

University of the Western Cape



EMS Faculty

School of Government

**A CRITICAL ANALYSIS OF ELECTRICITY DISTRIBUTION
PROCESSES IN NIGERIA: A MANAGEMENT PERSPECTIVE**

(2005 – 2015)

A mini thesis submitted to the School of Government, Faculty of Economic and Management Sciences, University of the Western Cape as partial fulfillment of the requirement for the award of the Masters of Public Administration (MPA).

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2016

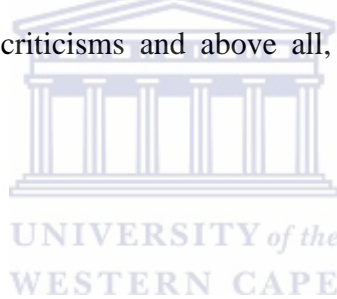
ACKNOWLEDGMENT

I appreciate God Almighty for his endless grace and mercies which has accompanied me throughout the duration of my studies. Without him with me, this work will not have been made possible

Secondly, I express my sincere gratitude to my supervisor, Prof. Isioma Uregu Ile for her guidance, inspiration and constructive criticism which has immensely contributed to the successful completion of this research.

To my parents, Mr & Mrs Martin Igwemezie who have always encouraged me and gone out of their means to make sure that I am comfortable. To my siblings; Christina, Henrietta, Daniel, Elvis, Lilian and Prisca, thank you all for the care, love and support. I remain ever grateful.

Finally, I want to appreciate Maria Goretti Ndzelen for her support system throughout this research. Her constructive ideas, criticisms and above all, her love have not been taken for granted. Thank you so much.



DEDICATION

I dedicate this work to God Almighty who has made it possible for me to complete this research.



List of Acronyms and Abbreviations

AFDB	African Development Bank
APP	Africa Progress Panel
DisCos	Distribution Companies
EPSRA	Electricity Power Sector Act
FGN	Federal Republic of Nigeria
GenCos	Generation Companies
KPMG	Klynveld Peat Marwick And Goerdeler
IEA	International Energy Association
NERC	Nigeria Electricity Regulatory Commission
NEPA	National Electric Power Authority
OPEC	Organisation of the Petroleum Exporting Countries
PACP	Presidential Action Committee on Power
PHCN	Power Holding Company of Nigeria
PTFP	Presidential Task Force on Power
SSA	Sub Saharan Africa
TransCos	Transmission Companies
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development

Key Words

Electricity

Management

Distribution

Planning

Control

Organise

Leadership

Crisis

Energy

Load shedding

Effects

Economy

Standard of Living



DECLARATION:

I declare that this thesis entitled a critical analysis of electricity distribution processes in Nigeria: a management perspective (2005 – 2015) is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Signature:



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ABSTRACT

Nigeria has been experiencing challenges in the distribution of power to the whole country in the past decades. As a result, more than half of Nigeria's population is affected by the ineffectiveness of the distribution of electricity which lowers their standard of living. As the country's power sector experienced a steady growth after its independence in 1960, it was anticipated at the time that, at that rate of growth and development, most of Nigeria should have been electrified by now. However, challenges in the distribution of electricity have persisted and this has negatively affected the economy and living standard of the country.

From the management perspective, this research looks at the situation of the distribution of electricity in Nigeria from the year 2005 to 2015. Specifically, it will analyse management challenges affecting the distribution of electricity in the country. It is well documented how Nigeria is currently facing an electricity crisis despite all the government efforts to provide adequate power to the citizens. In the distribution of electricity in Nigeria, the research will look at how the planning of the organization is being done so as to ensure effective power delivery to the country. The research will further look at how the management manages the organization and how it is being controlled for effective power distribution.

In this research, I shall use qualitative and quantitative research techniques. Secondary qualitative and quantitative data will be used in carrying out this research. Published books, journals, newspaper articles, and government policies shall be critically examined in order to produce a well-informed report. Before the research is conducted, the appropriate consent from the University of the Western Cape will be sought to ensure that all protocols are strictly adhered to.

Chapter 1

1. Introduction

1.1 State of Electricity Distribution in the World

Power stations require large amounts of energy to turn turbines for the generation of electricity. In Africa and various parts of the world like India, Power stations use heat energy produced from burning coal, moving water energy or wind energy (World Bank, 2011).

According to South Africa's electricity supply company - Eskom, electricity distribution in various countries which is usually carried out by their respective electricity distribution industry plays a very important role to those supplying and consuming it (Eskom, 2015). (Abdelhay & Malik, 2011) describes electricity distribution as an important stage in the three stage delivery of electric power which also includes generation and transmission. With the world population steadily increasing from 6.8 billion people in 2011 to 7.4 billion in 2015, Ross (2015) recognises that, challenges faced by EDI's in the distribution of electricity are bound to multiply. This is because these challenges which include generally poor infrastructure, wear out of distribution grids and climate change, are compounded by increase in the demand for electricity. Other authors like (Bouttes, Dasaa & Crassons, 2011) support Ross' view by identifying 3 main global challenges faced by the delivery of electric power – increase urbanization, the change in climatic conditions and the increase of demand in power. The problems faced with electricity distribution around the world, even though common, occur at different intensities in different countries.

In places like the United Kingdom, for example, there is more concern about future electricity distribution. (Watson, McDonald & Ferguson, 2001) says that the method used for distribution network design now that is based on the reinforcement network will be outdated for network designs in the future as they rely heavily on reinforcing network practices. They view this problem not only as a mechanical problem but also a managerial challenge as the design makes less severe the challenges of electricity distribution and at the same time hindering the ease of taking advantage of the opportunities. In India, managerial reforms and governance have included the

unbundling of their electricity distribution system such that there are both economic incentives and disincentives and more private players in distribution. A critical assessment by the country's electricity planning commission revealed that this reform has weaknesses in terms of performance and affordability of electricity. While realising that it is good for free and fair competition to exist, high cost of electricity rates have also been noted around the country (Alagh, 2013).

The United States Agency for International Development (USAID), make an interesting observation about the politics of electricity management in developing countries in an article entitled "Improving Power Distribution Company Operations to Accelerate Power Sector Reform". In this article, electricity power supply is being described as a tool that has been used to build economies of developing countries as well as placate masses (USAID, 2005). It is worthy of note here that, electricity power supply, especially in developing market economies like Nigeria and Cameroon is being viewed both as a public good and service. As such, these services fall into the hands of their government to provide, in Cameroon the electricity is supplied by ENEO and in Nigeria, electricity distribution is carried out by PHCN (KPMG, 2013). In the above mentioned article by USAID, it further brings to light that for most government handled utilities in developing countries, the policy goals of the government that controls the fiscal policies often comes before the fiscal policies. An example can be seen by countries that are interested in investment, and because they do not want their country to be behind in investment, tend to open to foreign investment by means of concessions, guarantees to secure contract and tax break assortment. These were the norms before elements of related legal, fiscal and regulatory policies are put in place for sustainable growth. Such policies that were created so quickly without proper planning the economy in deficit and poor service quality

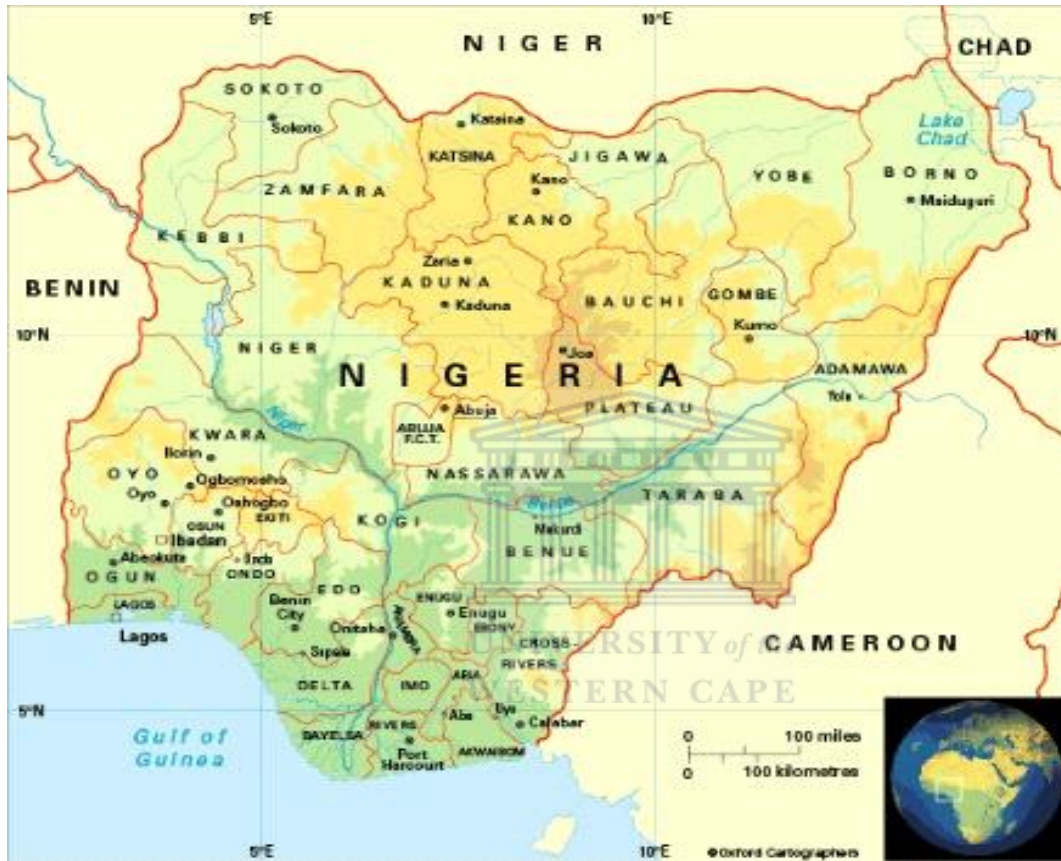
1.2 Introducing the Case Study: Nigeria

1.2.1 Population and Geographical Location

Regarded as the most populated country in Africa, Nigeria has an estimated population of 182 million people, accounting for 1/6 of the African population (Mbachu & Alake, 2016). Nigeria is a country in West Africa sharing land borders with the Republic of Benin in the West. In the

East, it is bordered by Cameroon and Chad while to the North it shares a boundary with Niger as shown in figure 1.1

Figure 1.1 MAP OF THE FEDERAL REPUBLIC OF NIGERIA SHOWING ITS BOUNDARIES



Source: Total Facts about Nigeria (2012)

Nigeria location is in the Tropics, where the climate is seasonally very humid and damped seasonally. It has four different climate types, as they move from the northern part of the country to the southern part via its middle belt. Nigeria noted geographical features include the Adamawa highlands, the Mambilla, Jos and Obudu Plateaux; the Niger and Benue Rivers and the Niger Delta. Another geographical feature of the country which is relevant to this study is the Kainji Dam which is in Niger state of Western Nigeria, across the Niger River. The construction of this dam took four years from 1964 to 1968. The dam is large and has eight installed turbines that are capable of supplying electricity to large cities of Nigeria and even to the some neighbouring

countries like Niger. However, the dam electricity output has been diminished recently due to occasional droughts on the Niger water flow, making it unpredictable (Total facts about Nigeria, 2012).

1.2.2 Background to the Study: History and Reformation of electricity supply in Nigeria

According by (KPMG, 2013), 1929 was the year the first utility company (the Nigerian Electricity Supply Company) was established; although electricity generation started over 30 years before in 1896. Despite the efforts of the utility which was owned by the state, which acted as a monopoly to manage the sector properly to solve the power problem, it became clear in the late 1990s that Nigeria needed a reform to solve Nigeria Power problem. The National Electric Power Policy of 2001 kicked off the reform which has been followed by several other reforms in the last decade.

There have been significant strides in the reform of the sector since the introduction of democratic rule in the country. The privatisation process has been completed with the Federal government keeping ownership of the transmission (management under concession) while the generation and distribution sectors were fully privatised (KPMG, 2013). NEPA was the entity that was previously tasked to generate, transmit and distribute electricity in Nigeria and it operated as a monopoly. However, the combined challenges of poor financial performance and operations made the Federal Republic of Nigeria (FGN) to amend the Electricity and NEPA Acts in 1998 to encourage private sector participation while removing NEPA as a monopoly. The Nigeria Power sector privatization initiatives which transaction cost was about \$3.0billion was among the boldest initiatives and decisions taken in the global power sector. (KPMG, 2013). This amendment was not far reaching until the FGN took holistic policy, legal and regulatory reforms by establishing the PHCN (Olerunkanmi, 2014). PHCN comprises of 3 generating stations, a transmission grid and 11 distribution companies. Based on the focus of this research, it is important to know the 11 distribution companies and their task. These companies are Abuja Electricity Distribution Company (DisCo), Benin DisCo, Eko DisCo, Enugu DisCo, Ibadan DisCo, Ikeja DisCo, Jos DisCo, Kaduna DisCo, Kano DisCo, Port Harcourt DisCo and Yola DisCo (KPMG, 2013).

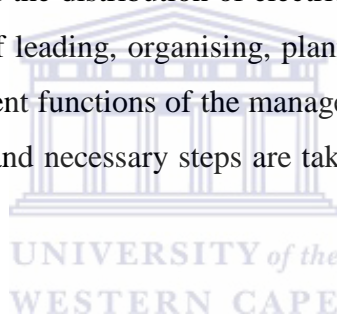
(KPMG, 2013) also states that a distribution licence authorizes the licensee to carry out activities of operation, construction and maintaining distribution systems and facilities. Also, it needs to deal with;

- Connecting consumers so that they can have access to the supply of electricity
- Installing, maintaining, meter reading and collection of revenues.

It is mandated and obliged to provide electricity to its distribution customers.

This study thus, will focus on discussions on the distribution of electricity in Nigeria. Specifically, it will focus on how the management of the distribution of electricity has been carried out to see if it has been effective or not and ways to improve the situation.

In dealing with the management of the distribution of electricity, the study will carefully look at the main management functions of leading, organising, planning and control. The research will critically analyse all the management functions of the management of the distribution companies by carefully ensuring that proper and necessary steps are taken so as to ensure efficiency in the distribution of electricity.



1.2.3 Nigerian Economy and electricity distribution

Nigeria is a middle income country with a mixed economy and an emerging market economy. According to (Masetti, 2014) Nigeria has the largest economy in Africa and is acknowledged as such after displacing South Africa in 2014 as the largest economy in Africa. (African Economic Outlook, 2012) declared that the GDP of Nigeria has been growing averagely at a rate of 7% a year for the past decade explaining why there has been an increase in GDP in recent years and growth in its economy. Nigeria produces about 2.2 million barrels of oil a day, making the country Africa's largest oil producer and the 4th highest oil exporting African country in the World (World Bank, 2016). The country also identifies itself as a member of the Organisation of the Petroleum Exporting Countries (OPEC) since 1971. However, in recent years, the oil sector in Nigeria has been affected by challenges, including limited power supply causing many other oil producing countries to take over existing opportunities.

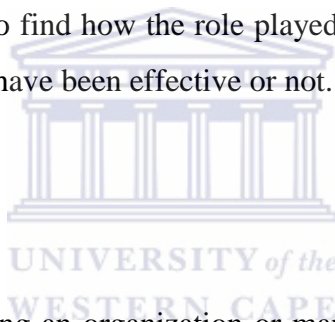
Given its economic background and its ability of producing oil, it will be expected that Nigeria will have good electrification as is the case with South Africa where not less than 80% of its households have access to electricity (World Bank, 2016). The problem with limited power supply in Nigeria is such that, over 50% of Nigerians do not have access to electricity making it one of the lowest percentages of household access to electricity in the world. Some of the challenges the nation faces with regards to adequate household access to electricity are encompassed in the challenges outlined by (Ross, 2015) above. Even the less than 48 percent of those with access to electricity constantly experience power shortages and sometimes go for days without electricity. The distribution of electricity is generally unreliable and inconvenient, greatly affected the socio economic development of the country (KPMG, 2015).

In addition to the general incompetence of governments of developing market economies in the provision of public utilities identified above by USAID, Nigeria as a country on its own suffers from ineffectiveness and inefficiency in the management of the distribution of electricity. This has negatively affected the country particularly in the last two decades (AfDB, 2015). There is not only an access problem, but also a problem of reliability as there are constant power failures and load shedding, prompting citizens to look for alternative sources of electricity like purchasing generators. These alternative sources also tend to be costly for single consumers, about 4 times more costly than if the electricity was being generated by the national grid. The national grid's inability to supply constant and steady electricity constitutes high cost to the economy as a whole as most individual disposable income are spent on ensuring electrification of their homes at all times.

