

THE PROBLEMS OF POWER GENERATION IN NIGERIA: IMPLICATION FOR ECONOMIC DEVELOPMENT

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Abstract

This study examined the problems of power generation in Nigeria. The study was a descriptive survey research. The population of the study consisted of 430 staff drawn from Power Holding Company of Nigeria (P.H.C.N.) Ogorode, Sapele. 100 staff were sampled. The instrument was the questionnaire. The data collected were analyzed using Chi Square. The result revealed that there is no significant difference between male and female staff opinion on the problems of power generation in Nigeria; there is no significant difference between senior and junior staff view on the problems of power generation in Nigeria; that system disorders, corruption and embezzlement, bureaucratic delays, lack of fund and lack of spare parts are some of the problems of power generation in Nigeria and that inadequate power generation and supply retard industrialization, does not encourage the use of electronics sets, for relaxation and news at home, affects the emotional, social, psychological and economic services to its users, exposes its consumers to dangers, retards commercial activities such as trading, banking, shop operations, and retards food and fruit preservation. The study recommended that the computerized maintenance management system should be adopted to effectively streamline activities like predictive, preventive and corrective maintenance.

Within the socio-economic processes which underscore every economic system, economic development globally, revolves around the issues of the character, structure, pattern and evolution of desirable inter-personal relation of production, allocation and utilisation of available resources in any country. In order to optimally develop and efficiently manage such available resources, equitably allocate and effectively utilise them and subsequently, put economic development firmly on course, modern operational technologies with respect to production, allocation and utilisation are designed and tied strictly to the use of energy in one form or the other. Thus, the quest to rapidly and firmly put the Nigerian economy on the course of economic development is technically, a function of adequate generation of energy, particularly, electricity.

Madume (2002) observed that in Nigeria, the national peak demand for electric energy is on the increase as a result of many development activities. He went further to state that in spite of this, the total power generation has not matched this increase. It is a fact that most communities in Nigeria regard the construction of access roads, installation of pipe borne water, building of town halls, etc as the rudiments to their development, yet electricity promotes instantly their social and economic life as many services and facilities become readily available (Ogumodede, 2005). In this regard, adequate power/electricity generation constitute a central development issue which cannot be over-emphasised. Apart from serving as the pillar of wealth creation in Nigeria, it is also the nucleus of operations and
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subsequently the 'engine of growth' for all sectors of the economy. Ayodele (2008) asserted that in recognition of the consolidating linkage between the energy sector and the other sectors of the economy, electricity generation and utilisation therefore, have pervasive impacts on a range of socio-economic activities and consequently, the living standard of citizens in the country. Adequate power generation and regular supply is the prime mover of technological and social development. There is hardly any enterprise or indeed any aspect of human development that does not require energy in one form or the other- electric power, fuels etc (Akpan, 2005). Nigeria is richly endowed with various energy sources, crude oil, natural gas, coal, hydropower, solar energy, fissionable materials for nuclear energy, yet Nigeria consistently suffers from energy shortage- a major impediment to industrial and technological growth. The total generating capacity is about 3000MW, approximately one third of the current level of national demand.

Electricity generation and supply is indispensable in modern living in any industrial or commercial society. Nigeria being rapidly growing in development, industry and commerce, is battling with the problems of continually expanding consumption and increase in demand for electricity. Adesola (2007) posited that sufficient power generation is a basic pre-requisite for rapid industrialization and general economic development. Therefore, adequate electricity generation in Nigeria should be the wheel of upon which progress rotates. Adequate electricity generation in Nigeria will also encourage the nation's march toward economic self-reliance and development, since virtually all industries (small and big) depend on electricity.

According to Okonkwo (1999) there is inadequate utilization of the abundant natural resources. The mere possession of primary resources could only be termed a necessary condition which is not necessarily sufficient to guarantee adequate generation of electricity. According to Ayodele (2008) one inconvertible attribute of electricity generation and utilization is a country's technological capability in which Nigeria is apparently deficient. Nigeria lacks electricity supply in the midst of plenty especially as Nigeria generates and supplies electricity to some of her neighbouring countries (Odiaka, 2006). Presently, we can generate up to 5400MW whereas the country generates below 3000MW. Okoro (2007) reported that the situation of electricity outages especially one year before the inception of Obasanjo led-civilian administration on May 29, 1999, was at alarming frequencies in the face of abundant primary electricity resources- coal, natural gas, geothermal, tide, solar, biogas, biomass etc. Incidentally, some analysts (Iwayemi, 1991; Adegoke, 1991; Awowede (2000) and (Oraye, 2000) have defined this period as a period of serious electricity crisis; a crucial or decisive movement; an undesirable turning point; a time of difficulty and distress; a state of confusion when things no longer happen in the normal or usual manner.

