been a major barrier to the growth and development of our economy. The effects of power outage on businesses can be catastrophic. With human and natural resources the country is blessed with. This research have four (4) research questions which were raised to guide this study. Sample of one hundred and twenty students were the respondents used as the sample population for this study. Structured questionnaire which had two (2) sections was duly validated and was used as instrument for data collection and same data collected through the research instrument was analyzed using frequency counts, percentages analysis, and inferential statistic of t-test was used to test the hypotheses at 0.05 level of significance. Data collected was analysed and the following results were obtained and tested hypotheses which was confirm the level of degree of freedom (df) = 100 ( $t_{cal} = 1.645$ ), which is less than the ( $t_{tab} =$  value of 2.163) which shows that, there is no significant difference between the factors responsible for erratic power supply and effects on the household appliance, also obtained in the second hypothesis tested that there is no significant difference between the factor responsible for erratic power supply and effects on the industrial development  $t$ -value of 1.850 is less than (critical value of 2.240) at 0.05 level of significance and at 12 degree of freedom (df) finding deduced that the majority of the respondents are of the view that poor maintenance culture, drought, winds, lightening, flood, theft and vandalization of electrical power equipments are the major causes of erratic power supply in Nigeria. Based on the finding, it was conclude that the problem of erratic power supply in Nigeria is as a result of low power generation capacity in the country. It is therefore recommended that to achieve an optimum reliability and the problems facing the power generation, transmission and distribution must be addressed.

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**Keywords:** Erratic, power, Economy, Shedding, Epileptic, Appliances, Electricity, Distribution

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### INTRODUCTION

Erratic power supply in Nigeria has been a major problem to the growth of Nigeria economy and its is a widely acknowledged fact that erratic power supply in the country is the problem of economic and industrial development in the country. The effects of power outage on businesses can be disastrous. Huge revenue loss, business disruptions, laying-off of workers by affected industries, loss of very important records of at data centres, wastage of perishable goods, destruction of home appliances e.t.c. are some of the effects of electrical power problems.

With the abundant human and natural resources the country is blessed with, it becomes paradoxical that after one hundred years of existence and sixty years of independence, Nigeria is still battling with the problem of uninterrupted power supply. Ponle (2015), stated that the long hours of black out always experienced in some area to shedding of load by electricity distribution companies as electricity distribution companies always resort to load shedding due to small amount of power being generated in the country.

Commercial electric power in Nigeria is produce as alternating current through a silent, superficially

limitless energy source that can be generated at power stations, boosted by transformers, and delivered over hundreds of kilometers to any location in a particular region (Aliyu, 2017).

Nigeria is a highly populated Western African country and on a rough evaluation, only about 40% of Nigerians are connected to the national energy grid and this percentage of Nigerians who actually have electric power supplied to them still suffer electric power problems. Nigeria, though one of the largest primary energy producers in the world still struggles to generate adequate electricity to support it economy and giant population. Salah (2013) asserted that the erratic nature of this power supply cripples the industrial sector, which leads to economic loss. Lack of reliable electricity also causes problems for agricultural development as most irrigation lines are own by electricity.

Owafe (2017) identified incompetence of staff of the energy companies, inconsistent energy policies of the federal government of Nigeria, and inefficient power generation, transmission, distribution and consumption as the major factors responsible for erratic power supply in Nigeria. Also, Awosope (2019), identified lack of good maintenance culture

as the reason behind investors' unwillingness to patronize the Nigerian electricity supply industry. He also listed lack of modern equipment, lack of policy that support the local production of machines and spare parts, and low morale among workers and embargo on employment as some of the effects of low power generation in Nigeria.

