

POOR AND INADEQUATE ELECTRICAL POWER GENERATION, TRANSMISSION AND DISTRIBUTION IN NIGERIA: ECONOMIC, PSYCHO-SOCIAL, HEALTH, SECURITY AND EDUCATIONAL CONSEQUENCES**Jacob Omede, PhD^{1*} Andrew Abdul Omede²**

1. Department of Educational Psychology, Kogi State College of Education, P.M.B. 1033, Ankpa, Kogi State, Nigeria
E-mail: ja_omed@yahoo.com
Phone no: +2348038822124
2. Department of Educational Psychology, Kogi State College of Education, P.M.B. 1033, Ankpa, Kogi State, Nigeria

Corresponding Author: Jacob Omede, PhD**Abstract**

This paper examined the consequences of poor and inadequate electricity generation, transmission and distribution on the economic, psycho-social, health, security and educational development of Nigeria and Nigerians. In an attempt to do this, the paper discusses the state of electricity generation, transmission and distribution in Nigeria and affirmed that it was still poor and low comparable to other nations despite efforts of government to improve it. Some of the problems responsible for the inadequate electricity supply and poor performance which the paper identified included over loading and load shedding, poor funding, natural disasters such as rain and wind storms as well as erosions and wild fires that destroy electricity installations and also the non-diversification of energy sources to include solar and wind. The paper further discussed the consequences of these poor and inadequate electricity supplies on national economic growth and development, psycho-social, health, security and the educational growth and development of both the individuals and the nation. The paper finally concluded discussions by recommending among others that sources of energy be diversified to include the use of solar and wind in addition to oil and gas, promotion of more research efforts in the sector through frequent seminars and conferences and that security agents should intensify surveillance to forestall, arrest and penalize illegal exploration of oil and gas as well as destruction of oil and gas installations that frustrate supply of available electricity.

Keywords: Electricity, supply, inadequate, consequences, educational development and national transformation**1.1 Introduction**

Electricity supply, transmission and distribution are pivotal to socio-economic and technological transformation of nations. The use of electricity is directly correlated with healthy economic growth (Kaseke & Hosking; 2013). Virtually, every nation's economic activities –industrial, commercial, agricultural and even educational depend hugely on electricity supply to be successful in operations. With electrical energy, the people are empowered to work from the domestic level and the cottage industries through the small-scale and medium-scale industries to employment in the large scale

manufacturing complexes (Abdullahi; undated). In fact, according to Abdullahi, depriving people of electric power in these days is tantamount to castration. This statement actually underscores the importance of electricity known to all and sundry. Little children for instance, shout “NEPA!” When suddenly there is power restoration or outage. Everybody knows that electricity supply is good as it promotes both the economic and welfare of nations and individuals.

But as important as electricity is to societal and human transformations, its supply in Nigeria is poor and grossly inadequate. Supply is by far short of demand because of the ever increasing population of the country and the inability to expand output. Nigeria has one of the lowest net electricity generation per capita rates in the world (MBendi; 2015). Public electricity supply in Nigeria covers less than 30 percent of Nigerian homes and still not on a full time basis (Kara.com.ng; 2014). Wikipedia (2014) puts the percentage of Nigerians connected to the energy grid at 40.

This poor and inadequate power generation and distribution are of local, national and international concern particularly among the developing nations of the world because of its utilitarian benefits. Electricity is a major issue affecting economic growth and development (The Nigerian Observer; 2013). According to the Nigerian Observer, the cost of power generation by both high and low investors in Nigeria is heavy and takes a huge chunk of total cost of inputs making it difficult for made-in-Nigeria goods to compete with imported products in the open market. This is capable of dwarfing local production efforts.

