Prioritizing Functional Infrastructure Facilities for Sustainable Privatisation of Electricity Service Delivery In Nigeria

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Abstract:

Background And Objectives: Actualizing constant supply of electricity is the desire of every nation as it facilitates economic development and national growth, some nations had gone the way of privatisation The privatisation of the power sector had been the strategy embarked upon across the globe aiming at finding probable last solution to the menace of incessant power failure most especially in the developing nations which is detrimental to their economic development. The consideration for adequate functioning of electrical infrastructure facilities before the full privatisation of the power sector as fundamental to effective electricity service delivery is the main focus of this study as it applies to Nigeria.

The paper stresses that the poor functional condition of these electrical facilities was one of the causes of the poor performance of electricity service delivery after privatisation. Hence, the paper opined that the functional condition of these electrical infrastructure facilities ought to have been put into consideration before embarking on the privatisation of electricity service delivery.

Methods: The study draws its information from the extant publications on infrastructure facilities that are relevant to the case study. The study adopted on the spot observation and assessment of facilities in the study area. The electrical facilities considered in this study were the distribution transformer, electric poles, and electric wire and cables. Tertiary data were also made use.

Finding: The study based on the findings from the literature recommended that the policymakers, decision-makers, relevant government officials, and all concerned stakeholders should go back to the roundtable and hold an in-depth, thoughtful deliberation that will factor in the consideration for the indispensability of electrical infrastructure facilities to successful privatisation of power sector.

Conclusion: Conclusively, figure 4,5,6,7, and 8 gave the visual condition of the electrical facilities state. Hence, prioritising these facilities before privatisation is imperative.

Keywords: Distribution Transformer; Electric poles; Power sector; wire and cables.

I. INTRODUCTION

Generally, infrastructure facilities encompass all public utilities and basic facilities ranging from roads and transportation facilities to telecommunication systems, electricity, water, and gas supply, to community services such as; police, firefighter services, waste collections and treatment and community facilities such as; schools, health, civic center, research and financial institutes, credit facilities, that summed up as a bundle of essentialities of life, desirable for man’s convenience, comfort, and better quality of life, (Okoye, & Onwuka, 2014). And again, it encompasses those basic facilities and services upon which all primary, secondary and tertiary production activities are solely dependent for adequate functioning (Madu, 2012). These infrastructure facilities had been viewed under three groups as; Physical, Social, and institutional infrastructure, (Kahn 1979, RBI/Vinod Kothari 2014).

The nature, shape, and morphology of urban landscape are reflections of the configuration of the available urban infrastructure facilities and their existence are either through the public provision or through the involvement of private organisations (Dalakoglou, 2010., Adekunle et al., 2011; Klein et al. 2012., Jahangeer et al., 2012, cited in Humphrey & Emmanuel, 2014).

A nation well furnished with functional infrastructural facilities and services, serve as a physical framework on which the economy of that particular Nation can thrive even right from the local level? As such, infrastructural facilities and services must, therefore, keep pace with the growing needs and resources of the people, for if they lag too far behind, the whole community is bound to suffer, Olayiwola and Adeleke (2005). For this reason, development in this sector must be geared towards ensuring that physical facilities, services, and amenities are within the easy reach of the people as well as an artificulately planned and well-designed Neighborhood layout, (Klein et al. 2012).

The Location of the Study Area

Ekiti State was among the six states that were created in October 1996, with Ado-Ekiti as the capital (Nigeria elites,
Ekiti State is one of the thirty-six states of the Federal Republic of Nigeria. It was created out of Ondo State; covering the former 12 local government areas that made up the Ekiti Zone of old Ondo State. Ekiti State is made up of Ekiti Central, Ekiti North, Ekiti South and Ekiti West senatorial districts (Busayo et al., 2014). Before its creation, what now Ekiti State has 12 Local Government Authorities at its creation; four more Local Government Authorities were created, bringing the number to 16 Local Government Authorities (LGAs). Ado Ekiti is the capital of the state.