In Nigeria, the authority responsible for electricity generation is the Power Holding Company of Nigeria (Former National Electric Power Authority (NEPA). It was established under Decree Number 24 of April 1972. Electric Power from all its numerous power stations are harnessed together and fed through associated transmission lines and equipment which in turn, supply power to several towns and states through distribution lines and equipment.

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Studies and experiences have shown that power generation in the country has been dismal and unable to compare with what obtains in smaller African countries. In 2001, electricity/power generation went down from the installed capacity of about 5,600MW to an average of about 1,750MW, as compared to a load demand of 6,000MW (Sambo, 2008). Also, only nineteen out of the seventy-nine installed generating units were in operation (Odiaka, 2006). Government recognised this supply inadequacy and thus noted the cardinal challenge there from. Given the foregoing crisis and its implications, government recognised the need to rehabilitate the electricity sector in order to meet the aspiration of citizens as the dividend of democracy. In the last four years (2007), the existing power stations were overhauled to attain full capacity. Also, some independent power plants at Egbin in Lagos; Katampe, Sharp-corner and AB3 in Abuja; River State independent Power Plant, Okpai gas plant in Delta State, etc were established to attain combined capacity of 4000MW (Owan, 2005). However, these efforts in the areas of power generations are daunted with a lot of problems that can solely be responsible for frequent total outages (system collapses) that are rampant in the operations of PHCN system over the years.

From all indications, the performance of power sector in Nigeria as represented by PHCN activities in the last eight years has been dismal and, by extension, accentuated the economic and industrial underdevelopment situation of the country. It shows that Nigeria as a developing country is not even at the stage of take off since the stage would imply that basic infrastructural facilities are in place. Also summarising the effects of dismal electricity supply situation in Nigeria between 1999 and 2009, Iweha (2009) argued that at inception in 1999, Obasanjo's administration promised Nigerians steady power supply. The promise of increasing the nation's output from 1,700MW to 10,000MW has remained largely unfulfilled. Despite government investment of over N574 billion in the sector, power output continues to dip, a situation that has killed many business ideas and is costing investors huge sums to run generators.

Several reasons have been adduced on why the various efforts made over the years by government have not yielded any significant improvement on power generation and supply in Nigeria. With the installed capacity of about 6000MW, the country manages to generate only a meagre (of more or less) 4000 MW of electricity (Atser, 2006). The current per capita consumption of electricity in Nigeria is about 106KWh/person compared to Ghana's 430, India's 470 or Brazil's 1800. Expected increase in consumption is 379MW annually at 2.5 percent population annual growth rate and five percent annual growth of the economy. For a country that prides itself as the giant of Africa, less than 3,000MW of electricity generation for a population estimated at about 140 million people is unacceptable and certainly, a mockery of that status when compared with the over 36,000 MW generated by South Africa with a population of 40 million and Egypt which generates 23,000 MW for a population of 79 million. Meanwhile, power generation in Iran and Nigeria were both at about the same level in the 70s. Today, Iran's power generation capacity with a population of 70 million is 42,000MW (Chiedozie, 2007).

Available records showed that government set 10000 MW target to be achieved by the end of 2007 as it has invested in new power projects that would be privatised after completion. However, it is instructive to note that these huge investments did/have not improved the situation of power

generation in Nigeria for some obvious reasons (Ajanaku, 2007). Therefore, huge deficiency exists in Nigeria's electricity generation capability.

The performance of the energy sector did not justify the expenditure of government within the past years in Nigeria. The projected electricity generation and supply from all sources (conventional and renewable) in the short (2007), medium (2015) and long term (2025) is 7,000MW, 14,000MW and 29,000MW respectively. This falls short of the current electricity demand of about 30,000MW and at a growth rate of 10% in the economic sector (most optimistic case scenario), a corresponding 10% growth rate in the energy sector is anticipated. The country's electrical power demand is high but actual generation is considerably below demand. As a result, Nigeria has experienced an energy supply crisis in recent years. Efforts to reverse this state of affairs are yet to yield enduring results despite recorded progress so far.

Purpose of the Study

The main purpose of the study is to determine the causes of irregular electricity supply in Nigeria. Specifically, this study sets to find out purpose the following:

1. To investigate the problems of power generation in Nigeria.
2. To help establish the relationship that exists in Power Holding Company of Nigeria (PHCN) Staff view on the problems of power generation in Nigeria with regard to sex and rank.

Research Questions

The study was guided by the following research questions:

R.Q.1: What are the problems of power generation in Nigeria?

R.Q.2: What are the effects of inadequate power generation in Nigeria?

Hypotheses

The following hypotheses were formulated and tested at 0.05 alpha level:

HO1: There is no significant difference between male and female staff mean response to items on the problems of power generation in Nigeria.

