

Erratic Power Supply and Socio- Economic Development in Ado-Ekiti, Ekiti State, Nigeria

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ABSTRACT

This paper appraises the structure of power supply in Nigeria. Data were sourced through the conduct of interview with electricity consumers and the use of questionnaires for selected areas of Ado-Ekiti in order to determine the level of power supply in one year (2012). The frequency of power outages for the areas under consideration was determined and the effects of constant power failure on the socio-economic development of the metropolis were adequately assessed. Recommendations were made to proffer solution to erratic power supply in the metropolis with a view of improving the level of power supply.

KEYWORDS: *Development, Erratic, Outage, Power, Supply*

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I. INTRODUCTION

Power supply in Nigeria at the moment is faced with many challenges and this had ravaged the country with slow pace of development. The components of power supply universally are the generating stations, the transmission system and the distribution networks (Adeoye et al, 2012). The bulk electric power is produced by special plants known as generating stations (Metha, 2005). A generating station employs a prime mover coupled to an alternator for the production of electric power. The form of energy is converted into electrical energy depending on the type of generating station. Today, the world has moved to a level by which the environmental pollution through CO₂ emission from the conventional generating stations is discouraged. The use of renewable energy is the solution to power shortage in most developed nations of the world in recent years. Transmission lines have three constants, resistance, inductance and capacitance which are distributed uniformly along the whole length of the line (Metha, 2005). The overhead lines are classified into short, medium and long transmission lines depending on their voltage level and span. The part of power which distributes electric power for local use is called the distribution system. Distribution system is classified based on the nature of current, types of construction and scheme of connection. The hydropower in Nigeria and thermal generating stations are incapable to generate the required power to sufficiently feed the domestic, commercial and industrial demand of the country. The population of Nigeria is 140,003,544 with the estimated power demand of the country as 13,160.33W. It is obvious that the country needs to generate about 15,000MW to meet up with the growing population and power demand required for socio economic development (Adeoye et al, 2011). The present power generation is 4439.5MW with Lagos taking about 1,124MW which represents 25.32% of the total power generated in the country (The Nation, 2012). The distribution system has the major challenges ranging from inadequate transformers capacity, maintenance, and low current densities for conductors and cross sectional areas, improper planning, problems of power supply authorities, and staffing. Nigeria has an installed capacity of 8,644MW of which 6,905MW is government owned. The population of the country has increased to about 150 million with an average GDP growth rate of 6.66%. 25,561MW will be required in the next 9 years to meet demand by vision20: 2020 target (Presidential Taskforce on Power, 2011).

A study on power supply on Ado -Ekiti showed that women whose age ranges from 18 -29 and their men counterpart had 67% access to electricity (Adeoye et al, 2013).

Successive Governments have tried to improve power supply over the past few decades. Trillions of Naira had been spent but little had been achieved. The problems are inadequacy of past policies and their poor implementations. Others are: High capital, intensive nature of power sector projects; inadequate power generation capacity of a peak value of about 4300MW; the use of older power plants; vandalism of existing power infrastructure; gas supply constraints; inadequate maintenance of equipments; dearth of skilled manpower; dependence on imports of parts; and foreign experts to effect repairs and overhaul.

(<http://www.power.gov.ng/index>).

The Manufacturers Association of Nigeria indicated that capacity utilisation which was recently at a disturbingly low level of 35 percent has plunged further to 27 percent as a result of inadequate and erratic power supply. A grossly inefficient fuel distribution system compounds the power problem for all economic operators. Service organisations are losing man hours and business opportunities while operational costs are escalating. Energy experts noted that the energy crisis adds at least 40 percent to the cost of doing business in Nigeria. This makes the cost of production very high and renders Nigerian made goods uncompetitive in both the local and international market place. Data from the Nigerian Electricity Regulatory Agency indicates that Nigerians spend around N797 billion yearly to buy fuel for powering their generators. A sum N540.9 billion goes into purchasing diesel while N255 billion go into petrol(<http://www.nigerianoilgas.com>, 2010).