It is worthy to note that the federal government has been making frantic efforts to improve electricity generation and distribution. Both physical and structural transformations aimed at improving and sustaining electricity efficiency and quantity had been put in place at one time or the other in the name of various reforms. As part of the reforms, on February 21, 2013, the Bureau of Public Enterprises on behalf of the federal government privatized the Power Holding Company of Nigeria (PHCN) and executed share sale agreements and concession agreements (Nigeria Electricity Privatization Project; 2013). Thursday, 19th February, 2015, and Saturday, 21st, the phase 11 of Olorunsogo power station in Ogun state and Egbin power station in Lagos state were commissioned by the federal government. These two power stations commissioned would hopefully contribute 750 megawatts and 220 megawatts respectively to the available electricity generation capacity in the country. The commissioning of Olorunsogo power plant was however, political as it was said considered to be commissioned previously by president Olusegun Obasanjo in 2007 (The NEWS, 2015).

Whatever it was, the federal government is making frantic and practical efforts to improve the power and energy sector in Nigeria, even though these efforts are yet to translate into meaningful economic benefits for the nation and the individuals due to erratic supply of this product and the protracted blackout in many other parts of the country. Production activities are still being inhibited as a result of this epilepsy and occasional comatose in transmission and distribution of this very important commodity.

In as much as is not in the domain of this paper to touch on some technicalities especially as this is not the professional fields of the writers, one thing stands out very evidently that poor and inadequate

Journal of Applied Science

electricity generation and distribution impacts negatively on the economic, psycho-social, health, security and educational growth and development of the individuals and nations at large. The interest of this paper therefore, is to discuss the consequences of poor and inadequate electricity generation and distributions on the psychological, social, economic, security and educational developments of Nigerians and Nigeria. But before this is done, the paper will first discuss the state of electricity generation and distribution in Nigeria as the next sub-head.

2.1 The state of electricity generation and distribution in Nigeria

Electricity generation and distribution are yet abysmally low or inadequate in Nigeria despite efforts of governments to shore it up. The privatization of Power Holding Company of Nigeria (PHCN) was an attempt by the federal government to improve the performance of the sector, stimulate economic growth and to widen its scope of distribution to cover all parts of the country.

Statistics had it that Nigeria is achieving growth in electricity generation, transmission and distribution. For instance, Home Coming Revolution (2014) noted that between 2009 and 2010, Nigeria’s power generation has improved from about 2000MW to about 4,502 MW in December, 2012. By July 2013, 6000MW of power generation was achieved although some of these increased power generation gains are being lost due to incessant activities of vandals and oil thieves (Home Coming Revolution; 2014). This perhaps could be why the Benin Electricity Distribution Company (undated) put the actual energy available to be between 2,500MW-4,500MW. Assuredly too, commissioning of Olorunsongo and Egbin power plants by the president of Nigeria on 19th and 21st February, 2015, respectively had increased operational capacity beyond its former status.

But good as the reports of these advancements are, juxtaposing Nigeria’s per capita electricity consumption with other countries shows that is one of the lowest in the world (MBendi; 2015). Nigeria’s per capita electricity consumption accounts for only 3% of that of South Africa (Benin Electricity Distribution Company; undated). Nigeria’s current electricity production per capita was put at 103.81kwh per capita consumption (Benin Electricity Distribution Company; undated). Taking a glance at the table comparing per capita production and consumption rate of electricity in Nigeria with other countries provided by Benin Electricity Distribution Company (undated) shows that Nigeria still has a longer way to go in electricity generation and distribution.

Table 1: Comparison of electricity consumption per capita for four nations

Country	Population	Per capita consumption in (kwh)
South Africa	49 million	4,222.46
Egypt	83.6 million	1,388.71
Ghana	24.6 million	248.33
Nigeria	170 million	103.81

Source: Benin Electricity Distribution Company: Undated

The above table reveals that Nigeria with the highest population has the lowest per capita consumption rate because the available electricity capacity is shared among very large population. A similar comparison made in 2008 showed that Nigeria was behind United Arab Emirate (UAE) in electricity generation capacity (Adenikinju, 2008). According to Adenikinju, Nigeria with a population of over 150 million people, has an installed generation capacity of 6000 MW compared to UAE that has 4740MW to a population of 4 million or South Africa that has 46000MW to 44 million people.