In 2017, Nigeria generated approximately 5,000MW of power for the population of over 150 million people. You may compare this situation with South Africa which produces over 40,000MW of energy for 62 million people (Dike, 2019). All the mechanisms put in place by present and past government to checkmate this anomaly seems not to be generating positive results. There is a need for a robust method to be adopted to identify the root causes and proffer possible solutions. Regular and reliable electricity supply is therefore significant for industrialization and economic development of Nigeria. Therefore, this paper is carried out to analysed the factors that are responsible for erratic power supply in Nigeria.

### **Statement of Problem**

Epileptic power supply in Nigeria has been a major concern, not just to the citizens, but also to the federal government and the companies in Nigeria. The federal government with the intention of addressing the issue of electrical power problems and improving the reliability of the electrical power system, have at one time or the other had to merge Electricity Corporation of Nigeria (ECN) and Niger Delta Authority (NDA) to National Electric Power Authority (NEPA) in 1972; in 2005 changes the nomenclature of NEPA to Power Holding Company of Nigeria (PHCN), focusing mainly on restructuring; privatized and split PHCN into 18 Companies in 2012. However, records shows that all of these actions have had little or no positive impact on availability of electricity which is of utmost concern to consumers. Therefore, the incessant electric power supply problems facing Nigeria is a pointer to the fact that there is great need to analysed the situation and with a view to provide lasting solutions to and resolve the pathetic power supply situation in the country from the analyses of the factors that are responsible for the epileptic power supply in the country.

This study would be of great value to Nigerian citizen and foreigners investing in Nigeria, if the problem of unreliable, erratic power supply is solve, there will be a good enabling environment for good businesses and large industrial companies to be establish for better business as this will improve their productivity and also make the household appliances have long life span.

The study will focus on the major factors responsible for erratic power supply in Nigeria and its effects on

household and on industrial appliances only and not on power generation or distribution.

### **Purpose of the Study**

The main purpose of the study is to analyse the factors responsible for erratic power supply in Nigeria. Specifically, this study sought to;

1. Analyse the causes of erratic power supply in Nigeria
2. Analyse the effect of erratic power supply on household appliances in Nigeria
3. Examine the effect of erratic power supply on the industrial development in Nigeria
4. Determine possible remedy for the erratic power supply in Nigeria

### **Research Questions**

The following questions guides the study.

1. What are the causes of erratic power supply in Nigeria?
2. What are the effect of erratic power supply on household appliance in Nigeria?
3. What are the effect of erratic power supply on the industrial development in Nigeria?
4. What are the possible solutions to the problem of erratic power supply in Nigeria?

### **Hypotheses**

1. There is no significance difference in the view of male and female residents on the causes of erratic power supply and the effect on household appliance.
2. There is no significance difference in the view of male and female residents on the effect of erratic supply and industrial development in Nigeria.

### **Methodology**

The evaluation research design was adopted for this study. Evaluation design seeks to provide data for making value judgment about some events, objects, methods and materials within the context of the phenomenon evaluated (Ali, 2006). This design is considered appropriate for the study because of the evaluative nature of the study.

### **Population of the Study**

The population for this study consists of all residents in Akungba, Iwaro-Oka and Supare in Akoko South West Local Government Area, Ondo State, Nigeria.

### **Sample and Sampling Techniques**

The sample for the study consisted of One hundred and Twenty (120) residents selected through simple random technique in which 70 males and 5 females were selected from the population

### **Instrumentation**

The instrument used for data collection was a self-develop questionnaire. It consisted of sections A and

B. Section A consisted of demographic information of the respondents while Section B consisted of items on the causes of erratic power supply in Nigeria. A modified four points rating scales of Strongly Agree (SA) – 4 points, Agree (A) – 3 points, Disagree (D) – 2 points and Strongly Disagree (SD) – point was used in rating the responses of the respondents.

**Validity of the Instrument**

The research instrument was given to three expert lecturers in Vocational and Technical Education Department, AdekunleAjasin University, Akungba-Akoko for necessary corrections and criticism to ensure face validity

**Reliability**

The test-retest method was used to determine the reliability of the instrument. The draft items were administered in two phases on 50 respondents from

another local government that is not part of the study. The two scores obtained were analysed using Pearson Product Moment Correlation and a reliability coefficient of 0.85 was obtained.