Over the year, the nation's power sector has been be-devilled by managerial inefficiencies and leakages, lack of transmission, efficient investment in generation, distribution, and continued increase in load demand. With Nigeria on the quest to become one of the 20 leading economies by 2020, fast tracking the nation's electricity needs is critical for industrialisation.

The growth of any nation is critically dependent on the sufficiency of its electricity supply industry. However, the development of the various sectors of the economy, such as industry, agriculture, health, education, tourism, etc, depends heavily on reliable, adequate and economically priced power (<http://www.businessdayonline.com> March, 2012).

Electricity generation, transmission and distribution have been faced with many challenges. The erratic power supply experienced has been a source of concern for individuals, businesses and investors and has hampered the economic growth of the nation. In most urban areas, power supply is a privilege that should be enjoyed when available but should not be expected to last for long. While in some rural areas and new communities, power supply is very erratic and cannot be hoped for rapid improvement at the moment. Energy is central to improved social and economic well-being and indispensable to most industrial and commercial wealth generation, analysts, stakeholders and well meaning Nigerians believe that for the nation to become one of the twenty most developed countries by 2020, the country would require adequate and reliable energy services at affordable costs in a secure and reliable energy services at affordable-costs. (<http://www.businessdayonline.com> 26 March , 2012).

Sequel to the fact that only 40 % of Nigerians enjoyed electricity supply, most Companies had been driven out of the country. The epileptic electricity supply in spite of huge investment by the Federal Government cannot be dissociated from the Management of the defunct Power Holding Company of Nigeria. (New Agency of Nigeria, retrieved from <http://www.nanngronline.com>, 28th Nov, 2013). Erratic delivery of power supply for domestic and industrial use is dependent on the low level of water in some power plants and shortage of gas supply, inadequate human capacity and insufficient system synergy (Vanguard Newspaper, retrieved from <http://www.vanguardngr.com>, 1st May, 2012).

Nigeria's power sector is credited with high energy loss of 30-50% from generation to billing, a low revenue collection rate of 75-80%. This inefficiencies result in low access to electricity by the largest part of the population (<http://blueprinting.com>/2012).

Methodology: The method employed in this research is the use of questionnaires and direct interview with the residents. Selected areas in Ado-Ekiti metropolis such as Adebayo, Ekute Quarters and Omisanjana were visited in order to assess the level of their supply of power and frequency of outages in one year (January-December ,2012). Omisajana and Ekute were selected as residential areas with a population of over 10,000 and 12,000 residents respectively (estimate). Adebayo was selected as another area being both residential and commercial part of the state with a population of about 50,000 people (estimate). Adebayo area is an area where the residents are Students, families and artisans. Simple mathematical approach was used to assess the level of incessant power supply in these areas. Recommendations were made with a view of minimising the present erratic power supply in the country. The simple mathematical equations were used to assess the frequency (%) of power supply per person and the selected people of such areas that were interviewed. The equations are stated as in equations 1.1 and 1.2. The rate of power outages were determined as inverse of the frequency of power supply (%) as stated in equation 1.3.

$$\text{frequency of power supply (\%)} = \frac{\text{Number of hours of power supply to an area}}{\text{Total hours in a month}} \dots\dots\dots 1.1$$

$$\text{freq of power supply per year (\%)} = \frac{\text{No of hours of power supply to an area}}{\text{Total hours in a year}} \dots\dots\dots 1.2$$

$$\text{rate of power outages (\%)} = 1 - \text{frequency of power supply} \dots\dots\dots 1.3$$