If the Nigerian government actually knows that electricity is pivotal to national economic growth and transformation, which the writers think she knows, then she needs to be more aggressive and realistic to face the development of this sector much more than what obtains currently. The rule of thumb for any developed industrial nation is that at least, 1 gig watt, that is 1000 Megawatts of electricity generation and consumption is required for every one million head of population (Benin Electricity Distribution Company; undated). Nigeria is realistically very far from this ideal. The government has targeted increasing available electricity generation capacity to 16000 megawatts in this 2015 and to again increase electricity access to 50% of the population and 75% by 2020 from the 40% that it is currently (Home Coming Revolution, 2014).

This is 2015 and characteristically, load shedding, low voltage, protracted power failure and arbitrary billing that are habitual of National Electric Power Authority (NEPA) renamed Power Holding Company of Nigeria (PHCN) are still the same ugly faces of this sector even now that is privatized. In some parts of Kogi state, old Ankpa local government comprising Ankpa, Olamaboro and Omala to be specific, have not noticed improvement in electricity supply for the past decade. If anything, it is protracted darkness as these local governments will not see electricity one or two days in a month. This is not an exaggeration! This section of the country is in gross darkness and nothing tantalizing is being said to the inhabitants.

Electricity is the life wire of industrialization. Education and industrialization are sectors that must not be ignored by any nation that is development oriented. Government should therefore, do all that is within her powers to overcome some of the problems of non-performance of electricity in the country.

3.1 Problems of Electricity Generation, Transmission and Distribution in Nigeria

The problems facing electricity generation, transmissions and distribution in Nigeria are multifarious. Some of such problems are:

1. Overloading of transformers. And these at times lead to load shedding, low voltage and frequent power outage
2. Poor maintenance culture
3. Illegal connections
4. Estimated bills that most times result to overcharging the customers due to absence of billing meters
5. Delay or refusal to pay electricity bills by some consumers

6. Natural disasters such as rain storms, erosion, wild and uncontrolled fires. The occurrences of these events could burn down electricity poles, cables and other installations
7. Frauds and Corruption by some personnel of the corporation
8. Low water level due to inadequate rainfall in some years. This affects maximum operations of hydro-generating plants
9. Inadequate trained manpower
10. Poor research in power and energy sector
11. Inability to diversify sources of energy generation and distribution to include solar and wind as well as the use of coal in greater percentage
12. Activities of vandals and illegal oil and gas explorers
13. Poor funding

The above enumerated problems characterize electricity generation and distribution in Nigeria leading to its poor performance before it was unbundled and privatized. Even though government is still a major player in this business of electricity after privatization, it is hoped that with the private sectors brought on board, some of these problems will be addressed drastically for the sectors' performance to be enhanced. Meanwhile, as Nigerians are waiting for improvement of service, the consequences of inadequate electricity generation and distribution are enormous on the psycho-social, economic, health, security and educational growth and development of the people and the nation in general. These consequences are discussed in the next sub-head.

4.1 Consequences of poor and inadequate electricity generation, transmission and distribution in Nigeria on:

4.1.1 National Economic growth and development

Electricity is fundamental and central to daily living as well as national economic growth and development. Electricity gives light to the environment, power the homes, schools, hospitals, offices, businesses and also aid industrialization (Koledoye, Jumah & Phillips; 2012). No nation can achieve development in all the sectors of her economy without reasonable levels of industrialization and every industrialized economy is powered by electricity. As noted earlier, with electrical energy, people will be empowered to work from the domestic level through cottage to small scale, medium and large scale manufacturing companies (Abdullahi; undated).