**Administration of the Instrument**

The questionnaire weredistributed personally to the respondents with the help of five (5) trained research assistants.

**Data Analysis**

The data collected were analysed using frequency counts and percentage to answer research questions and t-test was used to test the hypotheses at 0.05 level of significance

**RESULTS**

Research Question 1: What are the causes of erratic power supply in Nigeria

Table 1: Descriptive Statistics showing thecauses of erratic power supply in Nigeria

S/N	ITEMS	SA (%)	A (%)	D (%)	SD (%)	Mean	Remark
1	Corruption and looting of fund meant for power sector reform	56 46.7	37 30.8	17 14.2	10 8.3	2.3300	Agreed
2	Poor maintenance culture	32 26.7	71 59.2	13 10.8	4 3.3	2.5550	Agreed
3	Drought, wind, lightning, flood, etc.	53 44.2	58 48.3	9 7.5	-	2.7050	Agreed
4	Theft and vandalisation of electrical power equipment	41 34.2	55 43.3	19 14.2	5 12.5	2.7450	Agreed
5	Inconsistent energy policies of the federal government	39 32.5	39 32.5	10 8.3	9 7.5	2.4500	Agreed

The above table which state the causes of erratic power supply in Nigeria revealed that 56 (46.7%) and 37 (30.8%) which are the majority of the respondents were of the opinion that corruption and looting of fund meant for power sector reform is one of the major factors responsible for the causes of erratic power supply in Nigeria, while 27(22.5%) of the disagreed with the statement, which indicate that corruption and looting of fund meant for power sector reform is one of the major factors responsible for the causes of erratic power supply in Nigeria.

Following the finding, 103(85.9%) of the respondents that poor maintenance culture which most Nigerian lack is another major factors responsible for the causes of erratic power supply in Nigeria, only 17(14.1%) of the respondents disagreed with the statement which means that poor culture constitute to the erratic power supply in Nigeria. In another item which state that Drought, wind, lightning, flood, etc. are the causes of erratic power supply in Nigeria, 53 (44.2%) strongly agreed and 58 (48.3%) agreed that drought, wind, lightning flood are responsible for the

erratic power supply in Nigeria while, 9(7.5%) of the total respondents disagreed with the state which revealed that drought, wind, lightning flood are responsible for the erratic power supply in Nigeria. 96(79.5%) of the respondents agreed and strongly agreed that theft and vandalisation of electrical power equipment is another factors responsible for erratic power in Nigeria, meanwhile 24(20.0%) were of the contrary opinion. Finally, 78(65.0%) of the respondents reacted that Inconsistent energy policies made by the federal government is the factor responsible for the erratic power supply in Nigeria, while 19(15.8%) of the total 120 respondents disagreed with the statement. Meanwhile, Corruption and looting of fund meant for power sector reform, Poor maintenance culture, Drought, wind, lightning, flood, etc., Theft and vandalisation of electrical power equipment and Inconsistent energy policies of the federal government are factors responsible for erratic power supply in Nigeria because majority of the respondents agreed and strongly agreed with all the statement

**Research Question 2: What are the effects of erratic power supply on household appliance in Nigeria**

Table 2: Descriptive Statistics showing theeffect of erratic power supply on household appliance in Nigeria

S/N	ITEMS	SA (%)	A (%)	D (%)	SD (%)	Mean	Remark
1	Erratic power supply causes my house hold appliances to breakdown easily	30 35.0	45 37.0	25 29.2	10 8.3	2.4500	Agreed
2	Because of erratic power supply I always replace my bulb almost a week interval	28 23.3	53 44.2	35 29.2	4 3.3	2.2150	Agreed
3	Erratic power supply causes armed robber to rob because of black out at night	31 25.8	43 35.8	46 38.3	-	3.0700	Agreed
4	Erratic power supply causes fire outbreak that usually lead to loss of valuables	43 35.8	52 43.3	25 20.8	-	3.0450	Agreed
5	Erratic power supply causes increase in fuel pump price	51 41.7	41 34.2	29 24.2	-	2.4500	Agreed