Benin Electricity Distribution Company (BEDC) has Ekiti State as one of the four states under its coverage. BEDC is one of the 11 electricity distribution companies in Nigeria. The selection of Ekiti State was borne out of the homogeneity experience of power failure all over the country, and the choice of BEDC out of the 11 Distribution Companies was as a result of the ineffectiveness in operation that characterized generally all the DISCOS all over the nation, (Okekale, 2015, Onwe, 2014, and Okafor 2014). BEDC is the umbrella service delivery of electricity supply covering Delta, Edo, Ekiti and Ondo state.

**Population**

The population of Ekiti State was 1.6 million while the estimated population upon its creation on October 1st, 1996 was placed in 1.8 million with the capital located at Ado-Ekiti. The 2006 population census by the National Population Commission (NPC) set the population of Ekiti State at 2.4 million people. The estimated population figure for the state stood at 2.7 million comprising of 1,392,561 males and 1,355,880 females. The annual population growth rate is 3.2%. In 2011 the population was expected to be 2.8 million (Klein et al. 2012) (National Population Commission web 2015). Highlighted in the

Ekiti State is located in the Southwest region of Nigeria. The State was created in October 1996. This development brought about the establishment of the State and Federal Ministries, different Parastatals, Agencies, and Commissions, the springing up of private business organizations and corporate bodies, which had resulted into an influx of various people of different missions into the State, hence the rise in the population growth, socio-economic development, and the consequent urban expansion of some of the cities in the State without commensurate infrastructure facilities to cope with their existence. This has been the situation in most of emerging urban centres in Nigeria, where the population of the public facility users are not taken into consideration, the location of infrastructure facilities are not given a spatial dimension, the standard that supposed to be the yardstick for service delivery of these public facilities are not considered to mention a few.

**II. PROBLEM STATEMENT**

The centrality of infrastructure facilities and their appropriate location for the community life and their economy cannot be underestimated. It has a strong influence on people’s earning capacity and productivity, it affects economic activities and it is fundamental to people’s ability to enjoy and appreciate all other aspects of life, (Uhumwuangho & Christopher, 2012; Petra, 2013). The foregoing was the observation of Marful, (2010), who averred that the emergence of crude oil is always a catalyst for infrastructure development in any nation, more so, if it is artificulately planned and implicitly established, could lead to the transformation of all sectors and foster healthy and wealthy socio-economic life of the nation. Unfortunately, the adverse is the situation in Nigeria, where these infrastructural facilities and services, that should be a major stimulant which ought to have influenced a constellation of people and induce growth, to establish a solid background for developmental programme, as well as the major elements and factors of developmental processes but are not properly harnessed, in this regard, poor standard of living, joblessness and unemployment, poor economic activities are the consequence of failure to provide basic public utilities and services such as; electricity, potable water, and gas supply, public health care facilities and services for the people are abundant of the oil boom in Nigeria in
Strategic planning was prominent among companies in the 1960s and remains relevant in strategic management. Definitively, strategic planning is the process taking by an organization to scheme its course of actions and steps, and allocation of its resources to achieve the goals through a decisive decision making, with control machinery as guides for the processes of formulation and implementation of the plan. It involves the analytical nature of discovering spots and synthesis by connecting the spots through strategic thoughtfulness, Yurasek, (2014) in Olamide et al (2018).

In this study, some of the main features of the strategic planning process are found appropriate as a fundamental base for the explanation of prioritizing functional infrastructure facilities for sustainable privatisation of electricity service delivery in Nigeria. Firstly, the tenets of the theory necessitate an on the spot concrete assessment activities showing evidence of strengths and weakness of the current situation which applies to the electrical infrastructure facilities. Also, it will require an initial collection of data on the condition of the electrical infrastructure facilities environment and how it will change or move. Professional planning about the opportunities discovered with the assurance of the viability of the planned initiatives is another main feature required. Finally, there is a need for constant evaluation of the electrical infrastructure facilities every year for assurance of persistence functionality, furthermore to the initially established structure.