The Nigerian government is aware of this problem and has looked at ways to remedy the situation. Some of the implemented measures so far include the creation of the Electricity Power Sector Act (EPSRA) in 2005 aimed at engaging the private sector in the reforming or revamping of the power sector of the country. The private sectors are expected to be actively involves in the generation, transmission and distribution of electricity to the country. However, the reinforcement of ESPRA has been slow due to the lack of continuity which is caused by the constant change of management. There is, however, hope for the future in terms of power supply and distribution as there is increase in private involvement in the power sector. One thing remains certain; there still need remains a lot to be done to make the reform a success.

1.3 Rationale of Study

The process of delivering electricity to the general public starts from generating, transmission to the distribution process. All of these different stages are been managed by different entities and management bodies. The efficiency of the level of management determines the output or results that is been produced. As the research will be focusing on the management of the distribution of electricity in Nigeria, it will be looking at the management level of the distribution of electricity. In the management level, the study will find out if the top management have a good background or are qualified on carrying out the task. There have been a lot of issues with regards to distribution of electricity in Nigeria over the past decade as many homes still do not have access to electricity and even those that have access to electricity keep having interrupted supply. Hence, this research will attempt to find how the role played by the management in distributing electricity in Nigeria to see if they have been effective or not.



1.4 Scope of Study

From the point of view of managing an organization or management perspective, this research will focus on the distribution of electricity in Nigeria by the power sector. It will examine how the management of the distribution of electricity in Nigeria is carried out and the causes for the inadequate distribution of electricity despite the government's continuous effort to remedy the situation. An analysis of the management of electricity distribution in Nigeria will be carried out and compared alongside the goals of the organisation. This will be to establish if the desired results or expected results are achieved. Ultimately, this paper examines aspects of planning, organization, leadership and control (management functions) of the electricity distribution process in Nigeria.

In covering the aspects of management in the distribution of electricity in Nigeria, the research is going to carefully look at how effective the management has been. This will focus on the main functions of management that has been mentioned above to see if they are effectively been managed.

1.5 Research Problem

According by (Onuka, 2006), one of the major problems affecting Nigeria as a whole is the problem of ineffective management. He further states that Nigeria has not developed its man management effectively and many of those that are put in management positions have little or no knowledge on management education, even at rudimentary level. (Onuka, 2001) gave emphasis on the need to give good management education to those in management positions or to those whose intend to be managers. This will go a long way in solving the problem of mismanagement in the country

Given its economic status and position when compared with other African countries, Nigeria has been facing challenges with the distribution of its electricity in the past decades. This research by examining the challenges and opportunities for effective electricity provisioning and distribution, seeks to understand and make a contribution to the management's ability to accomplish the required organizational goals.

Most organisations like PCHN mandated to regulate and monitor Nigeria's electricity industry, exist to achieve specific or certain goals that have been put in place with certain available resources at their disposal. According to (Jones, 2003), the efficient use of these resources to accomplish its goals demonstrates the management's ability to achieve realistic planned organizational goals. This in turn, depends on the ability of the organization to organize, lead and control its resources, be they financial, human resource or any other. Thus, the inability of an organization to properly manage its resources means it has failed and cannot meet the constraints and challenges in providing goods and services to the consumers. This is the case of PCHN (Ijewere, 2012).

(Ijewere, 2012) further states that, electricity supply and distribution has become very significant in recent years due to the importance or role played by electricity in our daily lives. Long periods or absence of electricity for a while causes discomfort and it negatively affects productivity. According by (Mohammed, 2005), the parameter used to measure standards of living and level of industrialisation of nations is the consumption of electricity. These authors together with others like (Darling et al. 2003) explain that Nigeria has been facing extreme electricity shortage

and that the causes are structural, socio political and financial. All these, clearly identify a problem of poor or inadequate management in the distribution of electricity in Nigeria. The inadequacy in management is likely to be right from the planning to the implementation of plans geared at electricity distribution in the country.

It has been stated that there has been inadequate and unstable supply of electricity in Nigeria for a long time now, which has caused great constraints to the local economy (Oshodi, 2014). This author supports the idea that there are aspects of inefficiency as far as the distribution of electricity in Nigeria is concerned. This is causing the country fortunes and affecting the economy negatively. (Oshodi, 2014) further states that, the Nigerian electricity industry is one of the components of its economy that continuously maintains the status of Nigeria as a developing country. With about 48% of the country's population not having access to electricity, it is evident that there is problem in the distribution of electricity amongst consumers.

It has been argued that, there is lack of futuristic planning or projection for improvement in the supply of electricity to consumers in Nigeria (Olawale et al, 2009). Lack of planning portrays inefficiency in management which has contributed to the inefficiency and ineffectiveness in the supply and distribution of electricity. This author further says that there is lack of strategic planning on the part of authority and lack of investment caused by the misappropriation of funds.

The availability of proper infrastructure is very important in the distribution and supply of electricity in any country. This is a major problem that has greatly affected the distribution of electricity in Nigeria. The infrastructures in the Nigeria electricity sector are very old and outdated and they do not function properly to meet up with the modern demands of the population. Speaking on infrastructure, (Awosope, 2014) stated that damages due to natural effects such as trees felling on line, bird perching on the lines and other natural disasters like wind storm and lightning strikes have greatly affected the distribution of electricity in Nigeria. Lack of sufficient maintenance on infrastructure has greatly affected the distribution of electricity in Nigeria negatively. This clearly shows a gap in the management policies as both the leadership and planning aspects are not properly handled. This greatly affects the distribution of electricity in Nigeria negatively

There has been inconsistency in the demand and supply of electricity distribution in Nigeria. The current status of electricity distribution in Nigeria with regards to its current population is grossly inadequate (Awosope, 2014). He further states that the challenge of inadequate electricity generation and distribution has been in existence since in the 1970's when the Udoji's government awards improved the economic life of workers which made them to increase their consumption of electricity by purchasing a lot of sophisticated machines that consumes a lot of energy. This has affected the distribution of electricity in the country negatively as there is insufficient electricity to distribute to over growing population of Nigeria. This means that the demand for electricity exceeds the supply of electricity. This can be traced back to flaws in the management policies as there is no efficiency in the planning, organising and control by the management.

Insufficient funding is also a factor that has greatly affected the distribution of electricity. According to (Awosope, 2014), insufficient funding has led to lack of latest modern equipment. Although there has loud cry of mismanagement and corruption in the Power sector, one cannot deny the facts there has also been limited funding in the Power sector of Nigeria. This limited or insufficient funding has negatively affected the distribution of electricity ion Nigeria in that it has made it very difficult for depreciation to be executed out properly and timely. There is struggle to secure funding to secure new energy sources or maintain old ones (Lum, 2012). There are a lot of broken pipes which have not been repaired due to no funding. (Lum, 2012) further states that till date, there has been a significant barrier in achieving adequate electricity supply in Nigeria and the major hindrance has been the availability of capital (Money). Also, there are lots of workers who are underpaid and some who don't get paid because of no funding or mismanagement on the funds and all these greatly affects the supply and distribution of electricity because the staffs are ineffective and inefficient and this affects the distribution and supply of electricity.

The problems mentioned above and others not covered this far, indicates that there are challenges with the distribution of electricity in Nigeria. It is important to find out how the resources available for the distribution of electricity in Nigeria is used and why there is inefficiency in the distribution of electricity in Nigeria despite the country's profile as one of the leading oil producing African country. Hence this paper focuses on analyzing the management of

Nigeria's power sector, identify its pitfalls. It draws from other countries that have successfully overcome the difficulties of their electricity sector as far as distribution is concerned and make relevant recommendations for Nigeria.

1.6 RESEARCH QUESTIONS

The central research question which this study will attempt to answer is:

- What management challenges are hindering the distribution of electricity in Nigeria?

In addition, this research will answer the following sub-questions:

- How effective has the planning been over the years with the Nigeria's electricity agency (PCHN) and its DisCos to distribute electricity in the country?
- Are the human resources put in place to manage this agency capable of this task?
- How efficient are the sub-institutions/organisations responsible for circulating electricity in the country?
- How stable has the leadership of the key distribution industry been over the years?

1.7 Research Objectives

The main objective of this research is to find out the management challenges that are hindering the distribution of electricity in Nigeria by the distribution companies. This will focus on the main functions of management which are planning, organizing, leadership and control.

Specifically, the research aims to

- Critique the planning of PHCN and its subsidiary companies to determine the efficacy of their plans.
- Highlight the management challenges in the distribution of electricity in Nigeria.

- Discuss the availability of qualified personnel.
- Present findings on PHCN institutional ability to deliver on its mandate.
- Draw conclusions and make recommendations

1.8 Research Assumptions

In carrying out this research, certain assumptions will be validated or not at the end of the research.

- * Firstly, it is going to be assumed that, PCHN and its subsidiaries are ineffective and inefficient in the distributing electricity in Nigeria.
- * Some of the main goals outlined by PHCN are unrealistic and not achievable given the resources available to them.
- * The subsidiary institutions under PHCN that are tasked in the distribution of electricity in Nigeria, faces challenges in areas of planning, organising, leading and control. These challenges make it difficult for them to function properly and achieve main goals.

1.9 Significance of study

After this research has been carried out and the findings and conclusions have been drawn, it is intended that this research will go a long way to contribute to the already existing knowledge of the challenges faced in managing in distribution of electricity in Nigeria. In managing the challenges, this research will focus on areas of planning, organising, leading and control to make recommendations that will ensure a better management in the near future when dealing with distribution of electricity in Nigeria.

Secondly, it is intended that this research will help the different spheres of government of the Federal Republic of Nigeria to better understand and have a broader knowledge in carrying out

policy formulation and implementation especially with regards to the Power sector in the distribution electricity in Nigeria as a whole.

The suggestions made by this research paper will go a long way in improving the living conditions of many Nigerians who do not yet have access to electricity and even the living conditions of those that have access to electricity but are constantly facing irregular supply. Hence, this will improve their living condition and standards of living. Finally, the suggestions that will be made in this research will contribute to a better economy. As will be established from discussions in this paper, proper management in the distribution of electricity in Nigeria will generally improve efficiency in the different economic sectors and it will also attract investors into the country.

1.10 Ethics statement

The processes of the University of the Western Cape Senate, the EMS Faculty Board and the School of Government have been adhered for the purpose of this research. This study does not intend to harm any of the parties involved. Confidentiality will be maintained where necessary during the study. However, it is important to note that the research is based on secondary data only and hence, information or data used in the work which are not mine will be properly cited and acknowledged to the original authors and/or sources.

CHAPTER 2

MANAGEMENT OF ELECTRICITY DISTRIBUTION IN NIGERIA

2. Introduction

Chapter two presents the literature review of the work. Literature on various important concepts such as electricity, electricity distribution and management will be discussed. Electricity distribution in the sub Saharan African and Nigeria will be examined as well. The theoretical framework of the research will be brought out and explained before the contextual and legislative framework will be finally examined.

Firstly, the conceptual framework of the research will be explained. In the conceptual framework, important concepts that are useful and very important in the research are been explained. A detailed explanation of the meaning of electricity, electricity distribution and management are examined relating them to electricity distribution in Nigeria. A further evaluation of the four management functions within the distribution of electricity in Nigeria is done.

Furthermore, the theoretical framework of the research will be presented. This will be drawn from the concept of organizational climate by Kurt Lewin. This will form the basis for investigating the effectiveness of the distribution of electricity in Nigeria from a management perspective.

Contextual and legislative framework of the research will also be examined further in this chapter. Electricity distribution will be broadly examined in the Sub Saharan Africa before it will be narrowed to our case study of Nigeria. From the legislative framework, Acts and policies that are binding and guiding the electricity sector of Nigeria will be presented. This will show how they affect the electricity distribution in Nigeria.

2.1 Definition and discussion of Key Concepts

This includes a definition of 3 concepts – electricity, electricity distribution and management.

2.1.1 Electricity

The Concise Oxford Dictionary defines electricity as a form of energy resulting from the existence of charged particles (like electrons and protons), either statically as an accumulation of charge or dynamically as a current (Thompson, 1995). Similarly with reference to electrons, (Hydro Québec, 2004, 2011) defines electricity as an invisible phenomenon created by the movement of electrons in a conductor. It is important to note that getting one definition of electricity has been quite challenging. This is evident in the numerous definitions of electricity that exist and the interchangeable use of the word “electricity”. This can be seen in the Concise Oxford dictionary for example, where the word “electricity” has four different definitions including being expressed as a human emotion “a state of heightened emotion, excitement, tension” (Thompson, 1995: 436). To this effect, (Hydro Québec, 2004, 2011) notes that, the challenge in getting one acceptable definition of electrical energy is a reflection of the world which is filled with too many possibilities and unknowns. However, various authors who have made an attempt at defining electrical energy (which is the focus of this paper) stick to put across an understanding of its various properties; how it is generated, transmitted from one point to another and how it is used. A typical of this kind of definitions is made by (KPMG, 2013) which defines electricity as a type of energy fuelled by the transfer of electrons from positive and negative points within a conductor. These authors go further to indicate that electricity is widely used for providing power to buildings, electrical devices and even automobiles. The concept of electricity can be traced far back to the 1740s, as a phenomenon which was on people’s minds but not in the way we perceive and think about it today. It was used in the 1740s as a way of creating magic tricks by creating sparks and shocks and scientists at the time used electricity in conducting experiments. Even though it was used by scientists, scientific thinking about electricity up to 10 years after the 1740s had not changed much. Electricity was still not useful. The concept of electricity as it is being used today was developed by Benjamin Franklin in 1759 following a discovery he made about the similarity between electricity and lightning as two phenomena that created light, made loud sounds when they exploded, were attracted to metal and had a particular smell (Hirram, 2013:5).

Today, the movement of electricity from its sources to a final consumer involves 3 main processes – generation, transmission and distribution (IEC, 2007: 7). Thus it is important to note here that, making discussions on electricity distribution in isolation of generation and transmission will be presenting an incomplete discussion. This paper thus will make references to electricity generation and electricity transmission in Nigeria where ever necessary. Nigeria's Power Holding Company is made up of three types of subsidiaries these are: generation companies (GENCO), transmission and systems operations companies (TRANSYCO), and distribution Companies (DISCO) (Bloomberg, 2016). Electricity is **generated** at a power station by electromechanical generators which are primarily driven by heat engines and fuelled by chemical combustion or nuclear fission. It is also generated by other means such as kinetic energy of flowing water and wind. As noted earlier in chapter one, electricity can be generated through various means. In Nigeria for example, electricity in various power stations is generated using different means. The Kainji, Jebba and Shiroro power stations use water for the generation of Electricity, Egbin and Sapele use steam while Sapele, Afam and Delta power stations currently use gas (Ijewere, 2012).

According to the South African electricity company – Eskom, electricity is different from the other services that can be harvested from nature and provided to households such as water (Eskom, 2016). The difference lies in the fact that electricity must be manufactured. Most importantly, it must be manufactured at low cost to keep power bills low and ensure that the lowest-possible impact is felt on the environment (Eskom, 2016). The amount of electricity manufactured in each country is measured in megawatts and differs depending on the country's demand for electricity. This will be discoursed in detail in later parts of this chapter. It is however important to note here that, there has been a global increase in the demand for electricity putting increased pressure on electricity manufacturers and distributors (World Bank, 2013). In an attempt to meet increasing demand and to cope with the global scarcity of water due to climate variability, countries such as India and South Africa also use low quality coal in power stations next to coal deposits to generate electricity (Eskom, 2016). Even though using coal is an economical means of generating electricity, it not ideal because, no matter how carefully it is burnt, there are gaseous and solid emissions. The gases that are given off include sulphur dioxide, carbon dioxide and oxides of nitrogen, the first two of which are regarded as having climate-change effects on the environment (Eskom, 2016).