Table 2 above show the result of the effect of erratic power supply on in Nigeria item 1 on the list indicate that 30 (35.0%) strongly agreed and 45 (37.0%) agreed that erratic power supply causes my house hold appliances to breakdown easily while 35 (37.5%) of the respondents disagreed with the statement, 81 (67.5%) which is the majority of the respondents agreed that because of erratic power supply I always replace my bulb almost a week interval, while, 39 (32.5%) of the respondents disagreed with the statement. 74 (66.4%) of the respondents were of the opinion that Erratic power supply causes armed robber to rob their street because of black out at night, while 46 (38.3%) were of the contrary opinion that that total blackout at night does not invite armed robber, which is not part of the effect of erratic power supply on household appliance. 95 (79.1%) of the total respondents were of the positive opinion that Erratic power supply causes fire outbreak that usually lead to loss of valuables and 25 (20.9%) of the respondents

disagreed with the statement. Finally on the table it was revealed that 92 (75.7%) of the respondents agreed that Erratic power supply causes increase in fuel pump price, whereas only 29 respondents, representing (24.2%) of the respondents were of the contrary opinion that Erratic power supply causes increase in fuel pump price.

Conclusively, Erratic power supply causes household appliances to breakdown easily, Because of erratic power supply bulbs are always replace almost a week interval, Erratic power supply causes armed robber to rob because of black out at night, Erratic power supply causes fire outbreak that usually lead to loss of valuables and Erratic power supply causes increase in fuel pump price are all effects of erratic power supply on in Nigeria which the analysis in the research question 2.

**Research Question 3: What are the effects of erratic power supply on the industrial development in Nigeria**

Table 3: Descriptive Statistics showing theeffects of erratic power supply on the industrial development in Nigeria

S/N	ITEMS	SA (%)	A (%)	D (%)	SD (%)	Mean	Remark
1	There is high cost of materials produce in the economy	63 52.5	29 24.2	15 12.5	13 10.8	3.1650	Agreed
2	Industries always have machine breakdown	21 17.5	64 53.3	25 20.8	10 8.3	3.1050	Agreed
3	Industries reduce the number of staff because money suppose to be use to pay 3-6 staffs will be used to buy fuel	62 51.7	40 33.3	18 15.0	-	3.1400	Agreed
4	The is shortage of industrials products	29 24.1	67 55.8	8 6.7	16 13.3	3.0550	Agreed
5	Most industries fold up because of erratic power supply.	54 45.1	40 32.3	22 18.3	4 3.3	3.1650	Agreed

Table 3 above show the result of effects of erratic power supply on the industrial development in Nigeria. It was revealed that 92 (77.7%) of the respondents have positive view that there is high cost of materials produce in the economy which is one of

the effects of erratic power supply on the industrial development, while 28 (22.2%) of the respondents disagreed with the statement. Subsequently the statement on Industries always have machine breakdown which is due to the effect erratic power

supply on the industrial development, 85(70.8%) of the whole respondents agreed while 35(29.1%) of the respondents disagreed with the statement. Furthermore, 102(85.0%) of the respondents have positive interest that, Industries reduce the number of staff because money supposed to be used to pay 3-6 staffs will be used to buy fuel, while 18(15.0%) of the disagreed with the statement. Likewise, on the table it was revealed that 98(79.9%) of the respondents agreed that the shortage of industrials products is one of the effect erratic power supply on the industrial development, while 24 (20.1%) disagreed with the statement. Finally on the table, it was depicted that,

Most industries fold up because of erratic power supply 94(77.4%) agreed while 24(23.6%).