Specifically, absence of electricity will impact negatively on the economy of Nigerians and Nigeria as follows:

1. Increase in operational costs of firms as well as the cost of running families that use diesel or petrol to power their generators (Naira Land; 2010). This has multiplier effect on the economy as there will be increase in unit cost of goods and services, reduction in demand as well as the production output culminating in low Per Capita Income (PCI) and Gross Domestic Product (GDP) that will slow down national growth and development.

2. In addition, absence, low or erratic power supply will affect location of industries. This is due to the fact that many industries require electricity for their services and depending on personal machines or generating plants will shoot up operational costs.
3. Some domestic commercial business centers will not find it easy to operate. Examples of such are: Viewing centers (football and other national and international competitions), Hair salons, Laundries, Sellers of cold drinks and ice blocks, Electric welders, Tailors and Seamstresses, Battery chargers as well as Carpenters to mention these few. These small scale businesses have helped in no small measures to gainfully employ many Nigeria youths educated and illiterates. One can imagine several of them that would be thrown out of jobs and the social consequences that will follow.
4. Absence of public electricity will force many industries to operate below capacities. Many of the installed plants will be underutilized as private generators will require periodic servicing and sometimes, repairs. Apart, there are some generating plants that may not have the capacity to work for long hours and one can be sure of the consequence of this on the economy.
5. Absence of or inadequate electricity resulting to low industrialization promotes unemployment in the economy with its attendant social consequences such as armed robbery, prostitution, etcetera.
6. The contribution from industrial sector to Gross Domestic Product (GDP) will drastically fall due to industries operating below capacities. In addition, there will be low Per Capita Income, low personal savings and then low or poor investment. Vicious circle of national poverty continues keeping Nigeria perpetually in her state of underdevelopment and economic dependence.

4.1.2 The Psycho-social development

Inadequate electricity generation and distribution culminating in frequent power outages and most times protracted darkness impacts negatively on the psychological, emotional and social wellness of users particularly, those that cannot afford alternative source of generating power for homes and businesses. Some of the psycho-social consequences of absence of or frequent power outages on the electricity consumers are:

1. Worries and anxieties as well as frustrations that are capable of causing disease conditions such as ulcers and hypertension
2. Transfer or displacement of aggressions if not controlled on some members of the family as if they are responsible for the darkness or disruption to the program of interest that one was watching on the television.
3. Inferiority complex and self pity for not being able to afford or not being able to continually service or fuel available alternative family power source (personal generator).
4. Low feeling or sudden mood swing from that of excitement to sadness especially if the power goes off during an interesting program or in the evenings with full darkness all around.
5. Fear. If one is of high social or economic status and one can afford to put on the personal generator when the rest compounds within the community are in darkness, and this continues

on regular basis, the tendency is that one could become victims of attack by armed robbers and other criminals around the community.

6. Armed robberies, prostitutions, kidnapping, child and drug trafficking, terrorism, pipeline vandalism and illegal oil bunkering among other social crimes will litter the nooks and crannies of Nigerian societies as a result of poor or absence of electricity. Adequate electricity supply correlates with industrialization that correlates with employment, improvement in GDP and PCI as well as national growth and development. Absence of electricity would directly or indirectly manifest in some of these social crimes.
7. Keeping of late nights or outings in social centers such as clubs and hotels because home environments no longer provide the comfort that is needed due to non-functionalities of gadgets and appliances that are electrically powered
8. The noise pollution from personal and industrial generators and plants equally has negative psychological impact. The noise is irritating as it pollutes the entire environment. As it overrides every other sound especially if the generator is old, it keeps home occupants from being sensitive to any other form of danger alert or looming danger within the environment.