### Table 1: Proving evidence of where Strategic Planning was practised

<table>
<thead>
<tr>
<th>S/N</th>
<th>According to;</th>
<th>Nations and Places where Strategic Planning was practised</th>
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<tr>
<td>1</td>
<td>Mafi, &amp;Heydari, (2014)</td>
<td>Strategic Planning and Urban Green Spaces in Saqqez City, Iran</td>
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Relevant information gathered from the major stakeholders forms the reliability base of a solid strategic planning process, and the eventual decision made would be comprehensive and all-inclusive of the stakeholders’ ideas and objectives.

**Literature Review**

The indispensability of infrastructure facility to the development of physical and socio-economic of a particular region or community cannot be over-emphasized. It is the propelling force that serves as nation’s locomotive of economic growth and development, with a significant effect on the Gross Domestic Product (GDP). Olatinwo, et al., (2013), not in terms of all-round development alone, but, highly essential to the maintenance and sustainable standard of living of the community dwellers. In most cases, spectrums of ideas are always on how to improve the economy, embark on capacity building, and foster international trade for national economic growth and development, with a significant effect on the Gross Domestic Product (GDP), Olatinwo, et al, (2011), not in terms of all-round development alone, but, highly essential to the maintenance and sustainable standard of living of the community dwellers. In most cases, spectrums of ideas are always on how to improve the economy, embark on capacity building, and foster international trade for national economic development, but, the wherewithal, that is, ‘infrastructure facility location’ like sewer systems or roads to actualize these, is not mostly put into consideration. (Erskine 2014:1).

The term infrastructure has been averred to be a subterraneous physical structure that serves as bases and the foundational requirements for any nation’s physical growth and socio-economic development, (Harper, 2008; Lewis, 2008, vocabulary.com /dictionary/ infrastructure 2014). In another dimension, infrastructure also referred to, the structural background and the fulcrum upon which all the nations’ investment and commercial activities are sustainably carried out and controlled, (business dictionary, 2014). Similarly, it is viewed as the essential and basic facilities that serve as a springboard upon which the modus operandi of all government functionaries and community activities are smoothly carried out, such as; transportation and educational facility, telecommunication, sewerage and sewage treatment plants, power generation and electricity supply, (Ihemeje, 2014; Oguejiofo & Udeagha 2014; Your dictionary definition, 2014; American Heritage Dictionary of the English Language, 2014).

‘Facility’ is viewed as the functional connotation of ‘infrastructure’, the functions, goods, and services for which the infrastructure is purposed to facilitate is the facility, (American Heritage Dictionary of the English Language, 2009). Synonymously infrastructure, public facilities and services are intertwined words for economic development and social wellbeing, defining infrastructure according to Encarta dictionaries (2009), posits, infrastructure is groundwork, an arrangement, an organised setting that serves as a foundation or framework, base; in the same vein, it is seen as; Public utility telecommunications, transportation and road infrastructure facilities, electricity, water, and gas supplies, mass media, and rail networks. In the same direction, the designation of infrastructure is the function it meant to perform as; health facility, education facility, electricity and water supply facility. Encarta dictionaries (2009), conceived the word facility as somewhat with a certain task or role to perform, something designed or created to provide a service or fulfil a need,

According to Olayiwola and Adeleke (2005), infrastructure facility is seen as an indispensable pivotal and a fundamental basic foundation without which all production activities at all levels; from the extraction, exploitation, exploration, to processing, manufacturing, packaging, and all tiers of administration cannot function effectively. It is the parameter for measuring the level of development and growth of any nation (Sullivan, & Sheffrin 2003, 2009; Fulmer, Jeffrey 2009).

Generally, infrastructure facilities encompass all public utilities and basic facilities ranging from roads and transportation facilities to telecommunication systems, electricity, water, and gas supply, to community services such as; police, firefighter services, waste collections and treatment and community facilities such as; schools, health, civic centre, research and financial institutes, credit facilities, that summed up as a bundle of essentialities of life, desirable for man’s convenience, comfort, and better quality of life, (Okoye, & Onwuka, 2014). And again, it encompasses those basic facilities and services upon which all primary, secondary and tertiary production activities are solely dependent for adequate functioning (Madu, 2012). These infrastructure facilities had been viewed under three groups as: Physical, Social, and institutional infrastructure, (Kahn 1979, RBI/Vinod Kothari 2014).