Conclusively, There is high cost of materials produce in the economy, industries always have machine breakdown, industries reduce the number of staff because money suppose to be use to pay 3-6 staffs will be used to buy fuel, The is shortage of industrials products and Most industries fold up because of erratic power supply which the high scores on the table indicated.

**Research Question 4: What are the possible remedies to erratic power supply in Nigeria**

Table 4: Descriptive Statistics showing the possible remedies to erratic power supply in Nigeria

S/N	ITEMS	SA (%)	A (%)	D (%)	SD (%)	Mean	Remark
1	Federal government should implement policies for prompt payment of electricity bill	70 58.3	35 30.8	8 6.7	5 4.2	2.8350	Agreed
2	There should be increase of electricity power plant in the country to have enough	27 22.5	80 66.7	12 10.0	1 0.8	2.8300	Agreed
3	Government should provide auto-electric meter for all house so as to have accurate bill paid per month	65 54.2	34 28.3	17 14.2	4 3.3	2.7500	Agreed
4	There should be bush clearance to allow free space for the power line so as to avoid damage to the power line/distribution line	59 49.2	39 32.5	18 15.0	4 3.3	2.6800	Agreed
5	Government should employ and security staffs to all transformers and Distribution stations to avoid theft transformer and other electric garget on site	70 58.3	27 22.5	23 19.2	-	2.7250	Agreed

Table 4 above revealed that result on the possible remedies to erratic power supply in Nigeria, 105 (89.1%) of the total respondents viewed that Federal government should implement policies for prompt payment of electricity bill, which is one of the major remedy to erratic power supply in Nigeria, while 13 (10.9%) of the respondents disagreed with the statement, 107(89.2%) majority of the respondents were of the that There should be increase of electricity power plant in the country to have enough to put to an end the remedies of erratic power supply in Nigeria, 13 (10.8%), of the respondents disagreed with the statement, Government should provide auto-electric meter for all house so as to have accurate bill paid per month, 99(82.5%) have positive interest, while only, 21 (17.5%) shared negative view on the issues that Government should provide auto-electric meter for all house so as to have accurate bill paid per month, 98 (81.7%) of the total 120 respondents have the same interest that There should be bush clearance to allow free space for the power line so as to avoid damage to the power line/distribution line, which is going to be another major remedy for the erratic power supply in Nigeria, while those that disagreed with the statement are 22 (18.3%). Finally in the table it was revealed that majority of 97 respondents

representing (80.8%) agreed that Government should employ and security staffs to all transformers and Distribution stations to avoid theft transformer and other electric garget on site, while 23 (19.2%) also disagreed with the statement.

Conclusively, Federal government should implement policies for prompt payment of electricity bill, There should be increase of electricity power plant in the country to have enough, Government should provide auto-electric meter for all house so as to have accurate bill paid per month, There should be bush clearance to allow free space for the power line so as to avoid damage to the power line/distribution line and Government should employ and security staffs to all transformers and Distribution stations to avoid theft transformer and other electric garget on site. These high scores indicated that the above statements are the remedies for the erratic power supply in Nigeria.

**HYPOTHESES**

**Research Hypothesis 1:** There is no significance difference in the view of male and female residence

on the factors responsible for erratic power supply and the effect on household appliance.

Table 5: Factors responsible for erratic power supply and the effect on household appliance

Categories	N	Mean	SD	Std Error	df	t-cal	t-tab	Rmk.
Male	48	2.091	.814	.0685	120	1.645	2.163	Not Sig.
Female	62	2.050	.629	.06001				

From table, the result indicates that there is no significant difference in the view of male and female residents on the factors responsible for erratic power supply and its effect on the household appliances was confirmed ( $X^2$ Cal. 12.15;  $X^2$ Tab. 3.84,  $p>0.05$ ). This implies that the erratic power supply have negative effects on the household appliances.