Electricity *transmission* is the more technical part in the process of getting electricity to the final consumer. It involves the transfer of electrical energy to electrical substations located near demand centres after generation (Dieter Betz et al, 2009). According to Brown et al. (2004), a strong electricity transmission system is important for 4 main reasons

- It improves the reliability of the electric power system
- It gives electricity customers flexibility to diversify the mix of fuels that produces their electricity by giving them access to power plants,
- It improves the cost structure of the entire industry by giving low-cost power plants access to high-cost power markets, and
- Enables competition among power plants by giving more plants access to more markets

Electricity that is generated at power stations is being transmitted through power lines that exist all over cities, towns and rural areas which are visible as one walks along the road (Eskom, 2015: 1). These power lines carry the electricity. These lines can be seen in the picture below

Figure 2.1: Power lines that transmit electricity



Source: (Energy story, 2012)

As large electricity generators spin, they produce electricity with a low voltage. (A volt is a measurement of the electric force that pushes electrons around a circuit) (Brown et al. 2004). Once the electricity has been produced, it first goes to a transformer that boosts the voltage up. The need for a boost in the voltage is because scientists have noted that in traveling long distances, it is better for electricity to be transferred at higher voltage. In addition, electricity is

said to be transmitted more efficiently at higher voltages (Brown et al. 2004). As can be observed from Figure 1.2 above, the thick long cables (power lines) are made of copper or aluminum because they have a low resistance. The power lines go into substations near businesses, factories and homes. Here transformers change the very high voltage electricity back into lower voltage electricity.

From these substations (like in the diagram above), electricity in different power levels is used to run factories, street cars and mass transit, light street lights and stop lights, and is sent to neighbourhoods. In the neighbourhoods, another small transformer mounted on poles (see picture) or in a utility box converts the power to even lower levels to be used in your house (Brown et al. 2004). The voltage is eventually reduced for larger appliances, like stoves and clothes dryers, lights TVs and other smaller appliances. Rather than over-headlines, some new distribution lines are underground. The power lines are protected from the weather, which can cause the line to break (Brown et al. 2004).

2.1.2 Electricity Distribution

Electricity distribution is the final stage in the delivery of electric power and the main focus of this study. At this stage the electric power distribution carries electricity from the transmission system to individual consumers (Brown, 2008). Electricity distribution companies have been identified as a vital link between the supplier of electricity and customers that buy and use electricity. It involves a process which constructs and maintains equipment that transforms the power supply to the type that meets the customer's needs, meters the amount the customer uses, provides the appropriate billing and collects the payments. In different countries, electricity distribution is managed by the central government, private organisations or the local government (Brown, 2008). In some countries in Africa, up to 500 electricity distributors may exist. In South Africa, for example, where electricity distribution is managed by Eskom and local governments, the number of electricity distributors recently reduced from 500 to 300 distributors (Eskom, 2016). The effective management of this large number of distributors has been difficult, reasons why in the past 2 decades the South African Electricity Distribution Company has been talking to its central government, local government and other involved stake holders like the National Energy Regulator about rationalising the Electricity Distribution Industry (EDI) (Eskom, 2016). With a recognition that it will be more effective to manage a fewer number of distribution

companies, Eskom is proposing the formation of six regional electricity distributors (REDs) whose sole responsibility would be to manage and drive all electricity distribution throughout the country (Eskom, 2016). This would allow tariffs to be aligned, service to be improved and the equipment to be better maintained and updated. Additionally, Interruptions of service (blackouts) because of old equipment would be much reduced (Eskom, 2016). Comparatively, Nigeria has a fewer number of distribution companies – 11. These will be discussed in detail in later sections of this chapter. As noted by (Eskom, 2016), it becomes difficult to manage and ensure effective distribution of electricity when there are many distribution companies. However, what can be noted here is that, even with a fewer number of distribution companies, Nigeria still seems to be facing challenges with electricity distribution. These challenges will be discussed more in later parts of this chapter. Thus this paper will seek to diagnose the managerial problems that are faced with the distribution of electricity in Africa and in Nigeria in particular.

In the distribution of electricity there exist a Distribution Management System (DMS) which is a collection of applications designed to monitor and control the entire distribution network efficiently and reliably (Huang et al. 2012:33, 43). A DMS is a very important aspect in the distribution of electricity. It acts as a decision support system that makes decisions that assist with the control room and field operations. It also performs other functions such as improving the reliability and quality of services in terms of reducing outages, minimising outage time, maintaining acceptable frequency and voltage levels (Huang et al. 2012:33, 43). Given its importance, it means that it is important for various countries to have effective DMS' to ensure effective distribution of electricity. In recent years, most DMS have been comprehensively using information technology solutions through their Outage Management System (OMS). An OMS is a combination of other systems that give feedback about customer satisfaction. These include a Customer Information Systems (CIS), Geographical Information System (GIS – which provides information about customer geographical location) and Interactive Voice Response System (IVRS) (Huang et al. 2012:33, 43). The most advanced and widely used DMS is the Schneider Electric's Advanced Distribution Management System (ADMS) which provides the most comprehensive network management solution, including monitoring, analysis, control, optimization, planning, and training tools that all function on a common representation of the entire electric distribution network (Huang et al. 2012:33,43). By merging distribution management (DMS), outage management (OMS), and supervisory control and data acquisition

(SCADA) systems into one secure, unified solution with more than 50 advanced functions, it can maximize the benefits possible from a growing foundation of intelligent grid devices, distributed renewable energy, advanced metering, and all things smart grid.

2.1.3 Management

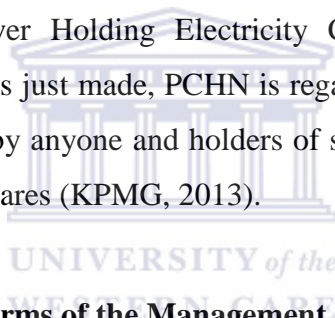
This section attempts to make linkages between some management definitions, views and important aspects of management. The discussion of management will form the basis and define the angle from which evaluations of Nigeria's electricity distribution from a management perspective will be made (Patel & Kopf, 2010: 27). Like many other concepts, giving a single definition of management will not be right because, various management authors defined the term differently during the evolutionary process of management. They defined the term based on the experience at the time (Patel & Kopf, 2010:27).

2.1.3.1 Management Viewed in terms of achieving organization's goals and objectives through people

The term management brings to mind some terms like people, resources, goals, objectives, organizations and businesses. This is evident in some of the definitions like the one by (Kotter & Cohen, 2002) that define management as the function that coordinates people's efforts in using available resources effectively and efficiently to accomplish the organization's goals and objectives through others. (Jonkar, 2008) also captures a similar definition of management as a process that enables an organization to reach its goals by working through its employees and other organizational resources. (Thomas, 1996), points out that, the term may be used about people. These definitions are in line with an older definition of management by one of the management pioneers Harold Koontz (1909-1984) who defined management as the art of getting things done through other people within formally organized groups (Gautam, 2013). Three common aspects of these definitions can be seen; "organization", 'goals', 'objectives' and 'through people'. In the context of this paper, an evaluation of is made of the management of people, resources, goals and objectives of Nigeria's Electricity distribution Industry.

In today's world we can identify 3 types of organizations, with different management structures and goal orientations, but whose goals and objectives are achieved through people – its

employees and other stakeholders (Mulugeta, 2014). These are *private organizations* which are managed and operated by private individuals and they have profit making oriented goals and objectives. (Keller, 2012); *Public Organisations* on the other hand are organisations in today's world that are operated and managed by the government. Unlike a private sector organisation, its objectives are not profit making but the provision of public services which are often free at the point of delivery (Roehrich, J.K.& Wright, 2010); while *Non-Profit Making Organisations* (NPO) includes Community Based Organisations, according to (Mulugeta, 2014), are organizations whose primary objective does not include making profits or revenue (Grobman, 2008), clarifies this popular view when she points out that, the fact that such organizations are designated as nonprofit does not mean they do not intend to make profits, but rather, it simply means such organizations have no owners and that the funds realized in the operation of the organization will not be used to benefit any owners. The company in Nigeria, responsible for its electricity is known as the Power Holding Electricity Company (PCHN). Based on the definitions of types of organisations just made, PCHN is regarded as a Public Limited Company (Plc) as its stock can be acquired by anyone and holders of stock are only limited to potentially lose the amount that they pay on shares (KPMG, 2013).



2.1.3.2 Management Viewed in terms of the Management Function

Henri Fayol, described as the father of modern management and also regarded as the first person to come up with the four management functions, defined management as forecasting and planning, organizing, commanding, coordinating and controlling (Hissom, 2009: 8). A similar definition was made by (Aquinas, 2011: 2) when he defined management as a distinct process consisting of planning, organising, actuating and controlling (Gautam, 2013). Management is a set of functions that are directed towards the effective and efficient use of resources for the achievement of organizational goals (Whetton & Cameron, 1991) . The management functions they refer to in their definition are the planning, organizing, leading and controlling functions. Given that these functions are 4 important aspects of management, it is important for this paper to discuss what these functions in detail.

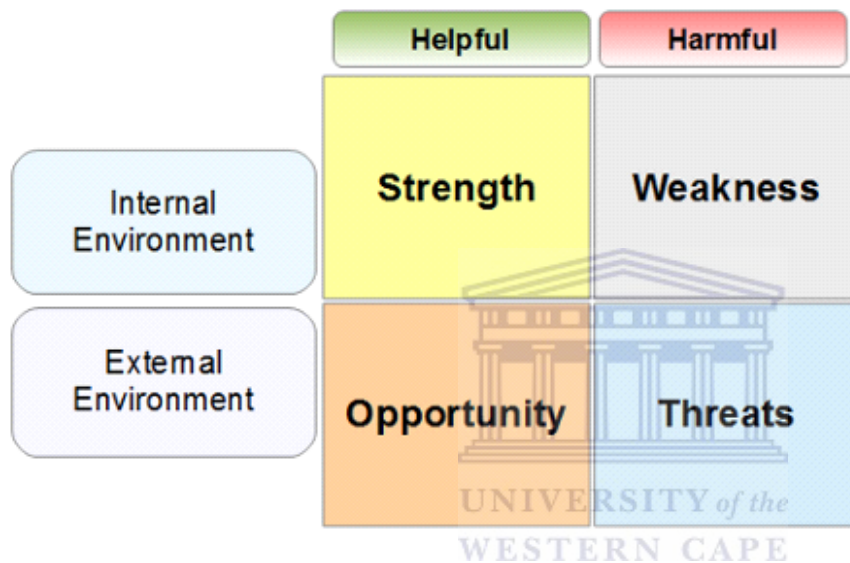
Planning: (Norman, 2014) views planning as the management function that involves making a decision on where an organisation wants to go and taking the right steps to get there. Planning requires the management team of an organisation to ascertain themselves with both the external and internal environment in which their organisation is and know the opportunities and challenges the environment is likely to present. With this knowledge they can proceed to define what their objectives are and be ready to make necessary adjustments to their plans when the need arises (Wanish, 2009: 2). Carrying out proper planning in an organization helps to reduce or eliminate the chances of waste of resources and ensure proper resource allocation. (Whetten & Cameron, 1991) also point out that decision making is a crucial part of planning. It involves choosing the best action to take, from a set of alternatives. Thus in order for the management of PHCN to be effective in its operations, it needs to set out a good plan.

The aspects of analyzing the environment in which the organisation exists, defining objectives and making decisions on best courses of action discussed above as noted above, brings up at this point of this discussion the aspect of *strategic management* which involves **strategy** and **strategic planning**

Strategic planning requires the management team to carry out an analysis of its environment. One tool which is commonly used for accessing their environment is the SWOT analysis which helps management find what their strengths and weaknesses are, identify areas where they have opportunities and prevent any threats arising from both the external and internal environments (Buzzle, 2013).

The matrix below gives an understanding of the SWOT analysis

FIG 2.2 A SWOT ANALYSIS MATRIX



Source: (Pakhare, 2016)

As can be seen from above fig 2.2, the internal environment represents Strengths (helpful: organisation's competencies) and Weaknesses (harmful: areas of the organisation which need improvement). They are factors within the organisation. While, the external environment has opportunities (Helpful) and threats (Harmful: variables outside the organisation such as competition). These factors are out of the organisation but can affect performance within the organisation. They are factors that are beyond the control of the organisation (Mulugeta, 2014). Thus, the management function of planning, involves both short term and long term planning.

Organising: Organising is the second of the management functions, which involves determining how resources will be distributed and employees will be arranged to fit the plan that has been made. When organising, delegation of authority and assigning work to various individuals by the manager are very important for achieving goals and objectives (Harcourt, 2013). According to

(Whetten & Cameron, 1991), contrary to what some people think, organising is much more than the creation of an organisation chart. It involves designing each employee's job and deciding how they should carry them. "Job Design" is a popular organisation term, which refers to decisions made about the nature of jobs within the organization. Organising jobs can be done at the level of the organisation and at the level of a particular job. At the level of the organisation, organising involves how best to put jobs into various departments (departmentalization) (Whetten & Cameron, 1991). At the level of a particular job, organisation involves how best to design individual jobs so that human resources can be used in the most effective way. Traditionally, job design was based on principles of division of labor and specialization, which made and assumption that, individuals will perform a job more proficiently if the job content was narrow. (Carpenter et al. 2014) however, point out that, it is possible for jobs to become too narrow and specialized.

Leading: Leading is the third management function considered to be the most important and at the same time, most challenging (Whetten & Cameron, 1991). According to the findings of one of the researches by (Carpenter et al. 2014), for managers to be effective in leading, they must first of all understand the values, attitudes, personalities and emotions of their subordinates. Leading requires that employees are motivated, encouraged, guided and communicated with (Harcourt, 2013). Managers can distinguish themselves as good leaders by constantly reading studies carried out by different people on aspects like motivation which outline how workers can be stimulated to direct their efforts towards production; communication which provide indications on how managers can productively communicate with their employees and finally studies on leadership which will tell managers the various leadership styles to use in different situations.

Controlling: Controlling is the final management function which involves ensuring that all the other management functions are in place and working effectively. It requires that, performance standards should be put in place and other measures be set to ensure that workers are attaining the required standard (Roberts, 2014). It is an important management activity because it ensures that an organisation is moving towards the achievement of its goals, it is performing in such a way that it will achieve the goals within the required time (Whetten & Cameron, 1991). In addition to setting performance standards, depending on the type of organisation, other measures

that can be used to measure performance include sales and production reports, level of customer satisfaction and financial statements.

Controlling requires also that, there is a clear-cut understanding of where the deviations from standards lie (Harcourt, 2013). Traditionally, there are 2 control techniques: performance and budget audits. A budget audit will provide information about where the organization is with respect to what was planned or budgeted for, while a performance audit will make an effort to determine whether the figures that are reported reflect the organisation's actual performance. In companies where this may apply like manufacturing and service companies, there is a tendency to only view the controlling function in financial terms. Managers, however need to be careful against this as there is need to control other aspects like the production and operations processes, delivery of services procedures and many other activities within the organization (Harcourt, 2013).

Thus, the above discussed 4 management functions are considered widely management functions of planning, organizing, leading, and controlling are widely to be considered to be the best describers of the job of a manager as well as the best way to classify accumulated knowledge about the study of management. This discussion of management will form the basis and define the angle from which evaluations of Nigeria's electricity distribution from a management perspective will be made.

Motivating is an element of the management process that involves the deliberate encouragement and inspiration of employees to work more towards achieving organizational goals. It is about stimulating people to use their own initiative and be more interested in organizational activities. A manager's ability to motivate is a reflection that he is a good leader as motivation has no strict formula to follow (Quittner, 2014).

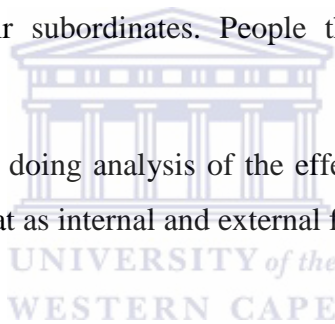
Coordinating is also regarded as a function of leadership. It involves controlling all the organizing, planning and staffing activities of the organisation, ensuring that all the organizational activities work together for the good of the organization (Roberts, 2014). Coordination usually takes place in meetings and other planning sessions with the department heads so that all departments will be on the same page in terms of objectives and goals.

Coordinating requires that management should communicate, supervise and direct (Roberts, 2014).

Staffing: (Gaurav, 2010) points out that, staffing involves choosing the right people to perform various tasks; giving them the right training and development and preparing the right salary package for them. It is regarded as a function that caters for all the recruitment and personnel needs of the organisation (human resources). Thus without the staffing function, an organisation is likely not to perform well as the aspect of doing things through people will be undermined (Robert, 2014)

Communicating: In an organisation, written and oral communications are essential for exchanging ideas, opinions, information and facts between employees within departments. Managers are required to use more of their time on communication in order to direct, motivate and co-ordinate activities of their subordinates. People think and act collectively through communication (Gaurav, 2010).