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The importance of physical facilities and services in the social and economic progress of people’s life cannot be underestimated, thus, Ale, et al (2011) opined that...
infrastructure serves as the forerunner of economic development and is capable of revamping the economy and transforming the nation if diversified. Similarly, it is increasingly being appreciated from different perspectives as its availability is synonymous to development and stimulates growth in all sectors of any nation’s economy, (Oguzor, 2011; Oisasoe & Ojeifo, 2012). Averred by UN (2011), it has the potentiality of alleviating poverty through the massive provision of job opportunity for the masses. In another perspective, infrastructure is such a product with inherent developmental qualities, that if provided in any nation would lead to the development of all other sectors of the nation’s economy thereby enhancing growth in all realms of life, (Calderon, 2009; Egbotokun, 2009).

The problems bedevilling the electrical facilities of the power sector generally and electricity service delivery subsection in particular from the time immemorial were among those problems identified by the Central Bank. The first identified problem is management deficiency and poor routine maintenance causing both technical and commercial energy loss. Again is, obsolete electrical facilities and overloading resulting in the incessant breakdown of equipment. More importantly among this problem is the absence of the spatial dimension of the electrical networks and non-coordination between physical planning authorities and the NEPA/PHCN. All these were detrimental to effective overall power system planning and consequent overloading and overstretching of electrical facilities.

IV. METHODOLOGY

The study focuses on the priority of functional infrastructure facilities for sustainable privatisation of electricity service delivery in Nigeria. The study purposively the study area based on convenience approach as supported by (Klein et al. 2012) (Ilker et al., 2016 and Account learning, 2016). Hence, one DISCO (BEDC) out of 11 DISCOS in Nigeria was selected and one State (Ekiti State) out of four states under the coverage of BEDC was selected. Relevant data and information were garnered from both the secondary, tertiary and observation source. The secondary data source would be relevant journals, texts, publications, excerpts from the newspapers, and internet surfing for published materials and facts, (Olatinwo, et al, 2013). “The study adopted tertiary information, that is, pictures sourced from publications that support electrical infrastructure facility as one of the factors for effective service delivery of electricity. Personal observation of the actual situation was also adopted in the study, as supported by (Oguejiofor & Udeagba, 2014).

Discussion on the factors of electrical infrastructure facilities

In this paper, the electrical infrastructure facilities considered were; Transformer, Electric poles, Wires and cables (overhead lines). These components were selected among other electrical components as they are more familiar with the electricity users. The considered components of electric facilities in connection with the distribution of electricity to customers through the distribution network according to Chan (2015). Hence, in this section on the spot situation of the facilities, explanation and the pictures of the conditions of the electric facilities considered, (Uche, 2014).

Functional Condition of Electrical Facilities

There is electrical infrastructure facility deficit in the State which is commonplace across the nation and also peculiar to most of the developing countries. One of these infrastructures is the poor state of electric power distribution facilities. Electric Power distribution system in Ekiti State is something disturbing and of major concern. There are incessant outages than uninterrupted power supply in major parts of the state all the year-round.

Oluusuyi et al, (2014) in a study conducted on the Power Holding Company of Nigeria (PHCN) subsector of Distribution and Marketing, corroborated the assertion on the poor electrical facilities premised on factors derivative of low tension lines faults, caused by broken and leaning poles, cables and wire cut, and substation faults caused by ageing and some overstretched distribution transformers. All these were not adequately taken into consideration before venturing into the privatisation of electricity service delivery.

This poor state of electrical facilities was the cause of poor service delivery of electricity in Nigeria. The study stresses the prioritisation of considering the deficit in the electrical infrastructure facilities before embarking on the privatisation of the power sector.

The above scenario was captured by Brown, (2016) in his speech that “ageing power infrastructure remains unable to meet the surge in power, demand. “Large infrastructure investments are therefore a rationale response to a myriad of well-documented challenges in power supply”.