Discussion: The study shows that the state of power supply in the country is devastating. Most streets in the selected areas of Ado-Ekiti are suffering from in-adequate power supply due to low power allocation, planning deficiencies from the power authority, inadequate capacity of transformers, poor voltage regulation, cable undersize, and lack of maintenance of transformer substations. The effects of the incessant power failure are numerous ranging from waste of resources, productive deficiencies, insecurity and slow rate of development. It was observed that the 132/33 kV has not been adequately utilised. 200 questionnaires were distributed and only 180 were returned which represents 90%. 70, 75 and 55 people were interviewed from Omisanjana, Adebayo and Ekute Quarters respectively. 60, 70 and 50 out of questionnaires were returned for analysis. The respondents at Adebayo who were students and other residents believed that the level of power supply in the area is grossly inadequate. They complained that power supply to the area could be guaranteed from 11p.m to 4a.m of each day of the week. This signifies 5 hours a day, 35 hours in a week, 140 hours in a month and 1820 hours in a year signifying 20.78 % supply of power throughout the year as shown in Table 1 and fig.1. Commercial activities in the area are usually paralysed during the day. This had forced residents and traders to purchase generators. Not only that, they need to buy petrol or diesel and carry out maintenance on the mechano-electrical device on constant basis. This is a set back for the metropolis because the amount to carry out the maintenance is uneconomical which could be invested on the socio –economic development of Ado-Ekiti. Omisanjana residents stated that the state of power supply was fairly encouraging based on the fact that power supply is made available for 5 days in a week for about 18hours per day due to constant load shedding in the area. The implication is that in a year, the supply is for 4680 hours representing 53.42 % as shown in Table 1 and fig. 1 respectively. In Ekute area, most resident applauded the Power Holding Company of Nigeria sequel to the fact that they usually enjoy power supply for about 20 hours in a day. This represents 7280 hours per year at 83.11% as shown in Table 1 and fig.1. The percentage power supply and outages are shown in Table 2 and fig.2 respectively. The average analysis of power supply to the three areas depict that power supply is 52.44% while the frequency of power outage is 47.56%. The present power supply in Ado Ekiti can be used as an average of approximately 52% power supply to residents and other commercial activities. This is a serious problem for the country's socio economic development. The hindrances to constant power supply are poor power allocation, inadequate planning, and load shedding. It is sad that most Companies in the country today had migrated to South Africa and Ghana due to erratic power supply. Examples of such are: Michelin, Dunlop, and PZ which had skyrocketed the unemployment rate in the country. Some small and medium scale industries had closed down. It is obvious that most residents in the metropolis make use of both petrol and diesel generators. The premium motor spirit and auto mobile gas oil in Ado-Ekiti presently cost 110 and 160 naira respectively. Fuel consumption for Ado Ekiti residents for a year domestically, commercially and industrially is several millions of naira. This amount could have been invested into provision of infrastructural facilities such as roads, electricity supply, drinkable water, agricultural development with a view of providing succour for the residents. The wasted resources could also generate employment opportunities for the people.

Conclusion: The present power allocations, maintenance, conductor sizes, voltage regulations and adequate planning should be properly scrutinized for adequate power supply to the country. The power supply in Ekiti in spite of the present increase in the supply capacity is grossly inadequate due to the fact that the 132/33kV is yet to be adequately utilised. It was established that the power supply level in Adebayo area was 1820 hours in a year signifying 20.78 % supply throughout the year and about 79.22 % of the year is characterised with power outage. In Omisanjana area, the power supply level was 4680 hours representing 53.42 % and 46.58 % representing period of power outage in the area. It Should be noted that in Ekute area, the power supply was 7280 hours in a year representing 83.11 % while the power outage was only 16.89 %. The average power supply to the areas under consideration was put at 52 %. The effective utilisation of the installed 132/33kV in the state will at least provide between 70-75% power supply to the entire populace which will form an economic base for the state. The farmlands in the rural areas of the state will have access to regular power supply so as to preserve the agricultural produce and the industries would be able to transform raw materials to finished products. Domestic consumers would be able to enjoy almost twenty-four hours supply in a day while artisans would also access about 24 hrs supplies for productive service. Renewable energy would help the country to provide stable power supply to meet up with domestic and commercial loads. The use of smart grids technologies and smart grids metering will proffer solution to all technical and non technical losses in both transmission and distribution lines.