These functions will be applied in doing analysis of the effectiveness electricity distribution in Nigeria where they will be looked at as internal and external factors



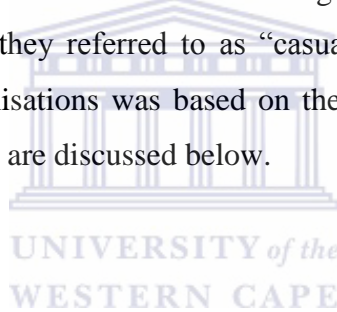
2.2 Conceptual Framework

This section will present the concept underlying this study and will make a brief review of studies that have also used the concept.

Analysis in this study will be done based on the concept of organisational climate. The concept of organisational climate dates back to the 1950s, derived in the work of (Lewin, 1951) who identified environmental (internal and external environment) impact as an important tool for determining organisational behaviour (Kritsonis, 2005). In the work of (Taguiri, 1968:27), a similar reference of organisational climate can also be seen where the author defines organisational climate as “a relatively enduring quality of internal environment of an organisation that is experienced by its members, influences their behaviour and can be described in terms of the values of a particular set of characteristics of the organization”. Likewise, (Olowu, 2001:89) states that the constellation of environmental factors determines to a great

extent the structure and functioning of a system. Thus, this study will be guided by the concept that, the behaviour of PHCN and its DisCos is influenced by its internal and external environment.

It should be recalled from earlier sections of this chapter the classification of Nigeria's PHCN as a Public Limited company (Awo, 2009). Scholars of public administration recognize the early need for an ecological approach to the study of public administration. Max Weber's work on authority-administrative system draws heavily on environmental influence on the character of public administrative system. It should also be noted that most organisations in Africa are characterised by dynamism and complexities. A study carried out by Emery and Trist in 1965 is still being applauded today as one of the best studies on the relationship between the external environment of an organisation and its ability to deliver goods and services. The uniqueness in their studies which was done on a British Food Canning Firm, lies in the classification of organisations into 4 types which they referred to as "casual textures" (Omoleke, 2010: 268). Their classification of these organisations was based on the environment they are likely to be influenced by. These environments are discussed below.



2.2.1 A Placid randomised environment:

These authors classified this as a stable unchanging environment which is not logically connected due to a random dispersion of resources within it. According to (Omoleke, 2010), organisations in such an environment find it difficult to predict what exactly will happen in the environment; thus a placid randomised environment will not be conducive for large organisations but small and independent organisations will thrive in them. This is because in such an environment very little strategic planning can be done, and organisations only proceed through trial and error. (Emry & Trist, 1965: 590-613), in their work noted that such an environment is unlikely to be encountered by organisations in Africa. However, given today's events with many natural disasters and terrorist attacks it this study questions this assertion as African countries are continually threatened by these random events. In my opinion, a country like South Sudan will be a randomised environment. This environment however does not describe the environment where PHCN operates.

2.2.2 Placid, clustered environment

This is a more predictable environment owing to the fact that there exist a logical and causal connection between resources and other elements within it (Drucker, 2001). Unlike a randomised environment, strategic planning is possible in such an environment and comparatively larger organisations can thrive here. However, the distribution of electricity in Nigeria will not be successful in such an environment because electricity distribution is large and involves at least 11 Discos. Given that such an environment still has an element of not being subject to rapid change, it will not be a conducive environment for PHCN's and NERC's electricity distribution activities.

2.2.3 Disturbed, reactive environment

The major difference between this environment and the preceding one is the existence of a number of similar organisations competing for the same resources. The ability to predict the environment and to plan accurately is complicated by the existence of competitors, and so, relative power becomes a vital consideration. As (Aldrich, 1979: 63) states a "large size might give organisations such power and overtime". The larger organisations might drive out the smaller ones". Such an environment also promotes structural flexibility and encourages decentralization. From our description of PHCN in earlier sections of this chapter, we find that it is a monopoly and thus we will not say it exist in such an environment. The new reform of the power sector has however encouraged private investment into the distribution of electricity. If this happens that electricity is no longer distributed in various localities by 1particular Disco, electricity distribution in Nigeria will exist in a disturbed reactive environment.

2.2.4 Turbulent environment

A turbulent environment is exactly the kind of environment where PHCN exist and carries out its generation, transmission and distribution activities by itself or through other national and local organisations. To summarise the definitions of many authors as to what a turbulent organisation is; it is described as a highly complex, rapidly changing environment, which is characterized by multiple connections between resources and other elements within it (Grobman, 2008; Gaurav, 2010; Harcourt, 2013). Three factors have been identified as contributors to the change and complexity which exist in this environment.

Firstly, adaptation to the third type of environment mentioned earlier increases the links between competing organisations (that is, because they are in competition, what happens to one often affects the other and them all), and this in turn creates a backwash effect from the organisations to the environment itself (Grobman, 2008).

Secondly, an increasing interdependence exists between organisations and society in general. Organisations heavily depend on customers and client groups within the society and in turn the society depends on formal organisations for certain goods and services. Thus, an organisation existing in such an environment that fails to create that link with customers will likely not be delivering as it ought to (Grobman, 2008).

Thirdly, competition and rapidly changing environments make it necessary for organisations to rely increasingly on research and development activities. This highlights the necessity for PHCN as a company to carry out research to ensure that it is efficiently delivering its goods and services. (Omoleke, 2010), cites the work of (Litterer, 1972: 335) where he points out that, organisations face a regular set of demands from the environment, like producing the same product or the same service for the same or very similar clients, the organisation faces stable conditions. He offers as an example of public utilities that produce a standard product, such as electricity, at a limited range of voltages and at a single frequency.

In analysing the effectiveness of an organisation, it is important to understand the environment because it enables the analyst identify the characteristics that contribute to uncertainty in the decision making of the organisation. (Duncan, 1972) identifies such uncertainty is as comprising mainly of three components. His identification is useful because it emphasizes the fact that perceived uncertainty and the degree of complexity and dynamics of an organisation's environment must be considered as dominant features in its decision making.

- Inability to accurately assess the probabilities of environmental factors affecting the success or failure of an organisation performing its function,
- Lack of information regarding the environmental factors associated with particular decision making situations,

- Lack of knowledge regarding the costs associated with an incorrect decision (Duncan, 1972).

Based on the above conceptual exposition and review of studies that have used a similar conceptual framework, this paper attempts to investigate whether the internal and external environment in which Nigeria's National Electric Power exists has an impact on its allegedly poor performance in the distribution of electricity. PHCN has thus remained a vital and almost indispensable public enterprise in the area of electricity distribution. The Authority as a whole was rated fairly well during its few years of existence but its performance deteriorated in the last two decades and since then it has remained the most criticized public enterprise and has thus become the butt of the Nigerian public (Omoleke, 2010: 12).

2.3 Electricity Supply and Distribution in Sub Sahara Africa

2.3.1 Power in Sub Saharan Africa

In recent years, Sub-Saharan Africa has been identified as a new frontier of growth with economic growth rates in 2013 reaching 5.5% in 2014 as compared to 3% for the global economy (KPMG, 2014).

With stronger institutions and high investment, debt relief, sound economic policies, many SSA countries like Ghana have now sustained a 5-6% growth rate for more than a decade. (KPMG, 2014).

However, economic activities and growth in the region continues to be underpinned by large investments in infrastructure and is supported by a continuation of strong domestic demand and higher production in the mineral resources, agriculture and service sectors (KPMG, 2014).

Moreover, the region continues to be characterised by an ageing power infrastructure unable to meet current power demands and therefore suppresses the power demand. According to (World Bank, 2014), SSA's 49 countries with a total population of up to 1 billion people, generate approximately the same amount of power as Spain, which has a population of 45 million. Its power consumption which is at 124 kilowatt hours (kwh) per capita per year and falling, is only a tenth of that found elsewhere in the developing world, which is barely enough to power one 100-watt light bulb per person for three hours a day (World Bank, 2014).

Recall from above that water and wind were mentioned as mediums for generation of power. Most SSA countries like Nigeria, Cameroon and South Africa generate power from water (hydro-power) (Findt et al, 2014). Due to climate change in recent years characterised by both short and long periods of dry spells, hydro power in some of these countries has become highly seasonal and droughts have affected countries over-reliant on hydro power in the recent past (KPMG, 2014). However, the hydro potential on the continent is enormous and will certainly remain one of the main sources of power. The frequent power outages have resulted in the growing use of emergency power, using liquid fuels, which are expensive. Using a single source of power has proven to be unsustainable and, given the increasingly stringent climate change regulations, this approach will likely result in additional costs, especially for coal and liquid fuel generated power (KPMG, 2014)

2.3.2 Electricity distribution in SSA: Challenges

The percentage of people having access to electricity is known as electrification and this varies from country to country in SSA. At the moment, most countries in this region have electrification level below 30%, with majority of the households without access to electricity living mostly in rural areas. (Findt et al, 2014) states that this low electrification level can be associated majorly to damaged, weak and underdeveloped electricity distribution infrastructure. The authors further explain that, given that the majority of the distribution system operators are in the hands of local municipalities there are often a lot of separate system operators which results in loss of economies of scale (Findt et al, 2014). In addition to these, small municipalities face problems with maintenance as they often struggle to maintain the distribution networks and most are in need for additional investment (Lindfeild, 2014).

Another challenge which affects the transmission infrastructure and consequently the distribution grid is that all the renewable energy projects are being developed in areas favouring the source of renewable energy, such as sunny and windy areas (KPMG, 2014). The problem lies in the fact that these areas are not always necessarily the closest to the existing infrastructure. The situation can however be improved if renewable projects contribute to the grid development or coupled projects (KPMG, 2014). Grid extensions may still be required in the long term to cater for future economic growth plans of all areas.

According to the (World Bank, 2014) African Power report, it is obvious that new generation assets, transmission assets and most importantly distribution assets are required in SSA and that the existing assets need to be improved and upgraded to meet the demand of the next two decades as well as to secure the energy supply. With regards to the distribution challenge, the rural electrification programme which is already in place in Sub Saharan Africa can help to fasten this development.

Referring to the management functions highlighted above, one of which is planning, (Findt et al. 2014) note that, the security of electricity supply is dependent on adequate planning and projecting the energy requirements of the future. By this, these authors point out that, future electricity requirements can be adequately met if plans are being made today (strategic planning). The current situation in Sub-Saharan Africa is unfortunately a result of poor planning and projecting in the past. And, even if there have been plans, the execution and implementation was poor (KPMG, 2014: 7). However, governments are already in the process of correcting this.

Further challenges to secure energy supply and maintain electricity distribution include:

- The inability of utilities to manage planned and unplanned outages and maintenance.
- The inability of Sub-Saharan African countries to deliver new build projects on time and within budget.
- Difficulties in securing funding for new generation projects, transmission and distribution assets in Africa (KPMG, 2014: 7).

The problem of electricity affordability is also highlighted as a major contribution to the low electrification rates in SSA. (Scott, 2014) points out that this problem also hinders the growth and development of the region. The region's economy will only grow with affordable energy prices and society can and will develop accordingly. The increasing quest by SSA governments for their countries to grow and develop necessitates prices to be kept low through political influence. This directly avoids or slows investments in new assets and also reduces the amount spent on maintenance and improvements. According by (World Bank, 2014) a more regulated market with policies for investment security could help to deal with this challenge. But often the

policies in place are not considered or implemented in a sufficient manner. So affordability is not only about efficient assets which can provide affordable energy but also about effective policies.

The next section of this chapter, discusses the theoretical framework around which this study is built.

2.4 Legislative framework

In discussing the legislative framework, one has to look at the policies, Acts and constitution of the Federal Republic of Nigeria that provided to control the proper functioning and management of the distribution of electricity in Nigeria.

2.4.1 The Electric Power Sector Reform Act No. 6 of 2005

In Section 67 of the Electric Power Sector Reform Act No. 6 of 2005, it promotes the distribution of electricity by issuing a distribution license to the various distribution companies. The distribution license shall authorize the license to construct, operate and maintain a distribution system and facilities. The distribution license also has the obligation to provide electricity to its distribution consumers and may also purchase power from other sources for resale (Federal Republic of Nigeria Official Gazette, 2005)

In section 81 of This Act, it focuses on performance standards and codes. Here, the standards of overall performance in connection with the provision of electricity supply services and promotes the use of electricity by consumers (Federal Republic of Nigeria Official Gazette, 2005). With this performance standards and codes in place, this will make sure all the various companies for electricity distribution, generation and transmission adhere to the quality of services that is produced so that the standards and quality of the electricity supply is maintained as they are been monitored.

Section 56(1) brings out the point of auditing the commission which is very important in running of the distribution companies. In this section, an auditor is appointed as stipulated by the auditor general who audits the accounts. The auditor audits and gives reports on irregularities found and this helps in running the structure that is responsible for electricity distribution in the country (EPSR, 2004).

Various reform policies were introduced in the energy sector which aided the transformation of electricity distribution in Nigeria.

Firstly, there was the Electricity (Amendment) Decree 1988 and the NEPA (Amendment) Act 1998 that were passed to terminate the monopoly status of NEPA and inviting the private sector participation in the electricity sector (Onagoruwa, 2011: 8). With the privatisation of the electricity sector, this prompted many individuals and shareholders to enter the industry in order to improve efficiency and lower cost. This gave room for the distribution companies to be established as 11 successive distribution companies were established to aid in the distribution of electricity to Nigeria.

The Nigeria Electric Power Policy (NEPP) was issued by the National council on privitisation with the objective to create a new electricity industry that is based on rules that are enforced by an independent regulator (Okeke, 2015: 13). NEPP was encoded in legislation through the Electric Power Sector Reform Act. The regulator ensures that efficient operators recover prudent costs. The NEPP recommended the establishment of a sector regulator, the privatization of the electric power sector and a market trading design, codes, new rules and processes (Onagoruwa, 2011: 8)

The Nigerian Electricity Regulatory Commission (NERC) was introduced in 2005 with the responsibility of tariffs regulation and monitoring of the quality of services of the PHCN (Okeke, 2015: 13). With this commission, it promotes the distribution of electricity in that it ensures that quality services in the supply of electricity are distributed and it monitors to make sure that both the consumers and distributors are not exploited.

2.5 Background and overview of the Nigeria Power and Electricity Sector

The history of the Power sector in Nigeria is dated back to 1896 when electricity generation started in Nigeria (KPMG, 2013). However, it was only about 30 years later in 1929 that the first utility (distribution) company was created. Nigeria's first electric power plant was located in Lagos and managed by the country's Public Works Department (PWD) NEPA which is otherwise known today as the Power Holding Company of Nigeria (PHCN) came into existence in 1972. It had the mandate to develop and maintain an efficient, coordinated and reliable power supply in the country. In 1973, only 8 of the present 36 States in Nigeria were directly connected

to the National Grid. However, today all Nigerian states are fed from the National grid (Harnzat, 2005: 4). According to KPMG, despite the government's continuous effort to manage the state owned utility which operated as a monopoly, it became clear in the late 90s that the Nigerian Electricity sector was failing to meet demands placed on it. This necessitated reforms in the sector. The Nigerian Power sector is said to have taken one of the boldest privatization initiatives on globe in the past decade, costing them about \$3.0 billion (KPMG, 2013). In addition to this, over the past decade, the Federal government of Nigeria has been able to complete the privatization of the generation and distribution processes of electricity while retaining the ownership of the transmission process (management under concession)(KPMG, 2013). The main organisation over seeing the distribution of electricity in Nigeria today is the Power Holding Company of Nigeria (PHCN). It took over from the National Electric Power Authority (NEPA) which was a monopoly and was noted for its inefficiency. PHCN was seen by many as a better alternative for NEPA because it was established to solve the problems NEPA faced.