As suggested by the National Electricity Regulation of Nigeria, the minimum electricity requirement is about 50,000 Megawatts. The nation can only boast of 4000 Megawatts presently, indicating, a power deficit of 46,000 Megawatts asserted by Oyediran and Adewumi (2014). In Ekiti State electricity demand required 250 Megawatts for its estimated population of 2.5 million. This is needful for stimulation and sustainability of the State development. However, the present electricity service delivery in Ekiti state revealed that electric facilities carrying capacity are in deteriorating condition and need for total overhauling and rehabilitation. The possibility of the electric facilities carrying capacity for an uninterrupted 2 hours is less than 25% (Olusuyi et al., 2014). Hence, in the context of this study, there is a need for all the factors of electric facilities to be put in a good functional and distribution condition for the achievement of effective service delivery. Therefore, there is a need for consideration of these factors of electric facilities functional and distribution condition that are fundamental to better performance of electricity service delivery privatisation.
The distribution electric facilities, in the distribution systems, connect a transmission system to the customer's home appliances. Typically, the distribution system can consist of distribution transformer distributing to the consumer (Low tension pole) that is, electric pole (Low tension line), that is, wire and cable. The main component in the distribution layout relevant to this research, are; distribution transformers, electric poles wire and cable, as obtained from Hamzah (2016).

(i) The factor of Transformer for Effective Performance

The transformer is that facility that allowed low voltage into the residential for utilization from the stepped-down transmission system voltage by the distribution substation transformers. It is the step-down transformers at utilization low voltage levels. It is from this point the household heads are connected to electricity service. As a result, the voltage of the primary circuit is reduced by the distribution transformers to the voltage required by customers as observed by Hamzah (2016). The factor needed for better performance is the functional factors of the transformer which are; size/capacity, the effectiveness of transformer, transformer coverage, voltage/current output, the arrangement of the transformer, location of the transformer concerning houses and safety of transformer facility. The picture below depicts the condition of most of the distribution transformer/feeder pillars.

(ii) The factor of Electric Pole for Effective Performance

Electricity distribution low tension poles unlike, transmission pole carrying transmission lines, utility poles are carrying distribution lines of different voltage ranges from 4kV, 11 kV to final consumers as the quantum of consumption may be, as defined by Valmont Structures India (2015). Utility electric poles are of different types either, wooden, concrete, Fibre-reinforced composite (FRC) or steel pole depending on the material made of. They could also be joint or non-joint poles depending on the purpose they serve and that determine the sizes. Locations, coverage purposes, and functions also determine the types of poles to be used (Kenney, 2015; American Standards Association 2014). In summary, the factors needed to be considered for better performance of electric pole facility are; size/capacity, the effectiveness of electric pole, coverage of electric pole, the arrangement of the electric pole, location of the electric pole concerning houses and safety of electric pole facility. Below is the condition of some of the low tension poles before and after the privatisation of the power sector.

(iii) The factor of Wire and Cable for Effective Performance

In the distribution network, two types of system been used that is overhead lines and underground cables. This research considered mostly the overhead lines. Installation of wire and cables varies in some ways. However, in the context of this research, the quality, safety and reliability of their distribution and functional condition were being examined. To establish the performance level of the wire and cable facility and its influence on electricity service delivery in the study area the factors for consideration are; size/capacity, the effectiveness of wire and cable, wire and cable coverage, voltage/current output, the arrangement of wire and cable, location of wire and cable concerning houses and safety of wire and cable facility. The picture below showed the chaotic condition of low tension of (overheads lines) wires.
experience supported the reason for negative reaction and protest for continuous power outage across the country. Figure 4, 5, 6, 7 portrayed the current situation of poor delivery networks and electrical infrastructures that are overloaded and overstretched. The consequences of poor electricity service delivery after privatisation were in Figure 8 and 9 below shown some of the customer's protest over incessant power outages in Ekiti State.

Cases of Dissatisfactory Protest on Poor Electricity Services in Nigeria

The outcome of electricity service delivery privatisation has witnessed a negative reaction from every quarter due to poor unexpected facility breakdown, unreliable and prolonged power outage. The people in the study area were not an exemption of this experience of poor electricity service delivery which is similar to the experience of the users across the country. The reaction of the currently serving, Honourable Minister of Power, Housing and Works, attested to the present instability of electricity supply in the country that everybody is virtually affected (Klein et al. 2012) (Ogbeche, 2016).