**Research hypothesis 2: There is no significance difference in the view of male and female residents on the factors responsible of erratic supply and its effect on the industrial development**

Table 6: Factors responsible of erratic supply and its effect on the industrial development

Categories	N	Mean	SD	Std Error	df	t-cal	t-tab	Rmk
Male	74	1.390	.490	.0467	120	1.850	2.240	Not Sig.
Female	46	1.590	.494	.0471				

From table, the result indicates that there is no significant difference in the views of male and female residents on the factors responsible for erratic power supply and its effect on the household appliances was confirmed ( $X^2$ Cal. 12.15;  $X^2$ Tab. 3.84,  $p>0.05$ ). This implies that the erratic power supply have negative effects on the household appliances.

**DISCUSSION OF FINDINGS**

Research question one which stated the factors responsible for the cause of erratic power supply in Nigeria, it was also discovered that the majority of the respondents are of the view that poor maintenance culture, drought, winds, lightening, flood, theft and vandalisation of electric power equipment are the major causes of erratic power supply in Nigeria. This was in line with the finding of Awosope (2014) who stated that with the intention of addressing the issue of electrical power crisis and improving the reliability of the electrical power system.

Research question two, also reveals that effect of erratic power supply on household appliance in Nigeria, the opinion of the respondents on the effects of erratic power supply on household appliance in Nigeria. It was revealed that majority of the respondents replace the electric bulb almost every week, with majority of the them concur with the statement while the rate at which armed robber operate in their street, is frequent, because of total blackout at night, majority of the respondents agreed that erratic power supply also cause fire outbreak that usually leads to loss of valuable properties. This finding was in line with the work of Ukpog, (2016) who says that, the lack of reliable electric power supply and the intermittent blackouts cause severe economic damage.

**SUMMARY**

This research work has outline the analysis of the factors responsible for erratic power supply in Nigeria. It was also discovered that the majority of the respondents view that poor maintenance culture, drought, winds, lightening, flood, theft and vandalisation of electrical power equipments are the major causes of erratic power supply in Nigeria

**CONCLUSION**

It is widely believed that the problem of erratic power supply in Nigeria is as result of low power generation capacity of the country. This is because Nigeria with a population of over 200 million has power generation capacity of around 3,600 megawatts out of the installed capacity of about 6,000 megawatt. This is very low when compared to that of other countries like Brazil with a generation capacity of 100,000mws of grid-based electric power for a population of 201 million people, South Africa which generates 40,000 mw of electricity for 50 million citizens, and Ghana which generates 2,111 megawattss for a population of 23.84 million peoples, while it is true that Nigeria’s power generation capacity is currently below what it should be, the low power generation capacity of Nigeria is not the cause of erratic power supply in the country. Low power generation should only result to not enough power available for consumption and not the power supply becoming erratic. The major cause of erratic power supply in Nigeria is energy wastage by consumers occasioned by default or estimated billing system adopted by power distribution companies. Other contributors include government misguided power reform policies, low standard and ill maintained transmission and distribution infrastructure, and the use of unqualified and technically incompetent work force by the power generation, transmission and distribution companies adopting energy conservative policies like the use of

LED bulbs and other energy saving electrical and electronic devices, immediate discontinuation of default/estimated billing system by the electricity distribution companies, upgrading of power distribution and transmission equipment and the engagement of competent and qualified staff by the electric power companies.

### RECOMMENDATIONS

Based on the findings, the following recommendations were made:

1. The problem of overloading on individual transformers that often lead to voltage and current surges should be addressed by providing more transformers so that the loads can be evenly distributed, voltage regulators are also recommended to be used with the equipment so that in the case of surges, it can be absorbed by the regulator without affecting the equipment.
2. The use of uninterruptible power supply is recommended with television sets so that it can provide it with additional protection that will improve its reliability and lifespan.
3. All equipments should be turned off and unplugged from the source of power whenever they are not in use.

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