As it has been clearly stated above, the power sector involves three processes which are the generation, transmission and distribution process. Nigeria's electricity transmission process is currently being managed by an international management contractor from Canada called the Manitoba Hydro International (Agboola, 2011). This organisation is responsible for the technical and financial adequacy and providing stable transmission of power. The generation process has been privatised, with 23 grids connected generating plants that are in operation in the Nigeria Electricity Supply Industry with 6 successor Generation companies

The 11 distribution companies (DisCos) responsible for the distribution of electricity in Nigeria are presented on Table 2.1 below as well as the areas which they distribute electricity to. These distribution companies are mandated to undertake wiring, sales, billing, collection and customer care functions within their area of geographical location (Agboola, 2011). These distribution companies are divided into five groups which are residential, commercial, industrial, special and street lighting and have particular coverage areas. The table which follows gives the location of each Disco and the various areas which they cover

Table 2.5: Electricity Distribution Companies and their areas of Coverage

Distribution Company	Address	Areas Covering	City Located in
Abuja Electricity Disco	Wuse Zone 4, Abuja	FCT, Niger, Kogi , and Nassarawa	Abuja
Benin Electricity Distribution Company	No 5 Akpakpava Street, Benin-City	Edo, Delta, Ondo, and part of Ekiti	Benin
Eko Electricity Distribution Company	24/25 Marina, Lagos	Lagos	Eko
Enugu Electricity Distribution Company	No 12 Station Road, Okpara Avenue, Enugu	Enugu, Abia, Imo , Anambra and Ebonyi	Enugu
Ibadan Electricity Distribution Company	Capital Building, 115 Ring Road, Ibadan	Oyo, Ogun, Osun, Kwara and part of Ekiti	Ibadan
Ikeja Electricity Distribution Company	Secretariat Road, Alausa, Ikeja	Lagos	Ikeja
Jos Electricity Distribution Company	No 9 Ahmadu Bello Way, Jos	Plateau, Bauchi, Benue and Gombe	Jos
Kaduna Electricity Distribution Company	Nagwamatse Building, Ahmadu Bello Way, Kaduna	Kaduna, Sokoto, Kebbi and Zamfara	Kaduna
Kano Electricity Distribution Company	No 1 Niger Street, P.M.B. 3089, Kano	Kano, Jigawa and Katsina	Kano
Port Harcourt Electricity Distribution Company	No 42 Obiwali Road, Rumuigbo, Port Harcourt	Rivers, Cross River, Bayelsa and Akwa Ibom	Port Harcourt
Yola Electricity Distribution Company	No 2 Atiku Abubakar Road, Jimeta Yola	Yola, Adamawa, Borno, Taraba and Yobe	Yola

Source: Nigeria Electricity Regulatory Commission (2016)

As can be observed from table 2.5 above, apart from the Discos in Ikeja and Enugu, the Discos cover at least 3 or more areas in the country. It can also be observed that Lagos alone is covered by 2 Discos exclusively. All of these Discos are public limited companies (Plc). Since its privatisation in 2013, electricity distribution in Nigeria has been undergoing sectorial reforms all aimed at ensuring reliable and effective distribution of electricity in the country (Amoda, 2013). Some of these reforms include the change of Disco names and web addresses. Also, some of the reformations include the possibility of investors in Discos to enlarge and extend their operations into other Discos. According to the Managing Director of the Eko Disco, with the privatisation the electricity generation capacity in the country is expected to go up in coming years. This will enable the provision of more bulk power available for a distribution companies to provide supply electricity for more hours to its customers (Amoda, 2013).

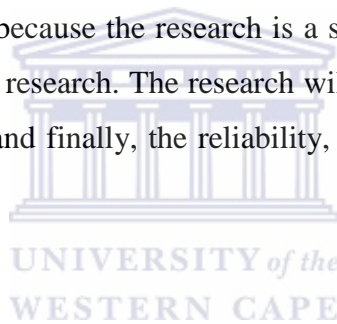


CHAPTER 3

RESEARCH METHODOLOGY AND DESIGN

3. INTRODUCTION

The previous chapters discussed and explained concepts, theories and also reviewed literatures that will be very beneficial in understanding electricity distribution in Nigeria from the management perspective. This chapter focuses on the research methodology and design. It is going to discuss the method that will be used in carrying out this research, the approach applied and the data collection technique used. *Secondary data* is the data collection method that will be used in carrying out this research because the research is a secondary research and hence, there will *no questionnaires* used in the research. The research will also explain the sampling method used and applied in this research and finally, the reliability, validity and limitation of the study will be included,



3.1 Research Methodology

It is important to understand the meaning of a *research* before proceeding to explain the research methodology and design. There are many definitions and explanations of the word research. For the case of this study, I will examine and explain a few definitions of research that is relevant to this academic discipline. According by (ORA/IRB, 2009: 1), *research* is a systematic investigation which includes research development, testing and evaluation which is designed to contribute or develop to the general knowledge. This definition is applicable to this study because this research has been framed and designed to be able to contribute to the general public and to Nigeria in particular on how to manage the distribution of electricity in the country.(Rajasekar, Philominathane & Chinnathambi, 2013: 2) define *research* as a logical and systematic search for new and useful information on a particular topic. This definition is also very relevant to our work because the research is searching for new and useful information that will be relevant to the management of the electricity distribution in Nigeria for better performance and efficiency.

There are many types of research and this research is *applied research* because it is a research which aims at finding an immediate problem facing an industry, society or business organization. As will be explained below, the research is also a *qualitative and quantitative* research as secondary data together with secondary figures will be used in the latter stage of the research in doing this work

3.1.1 Research methodology

Research method is different from research methodology and it is all the methods and techniques that are used in carrying out a research. They are the methods that the researcher uses in performing the research. (Kothari, 2004: 7-8).

Research methodology is a way of systematically solving the research problem. It is the science of studying how research is done systematically (Kothari 2004:7). In explaining research methodology, it is not only about the research methods and techniques that are used but also the logic behind the methods that is used in the context. The research should be able to explain why a particular method or technique is been used and not the other so that the results of the research can be able to evaluated by the researcher or someone else (Kothari, 2004:7).

Polit & Hungler (2004:233) defines **methodology** as the ways of obtaining, and analysing data. Decisions taken during methodology depend on the research question. By understanding the research question, a proper methodology decisions are taken to effectively carry out the research.

The purpose of this research to understand the distribution of electricity in Nigeria from the management perspective. It is disturbing that although so many resources have been spent on the electricity sector of Nigeria to ensure that Nigerians have access to electricity, many millions of people in Nigeria till date to not have access. The privatisation of electricity sector has mandated the distribution duties of electricity to certain companies and this research is going to examine how effective the management has been in carrying out their duties of electricity distribution.

Although this research making use of *secondary data only*, it will make use of mixed method as both the qualitative method and quantitative techniques will be used in carrying out this research. Both qualitative and quantitative techniques will be used because the researcher will collect secondary data from internet, books, journals, and magazines. This will include writings, figures and chats. The figures and chats will be examined and analysed so as to come out with reliable results. This makes up part of the quantitative technique that will be used. This method will help the researcher to come up with a reliable conclusion on how effective the management has been on the distribution of electricity in Nigeria by the Distribution companies (DISCOS).

3.1.2 Qualitative research technique

The qualitative research technique will be used in carrying out this research given that it is a desktop research. The data and Information that will be used in carrying out this research is secondary data which are from reliable work that has been done by others. This information will be taken from books, journals, articles, the internet and government Gazettes and report.

Qualitative research involves ideas, thoughts and opinions about the research that is being carried out. Qualitative research techniques help to gain an understanding of motivation, opinions and reasons. It also provides insight into a problem and helps to develop ideas or hypotheses for potential quantitative research (Wyse, 2011). This research is based on different forms of evidence, such as verbal, written, stories and so forth, not easily reducible to numbers. For the purpose of this research, reliable sources from books, journals, articles, newspaper and the internet will be used in carrying out this research. The research problem will be understood clearly and recommendations will be made.

Qualitative research techniques tend to focus on how people or group of people can look at reality differently or from different ways. Qualitative research focuses on reports of experiences and they cannot be adequately expressed numerically. It studies behaviour in natural settings or uses peoples accounts as data and do not usually manipulate variables. (Hancock et al, 2009: 6).

According by (Hancock et al, 2009:6), qualitative research might lead to the development of other concepts, theory or evaluation of an organizational process because it focuses on description and interpretation.

Also, (Greenhaigh & Taylor, 1997) explains that a qualitative research aims to make sense of, or interpret phenomena in terms of the meanings of people bring to them. It will address the problem through a clearly formulated question and using more than one research method. Analysing a qualitative data can and should be done using more explicit, systematic and reproducible methods.

Qualitative research as a loosely defined collection of approaches to inquiry, all of which rely on visual, auditory, verbal and gustory data (LeCompte & Preissle, 1994: 141). It is based on and grouded in descriptions of observations. These descriptions address the fundamental question of what is happening here? And most of the research designs are intended to address these questions. It can be asked about anything like ordinary ocurnaces, circumstances puzzling to some investigator and extraordinary events.

According by (Ritchie & Preissle, 2003), qualitative research is used to address research questions that require explanation or understanding of social phenomena and their contexts. They are well suited in complex issues and studying processes that occur over time.

It is should be noted that qualitative and quantitive research are not two opposite concepts and should not be treated so differently because they both have the same end goal to answer research questions.

Those practicing qualitative research places emphasis and value on the human, interpretative aspects of knowing about the social world and the significance of investigators on interpretations and understanding of the phenomenon being studied. (Ritchie & Preissle, 2003). In qualitative research, the researcher is able to thoroughly investigate what is happening in particular case in which little is known about what is going on.

3.1.3 Quantitative Research technique

Due to the facts that the research is a secondary research, majority of the research will be carried out as qualitative research. However, it is important to understand and know the meaning of quantitative research because it will be used sparingly as this is a mix research. Like qualitative research, many scholars have different definitions of quantitative research.

Quantitative research techniques include the collection of data (in figures) with the aim of analysing them by applying different forms of statistical analysis, such as regression analysis, and so forth (Tustin, Ligthelm, Martin & Van Wyk, 2003:89; Cant, 2003: 144). In this research, figures obtained from the end of year reports of the PHCN will be evaluated and analysed before conclusion is made. These figures may include the amount of people electricity was distributed to in each state in a year, amount of money spend each month by the distribution companies, quantity of electricity that was distributed in a particular area per year and so forth

According by (Acaps, 2012: 4), quantitative research is the collection of information which can be analysed numerically and the results can be presented as graphs, bar chats and statistics. Acaps (2012:5) says that the aim of a quantitative research is to test a pre-determined hypothesis and produce generalized results. Due to the fact that Quantitative data is numeric, the collection and analysis of data from the representative samples is more commonly used.

Some advantages and disadvantages of a quantitive data by (Acaps, 2016: 6) is that a legitimate quantitative data is data that is collected rigourously, using the appropriate method and analysed critically is in its reliability. He further states that the most shortcoming or disadvantage of a quantitative data is that it fails to bring out in-depth description of the effect of the problem (Acaps, 2012: 6).

Quantitative research focuses on gathering numerical data and generalizing it across groups of people (Sibanda, 2009). In a quantitative research, the research has a clear defined research question in which the research is soughting to answer. (Sibanda, 2009) further states that all the aspects of the research are carefully and precisely designed before the data collection and the numbers are inform of numerical and statistics. It can be used to widely generalize concepts and future results.

3.2 Study design

According by (Sibanda, 2009), an appropriate study design is essential in ensuring the validity of the results that you will eventually report. A good study design consist if the a good research question and the hypothesis. The research questions are questions that you are trying to answer in your research or project. Most times, the research question can be divided into the main research question and the sub research questions. (Sibanda, 2009) furthers says that the research question must be specific and such that it is easy and direct to answer when carrying out the research bearing in mind the constraints of time and resources. A good research question should start with a broad area of the research interest before it is been narrowed down and making sure a good knowledge of the literature is known as this is very important in drafting the research question.

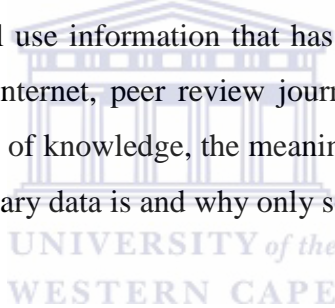
Research hypothesis is a statement that can be proved or disproved (Sibanda, 2009). This is very important because at the end, the statement that is made as the hypothesis need to be prove or disprove depending on the final outcome. Most often, research questions can be made into a hypothesis by changing the research question in to a statement (Sibanda, 2009)

(Welman et al. 2008:52) describes a research design as a plan according to which subjects or participants are obtained and data is collected from them. This is similar to (Parahoo, 1997: 142) definition of research design as a plan of how, where and when data are to be collected and analysed. It is the overall plan for connecting the research problems to achievable empirical data. It articulates what data is required, methods to be used for collection, data analysis and how its going to answer the research question.

Furthermore, (Burns & Grove, 2003: 195) defines research design as the blueprint in which study is conducted, having maximum control over the factors that may interfere with the validity of the findings. The data and method and the way they are configured in the research project need to be most effective in producing the answers to the research question. It is the researcher's overall method in answering the research question or testing the research hypothesis

3.3 Data collection

After examining the research design and what research design is, the data collection process is very important because it gives the readers the method or way the data collection process will be carried out. It is important for the data collection process to be carried out effectively because it is needed to meet the information requirement of the study and a great breakthrough in solving the research problem. It should be noted that *only secondary data* will be used in carrying out this research as the researcher will use information that has been primarily collected by others from sources such as books, the internet, peer review journals, magazines and newspapers to carry out the research. For the sake of knowledge, the meaning of primary data will be explained along when defining what a secondary data is and why only secondary data is used.



3.3.1 Primary data

Primary data is the firsthand and original data that the researcher collects to do his or her research. It is considered as the original or firsthand data from the direct source which is specifically purposed for the research. It is considered as raw material and originals in character. For the purpose of this study, primary data will not be used here as only secondary data will be used in this data. (Driscoll, 2011: 154) says that primary research is based on the principles of the scientific method and using scientific method; researchers develop research questions or hypothesis and collect data on people, events and objects that is observable, replicable and measureable.

3.3.2 Secondary data

Given that the researcher will be relying on secondary data to carry out the research, it is important to give a clear understanding of what secondary data is and why it is important in this research. (Hox & Boeijie, 2005) state that, secondary data can be used to answer some social research questions by using data collected earlier by other researchers for other purposes than research. Any type of primary data can serve as secondary data by virtue of being archived or made available. (Sutehall et al. 2010) describes secondary data of qualitative research as the use of data that is existing to find answers to research questions that are different from the questions asked in the original research. Secondary data analysis is very important when carrying out a research. As early as 1963, (Glaser, 1963: 11) said that “secondary data analysis carried out by an independent researcher can above all things lend new strength to the body of fundamental social knowledge”. This gives a useful importance of secondary data analysis as it can always add knowledge to the existing research that has been carried out by the topic or other related topics. With secondary data analysis, the data can be reanalyzed so as to solve the research problem. In this research, the secondary data will be used to answer the research question and solve the problem. Additionally, the secondary data that will be used will be taken from books, journals, articles, the internet and from archived document from government gazettes. These data will be analysed and re-analysed where necessary to get the required results for the causes of the problems associated to the distribution of electricity in Nigeria and the options for the future.

3.3.2.1 Sufficiency for using secondary data

Secondary data only in this research because;

Electricity crisis has been going on in Nigeria for a long time and a vast amount of research has been done on this which are available online, in peer review journals and other accessible forms. With the current technological advances, it will be easier to collect, compile, archive and access vast amounts of data for this research.

Also, secondary data analysis saves time, is more convenient and economical. Given that no funding was made available to carry out this research, it is more convenient, economical and will save a lot of time using available secondary data in carrying out this research.

3.4 Methods of data collection

Method of data collection is the means by which data is collected in carrying out this research. Having carefully stated above that the research will use *secondary data only*, this will limit the researcher to getting information online, text books, published articles and journals, government gazettes, magazines and any information found useful by the researcher in carrying out the research. The internet contains lots of unorganized information connected to the distribution of electricity in Nigeria from the management perspective. The researcher will carefully select the relevant and useful information from the internet to use conduct this research. There are also many books, journals and articles that have written about the distribution of electricity in Nigeria and forms of management. All these books, journals and articles will be carefully read and vital information or data related to this research will be selected and used.

3.5 Population and Sample size

According by (Hanlen & Larget 2011: 7), a **population** is the total number of all the individuals who have certain characteristics and are of interest to the researcher. A **sample** is a subset of the population. It is selected from the population. A sample is important because it is impossible to study the whole population as it is too costly and time consuming. Hence, a selected sample ensures that the whole population is represented (Hanlen & Larget 2011: 7),

The management of electricity distribution will be analysed with various aspects being analysed with reference to the various distribution companies where appropriate. The reason why a general analysis is done is because the 11 DisCos in Nigeria are centrally monitored and governed by PHCN and the National Electricity Regulatory Commission although they are private entity. They however have different leaders, are located in different areas, serve different regions in addition to other aspects that may be unique to each of them. Thus an analysis of their management will be done in general and reference will be made to particular DisCos where appropriate.