A similar experience of poor electricity service delivery across the country was reported concerning the youths protest in Niger State which has been without electricity supply for the past two years despite the state housing three hydro-electric power stations. The protest on electricity interruption is a reflection of the experience of electricity consumers across the country (Ahiuma-Young et al., 2017: 1-2) Above

The above scenario was partly consequent upon the poor functional condition of electrical facilities. In some urban centres in Ekiti, voltage drop, low current supply and blown off of distribution transformer were among the information garnered from the users in the research conducted by the author in 2016. The population expansion and the need for power without commensurate investment in the electrical facilities rendered their carrying capacity to sustain an uninterrupted supply of power for an as low period as 2 hours in a day to be less than 25 per cent. This was consequent upon the overstretching of the ageing and deteriorating condition of these electrical facilities in the State as also revealed by (Olusuyi et al., 2014).

It was similarly averred in 2019 that ‘an average of 13,542 megawatts is supplied to Ekiti on monthly basis and 14 per cent of the power generated is lost due to poor Network facilities...” (Ojomoyela, 2019). Given the foregoing, the
paper thus submits that the present electric facilities needed a total renovation and refurbishment before privatising electricity service delivery.

V. SUMMARY

The components of the electrical infrastructure facilities that were selected for the study were discussed as common in electricity network infrastructures and are familiar to the users. The need for appropriate consideration of the factors of these electrical facilities as reviews from the literature was lucidly explained and the current and the ideal condition of the facilities were pictured using tertiary data. This redefines the imperative of prioritising the electrical infrastructure facilities to ensure their state of functioning condition before privatising the electricity serviced delivery of the power sector.

VI. CONCLUSION

The findings from the field in this study and the information gathered from the various authors in this discourse, therefore, concluded that adequate functioning of the electrical facilities is essential to the effective performance of electricity service delivery in privatisation. However, the failure to put this into consideration during the privatisation planning process has been the raison d'être behind the incessant failure of electricity service delivery in Nigeria. This is evident from the apparent condition of the electrical facilities in figure 4, & 5, as depicted by from, Occupational Safety and Health Administration, OSHA. (2017) and on the spot observation by the author, figure 6, from Abiodun, (2015) and Olamide, 2017, and figure 7 & 8, by (Midsouth Utility Consultant, 2014; Olamide, 2017) and also from author’s fieldwork. Figure 9 & 10 is the consequential effect from the users’ reaction protesting against the poor service delivery of electricity in the state. This is majorly due to unresolved myriads of problems bedevilling the power sector, out of which obsolete facilities and equipment is a factor.

VII. RECOMMENDATION

Based upon the information garnered from the submissions of authors of extant and relevant articles, publications, and the study’s findings from observations of the situation on the ground, it is obvious that the functional condition of the electrical facilities was not giving priority before the privatisation of electricity service delivery. The hurriedness and the Government eagerness to privatise power sector undermined the necessity of an on the spot assessment of electrical facilities condition which formed one of the major factors of the poor performance of electricity service delivery privatisation. Drawn upon the above inadequacies the paper therefore in its suggested and recommended that:

- There should be the hierarchical and preferential ordering of the components of electricity service delivery like; the physical electrical facilities, Technical staff, Management staff and commercial and sale components.
- The government should recognise the peculiarity of each of these components and prioritised the most challenging aspect of the enterprise to be privatised.
- The study recommends that most ailing aspect of the electricity service delivery component which is the electrical facilities needs to be given priority.
- In this study, prioritisation is very germane to successful electricity service delivery privatisation.
- Adequate information about the electricity facilities among the critical area of the power supply components concerned must be made available. This is the existing background information of the entity’s functional performance.
- There should be physical contact, investigation and thorough facility auditing of the electrical facilities to ascertain their functional condition by the prospective investors before sealing the deal of privatisation.
- The prospective investors must also have proved to the Government beyond a reasonable doubt of its financial capacity and technical capability to stem the challenges of electrical facilities deficit before handing over the service delivery of electricity.

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