HO2: There is no significant difference between of senior and junior staff mean response to items on the effects of inadequate power generation in Nigeria.

Method

The study adopted the descriptive survey research design. The population for the study consisted of 430 staff of Power Holdings Company Nigeria (PHCN), Sapele Power Station, Ogorode, Sapele. The stratification sampling technique was used for the study. This is by first dividing the population into sub-groups depending on the number and type of sub- groups of male and female, senior and junior staff that exist in the population. After this, the simple random sampling was used to select appropriate sample size from each stratum or sub-group.

The sample for the study consisted of one hundred (100) staff of Power Holdings Company Nigeria (PHCN). The instrument for data collection was questionnaire. The questionnaire contained 20 items. This was in form of the Likert scale. The respondents were required to agree or disagree. A

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test retest method was used to determine the reliability of the instrument after which the scores were subjected to the Pearson Product Moment Correlational Statistical technique with a coefficient of 0.78 obtained. The arithmetic mean was used for items interpretation and analysis and data presented on tables. Items with meaning ratings up to and above 3.50 were regarded as accepted, while mean ratings below 3.50 was used to considered as unaccepted, Chi-square to tests the null hypotheses, at 0.05 significance level.

Presentation of Results

Research Question 1: What are the problems of power generation in Nigeria?

Table1 Mean Responses of PHCN Staff on the Problem of Power Generation in Nigeria.

S/N	Items	Mean	Decision
1	Delays in repairing damaged generating components.	4.52	Accepted
2	Untimely and insufficient routine repair.	3.65	Accepted
3	The vandalization of PHCN equipments, facilities and installations	3.90	Accepted
4	Lack of manpower	3.94	Accepted
5	Insufficient equipment, machineries and spare parts.	4.09	Accepted
6	The attitude to work and equipment by PHCN staffs.	4.13	Accepted
7	Corruption and embezzlement.	4.92	Accepted
8	Inadequate fund.	3.93	Accepted
9	A bureaucratic delay.	3.90	Accepted
10	Lack of spare parts to replace bad ones.	3.54	Accepted
11	Societal factors.	3.51	Accepted
	Total Mean (X)	4.00	Accepted

Table 1 above presents the meaning rating of PHCN staff views with regard to the problems of power generation in Nigeria. All the items met the 3.5 bench mark, which means that they were all accepted. The grand mean of 4.00 also met the 3.5 bench mark. This means that PHCN staff agreed on the problems of power generation in Nigeria.

Research Question 2: What are the effects of inadequate power generation in Nigeria?

Table 2 Mean Responses of PHCN Staff on the Effects of Inadequate Power Generation in Nigeria

S/N	Items	Mean	Decision
1	Retard industrialization.	4.61	Accepted
2	Does not encourage the use of electronics sets, for relaxation and news at home.	4.23	Accepted

3	Affects the emotional, social, psychological and economic services to its users	4.33	Accepted
4	Exposes its consumers to dangers	3.63	Accepted
5	Affects students performance in school work	2.40	Rejected
6	Peasant farmers loose their agricultural products.	2.24	Rejected
7	Its makes its users to spend heavily by buying and maintaining generators.	4.92	Accepted
8	Retards commercial activities such as trading, banking, shop operations etc.	4.10	Accepted
9	Retards food and fruit preservation.	4.20	Accepted
	Total Mean (X)	4.30	Accepted

Table 2 above shows that seven items have a mean above the 3.5 bench mark against two items that has a mean below 3.50. This means that seven items out of the nine items were accepted as the effects of inadequate power generation in Nigeria, meaning that inadequate power generation does not affect peasant farmers and students performance in school work. The grand mean of 4.30 indicated that there a lots of effects resulting from inadequate power generation.

HO1: There is no significant difference between male and female PHCN staff mean response to items on the problems of power generation in Nigeria

Table 3 Chi-square Analyses of the Opinion of Male and Female Staff on the Problems of Power Generation in Nigeria.

Respondents	N	$\frac{(fo-fe)^2}{Fe}$		Df	X ² Calculated	X ² Critical
Male Staffs	60	1.21				
Female Staffs	40	1.17	1	2.38	3.84	

Source: The Researcher

The result of the Chi-square for the difference in male and female opinions of the problems of power generation in Nigeria is not significant. This is due to the fact that the calculated value of 2.38 is less than the critical value of 3.84 at 0.05 level of significance. The null hypothesis, which states that there is no significant difference between male and female staff responses on the problems of power generation in Nigeria, is therefore not rejected.

HO2: There is no significant difference between of senior and junior staff mean response to items on the effects of inadequate power generation in Nigeria.

Table 4 Chi-square Analyses of the Opinion of Senior and Junior Staff on the Effects of Inadequate Power Generation in Nigeria.