3.6 Research Procedures

Permission has been obtained from the University of the Western Cape by the researcher before carrying out this research. The Ethic Committee of the University of the Western Cape has also given clearance for the Research to be done.

3.7 Limitation of the study

There are some limitations to this research. Due to the fact that the research is a secondary research, the researcher is relying on secondary data only and not firsthand data and this makes it difficult to find certain information online or in books and those found might not be hundred percent accurate. Figures and certain informations are not really seen online or on text books probably because the companies do not want to give some of their informations to the general public as they see the informations as confidential. Many of the distribution companies do not really put adequate informations on their website and hence it is very difficult for the researcher to get information pertaining to the management of the distribution of electricity in Nigeria.

3.8 Data Analysis

According by (Hatch, 2002: 148), Data analysis is a systematic search for meaning. It is the way that qualitative data is been processed so as to communicate what has been learned to others. The pieces of data have to be carefully labeled and organized in such a way that eases ongoing analysis. Data from various sources are gathered, reviewed and analysed to form a particular finding and conclusion.

Data analysis is the process of bringing order, structure and meaning to the mass of collected data (Marshall & Rossman, 1990: 111). It is the search for general statements about relationships among categories of data. The data analysis that is done depends on the data that is gathered.

Various data and useful information about how distribution companies are been managed is been derived. The next chapter is carefully going to analyse them to see how effective the management is and feedback will be given on the results found.

3.9 Summary

This chapter has in detail discussed the methodology of this research. The data collection methods, population and sample size, data analysis procedures and interpretation have all been discussed. The chapter also covers the limitation of the study. The results of the interpretation and the analysis will be done in the next chapter.



CHAPTER 4

Data presentation and Analysis

4. Introduction

The previous chapter presented a discussion on the research methodology and the method of data collection used in this study. It was clearly stated that only secondary data will be used in the research and the data will be collected from text books, articles, journals, magazines, government gazettes and from reliable electronic sources. Below are the research objectives that were outlined in chapter 2 of this research

- Analyse the planning of PHCN and its DisCos (electricity distribution companies) to determine the efficacy of plans
- Highlight the management challenges in the distribution of electricity in Nigeria
- Discuss the availability of qualified personnel
- Discuss the leadership stability or lack thereof on the distribution of electricity in Nigeria
- Present findings on PHCN institutional ability to deliver on its mandate
- Draw conclusions and make recommendations

Guided by the research questions and objectives, this chapter is presented as the core of this study.

As described chapter 2, the functioning of electricity distribution companies in Nigeria, faces managerial challenges ranging from lack of qualified personnel or inadequately skilled workforce; challenges related to funding which arises from the inability of the organisation's management to raise sufficient capital; and tariff challenges/revenue shortfalls arising from the management's insufficient efforts to raise revenue (Omonfoman, 2016). Employing the concept of organisational change presented as the conceptual framework in chapter 2, this section analysis secondary date to further examine the managerial challenges that exist in the distribution

of electricity in Nigeria. Analysis in this chapter are guided by the research study objectives outlined in chapter 1 and classified under the following headings: - the management of PHCN, the effectiveness of the management of the DisCos in managing the distribution of electricity in Nigeria and the effectiveness of the Nigerian Reform policies to aid in the distribution of electricity. Based on the findings, from a management perspective, recommendations will be made that can contribute to an improvement in the distribution of electricity in Nigeria.

4.1 Planning of PHCN and its Distribution Companies

4.1.1 Futuristic Planning and Projection

There exist insufficient futuristic planning and projection within PHCN as a whole and especially within the management of DisCos. This problem is most especially exhibited in projections about electricity supply in the country (Olawale et al, 2009). The management has not demonstrated their ability to make long term innovative plans which that will sustain and improve the electricity distribution in the country. Lack of futuristic planning and projection in the supply and distribution of electricity can be seen in the little or no improvement in the proportion of households with access to electricity in the country since the early 1990s (Energy Commission of Nigeria, 2016). According to the (World Bank, 2013) statistics of access of Sub Saharan Countries to electricity, 41.8% of Nigerian Households had access to electricity in 1990. In 2016, the percentage of households with access to electricity in Nigeria is still slightly less than 50%. The idea of reformation of the Nigerian Power Sector in 2005 was mainly to overcome the ineffectiveness and inefficiency of the state management of this entity and increase the access of households to electricity. Evaluating a few years later, these objectives have not been fully met as about half of the population of the country do not still have access to electricity in 2016 and depend heavily on generators for power (Energy Commission of Nigeria, 2016).

Privatisation of the National Electricity Company has made relatively insignificant changes as a result of the management's inability to respond to the ever changing needs of the growing population thus still exhibiting inefficiency in planning. With Population growth and increase in demand for electricity over the last 2 decades, it will be expected that there will be an increase in the number of distribution companies to serve different areas of the country but this has not been

the case. There have been only 11 distribution companies since the privatisation of the sector and this clearly has not been enough in solving the problems of power distribution in Nigeria..

Lack of futuristic planning also presents itself in the metering challenges faced by consumers in the past 2 decades. Between 2013 and 2014, a percentage of 83.2 households with access to electricity had metering complains (PWC, 2016). Metering problems include problems with billing consumers where estimated billing is done due to the absence of an electricity consumption meter to provide accurate readings. About 65% of these complains were centred around the households not being able to see their meter readings due to faulty meters that have not been replaced or the installation of electricity in households without meters (PWC, 2016). In addition to this, a recent review done by NERC to analyse the plans of DisCos at their inception in 2013 show that they are not adequately meeting their goals and objectives. With regards to metering, the table below presents the findings on the proportion of consumers with and without meters within the 11 distribution companies by March 2016

TABLE 4.1 CONSUMER METERING

Electricity Company (DisCos)	Distribution	Customer base	Customers with Meters	Customers Without Meter
Abuja DisCo		635,980	421,812	214,168
Benin DisCo		762,974	520,702	242,272
Enugu DisCo		737,423	220,088	517,335
Eko DisCo		407,285	232,908	174,377
Ibadan DisCo		1,247,187	535,927	711,260
Ikeja DisCo		667,931	453,927	214,358
Jos DisCo		329,858	168,644	161,214
Kaduna DisCo		351,359	219,201	132,158
Kanu DisCp		399,708	148,576	251,132
Port Harcourt DisCo		368,311	219,914	148,397
Yola DisCo		256,759	65252	191507

Source: Alohan, 2016

As can be seen from the table 4.1 over 50% of registered consumers do not yet have installed meters; contrary to some of the goals and objectives of the DisCos which was to install meters for all registered consumers in their first year of operation. It has been 3 years now since the creation of DisCos and an estimated 2.9 million registered customers remain without meters. Metering is critical in ensuring that consumers pay for the energy that they consume. The absence of meters has led to a plunge in the revenue of DisCos and the electricity sector as a whole. With a plunge in revenue, distribution operations are bound to suffer as cost are not being covered by revenue.

In addition to this, consumers are being given estimated billing, poor meter maintenance and huge metering gap. It was hoped that the unbundling of PHCN into successive companies like the DisCos should by now solve the metering challenges affecting the electricity sector. Estimated billing stimulates resistance from households to pay their electricity bill based on the fact that they have not seen their meter readings. For other households without meters that pay, the pay is based on “what they feel like paying” (PWC, 2016: 11). The reasons for lack of household meters are many including unavailability of meters during electricity installation, lack of technicians to install meters properly. Despite these vast numbers of problems that may account for lack of meter, there is an indication of lack of futuristic planning that is there are inadequate plans for stocking up of meters in anticipation of future demand.

Based on the concept of organisational climate by Kurt Lewin explained as the framework for analysis in chapter 2, PHCN and Electricity Distribution Companies operate in a “turbulent environment”. Recall the definition by (Gaurav, 2010) of a turbulent environment. Nigeria is a highly complex country with different ethnic groups like the Yoruba, Igbo and the Hausa with variation in culture (Olaniyi, 2014: 233). The country is experiencing changes in its economy and demography and with growth in its social and cultural industry; it is affected by foreign culture (Olaniyi, 2014: 233). The existence of the DisCos in a turbulent environment explains to an extent the problems faced by the management of the DisCos. The complexity of Nigeria and the ever changing environment affects the functioning of the organisation as whole and especially the ability of its management to make decisions. This disrupts the organisation’s operations including the activities of the distribution companies. Complexity is also reflected by the constant change in policies, ideas and laws by the government of Nigeria. Nigeria

experiences a change in government every 4 years, a change which most often comes with a cabinet reshuffle and modification of policies in place. This has the potential to influence the management and functioning of government and privately managed entities like the electricity Distribution Companies as it makes it difficult for implementation of plans to take place (Ike, 2015: 1). Continuous change of government, laws and policies does not promote long term planning.

4.2 Managerial Challenges

The challenges faced by the distribution companies are many and varied and include both internal and external challenges. This section, however, discusses some of the challenges from the internal and external environment that affect the management of the organisation; this analysis is done in an attempt to meet the second research objective.

4.2.1 Infrastructure and organisation

Electricity distribution is also hindered by aging infrastructure, incapable of carrying and supplying the right amount of electricity demanded by consumers. This also is classified as a planning oversight for DisCos (KPMG, 2014). In well thought organisational plans budgets are set aside as depreciation and replacement cost for fixing and repairs, replacement of old equipment's and upgrading of capita; resources so as to meet up with the increasing demand and changing environment (PWC, 2013: 11). According by (Ogah & Onyewuchi, 2016), the DisCos are unwilling to invest in infrastructures. In addition to this, poor future planning can be seen in the structure that does not make provision for depreciation or replacement of obsolete equipment. According to the (Nigeria Baseline Power Report, 2015: 3), the Nigeria Distribution Companies lost about 46% of energy due to technical, collecting and commercial challenges. This loss reduced the amount of energy generated and subsequently distributed. Planning of this companies does not make provision for depreciation and replacement of obsolete equipment as the equipment used can be described as old and worn out. Additionally, the same equipment and number of equipment have been used for distribution since the creation of these companies in 2005, meaning that, they have not been increased to match the growing demand for electricity in the country. With obsolete equipment, the distribution of electricity is interrupted.

There is an 8000MW deficit of power supply in the country as consumer demand for electricity stands at 12000MW against 4000 MW only which the DisCos can supply. This figure could be improved if the DisCos could invest more on infrastructure. The Ikeja DisCo can only supply between 370 – 425MW from the grid as against its demand of 1250 MW (Ogah & Onyewuchi, 2016). All these variations in figures could have been less if the DisCos can invest more on its infrastructures. Lack of effective top managerial skills is also presented as effective managers will refer to people who can forecast and make effective future plans. In most cases, effective leaders will have a team that can forecast and make these plans. Not only is the use of obsolete equipment a reflection of poor strategic planning but also a reflection of inefficiency of the staff/management. The ageing infrastructure, equipment and resources pose a threat to the electricity sector because it affects its production and supply. This clearly has a direct/indirect negative impact on the revenue and the economy of different sectors of the economy as a whole but most especially those highly dependent on electricity.

The complexity of PHCN is manifested in different forms including aspects such as the bureaucratic nature of the organisation where decision making goes through a rigid process. The existence of bureaucracy hinders timely decision making and implementation of plans because approval goes through long process (Olugbenga et al, 2013: 36-37). The highly complex and bureaucratic nature of PHCN also has the ability to influence decision made with regards to replacement of equipment. Decisions go through a long and generally hectic process to be made. Decisions on replacement of equipment as mentioned above for example may require the approval of more than 1 top employee which may take a few months to years. Such systems weaken the proactivity of employees and in some case their anxiety to add value to the organisation with regards to the affairs of the state.

4.2.2 Communication between the distribution companies and their consumers

With reference to its existence in a highly turbulent and complex environment, PCHN and its DisCos have to deal with the constant destruction of electricity distribution channels such as pipes that distribute and even the meters of the DisCos. These are destroyed through acts of theft or even riots and strikes against the organisation. This constant violence and destruction has been a major problem affecting the electricity industry and it has greatly affected the volume or amount of electricity available to be distributed to consumers. This point informs us of a security

problem that exist, where there is no adequate security mounted around infrastructure. The management of the distribution of electricity in Nigeria and the PHCN in large have failed in putting in place structures that will ensure the security of infrastructure that will facilitate the effective distribution of electricity.

Poor leadership is also exhibited here, where the organisation's leaders do not properly communicate with their customers using various channels when there is need. According to (KPMG, 2013: 24), consumers in areas like the Niger Delta feel that the leadership of the DisCos and the PHCN has neglected them despite their land contributing greatly to the GDP of the country from the mineral resources available in it and that is the reason for the constant violence and destruction of pipelines which greatly affects the efficiency of the DisCos in delivering services. Vandalism and destruction are ways of expressing their frustration towards the government and it has greatly affected the distribution companies negatively and contributed to the inefficiencies that exist in the distribution of electricity given that destroyed resources need to be replaced which takes time and financial resources which may not be available. About 78% of power supply in Nigeria is from gas pipelines and there has been recent vandalism on the pipelines despite the country reaching its generating peak of 5074 megawatts of electricity on February 2nd 2016. That "honeymoon" period of electricity generation has been followed by months of vandalism of gas pipelines causing increase in blackouts in the country (Alike & Okafor, 2016).

Vandalism of electricity distribution resources is something that can be avoided and controlled if more supervisory; control and leadership measures are put in place.

4.2.3 Employee supervision

With reference again to Lewin's turbulent complex environment there exist a continuous connection between resources in Nigeria and the environment. This connection demands that the technicians and engineers should constantly be in the field making sure that everything is going on well so as to ensure proper delivery and distribution of electricity to the consumers. However, this is not normally the case because qualified technicians are never in the field to do the repairs and installations (PWD, 2013 :11). In addition to this, technicians assigned to this task, most often are not supervised enough to regularly perform their roles. The distribution of electricity is

a technical job that requires field work where technicians and expertise are expected to regularly be in the field ensuring that electric poles, electricity pipelines, meters are in good condition and attending to the concern of the customers. This however is not the case demonstrating a problem with the organisation's control of human resources as it is possible to see electric fallen electric poles which stay fallen for a month with no technical intervention. The case mentioned earlier of faulty meters for reading electricity consumption is also evidence of lack of a maintenance team on the field to respond to maintenance issues. All these contribute to the loss of confidence in the system by consumers pushing them refuse to pay electricity bills and look for alternative sources of power leading to a decline in the revenue of PHCN and thus hindering its operations as a whole.

4.2.4 Corruption as a management challenge

Corruption is also one of the challenges affecting PHCN and DisCos over the years. Nigeria has been ranked by (Transparency International, 2015: 7) as the 137th most corrupt country in the world. Corruption and embezzlement of funds has also affected various industries in the country including the DisCos. Corruption as a management problem in this sector is due to the poor governance in the sector as top management officials are more concerned with personal profit than working to meet organisational goals. From 1999 to 2016, Nigeria has had 7 ministers of Power and Energy, all who have corruption and embezzlement charges levied against them (Alabandan et al, 2015). \$16 billion was budgeted during the regime of Liyel Imoke who was Nigeria Power minister from 2003 to 2007 for the reformation of the power sector and after his reign, there was no reform, the sector was rather mark by constant corruption allegations. Forms of corruption that takes place in this organisation in addition to embezzlement of public funds (Olugbenga et al, 2013: 38) also include ghost workers where people are been paid salaries but never showing up for work, mismanagement of funds where the management misuses funds available for other non-relevant issues and nepotism (Olugbenga et al, 2013: 38).

The embezzlement of public funds/funds allocated for the power sector reformation means that financial resources that are meant to be allocated for distribution are diverted for personal gains. Both foreign and national investors are being scared away by the high level of corruption as they feel like their money will be mismanaged and they will not get a good return or value of their money. The high level of corruption has also made it impossible for repairs to be done,

replacement of old equipment and to make proper use for depreciation funds. These ills are possible only because there are no adequate monitoring and evaluation, auditing and supervisory structures in place.