1.7 Recommendations: The following recommendations were made in order to reduce the erratic power supply in the country.

1. The power allocation to Ekiti should be increased.
2. Adequate planning should be put in place by the power authorities.
3. Good voltage regulating devices must be put in place.
4. Cable size for armoured and Aluminium conductors should be of the required standard.
5. Engineering maintenance of power facilities must be adequate.
6. Renewable energy should be used to boost the level of power supply in the state.
7. Smart grid technology should be incorporated.
8. Embedded Generation (EG) and Independent Electricity Distribution Network (IEDN) should be made operational in the country.
9. The wasted resources being expended on purchase and maintenance of generating sets should be used to generate employment opportunities for the people.

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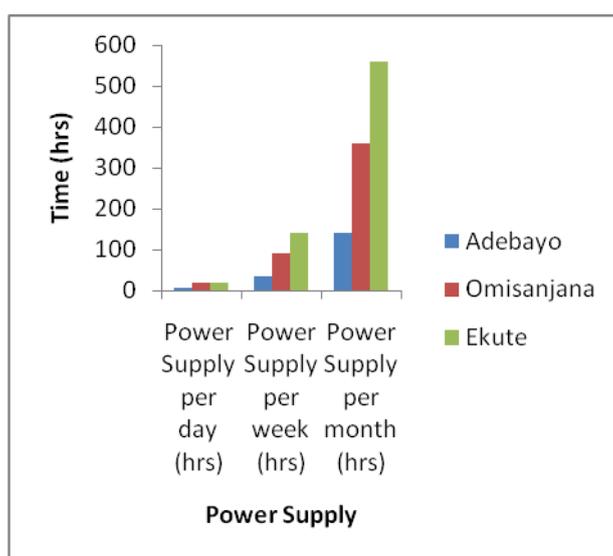


Fig.1: Power supply (hours) to the Areas in Ado - Ekiti

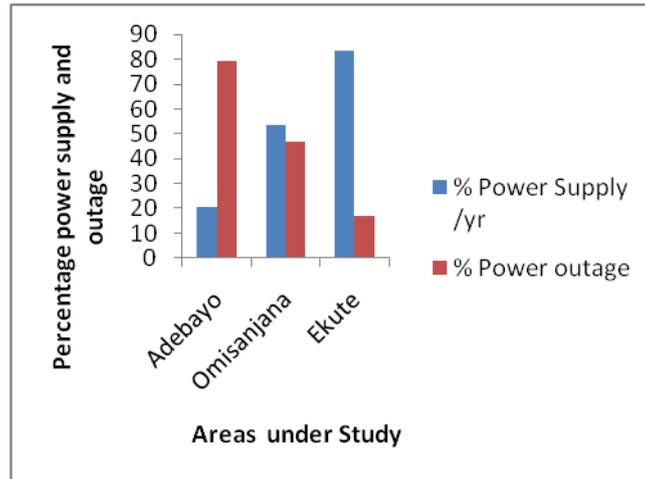


Fig. 2 Percentage power supply and outage for selected Areas in Ado - Ekiti

Table 1: Power Supply to selected areas in Ado- Ekiti

S/N	Areas	Daily (hrs)	Weekly (hrs)	Monthly (hrs)	Annual (hrs)
1.	Adebayo	5	35	140	1820
2.	Omisanjana	18	90	360	4680
3.	Ekute	20	140	560	7280

Table 2: Percentage power supply and outage to Areas in Ado-Ekiti

S/ N	Areas	Annual Supply (%)	Annual Outage (%)
1.	Adebayo	20.78	79.22
2.	Omisanjana	53.42	46.58
3.	Ekute	83.11	16.89