Respondents	N	$\frac{(fo-fe)^2}{Fe}$		Df	X ² Calculated	X ² Critical
Senior Staffs	40	1.01				
Junior Staffs	60	1.30	1	2.31	3.84	

Source: The Researcher

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The result of the Chi-square for the difference between senior and junior staffs opinion on the effects of inadequate power generation in Nigeria did not differ significantly. This is so, since the calculated value 2.31 is less than the critical value of 3.84 at 0.05 level of significance. The null hypothesis, which states that there is no significant difference between senior and junior staffs opinion on the effects of inadequate power generation in Nigeria, is accepted.

Discussions

The result of the study with respect to the research questions in table 1 and 2 shows that the respondents agreed on all the eleven items as the problems of power generation in Nigeria. They agreed that delays in repairing damaged generating components, untimely and insufficient routine repair, lack of manpower, corruption and embezzlement, inadequate fund as well as The attitude to work and equipment by PHCN staffs, vandalization of PHCN equipments, facilities and installations, Societal factors and bureaucratic delay are problems of power generation in Nigeria. These negatively affect the once enviable growth rate of electricity industry in Nigeria (Oruye, 2001). Consequently; it has caused a lot of harm in the epileptic nature of power generation Nigeria.

On the effects of inadequate power generation, findings from the study revealed that the respondents agreed on seven items as the effects of inadequate power generation as against two. They tend to hold the view that inadequate power generation and supply retard industrialization, does not encourage the use of electronics sets, for relaxation and news at home, affects the emotional, social, psychological and economic services to its users, exposes its consumers to dangers, retards commercial activities such as trading, banking, shop operations, and retards food and fruit preservation. This agrees with Martins (1992) who explained that inadequate power supply alters instantly social life and economic life as many services and facilities becomes readily unavailable, Still in support of the items as identified by the respondents, he went further to explain that lack of electricity supply will negate the use of fans, video sets and other electrical appliances which promote recreational facilities. The finding from the study is also in line with Madume (2002) who reports that the provision of storage facilities for agricultural products at controlled temperatures, such as refrigerators cannot be achieved without electricity.

Table 3 revealed that there is no gender difference of PHCN staffs mean response to items on the problems of power generation in Nigeria. The reason for this finding is that the problem of power generation in Nigeria has resulted to very conservative projection of power needs of the country and the erratic power supply. In a research carried out by Ayodele (1995) on improving and sustaining power (electricity) supply for socio-economic development in Nigeria, the result of the hypothesis on sex showed no significant difference. This finding supports Ewa (2003) who stated that Nigeria mere possession of primary electricity resources-coal, natural gas, solar, biomass, biogas, geothermal, etc could only be termed a necessary condition which is not necessarily sufficient to guarantee adequate generation and supply of electricity. This was also in agreement with Iweha (1983), Madueme and (2002) Akpan (2005).

Table 4 shows that there is no significant difference between senior and junior staffs of PHCN mean response to items on the problems of power generation in Nigeria. The problem of power

generation in Nigeria has been a much discussed subject. This finding is in agreement with Okonkwo (1999) who reported that the electricity system in Nigeria is unreliable and under-developed and this has contributed substantially to lowering the quality of life and well-being of the average Nigerian who, over the past four decades, has become more and more impoverished. It also confirms with Ogumodede (2005) who stated that the Nigerian power industry is never out of the news; and that there is a general agreement that the utility services in Nigeria, including electricity has failed to provide and develop the services and the infrastructure required for social and political development. This poor performance has resulted to the call or the proposals for privatisation.

Conclusion

The importance of power (electricity) cannot be overemphasized. Adequate power/electricity generation constitute a central development issue which cannot be over-emphasised. Apart from serving as the pillar of wealth creation in Nigeria, it is also the nucleus of operations and subsequently the 'engine of growth' for all sectors of the economy. Studies and experiences have shown that power generation in the country has been dismal and unable to compare with what obtains in smaller African countries. Electricity generation in Nigeria is inadequate and thus, affects its consumers commercially, industrially, domestically and emotionally. This situation is exacerbated by a grossly inefficient, poorly maintained system as well as other factors.

Recommendations

The following recommendations are suggested:

1. The computer controlled system should be encouraged.
2. The computerized maintenance management system should be adopted to effectively streamline activities like predictive, preventive and corrective maintenance.
3. There should be improved efficiency by providing working vehicles, better communication and easy access to operational electrical lines.
4. The government should provide adequate fund to meet with the demands of PHCN.
5. Electricity generation should be decentralized so that each plant will deliver electricity to its immediate locality in order to avoid waste and extra cost of linking to the national distribution system.
6. PHCN should be made more attractive to investors.

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