Although auditors are assigned to audit the DisCos regularly which expose the inappropriate activities of some leaders, very little action is taken against them as the same challenges that are occurring are the same challenges we have been facing with the electricity sector over the last decade. There are still blackouts in many parts of Nigeria as many areas especially the remote areas do not yet have access to electricity. In most cases, funds allocated for this have been swindled. All these malpractices and lack of proper government follow up and auditing over the years has greatly increased the corruption level in the industry. This has also greatly affected the amount of electricity made available to the DisCos for distribution and hence the revenue generated is affected negatively. Corruption is the main factor affecting the management of the PCHN and the DisCos

4.2.5 Dependence on Wind and Water as sources of electricity

As a turbulent complex environment, DisCos in Nigeria operate in an environment where there is cross reliance of resources. In addition to other things, this means that the functioning of one sector depends on resources in another. Over dependence on wind and water (hydro power) shows a planning mismanagement within the management of the DisCos and the PHCN. While developed nations have carried out research and invested in other forms of energy to produce electricity, the Nigerian electricity sector relies on the traditional method of hydro power. Even with the introduction of the DisCos, little has been done by the management to enhance other means of supplying electricity to the consumers. With the general changes in climatic conditions affecting various countries across the globe, Nigeria has been experiencing change of weather in recent years due to the global warming and the effects on the industries polluting the area. This has greatly affected the amount of water and rainfall in the country over the past years as the country has been experiencing longer droughts in some parts of the country. According to (Obot et al. 2010: 2222), the total amount of rainfall across Nigeria has been on a decrease recessing it to drought conditions in Northern regions. The drought condition also has the effect of reducing the amount of water in the dams to generate energy for electricity and hence has negatively affected the amount of water that is available to harness the electricity. The effects of insufficient

water and use of hydro power on the availability and supply of electricity could have been prevented by increase implementation and use of other means like solar energy and others. This has not been the case as there has not been sufficient investment by the authorities in alternative sources of electricity (KPMG, 2013: 24).

Referring again to the concept of organisational climate, Nigeria can be described as a rapidly changing environment, experiencing changes in various sectors of the economy. According to (Chete et al. 2012: 5), products from primary activities have been the main source of GDP in the last five decades, mainly products from agriculture, quarrelling and mining as they contributed 70 % to GDP at independence. Their combined contribution declined to 55.3% in 2011 which still shows that more than half of Nigeria GDP is still generated by primary products. This is in indication of a sluggish transition from primary sector to secondary and tertiary as contributors to the GDP (Chete et al. 2012: 5). As a country where the production of electricity depends on two dynamic aspects, climatic conditions and the government influence, the production and supply of electricity is bound to be affected. Regular government and management changes affect the long term planning of the organisation as plans that have been put in place by the previous management and government are revised or replaced by new policies and plans by every new management and government (Onochie et al. 2015: 499). This therefore makes it difficult for long term strategic planning to be put in place effectively.

The over reliance of PHCN on hydro power has therefore failed in realising the full potential of the amount of electricity that can be generated and distributed. There has not been adequate investment in alternative sources of electricity despite the potential of other means like solar energy. (Ohunakin et al. 2014) says Nigeria is endowed with abundant deposits of renewable solar energy from the sun. It is vastly deposited with an estimated 17,459,215.2 million MJ/day falling on Nigeria's 923,768km² land area This shows management of DisCos inability to adequately enforce other ways in which energy can be obtained and be distributed to Nigeria which indicates a flaw on the part of the management.

4.2.6 Marketing

Another management failure which has hindered the efficient functioning of the Distribution companies is inadequate marketing. Inability to properly market the DisCos and their products is a management challenge. It is a management challenge that can be associated to no proper organisation, control and even planning. An effective management has a good marketing team, tasked with marketing the organisation's products and services. However, this has not been the case as the distribution companies have not been able to carry out proper marketing of their services. Operating as part of a monopoly, Discos may not need to market their products and service, but this also raises questions as to whether the products and services are worth marketing. This question is posed due to the lack of confidence in the Nigerian electricity sector by the Nigerian population demonstrated by increase in the use of alternative sources of electricity by households and companies – generators and solar panels. It is estimated that over 90% of Nigerian businesses that use electricity have generators (Darling, 2008: 8). The lack of confidence is also demonstrated by the boycotting of payment of electricity bills, vandalism of pipelines for distribution and also the destruction of the meters.

The existence of Nigeria in an environment described by the concept of organisational climate as a turbulent and highly complex environment requires that DisCos put in place an efficient and effective marketing unit. A marketing department amongst other things ensures that the organisation stays on top of its game in producing services that meet the changing requirements of the environment.

Also, looking at the organisational climate environment, the connection between the people and the resources in the environment shows that the environment (Nigeria) is ever changing and that change ranges from the constant changing of leadership that leads to changes in the policies in place (Onochie et al, 2015: 499). It can therefore be concluded that the management has failed to organise a good team for proper marketing which has affected its revenue and output negatively.

4.2.7 Customer Relations

The provision of services within this organisation is characterised by poor customer relations (Onochie et al, 2015: 499). This is a control function that has not been handled properly by the

management of the DisCos. As part of the control function, management ensures that, all clients are properly catered for and that their queries are handled properly. Insufficient customer satisfaction is demonstrated through regular power out stages and general complaints from unsatisfied clients. They are being neglected as many of them are always having electricity interruptions and sometimes go without electricity for days because the injection substations and distribution substation transformers are overloaded (PWC, 2013: 11). This growing uncertainty and the inability of the management to properly control and manage clients' consumers shows inefficiency and flaws on the part of the management of the DisCos.

Below is a three month complaint statistic released by NERC on the registered complaints of customers in two electricity distribution companies.

TABLE 4. 2

3 months (January 2015 – March 2015) complain statistics from 2 distribution Companies

Discos	Total number of complains	Complains solved	Complains not solved
Ikeja	30,084	20819	5262
Abuja	9710	8908	802

Source: NERC, 2015

From the above table 4.2, it can be deduced that out of the 39,794 registered complaints at the Ikeja and Abuja DisCos, about 6,064 of them were never solved. This is a huge amount of complaints not solved probably due to lack of resources or just management negligence. However, such consumers will not be happy and these are some of the reasons for the complicated relationships between the consumers and the distribution companies.

By taking into consideration the concept of the organisational climate, it is important to understand the environment the DisCos are operating and to see if they have an influence on the way the management is operating with regards to controlling the customer data. The high complexity of the DisCos makes it difficult for things to be organised properly as staffs do not really do their job well due to no communication, commitment and expertise.

4.2.8 Gas Supply.

There exists the problem of high gas prices which affected the ability of the PHCN to afford the sufficient amount of gas needed for the operations. This problem is also linked to the inability of PHCN to negotiate lower but attractive prices of gas with gas producers and suppliers. According by (PWC, 2016: 6), gas is said to be the leading fossil ahead of oil by the year 2040 and Nigeria is the 8th highest country in the world in terms of gas reserve. However, economic growth and development is increased when the gas is being used and not reserved. Half of Nigeria gas is wasted, while only 15% is used and 30 % is exported. This shows that the gas is not used well although they depend a lot on it (PWC, 2016). The current government policy obliges gas suppliers to sell gas at the lowest possible price to PHCN. This is unattractive to suppliers as they tend prefer selling gas to other organisations they have contracts with that buy at a higher price (Onochie et al 2015: 499). Thus this hinders PHCN from receiving the quantity of gas they need for the smooth running of the operations the DisCos. The policy of selling at reduce price to the PHCN is detrimental to the operations and this has negatively affected the way the sector operates (Onochie et al. 2015: 499).

The policy in place for gas to be sold at a reduced price to PHCN despite the fact that other customers are prepared to pay higher for it is a characteristic of a turbulent environment. It also presents a flaw in the policy by the government and the PHCN leadership. All these hinder the ability of DisCos to effectively distribute electricity

4.3 Availability of Qualified Personnel within Discos

One major problem affecting the distribution of electricity by the DisCos is the lack of investment in man power or qualified personnel (KPMG, 2013: 23). When the electricity distribution company was to be privitised, many people were excited because they thought the competent staffs will be employed by the DisCos, however, this has not been the case as many of the incompetent staffs of NEPA are retained by the PHCN and its DisCos through the backdoor (corruption) (Ohajianga, 2014: 54). The existence of corruption in the system hinders the employment of qualified personnel. Contrary to what existed before where the distribution of electricity in Nigeria did not require individuals who had received some kind of formal training, this is however not the case today. Increasingly individuals are receiving formal training and qualifying as personnel with skills to take up roles as electricians. However, the existence of

nepotism within the organisation makes it possible for highly qualified technicians and administrative personnel to be side lined for the relatives and close friends of top management officials. People are employed based on family ties, friendship, their ability to pay bribes and other illegal means (Akindele, 2005). The DisCos employ unqualified engineers with no basic knowledge of circuit diagrams and trouble shooting and these are some of the reasons why faults linger on for a long time (AllAfrica, 2016). In 2016, the Ikeja electricity distribution company fired 229 staff because they did not meet up with the performance assessment (Akano, 2016). This raises the question of what criteria did they use to employ them before realising they are not qualified. If such a large amount of staffs can be fired at once in the DisCo, it clearly shows that the organisation do not have enough qualified staffs as the 229 were working in the organisation but not qualified, hence, affecting the distribution of electricity negatively. (Akano, 2015), states that the poor supply of power currently being experienced by its network is the inability of the technical staff to access Business units, undertakings offices and substations. There has however been an improvement in terms of the number of qualified engineers hired by PCHN for DisCos compared to the number hired by NEPA where it hired no engineer for 16 years (African Leadership Magazine, 2015). In this area, there is still much work to be done. (Obioha, 2015) states that the Benin DisCo in December 2015 employed 121 engineers as trainees and if this can be done consistently and effectively, it will go a long way to solve the problems related to lack of expertise. These are management problems under organising and leading as they allow unqualified personnel to take up jobs for which they are not qualified to perform or even passionate about, thus high rates of inefficiency of service. Lack of qualified personnel also make it difficult for the qualified engineers to be able to contribute in solving technical issues like giving technical advices, repairing broken grids and meters and actually doing proper field work and all these leads to revenue leakages and ineffectiveness (KPMG, 2013: 24).

4.4 Leadership Stability

From 1999 to 2016, Nigeria has had 7 ministers of Power; the table below will show the various ministers of powers that have acted as ministers in the power sector from 1999.

TABLE 4.4 Nigeria former and present power ministers with their years in office

Power ministers from 1999 to 2016	Years in office
Bola Ige	1999 – 2000
Olusegun Agegu	2000 – 2002
Liyel – Imoke	2003 – 2007
Rilwan Lanre Babalowa	2008 – 2010
Barth Nnaji	2011 – 2012
Chinedu Nebo	2013 – 2015
Babatunde Fashola	2015 – present

Source: Alabadan et al, 2016

According by (Alabadan et al. 2016), Nigeria has witnessed one of the highest turnover of power ministers from 1999 TO 2016. As seen on the table above, 7 ministers have occupied the position of the power minister within this period with each averaging 2 year and 4 months in office. As seen on the table, ministers like Bola Ige and Barth Nnaji lasted just a year in office. The effect of this short terms in office and constant changing of ministers is that policies implemented by one minister is being abandoned by the next minister and this tend to have a negative effect on the way the organisation function. The ministers being reshuffled out of the cabinet does not mean that they did not attempt to solve the problems but that their attempts were not good enough to take Nigerians out of the doldrums of constant load shedding and darkness in many parts of the country (Alabadan et al. 2016). This constant change of ministers shows instability in the leadership and hence a negative effect in the sector.

TABLE 4.4.1**President and years in office from 1999 to present**

Presidents from 1999 to 2016	Years in office
Olusegun Obasanjo	1999 – 2007
Umaru Musa Yar’Adua	2007 – 2010
Goodluck Jonathan	2010 – 2015
Muhammadu Buhari	2015 – present

Source: EarlyFace Group of Nigeria, 2016

The president of the Federal Republic of Nigeria is the Head of state of the country and has a very vital role to play with decision making with regards to the power sector (EarlyFace Group of Nigeria, 2016). Nigeria has had 4 presidents since independence in 1999 to present making it an average of 4 years in office. There are many policies that take 8 to 20 years to be accomplished and the constant change of leadership has affected various long term policies put in place. An example of such is the Presidential Action Committee on Power (PACP) which was created and chaired by the former president Goodluck Jonathan. This PACP was made up of his Vice president and other ministers who have a role to play in the reform of the power sector and the task of the PACP was to remove red tape and cut through bureaucracy in decision making (PTFP, 2013). The PTFP was also created as part of it for the day to day planning, developing and driving forward the reform plan for the Nigeria Power sector (PTFP, 2013). Goodluck Jonathan lost the presidential election of 2015 and consequently him, his vice and ministers were changed when the cabinet reshuffled in 2016. Many of the policies have being abandoned as the new president and his Power ministers have come up with their own plans and strategies. This clearly shows how the constant change of leadership in Nigeria affects the PHCN and the DisCos negatively and hence, the distribution of electricity in Nigeria.

From the organisational climate theory of Kurt Lewin discussed in chapter 2, it can be seen that Nigeria, the PHCN and the DisCos are operating in a turbulent environment. This is evidential by the constant change of power or leadership that affects the c\conomy negatively. The interdependence of one sector to the other and the growing economy are also reasons for this.

4.5 Institutional Ability

As already noted in earlier sections of this chapter, organisations are set up with specific goals and objectives which they seek to achieve. In order to achieve these goals, there is need for the management of the organisation to set out plans, organise and control resources such that both financial and human resources are combined to achieve these organisational goals and objectives. The constant reformation of the power sector in Nigeria saw the enactment of the (Electric Power Sector Reform Act) ESPR Act 2005. By this act the first independent regulatory agency - Nigerian Electricity Regulatory Commission (NERC) was inaugurated on the 31st of

October 2005 and the present one was inaugurated in December 2010 (NERC, 2016). NERC has the mandate to monitor regulate and create an enabling environment for effective and fair distribution of electricity. NERC assignment is further stressed in its mission statement which is to “promote and ensure an investor-friendly industry and efficient market structure to meet the needs of Nigeria for safe, adequate, reliable and affordable electricity (NERC, 2016). It should be recalled from above in the definition of electricity distribution that adequacy, reliability and affordability are key aspects of effective electricity distribution. In addition to this, NERC’s commitment to electricity distribution is further stressed in its vision which is to provide “electricity on demand” and its motto which is “keep lights on at all times” (NERC, 2016). Given that NERC is the agency in Nigeria monitoring PHCN’s distribution activities, this section will focus on evaluating its managerial aspects.

Like any organisation, NERC has goals and objectives. For purposes of this study, the two goals of its four goals referring to electricity distribution will be discussed. The organisations very first goal *GOAL 1 is to ensure uninterrupted electricity.* (KPMG, 2013) notes that, constant and reliable electricity supply is critical to the growth and development of the Nigerian economy. Thus, as an agency whose mandate includes ensuring effective distribution of electricity, NERC should be applauded for having this goal as its first goal amongst its 4 goals. The question is if the organisation is achieving this goal and if not what are the managerial issues that contribute to its inability to achieve this goal. With regards to this goal, the CEO of the commission, Dr. Sam Amadi notes that, their main objective is to ensure that the distribution of power covers a wide national footprint to maximise access to electricity in Nigeria. The second of NERC’s goals which makes reference to electricity distribution is its *GOAL 3 which is to ensure consumer protection.* In modern day management, consumers are regarded as the most important aspect, thus organisations seek to ensure consumer satisfaction which is basically an effort to keep the consumer happy at all times (Wren & Bedeian, 2009:16). Again, NERC can be applauded for including goals which consider the protection of consumers given that it is a government agency. As indicated above, there is still the question of how well this goal is being achieved. This goal also includes ensuring that consumers fulfil their obligation of paying their electricity bills.

With regards to the plans, organisation, execution and control mechanisms that have been put in place to ensure that these goals and objectives are achieved, the NERC in order to achieve these goals has engaged in the following

- Addition of new regulations that enable the nation to get safe, adequate, reliable and affordable services in the distribution of electricity. Such regulations include the invitation of more investors in the distribution of electricity such that they can meet the increase in electricity demand.
- Establishing fair pricing rules
- Constantly communicating with consumers to ensure they understand their rights and obligations
- Ensuring materials on consumer rights like service and safety are up to date, available and readily accessible.
- Establishment of an effective dispute resolution mechanism to guarantee consumer protection while also encouraging private sector participation

This clearly shows that there have been efforts at ensuring efficient distribution of electricity in Nigeria but the efforts are not sufficient as there are still many management challenges affecting the distribution of electricity as has been stated earlier.