4.1.3 Health and national security

Absence or erratic supply of electrical power has some health and security consequences. Some of such are:

1. Hearing loss resulting from constant exposure to noise from personal generating and industrial plants
2. Atmospheric and environmental pollution that is hazardous to terrestrial, land and aquatic organisms. Carbon monoxide that emits from smokes of industrial and home plants are hazardous to human, animals and plant health.
3. Most evils are conceived and executed in darkness. Examples of such are armed robberies, kidnapping, ritual murders, and etcetera. Absence of electricity especially during the nights prepares fertile grounds for the conception and execution of some of these evils.
4. In addition, absence of electricity frustrates the operations of certain security devices mounted to restrain, monitor or record certain criminal acts. For instance, some installations in the bank such as the security doors, Automated Teller Machines (ATM) and other forms of security alerts when cash withdrawals or deposits are made are all such efforts to checkmate or curtail criminal acts. Absence of electricity enhances the chances available to these criminals to execute their intentions.
5. Other security devices such as cell phones require electricity periodically for charging the batteries.
6. There are some road gadgets mounted strategically along the roads especially in some advanced countries of the world that monitor and track down abusers of traffic rules and regulations that equally require electricity to function.
7. In addition, with some security installations, criminals in their locations could be monitored and tracked.

These gadgets or installations cannot function effectively in the absence of adequate power or electricity supply. Security satellites mounted in spaces could be used to detect criminal activities within the beam of their searchlights. Those in the control rooms would require electricity to monitor and then to act accordingly.

4.1.4 Educational development

Schools are microcosm or a miniature community. All that go on in the larger societies go on in the schools. Therefore, as absence of electricity supply or its inadequacy frustrates economic and social activities in the larger communities so it also frustrates economic, social and academic activities of educational institutions particularly at the tertiary level.

Specifically, absence or erratic electricity supply to schools frustrates the operational activities of schools as follows:

1. Setting up of electronic library that is necessary for access to academic materials in other locations of the world
2. Automating students' results and other ancillary online activities like payment of school fees and other online registrations
3. Setting up of Information and Communication Technology (ICT) centers for improved learning and research
4. Effective security surveillance
5. Small scale economic or commercial activities such as hair salons, laundries, cold-drinks and ice water, banking, etcetera, will not thrive well
6. Comfort of the offices. Offices will be difficult to stay and work especially when temperatures are high and there is no electrical power to use fans, air conditioners and refrigerators
7. Effective research. This will be hindered because of the absence of electronic libraries and internet facilities on the campus which might be due to absence of electricity. In Kogi State College of Education, Ankpa, absence of public electricity is a major hindrance to effective academic activities as college plant is put on between 10am and 2pm during the working hours. The moment the power goes off; offices become inhabitable due to heat frustrating research efforts for teachers and students that have the intention.

5.1 Conclusion

Electricity generation, transmission and distribution are low in Nigeria. In fact, Nigeria is one of the nations of the world with lowest per capita electricity consumption due to ever increasing population without a corresponding expansion in electricity generation capacity and supply. Absence of electricity

supply or its inadequacies impact negatively on the national economic transformation, psycho-social, health, security and educational advancements.

Since it is not arguable that electricity supply correlates positively with technological transformation that will in turn translates in increased Per Capita Income (PCI), Gross Domestic Product (GDP) and National Income (NI), federal government and the managers of the unbundled Power Holding Company of Nigeria (PHCN) should step up efforts to improve electricity generation and transmission as well as access beyond what it is currently for the consumers by embarking on the following measures or recommendations:

6.1 Recommendations

1. Diversifying the power and energy sectors by promoting explorations of the wind and solar energy sources as well as coal that are in abundance supply in the country. This will undoubtedly, reduce dependence on oil and gas that are non-renewable.
2. Managers of electricity companies should promote more research activities in this sector through sponsorships in national and international seminars and conferences for the experts in this field to tinker out possible and cheaper means of tapping energy from solar and wind sources.
3. Managers of electricity generation, transmission and distribution should be prepared to make escape goats of employees that are fraudulent to deter others. Those caught in illegal connections, arbitrary billing and selling electricity products of the companies are to be duly punished.
4. Government should develop the will power to release fund and monitor how the funds are executed for building of more power stations in the six geo-political zones of the country. The power plant to be built in any of the locations in the zones should be determined by the energy source that is available. For instance, wind and solar energy sources are common in the north, oil and gas in the south-south, coal in the east and parts of middle belt and hydro-power source for areas along rivers Niger and Benue that traverse a larger part of the country. Power and energy generation should be appropriately diversified.
5. Nigerian security agents-Nigerian Civil Defense Corps, Nigerian Police Force, Nigerian Naval and Air Forces are to mount up more security surveillance on the land, water and air to frustrate and reduce very drastically activities of vandals and oil bunkers as well as deliberate destruction and theft of electricity installations and equipment that are rampant and inimical to effective electricity generation, transmission and distribution.
6. Patriotic Nigerians living in communities where there is electricity installation and those living along transmission lines should be patriotic enough to report incidences of vandalism, or its attempts timely to the relevant law enforcement agents within the area for prompt responses.

References

Abdullahi, M.D. (Undated). The Economics of Electric Power Supply in Nigeria. Retrieved 16/02/2015

from <http://www.gamji.com/article9000/NEWS/9075.h>

Adenikinju, A. (2008). Efficiency of the Energy Sector and its Impact on the Competitiveness of the

Nigerian Economy. Retrieved 17/02/2015 from www.iaee.org/documents/.../408adeola.p...

Benin Electricity Distribution Company (Undated). Electricity Distribution-An Operator's View. Retrieved

18/02/2015 from <http://www.ibs.edu.ng/LBSBreakfastclub/Electricity%20Distribution%20-%20An%20Operator%27s%20View.pdf>

Home Coming Revolution (2014). Nigeria's Unfolding Power Reform Programme. Retrieved 18/2/2015

from <http://homecomingrevolution.com/nigeria/2014/06/25/nigeria's-unfolding-power-reform-programme/>

Kara.com.ng (2014). The Benefit of Solar as a way of Generating Power Supply in Nigeria. Retrieved

17/02/2015 from <http://blog.kara.com.ng/the-benefit-of-solar-as-a-way-of-generating-power-supply-in-nigeria/>

Kaseke, N., & Hosking, S. (2013). Sub-Saharan Africa Electricity Supply Inadequacy: Implications. Eastern Africa Social Science Research Review. 29(2), 113-132

Koledoye, I.O., Jumah, A.A., & Phillips, D.A. (2012). The Current and Future Challenges of Electricity

Market in Nigeria in the Face of Deregulation Process. Retrieved 23/02.2015 from theses.covenantuniversity.edu.ng/.../

MBendi (2015). Electrical Power in Nigeria- Overview. Retrieved 17/02/2015 from

<http://www.mbendi.com/indy/power/af/ng/p0005.htm>

Naira Land (2010). Steady Electricity Supply in Nigeria Reduces Operational Cost of Firms, Families.

Retrieved 17/02/2015 from <http://www.nairaland.com/502234/steady-electricity-supply-nigeria-reduces-operational-cost-of-firms-families>

Nigerian Electricity Privatization Project (2013). Power Sector Reform. Retrieved 23/02/2015 from

www.nigeriaelectricityprivatisation.com

The News (2015). Jonathan Commissions Plant Obasanjo Commissioned in 2007. Retrieved 23/02/2015

From thenewsnigeria.com.ng/2015/02/22/jonathan-commissions-plant-obasanjo-commissioned-in-2007/

The Nigerian Observer (2013). Privatisation of Nigeria Power Sector. Retrieved 17/02/2015 from

<http://nigerianobservernews.com/03102013/editorial.html>

Wikipedia (2014). Nigerian Energy Supply Crisis. Retrieved 17/02/2015 from

http://en.wikipedia.org/wiki/Nigeria_energy_supply_crisis