4.5.1 Efforts that have been made by the Nigerian government to improve the distribution of electricity: Issues and Successes

The president of the Federal Republic of Nigeria, in March 2000 set up a Technical board made up of 9 people with full executive power. One of this board's mandates was to ensure uninterrupted power supply in the country by December 2001. However, there are still concerns that raise the question of how effective this board is. This is because; reviews made in 2002 described the supply of electricity in Nigeria as very unreliable (Amoda, 2013). The board was also tasked with the restructuring of PHCN such that present day realities of more private sector participation in the industry are met. This Mandate however seems to have been fulfilled in the past years as there is a minimal amount of private sector involvement in sector (Muhammed,

2005). The board has also been greatly acknowledged for proposing and implementing the first ever division of PHCN into functional parts of Generation, Transmission and Distribution. Jones, 2003) however notes that, Nigeria is blessed with an abundance of energy resources for the production of electricity. He emphasizes that there is still need for a good plant mix to provide for contingencies to ensure a stable and secure supply of electricity and investment to harness these resources to establish a strong and reliable power supply system. In order to meet the social, economic and technological demands of the 22nd century it is imperative to boost electricity consumption in Nigeria. Additional power stations are to be built to meet the projected power demand.

Other technical concerns identified which can be rectified at management level include the inability for PHCN to transmit enough generated power supply to Nigerian consumers. Even though this is problem directly affects the transmission of electricity the distribution of electricity cannot be effective with inadequacy in transmission. There needs to be a prioritisation of allocation of funds to increasing the number of grid lines and the number of transformer substations.

With the current reformations in Nigeria's power sector, the electricity distribution network has experienced very rapid growth especially with progressive rural electrification policy of the Federal Government. Most urban areas are developing very fast and power demand is on the increase. In terms of efficient and adequate supply however, numerous problems hinder the performance of PHCN. According to (Caven, 1998: 39-41) residential areas in some cities have suddenly been transformed into commercial centers thereby overloading the existing power supply facilities thus necessitating managerial action which cannot be immediately provided. The high cost of distribution materials has limited the ability of the Authority to cope as most urban planning and developments are carried out with prior information to the Authority to plan and provide the requisite electricity supply information. (Caven, 1998: 48) and other authors have identified in recent studies, the problems that hinder the smooth distribution of electricity in Nigeria by PHCN and its subsidiaries. These issues include *delayed rehabilitation of plants and power supply equipment* as (Shomulo, 2005) notes that every plant PHCN has now was ordered and built between 1965 and 1990. The concern here is that the bulk of the equipment may also need to be replaced within a few years of one another and this may pose funding problems for

management. Another issue identified is the *Lack of spare parts and the quality and availability of maintenance personnel*. Because of all these problems enormous amount of foreign exchange is required to rehabilitate and repair plants as well as provide running spares for scheduled maintenance. Rising inflation and scarcity of FOREX (largely as a result of stiff foreign exchange policy) constituted nightmare to PHCN Management (Caven, 1998:39).

This chapter is the last chapter of this dissertation and it is comprised of the summary of the chapters that have been presented earlier, summary of the findings, recommendations and the conclusion



Chapter 5

Summary of chapters, Findings and Recommendations

5. 1 Summary of the previous chapters

Before proceeding to this last chapter, it is important to give a summary of the previous chapters so as to recall what was discussed earlier. Chapter one of this dissertation started by bringing out the state of electricity distribution in the world and in Nigeria. The researcher went further by stating the research problem which is the management challenges affecting the distribution of electricity in Nigeria. In this chapter, the research questions, research objectives and the significance of the study were clearly brought defined.

Chapter 2 is the literature review where the literature available on the management of electricity distribution in Nigeria is been discussed. In this chapter, key concepts such as electricity, electricity distribution and management are clearly explained. The Swot analysis is used to describe the various management functions that are used to determine how effective the management is. The conceptional frameworks used are the organisational climate and the expectancy motivational theory. Focus is on the organisational framework theory where Nigeria was seen to be in a turbulent environment among other climates in the theory. Electricity distribution in sub Saharan Africa and the legislative framework are also discussed.

Chapter 3 of this dissertation discusses the research method and design used in carrying out this research. The research is a desk top research in which secondary data only is used in carrying out the research. Data used in the research is obtained from the internet, text books, newspapers, government gazettes and journal articles.

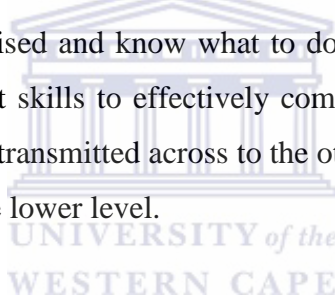
Chapter 4 of this research is data presentation and analysis. Data is presented and analysed in this chapter. Factors that relate directly and indirectly to management that affects the distribution of electricity in Nigeria are presented and analysed.

5. 2 Summary of Findings

This section will present a summary of the findings that have been found during the course of carrying out this research. In general, the findings showed irregularities from the management perspective in the process of distributing of electricity in Nigeria.

5.2.1 Weak leadership

It is deduced from this research that the leadership in place to ensure efficient distribution of electricity in Nigeria are not organised and this has greatly affected the outcome. Leadership here include the leadership of PHCN and its task agencies, and also the leadership of the various distribution companies across the country. Good leaders must have good management skills and this is the problem here as the research brought out evidence that many of the leaders responsible for handling the distribution of electricity in Nigeria are not really efficient in carrying out their duties. The leaders are not effective and it makes it difficult for the subordinates to get the job done. An effective leader is organised and know what to do and how to lead its sub ordinates. They do not have the management skills to effectively communicate information across and if the communication is not properly transmitted across to the other staff members, it makes it more difficult for things to be done at the lower level.



5.2.2 Inadequate planning from the management

After carefully analysing the findings, it is seen that the management of the distribution companies do not do proper planning on running the organisation. Proper planning brings out effective results. Evidence of lack of proper planning is seen with lack of qualified man power (experts) to carry out the activities of the distribution companies as many areas are seen with broken reading meters and connections and are not repaired on time. Failure in planning is also seen by the inability of the distribution companies to supply enough electricity to its locations as many of their allocated areas for distribution still do not get enough electricity. Although this is partly because they do receive enough from the transmission companies to distribute, other reasons which is from management shortcomings include inability to repair broken cables that are responsible for distribution, communication channels between consumers and the distributors are not organised and the consumers cannot easily lay their complains and their complains are not easily solved. Furistic planning is very important and the research found out the lack of proper furistic planning in running the organisation so as to meet up with future demands and

challenges. In planning also, the issue of the distribution plants been outdated that cannot properly distribute enough electricity to the amount of people that need electricity also shows a shortcoming on the management of the distribution companies and PHCN are to supposed to plans way ahead for the future so as to ensure that the equipment's available are relevant and has enough capacity to cope with the increasing demand

5.2.3 Insufficient funding

After analysing the findings, it was discovered that enough is not been done by the distribution companies to attract funding and this is a management challenge. Funding is very important when running any organisation and without adequate funding, the organisation is bound not to function properly. The management and leaders of the distribution companies ought to set up a committee that is able to draft proposals that can attract enough funding both nationally and internally. But this is not the case as there is a need for funds and this signifies a failure in the part of the management. Revenue is also gotten from the consumers who pay for their services and most of the consumers do not actually pay for the services because they are not happy with the services they receive. Most of the times, consumers do not have electricity as there is always interrupted power supply in many part of Nigeria. This makes them to always boycott the payment of electricity bills. Also, there is the constant complain of the distributing companies issuing out wrong electricity bills and the consumers then boycott to pay their electricity bills. This is not good and does not make the distribute companies to generate enough profits and hence it shows inefficiency on the part of the management of the distribution companies and the PHCN as a whole

5.2.4 Insufficient skilled labour / expertise

Beginning with PHCN down to the distribution companies, there is the issue of insufficient qualified personnel or engineers who are actually experts in the field. Many people are been given the job due to family ties, friendship ties and for political reasons and this creates a big gap in the organisation because there are many staffs available who do not know the technicality of their job and this affects the distribution companies negatively. This is seen as a shortcoming on the part of the management because it is the management responsibility identity, attract and bring on board qualified personnel who know the technicality of the department and can greatly

contribute to the organisation with their vast skills. However, this has not been the case because instead of hiring those with qualified skill labour, employees are rather employed base on family, political and friendship ties. The research shows that the insecurity at certain parts of the country also make foreign expertise to shy away from taking up jobs in the country. This is greatly affecting the growth of the organisation as proper job is not done and there is not enough skill labour to carry out the necessary operations needed.

5.2.5 Corruption

It is very difficult to discuss challenges of big organisations in Nigeria without mentioning the issue of corruption. Corruption is a big problem in Nigeria and it has affected many organisations in Nigeria negatively and the DisCos are not an exception. From the analysis and findings, it can be seen that corruption here ranges from the management employing staffs that are not qualified either by receiving bribes, family or social ties (nepotism), embezzlement of funds allocated for the organisation and diverting resources that are meant for the organisation and the public into personal use. These are some forms of the corruption that are existing within the distribution company (DisCos) of Nigeria and this shows that there is a shortcoming on the part of the management of the DisCos as the management is supposed to organise and control its organisation in such a way that corruption is minimised. In summary, the research found out that corruption was a vital problem affecting the distribution company negatively and the management has failed in its responsibility as leaders to ensure transparency within the organisation. Transparency for example can be seen by the fact the clients keep complaining about the DisCos giving them wrong meter bills and over charging them with bills that are not theirs.

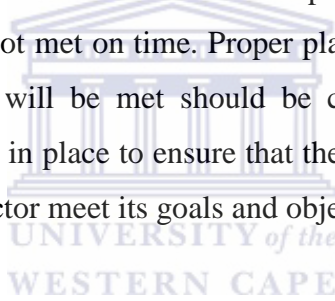
In summary of the findings, the research found out that the management of the DisCos and the PHCN has a lot of shortcomings and downfalls and this has negatively affected the organisation as it is evidential on its output and efficiency. Hence the next section will bring out some recommendations that I think is necessary for the organisation to implement in order to boost its output and efficiency.

5.3 Recommendations

After carefully analysing the data and bringing out the findings, the research shows a lot of inefficiency and shortcomings on the part of the management and hence, this section give recommendations that the researcher thinks will be beneficial to the management and the organisation as a whole to turn things around.

5.3.1 Proper planning in order to meet up with goals and objectives.

A major challenge that has affected the electricity sector and the distribution of electricity is insufficient planning and implementation of plans. The sector and the DisCos are faced with depreciated infrastructures that cannot actually carry out the required capacity needed by the whole of Nigeria due to the fact that the management of PHCN and the DisCos did not engage well on futuristic planning so as to overcome the challenges ahead. Issues of depreciated building, insufficient funds, insufficient resources are all due to no proper planning and hence objectives of the PHCN and the DisCos are not met on time. Proper planning on how the organisation will be run and how their objectives will be met should be clearly outlined and monetary and evaluation structures should be put in place to ensure that they are being implemented. This will go a long way to ensure that the sector meet its goals and objectives in the short and long run.



5.3.2 Proper engagement with the consumers regarding their challenges.

The main reason that has caused a breakdown of communication between the management and the consumers is that there is no proper engagement with the consumers. Consumers feel neglected as their complaints are not taken too seriously. They keep having interrupted electricity bills, broken meters, wrong bills given to them and when they complain, nothing or little is actually done to help solve the problem and this has made many of the clients to lose faith on the DisCos and PHCN as a whole. This is evidential by many boycotting payment of bills, constant vandalism and destruction of pipelines and distribution channels, and riots. Hence, it is very important for the management and leadership to engage properly with the consumers.

5.3.3 Increase awareness of other solar panels

The major challenge that the DisCos are facing is meeting up with the increase in demand of electricity. As has stated earlier, Nigeria population has increased over the years and this did not increase with the supply of electricity due to failure to plan properly for the future. Hence, demand has exceeded supply. The government should therefore find ways to engage in subsidizing other solar panels and increasing the awareness of these solar panels by advertisement. This will reduce the burden for the demand for electricity and it will reduce stress on the management. Types of solar panels that might be considered are monocrystalline, polycrystalline and the amorphous/thin film panels (Turner, 2007: 49). If the management and leadership of the DisCos can persuade the government into subsidizing these other forms of solar panels and successfully improve their awareness, this will go a long way in solving many of the challenges the management of the DisCos and the PHCN at large are going through.

5.3.4 Attracting qualified skill labour

As discussed earlier, a major challenge that has hindered the growth and successful running of the DisCos and the PHCN is the lack of qualified skill labour. The management and leadership of the PHCN and the DisCos have to find a way to attract qualified skill labour to the industry. This can be done through properly advertising positions, adjusting the wage/salary so as to attract both national and international experts who are able to improve the industry and creating an environment where the technicians will feel safe and secured. The presence of experts and sufficient qualified skill labour will greatly improve the organisation because their inputs will be very vital in turning the organisation around as they are experts of the field and they know what they are doing. This will improve efficiency and output of the organisation positively

5.3.5 Organising workshops/training programmes for staffs

Another means for the management and leadership of the DisCos to be effective is by organising workshops and training programmes for its staffs. There is the need for the DisCos to organise workshops and training programmes to its staffs at various times of the year. These seminars and workshops should be meant to constantly remind the employees on what to do, train them on new ideas/innovations and allowing them to contribute to the organisation by expressing themselves and bringing their own ideas and suggestions out. With these seminars and workshop programmes, it will help both the management and the employees to interact and the new ideas

and training from experts will also make the organisation to improve its efficiency because it will enlighten the staffs and will function with a more direct focus

5.3.6 Dealing with the issue of corruption

Another recommendation that will be proposed in this research is for the leadership and management of the DisCos and the PHCN to design means or ways to deal with the issue of corruption. From the findings, it can be seen that corruption in the forms of embezzlement of funds, nepotism, illegal issuing of tender and receiving of bribes are the main reasons why the electricity sector of Nigeria is actually facing the challenges it is facing today. If the management can design methods to tackle the issue of corruption, it will go a long way in making the DisCos and the PHCN to move forward. Some of the ways that can be implemented to fight against corruption here include proper auditing of the DisCos, deals within the organisation should be done transparently (transparency), penalties and punishments should be put in place for those caught in acts of corruption and there should be proper supervision and check at the different levels of the DisCos. These, together with others will go a long way in fighting corruption and this will improve the efficiency of the organisation.

5.3.7 Management should develop means to encourage their staffs by putting performance bonuses in place

In order for the management and leadership of the DisCos to improve efficiency and effectiveness within the organisation, it is very vital and important for them to cultivate the habit of appreciating their staffs and experts by encouraging them with incentives. This will make them feel very important in the organisation and it will definitely improve the working condition which will in turn improve the overall output and efficiency of the organisation in the long run.

The management can design performance bonuses in the form of monetary cash, vouchers, and even gifts. This can be done monthly or quarterly depending on how the staffs and experts perform. This will greatly encourage the staff to strive to do more knowing very well their efforts are being noticed and encouraged. This will also encourage healthy competition among the staffs and management and it will go a long way in improving the efficiency and effectiveness of the DisCos.

5.3.8 Monetary and Evaluation structure should be put in place

The research found out that enough is not done to ensure the implementation process. PHCN and the DisCos should set up a qualified Monetary and Evaluation team that ensures that activities are done and that they are actually done on time. An efficient Monetary and Evaluation team will ask questions like who does what? at what time? if it is actually done. With an efficient Monetary and Evaluation team in place, they will always evaluate to ensure that implementation is actually done and not just anyone doing what they feel like doing. With an efficient Monetary and evaluation structure in place, issues like insufficient planning and corruption will be very limited.

5.4 Conclusion

Drawing from the various secondary data collected from the internet, books, government gazettes, published articles, newspapers and journals, this study demonstrated the processes of the distribution of electricity in Nigeria from the management perspective. The results obtained shows that there are a lot of flaws and shortcomings from the management point of view which has greatly affected the effectiveness and efficiency of the distribution of electricity in Nigeria negatively.

Moreover, the study has shown that other factors linking to management directly or indirectly has a vital role to play in the way the DisCos are been run and this has a great effect on its effectiveness and efficiency in distributing electricity to the people of Nigeria. The effectiveness of the DisCos has a direct relationship on the way they are been managed. This involves the policies that are in place or that have been drafted by the management and the leadership of the PHCN and the DisCos. Hence, the leadership and management of the PHCN and the DisCos should be aware and take note of the policies that are put in place as these policies, when implemented will either negatively or positively affect the distribution of electricity by the DisCos.

Given that this study has generated a new perspective to the understanding of the distribution of electricity in Nigeria from the management perspective, it is envisaged that the policy recommendations given will give support both in Nigeria and internationally to the policy

makers and the management of the electricity sectors and the DisCos in Nigeria in their efforts to ensure efficient and effective distribution of electricity.



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